

Burma

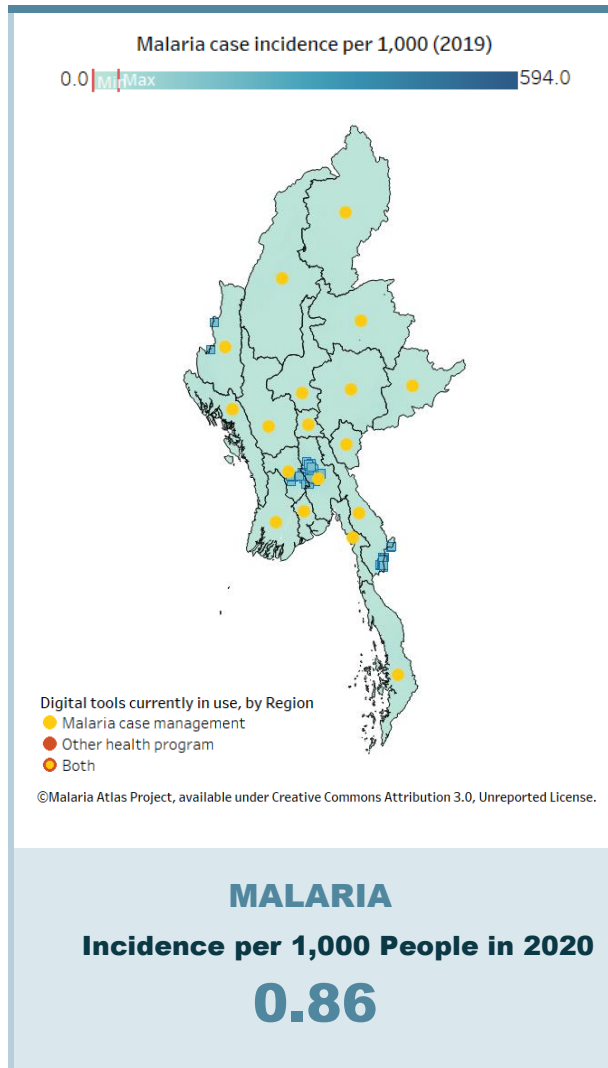
Executive Summary

Burma^a had a reported malaria incidence of 0.86 per 1,000 people in 2020 compared to 15 per 1,000 in 2012.¹ This success can be attributed to the efforts of the government and community health worker (CHW) programs in expanding prompt testing, treating and reporting (through (District Health Information Software 2 [DHIS2] and CommCare) of malaria cases. ²

Burma has a complex political system, a challenging geographical terrain, and low levels of technology expertise for digital programs.³ Increasing intragovernmental coordination, building tools to enable interoperability of malaria surveillance tools, and increasing levels of digital literacy can play an enabling role effective utilization of digital tools for malaria elimination.

Engaging the government in funding digital solutions is critical to ensuring their sustainability, given the existing reliance on external donors. Co-financing can be an initial step toward government engagement, along with longer-term planning for complete transition of funding to the national government.

Improving digital literacy is crucial in expanding the uptake and adoption of digital technologies. Targeted training of human resources in digital technologies can be adopted. Advocating for improvement of mobile network coverage and access to electricity is important for creating an enabling environment for digital technologies.



PEOPLE

Community Health Worker (CHW)

21,000+ CHWs
3.8 per 10,000 people

GOVERNANCE

National Digital Health Strategy

No

SYSTEMS

Market Segment Maturity^b

SCORE: 2

^a The military government changed the country's name to Myanmar in 1989. The United States Government continues to use the name Burma.

^b The digital health index does not exist for Burma. Instead, the authors used market segment maturity which is based on World Economic Forum Networked Readiness indicators.

Recommended Actions

PEOPLE



Community health workers (CHWs) and decision-makers

Improve and invest in digital literacy of CHWs

Digital literacy varies demographically,³ but it is particularly low among elderly Integrated Community Malaria Volunteers (ICMVs). There also are limited training materials focused on digital health for ICMVs. Therefore, training materials should be developed to increase the digital literacy of ICMVs.

Incentivize CHWs and reduce their frequent relocation

Incentivize CHWs, particularly in armed conflict situations and remote areas, to reduce attrition. Establish coordination mechanism for CHWs between the Ministry of Health and Sports and local implementing partners.

Promote trust in malaria case-based reporting and surveillance data

Reduce the National Malaria Control Program and implementing partners' reliance on paper-based reporting data to monitor trends in malaria epidemiology and improve programmatic decision-making.

Assess, recruit, and train supervisory staff

Local technical staff act as enablers for the rollout of digital health programs, but a lot of technical positions remain vacant.

Tailor training based on different cadres' levels of technical knowledge. Consider an adaptive training model for supervisory staff.

GOVERNANCE



Strategies and policies

Expand digital and CHW policies

Design a framework for the use and analysis of community health data from digital health tools. Promote culture of data use and follow-up of malaria patients.

Direct national strategies on financing of digital technologies

Provide technical assistance to the government on the development of budgets and a financing framework for the goals laid out in national strategies.

Transition from paper-based to digital reporting

Provide technical assistance in the development of a roadmap for transitioning from paper-based to digital reporting. This would reduce double entry of records and improve data quality and patient follow-up.

Develop a data management policy to ensure data security, confidentiality, and privacy

Build on the eHealth draft policy to develop a data management policy and create a regulatory framework for health data security, confidentiality, and privacy.

Adopt and enforce ICMV recruitment and selection processes

Encourage the adoption of guidelines on the ICMV recruitment, retention, and compensation processes at all levels.

SYSTEMS



Processes and digital tools

Optimize data flow for surveillance and case management

Harmonize data flow by adopting District Health Information Software 2 (DHIS2) at all levels. Enable data flow among the different CHW tools being used for malaria surveillance.

Improve mobile coverage and ensure offline options for hard-to-reach areas

The United States President's Malaria Initiative can advocate with other funders and the government to invest in infrastructure to improve coverage.

Digitalization is challenging since most malaria risk areas are remote and have low mobile phone and Internet coverage. SMS functionality can be built into the system to overcome this challenge.

Create an interoperability framework

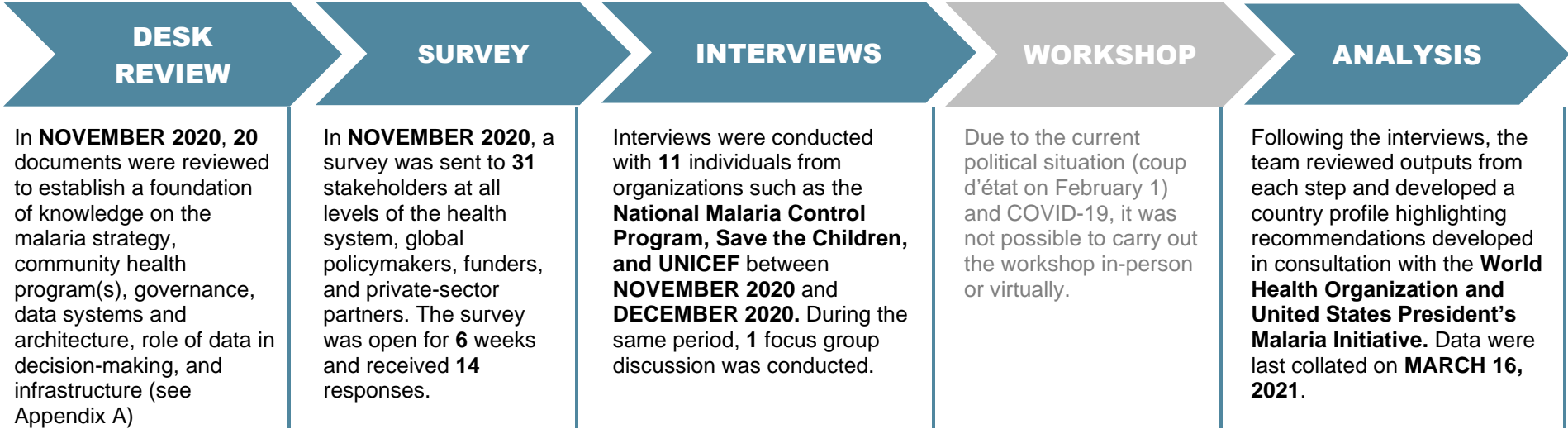
Develop national guidelines on interoperability to facilitate the flow of case-based malaria information from all sources (prioritizing digital sources) into the health management information system.

Research data flow for private-sector data and investigate interoperability


Develop a framework to facilitate the flow of data collected by private sector implementing partners. This would allow for referral of cases for follow-up and treatment.

Methodology


The country-level, mixed-methods assessment that was conducted to compile this document involved primary and secondary data collection in Burma. The assessment is based upon a survey, focus group discussions, key information interviews with relevant stakeholders in Burma that were identified together with the United States President’s Malaria Initiative (PMI) Burma and the National Malaria Control Program (NMCP), and a comprehensive analysis of policy documents of the government and relevant stakeholders.



Information collected through the methods described above was categorized according to key components within three domains: people, governance, and systems. The domains and their underlying components were informed by an [existing maturity model](#) and adapted to incorporate malaria-specific content. The components include personnel, training, and technical support (“People”); policies, strategies, governance structures, and their implementation (“Governance”); and data flow, digital tool structures, functionalities, and use (“Systems”). Together, these components describe the *desired state* for CHW use of digital tools for malaria case management, a state in which community health programs can leverage digital tools to generate and use data that improve malaria programming with the ultimate aim to decrease the local malaria burden.

PEOPLE 

People highlights the community health workers, supervisors, information technology support staff, and decision-makers that contribute to effective use of digital tools and data in malaria community health programs.

GOVERNANCE 

Governance describes the national strategies and policies that provide the framework for community health programs’ use of digital tools for malaria, and their implementation.

SYSTEMS 

Systems describes the processes and digital tools that enable community health programs to effectively use digital technology and data to strengthen malaria and other health programs.

People



Integrated Community Malaria Volunteers (ICMV) are the frontline workers for malaria response at the village level and in hard-to-reach areas. They provide a wide variety of services—from malaria diagnosis using rapid diagnostic tests to artemisinin-based combination treatments. In some areas, they also distribute long-lasting insecticidal nets and counsel patients, though this depends on the organization that supports them. The ICMVs are managed by the National Malaria Control Program (NMCP) or by international or national nongovernmental organization implementing partners.⁴

Burma's health care system is structured and hierarchical. There is medical oversight at each level by medical officers. An active national network of auxiliary midwives also exists in addition to the ICMVs. These two cadres of workers (paid \$30 USD per quarter) are under resourced but work in close collaboration with one another.⁵ International nongovernmental organizations fill the gap in some areas by supporting local initiatives, but most of these initiatives suffer from a shortage of resources for service provision.³

In recent years, human resources for health have increased and staffing in hospitals has improved.⁶ The main pillar of basic health services in Burma are midwives in rural settings. Though the recruitment and selection processes have been laid out in the *Community Based Health Worker Policy*, there is no deployment policy for CHWs and a there is lack of clarity on their adoption at the subnational level.³ Additionally, there is limited clarity around roles and responsibilities of the different health cadres at all levels of the system.³ This explains to some extent why midwives are overburdened. Though they are trained exclusively to carry out midwifery functions, it is common for them to take up additional tasks not related to midwifery.⁵

Community health worker digital readiness

CHWs are trained in digital tools when these tools are deployed as part of the implementation and rollout plan. In addition, CHW supervisors are trained on the malaria case-based reporting and surveillance (MCBRS) dashboard and can monitor the performance of ICMVs. Technical support staff do not receive specific training; instead, they are expected to resolve issues based on their knowledge and familiarity with technology. There also is no digital mechanism for escalating issues, which information technology support staff have to resolve through phone calls and in person. Digitization of the technical support process can play an important role in tracking issues and ensuring timely resolutions.

There is considerable variation in the level of digital literacy among the ICMVs in Burma. Field implementers suggested during key informant interviews that older ICMVs have lower levels of comfort and literacy with technology.³ Another challenge is the lack of local technical staff who can facilitate and manage the rollout of digital health programs. Overall, a cohesive approach is needed to create an enabling environment for digital readiness, which should include training workers, upskilling local technical resources, and building a continual process of training, staffing, and review.³ However, with low

40,000 Community health workers in country ^c	Compensation Policy: PAID Paid by external party
~21,000 Providing malaria services	Compensation Policy: PAID Paid by external party

^c CHWs consist of ICMVs, auxiliary midwives and assimilated health volunteers.

malaria incidence, Village Health Volunteers will not see enough cases to maintain their skills and the population might not see their value. This challenge may be overcome by regular training and engagement.⁴

Data-driven decisions at each level of health system

The public health care system in Burma is structured around state/region, district, and township levels. Since 2017, ICMVs have used the Malaria Case-Based Reporting (MCBR) Android mobile phone application to report malaria data to the DHIS2 database in real time. However, this has not been rolled out in the entire country and paper-based reporting still exists with ICMVs, with data collection and submission taking place monthly through standardized malaria case registers. These case data are then entered by program staff into the electronic database at the township level.⁶

In some regions where the MCBR application has been implemented, there is digitization and use of data at all levels, from the community to national levels. For non-MCBR regions, data are aggregated at the regional level, and these data can be viewed at the national level.

NATIONAL LEVEL	<p>The Vector Borne Disease Control Program focal point receives data from the states and regions, then reviews and provides feedback during biannual meetings held in May and December. In the case of a malaria outbreak, the focal point undertakes real-time or ad hoc reviews. Countrywide data are used to formulate policy and all aspects of forecasting and quantification of malaria commodities.</p>
REGION / PROVINCE / STATE LEVEL	<p>At this level, decisions are primarily made by the malariologist for the state. Malariologists are the focal point of surveillance and decision-making at this level. Their responsibilities range from determining which regions are eligible for full-scale elimination to forecasting malaria commodities for the region. They are also responsible for verification and analysis of data, which are used for management of a malaria outbreak and the response. Reports from all townships within the state/region are shared in a specific format with the Vector Borne Disease Control Program focal points at the central and state/regional levels.</p>
DISTRICT / SUBNATIONAL LEVEL	<p>The focal point at the township public health department compiles and sends data from rural health centers, subcenters, volunteers, and township hospitals within 15 days after the end of each month. The Vector Borne Disease Control Program focal point verifies the data and provides feedback to the health staff during monthly meetings.</p> <p>In some townships where full-scale malaria elimination surveillance is implemented, case-based surveillance data are used to classify foci and decide whether there is local transmission. Further actions are taken by using long-lasting insecticidal net distribution data, as well as if additional vector control is needed for the response to interrupt local transmission in active foci.</p>
HEALTH FACILITY LEVEL	<p>The Basic Health Services staff compile all the data received from different sources. The staff at subcenters submit the data to the rural health center focal point at the end of each month.</p> <p>At the rural health center level, health assistants compile all subcenter reports and send them to the focal point at the township public health department monthly. They also verify data and provide feedback to the subcenter staff monthly. The health assistants provide feedback to the volunteers and make them aware of any epidemiological trends that might be of concern.</p>
COMMUNITY LEVEL	<p>Village Health Volunteers attend quarterly meetings at the district level to review stocks of rapid diagnostic tests and antimalaria medicines. In transmission-reduction areas, general practitioners and the NMCP's Village Health Volunteers use carbonless copy case registers to capture their data. They submit two copies to their local subcenter/rural health center /township monthly. In malaria-elimination areas, each case is reported to the relevant Basic Health Services facility within 24 hours.</p>

Governance



	DIGITAL	COMMUNITY HEALTH	MALARIA	
Name	<i>Myanmar eHealth Architecture Blueprint (DRAFT)</i>	<i>Community Based Health Worker Policy</i>	<i>National Plan for Malaria Elimination in Myanmar</i>	<i>National Strategic Plan for Malaria Elimination 2021–2025</i>
Current strategy dates	December 2018	2020	2016–2030	2021–2025
Coordinating body	Ministry of Health and Sports and World Health Organization	Ministry of Health and Sports	Ministry of Health and Sports	Ministry of Health and Sports
Funding strategy	No	No	Yes	Yes

The *National Plan for Malaria Elimination in Myanmar* calls for the improvement of malaria surveillance policies and practices; it specifically calls for the use of digital interventions to support monitoring and evaluation. This includes reporting of cases in real time through case-based reporting applications based on GIS and use of data at each level.⁷ The *National Strategic Plan for Malaria Elimination* has further emphasized the need to strengthen case-based surveillance and information systems.⁴ It also acknowledges the current efforts undertaken through digital technologies, specifically DHIS2, and calls for strengthening the existing DHIS2 system. There is a need to develop an operational plan to implement, and create further alignment among, these policies, which could be done by providing technical assistance to the Ministry of Health and Sports.

The *Community Based Health Worker Policy* builds on the *Myanmar National Health Plan* and discusses the need for technology to enable supportive supervision, data collection, and communication among health workers. The policy emphasizes integration of all health data with the health information management systems (DHIS2) and the need for health workers to collect data at the community level.⁸ The NMCP was a key partner in the development of the *Community Based Health Worker Policy* and incorporated NMCP objectives into the policy.

The *Myanmar National Health Plan 2017–2021*⁵ has a significant focus on institutionalizing and recognizing all health workers, including community-based workers, to ensure efficiency and thus high-quality service provision. The commitment by the Ministry of Health and Sports to operationalize and include volunteers at all levels is a step in the right direction toward capitalizing on community-based services for effective delivery of all services, which would include malaria as well.

The *Myanmar eHealth Architecture Blueprint* builds on the *Myanmar National Health Plan* and the *Strategic Action Plan for Strengthening Health Information 2017–2021* to create a framework for interoperability of different systems.^{5,9} The blueprint can play a significant role in the pathway to scale and sustain health information systems in Burma. It also addresses standardizing the solutions and making systems interoperable, which would lead to better-quality and complete information and thus result in better decisions and health outcomes. Although the *eHealth Architecture Blueprint* exists, it has not been adopted by the Ministry of Health and Sports. It should be consulted when formulating digital and electronic health policies.

All of these policy documents attempt to address current gaps in the public health information system in Burma. These are recent policy documents and serve as important building blocks for a digital health policy. However, it might take some time for them to be understood and adopted across various levels. At the current stage, PMI can follow up these policies with an operational plan targeted at each level to establish a clear path to their successful implementation.

GOVERNANCE

Policies define digital health and health data governance roles, responsibilities, and structures.

The *Myanmar National Health Plan*, *National Plan for Malaria Elimination in Myanmar*, and *Strategic Action Plan for Strengthening Health Information 2017–2021* define the governance roles, responsibility, and structures across health system hierarchies. The *eHealth Architecture Blueprint* builds on the *National Health Plan* and the *Strategic Action Plan for Strengthening Health Information* to support digital health governance and create a framework for interoperability of different systems. The *Community Based Health Workers Policy* (2020) aims to bridge the gap between local health staff and communities.

DATA MANAGEMENT

Policies provide specifications for data access, privacy, security, and confidentiality and outline stipulations for data sharing.

Currently, no data management policy has been published. Burma lacks a regulatory framework for health data security, confidentiality, and privacy. The eHealth architecture draft policy is an important step in creating an outline for data management.

STANDARDS AND INTEROPERABILITY

Policies describe an enterprise architecture, normative standards—such as health information standards—and digital identity.

Most digital health data systems operate on the DHIS2 platform to align with the interoperability goals. The *Myanmar eHealth Architecture Blueprint* seeks to create a framework for interoperability among different systems. It also works on standardizing the solutions and making systems interoperable.

INFRASTRUCTURE

Policies define data hosting and storage (e.g., local or cloud), mobile device management, and telecommunications access.

The National Malaria Control Program database is locally hosted at data centers in Burma. The policies defined in the draft *eHealth Architecture Blueprint* will serve as the cornerstone of infrastructure policy as Burma takes steps toward inclusion.

WORKFORCE

Policies describe workforce job structures and descriptions, plans for training, digital literacy expectations, and incentives for digital adoption.

The *Community Based Health Workers Policy* (2020) aims to bridge the gap between local health staff and communities. There are two types of health workers: auxiliary midwives and community health workers (which include Integrated Community Malaria Volunteers and Village Health Volunteers). Their roles cover basic health services, including data collection, health promotion, prevention, and treatment and referral functions according to the guidelines developed by the Ministry of Health and Sports.

Systems

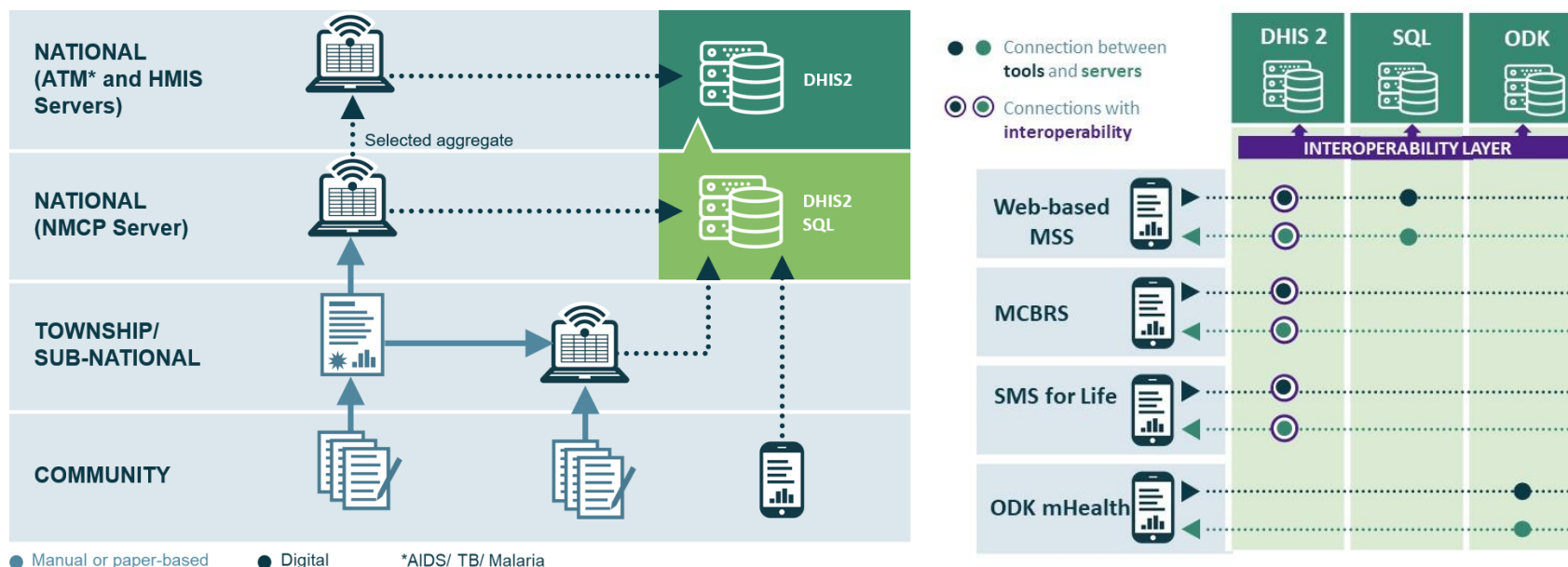


Data flow

There are three primary data collection systems for malaria in Burma—two of them are mobile-based, community-level systems and the third is a web-based reporting system. The first web-based system was built on a Microsoft Access database in 2014, but it has been replaced with the web-based malaria surveillance system. The web-based malaria surveillance system is operational at district/township level. Data entry operators use the system to enter data from paper-based reports.

Mobile-based applications for malaria were introduced in a significant way in 2017: MCBR and malaria case-based surveillance (MCBS) applications were developed and introduced. These were built on the DHIS2 Event Capture and DHIS2 Tracker Capture platforms and integrated with the national NMCP server using DHIS2 for reporting. In 2019, the MCBR and MCBS applications were phased out and the NMCP created a DHIS2-based application that integrated both applications into one—namely, the MCBRS application, which encompasses both the functions of reporting and surveillance.

Community-based systems feed data directly into the DHIS2 systems and enable access to surveillance data at the community level. In contrast, the web-based system relies on paper-based reports by CHWs, which are then collated at a township level and consolidate by data entry operators.



Digitally enabling infrastructure

The information and communications technology sector in Burma has seen significant improvements in the last decade. Among others, the launch of a new satellite, new foreign mobile-service competitors, and an expansion in network coverage have resulted in growth of the digital economy. However, gaps in network and electricity coverage remain.

According to the World Economic Forum, Burma needs to make significant progress to have a digitally enabling infrastructure. The World Economic Forum ranks Burma at 133 out of 139 countries in terms of network readiness.¹⁰ However, according to the World Bank, mobile cellular subscription is high at 114 subscriptions per 100 people in 2018.¹¹ The high mobile subscription is because of dual-SIM mobile phones that have led to individuals having more than one cellular subscription. Certain cellular networks work better in some geographies; this is a reason for individuals having different SIM cards. For digital health interventions, SIM card procurement should be based on network connectivity in each region. The overall improvement in mobile coverage is mainly attributed to the transition to a civilian government in 2010, which opened the market and ended the state-controlled mobile duopoly. Only 66.3 percent of the total population has access to electricity. This is further exacerbated by geographical differences in access to digitally enabling infrastructure.

This information and communications technology infrastructure is crucial for the viability of any digital tool. Mobile network coverage and access to electricity are instrumental for MCBRS to function as a cost-effective and efficient surveillance tool in Burma's progress toward malaria elimination. CHWs in rural, remote, conflict-affected, border, and hard-to-reach areas continue to struggle to efficiently use digital tools. Some of the regions with the most significant challenges are Kachin, Kayin, Rakhine, Shan, and parts of Tanintharyi. These regions do not have stable electricity and zero network coverage in certain parts.

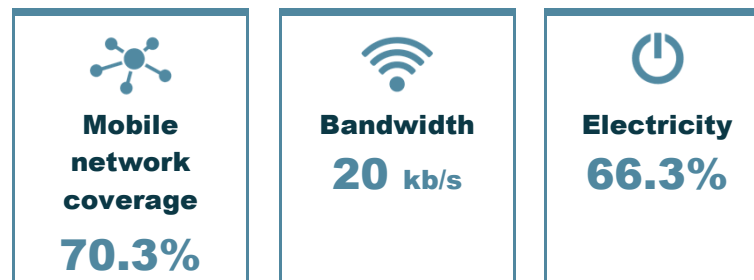
Digital health tools in use and functionality

Introduction of a web-based reporting platform, allowing both online and offline applications, was the cornerstone of the evolution of the malaria surveillance system in Burma. Though it has certain limitations in elimination-specific surveillance activities, such as case investigation, foci investigation, and response, it is able to capture countrywide case management data and opens opportunities for integration to the DHIS2 platform. Such integration would create one system that includes all steps in the malaria surveillance—from case detection, notification, case investigation, foci investigation, response, and follow-up.

ICMVs in Burma have used several digital health tools over the years, namely, the MCBR, MCBS, and MCBRS. The MCBR application, based on a DHIS2 Event Capture platform, is implemented nationally and allows ICMVs to undertake real-time, case-based reporting. The MCBR application was adapted from a malaria case surveillance application developed by Population Services International in Cambodia. It was designed to improve the accuracy, accessibility, and timeliness of malaria case data, and ultimately improve malaria surveillance and increase the effectiveness of malaria programs. It is primarily intended for ICMVs and to record case management data. While focusing on case management data, the MCBR application allows recording of malaria surveillance activities, such as case notification, investigation, and part of foci investigation conducted by Basic Health Services.

An evaluation of the MCBR application by the Burnet Institute showed that the cost of MCBR is higher than paper-based reporting. The cost of 1,527 volunteers for paper-based reporting is 0.29 million, whereas MCBR costs US\$0.46 million for one year.⁶ However, in the long run, the cost of MCBR will reduce as the initial capital investment in technology and training is spread out over the years.

The MCBS application, based on DHIS2 Tracker Capture, expands the scope of the MCBR to surveillance, including case investigation and part of foci investigation. In addition, the application allows stakeholders to access geospatial visualization of malaria tests and cases, village-based case information,



and other analyses, including malaria test positivity and long-lasting insecticidal net ownership and use. Since 2019, MCBR and MCBS have been phased out and integrated to create the MCBRS system explained below.

The MCBRS application (integration of the MCBR and MCBS applications) supported by World Health Organization (WHO) covers case detection, notification, and case investigation. Foci investigation and response functionalities are still in the development stage. For foci investigation and response, it is important for all the state- and regional-level focal persons to receive training on the *Malaria Elimination Field Implementation Manual*. WHO is already considering how to include foci investigation and response modules in the MCBRS application to avoid using many apps and tools. Since the MCBRS application integrates with DHIS2, the malaria digital health program is well positioned to become interoperable with national health information systems, as Burma has agreed to use DHIS2 as the common platform for all health systems, including the malaria surveillance system. Despite varying levels of connectivity, the MCBRS application has been well received by volunteer health workers and even preferred over paper-based reporting; however, further support would have to be provided for it to be a highly successful intervention.

The Swiss-based company Novartis collaborated with Union of Myanmar Federation of Chambers of Commerce and Industry, as part of their corporate social responsibility activities, to implement the SMS for Life application. This DHIS2-based application initiated the private-sector role for malaria elimination in Burma by contributing to the implementation of fast-moving consumer goods supply chain for elimination, digital payment systems, and mobiles phones. PMI’s Defeat Malaria program in Burma innovated the Open Data Kit (ODK) mHealth application for CHW supervision and long-lasting insecticidal net monitoring. Yet prerequisites—such as virtual private network (VPN) connection, username, and password assigned to Defeat Malaria staff—may pose challenges for national uptake. Additionally, interoperability could be challenging for nationwide implementation.

USE CASE(S)	MCBRS	MCBR/MCBS	SMS for Life	MSS (Web-Based)	ODK
Providing malaria community case management ^d	■	■	■	■	□
Tracking malaria proactive and reactive case detection	■	■	■	■	□
Tracking malaria screening with referral	■	■	■	■	□
Transmitting messages to community on malaria	■	■	■	□	□
Training health workers	□	□	□	□	■
Tracking routine LLIN distribution during ANC or EPI visits	□	□	■	□	□

■ = Current use ■ = Possible, but not currently in use □ = Does not meet use case

CASE MANAGEMENT FUNCTIONALITIES	MCBRS	MCBR/MCBS	SMS for Life	MSS (Web-Based)	ODK
Aggregate case reporting and analytics Tool collects aggregate case data and has data analytic functions in tool or online	■	■	■	■	□

^d “Providing” in this sense means supporting CHWs as they conduct malaria case management—in that the tool supports indicator and data tracking for malaria case management.

CASE MANAGEMENT FUNCTIONALITIES	MCBRS	MCBR/MCBS	SMS for Life	MSS (Web-Based)	ODK
Individual case entry and analytics (<i>important in low-burden or elimination settings</i>) Tool collects individual case data and has data analytic functions in tool or online	■	■	■	■	□
Case geolocation (<i>important in low-burden or elimination settings</i>) Tool allows collection or use of geospatial data for individual cases	■	■	■	■	□
Interoperability with HMIS Tool sends information to the official national health information system	■	■	■	■	□
Offline capability Tool functions, at least partially, offline	■	■	■	■	□

■ = Current functionality ■ = Possible, but functionality not currently in use □ = Does not have functionality

MANAGEMENT & SUPERVISION FUNCTIONALITIES	MCBRS	MCBR/MCBS	SMS for Life	MSS (Web-Based)	ODK
CHW identification Tool uniquely identifies CHWs	■	■	■	■	■
CHW catchment location Tool identifies CHW associated position in org unit hierarchy/link to health facility/system	■	■	■	■	■
CHW performance analytics Tool has analytic functions (data validation, graphs, charts) that support data quality, quality of care, or other performance issues	■	■	■	■	■
Communication Tool allows two-way communication between peer groups, associated health facilities, or supervisors	■	■	■	□	□

■ = Current functionality ■ = Possible, but functionality not currently in use □ = Does not have functionality

Appendices

APPENDIX A ► **References**

APPENDIX B ► **Abbreviations**

APPENDIX C ► **Contributors**

APPENDIX D ► **Community digital health tools**

APPENDIX E ► **Next-generation tool functionalities for malaria case management**

APPENDIX F ► **Business process**

APPENDIX G ► **Timeline of report**



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APPENDIX A

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APPENDIX B

Abbreviations

CHW	community health worker
DHIS2	District Health Information Software 2
ICMV	Integrated Community Malaria Volunteer
MCBR	malaria case-based reporting
MCBRS	malaria case-based reporting and surveillance
MCBS	malaria case-based surveillance
NMCP	National Malaria Control Program
ODK	Open Data Kit
PMI	United States President's Malaria Initiative
PSI	Population Services International
VPN	virtual private network
WHO	World Health Organization
ANC	antenatal care
EPI	Expanded Program on Immunization
MCBR	malaria case-based reporting
MCBRS	malaria case-based reporting and surveillance
MCBS	malaria case-based surveillance
MSS	malaria surveillance system
ODK	Open Data Kit
HMIS	health management information system
BMGF	Bill & Melinda Gates Foundation
DFAT	Australian Government Department of Foreign Affairs and Trade
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
ICMV	Integrated Community Malaria Volunteer
JICA	Japan International Cooperation Agency
URC	University Research Co.
FDG	focus group discussion
KII	key informant interview

APPENDIX C

Contributors

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Dr. Nan Khine Zar Aung
Dr. Hnin Su Khin
Dr. Saw Kyaw
Dr. Myo Win Tin
Dr. Thet Myo Tun
Dr. Phyo Wai Tun

Organization

United Nations Office for Project Services (UNOPS)
Population Services International (PSI)
Myanmar Health Assistant Association
United Nations Children's Fund (UNICEF)
Community Partners International
Union of Myanmar Federation of Chambers of Commerce and Industry
Save the Children
National Malaria Control Program
World Health Organization
National Malaria Control Program

Organization

Myanmar Council of Churches
Clinton Health Access Initiative
Medical Action Myanmar
Kayen Department of Health and Welfare
Malaria Consortium
American Refugee Committee
Myanmar Council of Churches

APPENDIX D

Community digital health tools*

Name of Tool	Type of Digital Health Intervention†	Implementer (Funder)	Scale	Malaria Use Case
Web-based MSS application	2.1 Client identification and registration 4.1 Data collection, management, and use	NMCP (WHO, GFATM)	Nationwide	Malaria active or reactive case detection; malaria screening with referral; malaria diagnosis and treatment; aggregate case reporting; individual case entry and reporting; CHW performance analytics
MCBRS mobile application	1.2 Untargeted client communication 2.1 Client identification and registration 4.1 Data collection, management, and use 4.3 Location mapping	NMCP (WHO, GFATM)	All (10) townships of Mon State	Malaria active or reactive case detection; malaria screening with referral; malaria diagnosis and treatment; aggregate case reporting; individual case entry and reporting; CHW performance analytics; case notification; case investigation, foci investigation, and response
MCBR mobile application	1.2 Untargeted client communication 2.1 Client identification and registration 4.1 Data collection, management, and use 4.3 Location mapping	NMCP and Save the Children (GFATM)	83 townships	Malaria active or reactive case detection; malaria screening with referral; malaria diagnosis and treatment; aggregate case reporting; individual case entry and reporting; CHW performance analytics; case notification
MCBS mobile application	1.2 Untargeted client communication 2.1 Client identification and registration 4.1 Data collection, management, and use 4.3 Location mapping	NMCP (WHO, GFATM)	5 townships	Malaria active or reactive case detection; malaria screening with referral; malaria diagnosis and treatment; aggregate case reporting; individual case entry and reporting; CHW performance analytics; case notification; case investigation, foci investigation, and response
Community-based health application	2.8 Healthcare provider training	Medical Action Myanmar (funded by private donors)	Unknown	Malaria case management; malaria screening with referral
Geographical information system (GIS) on smartphone and PC	1.2 Untargeted client communication 2.1 Client identification and registration 4.1 Data collection, management, and use 4.3 Location mapping	NMCP (JICA)	Unknown	Malaria case management; malaria screening with referral; malaria active or reactive case detection
PSI malaria notification chatbot	4.1 Data collection, management, and use	PSI (funded by BMGF, DFAT)	Unknown	Malaria case notification

Name of Tool	Type of Digital Health Intervention [†]	Implementer (Funder)	Scale	Malaria Use Case
ODK mHealth application	4.1 Data collection, management, and use	Defeat Malaria URC (PMI)	32 townships in 4 states/regions (Tanintharyi, Rakhine, Kayin, and Sagaing)	Long-lasting insecticidal net usage monitoring; ICMV supervision
SMS for Life	1.2 Untargeted client communication 2.1 Client identification and registration 4.1 Data collection, management, and use	NMCP and Union of Myanmar Federation of Chambers of Commerce and Industry (funded by GFATM, Novartis AG)	15 townships (1 in Chin State, 10 in Mon State, 2 in Rakhine State, 2 in Sagaing Region)	Malaria case management; malaria screening with referral; malaria active or reactive case detection

*Data that come from the survey have not been independently validated aside from tools featured within the profile.

†See [Classification of digital health interventions v1.0](#), World Health Organization, 2018.

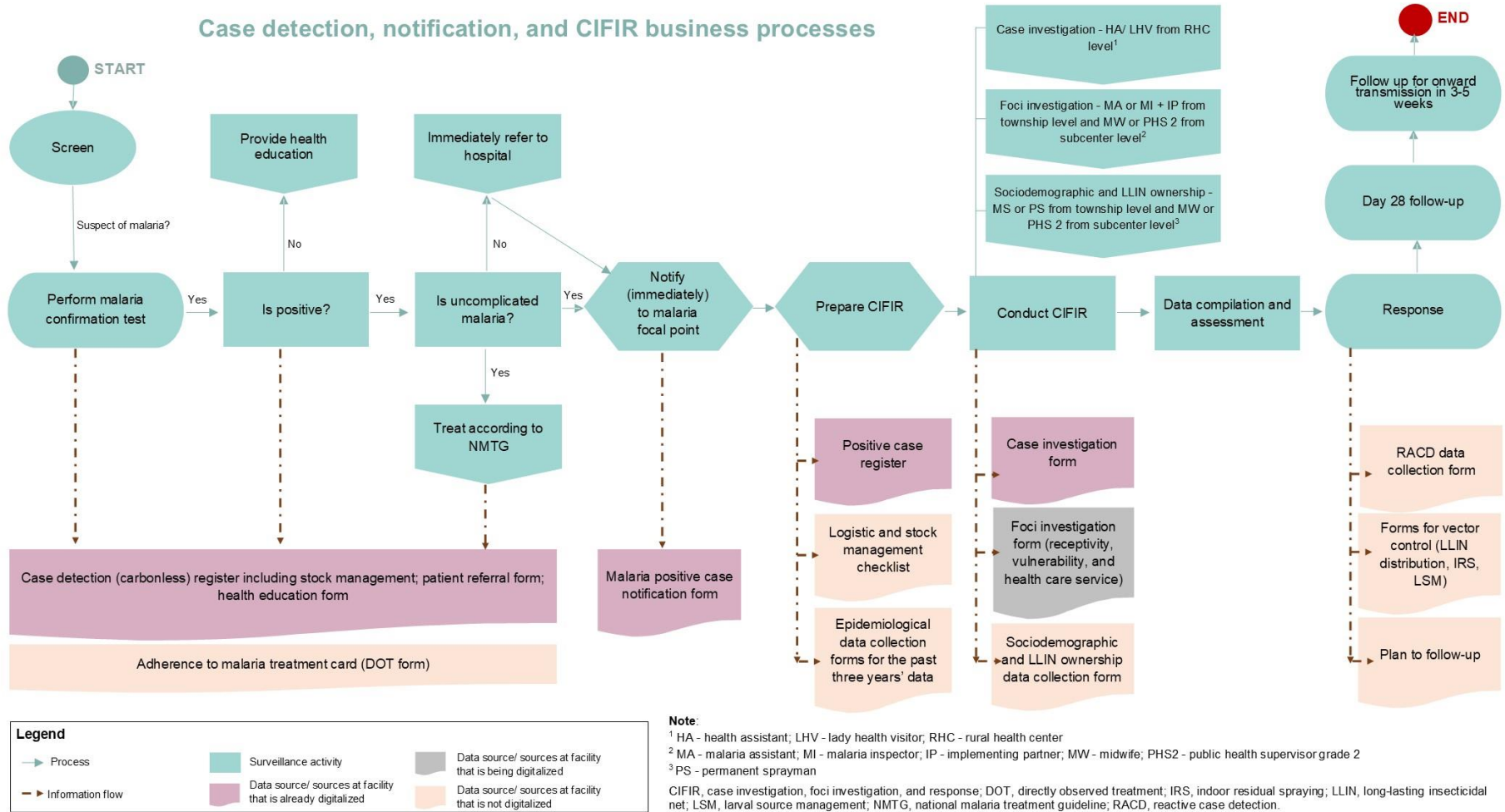
APPENDIX E

Next-generation digital health tool functionalities for malaria case management

CASE MANAGEMENT FUNCTIONALITIES	MCBRS	MCBR/ MCBS	SMS for Life	MSS (Web- Based)	ODK
Notifications Tool sends and receives notifications	■	■	■	□	□
Stock reporting & analytics Tool collects stock data and has analytic functions to support stock and logistics data analysis and decision-making	■	■	■	□	■
Interoperability with other national health systems Tool sends information to other national systems (iHRIS, LMIS, etc.)	■	■	■	■	□
Referral coordination Tool allows CHW to notify local health facility of referrals and track them	■	■	■	□	□
Scheduling & work planning Tool allows CHW to plan and schedule key activities in the community	□	□	□	□	□
■ = Current functionality ■ = Possible, but functionality currently not in use □ = Does not have functionality					
MANAGEMENT & SUPERVISION FUNCTIONALITIES	MCBRS	MCBR/ MCBS	SMS for Life	MSS (Web- Based)	ODK
Decision support Tool provides algorithms or checklists to guide CHW service provision	□	□	□	□	■
Training materials & resources Tool provides access to training materials, policies, or other useful reference documents	■	■	■	□	□
CHW geolocation Tool allows collection or use of CHW geolocation data for monitoring and planning distribution	■	■	■	□	■
Supervision Tool can be used by supervisors to assess CHW skills and capacity	■	■	■	■	■
■ = Current functionality ■ = Possible, but functionality currently not in use □ = Does not have functionality					

APPENDIX F

Business process



APPENDIX G

Timeline of report

Following data collection, PATH shared the United States President's Malaria Initiative (PMI) and Digital Square's progress update with PMI Burma on January 26, 2021. Based on the valuable feedback received, PATH planned for a meeting with PMI Burma to share the preliminary findings and recommendations on February 16, 2021. Due to a military coup in Burma on February 1, 2021, it was not possible to coordinate with the National Malaria Control Program and share the findings. In addition, convening the prioritization workshop even virtually became difficult due to the erratic Internet connection and power outages in many parts of Burma. Therefore, based on guidance from PMI Burma, meetings were planned with two key stakeholders, World Health Organization Myanmar and Defeat Malaria, to share/discuss the preliminary findings and recommendations on February 18 and March 16, 2021, respectively. The notes of both meetings were shared with PMI Burma. Based on all the feedback received, the final report was developed.

