The Importance of Building Community Trust for Sustained Malaria Elimination Interventions During Unforeseen Major Disruptive Events Such as COVID-19: A Cambodia Case Study

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Abstract

Background

Impressive progress in reducing malaria trends combined with the 2018 report of no malaria related deaths for the first time, puts Cambodia well on track to reaching its malaria elimination goals. However, the novel coronavirus SARS-CoV-2 (COVID-19) pandemic presents a potential challenge to this goal. The path towards malaria elimination is dependent on sustained interventions to prevent rapid resurgence, which can quickly set back any gains achieved.

Methods

Mobile Malaria Workers (MMWs) need to have a strong understanding of the local geography and, most importantly, build and maintain trust among the communities they serve. To achieve this, Malaria Consortium uses a peer-to-peer approach for the MMWs and ensures the same level of trust operates between the MMWs and Malaria Consortium. Malaria Consortium's policy during COVID-19 has been to follow national guidelines while continuing to support community-based malaria services via the MMWs / mobile malaria posts (MPs) with as minimal disruption as possible. A risk assessment was carried out by Malaria Consortium, with a mitigation plan quickly developed and implemented, to ensure MMWs were able to continue providing services without putting themselves or their patients at risk.

Results

Malaria Consortium ensured the MMW/ mobile MP program is built on trust, relevance to, and connection with the communities being served. An overall decline in malaria testing was reported from Health Centres and VMWs among all three provinces in March and April, not seen in previous years and possibly attributable to fear of COVID-19. However, Malaria Consortium supported MMWs have not reported any such decline in the utilization of their services and attribute this to the trust they have among the communities.

Conclusion

Malaria Consortium has effectively demonstrated care and solidarity with and among the MMWs and communities being served. This has ensured a high level of trust, and therefore willingness among the MMWs and communities to continue providing and utilising malaria services as usual despite the fear of COVID-19. Building trust among rural communities builds resilience and ensures uninterrupted and effective malaria elimination activities can continue even during a potential extraneous disruptive force, such as the Covid-19 pandemic.

Background

Objective

The path towards malaria elimination is dependent on sustained interventions to prevent rapid resurgence, which can quickly set back any gains achieved. This paper outlines the benefits of particular approaches towards engaging with target communities to promote acceptance and trust towards malaria workers, build resilience and thereby allow disease control efforts to continue despite the impacts of an unforeseen concomitant disaster such as Covid-19.

Introduction

Cambodia has set an ambitious goal of *Plasmodium falciparum* malaria elimination by 2020 and total *Plasmodium* malaria elimination by 2025. Figure 1 demonstrates the country's impressive progress in reducing malaria trends from Jan 2018 – May 2020. This reduction, combined with the 2018 report of no malaria related deaths for the first time (WHO, 2019), puts Cambodia well on track to reaching its elimination goals. However, the novel coronavirus SARS-CoV-2 (COVID-19) pandemic presents a potential challenge to this goal. As observed in other countries around the world, COVID-19 can quickly overwhelm health system capacity and divert attention from other pre-existing health priorities.

Despite significant advancement towards malaria elimination, efforts over the last decade have been challenged by the spread of artemisinin-resistant (ART-R) *P. falciparum* malaria in Cambodia and neighbouring Greater Mekong Subregion (GMS) countries. In the GMS, malaria parasite reservoirs cluster along international borders and around forests, the same areas where ART-R malaria is also most prevalent (Kingdom of Cambodia MoH 2016, Bannister-Tyrrell et al 2019). Individuals known to frequent these remote forest locations remain a priority high-risk population group that fall outside the reach of village-centred interventions, presenting operational challenges for malaria programmes (Canavati et al 2020). These include forest-fringe village inhabitants who go into the forest regularly to hunt and gather and also includes mobile and migrant people who spend extended periods of time in the forest, for example, gem miners, loggers, or soldiers; and ethnic minorities who live in or next to the forest and practice subsistence agriculture in forest farms and fields (Bannister-Tyrrell et al 2019). Due to cultural and environmental barriers, as well as lack of adequate road infrastructure, these remote and often poor communities bear the greatest economic burden of ill health, and have limited access to health facilities or community-based health workers (CHWs) such as village malaria workers (VMWs) that operate in static village locations (Liverani et al 2017). In 2009, the national malaria control programme (CNM) introduced a new cadre of CHWs known as mobile malaria workers (MMWs) to actively target these remote populations (Canavati et al 2016).

Malaria Consortium is supporting the provision of early diagnostic and treatment (EDAT) services for malaria among remote populations through MMWs and mobile malaria posts (MPs) in three provinces in North East Cambodia. The approach was developed in alignment with the National Strategic Plan for

Elimination of Malaria, in close collaboration with CNM and built on lessons learnt from earlier RAI projects (Malaria Consortium 2017).

Situated relatively close to China, Cambodia was quickly on high alert as international news first reported the outbreak of COVID-19 in Wuhan and the subsequent lockdown of the city. Cambodia's first COVID-19 case was diagnosed on 27 January 2020 (WHO 2020), and the country responded swiftly by reducing international travel and setting up screening points at border crossings to provide health education and fever screening for returning Cambodian migrant workers. Travel within the country has been allowed to continue except for the holiday period of Khmer New Year (April). The Ministry of Health (MoH), World Health Organization (WHO), and other partners ramped up preparations for the health sector to accommodate a potential increase in COVID-19 cases and developed an Emergency Master Plan for COVID-19 response. The MoH updates the number and location of COVID-19 cases on a daily basis at <https://covid19-map.cdcmoh.gov.kh/> and posts daily surveillance reports at <http://cdcmoh.gov.kh/resource-documents/covid-19-documents>. As of 20 July 2020 there have been a total of 171 confirmed cases and zero deaths reported in the country (<https://covid19-map.cdcmoh.gov.kh/>).

Literature review

There has been increasing global recognition of the important role CHWs play in helping to reduce inequities in access to essential health services. Renewed interest in these programmes can be traced, in part, to an increased focus on the achievement of universal health coverage (Naimoli et al, 2015). The WHO Global Strategy on Human Resources for Health: Workforce 2030, adopted by the World Health Assembly in 2016, encourages countries to adopt a diverse, sustainable skills mix, which includes harnessing the potential of CHWS in interprofessional primary care teams (WHO 2018). CHWs are now a component of many health systems, primarily in low- and middle-income countries, although in the context of COVID-19 there has been increased discussion about their usefulness in high income countries such as the United States (Water, 2020).

CHWs are broadly defined as members of a community, often chosen by the community and working within their own community, who are supported by the health system but have no professional training and are usually volunteers but may receive a stipend. Using CHWs to deliver health services in their source communities has been shown to be effective in improving coverage of interventions, leading to improvements in mortality. However, in some settings, high coverage of CHWs has not led to expected levels of improvement (Grant et al 2017). Because CHWs are recruited from within their own communities, they are likely to have both a personal and a service relationship with the people they visit (Grant et al 2017). Being a member of a community does not guarantee that CHWs will be trusted. To be successful, not only do specific efforts have to be made to ensure trust among the communities and CHWs, but between the CHWs, health facility staff and supervisors (Grant, 2017). Early community engagement, non- threatening home visits that enhance friendship and strong supportive supervision can improve the trust and acceptance of the CHWs within the communities, as well as the confidence of the

CHWs themselves, increasing the willingness of community members to utilise CHW services (Singh 2015).

Successful CHW programmes require a strategic partnership between communities and health systems (and MoH partners). Successful partnerships, however, do not happen automatically. They require explicit mutual responsibilities and accountabilities, a demonstrated willingness to work in tandem toward a common objective and flexibility (Naimoli et al, 2015). To date, there have been limited studies to show how this collaborative, dynamic approach creates trust, which can help maximise the efficient use of available resources and build resilience.

Methods

MMWs are a specific cadre of CHWs, introduced in Cambodia to improve the availability and accessibility of malaria services. To be effective, the MMWs need to build and sustain meaningful relationships with the communities they serve and be able to anticipate their forest movements. This means having a strong understanding of the local geography, since road access and river crossings change frequently; working in collaboration with local authorities; and, most importantly, building and maintaining trust among the forest goers so that they utilise the services being provided. To successfully access communities in and around the forest, some of who may be involved in illegal activities, as well as having cultural and linguistic differences from the majority Khmer population, it is essential that services are provided by a trusted and culturally acceptable person. To achieve this, Malaria Consortium uses a peer-to-peer approach, with the majority of MMWs representing at least two of the following groups: forest goers, communities that regularly cross borders, loggers, ethnic minority groups, migrant farmers or construction workers. Malaria Consortium supported MMWs must 1) have knowledge of the forest, 2) be known and trusted by the forest goers and, 3) be willing and able to work in either outreach activities or at the mobile MPs.

Once selected, MMWs are trained and incorporated into the national VMW program. MMW and VMWs meet every month with health centre staff, this ensures they are included in the general delivery of health services and can share challenges with health centre staff. However, unlike VMWs, MMWs are proactive with their work; actively seeking out hard-to-reach populations and adjusting how they deliver their services, depending on changing circumstances. To maximize the reach of activities and increases the population able to receive services, locations for MMP placement and targeted outreach activities are based on the triangulation of local MMW knowledge, distribution of cases, and accessibility of hard-to-reach and remote areas (see Fig. 3).

Just as the MMWs must gain the trust of their communities, Malaria Consortium ensures the same level of trust operates between the MMWs and Malaria Consortium. Malaria Consortium Community Mobilisation Officers (CMOs) each support an average of six or seven MMWs or mobile MPs. This enables each CMO to provide high quality support supervision; closely monitoring and following up with all MMWs/mobile MPs. If the CMO cannot join outreach activities for any reason, a home visit to the

MMW or the MMP is always planned, at least once a month. Because services are provided in very remote areas, Malaria Consortium staff often spend the night, especially during the raining season when roads can become impassable. Spending this additional time among the communities adds to the level of trust shared between the communities, MMWs and Malaria Consortium staff. Malaria Consortium staff also attend monthly MMW/VMW meetings at the HCs to arrange payments, check the register books, make sure there are enough supplies and discuss any issues or problems.

National guidance documents and operational plans for malaria interventions were quickly adapted by CNM and WHO for the context of COVID-19 (Kingdom of Cambodia MoH 2020, Kingdom of Cambodia MOH & WHO 2020). Malaria Consortium's policy during COVID-19 has been to follow national guidelines while continuing to support community-based malaria services via the MMWs / mobile MPs with as minimal disruption as possible. A risk assessment was carried out by Malaria Consortium, with a mitigation plan quickly developed (see Table 1 below) and implemented, to ensure MMWs were able to continue providing services without putting themselves or their patients at risk.

Table 1
Malaria Consortium COVID-19 risk assessment and mitigation plan for MMW activities

Malaria risks for Malaria Consortium MMW/Mobile Posts	Mitigation Measures	Implementation Status	Outcome
Risk of decreasing number of tests done by MMWs	Additional PPE material available & importance use of PPE strengthened by Malaria Consortium staff	Extra masks & forehead thermometers distributed March/April 2020	No decrease in number of tests observed; in Stung Treng some decrease for April 2020, but this is yearly recurrent phenomenon due to Khmer New Year - starting up activities in fields near villages resulting in less forest activities by population
Miscommunication/ limited understanding of COVID-19 transmission and prevention	Posters distributed related to COVID-19: transmission and prevention (provided by PHDs)	All MMWs received information (March) from Malaria Consortium staff on COVID-19 Strong messages given to continue screening, implementing/following safety instructions	Low number of COVID-19 cases/no proven local transmission makes it easier for MMWs to continue the task. Malaria Consortium staff continues to support and visit the MMW/MMP in a safe way.
Fear feeling at MMWs/MMP/Malaria Consortium staff level	Additional PPE materials provided, and communication done	Completed March/April with ongoing sharing information, updating by management team (e.g. repeat safety measures, weekly update mails task force etc.)	No fear observed among MMWs/MMP and Malaria Consortium staff; no local transmission, no cases in the area gives feeling of safety As MMWs/MMP are locally recruited, no limit in movement when some villages/areas were closed down for a few days. No limits in traveling for outreach activities.

Malaria risks for Malaria Consortium MMW/Mobile Posts	Mitigation Measures	Implementation Status	Outcome
Coverage LLIN/LLIHN	Ongoing top up of LLIN/LLIHN Malaria Consortium Stock out observed from March 2020	LLIN/LLIHN requested to continue activity LLIN: out of stock on national level (refill 2021) LLIHN: received June 2020 order	Distribution of LLIHN ongoing by MMW/MMP No more LLIN: increased risk for plantation workers, for new settlements in forested areas, for new remote annex villages
Number of positive malaria cases	System in place: any <i>Pf</i> + inform Health Centre for foci investigation & Malaria Consortium team perform re-ACD (= screening co-travellers)	Monitoring Malaria Consortium internal data base; compare/update national Malaria Information System (MIS) - monthly exchange data with CNM/WHO intensification plan for Stung Treng and Ratanakiri.	Decrease in the three areas of all types of malaria cases (end of dry season, starting rainy season) from January until May 2020

Results

The reported number of confirmed COVID-19 cases has remained low in Cambodia and there has been only minor disruptions to health services; however, the number of malaria tests conducted nationally did decrease by 20 percent in April and May compared to March, according to the WHO (WHO 2020). To date, there have been confirmed COVID-19 cases in just one the three provinces supported by Malaria Consortium, but – as with the rest of the country – there has been an overall decline in malaria testing at the HCs and VMWs among all three provinces. Such a decline was not seen in previous years and it is possible this could be attributed to fear of COVID-19 (see Fig. 4). However, Malaria Consortium supported MMWs have not reported any such decline in the utilization of their services.

Malaria Consortium supported MMWs/mobile MPs reported no disruptions to their services in the months of April and May. One MMW from Chom Ksant District, Preah Vihear Province commented “For sure, the activities of the MMWs in this area could still continue because the MMWs are all ‘recognized’ and trusted by the local people... CMOs and MMWs have heard some information from people in the communities that some villagers were worried about getting infected by COVID-19. But they still come for malaria testing at the mobile MPs or with the MMWs when they suspect they might have malaria, as they trust our services and clearly understood that COVID-19 can be prevented by wearing masks and washing their hands with soap or gel.” Another MMW in Cham village, Siem Pang District, Stung Treng Province

reported the same experience: “At the beginning of the outbreak of COVID-19, CMOs and MMWs heard some information from local people saying they were worried about the disease and afraid to go outside or to go to the town. They asked their children to stay at home. But when they suspect that they might get malaria, they will still go and meet with MMWs in the village, that they have known.”

Malaria Consortium ensured the MMW/MMP program is built on **trust**, **relevance** to, and **connection** with, **(TRC)** the communities being served. The communities trust the MMWs because they are one of them and are often known to them personally, they speak the same language and are engaged in the same forest activities. Likewise, the MMWs trust Malaria Consortium as the CMOs display a clear duty of care to them and provide consistent, relevant, and rapid support. Malaria Consortium’s TRC approach has made the communities and health service program more resilient to external factors beyond their control, and ensured people feel comfortable delivering and using MMW and MMP services even during times of uncertainty, such as the COVID-19 pandemic.

Recommendations and key next steps

- Recruit MMWs directly from the communities they will serve
- Ensure quality support is provided by the CMOs e.g. limit network size of MMWs/mobile MPs supported by each CMO
- Ensure flexibility with locations of mobile MPs and outreach services – through triangulation of relevant information
- Respond rapidly to changing circumstances
- Provide clear information and guidelines on changing situation e.g. COVID-19 transmission and prevention
- Ensure safety of staff (both CMOs and MMWs) and those utilising services e.g. rapid provision of PPE materials
- Continue to provide visible support to MMWs despite changing circumstances

If malaria elimination goals are to be successfully reached, it is vital to continue delivering essential EDAT services even during a time of potential crisis. TRC and flexible programming ensure communities and health services are resilient and less depending on external factors, making it possible for essential service delivery to continue with minimal disruption. Scaling up this approach to the MMW program will allow Cambodia, and potentially other settings, to ensure they succeed in achieving malaria elimination, regardless of the presence of COVID-19 or other potential extraneous disruptive events.

Conclusions

The rapid risk assessment and mitigation plan developed by Malaria Consortium, combined with the continued routine supervisory presence of Malaria Consortium staff, as well as the early provision of correct information on the transmission and prevention of COVID-19 and enhanced personal protective

equipment (PPE), demonstrated the care and solidarity that Malaria Consortium has for the MMWs and the communities being served. This ensured a high level of trust, and therefore willingness among the MMWs and communities to continue providing and utilising services as usual.

Preliminary data suggest that the care shown by Malaria Consortium's COVID-19 mitigation strategy, when combined with the peer-to-peer MMW approach and the social capital gained through the TRC strategy have been successful in building resilience and ensuring that COVID-19 has not impacted the delivery of EDAT services for malaria across the three supported provinces. This clearly demonstrates the important role of building and sustaining genuine trust among programme beneficiaries and service providers for the continuation of vital malaria elimination services, regardless of the ongoing external factors, whether that be COVID-19 or other potentially catastrophic future events such as other pandemics or natural disasters etc.

List Of Abbreviations

ART-R Artemisinin- resistant

CHWs Community health workers

CMOs Community mobilisation officers

CNM National Center for Parasitology Entomology and Malaria Control

EDAT Early diagnostic and treatment

GMS Greater Mekong Subregion

HC Health centre

MMWs Mobile malaria workers

MoH Ministry of Health

MPs Malaria posts

PPE Personal protective equipment

TRC Trust, relevance, connection

VMWs Village malaria workers

WHO World Health Organization

Declarations

Ethics approval and consent to participate:

Not applicable

Consent for publication:

Not applicable

Availability of data and materials:

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing Interests:

The authors declare that they have no competing interests

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Authors' Contributions

MF wrote the paper based on information provided by co-authors. JT identified the value of writing a paper on practices that sustain malaria control interventions during an exceptional disruptive event, and provided overall guidance on content and emphases. HT coordinated manuscript inputs and process management. All authors contributed to manuscript development and proof-reading.

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Figures

Figure 1

Malaria trends in Cambodia 2018 - 2020 (Source: Cambodia Malaria Elimination MIS)

Figure 2

Example of reach of Malaria Consortium supported MMW service delivery

Figure 3

Triangulation approach for determining where to deliver MMW/MP services

Figure 4

Testing and confirmed Pf and mixed cases 2017- 2020 (Source: WHO sub-regional database)