

Field survey report Malaria Case mRegister for GPs

Global South eHealth Observatory
Fondation Pierre Fabre

Collect data on malaria cases from the private sector in order to have a comprehensive epidemiological study of malaria in Myanmar



Private clinic doctor completing the malaria case reporting form using the ODK Collect application

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1. CONTEXT

In Yangon I met with the NGO Malaria Consortium, this time for a malaria-only project which is at a very early stage in its implementation, having started in September 2018. The atmosphere in Myanmar was similar to that in Mozambique, the country having been under military government for a long time, still with harsh administrative procedures. I was required to obtain visit authorisation for the field mission to Kalay, well off the tourist trail, and with a few exceptions, I was not given the right to film or photograph the administrative staff.

In the recent past, the country went from a post-independence socialist government, set up in 1948, to a military regime in power from 1988 to 2011. This double heritage is particularly evident in the health system, the public aspect of which is free to all. In 2016, the government decided to extend the absence of charge from consultations to include most medicines, still within the public hospital network.

"Many people resident in rural areas still do not know that, and continue to visit private sector doctors who are often close to their homes", explains one of the doctors whom we met, Dr Myint Aung. The prime motivation of patients, however, is still speed of treatment. "If you go to the public hospital, you will see endless queues with hours of waiting time. There are few doctors and they treat the patients most in danger first of all", explains Kyaw Thura Tun, a technical specialist with Malaria Consortium Myanmar.

The salary received by the public sector doctors is \$200-300 per month, contrasting with a little under \$100 for the minimum salary. After six years of study, many doctors therefore choose to open their own surgeries. Because of the administrative obligations imposed by the government for opening a specialised surgery, the vast majority of doctors set themselves up as *General Practitioners* or GPs.

Health Manpower, 2013-2014

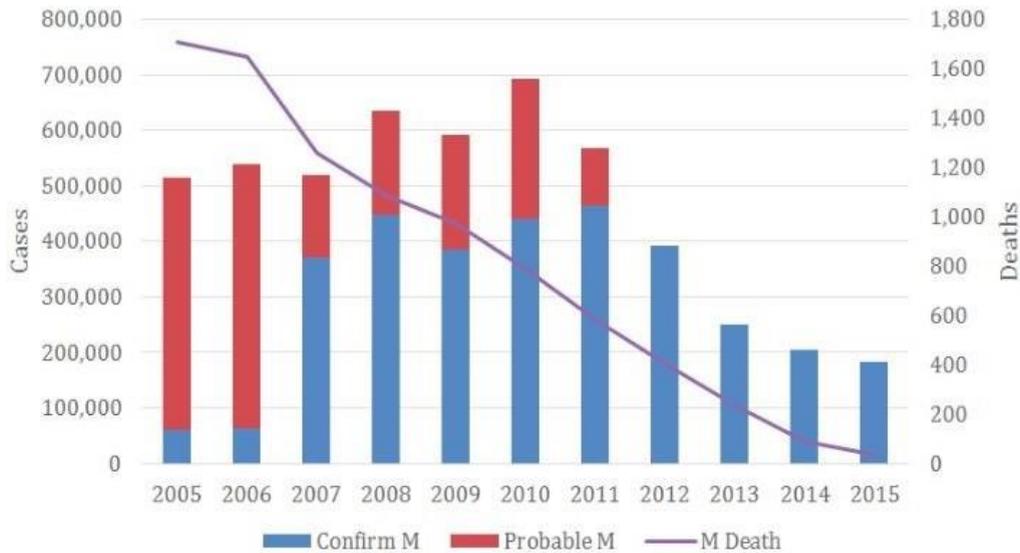
Total n. of Doctors (Public)		Total n. of Doctors (Cooperative & private)		Nurses	Health Assistants	Lady Health Visitors
13099	31542	18443		29532	2062	3467
Midwives	Health Supervisors 1	Health Supervisors 2	Traditional Medicine Practitioners (Public)	Traditional Medicine Practitioners (Cooperative & Private)		
21435	652	4998	1048	5915		

Health-related human resources in Myanmar, figures for 2013-2014. Source: National Strategic Plan 2016 – 2020, Ministry of Health and Sports, World Health Organization.

As can be seen from the 2014 figures, the number of private sector practitioners is consistent with the scale of the country. In addition to this initial distribution, numerous public sector doctors also work as GPs outside their working hours in order to increase their income. The scope of practice and health data for these doctors are unknown.

It is against this background that Malaria Consortium Myanmar's ODK Collect project was set up, with the aim of meeting the targets of the National Strategic Plan for Malaria set up in 2016 by the

ministry. This project has undertaken to eradicate malaria by 2030. To achieve this target it will require precise figures from the field, and these figures can only come from the public health services.



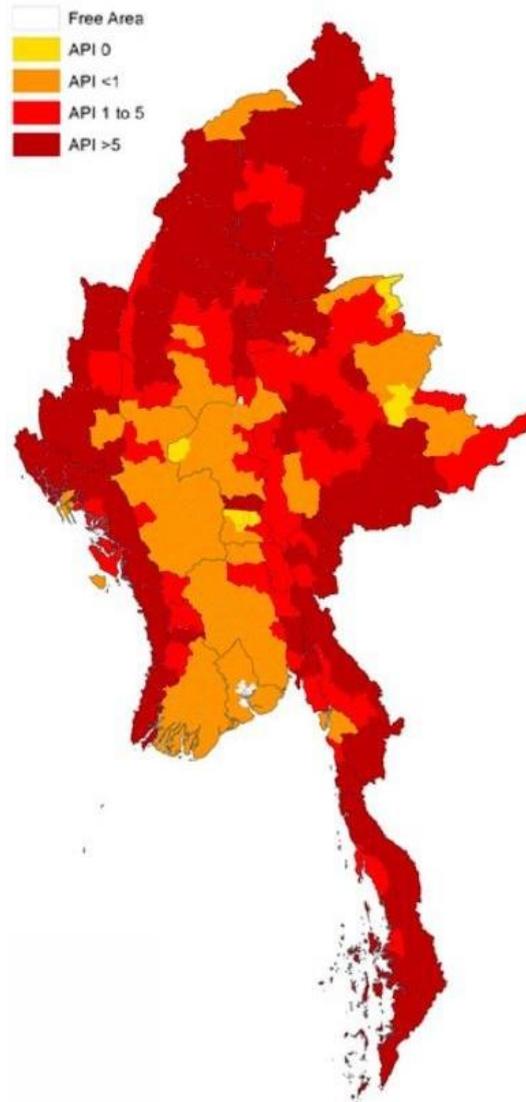
Changes in numbers of cases and mortality rates for malaria, 2005-2015. Source: National Strategic Plan 2016-2020, Ministry of Health and Sports, World Health Organization.

The data currently available shows that the incidence of cases reported has dropped by almost 49% since 2012, from 8.09 to 4.16 per 1,000 in 2015. Despite this significant process, Myanmar still accounts for almost 70% of cases reported in the Mekong sub-region.

2. THE BIRTH OF THE PROJECT

The ODK Collect application was launched following an observation of the problem of malaria in the country by Malaria Consortium. The organisation was established in Myanmar in 2013, initially to conduct a study of the national malaria monitoring system. This study highlighted in particular the importance of obtaining high-quality data in the field. From 2015 onwards, the project was extended through the technical support given to the National Malaria Control Program (NMCP), which includes the training of health managers at three levels: central, regional and local. At least one NMCP staff member was thus trained in the use of a diagnostic and malaria treatment database for each town and city located in the endemic area, making 291 managers.

Within this programme, each region was classified according to its annual incidence of malaria cases: eradication zone (no cases reported), pre-elimination zone (1 case or less per year), controlled malaria (less than 5 cases) or endemic malaria (over 5 cases).



Incidence of malaria cases at regional level in 2015. Source: National Strategic Plan 2016-2020, Ministry of Health and Sports, World Health Organization.

The reporting of each case of malaria in the pre-elimination zones was made compulsory in 2016 by the NMCP. *"But that only applies to public health, and the obligation does not extend to GPs "*, clarifies Malaria Consortium's technical expert. A whole layer of health care at local level is therefore under the radar of the NMCP's monitoring of malaria cases. This is a major gap which Malaria Consortium is determined to fill by launching the ODK Collect project in August 2018, with a first pilot scheme restricted to pre-elimination zones only, to study the impact on a small number of cases while restricting the needs for funds.



Dr Myint Aung, Member of Malaria Consortium Myanmar

The Malaria Consortium Myanmar team employs twelve people, working on NGO projects (including the ODK Collect application) and on technical support for the National Malaria Control Programme.

3. AIM AND ESTABLISHMENT OF ODK COLLECT

A) Aim of the application

The application forms part of the aims of the NMCP programme, the ultimate aim of which is to eradicate malaria completely by 2030. To achieve that, the ministry needs better monitoring of cases, and therefore needs to have data in real time, in order to plan interventions at community level.

ODK Collect is a data collection application for suspected cases of malaria. It must allow local, regional and central health officials and local NMCP investigation teams to be informed immediately. This apparently simple mandate, however, is hampered by the health situation particular to Myanmar, with which Dr Moe attempted to familiarise me during our mission.

The first difficulty, therefore, is visibility of health data linked to the private sector. Aung Shwe Tun, local director for the Kalay NMCP programme, explained as follows: *"The private clinics in Kalay do not report the cases of malaria which they encounter. There are a great many, and if this data is not visible, how can we work to try and eradicate malaria?"*

The technical specialist from Malaria Consortium adds to this observation: *"You need to understand that private practitioners are the first entry into the system. Most people, when they have a high temperature, start by taking paracetamol, then if that doesn't work they visit the GP, but they*

only visit the public hospital very rarely. The private health sector in Myanmar is therefore a blind spot in the system."

This lack of visibility is reinforced by the reluctance of private practitioners to involve themselves in a data collection programme, because of lack of time: "*We're overwhelmed, and for many people, taking the time to fill out one more form and learning to use a mobile application is out of the question*", explains Dr Soe Eung, another GP from Kalay. Many private practitioners simply do not test patients for raised temperatures, so as not to overload themselves on a daily basis. If they have any concerns about malaria, they direct the patients to private hospitals and laboratories. The application has therefore been developed in response to these difficulties.

B) Technical context of development and public health protocol

ODK Collect was developed internally on Android and in *Open Source*, to meet the needs of its future users, with whom the team consults regularly during the pilot phase. The data is then displayed and stored on the ONA server platform, a free American-Kenyan service dedicated to health applications and supported by international sponsors. The Ministry of Health has not as yet defined any data protection regulations, but Malaria Consortium follows the rules applicable within the European Union.

Regarding the content and ultimate aim of the application, the NGO has worked closely with the Ministry of Health. The systematic reporting of cases that it has set up is along the lines of government targets and could thus soon become obligatory. It has therefore been keenly supported by the Ministry since its beginning, as explained to me by the Malaria Consortium Country Director, Dr Moe Myint Oo.

In 2018, the teams were approved by the ministry and by the NMCP to test the pilot project, enrolling up to 20 GPs in each district. The two organisations even assisted the NGO in its steps with the general practitioners. Finally, the health protocol according to which the application is guided complies with that of the NMCP, standardised by the ministry for public sector doctors.

C) Enrolment and training of doctors

The general practitioners in the private sector were initially invited by the ODK Collect teams to a series of awareness seminars on malaria in general and more specifically on the importance of listing each case with the aim of eradicating malaria. They then had the opportunity to commit themselves voluntarily to the programme, before undergoing training in use of the application.

The training lasted half a day, and was given by the Malaria Consortium teams who were then available to the doctors in cases of difficulty with the application, and in particular to provide remote technical support where needed. The NGO also trains local, regional and central health managers in the use of ODK Collect.

4. OPERATION OF THE PROJECT: THE CASE OF KALAY DISTRICT

A) Structure and principal characteristics of health in Kalay

Our field mission thus started in Kalay, a city with about 350,000 residents located in the North-West of the country, close to the Indian border. Kalay is one of five cities in Sagaing Region accepted to test the project, alongside Banmawk, Katha, Pinlebu and Wuntho. The city has 60-70 doctors within the district hospital (300 beds), 18 GPs and 8 private hospitals each with one doctor. Alongside the NGOs, three organisations are authorised to train the 150 local malaria volunteers. These are the Myanmar Medical Association (MMA), Population Service International (PSI) and the Myanmar Church Council (MCC), who are obliged to work with the NMCP to transfer the data.

Initially we were received by the ministry's district health manager, Dr Goh Khan Non, who explained to us that his principal mandates in terms of public health were dengue fever, malaria and tuberculosis. Diabetes and hypertension, which are rapidly increasing everywhere in the country, follow close behind. According to his data, 10-20 cases of malaria are recorded each year throughout the district.

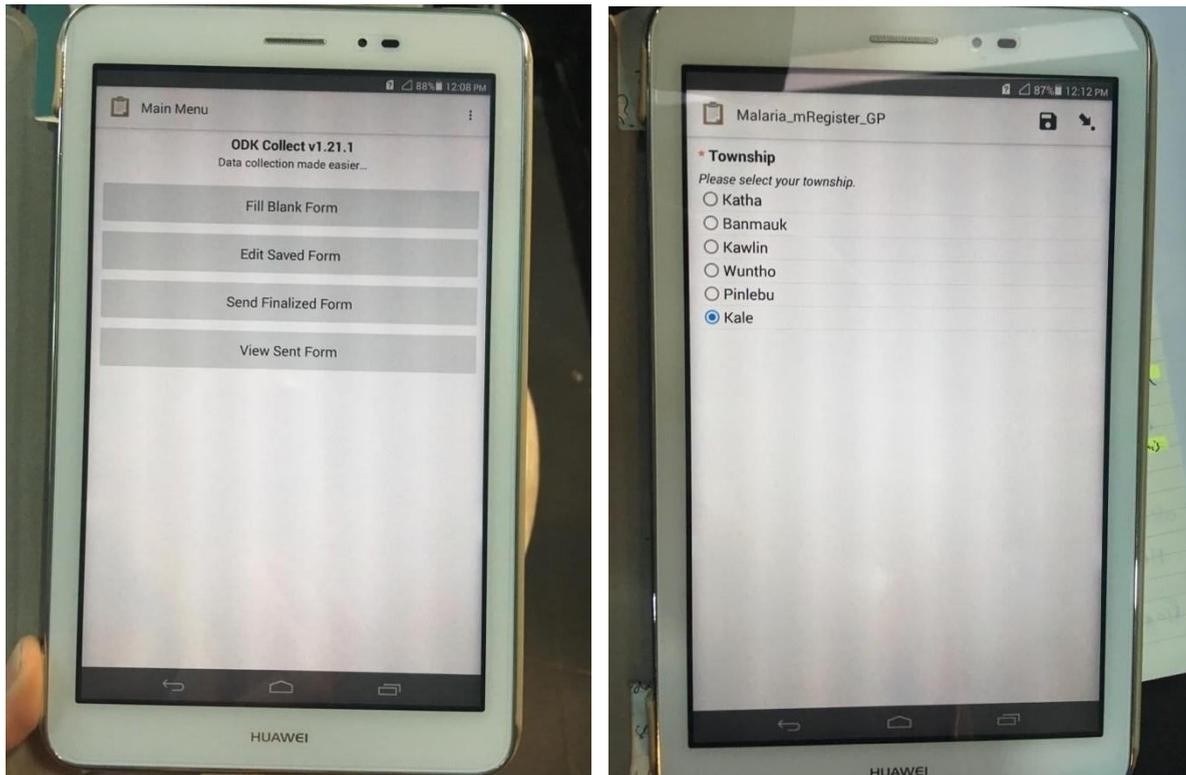


StartupBrics with Dr. Moe Myint Oo, Country Director of Malaria Consortium, and Dr. Goh Khan Non, District Health Manager.

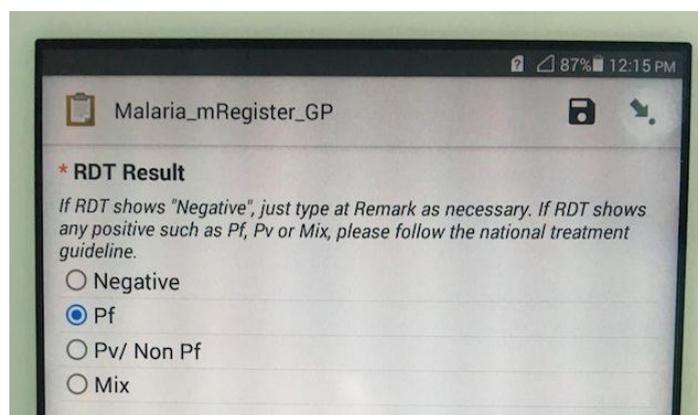
B) Functioning of the application

The ODK Collect pilot scheme is currently being tested by 19 general practitioners in the private sector, 80% of whom use the application regularly (systematic reporting of cases both positive and negative) and comply with the 24-hour notification deadline. Almost 50 patients per month are therefore reported using ODK Collect.

The project supplies the doctors with tablets, telephone credit (3,000 kyats per doctor) and rapid malaria detection tests. In order not to overload the GPs, ODK collects a specific and limited amount of data: 7 variables (name, sex, age etc) for patients testing positive and 11 for those testing negative. In just 3 minutes, therefore, the doctor can enter the useful information and put the file online. The application also allows the form to be entered offline and sent by the platform when the next connection is made.



Displays provided by the ODK Collect application: (1) Home page, which offers the choice of completing, editing, sending and displaying a form. (2) One of the variables in the questionnaire: city in question.



(3) The application follows the test result and requests that ministerial guidance be compiled with.

The information on the form is placed online instantly on the ONA platform, accessible to the personnel of the NGO and to the public health managers.

Malaria Consortium has obtained ministerial approval for the introduction of a new function in the pilot project, to be active from June onwards: once the form is online, a text message will be sent to the NMCP field survey teams, inviting them to follow the eradication programme guidelines.

Field	Value
* Patient Name	Julie Lanckriet Test
* Patient Age	46
* Patient Location	Inside township
* Sex	Male
* RDT Result	Pf
* ACT	Coartem 6
* Primaquine	No
* Treatment Given	<24 hours
* Referral	No
* Malaria Death	No
Remark	None

(4) Completed form showing all variables. The GP may decide to send it or edit it later.

Aung Shwe Tun, Kalay's local NMCP director, explained the guidelines to us: *"Our aim is to completely stop the transmission of falciparum in the district by 2025. To achieve that, every volunteer, public hospital and NGO must obtain details of cases within 24 hours and carry out an investigation in the area involved. This is also a way for our teams to cultivate awareness: good practice, distribution of impregnated mosquito nets etc."*

The District Health Manager specifies this approach: *"It's method 137: report cases of malaria within one day, inquire about these cases within the three days following the notification, and carry out a scientific and medical examination of the area within seven days."* The questions put to the patient and those close to them are designed to determine whether the case is imported or indigenous. The NMCP teams must also test those around the patient. The examinations conducted within seven days must collect adult mosquitoes and larvae in the area involved, for laboratory analysis. This last stage is not yet effective, however, because of lack of funding for the NMCP programme.

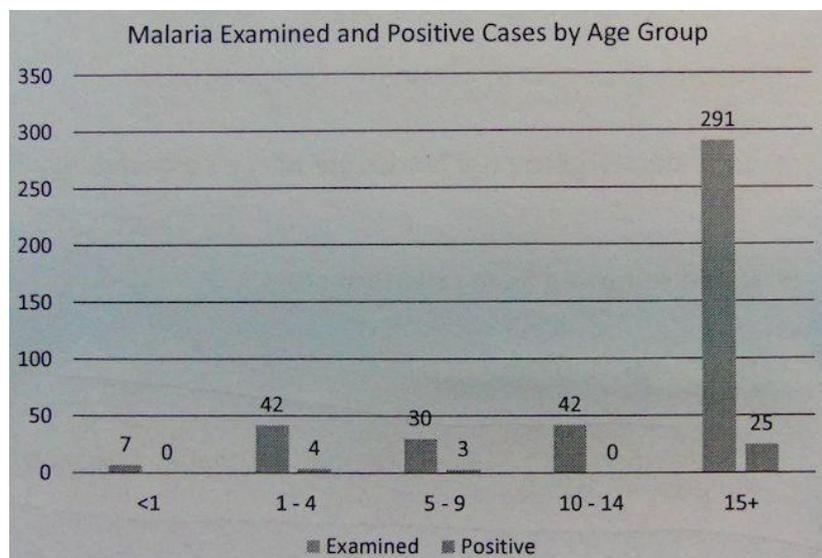
Outside the ODK Collect programme, cases are reported by public hospitals using a paper process, through which it takes a month for data to be passed on to central level. Other GPs, in a very small minority, also work together indirectly in the notification process, sending their data to the NGOs affiliated with the NMCP (since 2018, to Malaria Consortium also). However, this information takes three months to send and only collects data aggregated *via* paper forms.

C) Initial results

The local NMCP director for Kalay District has given us the latest figures available to him, which include all the cases collected (volunteers, NGOs, hospitals and GPs participating in the ODK Collect programme):

- 77 confirmed cases of malaria were recorded in Kalay in 2018.
- 6 cases were confirmed in early 2019 (2 cases in January, 2 in February, 1 in March and 1 in April).

Following the inquiries into each of the confirmed cases, "*We demonstrated that there were no more indigenous cases, but that these were imported cases*", declared Dr Goh Khan. Although the impact of ODK Collect is difficult to determine because of limited reporting and the seasonal nature of cases (the application has not yet seen a monsoon season), the proportion of cases encountered in the private sector nevertheless seems significant. The Malaria Consortium land country director advises me that of the 412 cases reported since the implementation of ODK Collect, 32 positive cases have been recorded in the five districts.



Proportion of cases examined/confirmed per age bracket according to data collected by ODK Collect.

Due to the zone's pre-elimination status, the frequency of these positive cases does not appear high enough to compile an in-depth analysis of the use of this application by private sector doctors. In fact, of the three doctors we met, none of them had seen a positive case since ODK Collect was launched. Dr Goh sees 20-25 patients per day during the dry season, and almost double that during the monsoon, but has not seen a case of malaria since September. The same is true for his colleague, Dr Soe Eung, who works in a semi-rural area,

sees 30-40 patients per day in total and systematically tests for malaria in cases of high temperature. He confirmed that he had not seen a case since September, neither in the cities nor in the rural areas. The same goes for Dr Myint Aung, who sees about 40 patients each day and works 100% for his clinic.

5. IMPACT AND ADDED VALUE

The first added value of ODK Collect is therefore the provision of visibility and reliable data in what was previously a blind spot in the health system, allowing its decision makers to plan for the future and monitor targets.

If the expansion phase of the application is successful and the programme is extended to every private sector practitioner, this will allow the NMCP to benefit from a complete overview of malaria cases and their number and type at local level, in order to shape their eradication campaigns better and distribute them over time.

"The international community has made huge investments against malaria in this region and especially in Myanmar, but nobody has touched on the problem of private sector practitioners. It's this approach that we've chosen, because it's impossible to achieve eradication if all or part of the problem is hidden", says Moe Mynt Oo.

For the District Health Manager, it is just as important to obtain data on negative cases. *"If there is no data, we cannot be certain that we have negative cases and therefore malaria-free zones. Having this data helps contribute to the eradication of the disease."*

The second added value of the project is the hitherto unseen speed with which the information is collected and sent up to the highest levels. This speed is essential in order for cases to be studied and treated in good time.

Obtaining a report for each case within 24 hours is a huge change compared with previous systems. Currently, it takes a month for public hospitals to send information outside the ODK Collect system, and up to three months for the few GPs monitored by the NGOs to send it. Dr. Soe Eung appreciates the qualities of this system: *"ODK Collect is very simple to use. Compared with the paper reporting system, it's very simple and a lot faster. With regard to the issue of sending information to central units, there's nothing like it: it just isn't possible to do that in 24 hours with the paper method."*

The procedure will also help to greatly increase the number of cases investigated, allow a better understanding of the epidemiological landscape, and help the country advance towards the 2030 target.

Finally, the programme will help restore the link between private sector practitioners and the central administrative authority, and this will benefit the rest of the health system.

As seen on the third picture of the application, this authority can recommend that practitioners follow the ministry protocols. The technical expert with Malaria Consortium explained that if a malaria test proves positive, ODK Collect will show a picture of a box of Coartem, given that private sector doctors often opt for their own treatment or injections of Arthemether. If the programme was extended, then the ministry could reinforce the application of its guidelines by GPs in other prominent areas of health.

6. DIFFICULTIES, RECOMMENDATIONS AND AREAS FOR EXPANSION

The first difficulty being encountered by the Malaria Consortium Myanmar teams is the enrolment and retention of practitioners: *"We are not currently managing to convince everybody in the same district to enrol, and we have no more than 20 GPs on the entire platform when we could be enrolling 20 for each of the five districts"*, laments Moe Mynt.

According to Dr Goh Kan, awareness needs to be increased at any cost: *"Cultivating awareness is the key to getting the programme extended and making it last long-term. The programme needs to be comprehensible and easy and quick to use, otherwise it will end shortly after it begins."*

Another problem to be taken into account is the strengthening of the legal network and ensuring the protection of data. In fact, it has been observed that an absence of current regulations may work in favour of a pilot project, but should be reconsidered for a project that is rolled out at national level. With that in mind, the team has considered two scenarios: either remain in *open source* (inexpensive but data stored abroad), or develop its own application which would be included on the NMCP server in Yangon. Notably, this second option would involve training GPs in a new version of the application.

Comparison of Scenario 1 and 2	
Scenario 1 – Open-source / ODK	Scenario 2 – Owned Application
<p>Pros</p> <ul style="list-style-type: none"> • Open-source software • Quick development and upgrade • Easy to add other diseases • In-house capacity • No trainings required for the existing GPs 	<p>Pros</p> <ul style="list-style-type: none"> • Host at the in-country NMCP server • No linkage required, direct link to the server • Hybrid version (iOS and Android) • No additional fee upon loads of cases • Ownership and sustainability
<p>Cons</p> <ul style="list-style-type: none"> • Rely on the external server • Additional fee upon loads of cases when scaling up • External linkage to link the national system • Cost for the linkage development 	<p>Cons</p> <ul style="list-style-type: none"> • Rely on external IT company/ contractor • Cost and time for the development • Additional cost for other diseases • Refresher trainings required for the existing GPs

Advantages and disadvantages of the two technical development scenarios envisaged by Malaria Consortium for ODK.

On a wider plane, from the perspective of most people interviewed, the future of ODK Collect will involve a geographical, thematic and conceptual expansion of its activities. This is the case with GP Myint Aung: *"The programme must be extended to other regions more seriously affected by malaria. There aren't sufficient cases here to have a significant impact. The other priority, in my mind, is to extend the programme to the public and private hospitals, which are major entry points for the health system."*

" The same goes for Dr Goh Khan: *"Rather than enrolling specialists, we need to work directly with the private hospitals and laboratories to whom the fever cases are referred for tests."*

Dr Moe's teams are well aware of the need to develop the pilot scheme, and they have devised expansion plans to contact up to 256 GPs, especially in the regions where malaria is endemic. Secondly, they will be targeting public and private hospitals in order to reach the care system in its entirety.

In the future, ODK Collect may be used to obtain other data on conditions such as AIDS, tuberculosis or dengue fever. Dr. Moe also mentioned the possibility of extending the application to another of the NGO's programmes, monitoring basic diseases in rural areas (similar to UpScale in Mozambique). The application could be crucial for detecting outbreaks of dengue fever in good time.

7. DONORS AND ECONOMIC MODEL

As ODK Collect was developed in *open source*, the service is currently free of charge and plans to remain so, being in the public health domain. Although the application does not really have an economic model, it does have a strategy for making the project durable.

The medium-term "road map" for Malaria Consortium will take it through an assessment of the impact of ODK Collect in the field in September, before activity is interrupted to concentrate on the final assessment of the project by December. The results will then be sent to potential donors to study how the programme will be resumed. Once the programme is better developed and a solid results base is obtained, the team believes that it will convince the Burmese health ministry to include it completely.

The cost of the project is difficult to determine as the initiative was only started about six months ago. However, the costliest areas of the budget are training (\$123 per GP, \$48 per official and \$240 for the team per training session), the tablets and the telephone credits.

For its inception in Myanmar, and for its other programmes, Malaria Consortium was supported by USAID, the DFID and the Norwegian Refugee Council. The ODK Collect initiative has been supported by GSK (GlaxoSmithKline), a British sponsor, *via* its Comic Relief funds manager (which also finances the NGO PSI). Their financial contribution, which totals \$1.1 million over two years, lasts until the end of 2019.

CONCLUSION

ODK Collect is a very new programme, which forms part of the government's national malaria plan, the NMCP, which is committed to eradicating malaria by 2030. Against this background, Malaria Consortium has developed, in association with the Burmese health actors, a mobile application for collecting details of suspected and confirmed malaria cases. This is initially being done in areas with very low incidences of cases, to allow the concept to be tested.

The programme has expressly chosen to target private sector practitioners, who are the weakest link in the system because their practices are not visible to the health ministry and this link is glossed over by the traditional sources of funds in the fight against malaria in Myanmar.

After an initial phase of cultivating awareness in the community and deploying the application in the districts selected, the use of ODK Collect is starting to show its first positive results. Practitioners and health managers are convinced of the importance of having these cases reported by the medical community as a whole, and recommend that the programme be extended to hospitals on one hand, and other regions with higher incidences of malaria on the other.

To achieve this twofold target of conceptual and geographical expansion, it is essential to confirm public support for the programme and to obtain the necessary funds. These aspects will initially allow ODK Collect to increase in maturity and thus cultivate habit of use amongst the users (especially practitioners), while at the same time developing a legal framework for data of protection and secondly allowing the application to reach many more cases and even, in time, cases of other diseases.