

ADAPTING PRIVATE SECTOR SURVEILLANCE STRATEGIES

FROM THE GREATER MEKONG SUB-REGION TO HIGH BURDEN SETTINGS



EXECUTIVE SUMMARY

Despite global recommendations that surveillance systems should capture malaria case data from both private and public sectors, the integration of private sector data into national systems remains a challenge for National Malaria Control Programs (NMCPs) in high burden settings. Between 2015 and 2019, through the Bill & Melinda Gates-funded Greater Mekong Sub-region Elimination of Malaria through Surveillance (GEMS) program, PSI supported private sector providers in Cambodia, Lao PDR, Myanmar and Vietnam to test, treat, and report malaria cases into national surveillance systems. Key components of success for the GEMS program involved comprehensive support to providers that included training, supervising, monitoring, and motivating them; maintaining an active register of those providers; ensuring availability of sub-national staff to support collection of forms; supervising and monitoring of quality data entry; allowing a flexible approach to reporting mechanisms that work within the existing systems; and leveraging previous work with private sector providers that built trust and established networks. These learnings can be applied to high burden settings.



Identifying and treating more cases earlier has the potential to accelerate the transition from control to elimination. High-burden countries can learn from experiences in the Greater Mekong Subregion (GMS) and develop strategies appropriate to their own country contexts in order to accelerate the pathway to elimination.

KEY LEARNINGS FROM GEMS TRANSLATE TO THE FOLLOWING RECOMMENDATIONS

Ministries of Health should begin engagement with private-sector providers early, establish mechanisms for accreditation where possible, budget for the comprehensive support that's needed, and identify cost-savings through the leveraging of expanded digital and mobile technologies.



BACKGROUND

Global progress against malaria has stalled since 2016 and there is renewed urgency to expand access to core malaria interventions, particularly in high-burden countries. A holistic health system approach must be taken to achieve the coverage necessary for substantial reductions in malaria morbidity, mortality, and overall transmission. This necessitates strategic engagement of public and private sector actors, operating at both facility and community levels to ensure that all cases are tested, treated appropriately, and reported into national health information systems. In many high burden countries in sub-Saharan Africa, a significant proportion of individuals first seek treatment with private sector providers. For example, national representative surveys from 2015-2017 found that caregivers of febrile children in Chad, DRC, Ghana, Nigeria and Uganda sought initial treatment in the private sector in more than 50% of cases¹.

A significant proportion of the population in the GMS seek and receive malaria treatment from the private sector. Levels vary depending factors such as living

in urban or rural locations and wealth quintile, with estimates of up to 65% of the population seeking malaria care in the private sector in Myanmar and 75% in Cambodia². In Lao PDR, a study in a malaria endemic districts showed that 77% of patients first sought care in the private sector³.

Surveillance systems designed to capture and report data from this sector will enable NMCPs to more accurately resource and target interventions, and to ultimately accelerate timelines to elimination. This paper draws on lessons learned from private sector surveillance strategies that PSI has adopted in elimination settings in the GMS, to put forward a set of recommendations for how these strategies can be adapted in high burden settings to strengthen case surveillance in the private sector.

- 1 WHO. Meeting report of the WHO technical consultation on malaria case management in the private sector in high-burden countries. Geneva: World Health Organization; 2019.
- 2 Bennett, A., Avanceña, A.L.V., Wegbreit, J., Cotter, C., Roberts, K. and Gosling, R. (2017). Engaging the private sector in malaria surveillance: a review of strategies and recommendations for elimination settings. *Malaria Journal*, 16:252. <https://malariajournal.biomedcentral.com/articles/10.1186/s12936-017-1901-1>
- 3 Nonaka D, Vongseththa K, Kobayashi J, Bounyadeth S, Kano S, Phompida S, et al. Public and private sector treatment of malaria in Lao PDR. *Acta Trop*. 2009;112:283–7.

THE GREATER MEKONG ELIMINATION SUB-REGION OF MALARIA **THROUGH SURVEILLANCE (GEMS) PROGRAM**

The threat of artemisinin resistance has prompted countries in the Greater Mekong Sub-region (GMS) to set as a goal the elimination of all plasmodium species by 2030. Key to disease elimination is an intensified surveillance system that identifies cases in a timely manner in order to initiate an appropriate response. Such systems are indispensable to successful malaria elimination programs⁴. Between 2015 and 2019, PSI led the Bill & Melinda Gates Foundation-funded Greater Mekong Sub-region Elimination of Malaria through Surveillance (GEMS) program. This project supported NMCPs in Cambodia, Lao PDR, Myanmar and Vietnam to capture private sector data by engaging private providers in the provision of quality malaria case management, generating private sector case data, and integrating these data into national surveillance systems. These data allowed NMCPs to gain a more accurate understanding of the true burden and distribution of malaria to better target interventions in the pursuit of elimination goals.

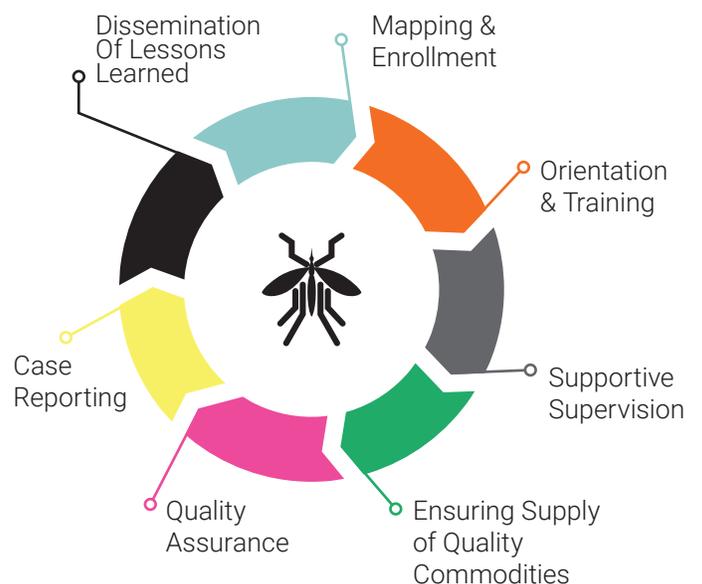
Essential to the success of the GEMS program were previously established relationships between PSI, Ministries of Health and private sector providers in each of the four countries. Models to engage private sector providers, such as the public-private mix (PPM) model and social franchising, were established and tested as far back as 1993 to address various health conditions and eventually to incorporate malaria testing and treatment.

4 WHO. Global Technical Strategy for Malaria 2016–2030. Geneva: World Health Organization; 2015.

THE GEMS FRAMEWORK FOR SUCCESS

When considering private sector engagement in high burden settings, key components of success for the GEMS program included 1) comprehensive support to providers to test, treat, and report malaria cases; 2) training, supervising, monitoring, and motivating providers; and 3) ensuring availability of sub-national staff (both internally and in government) to support collection of paper forms, supervise and monitor quality. Alongside the direct provider support there was a flexible approach to reporting mechanisms that worked within the existing system, maintaining an active register of providers, and previous work with private sector providers that had built trust and established networks.

To achieve and sustain malaria elimination, countries need to engage the private health sector in national malaria elimination strategies, particularly in countries where the private sector serves a significant proportion of those most at risk.





PSI mapped and enrolled private sector providers in Cambodia, Lao PDR, Myanmar and Vietnam to participate in a private sector malaria case management and surveillance program. Mapping of private sector providers was carried out in collaboration with key MoH stakeholders and sub-national health staff. This entailed conducting a comprehensive census of all private providers including formal and non-formal providers not part of government lists. (A laborious task, but made easier when drawing on PSI's established relationships with private healthcare providers in some countries).

Only private providers authorized by national guidelines to provide malaria case management and who agreed to participate in the program were recruited. Private outlets received a comprehensive support package developed in partnership with NMCPs. This package included training on national case management and reporting guidelines, a consistent supply of quality assured malaria rapid diagnostic tests and first-line treatments, routine supportive supervision visits and quality assurance assessments.

To facilitate private sector case reporting, data collection tools and data flows were designed in alignment with NMCP standardized malaria reporting forms and processes. In all four countries, standard

government case reporting forms were modified to simplify the use of the form for the providers, balancing public program needs with private provider's incentives to spend time on reporting duties. Alignment was prioritized to ensure data from PSI-supported private providers was reported appropriately and could be integrated into the national system. In all countries, PSI was responsible for collecting data from private sector points of care and conducting data validation before submitting monthly reports to district, province and/or national level in accordance to national protocols that mirror the reporting required from public sector facilities. Supportive supervision was used as a mechanism to collect paper-based case reports from private providers.

Malaria elimination requires that all cases, including those detected in the private sector, are accurately reported and a timely response is implemented to reduce malaria transmission.

Mobile case reporting was introduced mid-program implementation in Cambodia, Lao PDR and Myanmar alongside paper-based data entry forms⁵. Customized, open-source Android-based mobile data collection applications were developed and used by providers to report data into the project's malaria information system. In Vietnam, paper reports were

5 Lourenço, C., Tatem, A.J., Atkinson, P.M. et al. Strengthening surveillance systems for malaria elimination: a global landscaping of system performance, 2015–2017. *Malar J* 18, 315 (2019).



captured as photographs on providers' personal mobile devices and submitted to project staff via a popular social media app called Zalo for entry into the information system.

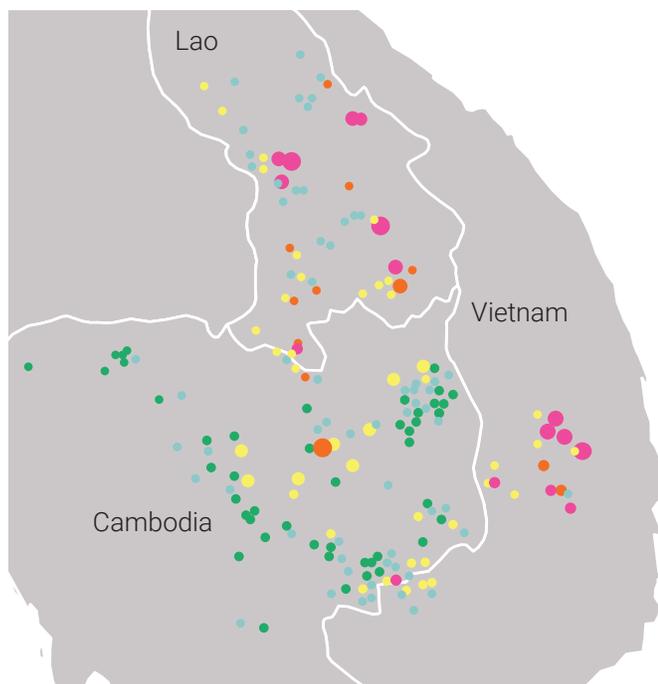
ELECTRONIC SURVEILLANCE INFORMATION SYSTEM

District Health Information System 2 (DHIS2) software was used to capture, store, and validate malaria case data prior to submitting to NMCPs in the mandated format during each reporting cycle. The configuration of the malaria information system was tailored to each country's data model and input requirements, with the

capacity to produce custom and standardized outputs across four countries. In all countries, case-based data was captured for positive cases and reported as line-listings into the national surveillance system.

Automated dashboards were designed in DHIS2 to enable timely monitoring of surveillance and operational data for program decision making. Standard reports and surveillance bulletins were also developed within the malaria information system to produce standardized outputs at national and sub-national levels based on common data requirements defined by NMCPs in each country.

CONFIRMED CASES BY OUTLET, 2019



CAMBODIA (PRIVATE WORKSITES)

- Very Low 0-1 (73)
- Low 1-2 (15)
- Medium 2-6 (11)
- High 6-11 (7)
- Very High 11-100 (1)

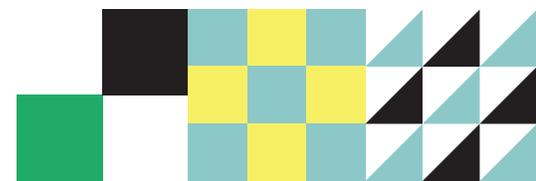
LAO PDR (PPM PHARMACY & CLINICS)

- Very Low 0-1 (0)
- Low 1-2 (35)
- Medium 2-6 (27)
- High 6-11 (7)
- Very High 11-100 (4)

VIETNAM (PRIVATE CLINICS)

- Very Low 0-1 (0)
- Low 1-2 (16)
- Medium 2-6 (12)
- High 6-11 (2)
- Very High 11-100 (8)

Figure 1: Near real-time case data used to identify 'hot spots' for intervention targeting

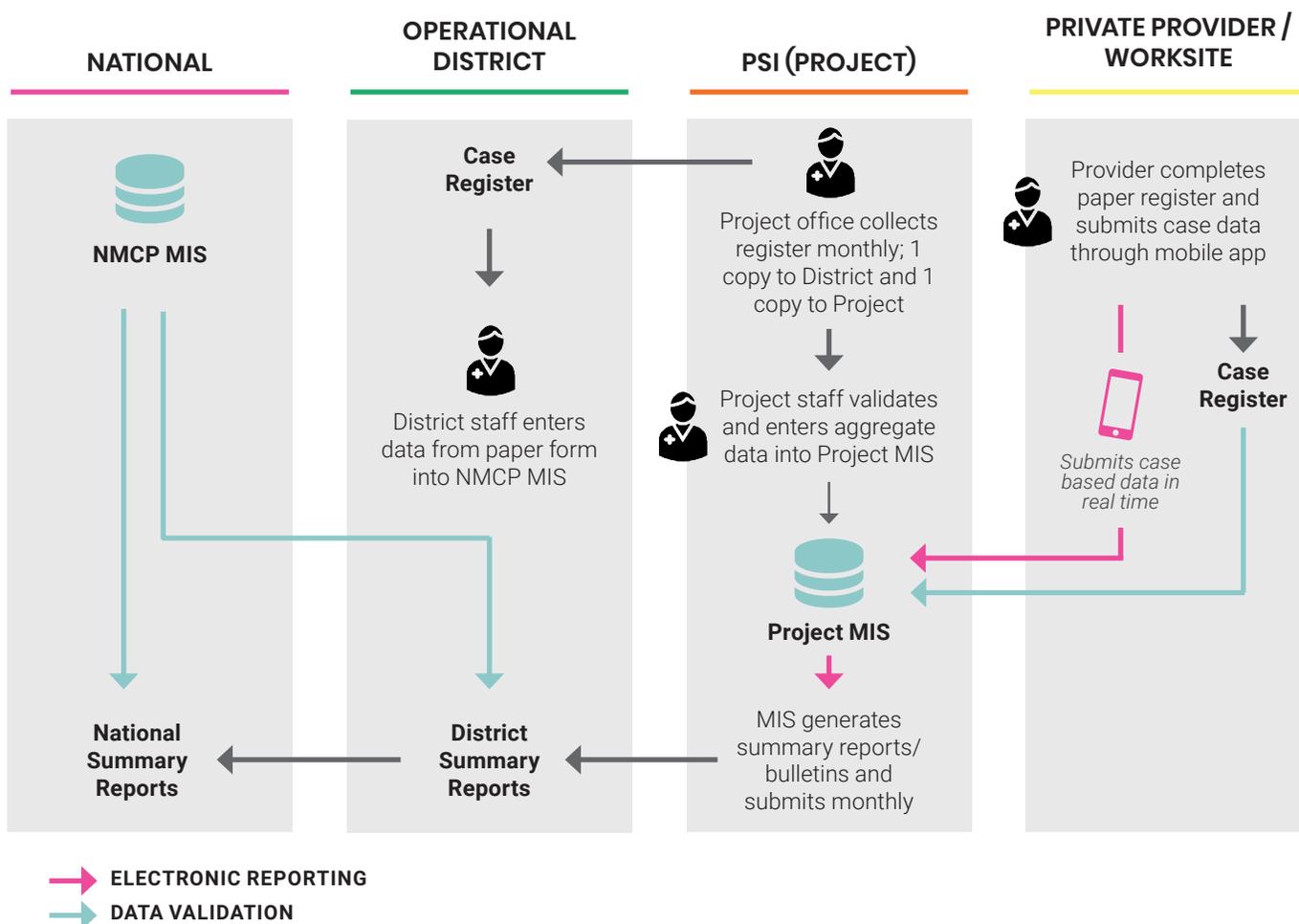


INTEGRATION WITH NATIONAL SURVEILLANCE SYSTEMS

Data flows and integration mechanisms were co-designed with NMCPs in accordance with existing reporting protocols in place in each country:

- In Cambodia, hard copies of paper forms were submitted to operational districts for district data entry staff to enter into the national malaria information system (MIS).
- In Lao PDR, standard reports for aggregated case data were generated from DHIS2 on a monthly basis and submitted to district malaria staff for entry into the national health management information system (HMIS). In addition, an automated electronic reporting mechanism was developed for pushing positive case-based data from the project malaria information system to the national HMIS.
- In Myanmar, standard reports were generated on a monthly basis and submitted to national, state/ regional and township levels via Excel sheets for entry into the national surveillance system.
- In Vietnam, private sector data were extracted from DHIS2 into Excel and submitted to the provincial level on a monthly basis for inclusion in monthly reporting to the NMCP following data verification completed by local authorities.

SAMPLE DATA FLOW FROM THE GEMS IMPLEMENTATION



Private sector contributions to national testing and caseload identification by country were estimated by calculating the proportion of total data reported by NMCPs to the World Health Organization's World Malaria Report that could be attributed to private sector case detection based on data generated by the project and reported to the NMCP. The quality of the integration mechanism between private sector surveillance system and national malaria surveillance system was monitored by comparing the number of confirmed cases captured by the project MIS in any one year to the number of cases reported from the private sector in that same year by NMCPs to the WHO World Malaria Report. Internal project data quality was assessed annually for accuracy, completeness and timeliness using a standardized routine data quality assessment tool.

PRIVATE SECTOR REPORTING RESULTS

Between 2016 and 2019, the project enrolled and trained 25,600 private providers across targeted geographies in Cambodia (n=918), Lao PDR (n=525), Myanmar (n=23,329) and Vietnam (n=828). During the same period, these providers reported 3,531,837 suspected cases tested by rapid diagnostic test (RTD) and 96,216 RDT-confirmed malaria cases into national surveillance systems, accounting for between 1.3 - 19% (2019) of national annual caseloads. Annualized reporting rates in the last year of the project (2019) ranged between 78%- 100% across the four countries.

PSI CONTRIBUTION TO NATIONAL TESTING & CASELOAD DATA

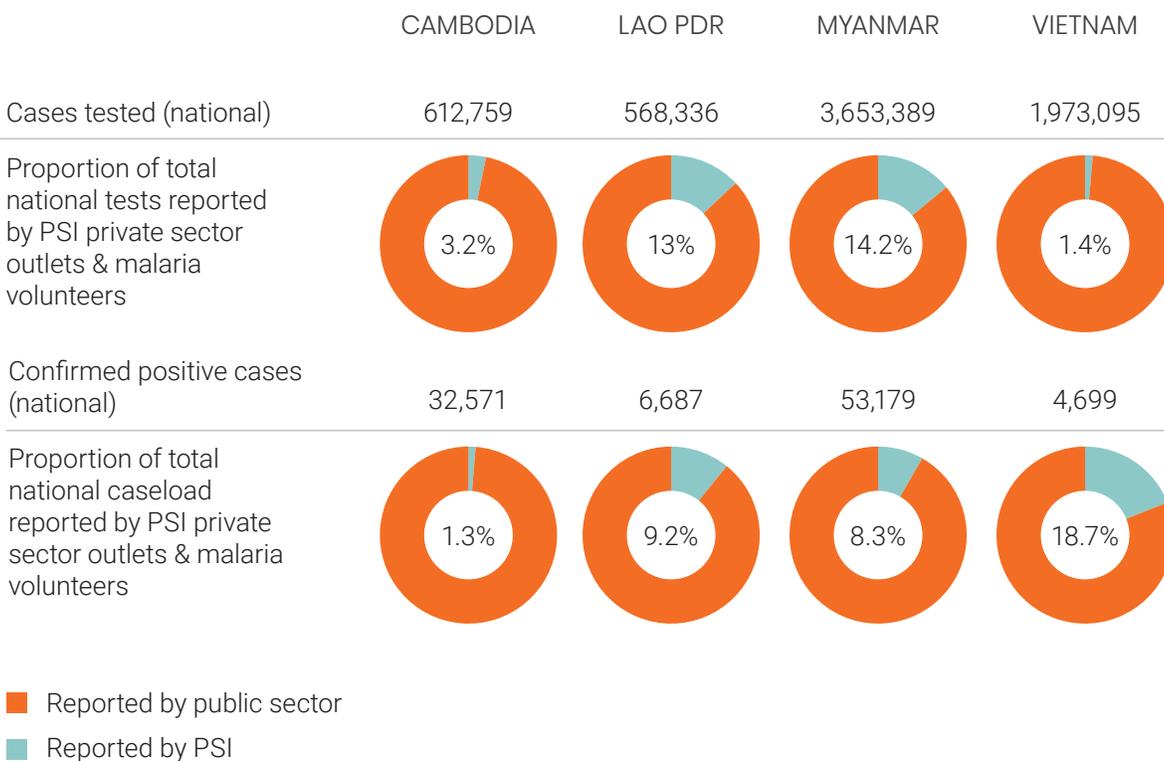
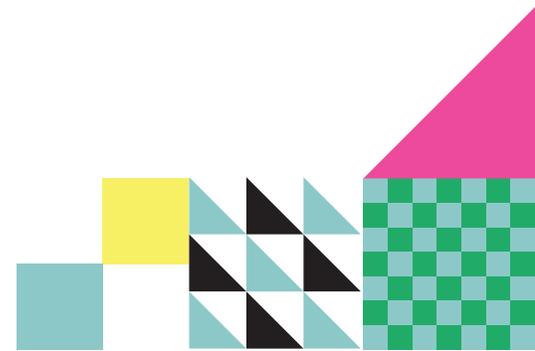


Figure 2: PSI contribution to National Testing & Caseload 2019



READINESS:

The GEMS project achievements demonstrated that in order for NMCPs to successfully support private sector reporting and integration into national systems, the following conditions must be met:

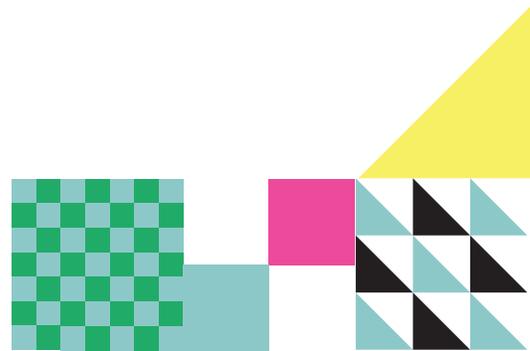
1. Private providers sites must be mapped, and rosters routinely maintained due to the dynamic nature of the sector (e.g. outlets that may open and close seasonally or permanently, providers which voluntarily dissociate from the program).
2. The malaria information system must be designed to capture data at the private sector outlet and community level, and routinely updated based on rosters.
3. A functional mechanism for private sector reporting must be established and maintained by the NMCP, without continued reliance on an implementing partner to serve as intermediary for data generation and integration. This is also relevant for subnational reporting and referral linkages between private providers and local health authorities.
4. Providers must be trained and supported to keep reporting testing and case data; regular supportive supervision visits and mentoring strategies are two possible approaches.
5. Private sector support is sufficiently incorporated into NMCP or sub-national health staff routines to ensure that data generated by the private sector is entered accurately and completely into the national surveillance system in a timely manner.

APPLICATION TO HIGH BURDEN SETTINGS

At the core of any malaria program, in all countries and at all stages of the elimination continuum -- through to the prevention of re-establishment -- are strong surveillance systems and a strong response to the data which they produce. To ensure this response is appropriately targeted, that risk factors are properly understood, and to effectively halt transmission, surveillance systems need to be comprehensive, i.e. they need to capture data on cases detected by private sector care providers, both formal and informal⁶. To this end, Ministries of Health should develop a vision for private health sector engagement in malaria elimination. High-burden countries can learn from the experience in the GMS, where several countries have made this transition, to develop strategies appropriate to their country contexts in order to accelerate the pathway to elimination. Early engagement with private-sector providers, financial and human resource allocation for the comprehensive support that's needed, established mechanisms for accreditation, and leveraging mobile technology are all elements of the strategy that need to be well developed.

In high burden countries where a significant proportion of the population seeks care in the private sector, a national strategy for private sector engagement in malaria elimination, that articulates roles and responsibilities is key.

6 WHO. Global Technical Strategy for Malaria 2016–2030. Geneva: World Health Organization; 2015.



RECOMMENDATIONS

1. ENGAGE EARLY

The success of GEMS was built on a foundation created by partners engaging with private sector providers through various mechanisms for many years. Engaging these key players has proved challenging in many countries because the private sector encompasses such a diverse range of operators, from registered clinic-based doctors, to traditional healers, to village grocery store clerks. There has been no singular effective channel of communication to support all of them at once. Identifying key stakeholders in various contexts and seeking their buy-in is critical. For example, professional organizations or other interest-groups (e.g. groups of chemists or drug vendors) could lead to a deepened engagement and support for surveillance in high-burden settings, possibly linking case reporting to accreditation processes. As private sector networks are often large and complex in their organizational structure, early engagement to build trust and relationships will be crucial. Determining what level of time and effort providers can dedicate to the program is important as the burden of documentation and reporting malaria cases can be significant and motivations to participate in a national malaria program can be complex. Multi stakeholder engagement is critical when developing a surveillance system that can receive private data. GEMS maintained a minimal number of data collection points that provided the NMCPs with actionable data without overburdening providers.

2. BUILD A COMPREHENSIVE SUPPORT PROGRAM

Ensuring that comprehensive program support is built into national malaria response financing and support plans through mechanisms such as country Global Fund grants is critical. Most high-burden countries are resource poor with low government expenditure on healthcare. As surveillance is scaled-up to the

levels needed to accelerate control and elimination, substantial financial support will be needed and plans for sustainable transition should be developed from the start of implementation. The results from the GEMS project demonstrate that the private sector is capable of reporting case surveillance data when incorporated into a comprehensive private sector support program for malaria. The substantial support providers received through the program - such as training, free or subsidized provision of RDTs and first-line treatment, and routine supportive supervision - is a contributing factor to the high reporting rates documented by the project. Along with citing the importance of leveraging the private sector, The Lancet Commission on Malaria Eradication emphasized the importance of improving 'software', i.e. strengthening management capacity through rigorous training programs at the sub-national and national levels, as well as the need for improved staff incentivization, the use of timely and high-quality data to inform decision-making, and active and sustained community participation in local elimination efforts⁷. Although less is known about the private sector's capacity and motivation to report malaria case data directly to government systems in the absence of a comprehensive malaria case management and surveillance support program, results from GEMS suggest that up to 75% of those surveyed are willing to continue to report into government surveillance systems after project support ends⁸.

A tailored engagement approach, including prioritizing what type of providers to engage and where, should be developed based on evidence on health seeking behavior, epidemiological data and access to points of care.

7 Feachem, R.G.A, Chen, I., Akbari, O., Bertozzi-Villa, A., Bhatt, S., Binka, F. et al. Malaria eradication within a generation: ambitious, achievable, and necessary. *The Lancet*, Vol. 394, No. 10203. (Sep 9, 2019).

8 Brown et al: Motivation to Test, Treat, and Report Malaria Cases: A Quantitative Assessment Among Private Sector Providers in the Greater Mekong Subregion (forthcoming)





3. PRIORITIZE STARTING POINTS OF CARE

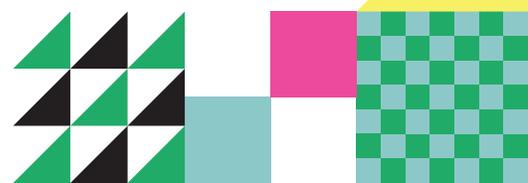
The private health sector is comprised of a large number and a wide range of actors from highly skilled doctors to informal providers such as itinerant drug vendors. Engaging providers who are already accredited and recognized by the government may be a logical starting point as those providers will have achieved a minimum level of competency for their accreditation, and may have established relationships with public health teams in their sub-national administrative areas. This may facilitate mechanisms for collaboration such as private providers being trained, supplied, and supervised by sub-national public health staff. Understanding the access to healthcare and the preferences of those most at risk of malaria should inform the types of providers engaged. For example, the GEMS project targeted high-risk populations in remote locations without easy access to the public sector. In Myanmar, many of these communities had long-standing relationships with, and preference for seeking healthcare from non-formal providers. The program facilitated approval from the government to improve the quality of malaria case management provided by the non-formal sector and reported detected cases into the national surveillance system.

4. LEVERAGE MOBILE TECH

4a. Finding the balance with segmented reporting mechanisms:

Using both paper and electronic reporting mechanisms based on provider needs and preferences and reported into a central electronic information system have proven effective in other settings, such as Thailand's electronic surveillance information system⁹. In places where mobile Internet coverage is high and among populations of private providers where mobile phone ownership is high, mobile reporting through smartphone apps, social media apps, and SMS can provide an effective method for private sector providers to report data. However, provider motivation surveys conducted by GEMS found that with the roll-out of reporting applications and SMS tools, providers were still required by national programs to complete paper reports. The dual burden of reporting on paper and electronically (i.e. through a mobile app) were seen as a barrier to consistent case reporting among private providers. Whether the mobile reporting solution enables data submission directly to the malaria information system or is used as an intermediate step to transmit the data from the paper report which gets

9 Ma, S., Lawpoolsri, S., Soonthornworasiri, N., Khamsiriwatchara, A., Jandee, K., Taweeseeneepitch, K., Pawarana, R., Jaiklaew, S., Kijsanayotin, B., & Kaewkungwal, J. (2016). Effectiveness of Implementation of Electronic Malaria Information System as the National Malaria Surveillance System in Thailand. *JMIR public health and surveillance*, 2(1), e20. <https://doi.org/10.2196/publichealth.5347>



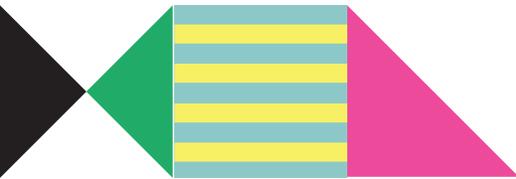
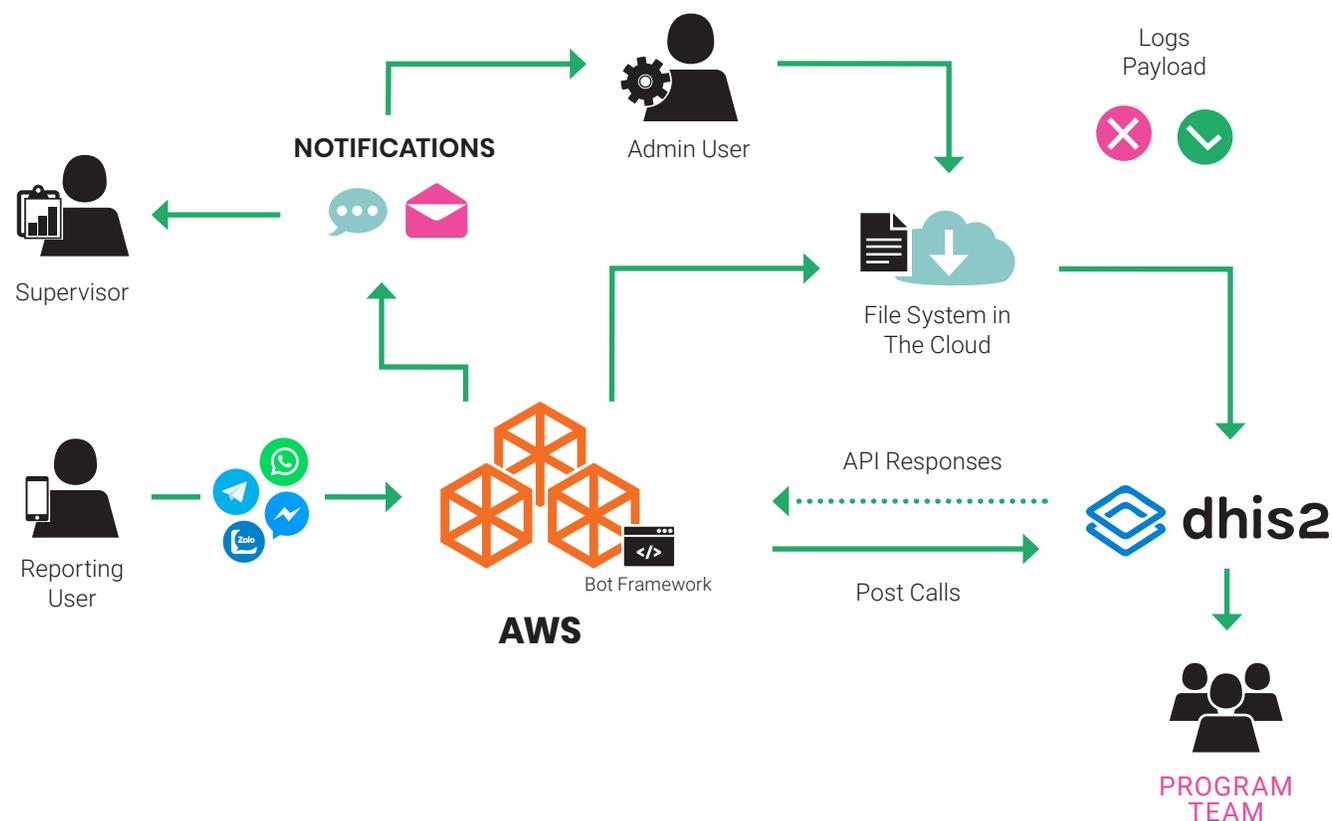
entered into the system by project or government staff, mobile technology can alleviate the financial costs and human resources required to collect monthly paper reports in a traditional paper-based reporting system. However, there is a need for any mobile reporting tool to integrate with the national HMIS, so that dual data collection is no longer needed and any digital tool may end up being more sustainable.

4b. Maximize social media apps for local empowerment:

PSI developed and successfully piloted the use of social media platforms such as Facebook and Zalo

for malaria surveillance. The approach built chatbots to facilitate routine reporting, tailored communications & targeted support to providers. The chatbots empowered front-line health workers to use a familiar communication platform, in a local language, on their own mobile device, removing the need for new standalone applications for reporting. This minimized the effort required to install, train, update, and manage stand-alone apps. The chatbots are also connected to DHIS2, opening the possibility of instant reporting into government disease programs.

SOCIAL MEDIA CHATBOT FOR MALARIA SURVEILLANCE





CONCLUSION

As countries shift from malaria control to elimination, the value of timely, case-based data from all health sectors becomes increasingly important. Ensuring that every case is notified, investigated and classified is critical for understanding risk groups and foci and in taking the appropriate response measures to halt transmission in a timely manner. Robust surveillance data from the private sector should be captured and analyzed with other data sources to inform national strategies to achieve malaria elimination goals. As high burden countries face this challenge and develop a vision for private sector engagement in malaria surveillance, the lessons learned from GEMS can help to guide this process. To reiterate, early engagement with key private-sector providers is critical, as it may take time to understand the scope of the private sector network and to identify which key stakeholders should be prioritized for initial consultation. Once the vision is set, a comprehensive surveillance system that supports private sector integration requires dedicated financial and human resource allocation. The GEMS project demonstrated that in order for NMCPs to successfully support private sector reporting and integration into national systems, certain conditions had to be met and maintained, which may cause additional strains in high burden settings. These conditions include the mapping and updating of

private providers and setting up procedures and guidelines for private sector reporting. Other necessary conditions include: continued training and supervision of providers, and the incorporation of private sector support into NMCP or sub-national health staff routines to ensure that data generated by the private sector is entered accurately and completely into the national surveillance system in a timely manner to inform intervention targeting. These conditions depend on local context and constraints, but each need to be addressed in relation to available resources. For example, case-based data collection most likely will not be taking place in high burden settings, so data collection processes from the private sector should be simplified where possible. To maximize resources and to potentially increase involvement of providers, the increased coverage of mobile and digital technology can be leveraged to explore alternative and more context-appropriate reporting mechanisms or ways in which reporting can be merged into other provider needs like sale or stock management. Nevertheless, in settings where the public sector alone cannot adequately cover the population at risk and where high-risk populations face barriers to accessing care at public health facilities or at the community level, the private sector is a crucial partner in the malaria end game.



RECOMMENDED CITATION

Tesfazghi K, Poyer S, Haslam T, Lourenço, C. Adapting private sector surveillance strategies from the Greater Mekong sub-region to high burden settings. PSI; 2021.

ABOUT PSI

Founded over 50 years ago, Population Services International (PSI) is a global nonprofit that encourages healthy behaviors and delivers affordable healthcare for individuals to live healthier lives and plan the families they desire.

PSI brings innovation to scale through our presence in 48 countries, our vast network of clinics and community-based healthcare delivery.

With a business approach to saving lives, PSI designs effective, scalable and sustainable solutions to the world's biggest healthcare challenges.

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PSI supports national malaria control and elimination programs (NMPs) in 27 countries with the support of the U.S. President's Malaria Initiative (PMI), United States Agency for International Development (USAID), Bill and Melinda Gates Foundation (BMGF), Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), Australian Government Department of Foreign Affairs and Trade (DFAT), and Unitaid. Committed to consumer-powered health care, PSI shapes mixed market systems, shifts policy and funding, and strengthens global capacity to make it easier for people affected by malaria around the world to seek and receive quality malaria prevention, diagnosis, and treatment services.

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