Countries of the Greater Mekong ready for the “last mile” of malaria elimination
ABBREVIATIONS

ACT  artemisinin-based combination therapy
CIFIR  case investigation, foci investigation and response
COVID-19  Coronavirus disease 2019
eCDS  electronic communicable diseases system
FTAT  focal testing and treatment
GMS  Greater Mekong subregion
GPARC  Global Plan for Artemisinin Resistance Containment
G6PD  glucose-6-phosphate dehydrogenase
HPH  health promoting hospitals
iDES  integrated drug efficacy surveillance
IMPE  Institute of Malariology, Parasitology, and Entomology
IPT  Intermittent preventive treatment for travellers who visit malaria-
Lao PDR  Lao People’s Democratic Republic
MEAF  Malaria Elimination Action Framework (Cambodian)
M&E  monitoring and evaluation
MME  Mekong Malaria Elimination programme
MMP  mobile and migrant populations
MMW  mobile malaria workers
NIMPE  National Institute of Malariology, Parasitology, and Entomology
NMP  national malaria programme
PPE  personal protective equipment
QGIS  quantum geographic information systems
RAI  Regional Artemisinin-resistance Initiative
SDG  Sustainable Development Goals
SOP  standard operating procedure
TDA  targeted drug administration
WHO  World Health Organization
KEY MESSAGES

• Despite the emergence of the COVID-19 pandemic, all countries of the Greater Mekong subregion (GMS) have continued to achieve great progress towards the malaria elimination targets outlined in the GMS strategy. Between 2012 and 2019, the number of malaria cases in the six GMS countries fell by 83%; malaria deaths fell by 95% over the same period. The annual reductions in cases and deaths surpassed those of previous years, which is commendable given the context and challenges faced by all countries in 2020.

• There continues to be a steep decline in the presence of *P. falciparum* malaria cases – a primary target in view of the ongoing threat of antimalarial drug resistance. In the first nine months of 2020, *P. falciparum* cases dropped by 67% in the GMS compared to the same period in 2019.

• Over the last year, Cambodia, the Lao People’s Democratic Republic and Myanmar have accelerated and intensified their malaria elimination efforts. In the next 12 months, it is expected that similar intensive elimination efforts will be adopted by all GMS countries.

• In the face of the dual challenge of antimalarial drug resistance and COVID-19, the GMS countries were able to maintain and even increase their malaria services in 2020. The risk of disruptions to malaria programming was generally avoided through the creation of country-led risk assessments and operational plans which ensured the adaptation and continuation of malaria activities.

• With less than 50 000 cases and 10 deaths reported across the subregion this year, GMS countries are now preparing to enter “the last mile” of malaria elimination. Recent efforts to combat resistance to antimalarial drugs have shown promising results, and the goal of eliminating *P. falciparum* appears to be within reach. As a result, the GMS countries recently revised their targets to eliminate *P. falciparum* by 2023. Maintaining this momentum will require more nuanced, proactive, and targeted approaches.

BACKGROUND

The past year has tested the resilience of malaria elimination approaches in the GMS. The countries of the GMS – Cambodia, China (Yunnan Province), Lao People’s Democratic Republic (PDR), Myanmar, Thailand and Viet Nam – continue to make significant gains in their efforts to eliminate malaria by 2030. Despite the rapid emergence and spread of COVID-19, all national malaria programmes (NMPs) have ensured that malaria control measures were not hampered or neglected.

As of October 2020, the GMS countries had reported 47 525 malaria cases and 10 deaths, representing reductions of 38% and 9%, respectively, compared to the same period in 2019 (77 196 cases and 11 deaths by October 2019). Concurrently, the subregion recorded 8550 *P. falciparum* cases by October 2020, a drop of 67% from the 25 856 cases recorded by October 2019. The gains accomplished by the end of 2020 are a testament to the strong support provided by all stakeholders to the respective NMPs.
Beginning in early 2020, a combination of regional and national health measures were put in place to address the pandemic. These have inevitably affected the operational modalities of the GMS countries and partners as they have adjusted procedures concerning prevention and case management services to maintain a safe environment for patients, clients, and staff. Despite the temporary lockdowns, all countries pursued their drug resistance monitoring activities through both therapeutic efficacy studies (TES) and/or integrated drug efficacy surveillance (IDES).

Routine TES have shown that drug-resistant *P. falciparum* parasites are still present but have not worsened nor expanded beyond the region. As countries have begun to adopt more intensive elimination approaches, the subsequent decrease in *P. falciparum* cases has meant that national stakeholders are transitioning from TES in favour of iDES. Revisions were also made in national treatment guidelines, in line with recommendations on second-line drugs and alternative artemisinin-based combination therapies (ACTs) from the 2019 TES meeting.\(^1\) Notably, NMPs, national regulatory authorities, partners and WHO Country Offices were able to jointly address operational challenges related to drug regulatory requirements such as drug importation/distribution, shortages of essential antimalarials (in some countries) and the need to fast track the registration for new ACTs.

All countries have continued to enhance their existing surveillance systems, providing more granularity, sensitivity and timeliness of data in order to guide their malaria activities, including outbreak responses. This has enhanced the quality of data captured within WHO’s Malaria Elimination Database for the Mekong. WHO continues to collect aggregate district and lower level data across all six countries and, from 2020, has increased the frequency of its epidemiology reports from a quarterly to monthly basis. The Malaria Elimination Database enables the GMS countries to strengthen surveillance, enhance monitoring and evaluation (M&E), and perform analyses on malaria distribution and trends.

The GMS countries continue to make promising progress towards the targets outlined in the *Strategy for malaria elimination in the Greater Mekong*.

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subregion (2015–2030). However, malaria programming has undoubtedly been affected by the emergence of COVID-19, which appeared in the region in early 2020.

The Mekong Malaria Elimination (MME) programme has supported surveillance activities by providing regular analysis on global stocks of malaria drugs and commodities as well as on activities, and by convening regular meetings on the risks and impact of COVID-19 on malaria services. These data-sharing and analysis exercises have supported all six countries in conducting risk assessments and later adopting operational plans to ensure the continuation of essential malaria services during the pandemic. The plans were developed in line with recommendations outlined in the WHO technical guidance document Tailoring malaria interventions in the COVID-19 response.

The dramatic experience and scrutiny placed on health programming as a result of the pandemic has also increased awareness and attention to the problem of malaria in the GMS. The unique situation posed by COVID-19 presented the MME programme with a “window of opportunity” to intensify and refine its malaria elimination approaches. The potential risk of mobile and migrant populations (MMPs) moving from non-endemic to endemic areas prompted countries to endorse more aggressive approaches. The emphasis has now shifted from country-based interventions to foci-based approaches which involve foci mapping and cleaning. During this period a number of countries have begun adopting malaria elimination intensification plans and more aggressive approaches which formalize these foci-based approaches.

All countries have been active in accelerating their malaria elimination efforts. Cambodia, Lao PDR and Myanmar have started implementing national intensification plans and more aggressive approaches in hotspots. In Thailand, malaria elimination activities are being increasingly mainstreamed and malaria programming continues to be integrated into the national health system. Viet Nam has also focused on strengthening its surveillance system in hotspot areas. This includes reporting all malaria

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cases within 48 hours followed by foci investigation and response in order to emphasize and expand early diagnosis and prompt treatment for forest goers and communities living at forest fringes.

**REACHING THE UNREACHED**

The current period has been marked by an increased focus on implementing strategies to support vulnerable and hard-to-reach populations – including forest goers and mobile and migrant populations. These populations are at the highest risk of contracting malaria as they are located in remote areas and tend to work and live in conditions that limit the effectiveness of standard vector control and case management approaches. Population movement has always been a challenge in malaria control and elimination programmes. The mass movement among endemic and non-endemic zones increases the risk of importing cases into malaria-free areas and spreading drug-resistant parasites to new areas.

As part of their commitments to reduce malaria transmission among hard-to-reach populations, all countries have been engaged in accelerating their malaria elimination efforts. In the next 12 months, it is expected that all countries will continue implementing more aggressive approaches to reach the unreached in hotspots. The aggressive approaches will ensure a more agile and effective methodology for responding to local epidemiology efforts. These will align with priorities outlined in the 2030 Sustainable Development Goals (SDGs) and the World Health Assembly resolutions which call for health systems to place a special emphasis on the poor, vulnerable, and marginalized segments of the population.
Cambodia’s intensification plan covers seven provinces that account for over 80% of the country’s malaria caseload. The plan focuses on strengthening coordination, depleting parasite reservoirs in high-risk populations and ensuring full implementation of malaria interventions including more aggressive approaches. It has been developed in line with the Government’s Malaria elimination action framework (MEAF) covering the periods 2016–2020 and 2021–2025. Core actions include rolling out “test-and-treat services” for travellers to malaria-risk areas and MMPs by deploying 100 rural-based mobile malaria workers (MMWs) through active case detection in forested areas.

The crux of the strategy is a shift from a passive to an active case detection approach and the inclusion of MMWs, which allows for outreach to remote and forested areas. To achieve this, Cambodia is adopting a synergetic strategy, including vector control and rigorous case management. At the peripheral level, a team of four WHO epidemiologists support surveillance and case mapping and facilitate coordination among stakeholders. As part of the foci response, a further objective of the intensification plan is to implement more aggressive approaches for high-risk populations such as targeted drug administration (TDA) and intermittent preventive treatment (IPT) for travellers who visit malaria-risk areas.

The preventive treatment is a novel approach that targets high-risk populations before they are exposed to malaria. This requires a high level of collaboration and the active inclusion of MMWs, villagers living in forested areas, and leaders of remote communities. Their engagement will capture important insights from the people most affected by this issue and will create an opportunity for local communities to engage in malaria interventions. The MME programme will ensure that the findings that emerge from Cambodia’s preventive treatment approaches will be proposed to other GMS countries to consider for their own intensification efforts.

In June 2020 Myanmar stepped up efforts to reduce the number of *P. falciparum* cases in the hotspot townships and endemic forested areas. The initial approach has followed a similar model to Cambodia, with an emphasis on targeting rural forest goers through a combination of methods including active case detection through targeted screening and treatment; house-to-house visits to forest goers; and case investigation, foci investigation and response (CIFIR).

Due to the COVID-19 pandemic, WHO and partners have provided remote support to the country, including the provision of training on QGIS (quantum geographic information systems). In the second half of 2020, partners in Myanmar have begun to identify and determine high-transmission areas and select villages which will be supported by mobile malaria workers. In 2021, the MMWs aim to have two provincially-based epidemiologists to support both the NMCP and partners in the full implementation of malaria activities and aggressive approaches adapted to the country to accelerate malaria elimination.

Lao PDR has been implementing enhanced response (intensification) plans since mid-2019. These have included focal testing and treatment of all forest goers in 200 of the highest burden villages across 29 health facility coverage.

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4 Kampong Speu, Kratie, Mondulkiri, Pursat, Sihanoukville, Steung Ratanakiri and Steung Treng.
areas. These interventions were done in conjunction with the dissemination of information, education, and communication materials in collaboration with village chiefs. Outbreak alert thresholds were also incorporated into the malaria information system (DHIS2) in 2018, with aggressive, targeted response strategies linked to any breaches of these thresholds.

From 2021 Lao PDR plans to implement complementary enhanced response strategies to more aggressively target unreached forest goers. The additional strategies include the provision of forest packs which contain insecticide-treated nets, repellents and tailored information, education and communication materials; continued focal testing and treatments, such as weekly fever testing and/or testing of index case contacts of whole villages (such as households, neighbours or forest peers); the deployment of public health specialists/epidemiologists to support subnational data collection, surveillance and response; a combination of TDA and IPT for travellers to malaria risk areas; and weekly SMS reporting. Together, these actions will support Lao PDR towards achieving the goal of *P. falciparum* elimination by 2023.

**COVID-19 RESPONSES REFINE MALARIA ELIMINATION APPROACHES**

The COVID-19 pandemic has defined malaria responses in 2020, and is expected to continue to do so in the upcoming year. Although the GMS countries have been relatively successful in managing COVID-19 case numbers, the associated public health measures and border restrictions have put a strain on their existing health systems. All countries and partners have had to adjust programming to safely serve communities with malaria prevention and case management, in line with COVID-19 health measures. However, the increased perception of the risk of COVID-19 infections has also served as an opportunity to cement increased commitment to malaria elimination in the GMS. The success of these commitments is evident in the fact that malaria cases and deaths continued to decrease while testing remained steady between January and September 2020 when compared to the same period in 2019.5

Major disruptions were avoided, and all countries worked to ensure the supply of malaria drugs and commodities despite some global suspensions in production. One clear concern resulting from COVID-19 was the risk of the movement of MMPs into forested areas.6 The economic strain of COVID-19 resulted in individuals seeking alternative sources of income in forests, which posed a high risk to malaria elimination efforts. As a result, innovative local approaches needed to be explored to mitigate the risk of exposure for vulnerable and hard-to-reach populations.

Overall, the GMS countries were prompt and consistent in adapting malaria programming to the COVID-19 pandemic. In April 2020, the MME

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5 From 5 512 794 tests in 2019 to 5 465 838 tests in 2020
6 MMP are classified into five groups: seasonal workers, construction/mine workers, forest workers/goers, security personnel and border-crossers.
programme convened a meeting on the “Risk assessment of the potential impact of COVID-19 pandemic on malaria elimination efforts.” MME began hosting weekly (and later bi-monthly) update meetings with all GMS partners to provide analyses for strategic planning purposes, verify malaria activities, and assess the impact on stocks, key commodities and testing.

National and local programmes were requested to ensure the provision of core preventive and case management interventions for malaria. The MME programme facilitated the efforts of the GMS countries to realize risk assessments on the potential impact of the COVID-19 pandemic on malaria elimination. This led to all NMPs developing guiding documents or operational plans on how to adapt their malaria interventions in the context of COVID-19; the documents were developed in line with WHO’s technical guidance on Tailoring malaria interventions in the COVID-19 response. As a result, disruptions were avoided and all countries worked to ensure the supply of malaria drugs and commodities, despite some global suspensions in production. Emphasis was placed on supporting MMPs in order to ensure distribution of preventive measures for those reaching endemic areas. Going forward, MME partners will continue planning efforts to ensure commodity availability and that logistic systems will respond to any future disruptions.

FIGURE 3.
Malaria case distribution in the GMS (2019 and 2020)

Cambodia implemented a solid malaria response in early 2020, with the publication of an operational plan in April 2020 on ensuring continuation of essential malaria services during COVID-19 pandemic. The plan outlined clear objectives to avoid disruptions in activities and measures to support at-risk populations such as migrant workers returning from neighbouring countries and domestic migrants travelling to malaria-risk areas.

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7 Risk assessment of the potential impact of COVID-19 pandemic on malaria elimination efforts, virtual WHO meeting held on 20 April 2020.


In China, the National Health Commission initiated a campaign on National Malaria Day in 2020 calling for the simultaneous prevention of imported malaria and imported COVID-19 cases. As a result, the actions that were implemented to flatten the epidemic curve have concurrently been applied to imported malaria cases.

The COVID-19 outbreak has so far had minimal impact on malaria activities in Lao PDR. The Government was quick to adopt aggressive containment and travel restrictions to prevent infections from entering the country. These restrictions resulted in a slight downward trend in testing between April and May 2020, however, once restrictions were lifted, malaria testing rates in the country quickly returned to near-normal levels. A COVID-19 malaria risk assessment and mitigation plan was developed and incorporated into the national response plan for the pandemic. The plan has addressed the issues of COVID-19 surveillance among community health workers as well as accessibility and training on the use of personal protective equipment (PPE) for all primary health care workers and village malaria workers.

In Myanmar, the NMP has been active in communication activities to counter fear, stigma, and discrimination associated with frontline health workers that support malaria work at the field level. National partners have adapted by implementing virtual trainings and meetings to support the continuation of the malaria programme in the country.

At the height of the COVID-19 outbreak, Thailand also experienced disruptions in malaria activities relating to access to health services and mobility at the community level. However, the situation has since been resolved with standard operating procedures (SOPs) in place and the necessary PPEs secured.
COUNTRY PROGRESS

CAMBODIA

Cambodia continues to observe a reduction in malaria cases. During the first nine months of 2020, the country reported a 71% reduction in malaria cases compared with the same period in 2019 (from 26,258 cases to 7,719 malaria cases). Cases are mostly found along forested border areas in the north-eastern and south-western regions of Cambodia. Only 861 P. falciparum and mixed cases were reported during this period, which represents a 79% decrease from the previous year (4,177 cases were recorded by October 2019).

Following a peak in malaria transmission in 2017, Cambodia mobilized a Malaria intensification plan for hard to reach populations to halt and reverse this trend. The plan involved strengthening surveillance and implementing more aggressive interventions for travellers to malaria-risk areas and migrant populations. The aggressive approach, launched on 3 November 2020, includes a commitment to eliminate P. falciparum in malaria hotspots in six provinces through the distribution of treated mosquito nets and hammock nets; weekly house-to-house fever screening to ensure every person with a fever is tested for malaria and receives treatment if positive; and TDA as well as IPT for travellers who visit malaria-risk areas. In addition, the Government has continued to ensure universal access to preventive interventions, diagnosis and treatment.

With the rapid decline in P. falciparum cases, the remaining challenge is the elimination of P. vivax malaria which is now responsible for approximately 90% of all malaria cases. In 2020, the country started piloting qualitative glucose-6-phosphate dehydrogenase (G6PD) testing and a radical cure for P. vivax in four provinces. In 2019, a malaria programme review was conducted to assess Cambodia’s progress and identify challenges to accelerate elimination. The highest priority was given to the mobilization of the accelerated implementation of countrywide case-based and foci-based surveillance to eliminate drug resistant P. falciparum within the next two years.

In addition to these successes, Cambodia released the second phase of its Malaria elimination action framework which covers the period 2021–2025. The framework envisages achieving the elimination of P. falciparum malaria by 2023 and all species of human malaria by 2025. This will require reaching, tracking, and serving unreached populations affected by malaria and the introduction of innovative and more aggressive interventions, including TDA and IPT for at-risk populations. WHO has supported this framework by strengthening malaria surveillance and monitoring antimalarial drugs through the completion of TES and insecticide assessments.

10 Mixed cases include cases identified with more than one Plasmodium species.
12 Pursat, Kampong Chhnang, Battambang and Kampong Speu Provinces.
In terms of the COVID-19 response, Cambodia has focused on implementing guidelines from WHO’s risk assessment for malaria programming. The country has adopted its own operational plan which has minimized disruptions to routine programmatic activities and the supply chain of malaria commodities.

**CHINA**

China has reported no indigenous malaria cases for three consecutive years since 2017 and the process for WHO to certify China as malaria-free is ongoing. As elimination is a country-led process, China has started its subnational malaria-free verification from 2017 for provinces that have proven zero indigenous malaria cases for at least three years. The subnational malaria-free verification in each province consists of two steps, the technical verification and final verification, which each cover a different area of focus to examine the technical aspects of elimination and the overall managerial aspects (including multi-sectoral collaboration). By the first half of 2020, the country had completed the subnational malaria-free verification in all 24 malaria-endemic provinces. The national malaria elimination report and the national framework for preventing malaria re-establishment are under development.

Imported malaria cases are the main challenge in all areas of China. In 2017, 2018 and 2019, the country reported over 2000 imported cases annually. During the first nine months of 2020, China recorded a 52% reduction of imported cases in comparison with the same period of 2019 (from 1753 to 845). This reduction can partly be attributed to the measures that have been put in place to curb COVID-19 in the country, such as border closures, tracking of imported COVID-19 cases and efforts of the National Health Commission to jointly address COVID-19 and malaria elimination. In Yunnan Province, 120 imported cases were recorded by October 2020, which represents a 9% increase compared to the same period in 2019 (110 cases).

During the elimination phase, the “1-3-7” approach is still the key malaria surveillance and response strategy in China, whereby case notification occurs within one day, case investigation within three days, and foci investigation and targeted action within seven days. To address the imported malaria cases and accelerate elimination in the region, China (Yunnan Province) is actively seeking collaboration under the Belt and Road Initiative and the Lancang-Mekong Cooperation Mechanism. In recent months, the province has organized virtual meetings with counterparts in Lao PDR and Cambodia in order to identify potential areas of cooperation.

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13 Risk assessment of the potential impact of COVID-19 pandemic on malaria elimination efforts, virtual WHO meeting held on 20 April 2020.


16 The Belt and Road Initiative is a national effort proposed in 2013 to improve China’s global connectivity.

17 The Lancang-Mekong Cooperation Mechanism was proposed in 2016 to promote multifaceted cooperation at the sub-regional level among China, Cambodia, Lao PDR, Myanmar, Thailand and Viet Nam.
LAO PEOPLE’S DEMOCRATIC REPUBLIC

Lao PDR has continued to record a significant reduction of malaria cases, with a 61% decline in the first nine months compared to the same period in 2019 (from 5228 to 2015). The number of *P. falciparum* and mixed cases also decreased by 53% during the first nine months of 2020 compared to 2019 (from 1760 to 829). These achievements are a result of the ongoing integration of the malaria surveillance system as a core intervention at all levels of the programme, and the capacity for sub-national units to perform routine analytics and implement evidence-based responses.

One example of this is the improvement observed in active case detection mechanisms since 2018. In 2018, active case detection in Lao PDR accounted for less than 1% of both tested and positive malaria cases. By 2019 active case detection rose to 11% of tested cases and nearly 7% of positive cases. As of the end of September 2020, active case detection accounted for 13% of tested cases and 15% of all positive cases. This is in line with the "last mile of malaria elimination" approach, which requires countries to adopt more tailored and proactive methodologies.

By the second half of 2020, Lao PDR has also started phasing in a system of weekly case reporting from villages and health facilities with the highest malaria burden. This reporting method is part of a weekly outbreak alert system at the health catchment level that will allow the programme and partners to have more granularity, sensitivity, and timeliness in their malaria epidemic response.

In 2020 Lao PDR continued to conduct "enhanced response strategies" that were designed to complement existing core interventions (including outbreak response activities) by more aggressively targeting high-risk forest going populations in areas with the residual transmission of *P. falciparum*. Strategies for the enhanced response include bi-weekly focal testing and treatment (FTAT) for all forest going populations by village malaria workers and village heads in targeted areas; testing of all outpatients at high burden health facilities; the provision of G6PD rapid diagnostic tests at selected health centres; strengthened procurement supply management systems to prevent stockouts; and the provision of subnational technical assistance in high burden provinces.

Other key milestones achieved in 2020 include the completion of the malaria programme review, the findings of which informed the development of the next national malaria strategic plan (2021–2025). The national malaria treatment guidelines have also been revised to include an ACT as the new second-line treatment, as well as the registration of a third ACT. Procurement and supply chain management were strengthened substantially through the integration of logistic management information systems. There are now malaria commodity monitoring dashboards that monitor maximum and minimum supply levels of all antimalarials at the health facility level for the entire country, which will help reduce the risk of stockouts considerably.

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18 The 2021–2025 national malaria strategic plan will be available by the end of 2020.
MYANMAR

Myanmar has also achieved a steep decline in malaria morbidity and mortality. In the first nine months of 2020, the number of cases fell by 13% compared to the corresponding period in 2019 (from 37,850 to 32,955).19 Malaria cases continue to decline amid the COVID-19 pandemic. In 2019, *P. falciparum* and mixed cases had dropped significantly and only accounted for 49% of all cases. *P. falciparum* and mixed cases continued to decrease by 59% in the first nine months of 2020, compared to the same period last year (from 14,966 to 6,199). Despite the significant reduction in *P. falciparum* cases, an emerging challenge is the rising prevalence of *P. vivax* cases and unusual seasonal upsurge of *P. vivax* in some parts of the country.

Currently, more than 80% of malaria cases are located in 20 high burden townships. WHO is supporting the NMP’s *National strategic plan for malaria elimination (2021–2025)* to intensify malaria activities in hotspots of these townships. The plan is based on the recommendations of the external malaria programme review in 2019. Resources covering the programme for 2021–2023 have been mobilized through donor funding.

Since the beginning of 2020, Myanmar has strengthened its malaria surveillance system by changing to a web-based structure. Public sector entities such as other ministries and the military, as well as private sector health providers, will also be included in this surveillance system. In some townships, with the support of WHO and partners, real-time reporting through a mobile application has already started. The mobile application is able to conduct surveillance related to case management, notification, investigation, and classification.

Although significant progress has been made, there are remaining challenges concerning the high malaria burden in conflict-affected areas, and in provinces hosting hard-to-reach populations. The delay in reporting and physical meetings and trainings have been impacted due to the COVID-19 travel restrictions. Myanmar needs to accelerate its efforts to reach vulnerable populations such as forest goers, MMPs, communities living and working in plantation sites, and individuals that are exposed to outdoor malaria transmission. This is particularly concerning given the noticeable relapse in *P. vivax* malaria.

The NMP, with the technical assistance of WHO, has successfully mobilized financial resources from the the Global Fund to Fight AIDS, Tuberculosis and Malaria to mitigate the impact of the pandemic and implement guidelines to tailor malaria activities for Myanmar in the context of COVID-19. With the disruptions to surveillance, meetings and trainings, the NMP and its partners have promoted supervision of the field activities through mobile and online communications platforms. Remote supervision and alternate methods of data collection will continue to be deployed in areas with COVID-19 travel restrictions. In addition, partners will continue to prioritise the provision of community level malaria diagnosis and treatment services through the provision of both malaria commodities and PPE to health providers.

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19 Case numbers reported in Myanmar for 2020 may be subject to change.
THAILAND

Thailand has also recorded a decrease in the number of malaria cases, with a 21% decline from the first nine months of 2020 compared to the same period in 2019 (from 4462 to 3519). The number of *P. falciparum* and mixed cases also fell by 67% during the first nine months of 2020 in comparison to 2019 (from 594 to 197). Between 2012 and 2019, the country observed a 95% decrease in *P. falciparum* and mixed cases. These achievements are a result of the ongoing integration of the malaria surveillance system as a core intervention at all levels of the programme, and the capacity for sub-national units to perform routine analytics and implement evidence-based responses.

Currently, 35 out of Thailand’s 77 provinces have been validated as malaria-free. Thailand is committed to achieving the elimination of malaria by 2024 as outlined in the *National strategic plan for malaria elimination (2017–2024)*. An operational plan covering the period 2021–2024 has been approved, with the aim of achieving this target even earlier, particularly through the aggressive elimination of *P. falciparum*.

The key priorities of the plan include establishing a national reference laboratory, improving the quality of foci response activities, maintaining access to remote endemic areas through malaria posts, strengthening community systems through the inclusion of health promoting hospitals (HPH) in the diagnosis and treatment of malaria, and the integration of local administrative organizations at the sub-district level in order to sustainably allocate resources for malaria elimination.

Malaria elimination in Thailand is being increasingly mainstreamed into the general health system. The country continues to use integrated drug efficacy surveillance (iDES) and the “1-3-7” surveillance and response approach. Despite the reduction in cases, the Ministry of Public Health continues to consistently allocate a budget towards malaria each year – a positive sign of the Government’s commitment to the goal of malaria elimination by 2024. The integration of malaria programming into the national health system has involved the local administrative organizations and local governments at the subdistrict level. For example, in the southern endemic province of Yala, the local administrative organization has supported a budget increase of two million Thai baht towards malaria elimination activities.

Since early January 2020, when Thailand reported its first COVID-19 case, the Thai Government has initiated response measures in policy, budget, and management across many affected sectors. This has allowed the Ministry of Public Health to reallocate its health budget to the COVID-19 response with a focus on surveillance systems, case investigation, and public health prevention. As of October 2020, malaria elimination activities had returned to normal with the support of SOPs and PPE distributions.
VIET NAM

Between 2012 and 2019, Viet Nam reduced its malaria cases by 76% (from 19 638 to 4665). In 2019, the country certified 25 out of 63 provinces as malaria-free. In 2020, it is expected that 10 more provinces will gain this certification.

Following a slight increase in malaria cases between 2016 and 2018, Viet Nam has managed to reverse this trend since 2019. In the first nine months of 2020, there was a 64% drop in cases compared to the corresponding period in 2019. Although 18 provinces reported *P. falciparum* cases, only 10 provinces reported more than 10 cases. In total, *P. falciparum* and mixed cases dropped by 67% between January and 30 September 2020, when compared to the same period in 2019 (from 2165 to 715 cases).

In the past year, Viet Nam has focused on strengthening the surveillance system and capacity for early detection through both passive and active case detection in malaria hotspot areas. This method includes reporting all malaria cases within 48 hours followed by foci investigation and response. The Institute of Malariology, Parasitology, and Entomology (IMPE) Quy Nhon and the National Institute of Malariology, Parasitology, and Entomology (NIMPE) also sent rapid response teams to malaria hotspots in hard-to-reach areas to support local staff. As part of the efforts to improve the malaria information system, malaria focal points from all health facilities were trained on online reporting. Lastly, the country has completed the integration of its malaria information system into the electronic communicable diseases system (eCDS).

In Viet Nam, most malaria cases are predominately from MMPs and forest goers. The majority of cases are currently concentrated in hilly, forested areas in four provinces which account for nearly 68% of all cases. The remaining primary challenges include reaching the most vulnerable populations with quality malaria services, updating a national guideline on malaria diagnosis, treatment, prevention, and providing follow-up treatment to ensure effective case management. In November 2018, WHO conducted a joint mission with the IMPE in Quy Nhon to identify key determinants of malaria transmission among forest goers. This mission recommended the malaria programme should continue to emphasize and expand early diagnosis and prompt treatment among forest goers as well as communities living at forest fringes. The proposed actions included deploying mobile teams, conducting contact tracing of co-travellers, and working with the logging transporters on motorbikes to expand access to diagnosis and treatment. In 2020, the malaria programme began to implement the above recommendations in the pre-identified hotspot areas.

Since 2020, a new ACT, Pyramax®, has become available at all health facilities within the four provinces that have evidence of low efficacy of dihydroartemisinin-piperaquine (DHA-PPQ) in the treatment of *P. falciparum*. Pyramax® is currently the first-line treatment for *P. falciparum* in the provinces of Binh Phuoc, Dak Nong, Dak Lak, and Gia Lai.

20 Viet Nam recorded 3288 positive cases by 30 September 2019 and 1197 cases by 30 September 2020.  
21 The provinces are Gia Lai, Dak Lak, Phu Yen and Binh. 
22 Artesunate-pyronaridine
### National elimination plans and strategies in the GMS

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<td></td>
<td>National plan for malaria elimination in Myanmar (2016–2030)</td>
<td>Malaria eliminated by 2030</td>
</tr>
<tr>
<td></td>
<td>National strategic plan for malaria elimination (2021–2025) (upcoming)</td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td>National malaria elimination strategy (2017–2026)</td>
<td>P. falciparum malaria eliminated by 2023</td>
</tr>
<tr>
<td></td>
<td>Malaria Elimination operational plan (2021–2024)</td>
<td>Malaria eliminated by 2024</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>National strategy for malaria control and elimination in the period 2020 and orientation to 2030</td>
<td>P. falciparum malaria eliminated by 2023</td>
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<td>Malaria eliminated by 2030</td>
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### THE “LAST MILE” OF MALARIA ELIMINATION

The GMS countries continue to make promising progress in achieving the targets outlined in the *Strategy for malaria elimination in the Greater Mekong subregion (2015–2030)*. However, the emergence of COVID-19 has inevitably brought new challenges that have the potential to disrupt the momentum achieved in recent years.

National programmes, partners and the MME programme must remain flexible and innovative to adapt to the new environment and modalities as they work to eliminate malaria in the region. Approaches such as active case detection in Lao PDR have successfully pivoted the country from implementing routine mass interventions to more nuanced, proactive, and targeted approaches, which are a critical pre-requisite for the country to enter “the last mile” of malaria elimination.

Strong technical guidance is essential. In line with this, the MME programme will use financial support from the Global Fund’s third Regional Artemisinin Initiative (RAI3) to cascade a similar model to the Cambodian Malaria Intensification Plan in the four remaining countries of the GMS according to their specific needs, as well as political, epidemiological and social contexts. WHO epidemiologists and UN Volunteers will be
deployed at decentralized levels in hotspot areas to support NMPs and implementing partners, in collaboration with local authorities, to develop long term capacity to manage elimination surveillance systems and support coordination and implementation of operational activities.

MAP 1.

Regional map of malaria incidence by district (January to October 2020)

Active surveillance will become more crucial as the GMS countries enter the “last mile” of their malaria elimination approaches. MME’s Malaria Elimination Database will continue to play an important role in malaria surveillance. The database will become more dynamic and interactive in collecting, processing, and sharing the information more routinely at the subnational, national, and regional levels.

In order to harmonize analysis across all countries, MME will closely collaborate with NMPs to share more detailed data concerning malaria threats, insecticide resistance monitoring, and case mapping. The aim is to identify innovative strategies, avoid overlaps, inform rapid response programming, provide an alert system for regional outbreaks, and update the RAI Regional Steering Committee and Malaria Policy Advisory Committee. This will allow partners to adjust their work plans in accordance with any needs that are identified through the Malaria Elimination Database. MME will also facilitate coordination through the frequent publication of data, including monthly epidemiology summaries, surveillance bulletins, and partner activity summaries.
Recent regional workshops have also highlighted several tools and recommendations to accelerate malaria prevention, target malaria foci linked to forests, and contain any possible outbreaks. During the 2020 surveillance meeting, the Malaria Elimination Database was recognized as a key support tool for enhancing dialogue and data sharing within the GMS.\textsuperscript{23} During the meeting, MME committed to strengthening the database, ensuring a shift towards more regular data sharing, and the integration of more granular data and other datasets. As noted in the 2020 GMS TES meeting, WHO will also support countries to move towards elimination activities, particularly as they transition to iDES.\textsuperscript{24}

\textsuperscript{23} “Conclusions and recommendations” from the Third annual country surveillance meeting to facilitate malaria elimination in the Greater Mekong subregion. Meeting report to be published.

\textsuperscript{24} “Conclusions and recommendations” from the 8th GMS therapeutic efficacy studies meeting. World Health Organization. Meeting report to be published.
Number and breakdown of malaria cases in GMS countries (2012–2020*)

Cambodia

- Other
- Pf.
- Pf. + mixed cases

China (Yunnan province)

Lao PDR

- Other
- Pf.
- Pf. + mixed cases

Thailand

- Other
- Pf.
- Pf. + mixed cases

Myanmar

- Unknown
- Other
- Pf.
- Pf. + mixed cases

Viet Nam

- Other
- Pf.
- Pf. + mixed cases

* January to October 2020
Number of malaria cases in GMS countries (2018–2020*)

Cambodia

Thailand

Lao PDR

Viet Nam

Myanmar

* January to October 2020
Changes in *P. falciparum* and mixed cases from January to October 2019 and January to October 2020

Changes in *P. vivax* and mixed cases from January to October 2019 and January to October 2020

Monthly trend of malaria cases in GMS countries (1 January 2016–30 September 2020)
Early warning signs of *P. falciparum* resistance to artemisinin detected in Cambodia.

*P. falciparum* resistance to artemisinin first confirmed along the Cambodia-Thailand border.

Artemisinin resistance containment project, supported by WHO and funded by the Gates Foundation, initiated along the Cambodia-Thailand border.

WHO launches a Global Plan for Artemisinin Resistance Containment (GPARC). The GPARC sets out a high-level plan of attack to protect ACTs as an effective treatment for *P. falciparum* malaria.

WHO launches the *Emergency response to artemisinin resistance in the Greater Mekong subregion, Regional framework for action 2013-15*, and establishes a regional hub in Phnom Penh, Cambodia, to coordinate multi-partner action.

The WHO Malaria Policy Advisory Committee recommends the adoption of the goal of elimination of *P. falciparum* malaria in the GMS.

GMS Ministers of Health adopt the WHO *Strategy for malaria elimination in the Greater Mekong Subregion*. The plan aims to eliminate *P. falciparum* malaria from the subregion by 2025 and all species of human malaria by 2030.

GMS Ministers of Health sign the *Ministerial Call for Action to Eliminate Malaria in the GMS before 2030*.

All species of human malaria eliminated in Yunnan Province, China.

*P. falciparum* malaria eliminated in all countries of the GMS.

All species of human malaria eliminated in Thailand.

All species of human malaria eliminated in Cambodia.

All species of human malaria eliminated in all countries in the GMS.
Countries of the Greater Mekong ready for the “last mile” of malaria elimination

WHO/UCN/GMP/MME/2020.05

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