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KEY POINTS

- With malaria a significant public health threat in Asia and the Pacific, the race is on to eliminate the disease in the Greater Mekong Subregion (GMS). Cambodia, the Lao People's Democratic Republic (Lao PDR), Myanmar, Thailand, and Viet Nam have all detected growing resistance to artemisinin-based combination therapies, the last line of simple-to-use and effective malaria drugs.
- In the past 15 years, GMS countries have been successful in reducing malaria, but more recently case numbers have largely flatlined in Viet Nam, and Cambodia, the Lao PDR, and Thailand have all experienced setbacks. Policy is moving from containment of drug-resistant parasites to total elimination of malaria in all five affected countries.
- The World Health Organization has a regional strategy for malaria elimination in the GMS. This calls for systems for robust case-based malaria surveillance across all GMS countries. When an alert system is in place and malaria is notifiable, making it a legal requirement for all health-care workers to report confirmed cases, it becomes easier to ensure that all malaria cases are detected, reported, and followed up.
- Achieving malaria elimination in the GMS will require robust systems for case reporting, investigation, and response in order to prevent the onward transmission of malaria. Information and communication technology (ICT) has a key role to play in this.
- Of 75 identified ICT health projects initiated across the GMS and geared to surveillance of malaria and other communicable diseases, only 19 were directly applicable to surveillance strengthening for malaria elimination. While digital health solutions have a key role to play, malaria elimination cannot be successfully supported by piecemeal measures and requires a robust digital health infrastructure backbone and, where appropriate, integration of vertical programs into mainstream health systems.
- The "1–3–7" reporting system implemented by the People's Republic of China incorporates a strict time frame for these activities and serves as a useful model for GMS countries to adopt and adapt.

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DIGITAL HEALTH INFRASTRUCTURE: THE BACKBONE OF SURVEILLANCE FOR MALARIA ELIMINATION

Strong health information systems hold the key to ending malaria in the Greater Mekong Subregion

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THE IMPERATIVE TO ELIMINATE MALARIA

Elimination of malaria is not only technically feasible but also a public health imperative. With millions of people at risk from the disease across Asia and the Pacific, and malaria imposing an even bigger burden in Africa, the race is on to eliminate the disease in the Greater Mekong Subregion (GMS). The area is of particular concern because of growing resistance to artemisinin-based combination therapies. Resistance to this last line of simple-to-use and effective malaria drugs has been detected in Cambodia, the Lao People's Democratic Republic (Lao PDR), Myanmar, Thailand, and Viet Nam.

Elimination of malaria is not only technically feasible but also a public health imperative.

What is malaria elimination?

Malaria elimination is "the interruption of local transmission (reduction to zero incidence) of a specified malaria parasite in a defined geographical area as a result of deliberate activities. Continued measures to prevent re-establishment of transmission are required."

What is malaria eradication?

Malaria eradication is defined as "permanent reduction to zero of the worldwide incidence of infection caused by human malaria parasites as a result of deliberate activities. Interventions are no longer required once eradication has been achieved."

Source: World Health Organization. 2016. *WHO Malaria Elimination Terminology.* http://www.who.int/malaria/publications/atoz/malaria-terminology/en/

Government policy in these five affected countries is moving from containment to elimination. All five have elimination plans in place, and their heads of government were among the signatories to the 2015 Asia Pacific Leaders Malaria Alliance (APLMA) commitment to rid the region of malaria by 2030.[1]

In the past 15 years, GMS countries have been successful in reducing malaria, largely attributable to scaling up of artemisinin combination therapies, rapid diagnostic tests, and vector control strategies, made possible with support from the Global Fund to Fight AIDS, Tuberculosis and Malaria from the early 2000s onward.

According to the World Health Organization (WHO), Cambodia, the Lao PDR, and Viet Nam have achieved a decrease in cases of more than 75% from 2000 to 2015 and Thailand a 50%–75% decrease.[2] Because of changes in diagnostic testing over time, the direction of trends in Myanmar before 2008 cannot be discerned, but the incidence of confirmed cases decreased by 68% between 2008 and 2014.

While cases and deaths in Myanmar have fallen dramatically over the past 5 years, case numbers have largely flatlined in Viet Nam. Moreover, Cambodia, the Lao PDR, and Thailand have all experienced setbacks. For example, reported case numbers in Thailand rose from 32,569 in 2012 to 37,921 in 2014. Certain population groups are at especially high risk for malaria (Figure 1). Similarly, in the Lao PDR the number of reported cases fell from 46,202 in 2012 to 38,131 in 2013, but rebounded to 48,071 a year later (Table 1). Available data also demonstrate the potentially epidemic nature of malaria transmission in the GMS—for example, in the Lao PDR case numbers in 2012 were more than 2.5 times higher than in 2011 following major malaria outbreaks in six southern provinces.

SUPPORT FOR MALARIA ELIMINATION IN THE GREATER MEKONG SUBREGION

Extra resources for targeted elimination along key sections of the Thailand–Cambodia border were mobilized through the Bill & Melinda Gates Foundation, which supported a containment project from 2009 following the emergence of artemisinin-tolerant *Plasmodium falciparum* parasites in this area. As potential resistance was detected elsewhere in the GMS,

Table 1: Confirmed Malaria Cases and Malaria Deaths in the Greater Mekong Subregion by Year

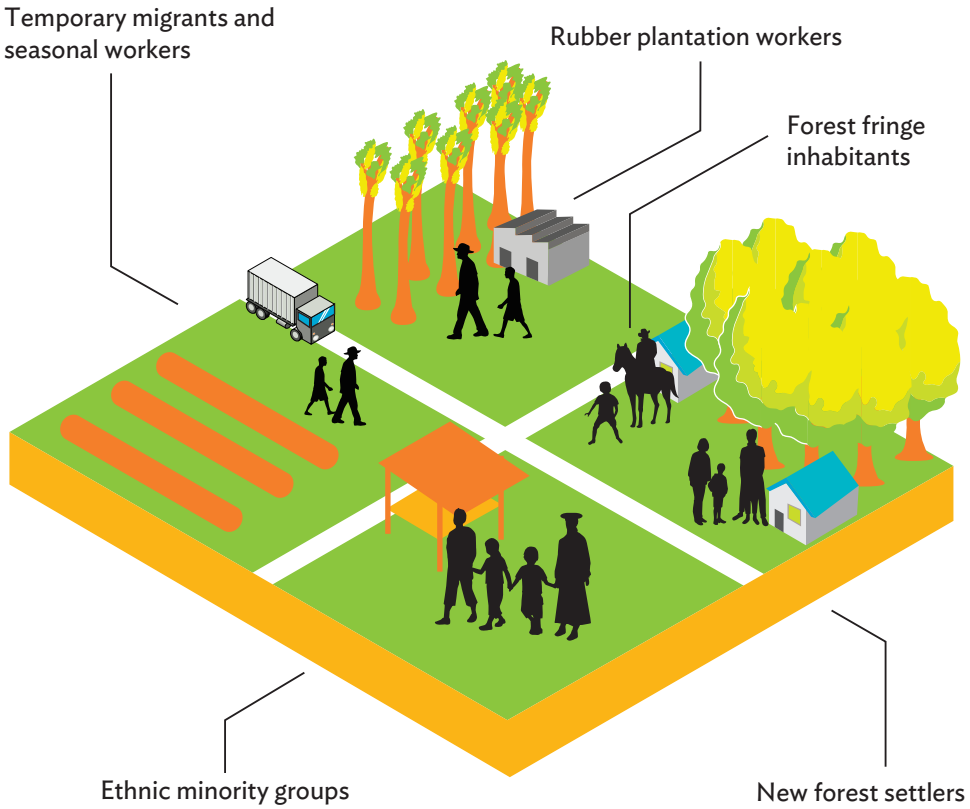
Health Facility	2010		2011		2012		2013		2014		Change (%)
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	
Cambodia	49,356	151	57,423	94	40,476	45	21,309	12	25,152	18	(49.04)
Lao PDR	20,800	24	17,835	17	46,202	44	38,131	28	48,071	4	131.11
Myanmar	420,808	788	465,294	581	480,586	403	251,273	236	152,195	92	(63.83)
Thailand	32,480	80	24,897	43	32,569	37	33,302	47	37,921	38	16.75
Viet Nam	17,515	21	16,612	14	19,638	8	17,128	6	15,752	6	(10.07)

( ) = negative, Lao PDR = Lao People's Democratic Republic.
Note: These figures represent confirmed malaria cases from health facilities and may not include cases reported by community health workers and the private sector.
Source: World Health Organization. 2015. *World Malaria Report 2015.* Annexes 6b and 6d.

[1] Asia Pacific Leaders Malaria Alliance. 2014. *Asia Pacific Leaders Malaria Alliance Malaria Elimination Roadmap: To Save More than a Million Lives and Deliver $300 Billion in Benefits.* http://aplma.org/upload/resource/files/APLMA_Roadmap_final_EAS_2015.pdf

[2] World Health Organization. 2015. *World Malaria Report 2015.* http://www.who.int/malaria/publications/world-malaria-report-2015/report/en/

Figure 1: High-Risk Groups



Source: S. Hewitt et al. 2013. Malaria Situation in the Greater Mekong Subregion. *Southeast Asian Journal of Tropical Medicine and Public Health.* 44 (Supp. 1). pp. 46–72.

the geographical scope of containment widened. A subregional action framework—the Emergency Response to Artemisinin Resistance—was initiated in 2013, and following a WHO review in late 2015 the strategic focus was realigned to support malaria elimination rather than containment of artemisinin resistance. Ambitious national elimination targets within the GMS reflect the seriousness of the current drug resistance problem, but also the fact that rates of malaria incidence in many parts of the subregion are now sufficiently low to make interruption of transmission a realistic objective. This switch in emphasis has been endorsed by ADB as a public health "best buy" and supported under ADB's Regional Malaria and Other Communicable Disease Threats Trust Fund.[3]

WHO has a regional technical strategy for malaria elimination in the GMS which is already being incorporated into country plans.[4] This calls for case-based malaria surveillance across all GMS countries and specifies the essential components of robust malaria surveillance systems (Figure 2). In addition, it recommends mandatory case notification and operational systems for epidemiological investigation and classification of cases, and foci in areas targeted for elimination.

Malaria elimination in the GMS presents unique challenges that countries must address, including the role of the private sector in health care; lack of access to high-risk groups, especially migrant and mobile populations; the importance of asymptomatic and/or low-density infections; and the increasing relative importance of *Plasmodium vivax*.

There are three principal approaches to malaria surveillance (Table 2). Typically countries use one or more of these systems to collect malaria data. To eliminate malaria, it is not enough just to know the total number of cases—information typically collected at the facility level and aggregated nationally on a monthly basis through a health management information system (HMIS).

[3] Asian Development Bank. 2015. *Malaria Elimination: An Entry Point for Strengthening Health Systems and Regional Health Security, and a Public Health Best-Buy.*
[4] World Health Organization. 2015. *Strategy for Malaria Elimination in the Greater Mekong Subregion 2016–2030.* http://iris.wpro.who.int/bitstream/handle/10665.1/10945/9789290617181_eng.pdf?sequence=1

Figure 2: Essential Components of Robust Malaria Surveillance

Source: World Health Organization. 2012. *Disease Surveillance for Malaria Elimination: Operational Manual.* http://www.who.int/malaria/publications/atoz/9789241503334/en/

It is also essential to identify, treat, and track individual cases. Disease-specific programs, including those tackling malaria, collect this information and can gather individual case and foci investigation and response data. However, this type of surveillance is often donor supported rather than government funded, and has limited scope for collaboration on data gathering with the private sector, where many patients are treated. When an alert system is in place and malaria becomes notifiable, making it a legal requirement for all health-care workers to report confirmed cases, it becomes easier to ensure that all cases are captured, and to conduct the necessary case and outbreak investigation and response to eliminate malaria.

DIGITAL HEALTH TECHNOLOGY AND MALARIA ELIMINATION

An inventory of current information and communication technology (ICT) applications in Cambodia, the Lao PDR, Myanmar, Thailand, and Viet Nam found there has been a plethora of digital health projects initiated across the GMS geared to surveillance of malaria and other communicable diseases (see Box, p. 6).[5] However, of the 75 activities captured by this exercise, only 19 were directly applicable to surveillance strengthening for malaria elimination. Approximately half of the activities focused on data collection and reporting, including

[5] Methodology: (1) Electronic literature searches to identify (a) malaria-specific mHealth projects outside the GMS and (b) any mHealth activities, regardless of health focus, within the GMS. Initial searches were carried out in PubMed and subsequently extended to include gray literature and web materials identified through Google Scholar and online directories and repositories [1-7]. (2) Country visits to Cambodia, the Lao PDR, Myanmar, Thailand, and Viet Nam. Interviews were conducted with a range of partners (local and international nongovernment organizations, international agencies, and donors) to obtain key data for the mHealth system directory and solicit views on the potential role of mHealth within national malaria elimination strategies. Partners were identified in advance through web and literature searches and existing networks of contacts. (3) Review of available strategy documents relating to malaria elimination, surveillance, and monitoring and evaluation at national and subregional levels. It is important to recognize that this constitutes a rapid landscaping exercise and as such the outputs should not be considered as an exhaustive mapping of all activities across the subregion, although it is unlikely that any malaria-specific activities were overlooked.

Table 2: Disease Surveillance Systems

Type	National	Frequency	Typical Primary User	Typical Characteristics	Uses
Health management information system Aggregated data from health facilities (can be split into hospital and other facilities)	✓	Monthly	Ministry of Health Planning Department	• Facility-level aggregate data for all diseases • Limited malaria data (number of cases) • No or very limited private sector • Government funded	• National level planning • National statistics • Monitor system performance (limited)
Disease specific Detailed data about a specific disease (malaria, tuberculosis, HIV)	Not always	Usually monthly but can be more frequent	Vertical programs such as malaria, tuberculosis, and HIV	• Vertical programs • Can be limited to specific geographical areas • Basic case-level data (line listing) • Data on interventions (bed nets, indoor residual spraying, behavior change communication, etc.) • Can include case and foci investigation and response data • Includes community health workers • Limited private sector	• Support program management and performance monitoring • Stratification • Targeted intervention • Case investigation and response • Donor reporting
Alert system Notifiable diseases, outbreaks, and health-related events	✓	Real time, 24/48 hrs, and weekly depending on disease	Country Centers for Disease Control and Prevention	• Notifiable diseases (by law) • Case-level data • Outbreak data • Case and foci investigation data • Includes private sector (for notifiable diseases) • Government funded	• Case investigation and response • Outbreak investigation and response

Source: Authors.

applications for national or subnational data reporting or data collection and reporting tools for frontline workers. Some focused on client education and behavior change communication, diagnostic and treatment support, decision support, and work planning and supply chain management. A number of activities also included an operational research element.

More than a third of activities identified in the landscaping exercise represent routine systems, but only three of the 35 mHealth activities (i.e., those that make use of cellphone technology) can be considered to be routine; moreover, the large majority of these are either pilot projects or projects currently in their development phase. There are currently no examples of large-scale/programmatic mHealth tools being used to support malaria surveillance in the subregion, although some relatively ambitious projects are being planned.

Notably, a number of mHealth application areas (e.g., tools to strengthen diagnostic services and support quality assurance systems, to provide training and education to frontline health-care workers in planning and scheduling, and to manage financial transactions and incentives) have been largely unexplored in the GMS context and there is scope to learn from non-GMS experience in these areas. The current landscape points to a variety of ways in which ICT could be better deployed in the GMS to support malaria elimination (Figure 3).

The need to go upstream

While digital health solutions have a key role to play throughout the health systems of all five GMS countries, malaria elimination cannot be successfully supported by piecemeal measures. Moreover, none of the existing information systems for vertical, disease-specific programs provides spatially and temporally specific data with sufficiently detailed case information to enable disaggregation by population group or classification by origin of infection—both essential elements for case investigation for malaria elimination.[6]

[6] Asian Development Bank. 2016. *The Geography of Universal Health Coverage: Why Geographic Information Systems Are Needed to Ensure Equitable Access to Quality Health Care.* http://www.adb.org/sites/default/files/publication/183422/geography-uhc.pdf

Box: Digital Health Solutions in Cambodia's Drive to Eliminate Malaria

Cambodia's routine systems use simple and sustainable technology. Its malaria information system database processes malaria data from village malaria workers, health facilities, and the private sector, and data relating to bed-net distribution and management. It collects individual case data for all patients seen by village malaria workers at public facilities and by selected private providers. The system enables village-level stratification based on incidence data and is linked to the country's HMIS data for 100% coverage and data cross-checking. These data are synchronized monthly by e-mail.

The system has been a standalone database since 2010, but now needs to be updated to a web-based system as Cambodia's internet connectivity has improved and as the country transitions from control to pre-elimination and elimination. Core registries allowing mapping of cases (for administrative divisions, villages, and health facilities) also need to be updated and maintained. This is essential for timely case investigation and response and easier linkage with other systems, such as the HMIS and a private sector database managed by the international nongovernment organization Population Services International. Cambodia is also working on improving its capacity to geo-enable its information to allow targeted case investigation.

Cambodia uses mHealth solutions only for gaps in routine system and special situations.

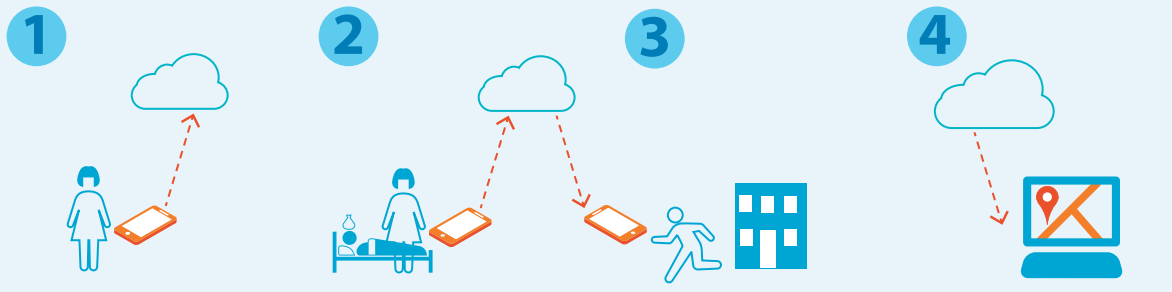
- Day 0: SMS and web-based technologies for real-time alerts from community health workers to enable rapid response (Box figure).
- Stock-out system: monitoring of malaria drugs at health facilities using simple SMS- and web-based technologies to minimize incidence of medicines being out of stock.
- SMS referral system to monitor private sector referrals to the public facilities in a containment zone.

All systems are free to users through an agreement with the telecommunications companies.

The development of mHealth solutions in Cambodia holds several important lessons for other countries looking to do the same.

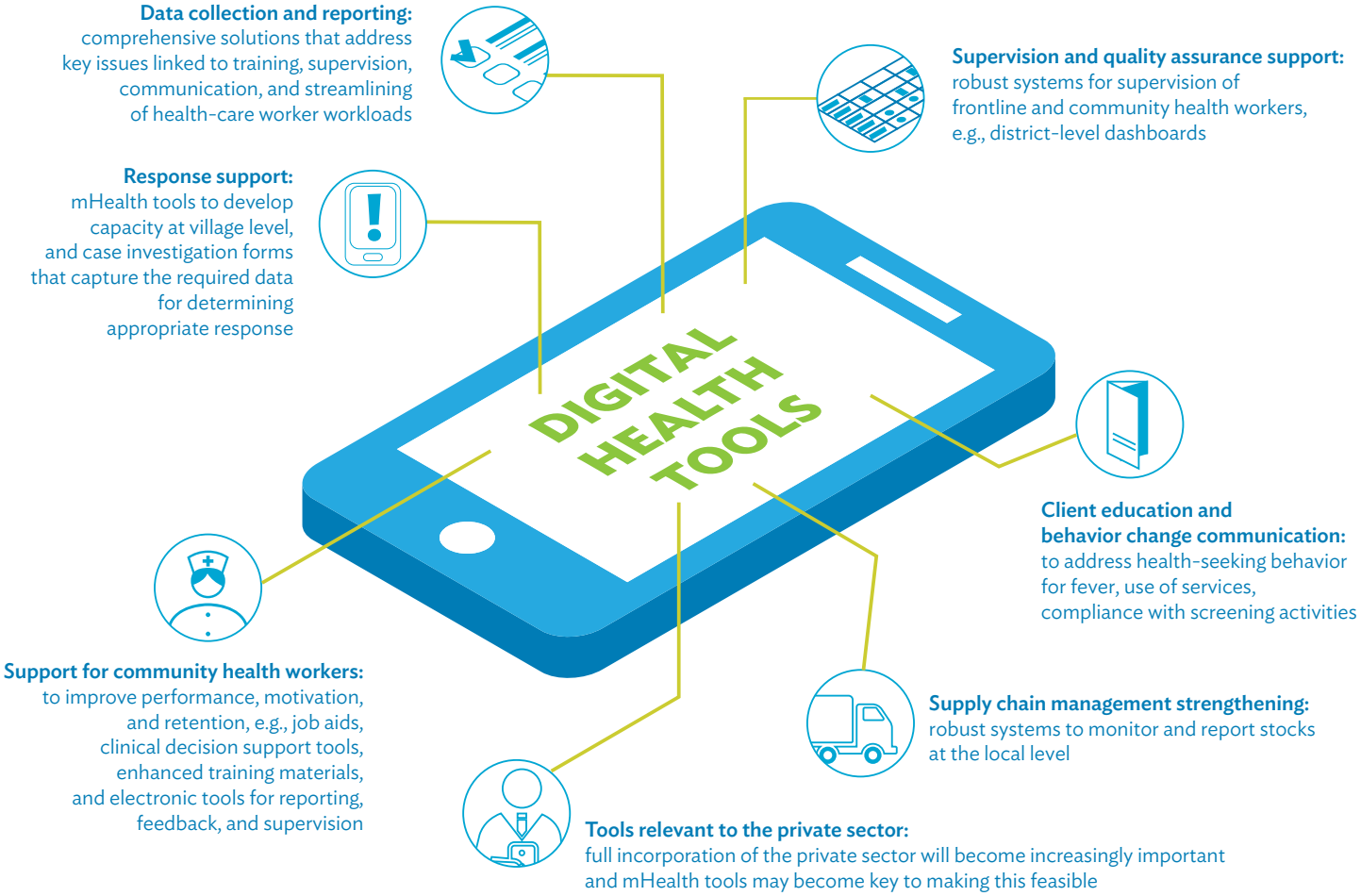
- Consider mHealth solutions that address gaps in the routine surveillance system or where real-time data and/or immediate action are required.
- Keep it simple and use appropriate technology: using SMS on a cheap phone can be as effective in some situations as an app on a smartphone, but may cost less and be more sustainable.
- Try to make the system free to users by collaborating with telecommunications companies and other private sector providers not only to reduce the cost but also to make the system easier to maintain.
- Regular monitoring and evaluation and refresher training are required to ensure the completeness and accuracy of the data and to address any challenges encountered quickly.
- Use a standardized approach across vertical diseases programs and the entire HMIS to geo-enable the health information.

Day 0 reporting data flow



HMIS = Health management information system, SMS = short messaging service.
Source: S. Mellor. 2013. *Moving towards Malaria Elimination: Developing Innovative Tools for Malaria Surveillance in Cambodia.* www.malariaconsortium.org/pages/learning-papers.htm

Figure 3: Digital mHealth Tools for Malaria Elimination



Source: Authors.

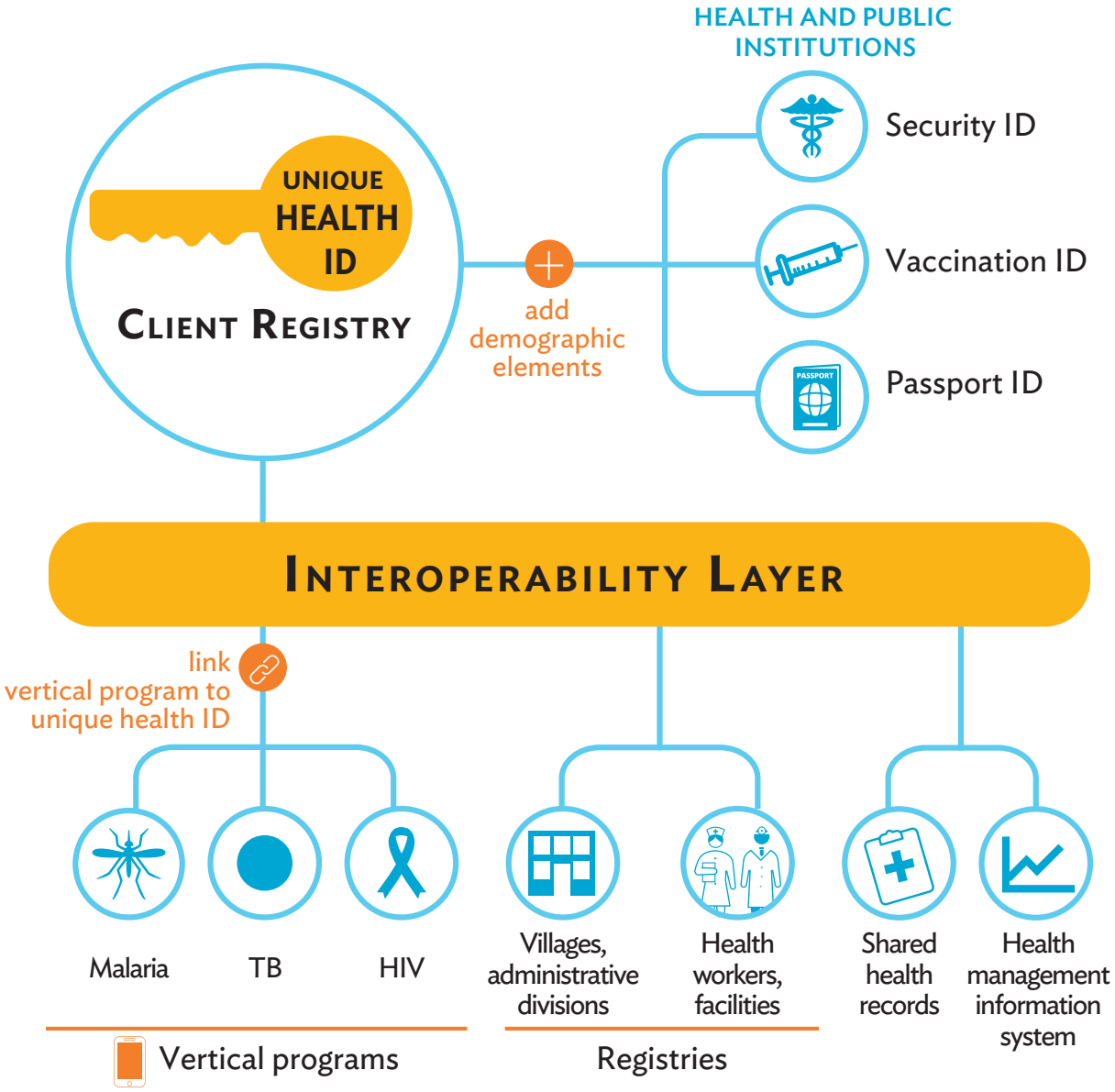
A strong digital health backbone connecting different levels of the health system is a sound long-term aim, while in the short to medium terms improving vertical systems targeting malaria is also helpful. However, rather than continuing to focus exclusively on investment in vertical programs such as those targeting malaria, GMS countries would be well served to broaden their investments and deploy them further upstream. A key part of this process is to examine and address the degree of information system interoperability and data compatibility between vertical components and other parts of the health system. At present vertical programs exist in isolation from the wider health system, and even within a program there is limited linking of patient data from one facility to another. A range of broader digital health solutions can benefit all diseases, including malaria, besides ensuring reliable access to internet and cellphone coverage.

Rather than continuing to focus exclusively on investment in vertical programs such as those targeting malaria, GMS countries would be well served to broaden their investments and deploy them further upstream.

These include unique patient identifiers, master patient registries, and electronic medical records[7] that are all connected to the other registries (administrative divisions, villages, health facilities) core to the HMIS. Moreover, investments in the eHealth backbone

[7] Asian Development Bank. 2016. *On The Road To Universal Health Coverage: Every Person Matters: Unique Identifiers for Every Citizen Are Key to an Effective and Equitable Health System.* http://www.adb.org/sites/default/files/publication/183512/uhc-every-person-matters.pdf

Figure 4: Health Management Information System Backbone and Interoperability Layer



HIV = human immunodeficiency virus, TB = tuberculosis.
Source: Open HIE. https://ohie.org

infrastructure, such as a client registry, shared health records, and an interoperability layer that can facilitate the integration of malaria elimination and other vertical disease programs into wider national and regional health security mechanisms. They can play a significant role in overall strengthening of health systems, which has population health benefits beyond malaria elimination and contributes to universal health coverage (Figure 4). From this framework, malaria information systems can then be effectively implemented.

ADB supports the improvement of malaria information systems as a high-priority action for malaria elimination in the GMS. Some countries are currently struggling to manage large amounts of case-level data using outdated paper or Excel-based legacy systems involving aggregation of data at lower levels. This results in data errors and a lack of detailed case data required for elimination. An opportunity exists to move to case-based online systems by upgrading existing country-specific systems or using platforms such as DHIS2 and OpenMRS, and ensuring that these

ADB supports the improvement of malaria information systems as a high-priority action for malaria elimination in the GMS.

systems build on strong and common data management practices across the whole health sector. Once in place, robust malaria information systems will be platforms upon which specific digital health applications can be used. The first step toward this end for GMS countries is to address the weaknesses in their current communicable disease reporting systems. There are examples from elsewhere in Asia and the Pacific that GMS countries can draw upon, such as the Philippines, which has a national strategic plan for control and elimination of malaria with a vision of a malaria-free Philippines by 2030. In 2016, the country plans to declare malaria a notifiable disease to be reported within 24 hours, and the Ministry of Health has announced plans to upgrade its reporting of 33 notifiable diseases to a web-based system and integrate malaria into the system. It is also developing specific protocols and tools for following up malaria cases.

An existing model to adopt and adapt

The GMS countries are currently at the pre-elimination stage in terms of their disease surveillance systems, with standalone malaria-specific surveillance systems in place to manage their malaria programs and gather village-level data. However, as countries move toward elimination (and subsequently prevention of reintroduction) it becomes more difficult to sustain vertical systems with low case numbers, and integration of malaria surveillance into the country's existing notifiable disease system should be considered. This approach has already been taken by the People's Republic of China (PRC).[8] Its "1–3–7" reporting system applies to all public and private health-care facilities and describes the time frame in days for action to detect, treat, notify, investigate, and prevent the onward transmission of malaria.

Under the 1–3–7 system all patients presenting with fever are tested for malaria using microscopy or a rapid diagnostic test, and those with the disease receive immediate treatment. Confirmed and suspected cases are reported within 24 hours using the web-based China Information System for Disease Control and Prevention. A cellphone-based short messaging service (SMS) alert system notifies staff at the local Chinese Center for Disease Control and Prevention.

Case investigation is completed within 3 days, with verification of slide results (and, where possible, molecular confirmation) carried out at a provincial laboratory. In the same time frame, epidemiological investigation classifies the case as either locally acquired or imported (i.e., individuals who have traveled to a malaria-endemic country or an endemic part of the PRC within the previous month). Where cases are considered to be locally acquired, measures to prevent onward transmission, including screening of neighbors and vector control, are implemented within 7 days.

The 1–3–7 approach took time to implement. During early phases of implementation, targets for timeliness of case notification, investigation, and response were often missed. Even today some challenges remain, particularly in terms of community acceptance of malaria screening and maintaining awareness and diagnostic skill among health staff where case numbers are extremely low.

A recent study of the 1–3–7 approach concluded that ambitious time-bound targets for reporting, case investigation, and foci response can be achieved even in a large and diverse country like the PRC.[9] Strengths of the approach include a well-functioning web-based system to enable different administrative levels to communicate information to each other, and a system that encourages health-care workers to adhere to the process of rapid and complete reporting. Notwithstanding the challenges noted, the PRC model is viable and useful for GMS countries to use as a guide. Robust, durable digital health information management systems are key to this process (Figure 5).

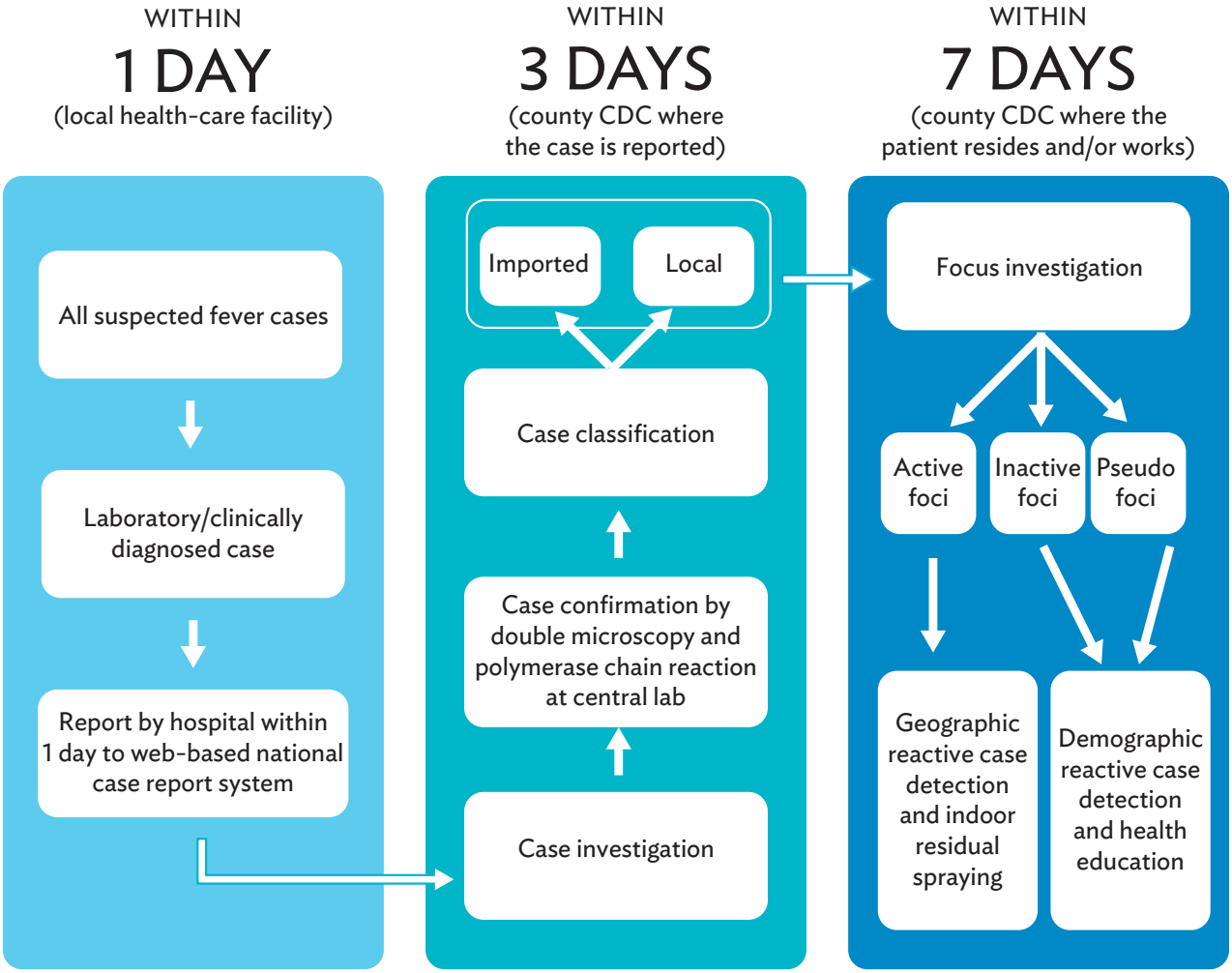
Tracking progress in surveillance systems for malaria elimination

The GMS countries can also look to the APLMA as they embark on the road to malaria elimination. The APLMA Leaders' Malaria Elimination Roadmap is based on six priorities to accelerate progress: three to establish a robust and coherent approach to malaria elimination, and three to build sustained and effective financing.[10]

1. Unite national efforts and regional action.
2. Map, prevent, test, and treat the disease everywhere.
3. Ensure high-quality malaria services, tests, medicines, nets, and insecticides.
4. Improve targeting and efficiency to maximize impact.
5. Mobilize domestic financing and leverage external support.
6. Innovate for elimination.

[8] J. Cao et al. 2014. Communicating and Monitoring Surveillance and Response Activities for Malaria Elimination: China's "1–3–7" Strategy. *PLoS Medicine*. 11(5).
[9] S. S. Zhou et al. 2015. China's 1–3–7 Surveillance and Response Strategy for Malaria Elimination: Is Case Reporting, Investigation and Foci Response Happening According to Plan? *Infectious Diseases of Poverty*. 4. p. 55. https://idpjournal.biomedcentral.com/articles/10.1186/s40249-015-0089-2
[10] Asia Pacific Leaders Malaria Alliance. The APLMA Leaders' Malaria Elimination Roadmap. http://aplma.org/upload/resource/files/APLMA_Roadmap_final_EAS_2015.pdf

Figure 5: Schematic of the Chain of Events Conducted Within the 1–3–7 Time Windows



CDC = Center for Disease Control and Prevention.
Source: J. Cao et al. 2014. Communicating and Monitoring Surveillance and Response Activities for Malaria Elimination: China's "1–3–7" Strategy. *PLoS Medicine.* 11(5).

APLMA will produce the APLMA Leaders Dashboard to highlight progress toward its priorities. The dashboard will enable the five GMS countries to benchmark themselves against their regional peers, and show where they must increase their efforts so as to reach their targets in the coming years.

The Asia eHealth Information Network (AeHIN) is also a valuable resource for countries. This peer network promotes better use of ICT to achieve better health outcomes through peer-to-peer assistance and knowledge sharing and learning throughout the region. AeHIN coordinates country-level HMIS convergence workshops to develop road maps for HMIS strengthening and integration of vertical diseases program surveillance systems based on the iCTEN principles.[11] The recently established AeHIN Geographic Information Systems Laboratory does itself provide support for countries to geo-enable their HMIS and therefore be positioned to map cases precisely based on established and maintained core registries (i.e., for administrative divisions, villages, and health facilities).[12]

[11] Asian Development Bank. 2015. *Universal Health Coverage by Design: ICT-enabled Solutions are the Future of Equitable, Quality Health Care and Resilient Health Systems.* http://www.adb.org/publications/universal-health-coverage-by-design
[12] Asia eHealth Information Network. 2016. AeHIN GIS Lab resources. http://www.aehin.org/Resources/GISLab.aspx

RECOMMENDATIONS

Future investments in digital health infrastructure to support the strengthening of health systems and malaria elimination efforts have the power to be transformational. However, it must be remembered that digital health solutions are tools, not health interventions in their own right, and must be guided by certain principles.

- Have a digital health strategy as part of the health information system strategy to ensure future digital health investments are better planned and coordinated across the health system. This is key to ensuring sustainability, information system interoperability, and data compatibility between disparate parts of the health sector.
- Vertical disease programs will always have their place, but building the data infrastructure backbone yields greater gains, especially in terms of strengthening health systems.
- mHealth has the potential to improve the quality of malaria surveillance and bring surveillance closer to the patient, but applications need to be well designed to take into account contextual factors (e.g., existing workflows), anchored in national eHealth strategies, scalable, sustainable, and allow for formal monitoring and evaluation.

Future investments in digital health infrastructure to support the strengthening of health systems and malaria elimination efforts have the power to be transformational.

- Do not reinvent the wheel: look to working examples from other countries in Asia and the Pacific and beyond.
- Team up with regional peers wherever possible, e.g., through APLMA to maintain momentum for political commitment, and through peer networks such as AeHIN for practical and technical support.
- Use the business case for digital health investments to lobby for government-supported expansion of cellphone and internet coverage.

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