THE VILLAGE BASED MALARIA ELIMINATION MODEL FOR INTERRUPTING MALARIA TRANSMISSION IN BANMAUK TOWNSHIP, MYANMAR

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รูปแบบการกำจัดโรคไข้มาลาเรียในระดับหมู่บ้านโดยการยับยั้งการแพร่เชื้อมาลาเรียในเมืองบานมี่อก ประเทศเมียนมา

นายพเย ลิน อ่อง

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พเย ลิน อ่อง : รูปแบบการกำจัดโรคไข้มาลาเรียในระดับหมู่บ้านโดยการยับยั้งการแพร่เชื้อมาลาเรียในเมืองบานม็อก ประเทศเมียนมา. (THE VILLAGE BASED MALARIA ELIMINATION MODEL FOR INTERRUPTING MALARIA TRANSMISSION IN BANMAUK TOWNSHIP, MYANMAR) อ.ที่ปรึกษาหลัก : อ. ดร.เทพนาฏ พุ่มไพบูลย์

โครงการต่างๆ หลากหลายโครงการเกิดขึ้นเพื่อมุ่งกำจัดโรคไข้มาลาเรียในประเทศเมียนมา อย่างไรก็ตามโรคไข้มาลาเรียยังคง เป็นปัญหาสำคัญด้านสาธารณสุขของประเทศ ด้วยเหตุนี้การทดลองใช้รูปแบบการกำจัดโรคไข้มาลาเรียในระดับหมู่บ้านจึงได้ดำเนินการ ในช่วงเดือนมิถุนายนถึงเดือนพฤศจิกายน ปี 2561 ในพื้นที่เมืองบานม็อกซึ่งเป็นพื้นที่หนึ่งทางตอนเหนือของประเทศที่ได้รับผลกระทบ จากการแพร่ระบาดของโรคไข้มาลาเรีย รูปแบบดังกล่าวมีจุดประสงค์เพื่อยับยั้งการแพร่เชื้อมาลาเรียอย่างเป็นระบบเพื่อให้ได้ตามเป้าหมาย ของการกำจัดโรคไข้มาลาเรีย (อัตราป่วยด้วยโรคไข้มาลาเรียต่อประชากรพันคนน้อยกว่า 1) ด้วยกิจกรรมต่างๆ ในการควบคุมโรค ประกอบด้วย การสำรวจยุงพาหะและความรู้ ทัศนคติ การปฏิบัติตนของคนในพื้นที่ศึกษา การตรวจโลหิต การประเมินความถูกต้องของ เครื่องมือวินิจฉัยโรคที่ใช้ในปัจจุบัน การประกาศข้อมูลสุขภาพผ่านเสียงตามสาย การรายงานผู้ป่วยทันทีผ่านข้อความทางโทรศัพท์เคลื่อนที่ โดยเจ้าหน้าที่มาลาเรียของหมู่บ้าน ทำการศึกษาโดยคัดเลือกหมู่บ้านแบบสุ่มจำนวน 4 หมู่บ้านจากพื้นที่ที่มีการระบาดของโรคไข้มาลาเรีย สูงเพื่อเป็นกลุ่มทดลองจำนวน 2 หมู่บ้านและกลุ่มควบคุมจำนวน 2 หมู่บ้าน

แต่ละกิจกรรมประกอบของรูปแบบดังกล่าวนั้นมีผลต่อผลลัพธ์แตกต่างกัน โดยภาพรวมการปฏิบัติตนในการแสวงหาการ รักษาโรคไข้มาลาเรียของคนในหมู่บ้านดีขึ้นอย่างมีนัยสำคัญ ระบบการรายงานผ่านข้อความทางโทรศัพท์เคลื่อนที่เพื่อให้ทันตามเวลานั้นมี ความเป็นไปได้ และที่สำคัญยิ่งกว่านั้นรูปแบบดังกล่าวนี้มีผลทำให้การเจ็บป่วยด้วยโรคไข้มาลาเรียลดลง การวิเคราะห์การถดถอยเชิงเส้น พบว่าปัจจัยทำนายการลดลงของโรคไข้มาลาเรียในหมู่บ้านกลุ่มทดลอง คือ จำนวนกิจกรรมการประกาศข้อมูลสุขภาพผ่านเสียงตามสาย ($p < 0.001$) การส่งรายงานผู้ป่วยทันทีทางโทรศัพท์เคลื่อนที่ของเจ้าหน้าที่มาลาเรีย ($p < 0.001$) การมีมุ้ง ($p < 0.001$) และการ สำรวจด้วยการตรวจโลหิตเป็นประจำ ($p < 0.05$) อย่างไรก็ตามการได้รับการอบรมของเจ้าหน้าที่มาลาเรียไม่มีความสัมพันธ์อย่างมี นัยสำคัญทางสถิติกับการลดลงของโรคไข้มาลาเรีย ($p > 0.05$) การลดลงอย่างรวดเร็วของจำนวนผู้ป่วยในหมู่บ้านกลุ่มทดลองนั้นแสดง ให้เห็นว่ารูปแบบที่ใช้นี้อาจจะมีประสิทธิภาพในการลดโรคไข้มาลาเรียเมื่อใช้กับพื้นที่ชนบท ด้วยเหตุนี้โปรแกรมควบคุมโรคไข้มาลาเรียใน ประเทศเมียนมาควรจะพิจารณานำรูปแบบดังกล่าวนี้ไปใช้และให้การสนับสนุนเพื่อความยั่งยืนต่อไป

สาขาวิชา	สาธารณสุขศาสตร์	ลายมือชื่อนิสิต ....
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Different projects engage to eliminate malaria in Myanmar; however, malaria continues to remain a significant public health problem. Therefore, a comprehensive package intervention called "the village-based malaria elimination model" was carried out in one of the malaria-affected townships, Banmauk, in upper Myanmar, during June to November 2018. It is a systemic intervention to address interrupting of malaria transmission in accordance with elimination definition (i.e <1/1000 API) by means of comprehensive malaria control activities which consists of preliminary entomology assessment and KAP survey, routine mass blood survey, assessing diagnostic accuracy of current tools, loud-speakers base health messages announcements, real-time cases reporting and notification through mobile messaging by village malaria workers. Four villages among the most malaria-burdened areas were randomly selected: two villages were assigned as the intervention group and two as the control group.

Each activity included in the model showed separate effective outcomes. Overall, there were significant improvements in community practice related to malaria care-seeking. In-time reporting systems through mobile messaging were feasible and, more importantly, there was an overall effect in reducing malaria morbidity. In the linear regression model, the factors demonstrated to be significant predictors of decline in malaria by intervention villages were the number of health message announcement activities ($p < 0.001$), real-time mobile case reporting by malaria workers ($p < 0.001$), ownership of nets ($p < 0.001$), and routine mass blood survey ($p < 0.05$). However, the training showed no statistically significant association ($p > 0.05$). The steep decline in malaria cases among the intervention villages suggested that this intervention might be effective to reduce the malaria burden among these rural locales. The National Malaria Control Program may consider implementing this standard model and provide support for its sustainability.

Field of Study: Public Health   Student's Signature ....
Academic Year: 2018   Advisor's Signature ....

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ACT	Artemisinin based Combination Therapy
AL	Artemether + lumefantrine
ASMQ	Artesunate + mefloquine
DHAPPQ	Dihydroartemisinin + piperaquine
DoPH	Department of Public Health
DOT	Direct Observe Therapy
GMS	Greater Mekong Sub-region
G6PD	Glucose 6 Phosphate Dehydrogenese
ICMV	Integrated Community Malaria Volunteer
KAP	Knowledge, Attitude and Practice
MoHS	Ministry of Health and Sports
NGO	Non-Governmental Organization
NMCP	National Malaria Control Program
NMTG	National malaria treatment guideline
RDT	Rapid Diagnostic Test
RRT	Rapid Response Team
SOP	Standard Operating Procedure
TES	Therapeutic Efficacy Survey
VBDC	Vector-borne disease control
VMW	Village Malaria Workers
WHO	World Health Organization

CHAPTER I

INTRODUCTION

1.1 Background and Rationale

According to the World Health Organization's data, in 2016, more than half of the world's total population approximate of three billion people are at risk of affecting malaria. Among them, around 216 million people became ill with malaria and more than 440,000 deaths were reported globally. In this particular context, sub-Saharan Africa possessed the highest number of malaria cases by 80% of cases and 91% of all malaria deaths when only 10% of world malaria cases and 6% of deaths were occurred in South-East Asia Region [1]. It was very obvious that the result came out from intensive malaria control and prevention activities by multi-sectorial approaches over the world.

Malaria elimination is defined as the "interruption of local transmission of a specified malaria parasite species in a defined geographical area as a result of deliberate activities". Whereas, there should be sustainable measures that should be in place to avoid re-establishment of malaria transmission. For the certification of malaria elimination in a particular country, there should be the interruption of local malaria transmission by all human malaria parasites at least three consecutive years. In the meantime, there were some determinants to conclude the success rate for elimination progress, which are readiness and capacity of the health system, amount of investment and other factors like biological situation, the surrounding environment, and the demographic and economic realities of each country [2]. During this decade, seven countries: United Arab Emirates (2007), Morocco (2010), Turkmenistan (2010), Armenia (2011), Maldives (2015), Sri Lanka (2016) and Kyrgyzstan (2016) in the world were successfully declared for achieving malaria elimination [3].

Based on the recent evidence, the elimination of *Plasmodium falciparum* from the Greater Mekong Sub-region (GMS) seems to be the only way to halt the spread of multi-drug resistance and prevent the emergence of untreatable malaria. With the

commitment of all Asia Pacific leaders, during the 9th Asia Summit in November 2014, the malaria advisory group has declared that elimination of malaria in the GMS by 2030 is likely to be feasible and attainable [4].

In the meantime, even though Myanmar is on a good track of reducing malaria burden, there are still considerable morbidity and mortality in comparison to South East Asia Countries. In 2016, 43.9 million population living in 291 out of 330 townships are at risk of getting malaria infection [5]. The number of deaths and cases of malaria has dropped significantly from, respectively, 1,707 and 516,041 in 2010 to 21 and 105,178 in 2016, reflecting a substantial improvement in case management, particularly at the periphery and among populations at risk of malaria. However, it is still in the list of the highest malaria morbidity rate and mortality rate countries in the WHO - Regional Office for South-East Asia (SEARO) region [5].

In Myanmar up to 2018, the recommended first-line treatment for confirmed uncomplicated *P. falciparum* malaria in adults and children includes a 3-day regimen of either artemether + lumefantrine, artesunate + mefloquine (ASMQ), or dihydroartemisinin + piperaquine (DHAPPQ) followed by a single stat dose of primaquine [6]. During 2009, the evidence suggested that prolonged parasite clearance times in malaria patients treated with Artemisinin-based Combination Therapies (ACTs) either one of all three recommended ACTs prescribed in the country. This was the very first alarming signal of evolving drug resistance malaria in Myanmar [7]. In 2014, mutation of K13 was noticed in some study areas including the western parts of the country. The results also revealed that these mutants came independently and declined the fact that it was spread from Cambodia [4]. Therefore, it is strongly recommended that every malaria case must be securely treated as soon after proper disease confirmation.

Moreover, day 3 positivity rate and treatment failures after 28 or 42 days are indicators for monitoring of antimalarial therapeutic efficacy in high-transmission settings [8]. All malaria cases detected in the drug resistance low-incidence areas should be followed-up on day 7 and 28 after confirmation of the diagnosis to ensure parasite clearance. However, while approaching malaria elimination with only a few caseloads,

it will not be possible to perform therapeutic efficacy survey (TES) studies with clinical and blood slide checks on the same days as recommended in TES protocols. Complete adherence cannot be expected, but in an elimination perspective, the advantage of this practice is that any treatment failure case will be given a second-line treatment. For this, patient mobility makes it necessary for treatment providers to give each patient an identifier number and malaria/treatment card [4].

Two randomized trials on the Thai-Myanmar border in which patients with *P.vivax* were randomized to receive directly observed therapy (DOT) or self-administered therapy demonstrated that *P.vivax* relapse was significantly lower in the DOT group [9]. However, both studies looked at a 14-day treatment regimen, and further evidence is needed for the 8-course schedule currently recommended by NMCP in Myanmar. Primaquine is expected to become increasingly acceptable as field-based G6PD testing becomes increasingly available [5]. Therefore, it is timely to identify strategies to improve primaquine adherence in real-world settings to optimize treatment efficacy with to decrease *P.vivax* transmission in the area.

In Myanmar, out of 37 species of Anopheles so far recorded throughout the country. Among them, based on entomological and parasitological evidence, six species, namely *An. minimus, An. dirus, An. annularis, An. sundaicus, An. culicifacies and An. philippinensis* are locally dominant vectors infected with the malaria parasite. In addition to the above, it is suspected that *An. sinensis* may also play a secondary role in malaria transmission. *An. maculatus* is also a suspected secondary vector in the hilly and foothill areas of the country. *An. Aconitus* could also play a secondary role depending on the man/cattle ratio of a particular area. *An. Jeyporiensis* is to be regarded as a possible vector wherever it is present in abundance [5].

With high-level political commitment is now in place, Myanmar has been well-positioned to pursue an elimination agenda. Regarding WHO GMS strategies, the country plays an ongoing process of malaria elimination in areas of both multidrug and ACT resistance, and also to be narrowed down malaria epidemiological scenery by reducing active transmission to achieve the elimination of malaria by the year 2015-2030 [5]. The National Strategic Plan for Intensifying Malaria Control and Accelerating

Progress towards Malaria Elimination 2016-2020 represents the first phase of a 15-year strategy to eliminate malaria in Myanmar. While delivering intensive control efforts in more burden areas to reduce cases, elimination activities are carrying out in fewer burden areas. Then the areas will be expanded progressively and expected that *P. falciparum* will be eliminated by 2025. Then, the country will be malaria-free by 2030.

In Myanmar, currently, the overall public health services are under the responsibility of the Department of Public Health (DoPH) of the Ministry of Health and Sports [4]. Then the National Malaria Control Program is founded under the Vector Borne Disease Control (VBDC) of DoPH for driving plans, policies to control malaria, conduct capacity building training and carry out operational research, outbreaks control and advisory and supervisory roles to all other implementing partners. Again, at State/ Regional level VBDC, the State/ Regional Health Director, team leaders and medical officers and other technicians operate field level implementations, laboratory, and entomological sections.

Currently, in Myanmar, response teams (RRT) are organized at the State/Region level, but constrained resources and large coverage areas can delay for urgent responses. Operational research on shifting the tasks of RRTs to lower administrative units (i.e. "Districts" in Myanmar) is limited. Small scale evaluations of an effective RRT in one district may be used to inform scale-up towards a national program of strong, responsive RRTs. Therefore, the country should consider the township level team rather than the district level by empowering current human resources by a task-shifting procedure [4].

In Myanmar, the public health sector is still under-resourced, facing human resource and supply chain challenges, and its service network is not sufficiently dense in many areas [4]. Thus, partnering with non-governmental organizations (NGOs) is essential to enhance quality services, especially in areas where health services from public sector coverage are poor or none. To date, 24 Organizations are currently implementing 30 projects for intensive malaria control activities in Myanmar without overlapping in any villages. Even though national strategy and elimination plans are uniformly assigned for each category, different projects are doing different activities

depends on their project goal, objectives, strategy, and available fund. Moreover, these projects might emphasize mostly on coverage or outputs rather than maximizing resources for improving outcomes and impacts. Hence, malaria prevalence is said to be lesser deducted than expected to arrive at elimination goal i.e. API should be (<1/ 1000) in 2018 among six current elimination States and Regions (Yangon, Mandalay, Bago, Mon, Magway and Naypyitaw territory). The country needs to develop a strategy for the involvement and supervision of the different kinds of private providers.

In the context of malaria elimination, the roles and responsibilities of VMWs should be adapted to the country's particular conditions and respond to local needs. There should be a national strategy and approaches on involvement and empowerment of communities, as well as improving their linkages with local health staff and partnership with the private sector to ensure the sustainability of malaria preventive activities. NMCP will conduct knowledge, attitudes, practices, and beliefs (KAPB) surveys to evaluate the impact of IEC/BCC strategies and to assess the compatibility of the practices, customs and beliefs of various social groups and minorities with existing prevention approaches. Based on the results, IEC/BCC strategies and related materials can be updated.

In the elimination phase, the country should concentrate on detecting every infection and reacting to every confirmed case. Thus, malaria surveillance in the elimination phase is aimed at (1) immediate detection and mandatory notification of all malaria infections, within 24 hours to ensure that they are early and properly treated in order to prevent generating secondary cases; and (2) whenever possible, investigation of each malaria case to differentiate whether it was indigenous or introduced or imported, ideally within 24 hours but not later than 3 days[10]. Once a local transmission of malaria or active foci has been observed, a proper investigation is carried out by malaria staff within 72 hours (3 days) to describe the locality where malaria transmission occurred for determining the underlying causes of ongoing transmission, and rapid measures (responses) should be applied in a given focus as early as possible but not later than 7 days to interrupt transmission and prevent its further spread. These particulars can be solely handled by a township-level response team [5].

Recording and reporting mechanisms and systems within existing public, private and community-based health sectors should be established to address elimination challenges by timely detecting and immediately notifying the malaria program of all confirmed cases by the fastest means possible. National legislative/legal requirements and administrative acts should be in place to facilitate compulsory notification of confirmed malaria cases. All private health sector providers must report every case diagnosed. In addition to the immediate reporting of every positive malaria scenario, each service provider should report on the number of suspected cases tested for malaria usually by RDTs and on the proportion of positive cases among them on a regular (monthly) basis. Globally, studies have found the mobile reporting-based malaria reporting system for malaria is an acceptable and feasible intervention for lay health workers and one that can significantly affect program operations and malaria transmission rates [11-13].

In Myanmar, mobile SIM cards were not freely available and even cost more than hundreds of dollars until 2013. But since then, it has been transformed and become cheaper and cheaper as less than 2 USD in 2015 [14]. Nowadays, SIMs are freely available across the country and 90% of areas have network signal coverage. In 2015, 40% of the total population owned a mobile phone [15]. According to a universal service strategy for Myanmar (2018-2022), most of the people (90%) will be covered by network and among them, around 85% will have internet access by 2022 (Post and Telecom Department, 2018). Particularly in Sagaing Region, only 4.2% of the area is uncovered by the facility as of January 2018 [16]. To take advantage of this, in this study, a simple mobile phone reporting system was introduced among VMWs and evaluated from the aspects of timeliness of reporting, correctness, and completeness of information, preference, and challenges on using the system and acceptability for the future. Hence, this study could also contribute evidence for the feasibility of real-time case notification using mobile phones among VMWs in the selected remote villages, where real-time reporting is rare but technology literacy is relatively high.

Ideally, it is recommended that malaria treatment should commence within 24 hours after the onset of fever, whereas self-treatment is not recommended to diminish the danger of serious developments and forward transmission [17]. Thus, appropriate

diagnosis and proper treatment-seeking behavior, along with easy accessibility, have become crucial [18]. In particular, after the onset of fever, a prevalent symptom of malaria, the patient should seek medical therapy [19]. It has been acknowledged that self-treatment may lead to delays in seeking treatment [20]. Delays may lead to the development of severe forms of infection, even within a few hours or days later [21, 22]. One research specified that 79.4% of patients in the five counties along the Thailand-Myanmar border in Tak Province were late in seeking malaria treatment [23]. Other studies also identified economic, geographical, and health system factors as the determinants for the delay [24-28].

During the malaria elimination effort, KAP must be considered an essential ingredient of adhering to the elimination agenda [29]. In the meantime, studies have proved that poor KAP levels have somehow contributed to the increased burden of malaria [30-32]. Thus, particular efforts to address the improvement of KAP always need to be considered and implemented [33]. Moreover, available data shows that overall KAP levels among Myanmar's people are drastically low [34-37]. Innovative and newly produced interventions based on published findings are still limited. Most of the studies in Myanmar were targeted especially at malaria-prevention practices and care-seeking behaviors rather than factors influencing overall KAP [35, 38]. The evaluation studies for the effectiveness of current interventions were also required in addition to strengthening community participation. By knowing these elements, the new, results-based health education interventions can also be figured out, especially for current malaria transmission areas. Thus, this study was also explored the basic characteristics associated with KAP regarding malaria among people living in the most malaria-endemic villages of Myanmar.

According to relevant studies, communities took note of the correct health facts but conversely, they still followed their own alternative beliefs [35, 39]. To overcome this, simple and repeated health messages should be delivered. In Myanmar, limited evaluation studies have been conducted, but result-based studies of innovative activities are still needed. For some disease prevention campaigns, an individual's details, such as age, gender, family income, and education level, are the main contributors to be considered for intervention effectiveness [40, 41]. However traditional health-talks and

community-based interventions delivered through voluntary-recruited selected villagers should be considered for whole population coverage in malaria prevention campaigns.

Loudspeakers are widely used in Myanmar for various purposes and occasions to advise people, especially in rural areas. These are easy to use by the local community, even without government electricity services or a large space to set up. All that is required are an amplifier, a microphone, and a pair of horns attached to two units. For the power source, 160-220 volts are required, supplied either by the government line or others, such as inverters, solar systems, generators, etc. A limited study reported that announcements made via such kinds of the system would be effective and conducive to the spread of information in real-time [42]. Besides, it can inform the community about a disease outbreak and ensure emergency preparedness at any time without any delays and with minimum effort, as only one person is required for the task. Hence, here the researcher has introduced and explored the effectiveness of health message announcement through loudspeakers about malaria care-seeking and prevention practice among people living in a malaria-endemic area of Myanmar.

In areas with poor public health infrastructure and services, the establishment of a network of Village Malaria Workers (VMWs)/ Integrated Community Malaria Volunteers (ICMVs) is the best and often only option to reach the total coverage of curative and preventive services, in order to detect, notify and treat every malaria infection in a proper and timely manner [43]. There are, however, many challenges. When malaria incidence is very low, VMWs may not see enough cases to maintain their skills and the population may not see their value. All service providers authorized to diagnose malaria should be properly trained. The program staff should carry out regular support and supervision visits to monitor the quality of laboratory services at all public facilities. Training and re-training of all laboratory technicians should be continued, and all laboratories should participate in quality assurance and control procedures. Private pharmacies certified for malaria diagnosis and treatment should also notify all confirmed malaria cases to public health providers and facilities, through proper channels for appropriate follow measures.

In low-transmission areas eligible for elimination, VMWs/ICMVs along with health staff should be actively involved in case detection and reporting and may support case and foci investigation and response. The public health staff should manage the work of VMWs/ICMVs and other volunteers in collaboration with relevant malaria health personnel. A proper national guide should be developed to assist in the implementation of VMW-related interventions, including regular supervision of VMWs/ICMVs. All VMWs/ICMVs should receive annual training on case management, malaria prevention, and health education, and case reports as well. VMWs/ICMVs should participate in regular meetings with township- and lower-level health staff. Malaria and general health staff with the support of VMWs/ICMVs should develop materials and organize campaigns to sensitize communities about the availability of free malaria diagnosis/treatment at public health facilities to increase their demand.

For the capacity building, the National malaria program should build the capacity necessary for entomological surveillance, and Standard Operating Procedures (SOPs) related to entomological monitoring and surveillance should be developed. Entomological surveillance should include identification of vector species, monitoring vector behaviors and bionomics, mapping species distribution and density, identification of host preference, seasonal fluctuation of species, and assessment of an area's receptivity. Entomological surveillance should also be carried out in epidemic-prone areas based on set outbreak thresholds. Insecticide resistance is one of the greatest threats to any concerted or prolonged attempt at malaria transmission control, whether the goal is transmission reduction or elimination [44]. All existing and possible breeding sites of *Anopheles* mosquitoes should be properly mapped with active foci of malaria, particularly in areas eligible for elimination.

Whereas, areas of high transmission are certain to be important exporters of parasites. Therefore, to reduce cases load in low burden areas, the massive reduction of transmission in adjacent high malaria burden areas can be reflectively effective to achieve elimination in both distances. Furthermore, an area of high transmission, which has not yet been affected by resistance, poses a high risk, because the arrival of one carrier of resistant parasites could ignite transmission of resistance there. Finally,

burden reduction saves lives. Some States/Regions are already in the elimination phase while others are still in the transmission reduction phase. States/Regions that are presently in the elimination phase may have some townships that are still in the transmission-reduction phase with API of 1 case per 1000 population at risk or above. At the same time, there are some States/Regions which are still in the transmission-reduction phase but have some townships that are already in the elimination phase. Each State/Region will be advised to classify their townships to figure out which of them are eligible for initiating elimination activities.

The goal of eliminating malaria in Myanmar is more distant because the celerity in achieving the declared goal is influenced by the relatively high burden of malaria, the suboptimal strengthen up of national health systems and technical and operational constraints (resistance to antimalarial drugs, vector behaviors, accessibility of remote/border areas, uncontrolled migration, etc.). Therefore, it is time to find out and prioritize specific hot spot areas and apply standard and comprehensive package intervention called 'village-based malaria elimination model' to overcome all the challenges and to achieve malaria elimination in the proposed timeline regardless of funding issue.

1.2 Research Gaps

1.2.1   Lack of current malaria intervention approaches for achieving malaria elimination in a proposed timeline.

1.2.2   Various approaches towards community awareness-raising interventions have been delivered through a variety of channels, but evidence for the effect of these practices has been minimal.

1.2.3   Knowledge gaps in roles of diagnostic accuracy mainly sensitivity and specificity of current using RDTs for the upcoming malaria elimination era in Myanmar.

1.2.4   Lack of systematic model for village-based malaria elimination rather than episodes-based implementation or donor-dependent interventions.

1.3 Research Questions

1.3.1　　What are the factors influencing overall malaria KAP in the selected areas?

1.3.2　　What is the operational effectiveness of loud-speakers based health messages announcements activities to improve KAP regarding malaria in intervention villages?

1.3.3　　What is the feasibility of real-time reporting by village health volunteers via mobile phone messaging for case mapping and rapid response?

1.3.4　　How is the accuracy of current using conventional RDTs in comparing microscopy results as a standard?

1.3.5　　Can the village-based malaria elimination model effectively reduce malaria transmission in selected hot-spot areas? (expected up to API <1/1000)

1.4 Research objectives

1.4.1 General Objective

1) To implement and evaluate village-based malaria elimination model for reduction of malaria transmission in selected malaria hot-spot areas, Banmauk township, Sagaing Region, Myanmar

1.4.2 Specific Objectives

1) To explore the socio-economic status, baseline KAP on malaria prevention, diagnosis and treatment, and their associations among the respondents in selected hot spot areas and produce evidence-based and innovative health education tool

2) To determine the effectiveness of announcements made through loudspeakers regarding malaria care and prevention practices among intervention and control villages before and after the intervention

3) To measure the prevalence of malaria in selected malaria hot-spot areas and find out the diagnostic accuracy and realistic of conventional RDTs

4) To introduce and observe the feasibility of mobile reporting by village malaria workers (VMWs) for accurate case notifying and timely response

5) To assert the overall effect of village-based malaria elimination model on substantially reducing malaria transmission in selected hot-spot areas and compared between intervention and control villages before and after the study period

6) To look into predictors of malaria burden reduction in selected villages after the intervention

1.5 Hypothesis

The malaria transmission can be significantly deducted in intervention villages than control villages of Banmauk Township, Sagaing Region, Myanmar.

1.6 Variables of the study

1.6.1 Independent Variables

Socioeconomic Status

- Age
- Sex
- Annual income
- Education
- Family members
- Sufficient ownership of LLINs for family

Experience on malaria

- Having fever attacks among family members
- Knowing of malaria term
- Involvement in health education services
- Previous episodes of malaria
- Volunteered for health-related services

Distribution of malaria vectors

1.6.2 Dependent Variables

Intervention Phase

Primary Outcomes: Changes in KAP scores after Loud-speakers based health announcements, Timeliness, correctness and completeness of reporting by village malaria workers (VMWs) through mobile phone messaging

Knowledge: Malaria signs and symptoms**,** Malaria Diagnosis and treatment

Attitude: Transmission of malaria**,** Severity of malaria

Practice: Utilization of LLINs**,** Seeking the care of malaria diagnosis and treatment**,** Treatment adherence

Distal Outcomes: Reduction of malaria transmission – changes in village level API

1.7 Operational Definitions

1.7.1 Village Based Malaria Elimination Model is a systemic intervention to address interrupting of malaria transmission in accordance with elimination definition (i.e <1/1000 API) by means of comprehensive package malaria control activities which consists of KAP survey, mass blood survey, address diagnostic accuracy of current tools, preliminary entomology assessment, improve access to early diagnosis and effective treatment of malaria, evidence-based health education, real-time reporting and notification, response and action accordingly.

a) **Slide positivity rate of malaria infection** means for malaria positive cases per total tested patients by different diagnostic tools (RDTs, Microscopy, and PCR) in the proposed study period.

b) **Malaria positive found by cRDTs Vs microscopy** will be compared by assessing the diagnostic accuracy of conventional RDT results with the standard microscopy results in aspects of disease confirmation through its sensitivity and specificity under proper quality control and quality assurance.

c) **Feasibility of mobile reporting by village health volunteers** stands for malaria case notification by each volunteer via mobile phone messaging to the township office. The quality has been measured and scored on timeliness, completeness, and accuracy of each separate scenario.

1.7.2 Socioeconomic Status

1) **Age** defines the number of years and months that completed after birth. Except for children under 1 year, the recently completed year will be accounted only and exclude months for adult people.

2) **Sex** defines as male or female as in each particular's national ID card.

3) **Annual family income** refers to the average revenue and richness of all family members in a single year from the available source of income.

4) **Education** refers to the highest educational attainment for each participant such as no school, primary school, high school, college or university and above.

5) **Family members** account for the total number of people living in one single household.

6) **Sufficient ownership of LLINs for family** means there should have at least one net for every two people of a family and these nets must be received not before the last three years.

1.7.3 Experience on malaria

1) **Having fever attacks among family members** counts for the presence of a kind of suspected fever history among participant's family members within the last month regardless of underlying disease types.

2) **Knowing of malaria term** will be assessed by asking the individual whether they are knowing malaria in any kind of language forms from whatever sources within their whole life

3) **Involvement in health education services** refers to having any experience of receiving a kind of health education activity delivered by particular malaria projects within six months before commencing the assessment.

4) **Previous episodes of malaria** represent everyone who has suffered malaria and taken anti-malaria drugs with or without any diagnostic tests last year.

5) **Volunteered for health-related services** will account for those who have had involved as a volunteer for organizing health-related delivery within their villages within six months before this study

1.7.4 Distribution of Malaria Vectors defines as the scattered of different vectors (Anopheles species either primary or secondary) for malaria transmission in selected areas assessed by an expert entomologist.

1.7.5 Dependent Variables

1) **Knowledge, Attitude and Practice (KAP)**

a. **Knowledge** stands for the people understanding about common signs and symptoms of malaria and severe malaria, diagnosis and treatment of malaria.

b. **Attitude** towards malaria refers to not only the physical sight of people but also emotional, psychological and spiritual sight on the transmission of malaria and the severity of malaria.

c. **Practice** based on the level of knowledge, malaria preventive behaviors among community people differed in the aspect of seeking malaria diagnosis and treatment adherence and preventive behaviors by effective utilization of LLINs.

2) **Effectiveness of loud-speakers based health announcements activity** by exploring changes in overall KAP scores of a community after delivered routine and repeated mass media announcements through provided loud-speakers performed by VMWs using standardized health messages.

3) **Reduction of malaria transmission** states that changes in malaria incidence after the intervention and expected up to Annual Parasite Incidence (API) less than 1 per 1000 total population at risk. The formula for API is as under;

$$\frac{\text{No. of Positive Cases}}{\text{Total Population at Risk}} \times 1{,}000$$

4) Population at Risk involves residence in the society in a specific geographic region where instances of local or indigenous malaria cases happened at present and/ or in the past year.

Independent Variables		Dependent Variables

1. Socio-economic status
- Age
- Sex
- Annual income
- Education
- Family members
- LLINs ownership

2. Experience on malaria
- Having fever attacks among family members
- Knowing of malaria term
- Involvement in health education services
- Previous episodes of malaria
- Volunteered for health-related service

3. Malaria Vectors Distribution

Intervention
The Village Based Malaria Elimination Model

Control
without intervention

Intervention Phase
Primary Outcomes: Changes in KAP scores after Loud-speakers based health announcements

- **Knowledge, Attitude and Practice** scores on malaria signs and symptoms, transmission, diagnosis and treatment, Severity, Protective measures, care seeking behaviors and treatment adherence

Distal Outcome: Reduction of malaria transmission
- Changes in village level API

Figure 1 Conceptual Framework of the study

CHAPTER II

LITERATURE REVIEW

The literature review of this study composed of six parts including theory use as a guide for the study and related researches as follows:

2.1 Epidemiology of Malaria in Myanmar

2.2 Current Situation of Malaria in Myanmar

2.3 Myanmar National Malaria Strategic Plan 2016-2020

2.4 Malaria Elimination concepts, theories, and intervention

2.5 Knowledge, Attitude and Practice (KAP) Model

2.6 Review on relevant research findings

2.1 Epidemiology of Malaria in Myanmar

In Myanmar, 6 out of 37 species of Anopheles were abundantly observed throughout the country, namely *An. minimus, An. dirus, An. annularis, An. sundaicus, An. culicifacies* and *An. Philippinensis*. Again, based on entomological and parasitological evidence, are infected with the malaria parasite. In addition, it is suspected that *An. sinensis* plays as a secondary vector for malaria transmission. *An. maculatus* is also a suspected one as a secondary vector especially in the hilly and foothill areas of the country. *An. Aconitus* could be also a secondary species depending on the man/cattle ratio of a particular area. *An. Jeyporiensis* is to be regarded as a possible vector wherever it is present in abundance forms.

Whereas, the primary vectors, *An. dirus* complex and *An. minimus* complex is both generally anthropophilic. Both primary vectors can bite the whole night. The peak biting time was found at 6:00 pm -12:00 midnight. The early biters, *An. minimus*, nulliparous mosquitoes generally emerge from slow running streams nearby. In an ecological area, more than one or two dominant vectors may exist. For instance, malaria transmission was not due to a single species in the Tanintharyi Region, and it was the combined infective bites of *An. dirus, An. minimus* and *An. sundaicus*. Depending on the climatic and environmental circumstances, the percentage of infectious bites among these three vectors may differ from location to location. Owing to the temperature,

altitude can also play a significant part as the gradual increase in altitude at above sea level. For example, in Shan State, there was very little *An. dirus*, and *An. minimus* may be the main vector responsible for malaria transmission in 1,000 meters and above sea level.

Annual rainfall patterns will also fluctuate the vector density. During the rainy season in monsoons, vector breeding sites may be wiped out in some areas when the greater density for post-monsoon is being recorded. Every year, the peak transmission season in Myanmar appears to be lying between March and December, although it may differ depending on the rainfall, temperature and other variables. The vectors features explain the geographical distribution of malaria in Myanmar.

The forest environment, strongly connected to the hilly terrain, indicates the most contributing malaria transmission ecology. Deforestation can decrease the danger of malaria transmission, but the process of deforestation often leads to heavy exposure. While re-plantation may result in malaria re-emergence or emergence. Transmission of malaria is generally sporadic in cultivated plains, but it is usually empty in urbanized/ developed regions. There has been some transmission of malaria in coastal regions, particularly if, for instance, aquaculture has occupied the surrounding area. Malaria re-emergence may be associated with fresh ecological niches for major vectors such as *An. minimus* breeding in shady wells in the Sagaing Region, and the introduction of infection by population influx. The present geographical pattern reflected that most transmissions happened in wooded foothill areas below the altitude of 1,000 meters. Higher altitudes are generally too cold for malaria transmission, but owing to global warming, the upper limit will be extremely variable and may have been moving upwards in the latest years. Most of these highlands are closed to international borders [45].

Most instances of malaria and fatalities typically happened among inhabitants residing in close or deep villages. These individuals are mostly ethnic minority groups living in subsistence farming supplemented by forest activities, such as cutting bamboo production of charcoal or mines. Residence within 1 km distance from the forest generally proposed that malaria transmission could occur in the village during the year

with all age groups being at risk. If the village is somewhat further away from the forest, the risk is generally restricted to adult men who regularly or periodically entered the forest for farming, collecting forest products, hunting, etc. Usually, these people came in groups and stayed in the forest in makeshift shelters for several days that are unlikely to safeguard against mosquito bites.

The other significant risk group is migrants, who are often caused by financial possibilities such as logging or mining in forested regions or road/dam building and maintenance and agricultural works such as rubber, palm oil plantation in malaria hot-spot regions. Displacement induced by the construction of the dam could also result in exposure to risk. It is possible to organize these population movements, in which case organizing prevention and curative facilities are comparatively simple. Migrant groups, however, are often tiny, spontaneous and even clandestine and illegal, and they were mostly inaccessible to health facilities that made it hard to protect them. Malaria risk was also present in plantations offering forest-like environments such as rubber trees and palm oil trees. However, organizing control operations was generally comparatively simple in such circumstances.

2.2 Current Situation of Malaria in Myanmar

Malaria continues to be a major cause of morbidity and death. Significant progress has been produced in decreasing the burden over the past 10 years, but, the disease remains one of the country's key public health issues. Of 52 million population residing in the country, 22.5 million (43%) live in endemic areas, while 21.4 million (41%) live in regions with receptivity and vulnerability risk of malaria. Malaria happened primarily in forests or nearby, but also in certain coastal areas and plantations. Because of these environmental determinants, the burden of malaria among ethnic national races in distant regions and migrants seeking economic opportunities in rural financial frontier areas in economic development operations such as forestry, mining, plantations, and road building has been particularly high. Especially since 2007, the percentage of the population residing in high and moderate risk areas has dropped substantially. High-risk areas, however, are the regions from which reliable information is most difficult to acquire. Furthermore, it should be observed that there were villages

with little or no transmission in these high-risk areas, and likewise, there are still villages with high transmission in low-risk areas, so there is always a need to conduct adequate micro-stratification to a target of malaria control measures more effectively.

There are two major Plasmodium species; namely, *P. falciparum* and *P. vivax* with occasional reports of *P. malariae* and *P. ovale.* Among them, *P. falciparum* accounted for more than 60% of cases at present. The annual incidence rate of malaria has fallen gradually since 1990, with a small upsurge from 1999 to 2003 and in 2010 and 2011. Despite the apparent encouraging trend in reducing the burden of malaria, current data needs to be carefully interpreted due to inadequate information on instances that are self-treated or treated in the private sector, and some regions of elevated malaria transmission are still unavailable throughout the year or sections. A total of 182,616 malaria cases has been reported in 2015. Over the last 4 years, Annual Falciparum Incidence (AFI) has also been declining each year from 5.46 per 1,000 population at risk in 2012 to 2.66 in 2015. On the other hand, the total number of hospital inpatients registered as malaria declined from 62,813 in 2005 to 43,602 in 2010, from 18,362 in 2013 to 7,478 in 2015, while the number of serious instances of malaria decreased from more than 9,000 between 2005 and 2008 to 660 in 2015.

The steep decline in hospitalized cases showed powerful proof that the burden of malaria at the national level has fallen. Reported malaria deaths peaked in 1991 (>5,000) and continued to decline; 1,261 in 2007, 788 in 2010 and only 37 in 2015 (see Figure **2**). Malaria is increasingly becoming a focal disease. In 2015, out of 291 endemic Townships, 120 Townships had API<1 per 1000 population at risk compared to 45 Townships in 2006. In 2015, 6 States/ Regions from the NayPyiTaw territory and 14 States/Regions together accounted for 75% of confirmed *P. falciparum* cases (Rakhine, Sagaing, Chin, Kayin, Shan, and Ayeyarwady). Rakhine and Sagaing respectively accounted for 15% and 19%.

The causes of outbreaks in Myanmar are generally multi-factorial, but the largest cause is population migration. Outbreaks may grow when migrant workers introduce malaria, while non-immune migrants may create outbreaks of malaria when moving to endemic regions in other areas. Over the past few years, the amount of

outbreaks has fallen. In development initiatives, the emphasis was placed on ecological surveillance and community-based surveillance along with case identification, management, and preventive measures - primarily Indoor Residual Spraying (IRS). In the future, more frequent outbreaks should be anticipated if malaria has been reduced further across the country.
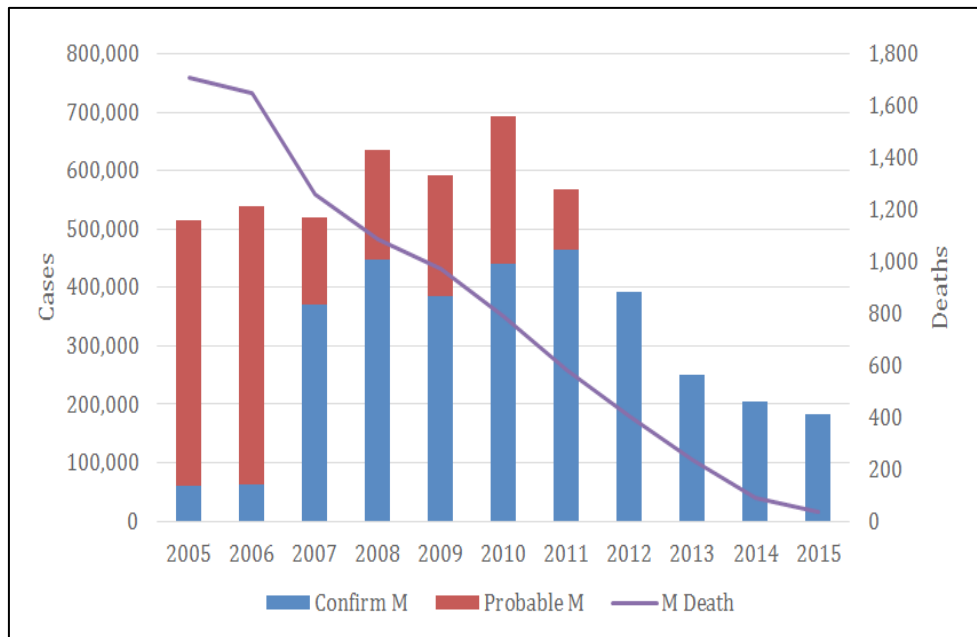
Figure 2 Recent trends in reported malaria burden (confirmed and probable cases and deaths) in Myanmar (2005 - 2015)

Overall, the age distribution assessment of reported cases suggested a modest overrepresentation among reported malaria data in young adults. Males are reported more at all ages below 60 years and even accounted for 65% of all confirmed cases. The prevalence among malaria cases of adult men may reflect the elevated risk of malaria transmission owing to the nature of their occupations (e.g., mining, forest-related activities, construction, rubber tapping, etc.). An analysis of several studies on malaria during pregnancy in Myanmar disclosed that the incidence of pregnant women with clinically suspected malaria was comparatively low, contributing approximately 1-2 percent to the overall disease burden.

Resistance to artemisinin likely appeared in 2001 at the Myanmar-Thailand frontier, but it was not recognized until 2008. Data from Myanmar has continuously

shown delayed parasite clearance times among a substantial percentage of patients treated with each of three ACTs since 2009 (AL, ASMQ, and DHA-PIP). Nevertheless, all these three remained effective, except for ASMQ in the Myanmar-Thailand border region by demonstrating high cure rates. In Myanmar, including recently in the west of the country, K13 mutants have been recognized. Recent studies have also suggested that these mutants arose from other adjacent countries separately rather than distributed.

2.3 Myanmar National Malaria Strategic Plan 2016-2020

The current national strategy in Myanmar is consistent with the Greater Mekong Sub-region Strategy for Malaria Elimination (2015-2030), the GTS for Malaria 2016-2030, and considers lessons learned from the effective execution of attempts to control malaria in Myanmar over the previous centuries. The National Strategic Plan for Intensifying Malaria Control and Accelerating Progress towards Malaria Elimination 2016-2020 represented the first phase of a 15-year strategy to eliminate malaria in Myanmar. The first five years of the strategy was designed to eliminate malaria in less endemic areas while accelerating control attempts to decrease instances to a low level in more endemic regions. The percentage of areas targeted for the stage of elimination is anticipated to be extended gradually in the post -2020 period. The percentage of areas targeted for the stage of elimination is anticipated to be extended gradually. Then, by 2025, *P. falciparum* will be eliminated and so on, by 2030, Myanmar will be free of malaria.

The Department of Public Health (DoPH) is accountable for delivering health care services to the entire population in the country. The National Malaria Control Program is introduced through the Vector Borne Disease Control (VBDC) Program, which is also a component of the DoPH of the Ministry of Health and Sports [46]. At the central level, the VBDC program is responsible for formulating malaria-related plans, policies, standards, and norms providing training, conducting operational research, controlling outbreaks, and providing implementing organizations with consultative and advisory services. Whereas at the State/ Region level, under the oversight of the corresponding State/Regional Health Director, VBDC is responsible for malaria control. Medical Officers lead the State and Regional level VBDC teams consisting of

field, laboratory, and entomological segments. These teams have responsibilities for supervision and monitoring of implementation at lower levels.

In 2002, the Department of Health created a Malaria Technical and Advisory Group (TAG) in cooperation with WHO. In 2005, the TAG became the Technical and Strategy Group (TSG) - Malaria. Its mandate includes offering technical advice in the creation of national strategies; formulating measures on case management, disease prevention and malaria surveillance, quality assurance of microscopy, tracking and assessment, and recommending them for MoHS approval; coordinating partners involved; and clarifying on major technical and policy issues. TSGs are also able to meet to discuss, review and endorse certain proposals, reports, and other records; carry out their tasks and provide wide-ranging supervision of the execution of grants and initiatives as needed, such as Global Fund grants.
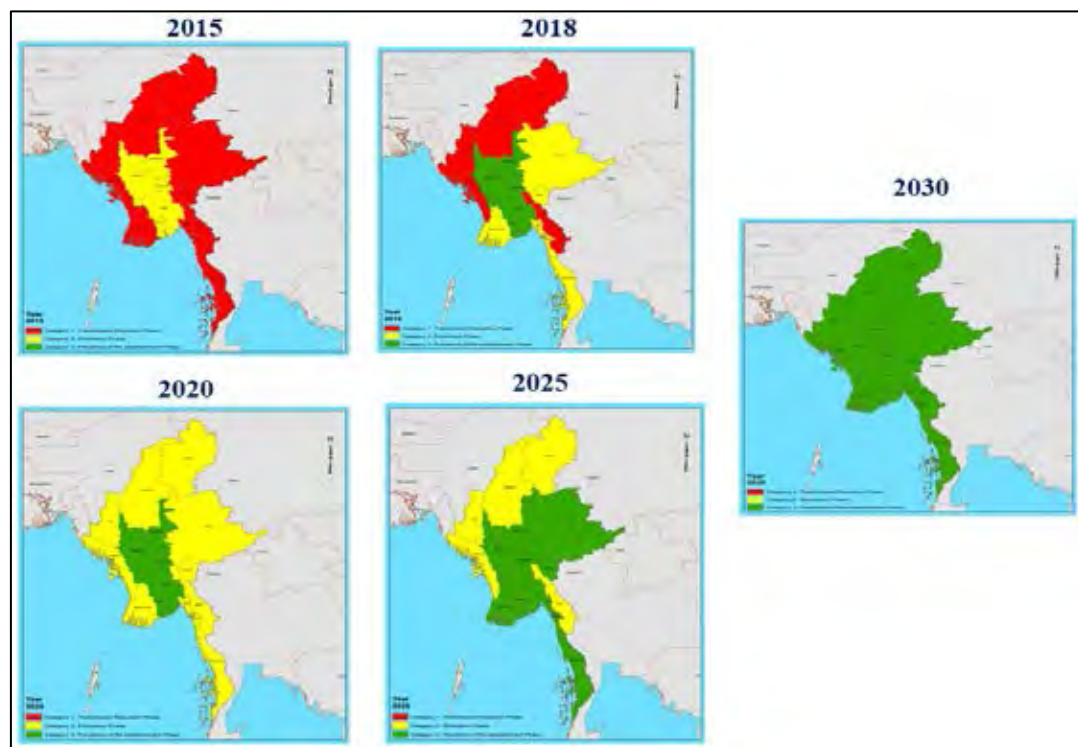
Figure 3 Planned Road Map towards the elimination

2.4 Theories and Concepts of Malaria Elimination

Malaria case definition in elimination program: 'A malaria case is an individual in whom malaria parasites have been verified by quality-controlled laboratory diagnosis irrespective of the existence or lack of clinical symptoms.'

Malaria Elimination vs. Control

Malaria elimination - requires the identification and treatment of all infected individuals, whether symptomatic or asymptomatic with the aim of elimination of parasite reservoirs for transmission reduction. It is an infection (presence of parasite) oriented program. Therefore, prevention and surveillance become more important.

Malaria Control - is concerned with reducing the risk of malaria-associated morbidity and mortality to a stage where a public health problem is no longer regarded. Control is not intended to avoid all transmission. It is a disease-oriented program.

Certification of malaria elimination

The formal recognition of malaria-free status given by WHO after it has been demonstrated beyond a reasonable doubt that *Anopheles* mosquitoes' chain of local human malaria transmission has been completely disrupted in an entire country for at least 3 consecutive years and there is proof that the elimination can be maintained.

Malaria eradication

Permanent decrease to zero of infection globally induced by a specific species of the malaria parasite. It is no longer necessary to take intervention steps once eradication has been accomplished.

The criterion of re-establishment of transmission

The occurrence of three or more autochthonous (introduced and/or indigenous) malaria infections related to local mosquito-borne transmission two consecutive years in the same geographic focus for *P. falciparum* and three consecutive years for *P. vivax* in space and time.

Principles and practice of malaria elimination

Malaria elimination is the interruption of local mosquito-borne malaria transmission. No local indigenous cases; no introduced cases (= first generation of local transmission subsequent from an imported case.) It does involve the elimination of vectors of disease or a full lack of reported malaria cases in the country.

The goal of elimination program:

- To halt local transmission area- or countrywide
- clear up malaria foci,
- Reduce the number of locally acquired cases to zero

Prioritization

Country level

- Flattening the epidemiological landscape by reducing transmission in highly endemic areas and
- Elimination malaria in areas of multidrug resistance, including ACT resistance

Regional level

- Eliminating malaria in areas with multidrug resistance, including ACT resistance, around the Cambodia-Thailand border;
- Reducing transmission in high transmission areas in Myanmar and Preventing and responding to the resurgence of malaria

Malaria elimination requires:

- **Evidence-based data** on the achievement of successful malaria control
- **Sufficient evidence that transmission can be interrupted** by scaling up planned interventions
- **Clearly defined responsibilities for management**, including decentralized authority and enforcement of regulatory and disciplinary measures
- **An effective system to ensure coordination** between public, private and community-based agencies and services, and to implement cross-border programs;

- **Intensive joint inter-sectoral** efforts
- **Sustained advocacy, social mobilization, health education, and behavior change communication** to support the preparation and implementation of the elimination program
- Adequate **pre- and in-service training** of service providers **and high-quality supervision/monitoring**
- **The existence of a monitoring, evaluation, and surveillance plan** able to timely measure progress, including assessments by an independent team
- **Long-term predictable and sustainable funding available** to support planned and unexpected expenses
- Eventually, **systems in place** for effective vigilance to prevent reintroduction
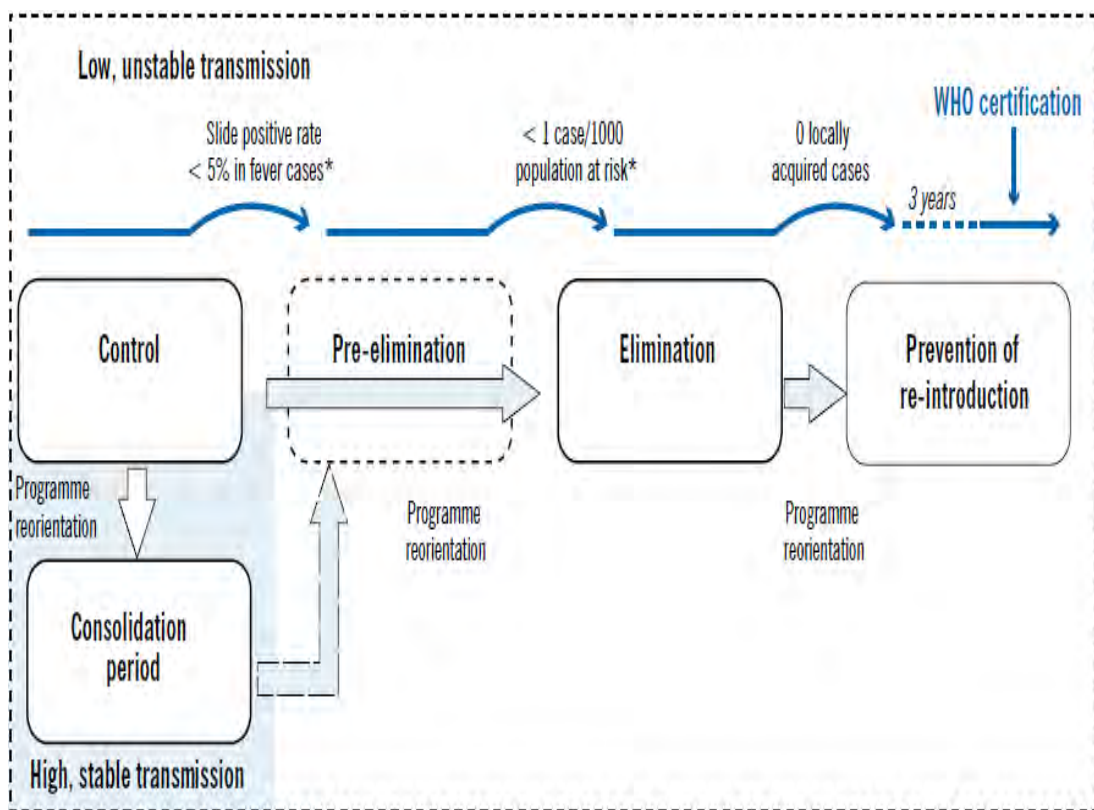
Figure 4 Continuum of malaria control, elimination to the prevention of reintroduction

In the elimination program, there are TWO phases:

(1)   Transmission Reduction Phase (Consolidation period)

(2)   Elimination Phase

In between these two phases, there is a pre-elimination period (not the phase) which is dynamic and the transition period from the Transmission Reduction phase to Elimination Phase.

Prevention of reintroduction comes after the end of the Elimination Program and is not the phase.

(1) Transmission Reduction Phase

This phase aims to bring down the malaria incidence to a level at which elimination can be considered (below 1 case per 1000 people at risk per year).

Approaches

- Interventions are aimed at reducing transmission and affecting morbidity & mortality.
- Strengthening malaria control.
- Collection of evidence for the planning of possible future elimination:

Interventions aim to reduce transmission

Aggressive scaling up of effective preventive and curative interventions to achieve universal coverage in transmission areas.

Strengthening malaria control for example through:

- Strengthening surveillance system (core function for elimination)
- The health system is enhanced and capable of providing fundamental health facilities, including malaria elimination interventions
- development of infrastructure;
- supplies and equipment;
- training and health education;

- Gaining experience in using selected new tools.
- Prepare legislation. Policy, – reporting from the private sector, notification, over the counter antimalarial, reallocation of IPs aiming for universal coverage.

Collection of evidence for the planning of possible future elimination:

- collection of basic information on parasites and vectors;
- documentation of successes and failures of operations;
- Identifying potential system weaknesses and investigating, if they can be efficiently addressed (e.g. health service coverage).
- systematizing and mapping information on climate, landscapes, hydrology, breeding places, foci, health services;
- stratification to identify areas with better prospects for elimination; (village-based data)
- applied field research;

(2) Pre-elimination Period (Transition period) – Not phase

Pre-elimination indicates a *transition*: (dynamically changing program, and not a static situation). The program is phasing in elimination program approaches, indicators, and systems, and phasing out of the malaria control mode with its emphasis on total coverage of vector control interventions. Pre-elimination programs are not yet fully in elimination mode, and no longer fully in control mode. Countries thus do not "achieve pre-elimination status", they go through it. Criteria for entering the pre-elimination phase where quality health facility data report that the monthly slide/rapid diagnostic test (RDT) positive rate among suspected malaria patients is consistently less than 5% year-round.

(3) Elimination phase

Elimination programs may start once the pre-elimination reorientation has been completed when systems are "ready to roll out" when the malaria incidence in the targeted areas is very low. (indicative milestone of less than 1 infection per 1,000 people at risk per year assumed equal to less than 100 new cases per year in a district with a population of 100,000 people).
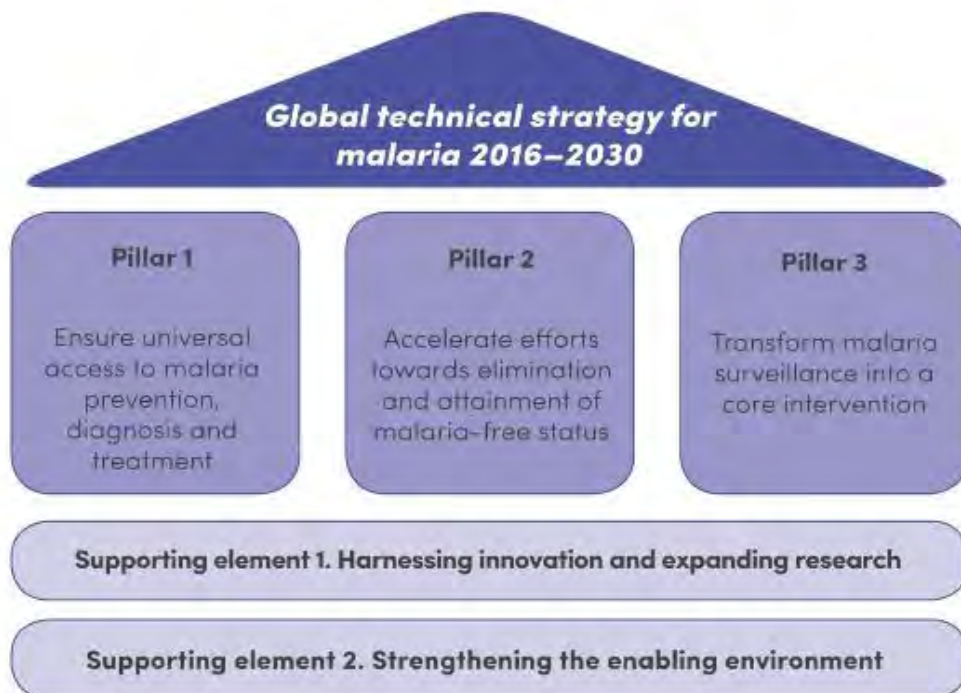
Figure 5 Global technical strategy for malaria: framework, pillars and supporting elements (Source: WHO)

Approaches (Surveillance) and key interventions in the elimination phase

- Early case detection (mainly employing Passive Case Detection; ACD is to fill up the gaps of PCD) & prompt treatment of positive cases (within 72 hours from the onset of fever)
- Notification of the positive cases (within 24 hours after getting a positive result)
- Case investigation and case classification (within 3 days after notification)
- Foci investigation, classification, and identification (within 3 days after notification)
- Foci management including ACD surrounding the index positive case in Potential Foci (depending on the interval between onset of fever and response)/ Active Foci (within 7 days after notification or on the same day of foci classification)
- Follow up of all positive cases on day 7, 14, 21 and 28 if possible. (to make it sure that all positive cases received radical cured and halt local transmission)

(4) Prevention of reintroduction (not the phase of Elimination Program. It comes up after the end of Elimination Program)

During this period, surveillance is termed as vigilance.

Criteria for entering the prevention of reintroduction phase

An autonomous evaluation should be conducted by the Malaria Elimination Monitoring Committee to determine whether the following goals have been attained:

- adequate surveillance indicates a full disruption of local transmission
- local transmission in recent years has resulted in no or very few sporadic instances
- All other malaria cases can be positively recognized as being imported
- Routine vector control operations apart from environmental hygiene have ceased except in restricted areas of high receptivity and vulnerability
- Prevention of malaria reintroduction is primarily a responsibility of the public health services as part of their ordinary function in the control of communicable diseases.
- Continued importation of cases means the high performance of case detection.
- Vigilance models that need to be implemented to guarantee that malaria-free status is maintained successfully.
- Maintaining malaria-free status depends on the vulnerability and receptivity of an area.
- If there is a significant threat to the re-establishment of malaria, the malaria component of the communicable diseases segment of the general health services should be sufficiently powerful to cope with it.

Table 1 Profile by types of malaria programs

Item	Control Program	Pre-elimination Program	Elimination Program	Prevention of Reintroduction Program
Main program goal	Reduce mortality & morbidity	Halt transmission nationwide	Halt transmission nationwide	Prevent re-establishment of local transmission.
Epidemiological objective	Reduce the burden of malaria	Reduce the number of active foci to zero. Reduce the number of locally acquired cases to zero.	Reduce the number of active foci to zero. Reduce the number of locally acquired cases to zero.	Prevent introduced cases and indigenous cases secondary to introduced cases.
Transmission objective	Reduce transmission intensity.	Reduce onward transmission from existing cases.	Reduce onward transmission from existing cases.	Reduce onward transmission from imported cases.
Unit of intervention	Country- or area-wide.	Foci	Foci, individual cases (locally acquired & imported)	Individual cases (imported cases)
Milestone for a transition to the next program type	SPR (MPR) <5% in suspected malaria cases	<1/1000 pop. At risk per year.	Zero locally acquired cases.	-
The data source for measuring progress towards reaching milestones.	Proxy data: health facility data. Confirmatory data: a population-based survey.	Proxy data: health facility data, notification report Confirmatory data: a population-based survey.	Notification reports, individual case investigations, genotyping	-

Foci/ Case investigation of *Plasmodium falciparum* cases

The rationale of a case investigation is to determine whether an infection has been obtained locally and whether local malaria transmission is ongoing. All reported *P. falciparum* or mixed malaria cases should be investigated to allow the case classification by origin of infection. It is used as one of the output indicators and introduced in 2015. Investigation and classification of malaria cases and foci are hallmarks of surveillance during malaria elimination program activities. It is essential that the malaria program staff understand case and foci investigation as these forms the basis for nearly all subsequent program activities. Case investigation would be started in the pre-elimination phase and after that throughout the elimination and prevention of reintroduction phases until malaria is eradicated on the world.

The ultimate aim of case investigation and foci investigation is to take immediate response depending on the type of foci to prevent onward transmission/ reintroduction of malaria.

The following steps must be carried out to achieve this aim;
- to investigate all positive cases for case classification (indigenous, introduced, imported, induced, relapse)
- By using case classification results, classify the foci (active foci, potential foci including clear up foci and transmission-free foci).
- After classifying the foci, identify the foci (demarcation of boundary of foci by using well-defined boundary like road, streams, etc.)
- Take rapid prompt action depending on the type of foci.

All the above steps are time-bound and need to be done as quickly as possible. The whole process should not be more than one week. To investigate the positive case and foci, time factors of the parasite must be understood which include the duration of the incubation period, sporogony cycle, appearance of gametocytes, maturation of gametocytes, and duration of infection.

Note that while the WHO definition of an imported case is a case, where the infection has been contracted in another country, it may be rational, during pre-

elimination and elimination phases to also distinguish cases, which were contracted within the country, where they were detected, but not in the same locality. Such cases can be called domestically imported. Depending on the size of the country and the structure of the program, there may be further differentiated as imported from within the same district/same province or the same state. Rapid information to the health authority in the area, where the infection was contracted, is, of course, an essential function of surveillance.

Foci management

Foci management depends on the types of foci. Generally, it includes the following activities but not limited to;

(a)   Surveillance around the day 3 positive index cases;

- Forty households surrounding the Day 3 index positive case are selected and family members are mobilized by the team. All members with fever, history of fever in last two weeks, repeated attacks of malaria, and pregnant mother, under 5 children from 40 selected households are tested with RDT and treated according to species according to national treatment guideline.

- The village leader and VMWs will mobilize people with the above criteria from the remaining households in the village.

(b)   Community awareness-raising sessions should be done and topics should be covered on not only prevention and treatment but also the facts related to Artemisinin-resistant.

(c)   If the village is not included in the previous LLIN distribution list, provide LLIN to all positive cases and if the local transmission is present, plan for the distribution of LLINs to all households.

(d)   Entomological investigations around the day 3 positive index case, if possible

-look for the presence of *anopheline* breeding places

-monitor indoor and outdoor resting habits of Anopheles mosquito

-If possible, take mosquito prevention measures- IRS, larvicides

(e)   In-door residual spray depending on the local epidemiological situation

(f)   If possible, take GPS coordinates of the index case as well as other positives.

2.5 Knowledge, Attitude and Practice (KAP) Model

In the 1950s, KAP surveys were first evolved. After 1960, KAP surveys in many countries were widely used primarily for family planning practice research. KAP surveys were the most cost-effective and more resource-conserving than other techniques of social research because they were tightly concentrated and restricted limited in a particular area [47]. This KAP framework was then commonly used for family planning in the field of health education and the developing world and as a guide to understanding health education processes for patient behavioral modifications and results for patient health [48]. Nowadays, KAP based studies are becoming a commonly used methodology and instrument for studying human behavior when a problem or disease affects them.

"K" refers to knowledge understanding the problem or disease, "A" for attitude to approach to the problem or disease, and "P" for practice or preventive actions to safeguard against the problem or disease. Whereby, the experts presumed that knowledge, attitude, and practice are interrelated and that knowledge and attitude had a direct impact on preventive practice. Surveys are used to evaluate the acceptance of the disease or health problem by people. Attitude tools measure the emotions, optimism, and views of study participants about the disease or problem, as well as data on practical intervention and the preventive actions followed by people to prevent a problem or disease. Researchers select a sample of respondents representing the population. Knowledge, attitude, and practice definitions are further described below;

Definitions of Constructs:

Knowledge. Knowledge is data or abilities acquisition, retention, and use [49]. Cognition by which knowledge is obtained by a process of comprehension and is differentiated from feeling experience. Knowledge is gained both from education and from experience. Knowledge of a problem or disease relates to its understanding of the disease, its progression, and self-care practice necessary for keeping under control.

Attitude. Eagly and Chaiken (1993) in "The Psychology of Attitude" described the attitude as "a psychological inclination expressed by assessing a specific entity with

some degree of favor or disadvantage" [50]. Attitude has three parts: cognition, impact, and conduct as mentioned by Katz & Stotland, 1959; Krech & Crutchfield, 1948; and Rosenberg & Hovland, 1960 was quoted in Eagly & Chaiken, 2007 [50]. Cognition included real and false views about the object of attitude; such convictions could be transformed by health education. Therefore, knowledge and attitude may overlap. For instance, some diabetic patients may be convinced that they may not live a good, lengthy life because they have heard of elderly relatives who died at an early age from complications of diabetes as heart attack, stroke, or kidney failure; then they assumed that the same fate might befall them.

Practice. Practice showed that knowledge acquisition (enhanced understanding of a problem/disease) and any changes in attitude induced by removing misconceptions about issues or disease that translated into behaviors of prevention and care-seeking. Thus, a reciprocal connection between knowledge and attitude could reflect that demonstration. The practice is behaviors or activities that can prevent or delay the development of a disease.

Knowledge, Attitude, Preventive Practice, and Outcomes (KAP-O) Framework

Some sorts of literature review proposed that educational interventions enhance knowledge and attitude and that improved knowledge enhances self-care practice. Improved attitude will also enhance practice, and improved practice will lead to better results. Therefore, the knowledge-attitude-practice - outcome framework (KAP-O behavioral change model) as suggested by Wan (2014) provides the perfect theoretical foundation for studying the fundamental mechanism by which health education intervention may improve health care results [51]. The proposed relationships are illustrated in below KAP-O model.
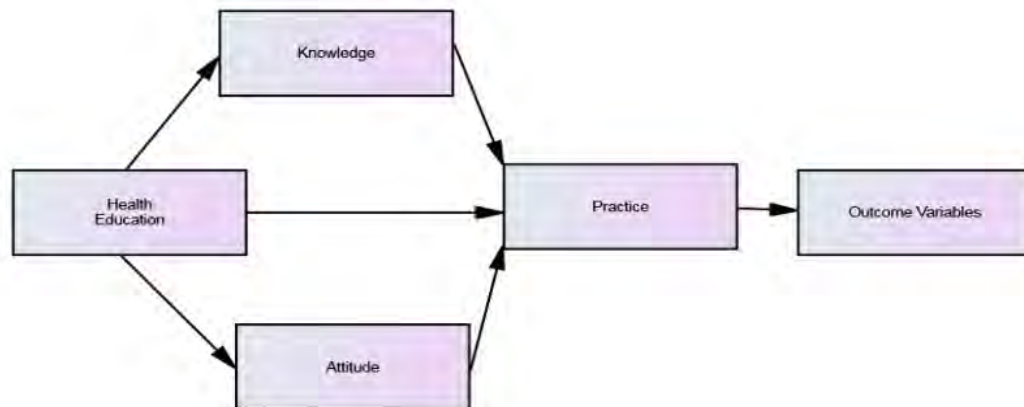
Figure 6 Relationships of KAP-O Components in Health Education Research

2.6 Review on relevant research findings

A high level of knowledge on the cause, transmission, and habit of practicing the available preventive and control measures by individual families and the wider community contributes significantly to the general decrease of the malaria burden.

One study in Iran suggested that it is crucial to have a better understanding of the community's knowledge, attitude, and practice (KAP) of malaria prevention to intensify elimination operations. The results revealed that KAP of participants about malaria was good in some cases but in general needed to be improved with educational programs [52]. Another study outlined poor practice of nationally approved malaria prevention and control measures including early treatment-seeking behavior although malaria knowledge and attitude scores were high. Health facility inaccessibility, analphabetism, and absence of health education were factors that impacted the community's KAP towards malaria. Therefore, priority should be given to extensive health education, the advancement of community education and coverage of health facilities. It is also encouraged that responsible bodies that all individuals in a family use ITNs properly, embrace an embedded vector control strategy and seek treatment early in Ethiopia [33].

One research in Ghana, 2011 found that knowledge in malaria prevention and control might not affect formal education only but other sources such as non-formal and informal education. The results showed that knowledge level was high yet among

people but their action towards prevention and control were discouraging [53]. Moreover, although individuals had a powerful knowledge of where the disease occurs in their own country and the fundamental connection between standing water, mosquitoes, and malaria, approximately half of participants in prospective risk areas rejected the present chance of malaria infection on their land [54]. A large amount of knowledge has been identified among the society about the cause, transmission and preventive techniques of malaria. A significant percentage, however, had misunderstandings about the cause and transmission of malaria, indicating the need for health education to increase the awareness of the disease among the community [55].

To tackle the deficiencies in local understanding of malaria, health workers operating in malaria-endemic regions should be trained to provide more suitable counseling in an attempt to alter some deeply entrenched traditional habits such as spending time outdoors at night, inappropriate use of bed nets and uneven use of insecticides during sleep [56]. One research in (Saudi Arabia/ 2016) found that most village-based communities have an acceptable amount of knowledge and consciousness and are looking for timely treatment. However, there is a need for marked enhancement in the favorable attitudes and procedures regarding personal protection and prevention measures against malaria. The apparent gap between malaria knowledge and prevention needs innovative local evidence-based approaches that are well suited to local conditions to promote and encourage the implementation and exercise of personal protective measures [57].

A total of 32 buildings were sampled randomly from the area and one-year light trap catches (LTC) were performed in one room in each house every two weeks for. A total of 147,448 mosquitoes from 789 LTC have been captured; 26,134 *Anopheles gambiae s.l.*, 615 *A. funestus*, an additional 718 *anophelines,* and 119,981 *culicines.* More than 60% of the total *A. gambiae s.l.* were discovered in five (0.6%) LTCs, with no more than 5889 caught in a single trap [58]. The vector species identified were *A. gambiae* (33.9%), *A. arabiensis* (63.2%), *A. melas* (0.3%) and *A. funestus* (2.5%). Similar proportions of *A. gambiae* (74.2%) and *A. arabiensis* (73.8%) contained human blood; 27.0% of *A. gambiae* and 28.3% of *A. arabiensis* had fed on cattle. The transmission was highly seasonal, from July to October in Senegal [59].

The threat ratio of malaria was decreased by 88.0% (95% CI 81.7–92.1) and 79.5% (95% CI 67.4–87.2), respectively in 16 environmental modification surveys and eight studies of human habitation modification. This review found that malaria control programs extremely efficient in decreasing morbidity and mortality [60]. The vector *An. dirus* remains to play a significant role in malaria transmission, whereas *An. minimus* showed temporal and spatial variations in its role as a vector. Due to the low incidence in the coastal research village, the role of *An. sundaicus* as vector could not be verified. Other Anopheles species may be engaged locally, but they may not contribute substantially to malaria transmission in the five study villages where malaria is still present. One study also pointed out that in Southeast Asia, incriminating *Anopheles* species in malaria transmission will become increasingly hard while the risk for malaria transmission persists [61]. Integrated management of vectors can have the biggest effect on the transmission of malaria. There are many gaps in the literature on entomological malaria [62].

According to the National Malaria Elimination Program, which is a streamlined set of objectives that delineates duties and actions, the "1-3-7" strategy has been created in China. The time frame of the approach has been incorporated into the nationwide web-based disease reporting system: '1' case reporting within 1 day after diagnosis; '3' case investigation within 3 days; and '7' focus investigation and action not later than 7 days. Some studies results showed that the total cases decreased while the proportion of imported cases has been rose. Except for the "3" indicator, which was 96.3% achieved on average in the 18 border counties but needs to be further reinforced, the "1-3-7" was well performed. Further attempts for timely and precise case identification and proactive mapping of hot spots for disease transmission to promote the elimination of border malaria were highlighted [63].

The '1-3-7' approach would profit from considering reactions to malaria intervention tailored to the distinctive and difficult setting of the mountainous environment. Improving the understanding and preparation of all personnel responsible for this approach will support the standardization and execution of malaria elimination reaction operations [64]. Out of a total of 5,688 malaria cases from 731 counties from January 1st, 2013 to June 30th, 2014, there were 55 (1 %) native cases (only in Type 1

and Type 2 counties) and 5,633 (99 %) imported cases from all districts. There was no delay in reporting instances of malaria by county type. As far as case investigation is concerned, 97.5 % of cases were reviewed within 3 days with the percentage of delays (1.5 %) in type 2 counties, being considerably lower than type 1 counties (4.1 %). In the case of active foci, 96.4 % could be handled correctly [65].

CHAPTER III

METHODOLOGY

3.1 Study Design

Multiple cross-sectional studies and Quasi-experimental design of research with 'Village-based malaria elimination model' including systemic and comprehensive malaria interventions in longitudinal approach has been designed and conducted.

3.2 Study Period

Based on the malaria seasonality changes of Myanmar, the study was carried out during the most malaria peak season as time-series study (June-November_2018). The pre-intervention assessment was done in May and further follow-up studies were carried out in November.
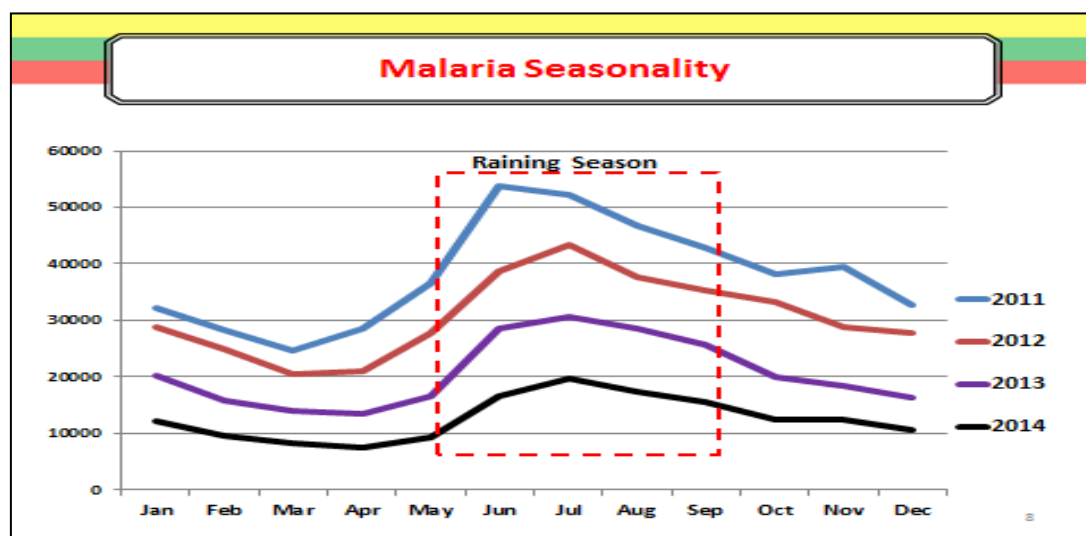
Figure 7 Malaria monthly caseloads by seasonal pattern (Source: NMCP 2017)

3.3 Study Site

Among 330 Townships in 14 States and Regions of Myanmar, the study was carried out purposively in one of the most malaria-endemic Regions, Sagaing that is located in the northwestern part of the country and structured with 34 townships. Among them, Banmauk Township is the most malaria burden areas in this decade. Therefore, to explore the effect of the intervention in current high transmission

reduction areas and to represent for both high transmission and low transmission townships, Banmauk Township has been selected purposively. Among 221 villages of this township, four villages with the highest malaria endemic situation were selected purposively to represent the profound results and to avoid underestimation of malaria risk. In 2018, with the funding support from the global fund (GFATM-RAI2E), there were three partners implementing malaria transmission reduction activities in Banmauk Township. Nevertheless, the study villages were selected in the coordination of all the partners and carefully avoid any overlapping issues.

Table 2 Current Malaria Situation of Banmauk twonship (Source: NMCP 2018)

No	Township	Pop	Rural Pop	Total Positive	API	No. tested	Positive Rate of Rural
1	Bamauk	112,668	106,503	2,768	24.6	16,957	25.99
Partners (2018) – IOM, PSI, NMCP							

API: Annual parasite incidence

3.4 Villages selection

To represent the findings and results of this study for all the villages in Banmauk Township, the stratified sampling method design has firstly been applied. The eligible villages were screened through the following criteria from 182 villages from that township.

- The village where no sub-center/ health center located
- No mobile/ migrants' population/ sites unless traveling to and from the villages
- Similar geographical situation (Distance from the downtown area, population density, and movement, geographical situations, etc.)
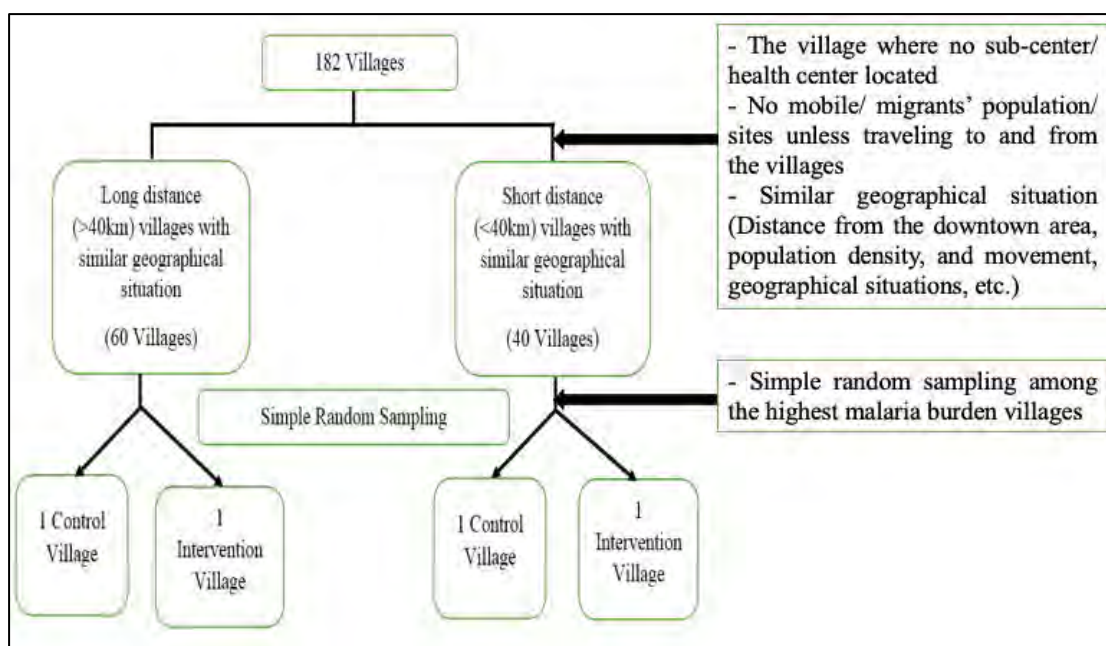
Figure 8 Village Selection Procedure

According to township available data from the township VBDC team, the below four villages with higher API were selected purposively to explore the effects of intervention in peculiar conditions. For the API by comparing in two years duration, it seems to be increased in all villages and it remains in the above elimination goal. Based on the population number of each village, the sample were adjusted and selected accordingly. Moreover, even though the total population numbers for each village were not the same, the villages 3 and 4 were considered as control areas and the remaining villages 1 and 2 were for interventions based on their geographical situations, malaria situations in 2017.

Table 3 Malaria situation of selected villages (Source: NMCP 2016 & 2017)

No.	Village	Population	2016		2017		Remark
			ABER	API	ABER	API	
1	NarKhar	523	14%	9%	17%	10%	I (Short Distance)
2	NarNantYaunt	378					I (Long Distance)
3	MyinThar	265	18%	8%	14%	11%	C (Short Distance)
4	LelOo	602					C (Long Distance)

ABER – Annual Blood Examination Rate, I – Intervention village, C: Control village

In addition, each village has an attached village malaria worker (VMW) currently trained and supported by the township vector-borne disease control (VBDC) team. All four VMWs possessed primary education with four years' experience as VMW. For them, the VBDC team provided 50,000 MMK (˜35USD) per three months as a travel incentive. At least one recruitment training at the beginning, in addition to two to three refresher training, has been supported annually. Moreover, supplies for malaria diagnosis and treatment were ensured.
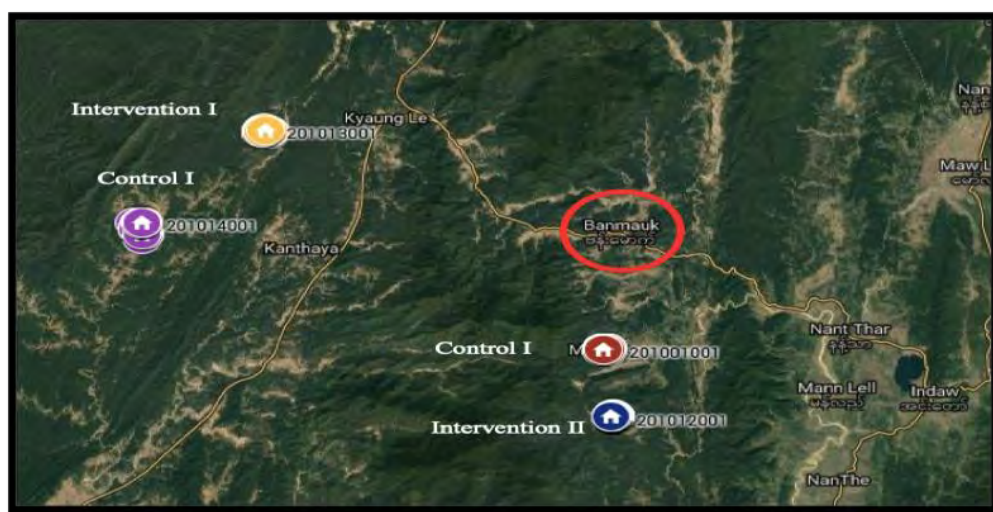
Figure 9 Google map showing study villages

(Source: Google my maps, Skill: 1 inch = 5 miles)

3.5 Overall Study Population

Malaria hot-spot areas (four villages) and people living in these particular areas were willing to involve in this study. The hot spot represented for the individual malaria transmission rather than environmental or household hot spots. As the study design has many dimensions, the static population sample cannot be estimated for each objective. Even though all the people residing in these two villages were covered by intervention, only the selected household leaders in each village were studied for KAP survey while all the people living in selected villages have been included for mass blood survey in pre, during and post-intervention. During the intervention, every positive case found by the service provider (VMWs) was also included for analysis as well. Firstly, population data was run through with proper inclusion and exclusion criteria. The

proportionate sampling has been drawn from each village by simple random sampling on the population census list to carry out a KAP study. For other parts of the interventions, all the villagers' residence for more than 14 days, were eligible for this study to cover enough incubation period for a locally acquired malaria infection.

Table 4 Inclusion and Exclusion Criteria for the overall study

Inclusion Criteria	Exclusion Criteria
▪ Male and female ≥1years ▪ Residence >14 days ▪ Ability and willingness to involve along with the study protocol	▪ History of hypersensitivity reactions or contraindications to any of the anti-malaria medicine because they have to be referred to the hospital and so difficult to follow up ▪ Refuse to take a blood specimen within the diagnosis and follow up ▪ Severe malaria cases who were referred to Hospital without giving any oral anti-malaria drugs

3.6 Village Based Malaria Elimination Model

3.6.1 Setting up for Intervention

The intervention applied in this study, called the 'village-based malaria elimination model' was formed by various stages and dimensions. Each stage had been prepared and planned cautiously and systematically with the different stakeholders. The intervention consisted of but not limited to;

1) Choose the most malaria hot spots areas from one particular area (either State/ region/ township/ village tract) and compared for similarity situation
2) Set up field office with enough diagnostic facility and proper sample storage at the township level and assign one lab technician there and one part-time internal validator for diagnosis
3) Advocacy meeting and orientation training at the township level and village level
4) Informal response team forming
5) Implementation of activities
6) Regular supervision and monitoring of field activities as well as data collection
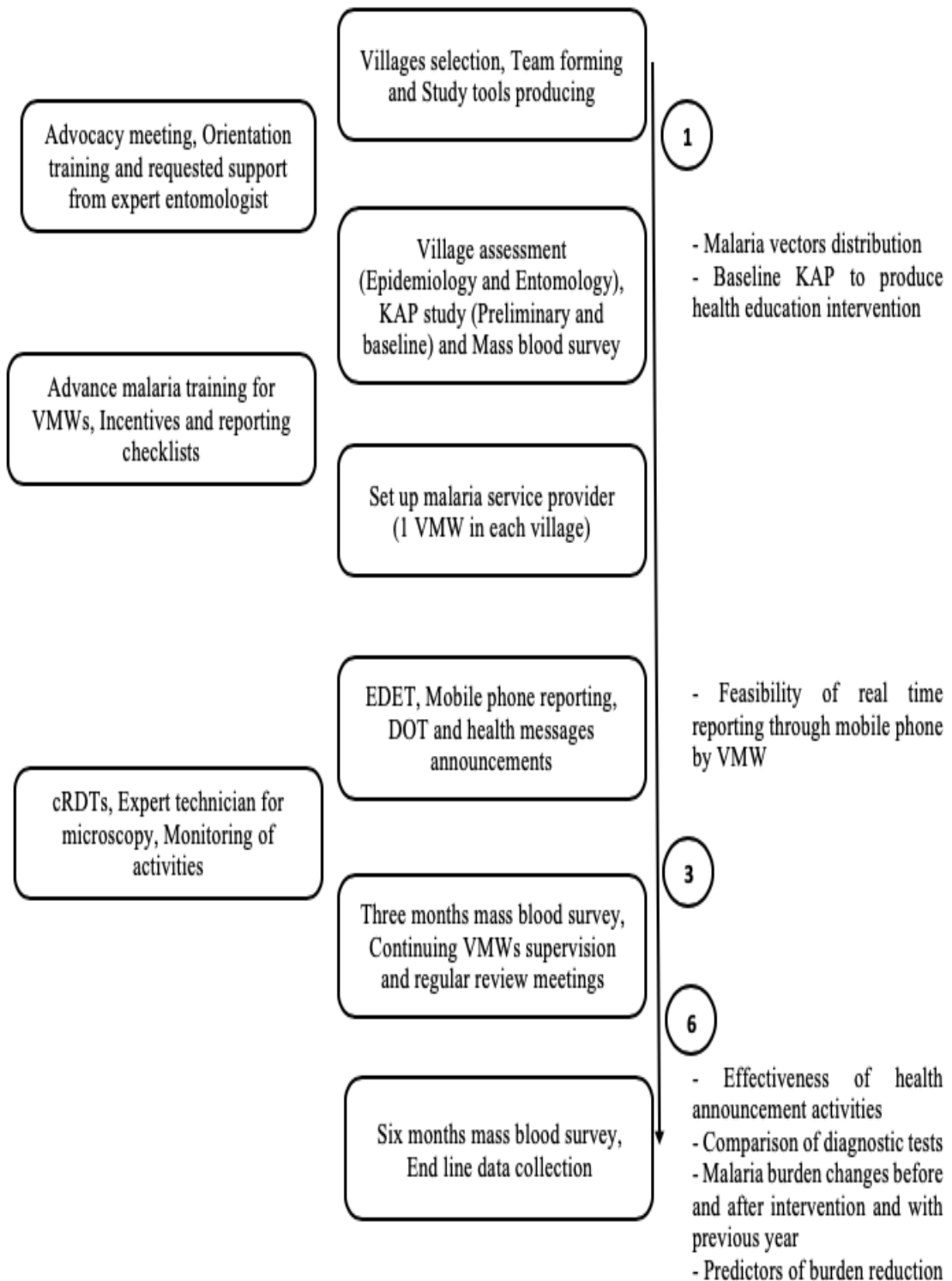
Figure 10 Modelling Frame (cRDT; Conventional rapid diagnostic test; VMW: Village malaria worker; EDET: Early diagnosis and effective therapy; DOT: Directly observed treatment)
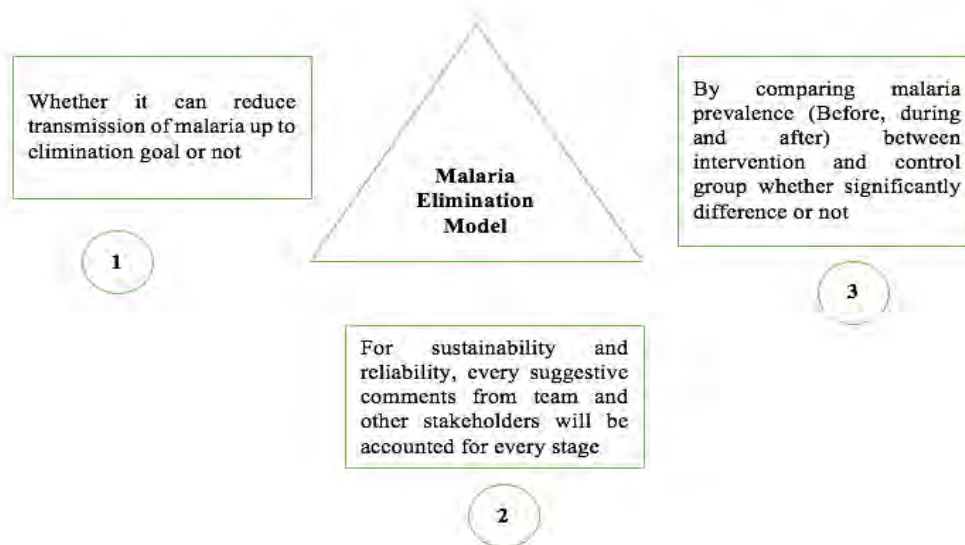
Figure 11 Three-Dimensional Evaluation for the Model

3.6.2 Tools Development and Procedures for each Intervention

a) Advocacy meeting and orientation training

Before starting anything at the village level, the researcher went to the township and met with township authorities and health authorities and organized an informal advocacy meeting. On the same day after the one-hour meeting, orientation training for the recruited team member to form a township-level response team. The 2 hours training could strengthen their existing knowledge regarding malaria elimination measures mainly on data collection, utilization and other follow up tools. In addition, the advocacy meeting was conducted among village leaders and respective government health staff from respective sub-centers to ensure to involve all the malaria patients who sought treatment at any other official places rather than assigned volunteers.

Not only comparing the malaria reduction in each study group, but also this study focused on additional inputs or suggestions from the survey team members and other local and health authorities. For that, the researcher organized informal bi-weekly office meetings among field team members and gave feedbacks accordingly. Moreover, monthly township level stakeholders meeting has been carried out among invited health-related authorities and some selected local authorities. Progress and brief

achievements of projects were presented and their feedbacks and suggestive comments were valued and put actions to the implementation activities accordingly.

b) Township level Response Team forming

The township-level response team composed of 1 medical person, 2 technicians, and 1 field assistant. The medical person has more than four years of experience in managing staff and doing malaria field implementation activities. Whereas, the technician was expert in microscopy particularly in diagnosing malaria and have had experience of checking more than 1,000 slides before. In addition, there was a graduate field assistant in assist to that medical person and technicians. Forms and checklist for each activity were used and recorded by medical personnel. The team members were supported for transportation and operational cost, field per-diem, copies of required forms and references.

Table 5 Response Team Structure

No.	Designation	Main Responsibilities
1.	Medical Person	Oversee all the data backup, findings and deliver decision for follow up actions
2.	Technician	Responsible all the malaria diagnosis activities, species identification, and parasite counts
3.	Field Assistant	Arranges all the logistics related process and assists in field-based activities

c) Entomology Study (Malaria vectors distribution assessment)

To exclude potential confounding of vector distribution among selected villages, one-time assessment of malaria vectors before the intervention was done with the help of one entomologist form the Department of Medical Research, Lower Myanmar. The checklist has been adapted to currently using the entomology checklist to address different *Plasmodium* species. The adult mosquitoes' collection has been done through cow baited and CDC light traps by both indoors and outdoors during night time from 6:00 PM to 6:00 AM on the next day. The biting behaviors were not accessed and that only one-time catching of mosquitoes was done in the early morning from both

animal bait and traps which were set up last night. The procedures were done for three consecutive days in clustered areas of each village around.

Figure 12 Adult mosquitoes collections. Three adult mosquitoes traps were shown; cow baited trapping (left); adult mosquitoes' collection (middle) and CDC light traps (right).

The entomologist identified each species and recorded accordingly whether primary or secondary vector and daftly compared within intervention and control groups. As the study timeline was only six months and the budget has been very limited, only the availability of malaria vectors could be assessed and other things like vectorial capacity and entomological inoculation rate could not be calculated or measured. Moreover, another genus rather than *Anopheles* was also removed from the assessment.

Table 6 *Anopheles* species distribution among intervention and control villages

Species	Intervention Areas	Control Areas
**An. Minimus****	✓	✓
An. Varuna	✓	✓
An. Annularis	✓	✓
An. Aconitus	-	✓
An. Hyrcanus	✓	-
An. Barbi	✓	✓
An. Maculatus	-	✓
An. Culicifacies	✓	-

An. = Anopheles, **the primary vector for local malaria transmission

d) Advance malaria training for village health volunteers

The assigned four VBDC volunteers have been previously trained for both theoretically and practically. However, they were upgraded for malaria intensive control activities especially elimination approach. The topics were covered for taking blood film, real-time reporting system via mobile phone messaging, directly observed treatment (DOT), disseminating needs-based malaria preventive messages referred to pre-intervention KAP survey result to each client during waiting for a blood test result. The modules and contents were adopted from current training power-points from NMCP, volunteer's guideline book, National malaria elimination plan (2016-2030) and proposed variables. Those volunteers served as screening points with full diagnostic and treatment facilities in each village and real-time case notification for each malaria patient. In addition, they could treat all malaria positive cases found according to National Malaria Treatment Guideline (updated NMTG 2015).

e) Monthly supportive Supervision for Village Health Volunteers

To ensure the volunteers' performance, data quality assurance, and testing procedure, the monthly supervision visit was organized by an assigned technician. On-site checking data and giving in time feedback system has been used.

f) Knowledge, Attitude, and Practice (KAP) Study (Preliminary assessment)

In four selected villages, all household information was collected from the village leader and applied systemic random sampling to get the required sample in each village. One person per selected household has been recruited to interview. Preferred individuals were household heads or representatives who can communicate very well about other household members' health and residence in their respective villages for more than six months. To be represented for a total of 352 households in all selected villages, 70% of households were invited for an interview.

The standard questionnaire form as a study tool: The standard questionnaire form in the English language which has been adopted from the WHO malaria indicator survey toolkit which was previously used in Myanmar for Malaria Indicator Survey during 2016. The majority of questions are designated as single or multiple responses

with a predefined choice. The information covered socioeconomic status for each resident together with knowledge, attitude, and practice regarding malaria. The overall scores were calculated for each KAP section and then the scores were determined by using the mean score as a cut-off point and grouped as either good (>mean score) or poor level (≤mean score) for each KAP portion [66]. The designed questionnaire contained four parts as follow:

Part 1: **Socio-economic status:** This part of the questionnaire was composed of 6 questions, which involve age, sex, family member, education level, the previous attempt of malaria and traveling history.

Part 2: **Knowledge towards malaria:** For the knowledge, 30 mini-questions were constructed and '1' score was given for each right answer whereas '0' for the wrong one. The scores were then be calculated and determined according to the Mean scores and classified them as a good and poor level of knowledge.

Part 3: **Attitude towards malaria:** There were 20 statements under the attitude section and four points Likert scale model was applied for the scoring. The maximum score and the minimum score were 80 and 20, respectively. The overall score for determining attitude was divided into 2 groups as a positive or negative attitude.

Part 4: Practice towards malaria treatment seeking and prevention: The practice section consisted of 25 questions regarding effective LLINs usage and other personal protective measures, malaria diagnosis, and treatment-seeking behaviors, and adherence to the prescribed anti-malaria medicines. A score was obtained for each correct choice and zero scores for the false answer. The total scores were determined and made as two groups as good and poor practice.

Validity and Reliability: Back-translation methods were used for rendering responses into Burmese. For the reliability, 30 respondents were pre-tested in ManKat village of the same township with similar geographical conditions. Cronbach's alpha coefficient of the questionnaires was calculated and resulted in 0.89 for reliability. To test the internal consistency of the questions with dichotomous choices, Kuder-Richardson formula 20 (KR20) was also calculated and it has been satisfactory at 0.89.

Data Collection: This process was carried out in all selected villages for one time (before intervention) in June 2018. Two research assistants have been trained for one day before data collection. The researcher gave training to those research assistants to understand the questionnaires, data collection process, practicing the real condition and human ethics. And requested the data collectors to explain clearly the questionnaire to the respondents and not to prompt answers to avoid bias. After briefing all and made sure that the respondents understand all, he or she asked to participate in the interview and to fill the informed consent form before answering questionnaires. The researcher checked all the answers to the questionnaire every day during the data collection time and if there is missing data, check together with data collectors and recollect the data the next day.

Data processing: All the data were entered into a Microsoft Excel spreadsheet and was encoded and analyzed using Statistical Package for the Social Sciences (SPSS version 23). A chi-square test and correlation were used to illustrate associations between dependent and independent variables. Statistical significance was set at 0.05.

g) Loudspeakers Based Health Messages Announcements

Based on the suggestive findings and recommendations from the preliminary KAP assessment study, this health message announcement activity was introduced and evaluated in the second phase of the study as under.

Health message announcement activity: First of all, the researcher conducted a very informal advocacy meeting with local authorities, together with the respective village malaria workers (VMWs) in each intervention village, and briefly explained the health message announcement activity.

A full set of loudspeakers was then provided directly to each intervention area. The loudspeakers were installed at each volunteer's home, and the volume was guaranteed to cover the whole village. However, sound pollution and annoyance were avoided by observing and informally asking for community input. Next, assigned VMWs received two hours of on-site training and were given ten sentences of standardized health messages. These sentences were adapted from the malaria section

of a published booklet of the Ministry of Health and Sports called '*Standardized Health Messages 2018*' [67], targeting malaria-like symptoms, diagnosis, and treatment, mainly for care-seeking behaviors and treatment adherence.

The 'Loudspeaker-based Announcement' intervention program was implemented in June 2018, whereby announcements were repeated in the evening (at approximately 7:00 pm) every other day until November 2018. To ensure the smooth and timely operation of the activities, the respective village authorities were routinely contacted by the researcher.

Figure 13 Setting up materials for intervention

(A. Amplifiers and mic for loud-speakers; B. Transferred to the villages; C. Setting-up of materials; D. Ready to be announced health message)

Participant selection: Similar to the preliminary assessment, household leaders/members older than 18 years of age who were well informed about their socioeconomic status and overall health were selected to participate in the study. A systematic, random sampling design using a random number generator was used to select a total of 270 households representing 75% of total households from the four study villages, using a local household list. The sampling occurred separately for each pre- and post-intervention survey in the four villages. Hence, although the number of participants was the same, the subjects were partially different each time.

Study tool: In this regard, the same questionnaire from the preliminary study was used but specifically, relevant items were regrouped under each KAP section. The knowledge section was presented in two separate components, pertaining to signs and symptoms of malaria, and diagnosis and treatment of malaria, respectively. The attitude

section also comprised two components, severity of malaria and transmission of malaria, for which the 4-point Likert scale was constructed. The practice section was similar to the knowledge section, as it comprised of ten predefined-choice questions under each category regarding the proper utilization of LLINs, malaria seeking care, and treatment adherence. Participants in the intervention group were required to complete an additional questionnaire section, aiming to assess their optimism towards delivered announcement activities during the course of the study.

Data collection: After signing informed consent, participants were asked to complete an interviewer-administered face-to-face questionnaire before the start of the intervention in early June 2018 and upon its completion in late November 2018, to compare the scores and identify necessary changes. Two research assistants were hired and trained in human subject research ethics and to become familiar with administering the questionnaire.

Data processing: By using the same software, descriptive statistics, followed by chi-squared and unpaired samples *t*-tests for statistical differences among mean scores for each KAP part in comparing before and after the intervention, were employed with the *p*-value of 0.05 signifying statistical significance.

h) Malaria infection screening through blood samples collection

Passive Case Detection: During these six-months, malaria-positive cases were identified by the assigned VMWs, to explore malaria incidence or prevalence in each village. VMWs were using RDT and also blood smear for diagnosis. Every blood slide was then be collected by the field team and confirmed the diagnosis. The real-time feedback of the result for consequence treatment was also performed. The required case record form has been produced before the study based on current using malaria carbonless register by NMCP and to be covered some variables. It was constructed to address fever pattern and other signs and symptoms of malaria, traveling history, previous malaria attempts, treatment given and disease outcome.

Active Case Detection: At the pre, during and post-rainy seasons, which represent the low and high malaria transmission seasons in the area respectively, the population has

been screened to eliminate malaria infection reservoirs as well as for early detection. To determine the seasonal malaria peak, the driest month is January, with 1 mm of rainfall. In September, the precipitation reaches its peak, with an average of 500-mm. The transmission of malaria is seasonal at these locations and peaks in June, July, and August. The warm and dry season is from January through April, marking the lowest season for malaria transmission; transmission changes are minimal during the short rainy season from November through December. Participants were visited three times (before monsoon, monsoon, and post-monsoon) and tested each individual who has cardinal symptoms of malaria-like fever with chills and rigor, severe headache recently or in the last 1-2 days before the examination for clinical malaria. At the same time, random people were also checked for malaria with diagnostic tools regardless of any malaria-like symptoms. Parasite densities and body temperature were used to define clinical malaria by age in the population. Thick and thin blood smears were taken from each individual.

During each visit, our team, consisting of a lead medical doctor, a laboratory technician, and a community malaria worker, communicated to individuals who have data about everyone's health at home, to find out about inhabitants who may have or have had experienced fever or suspected malaria. Each participant was given a unique identity (12 digits code) that represents the household, their villages, and township. The intervention team then assessed the eligibility of participants. Weight, temperature (fever [axillary temperature $\geq 37.5°C$] and symptoms of malaria, if any, recorded along with the surveys. Any drug allergies were also recorded. Screening tests were performed as parasite counts from *Giemsa* stained thick and thin blood films and malaria conventional rapid diagnostic tests (RDT). Blood smears were examined immediately and, therefore, all malaria positive cases by both microscopy and RDT were treated by updated National Malaria treatment guidelines.

For the sample size determination, with the reference value of 24.6% positive rate of malaria cases in this selected area, the sample size is calculated to be able to detect a clinically relevant increase in clinical malaria cases detected either by RDTs and microscopy of 10%. For testing of one population proportion to compare a binary outcome with a reference value in a one-sample design at the 5% significance level and

a 10% type II error probability, the total sample size required should be at least 500 samples in both intervention and control areas. Age ≥one year, male and female, who give informed consent were recruited and finger-stick or ear-stick blood samples have been collected.

Light-Microscopy: The thin and thick smears of the blood were prepared and dried with air. The thin smear was established in methanol and stained for 45 minutes with 4% *Giemsa*. In order to obtain a species-specific parasite count, the well-trained laboratory technician examined the slides under an oil immersion of ×1,000. For declaring a negative result, each slide was closely examined. The parasite density was also weighed against 200 leukocytes and calculated as of parasites per microliter of blood, assuming an 8,000 cells/μL leukocyte count [68]. In addition, a WHO certified external validator from the Department of Medical Research (DMR), Lower Myanmar, randomly chosen and inspected 10% of the blood smears for quality assurance and control purposes.

Rapid Diagnostic Test: The rapid test used in this study was the product of Standard Diagnostic (SD) Company from the Republic of Korea. These strips have been validated and started using in Myanmar since 2011. The test kits can detect both *Plasmodium falciparum and P. vivax*. The researcher ensured to avoid any stock out and expiry problems during the course of the study by monitoring the stocks monthly and distributed according to VMW consumption in the previous month.

Figure 14 Rapid diagnostic test (RDT) used for malaria screening

Data analysis: In order to validate the different performance of malaria tests, the results of conventional RDTs were compared with standard to microscopy results of both ACD and PCD. Respective sensitivity, specificity, Positive Predictive Value (PPV) and Negative Predictive Value (NPV) were calculated.

In addition, the current study's data from both PCD and ACD, unpublished malaria data provided by respective township-level VBDC teams was also utilized to ascertain any differences among villages. As individuals that present with fever have the right to seek malaria diagnosis and treatment in VMWs, the nearest health center, or even at the township hospital free of charge, the township-level compiled data of each village was utilized in this study to avoid missing any cases. Village level API was also compared between six-month data of current and last year. Chi-squared test to explore the changes in malaria positive rates was explored and p-value has been set up significance at <0.05.

i) Mobile Phone reporting by Village Health Volunteers

All four assigned volunteers cooperated for real-time reporting within 24 hours of every malaria case found by RDT. They were given one day of on-site training on reporting methods and how to use their owned mobile phone along with the practical session. A hotline number was provided and saved into their phone contact list. From each malaria patient, necessary information to be addressed for briefly case classification and also for routing surveillance purpose, date and time of diagnosis, age, sex, parasite species, traveling history and treatment given were collected and reported through a call. There was an assigned field supervisor at the township level and responsible for receiving calls and recording of data from each VMW into a checklist paper. Then data were translated into the English language, entry into the computer and back up regularly into a password protected the hard disk. As a regular incentive, 5,000MMK (approximately 3USD) per month remuneration was provided. At the end of each month, the mobile phone bill has been directly filled with the e-load system into a registered number of each volunteer and ensured of receipt by a direct call. It is like a standard amount and regular top-up regardless of the number of patients found.

Data collection and Analysis: In addition to the data tracking checklist, a structured questionnaire was used for data collection after implementing the intervention for six months between June and November 2018. It constructed with two parts; the quantitative part consisted of demographic characteristics of each VMW, simplicity of the system, their acceptability, preferences and other challenges. Next, the qualitative part explored for their overall comments as well as suggestions on this reporting system. At the end of November, data were collected at their village with the help of two graduated data collectors.

In the meantime, the compiled data from the checklist were cross-checked with their field carbonless data entry. Feedback on any discrepancies was provided and supported of solutions during monthly monitoring visits as well as at the end of the project. Timeliness, correctness, and overall completeness were also concluded. At the beginning of the project, the consent form was requested and signed by each VMW. Data were encoded, entry and analyzed by Microsoft Excel 2015 for descriptive statistics.
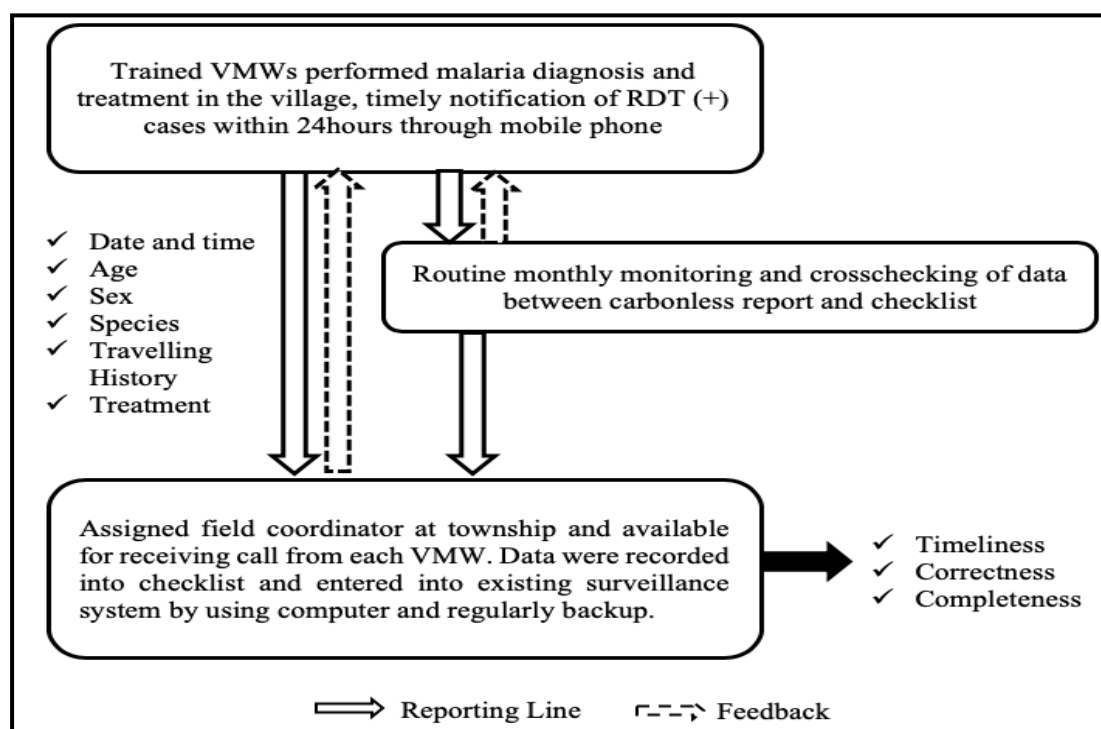
Figure 15 Mobile phone reporting system flow chart

j) Predictors of overall Malaria Burden Reduction

As this study included some sorts of activities targeted to decline malaria incidence in the selected community, in addition to measuring the effect of each intervention, the effectiveness of the absolute village-based elimination model was also measured by the linear regression model through SPSS version 23. The dependent variable was the number of cases confirmed by month when independent variables constructed into this model were;

- Health message announcements: Total number of announcements occurred during six months
- Mobile reporting: By giving scoring between 1-5 depends on reporting time of each malaria case by each VMW, shifted from the ideal time of 24 hours as; 5 for within 24 hours, 4 for 24-36 hours, 3 for 36-72 hours, 2 for >72 hours and last, 1 for no reporting.
- LLINs ownership: By observing during the cross-sectional study in addition to township level distribution data and 1% depreciation on the total number of LLINs, monthly data of LLINs ownership were put into analysis.
- Active case detection: The total number of ACD occurred in a total of four villages was counted and put into analysis though previously no ACD activity there.
- VMWs training: Person-days of training activity organized in each village along the six months study period was considered as a factor and included in analysis.

However, the total number of VMWs was excluded due to very few amounts to calculate for representative results. Also, due to data limitations, other external factors that might have an impact on malaria burden like rainfall, deforestation, humidity were skipped. Next, the malaria species were pooled only as malaria infection regardless of *P. falciparum* or *P. vivax*. Thus, there were likely other unknown risk factors but not yet included in this evaluation. Again, significant coefficients in regression represented only associations and not necessarily causality.

Table 7 Activities done among intervention and control groups

No.	Activities	Intervention Group	Control group	Time frame
1.	Entomology assessment	✓	✓	Before
2.	KAP survey	✓	✓	Before and after
3.	Mass blood survey	✓	✓	Before, during and after
4.	Assigned one volunteer in each selected village	✓	✓	Before
5.	Advanced training for VMWs	✓	-	Before
6.	Village level advocacy meeting for treatment-seeking and real-time reporting	✓	-	Before
7.	Health education by VMWs	✓	-	During
8.	Mobile phone reporting	✓	-	During

3.7 Ethical Approval

Ethical approval for this study has been submitted and approved by the Institutional Technical and Ethical Review Board, University of Public Health - Yangon, Ministry of Health & Sports (UPH-IRB 2018/Research/29).

Moreover, the participation of the respondents was voluntary and the decision to involve in this study was not being disclosed to any authority. Moreover, the researcher clearly explained the objectives of the research and obtained informed consent from all the respondents. All answer sheets and data reports were kept in locked cabinets as well as in a password-protected computer. After the collected data were put into the database, all the answer sheets and forms were destroyed by burning.

3.8 Dissemination of the study results

After the analysis has been completed, the researcher shared the results either by presentation or formal report with related health departments within Banmauk Township and relevant stakeholders. Dissemination of findings has also been done

through certain international conferences and or peer-reviewed journals. The results were shared internally with the NMCP for their feedback and questions. Thereafter, these results were disseminated along with the findings, with the NMCP and MOHS approval, with all in-country partners at research dissemination events, and as part of in-country partner meetings. The results may then be shared with the MOHS decision-makers at the township level and advocate that it can be incorporated into their operational planning cycle.

CHAPTER IV

RESULTS

4.1 Baseline KAP to produce a particular health education intervention

Among 250 participants, the general characteristics showed a majority of respondents were more than 35 years (56.0%), and 64.4% were male, 88.4% possessed family income up to 3,000,000 Kyats. Moreover, 87.2% of the respondents were low educated, 66.8% had a lesser number of family members in their household and 78.4% of them responded that their family members had no fever attack in the last two weeks. Nearly 90.0% of them had previous attempts of malaria in their life, almost all knew very well about malaria word and had enough ownership of good quality bed-nets for their family members. Furthermore, 75.6% of them received a kind of malaria-related health education session organized either by government malaria workers and or other non-government organizations (NGOs) during the last 6 months. Some participants (35.2%) had ever been volunteering for a kind of malaria-related activity in their village (Table 8).

Table 8 General characteristics of 250 respondents

Characteristics	n	(%)
Age (Years)		
18-35	110	44.0
>35	140	56.0
Sex		
Male	161	64.4
Female	89	35.6
Annual Income (Kyats)*		
≤ 3,000,000	221	88.4
> 3,000,000	29	11.6
Education		
Primary school	218	87.2
High school and above	32	12.8
Family members		
≤ 5	167	66.8
> 5	83	33.2
Fever attacks among family members in the last 2 weeks	54	21.6
Having previous attempts of malaria in life	220	88.0
Knowing of Malaria term	246	98.4
Enough ownership of good quality LLINs**	247	98.8
Receiving health education services in the last 6 months	189	75.6
Volunteered for village-based malaria-related health services	88	35.2

*1USD~1550Kyats; **the nets were impregnated with deltamethrin not exceed three years and provided for 2 people/net.*

For overall KAP regarding malaria, after grouping with its mean score, the results indicated considerably low percentages of good levels, especially in practice. Almost 40.0% of respondents had good knowledge, 56.8% had a good attitude while only 21.6% showed good practice (Table **9**).

Table 9 Overall level of knowledge, attitude and practices regarding malaria (n=250)

Characteristics	n	(%)
Overall Knowledge		
Good	96	38.4
Poor	154	61.6
Overall Attitude		
Good	142	56.8
Poor	108	43.2
Overall Practice		
Good	54	21.6
Poor	196	78.4

Grouping by mean scores

The significant associations were found between age (p = 0.022) and annual income (p<0.001) with the knowledge level of respondents whereas having a fever attack among family in the last two weeks (p = 0.023) showed statistically association with attitude level. By the results, those who aged more than 35 years were likely to have poor knowledge (67.9%). Again, participants with an annual income of ≤3,000,000Kyats were more favorable to have a poor level of knowledge (65.6%). For the attitude, it found 70.4% of the respondents who had a good attitude, their family members experienced a fever attack within the past two weeks. On the contrary, the respondents who had no family member suffered from a fever attack had a poor attitude. However, there were no associations with constructed variables and respondents' practice at p-value <0.05 (Table **10-12**).

Table 10 Associations between general characteristics and knowledge levels regarding malaria (n=250)

Characteristics	Knowledge Level		p
	Good	Poor	
	n (%)	n (%)	
Age (Years)			
18-35	51(46.4)	59(53.6)	*0.022
>35	45(32.1)	95(67.9)	
Sex			
Male	56(34.8)	105(65.2)	0.114
Female	40(44.9)	49(55.1)	
Annual Income (Kyats)***			
≤ 3,000,000	76(34.4)	145(65.6)	*<0.001
> 3,000,000	20(69.0)	9(31.0)	
Education			
Primary school	79(36.2)	139(63.8)	0.067
High school and above	17(53.1)	15(46.9)	
Family members			
≤ 5	68(40.7)	99(59.3)	0.285
> 5	28(33.7)	55(66.3)	
Fever attacks among family members in the last 2 weeks			
Yes	24(44.4)	30(55.6)	0.302
No	72(36.7)	124(63.3)	
Having previous attempts of malaria in life			
Yes	82(37.3)	138(62.7)	0.321
No	14(46.7)	16(53.3)	
Knowing of malaria term			
Yes	94(38.2)	152(61.8)	0.631
No	2(50.0)	2(50.0)	
Enough ownership of good quality LLINs**			
Yes	96(38.9)	151(61.1)	0.169
No	0(0.0)	3(100.0)	
Receiving health education services in the last 6 months			
Yes	71(37.6)	118(62.4)	0.633
No	25(41.0)	36(59.0)	
Volunteered for village-based malaria-related health services			
Yes	29(33.0)	59(67.0)	0.192
No	67(41.4)	95(58.6)	

Significance at p<0.05, Degree of freedom for Chi-square test=1, **the nets were impregnated with deltamethrin not exceed three years and provided for 2 people/net, ***1USD~1550Kyats

Table 11 Associations between general characteristics and attitude levels regarding malaria (n=250)

Characteristics	Attitude Level		p
	Good	Poor	
	n (%)	n (%)	
Age (Years)			
18-35	64(58.2)	46(41.8)	0.696
>35	78(55.7)	62(44.3)	
Sex			
Male	90(55.9)	71(44.1)	0.699
Female	52(58.4)	37(41.6)	
Annual Income (Kyats)*			
≤ 3,000,000	123(55.7)	98(44.3)	0.313
> 3,000,000	19(65.5)	10(34.5)	
Education			
Primary school	127(58.3)	91(41.7)	0.225
High school and above	15(46.9)	17(53.1)	
Family members			
≤ 5	92(55.1)	75(44.9)	0.439
> 5	50(60.2)	33(39.8)	
Fever attacks among family members in the last 2 weeks			
Yes	38(70.4)	16(29.6)	*0.023
No	104(53.1)	92(46.9)	
Having previous attempts of malaria in life			
Yes	129(58.6)	91(41.4)	0.112
No	13(43.3)	17(56.7)	
Knowing of malaria term			
Yes	139(56.5)	107(43.5)	0.459
No	3(66.7)	1(33.3)	
Enough ownership of good quality LLINs**			
Yes	140(56.7)	107(43.3)	0.729
No	2(66.7)	1(33.3)	
Receiving health education services in the last 6 months			
Yes	107(56.6)	82(43.4)	0.917
No	35(57.4)	26(42.6)	
Volunteered for village-based malaria-related health services			
Yes	49(55.7)	39(44.3)	0.793
No	93(57.4)	69(42.6)	

*Significance at p<0.05, Degree of freedom for Chi-square test=1, **the nets were impregnated with deltamethrin not exceed three years and provided for 2 people/net, ***1USD~1550Kyats*

Table 12 Associations between general characteristics and practice levels regarding malaria (n=250)

Characteristics	Practice Level		p
	Good n (%)	**Poor** n (%)	
Age (Years)			
18-35	21(19.1)	89(80.9)	0.393
>35	33(23.6)	107(76.4)	
Sex			
Male	34(21.1)	127(78.9)	0.803
Female	20(22.5)	69(77.5)	
Annual Income (Kyats)*			
≤ 3,000,000	44(19.9)	177(80.1)	0.073
> 3,000,000	10(34.5)	19(65.5)	
Education			
Primary school	48(22.0)	170(78.0)	0.675
High school and above	6(15.8)	32(84.2)	
Family members			
≤ 5	35(21.0)	132(79.0)	0.726
> 5	19(22.9)	64(77.1)	
Fever attacks among family members in the last 2 weeks			
Yes	11(20.4)	43(79.6)	0.804
No	43(21.9)	153(78.1)	
Having previous attempts of malaria in life			
Yes	48(21.8)	172(78.2)	0.82
No	6(20.0)	24(80.0)	
Knowing of malaria term			
Yes	54(22.0)	192(78.0)	0.290
No	0(0.0)	4(100.0)	
Enough ownership of good quality LLINs**			
Yes	52(21.1)	195(78.9)	0.056
No	2(66.7)	1(33.3)	
Receiving health education services in the last 6 months			
Yes	44(23.3)	145(76.7)	0.256
No	10(16.4)	51(83.6)	
Volunteered for village-based malaria-related health services			
Yes	23(26.1)	65(73.9)	0.199
No	31(19.1)	131(80.9)	

*Significance at p<0.05, Degree of freedom for Chi-square test=1, **the nets were impregnated with deltamethrin not exceed three years and provided for 2 people/net, ***1USD~1550Kyats*

Lastly, table **13** illustrated the correlations among knowledge, attitude, and practice. The results showed there was a negative association between knowledge with attitude and also knowledge with practice. Moreover, there was a positive association between attitude and practice. However, there were no drastically significant between them at p-value <0.05.

Table 13 Correlations between knowledge, attitude, and practice (n=250)

Descriptions	Attitude		Practice	
	r	p-value	r	p-value
Knowledge	-0.0752	0.235	-0.0147	0.816
Attitude			0.1045	0.098

4.2 Differences in overall Knowledge, Attitude and Practice levels after implementing loudspeakers-based health messages announcements

The potential covariates or factors that might contribute to the intervention outcome are presented in Table **14**. Within-group comparisons, as well as between groups, were conducted for both pre- and post-intervention periods. The findings yielded by descriptive data analyses showed that more than half of the respondents were 18 to 35 years old. In addition, the sample comprised of a similar number of males and females, and around half of the participants reported having malaria episodes over a certain period before taking part in the study. Moreover, the majority of the respondents possessed sufficient ownership of LLINs with enough family income, while more than half of the sample had only primary-level education. However, no statistically significant differences between the participant groups were noted in terms of their socio-demographic characteristics.

Table 14 Comparison of socio-demographic characteristics between intervention and control groups

Characteristics	Before Intervention		After Intervention		p-value			
					Within groups		Between groups	
	C (n=130)	I (n=140)	C (n=130)	I (n=140)	C	I	B	A
	n (%)	n (%)	n (%)	n (%)				
Age (Years)								
18-35	79 (60.7)	77 (55.0)	81 (62.3)	81 (57.9)	0.799	0.181	0.388	0.456
>35	51 (39.3)	63 (45.0)	49 (37.7)	59 (42.1)				
Sex								
Male	61 (46.9)	75 (53.6)	70 (53.8)	73 (52.1)	0.264	0.811	0.275	0.779
Female	69 (53.1)	65 (46.4)	60 (46.2)	67 (47.9)				
Malaria episodes before the study								
Yes	74 (56.9)	88 (62.9)	65 (50.0)	82 (58.6)	0.263	0.463	0.320	0.158
No	56 (43.1)	52 (37.1)	65 (50.0)	58 (41.4)				
Sufficient ownership of LLINs for family members (2 people/net)								
Yes	126 (96.9)	135 (96.4)	124 (95.4)	131 (93.6)	0.519	0.200	0.821	0.516
No	4 (3.10)	5 (3.6)	6 (4.60)	9 (6.4)				
Enough Annual Family Income								
Yes	109 (83.8)	121 (86.4)	116 (89.2)	124 (88.6)	0.203	0.588	0.551	0.863
No	21 (16.2)	19 (13.6)	14 (10.8)	16 (11.4)				
Education level								
≤ Primary	71 (54.6)	90 (64.3)	72 (55.4)	84 (60.0)	0.901	0.460	0.106	0.443
> Primary	59 (45.4)	50 (35.7)	58 (44.6)	56 (40.0)				

*Significance at p-value<0.05, Degree of freedom for Chi-square test=1, LLIN = Long-lasting insecticide-treated net, Education: Primary – able to read and write or grade 1 to 5; C=Control, I=Intervention, B=Before intervention, A=After intervention

In order to ascertain the changes in the overall KAP scores after the 6-month intervention, the mean scores and corresponding standard deviations (SD) of individual KAPs for the intervention group were illustrated and compared with those of the control group, as shown in Figure **16**. A large increase in the overall mean scores was noticeable, particularly in the intervention communities. The mean scores of each KAP

component were assessed and statistically compared (as seen in Table **15**). For the knowledge session, two constructed topics were measured between the two groups for pre- and post-intervention. The results revealed no significant difference between the groups before the intervention, but a statistically significant difference between the groups after the intervention (mean ± SD: 3.46±1.30 in the control group and 6.81±1.43 in intervention group for signs and symptoms of malaria, and 3.07±1.44 versus 6.49±1.28 by group respectively for diagnosis and treatment of malaria; $p<0.001$).
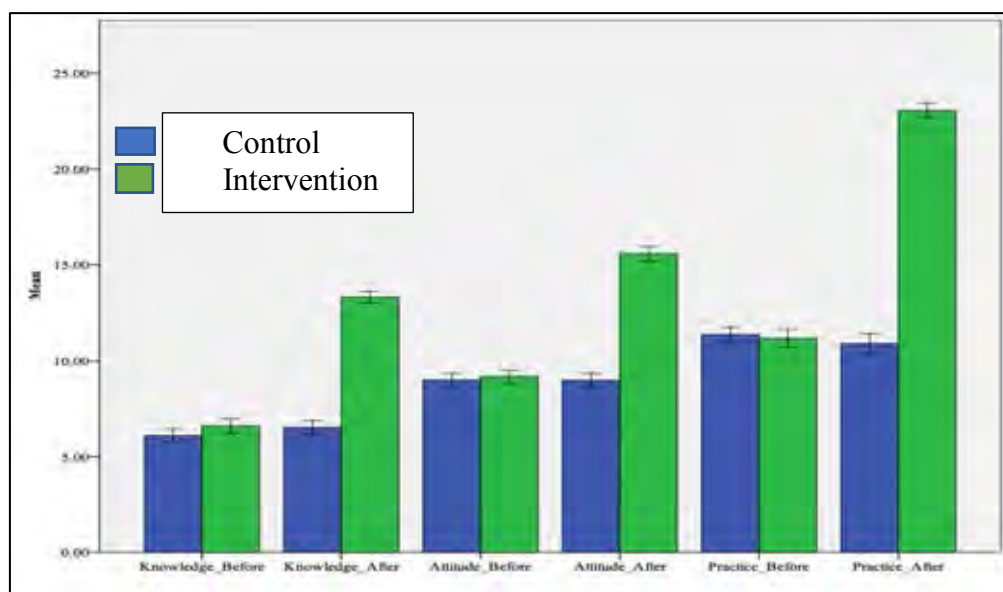
Figure 16 Changes in mean scores of overall Knowledge, Attitude and Practice before and after the intervention

The overall attitude and practice scores showed similar trends; there was no statistically significant difference between the two groups during the pre-intervention assessment but a statistically significant difference was found in the post-intervention assessment ($p<0.001$). The mean scores in the intervention group were 7.84±1.83 for attitude toward the severity of malaria and 7.74±1.29 for transmission of malaria, while the scores for these variables remained equivalent to the baseline scores in the control group (4.93±1.29 and 4.06±1.50, respectively). The post-intervention scores in all three categories of good practice regarding utilization of LLINs, malaria-seeking care, and treatment adherence improved (from 4.11±1.40, 3.75±1.47 and 3.34±1.42 to 7.78±0.96, 7.50±1.2, and 7.79±1.48, respectively). In the control group, the scores for these

variables remained equivalent to the baseline scores (3.82±1.49, 3.92±1.30 and 3.18±1.68, respectively) (Table **15**).

Table 15 Mean scores of knowledge, attitude, and practice between and within, two groups before and after the intervention

Descriptions	Before Intervention				After Intervention			
	Control	Intervention	Mean difference (95% CI)	*p*	Control	Intervention	Mean difference (95% CI)	*p*
Knowledge (mean±SD)								
Signs and Symptoms of malaria	3.58±1.73	3.86±1.64	0.29 (-0.12, 0.69)	0.163	3.46±1.30	6.81±1.43	3.35 (3.03, 3.68)	<0.001*
Diagnosis and Treatment of malaria	2.52±1.11	2.74±1.44	0.22 (-0.91, 0.53)	0.165	3.07±1.44	6.49±1.28	3.42 (3.09, 3.74)	<0.001*
Attitude (mean±SD)								
Severity of malaria	5.15±1.40	5.20±1.09	0.05 (-0.25, 0.35)	0.724	4.93±1.29	7.84±1.83	2.91 (2.52, 3.29)	<0.001*
Transmission of malaria	3.86±1.84	3.99±1.84	0.13 (-0.31, 0.57)	0.559	4.06±1.50	7.74±1.29	3.67 (3.34, 4.01)	<0.001*
Practice (mean±SD)								
Proper utilizations of LLINs	4.02±1.10	4.11±1.40	0.09 (-0.21, 0.40)	0.551	3.82±1.49	7.78±0.96	3.96 (3.67, 4.26)	<0.001*
Seeking care of malaria	3.89±1.37	3.75±1.47	-0.14 (-0.48, 0.20)	0.412	3.92±1.30	7.50±1.21	3.58 (3.28, 3.88)	<0.001*
Treatment adherence	3.48±1.62	3.34±1.42	-0.15 (-0.51, 0.22)	0.421	3.18±1.68	7.79±1.48	4.61 (4.23, 4.99)	<0.001*

Significance at unpaired t-test with p-value<0.05, LLINs = Long-lasting insecticide treated nets, p-value- within groups comparison

In addition to group comparisons, the within-group results (participants involved in both the control and intervention groups for the pre-and post-intervention assessment) were also differentiated (Table **16**). The post-intervention assessment revealed statistically significant differences ($p<0.001$) in all variables for the intervention group. Unexpectedly, while the post-intervention knowledge scores for the diagnosis and treatment of malaria were also significantly higher in the control group in comparison to the baseline scores ($p<0.05$), the improvement in the scores was much greater in the intervention group than in the control group (2.52±1.11 to 3.07±1.44 in control group and 2.74±1.44 to 6.49±1.28 in intervention group).

Table 16 Mean scores of knowledge, attitude and practice within two groups before and after the intervention

Descriptions	Before/ After:			
	Control		Intervention	
	Mean difference (95% CI)	*p**	Mean difference (95% CI)	*p**
Knowledge				
Signs and Symptoms of malaria	0.12 (-0.26, 0.49)	0.544	-2.95 (-3.31, -2.59)	<0.001*
Diagnosis and Treatment of malaria	-0.55 (-0.86, -0.23)	0.001*	-3.74 (-4.06, -3.42)	<0.001*
Attitude				
Severity of malaria	0.22 (-0.11, 0.54)	0.198	-2.63 (-2.99, -2.28)	<0.001*
Transmission of malaria	-0.2 (-0.61, 0.21)	0.338	-3.74 (-4.12, -3.37)	<0.001*
Practice				
Proper utilizations of LLINs	0.2 (-0.12, 0.52)	0.220	-3.67 (-3.95, -3.39)	<0.001*
Seeking care of malaria	-0.3 (-0.36, 0.30)	0.853	-3.75 (-4.07, -3.43)	<0.001*
Treatment adherence	0.31 (-0.10, 0.71)	0.134	-4.45 (-4.79, -4.11)	<0.001*

Significance at unpaired t-test with p-value<0.05, LLINs = Long-lasting insecticide-treated nets, p-value- within groups comparison

Community acceptance or preferences towards intervention

In addition to measuring the effect of the intervention, it is also important to address people's preferences towards interventions when considering future implementation. Therefore, five statements were summarized as descriptive data in Table **17**. Most of the participants (>80%) expressed their positive preferences, and they stated that they wanted the intervention to be maintained; in contrast, relatively few people (8.6%) stated that they suffered from the noise or an unclear voice of the announcement.

Table 17 People optimism toward intervention (n=140)

Descriptions	n	(%)
Like to be continued of intervention	116	82.9
Suffered noise pollution or unclear messages from loudspeakers*	12	8.6
Well absorbed and clearly heard of information	109	77.9
The provided messages reminded me to have a blood test soon after having fever	111	79.3
The intervention was good for me and other villagers	122	87.1

Negative statement

4.3 Malaria positive found by RDTs Vs microscopy

On the other side to explore the malaria diagnostic efficiency of current using RDTs in Myanmar, the blood test results were compared using microscopy as a standard (Table **18**). The results described that among pool samples of 1,374 testing, through passive case detection (PCD) as well as active case detection (ACD)/ mass blood survey (MBS), the malaria RDTs showed positive answers among 55 patients. Among them, only 41 samples were confirmed as malaria during microscopy examination while 14 were the absence of parasites. The sensitivity, specificity and diagnostic accuracy were 82.00%, 98.94%, and 74.55%, respectively. Moreover, there was a significant difference between the two diagnostic methods ($p < 0.05$).

Table 18 Malaria diagnostic efficiency of RDT using microscopy as a standard (n=1,374)

Techniques		Microscopy		Diagnostic Parameters (%)					p
		Positive	Negative	SN	SP	DA	PPV	NPV	
RDT	Positive	41	14	82.00	98.94	98.33	74.55	99.32	0.001*
	Negative	9	1,310						

*SN: Sensitivity, SP: Specificity, DA: Diagnostic accuracy, PPV: Positive predictive value, NPV: Negative predictive value, *p-value by Fisher exact test and significant at p-value<0.05.*

4.4 Mobile Phone reporting by Village Malaria Workers (VMWs)

First, the baseline demographic characteristics of four VMWs are reported, revealing the similar distribution of age, sex, and family income. Moreover, respondents are educated at the primary school level and possess a smartphone. During the study period, 24 of the 25 malaria patients (96%) were notified within 24 hours by the four VMWs. Two (8.0%) of these cases were reported within 10−15 hours, while most of the remaining patients (88.0%) could be informed within 1 hour from the diagnosis. Unfortunately, there was a delayed case notification only after 24 hours (Figure **17**).
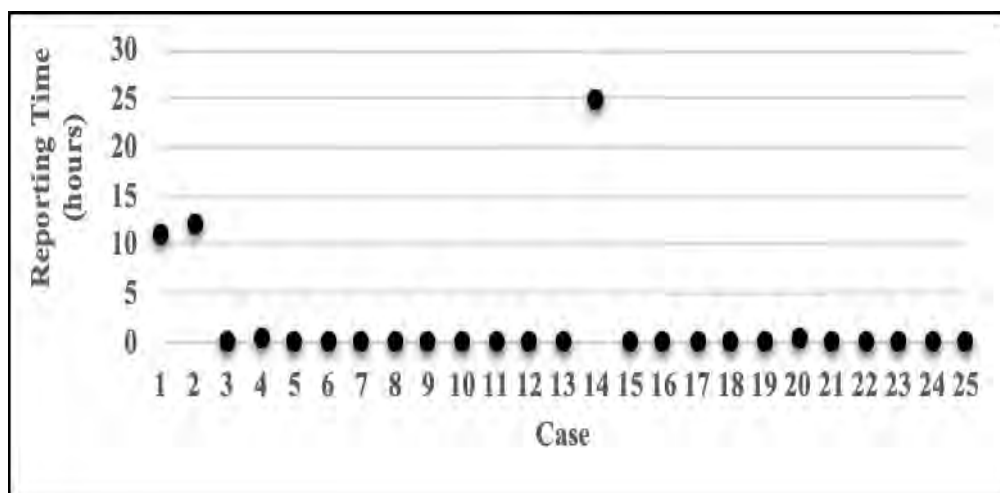
Figure 17 Reporting time for each malaria patient (n=25)

The findings pertaining to timeliness, correctness, and completeness of the information received from volunteers are summarized in Table **19**. The median reporting time was 0.2 hours, and only one case (4.0%) was reported after the designated 24-hour period. On the other hand, all the variables were more than 95% correct when cross-checked between reports. Similarly, all questionnaire items were at least 95% complete, except for age, which was provided by only 84% of the patients. Finally, timeliness analyses revealed that, in 96% of cases, patients could be notified within 24 hours, while full completeness and completeness were 92% and 80%, respectively (Figure **18**).

Table 19 Timeliness, Correctness, Completeness of the information (n=25)

Descriptions	n	(%)
Timeliness		
<24 Hours	24	96.0
Median	0.2 Hour	
>24 Hours	1	4.0
Correctness		
Date & time of diagnosis		
Correct	24	96.0
Incorrect	1	4.0
Age		
Correct	23	92.0
Incorrect	2	8.0
Sex		
Correct	25	100
Incorrect	0	0
Species		
Correct	24	96.0
Incorrect	1	4.0
Travelling History		
Correct	25	100
Incorrect	0	0
Treatment Given		
Correct	25	100
Incorrect	0	0
Completeness of Information		
Date & time of diagnosis		
Complete	24	96.0
Incomplete	1	4.0
Age		
Complete	21	84.0
Incomplete	4	16.0
Sex		
Complete	24	96.0
Incomplete	1	4.0
Species		
Complete	24	96.0
Incomplete	1	4.0
Travelling History		
Complete	25	100
Incomplete	0	0
Treatment Given		
Complete	24	96.0
Incomplete	1	4.0
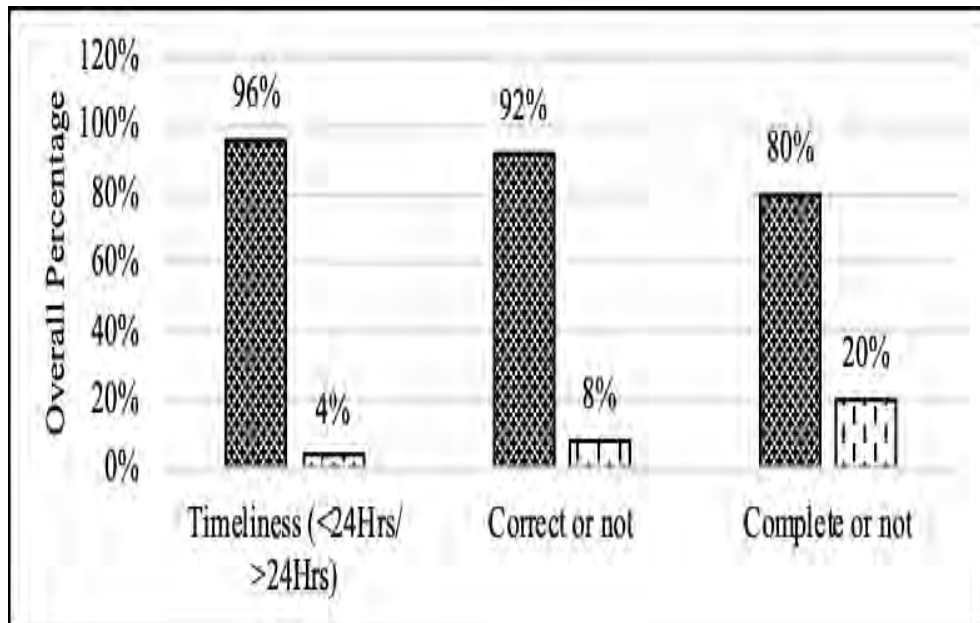
Figure 18 Overall percentage of Timeliness, Correctness, and Completeness of the information (n=25)

When VMWs were asked to share their overall perceptions of this reporting system, the volunteers suggested that it is simple and easy to utilize, while they would accept the implementation of this intervention. However, sometimes, they experienced difficulties using the application, such as poor signal and time-consuming. All the VMWs rated the system as reliable and felt that it was a viable reporting channel for timely notification of disease occurrence. Some of the reviews they provided following this qualitative study are summarized below;

'It was a great opportunity to learn such a new reporting system. As a result, I am more confident in treating my patients.'

'As network signal is sometimes terrible, I have to dial repeatedly and often have to call back three to four times.'

'To be honest, as malaria cases are becoming rarer, having one's mobile bill paid by the project is more than enough to promote the application use.'

'As not all people in this region know their exact age, we sometimes have to estimate.'

'Using the system is simple and routine work, so I guess that we should continue using this reporting channel in the future.'

'I would say that I am overall satisfied with this kind of system, and have had no challenges using it.'

'We should call the hotline number as soon as we have found the patient, as we may otherwise forget.'

It is particularly noteworthy that all four participants were satisfied with the training provided, as well as the routine monitoring visits from the township level and the telephone bill remuneration. Moreover, despite some challenges noted above, they would be willing to continue using this intervention.

4.5 Malaria Burden Changes

Correlated with the intervention, a large declining trend for malaria morbidity was also noticed in the intervention group. The reported confirmed cases per tested population data from the same period of two adjacent years were presented to illustrate the reduction in the malaria burden (Table **20**). The outcome affirmed that the malaria trend significantly dropped to 2% after the six-month intervention in comparison to 12% in the control group ($p<0.05$). Again, a significant decrease in morbidity was found (from 17% to 2%) when correlated with the intervention group itself; however, smaller change in morbidity was found for the control group (18% and 12%, pre- and post-intervention, respectively) after six months but not as much as intervention group.

Table 20 Changing of malaria morbidity (comparing with last year data of the same period between June - November)

June-November 2017 (%)				June-November 2018 (%)				Between groups (2017 Vs 2018)			
								C		I	
I	C	X^2	p	I	C	X^2	p	X^2	p	X^2	p
17	18	0.103	0.860	2	12	11.527	0.001*	1.970	0.205	18.455	<0.001*

*Data source: unpublished data from respective township's vector-borne disease control team, p-value by Fisher's exact test, *Significance at p-value <0.05, C: Control, I: Intervention*

Although there was a 75.0% reduction among intervention villages, in addition, the API for the intervention villages showed 4/1000 population as risk which is still not in line with the malaria elimination indicator. However, the intervention has achieved

to reduce the malaria burden up to a considerable level. Moreover, the results revealed a very far outcome among the control group as there were still considerable caseloads of malaria along with expanded ABER and even increased than last year (Table **21**). As the intervention has happened only six months, here the API was calculated for the same six months of two adjacent years and compared. This might affect the result and would not be representable for the whole year's data.

Table 21 Changed in Annual Parasite Incidence (API) after the intervention

Villages	2017 (June to November)		2018 (June to November)		% of reduction
	ABER (%)	API	ABER (%)	API	
Control	15.0	18/ 1,000	20.0	12/ 1,000	33.3
Intervention	16.0	17/ 1,000	25.0	4/ 1,000	75.0

*ABER: Annual Blood Examination Rate, API: Annual Parasite Incidence

4.6 Predictors of declining malaria caseloads by regression models

It is not straightforward to interpret the model to determine which of the significant factors is most important, because all the independent variables are scaled differently. The regression coefficients are an estimate of the anticipated change for a one-unit change in the independent variable per township in the dependent variable. For example, the units of one additional HE, one more mobile reporting, one more LLIN, one more active case detection, and one more person-day of training are all very different.

Thus, one shift in the HE session amount has a coefficient much bigger than the others. When considering the relative effects of additional LLIN, VHW training days, one must consider the amount of input required to deliver one more net (out of many thousands per village or township) compared to one additional health message announcement or one person-day of training for mobile reporting (Table **22**). For the p-value, the results were similar except the VMW training was not significant. In contrast, the factors demonstrated to be significant predictors of decline in malaria by intervention village were the number of health messages announcements activities, real-

time mobile case reporting by VMWs, ownership and effective utilization of LLINs and routine mass blood survey as active case detection.

Table 22 Coefficients in regression models evaluating associations between declining malaria cases and its predictors

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Health messages announcements	-0.803**	-1.223**	-2.113**	-2.245**	-2.240**
Mobile reporting		-0.695**	-0.986**	-1.098**	-1.099**
LLINs ownership			-0.772**	-0.937**	-0.934**
Active case detection				-0.148**	-0.147*
VMW training					-0.007

*Significant at p<0.05, **p<0.001*

CHAPTER V

DISCUSSION

5.1 Baseline KAP to produce a particular health education intervention

Overall KAP levels were considerably low percentages of good levels especially in practice, even among people living in malaria transmission areas. This might be due to (a) easy access to diagnosis and treatment services by village health volunteers' network, (b) effective interactions of current using anti-malarial drugs, (c) improvements in transportation facilities, (d) cultural beliefs and questionable health education curriculums, and (e) information, education and communication (IEC) materials distributed by various partners. Therefore, new approaches to improve malaria KAP are promptly needed in this community. These results were similar to other studies showing poor levels of KAP among their targeted community [29, 69, 70].

Separately, only 38.4% of participants showed a good level of knowledge, even though they are living in malaria-control-activities prioritized villages. This is similar to results from several other studies [34, 36]. This can be explained as the community people still have wide misconceptions and misbeliefs, though they have had involved in health education sessions, group health talks, and peers' education programs as seen in Ethiopia [55]. The effectiveness of interventions implemented by the partners will also be a questionable thing [71]. Generally, most of the educational activities were organized during the daytime, at a convenient place with only some of a family's decision-makers. Usually, villagers were at their working places in the daytime and hence, the majority of attendances were female who were either too young or too old to efficiently disseminate information, or make decisions for other family members. On the other hand, large numbers of low-educated people (87.2%) might also be another contributing factor [72]. There were significant associations between age (p = 0.022) and annual income (p < 0.001) with the knowledge level of respondents. Older age groups possessed more experiences on disease and participated in higher numbers of awareness-raising activities. The result was aligned with a study of Ethiopia [33].

Among the respondents, more than half (56.8%) had a good level of attitude, which was the highest level among KAP. The results were coincident with the studies in Nigeria and Ethiopia [32, 33]. This might due to the bounce effect on their attitude, as the study was conducted among the highest malaria burden villages, within peak season (June 2018). However, the significance of attitude on affecting malaria transmission is quite low [73]. Again, there were also two-fifth of samples (43.2%) who described a low level of attitude. This poor proportion may be increased during low malaria seasons, even among people living in high endemic villages. In the meantime, having a fever attack among family in the last two weeks ($p = 0.023$) showed statistically association with attitude level. If there was a fever attack among any family members within the past two weeks, a majority of respondents (70.4%) would have a good attitude level, compared to others. This is a simple fact that among those who have lived with malaria, attention on that disease would certainly be higher. This was demonstrated in a study among Chinese international travelers [74].

Contrastingly, the results revealed only (21.6%) of good practice among the sampled population, which was allied with other findings [26, 35, 37]. It was drastically low and alarming, considering a new kind of intervention in this community to strengthen malaria-control practices, especially care-seeking and prevention behaviors. The diagnosis and treatment facilities in each village are staffed by village health volunteers. However, the performance of those assigned volunteers still needs to be addressed [75]. Again, though villagers possessed enough bed-nets (98.8%), the proper use of Long-Lasting Insecticide-Treated Nets (LLINs) should be encouraged, to overcome people's ignorance and misperceptions in addition to sustaining the quality of distributed bed-nets [56, 76]. The durability of LLINs should also be upgraded in order to deal with both cold and hot weather. Care-seeking (diagnostic- or treatment-seeking) practices were essential to prevent unnecessary developing of severe forms and to curtail onward local transmission. Nevertheless, there were no associations with constructed variables and respondents' practice at $p < 0.05$.

Concerning correlations among knowledge, attitude, and practice, the results showed there was a negative association between knowledge and attitude as well as between knowledge and practice. Similar results could be found in Nigeria [77] and

contrary findings were seen in studies in Lower Myanmar, Lao PDR, and Southeast Ethiopia [55, 71, 78]. This means that, despite improving on knowledge, the attitude and practice will remain constant or even tend to be poor. Therefore, each activity should be targeted as a specific priority (i.e., either knowledge or attitude or practice by itself) rather than addressing the improvements in overall KAP. There was a positive association between attitude and practice, however. So, it seems that, if people pay more attention to malaria, their practices are going to improve. However, there was no statistically significant correlation between knowledge, attitude, and practice at $p < 0.05$.

5.2 Differences in overall Knowledge, Attitude and Practice levels after loud-speakers based health messages announcements

As a result of the baseline KAP study, the researcher produced and introduced an intervention called 'loudspeakers-based health announcements'.

Though this study was organized among people living in an endemic malaria area with attached VMWs during the peak infection season, the baseline KAP results showed very low-level scores. This could be due to the fact that although some kinds of community-based malaria control activities are in place, villagers' mindsets are difficult to change, resulting in constantly poor levels of KAP [77]. Also, the current VMWs' performances may have been influenced by inadequate training or support, or other multi-dimensional factors, such as incentive schemes and community and family support [75].

The socio-economic characteristics measured in this community showed that more than 90% of households owned sufficient LLINs (2 people/net). However, during the baseline study, the participants expressed a very low level of proper LLINs utilization. Similar results can be found in a national-level study where the results showed poor LLINs utilization among caregivers as well as children [46]. This might be due to the quality of the mosquito nets that are currently distributed, especially the types of lace used to ensure the privacy of girls/women, and the color and durability of the nets [79]. Sometimes, the historical and traditional misbelief of villagers could also be

associated with LLINs usage [72]. One possible reason concluded by a study conducted in Kenya was that people are not asleep under nets during the whole of the malaria vectors' ordinary biting time (dusk to dawn) [80]. The underlying low education level might also be another reason for LLINs usage [72]. Nonetheless, in the present study, the utilization rate has been profoundly increased as a result of intervention with a difference in the mean scores ranging from 3.67 to 4.26.

An additional finding of our baseline study was that most subjects exhibited poor malaria care-seeking behavior, despite reporting that they had sufficient family income. All the malaria-related services are free of charge, and even if people can pay for a consultation, as the malaria burden has declined through the decades, people's attitude towards the severity of the disease and its causation has decreased accordingly [78].

However, as an outcome of a health announcement intervention, the KAP scores improved in the present study. As a result of repeated announcements of simple messages, people had an awareness of correct information about malaria. This finding is in line with several other studies, in which increased levels of community KAP were verified by the use of an intervention [81-83]. As part of the increasing KAP levels, unexpectedly, the participants' knowledge levels about the diagnosis and treatment of malaria among control groups were boosted after six months. This outcome might be because people received information from other channels (e.g., television, radio, and health education videos) possibly from neighboring villages [84]. In Myanmar, a project has been broadcasting malaria diagnosis and treatment information since 2017 [85].

Overall, the effectiveness of intervention stands at an acceptable level. However, to consider implementing a new tool, its sustainability should be addressed. For this, as for a developing country, we should consider it not only for its effectiveness but also its cost, its complexity and lastly, the maintenance. In this case, the total cost for loudspeakers was no more than 200USD, which is cheap compared with other materials-based activity. Again, most of the people in rural areas are very used to such a system that they can maintain by themselves with low fees. In addition, future studies should be explored in larger targeted areas with expanded populations and the

assessment should be expressed as dose-response changes immediately after the intervention, 3 months, 6 months and one year afterward, if possible.

For this intervention, most of the subjects expressed satisfaction regarding the intervention. However, a few people were affected by noise pollution, and people living on the periphery of villages were not always clear about the messages broadcast. Interference caused by voices from the surrounding environment might be the reason. As such, we should introduce mid-night announcements in the future, if possible. One study noted that intervention implementers should be always aware of, environmental and human factors that might disrupt the intervention [86]. Meanwhile, residents around the intervention source (i.e. houses with loudspeakers) might have suffered slightly as a result of the noise, although they could absorb the health messages very distinctly. Nevertheless, the future implementation should be focused to prevent people from experiencing any potential adverse outcomes.

5.3 Malaria positive found by RDTs Vs microscopy results

Currently, in Myanmar, a popular diagnostic method for malaria is RDT which is easily available in most of the malaria service providers up to rural villages. The malaria volunteers can perform the diagnosis very well after 3-5 days of training organized by the respective organization. However, there should be a proper temperature control system as the SD-RDT cannot assist beyond normal room temperature (37°C) [87]. Regular supervision of volunteers' performance and on-site training, as well as regular refresher training, may be required to sustain their attainments and avoid false-negative and positive answers [75, 88]. On the other hand, a proper supply chain should be in place to be avoided by stocks out problems.

In this study, there were some results discrepancies between RDTs and microscopy among pooled blood samples especially in cases where RDT showed positive whereas nothing was seen by microscopy. There is a reason that in case the patient suffered malaria and have full treatment within last 28 days, the RDT result will still come out with positive findings as there was remaining parasites antigen in patients' circulation [89]. The result has been harmonized with the study in Guinea where 62.0% of microscopy examinations showed negative differently with 52.0% of RDTs

findings [90]. Thus, every fever patient who came to have a blood test should have traced the previous attempt of malaria along with treatment history, particularly within the last 28 days.

Again, the result revealed that there were some numbers of patients whose diagnostic results were controversial as RDTs showed negative finding while parasites have been seen under the microscope. For that, we could conclude that it was because of false-negative error due to a wrong testing procedure or the patient has low parasitemia (<200parasites/ µL of blood) which is beyond normal RDT's detectable limit [91]. A study in Nigeria concluded similar findings that 43.1% of microscopy results were malaria while RDTs see only 29.7% [92]. It points out that the program should consider the expanding of microscopy stations up to the village level or cross-checked system by transferring blood slides to the township lab so that at least the treatment can be followed by a result. However, before implementation, the results of this study should be confirmed with PCR as a standard and that we can exclude error results of microscopy as well.

5.4 Mobile Phone reporting by Village Health Volunteers

With the exception of the education level and ownership of a mobile phone, the distribution of the baseline demographic characteristics of the VMWs was similar. In remote areas of Myanmar, a primary level education is most common because those seeking further study must travel to a middle or high school, most of which are located in central, downtown regions. However, according to the national criteria, being a VMW requires only the ability to read and write [93]. In addition, before the system was introduced, all VMWs owned at least a functioning mobile phone (mobile networks were expanded across the Sagaing Region in 2017) [14]. During the study period, a total of 25 malaria patients were identified by VMWs, of which 24 were reported through the mobile phone reporting system within 24 hours.

In addition to early diagnosis and treatment, such real-time reporting is the essential step needed to carry out further case classification and foci investigations as well as to conduct management activities to fulfill the goal of malaria elimination, i.e., to interrupt the progress of locally acquired transmission of the disease [94]. The studies

conducted in Tanzania [95] and Kenya [96] suggested that real-time notification through a mobile phone or mobile application was a feasible and practical approach. However, as discrepancies can occur between report and actual data, a regular, intensive monitoring system must be implemented [97]. Public health staff should manage the work of VMWs and other volunteers in collaboration with relevant malaria health personnel. A proper national guide should be developed to assist in the implementation of VMW-related interventions, including regular supervision of their activities.

In this study, satisfactory levels of data accuracy and completeness were noted. By using a simple and user-friendly version of the intervention, the providers appeared to adhere closely to the guidelines and directions [12, 98]. However, only (80%) accuracy was noted in terms of the reporting of patient ages. This was likely due to the typical practice of the residents, who are either unaware of their correct age or who calculate it incorrectly due to the complicated Myanmar calendar year. It would provide a significant advantage if exact census information could be gathered on all residents. In addition, typing errors were observed in reports of patient data, such as age, date and time of diagnosis, and species classification. These errors likely occurred because of the difficulty of typing on a smartphone.

To evaluate the implemented system, a follow-up study was organized to explore the overall perceptions of the VMWs. All described the manner of reporting as easy, acceptable, and feasible to continue. One related study, conducted in Bangladesh (12) and South Africa [98], also demonstrated the acceptability and ease of using a mobile phone reporting system. However, some challenges were reported, including concerns about network signals, prolonged reporting time, and other challenges, such as hearing difficulties. To overcome these issues, when the elimination continuum begins in this area, an alternative means of timely reporting, in addition to mobile phones and/or a traditional reporting system, should be secured. Moreover, other options for follow-up action should be made available to interrupt the transmission of malaria in the event of delayed notification. As it relates to network signals, these cannot be controlled, and it is hoped that signal strength will improve in the near future, as has been announced by the strategic plan [99].

During the qualitative review, all of the VMWs described the system as reliable and useful, although they did mention some challenges. They also offered their preferences regarding an incentive scheme, monitoring visits, and training. To sustain both the intervention and VMW performance, there should be a regular incentive scheme, refresher training, regular monitoring, and a feedback system [75, 100]. Next, malaria and general health staff, with the support of VMWs, should develop materials and organize campaigns to inform communities about the availability of free malaria diagnosis and treatment at public health facilities as well as from VMWs to increase public usage of the service and avoid delayed reporting.

5.5 Malaria Burden Changes

As a likely consequence of intervention, in the present study, malaria incidence during the intervening months was compared to the same period from the prior year. A significant reduction in morbidity (from 17% to 2%) was found among members of the community in which the intervention occurred. To halt onward transmission of malaria infection, it is essential to receive early and effective treatment, as 100% adherence to treatment is required to ensure a radical cure [5]. The delivered messages reminded people to seek a timely diagnosis and receive treatment as soon as they had a fever. This step might interrupt indigenous transmission and result in a declining trend of malaria among members in the intervention group. However, in the control group, traditional malaria control activities continued, so no changes were observed. Similar studies have reported that increasing people's awareness could eventually result in a decrease in disease burden [77, 81, 101]. This is different from the results reported in a study on diabetes patients, in which no correlations were found between the KAP of the disease and its morbidity due to certain covariates and short-term dose-response mechanisms [102]. Moreover, improvements in the proper utilization of LLINs can have an impact on malaria transmission, as stated in other studies [103, 104].

This comprehensive intervention could also contribute to malaria burden reduction until the targeted village level API. As it involved multidisciplinary approaches towards the rapid and timely detection and treatment of disease to interrupt the onward transmission either from both sides (readiness of providers as well as

diagnostic seeking and treatment adherence by the community). Moreover, marked increments of prevention practices especially by effective utilization of LLINs might have an effect to prevent foreword transmission among the villages. The targeted annual blood examination rate (ABER) should be sustained at an acceptable level mainly by PCD post if possible. The profound data entry system and case base surveillance should also be strengthened to exclude repeated entry and inspect any imported cases. However, the resulted API could not be achieved up to <1/1000 total population at risk possibly due to (1) lack of adult mosquito control measures, (2) lack of materials distribution to enhance personal protective measures such as repellents, insecticide-treated clothing particularly for night-time workers, and (3) shorter duration of intervention.

5.6 Predictors of declined malaria caseloads

5.6.1 Health messages announcement

The regression model approved that whenever increased the number of announcement activity through loud-speakers, there was a greater impact on declining malaria infection. Also, among constructed variables, this activity seems to be cheaper and the most user-friendly intervention which can be easily sustainable. Community participation should be strengthened with regular advocacy meetings and materials maintenance system should also be given. In order to achieve the malaria elimination goal, the proper surveillance system will be the most essential ingredient [105]. The announcement activities can persuade the community to utilize the surveillance in either way. Thus, the early diagnosis and effective treatment can be achievable and prevent further onward transmission as well as favor radical cure to avoid any recrudescence or relapse cases.

5.6.2 Mobile reporting

With regard to mobile reporting by village health employees, attempts should continue to guarantee that all cases are notified at any moment in their community in relation to village inhabitants having access to timely and efficient malaria therapy. As malaria decreases, the transformation of malaria-only employees to more extensive health workers needs to be initiated and continued, as proof demonstrates that

community participation of village health employees who can only treat malaria will decline quickly as other health issues become more prominent [106]. It is essential to consult the communities about the urgent health issues in their fields so that VMWs can be trained to tackle them, rather than just becoming outreach employees for other vertical programs like TB Directly Observed Treatment (although these programs could certainly form a part of the workload). If VMWs expand their job to become embedded VMWs, additional supports (i.e. phone bills) would be required. Lastly, it would be better to integrate this easy intervention into other follow-up measures to ensure the supply chain of diagnostic exams and drug inventory and other real-time feedback messages for any particular scenario.

5.6.3 LLINs ownership and utilization

The possession of LLINs in this society was at a decent rate, according to the accessible information. Therefore, if indicated and necessary, the program should conduct additional qualitative research, to identify the best ways to inform and encourage the community to increase net use, including by mobile populations. They should make it a priority to develop ways to increase the nets usage in priority villages and among needy or hard-to-reach populations, and/or also the frequency of net replacement. The regression analysis showed that the LLIN's supply is effective at interrupting transmission and that this message needs to be transmitted to both within the society and to the NMCP at domestic and other levels. The regular monitoring of pyrethroid resistance should also be endorsed to guarantee the continued efficacy of LLIN.

5.6.4 Active case detection

Though the regression analysis showed there was a little effect of ACD on reducing disease burden, it is a kind of expensive activity particularly when a country approach to elimination with a few caseloads. A study approved that ACD activity could somehow precipitate the control of malaria in very endemic settings [107]. However, it is still useful to cover the gaps of the passive case detection (PCD) and to achieve the targeted annual blood examination rate (ABER). It can also give useful baseline information in case the country has limited data to construct the evidence-

based intervention for a particular area. However, the program should have considered a very feasible activity unless enough financial and human resources are guaranteed.

5.6.5 VMWs training

Unfortunately, the numbers of training was not a predictive factor in the declining of malaria cases. However, this variable was poorly reported and very hard to subtract the information with much specificity. Moreover, it was difficult to separate initial from refresher training or determine how many of the person-days were to the same people repeatedly (which might be necessary for skill retention). There was a reported number of amount of training but the relative proportion was not easy to disentangle. The program would insist on investigating the quantity and efficiency of training in more detail, such as describing trained people and training material, learning goals, and pre- and post-test knowledge shifts among trained VMWs. This data can be used in cooperation with the NMCP and other township-level donors to develop enhanced training content and delivery.

5.7 Limitations of the study

This study has a few limitations. Additional factors may influence the quality and interpretation of the data. For example, villagers may obtain malaria-related information from other sources such as radios and TV, which may result in an overall improvement of KAP scores in all villages. Although this may be possible, it will unlikely to have a major impact on the outcome since control and intervention villages should be affected similarly.

This study was conducted in six months, and the result may differ with long-term intervention. Again, the API in this study has been calculated only for six months to reflect the intervention period. Because of the quasi-experimental study design, the assignment of the control and intervention villages may not be fully random. Thus, the results of this study might not be generalized for all the locations in Myanmar. Other follow-up assessments to explore the long-term effects in different sites are warranted. Last but not least, the cost-effectiveness analysis of each activity would also be an advantaged in considering implementing an intervention in resources limited settings.

CHAPTER VI

CONCLUSION

Overall, KAP regarding malaria was poor among people living in malaria-transmission areas. On the other hand, only a few associated factors were found, as people are mostly neutral. Therefore, new approaches to improving malaria KAP are evidently needed in this community. Quality interventions should be conducted according to area situation and malaria data, while static and continuous delivering of the traditional form of activities are discouraged. From the results, the study concluded that the intervention should be a simple, friendly, short-points presentation to complete essential tasks in a timely manner. Last but not least, similar studies, of wider scope and with broader populations, as well as studies addressing the evaluation of community participation in current health programs, are also encouraged.

After the delivery of loudspeaker-based health announcement intervention, large improvements of overall KAP scores have been resulted. Therefore, this intervention is seen to be effective and feasible as a kind of integrated activity in reducing a higher malaria burden. The national program can implement this intervention as a user-friendly practice with cheaper cost consumption while maintaining its long-term sustainability. Participation from the local community should also be encouraged to broaden the coverage health area, not only for malaria but also for other diseases. The present study, eventually, provides a baseline idea or theoretical tool to produce material-based awareness-raising intervention to contribute to transmission reduction in ongoing malaria-elimination trajectory.

In this study, the results from RDTs and microscopy showed significant different findings. It is alarming that this community should have had immediate actions, firstly to consider eliminate low parasitemia patients, secondly to supervise volunteers practicing for asking a complete patient history and last, health education for the community, to adhere to the treatment completely. The quality of RDTs should also be routinely checked with National Health Laboratory (NHL). As the current

weather seems to be hot, a kind of feasible cool chain system or alternate option should be introduced for proper RDTs storage.

One outcome of this study demonstrated that the simple, efficient, and user-friendly mobile phone reporting system helped ensure timely and acceptable reporting of malaria cases by VMWs. For in-time disease notification purposes, this approach is better than more complicated, internet-based mobile applications. Regular monitoring should be implemented to address challenges with the completeness and accuracy of surveillance data. Some type of incentive schemes might be helpful in achieving better performance from the VMWs. The success of the reporting system notwithstanding, only a few indicators can be submitted using this mobile-based approach, and the system cannot be used in areas without adequate cellular network coverage. Future studies should expand the number of study participants and, if possible, compare them with the control villages. The sustainability issue should also be addressed by the consortium of health programs, stakeholders, and local authorities as well as the donors. At the same time, it is important to exercise caution regarding overburdening the VMWs with the sudden introduction of new techniques and advanced tools.

In contrast, this constructed comprehensive model has shown perfectly effective in increasing the community's malaria KAP, the effectiveness of the mobile phone reporting system, gaps of currently using diagnostic tools and other valuable predictors for malaria burden reduction like LLINs, active case detection and training for VMWs. These changes were also associated with a decline in malaria cases in the intervention villages even up to the ideal elimination indicator. The program can subtract some prominently effective activities to be adapted or modified the current interventions. If possible, there should have further studies for cost-effective analysis which has been missed in the current one. A proper monitoring system directly from the national program should be introduced, and or standard quality control checklist should be produced and disseminated rather than allowing scattered activities by different organizations. Results based implementations should also be strengthened to overcome less effective continuous activities without noticeable outcomes.

Lastly, the overall results suggested the victory of the priority interventions for the National Program and donors (innovative health education tool, distribution of LLINs, strengthening simple case reporting by VMWs and improvement of access to early diagnosis and treatment through ACD). These activities have markedly reduced the cases of malaria at the villages level, a proxy for onward transmission. It would be better the National Program could organize to have only one partner in each township or an area. Again, partners must be encouraged to work more closely with each other to entrap competition between them and harmonize different reporting lines between partners within townships/ regions. This should be facilitated by support for a malaria control/elimination task force at the township level, for political engagement with non-NMCP staff, and advocacy for elimination.

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APPENDIX

APPENDIX A

KAP QUESTIONNAIRE (ENGLISH VERSION)

IDENTIFICATION

Village (1-5)	☐☐	Address..	☐☐

Household Leader's Name : _____	Participant : _____ ☐☐
	Township ....

Village Tract : _____	Village : _____

Home Visiting	First Time	Second Time	Third	Last Time
Date	_ _ / _ _ / _ _	_ _ / _ _ / _ _	_ _ / _ _ / _ _	_ _ / _ _ / _ _ (D/M/Y)
Data Collector's Name	_____	_____	_____	Interviewer Code : ☐☐
Result:	_____	_____	_____	Result : ☐☐

For next appointment:			
Date:	_ _ / _ _ / _ _ (D/M/ Y)	_ _ / _ _ / _ _ (D/M/ Y)	Total time of visiting : ☐
Time:	_____	_____	

Result Code

1 = Complete

2 = No one at selected household

3 = Refuse to participate

4 = Empty House

5 = Other

Please ask and fill the following questions.

Family Numbers ☐☐

Age in years ☐☐

Education ☐☐

Sex _____

Did you travel and night stop at outside the village in last 28 days.

Field Supervisor	Researcher	PI	Data Entry
Name : _____	Name : _____	Name : _____	Name : _____
ID : ☐☐	ID : ☐☐	ID : ☐☐	ID : ☐☐
Date: _ _ / _ _ / _ _	Date: _ _ / _ _ / _ _	Date: _ _ / _ _ / _ _	Date: _ _ / _ _ / _ _

Part II : Knowledge

No.	Descriptions	Answers	Remark
Q2.1	What are the symptoms of malaria?	Fever .... 1 Chills .... 2 Headache .... 3 Muscle pain .... 4 Sweating .... 5 Malaise .... 6 Loss of appetite .... 7 Diarrhea .... 8 Other................................. 98 Specify: _____ Don't know................................. 99	
Q2.2	How could you confirm this illness is whether malaria or not?	By past experience .... 1 By symptoms .... 2 By medical person .... 3 HA/LHV/MW/PHS (Helath related Staff) findings .... 4 Blood test (either mocroscopy or RDT) .... 5 Other .... 98 Specify : _____ Don't know 99	
Q2.3	What is the transmission of malaria?	Biting mosquitoes................................. 1 Drinking Stream water .... 2 Bathing stream water................................. 3 Going forest .... 4 Sleep in the sea........ 5 Living/ sleeping in the forest .... 6 Eating banana/ papaya................................. 7 Other .... 98 Specify : _____ Don't know................................. 99	
Q2.4	How can we prevent from getting malaria?	Sleeping under bed-net .... 1 LLINs .... 2 Burning mosquito coils .... 3 Mosquito repellent................................. 4 IRS .... 5 Burning of leaves .... 6 Enviromental sanitation .... 7 Water sanitation .... 8 Good lighting and good ventilation for house .... 9 Long sleeves .... 10 Living away from forests .... 11 Other .... 98 Specify : _____ Don't know 99	
Q2.5	How many days do we have to take anti-malaria drugs?	No. of days .... ☐☐ Don't Know 99	

Q2.6	What are the more common illness in your community?	Flu .... 1 Malaria .... 2 Respiratory system disease .... 3 NCDs .... 4 Other .... 98 Specify: _____ Don't know 99	
Q2.7	If someone have fever, what will be the most common causes?	Malaria .... 1 Rather than malaria .... 2 Other .... 98 Specify : _____ Don't know.................................... 99	
Q2.8	Do you know what is malaria?	Yes .... 1 No 0	
Q2.9	What are the symptoms of severe malaria?	Coma .... 1 Fit .... 2 Shortness of breath .... Extremely High temperature........................ 4 Jaundice .... 5 Pallors .... 6 Loss of appetite .... 7 Nausea .... 8 Vomiting .... 9 Diarrhea .... 10 Other .... 98 Specify : _____ Don't know................................ 99	
Q2.10	What will be the outcome if someone didn't take complete course of drugs?	nevermind............................1 Relapse......................2 prolonged illness......................3 other......................98 Specify:_____ Don't know......................99	
Q2.11	What will be the outcomes if someone didn't take all the anti-malaria medicines?	nevermind............................1 Relapse......................2 prolonged illness......................3 other......................98 Specify:_____ Don't know......................99	

Part III: Attitude						
No.	Descriptions	Strongly Disagreed	Disagreed	Not Sure	Agreed	Strongly Agreed
Q3.1	Malaria is preventable	5	4	3	2	1
Q3.2	The best way to protect biting from mosquitos is LLINs	5	4	3	2	1
Q3.3	If malaria is suspected, its important to seek diagnosis and treatment within 24 hrs of symptoms occurred	5	4	3	2	1
Q3.4	The results of RDTs is mostly unreliable	1	2	3	4	5
Q3.4	Malaria can be predicted only by chills and rigors	1	2	3	4	5
Q3.5	Malaria can be cured by self-treatment	1	2	3	4	5
Q3.6	ACTs is the best medicine for malaria	5	4	3	2	1
Q3.7	We can stop taking drugs if symptoms are relieved	1	2	3	4	5
Q3.8	Malaria can transform into severe conditions unless its properly managed.	5	4	3	2	1
Q3.9	Severia malaria is fatal.	5	4	3	2	1
Q3.10	The free malaria diagnosis and treatment can get from village health volunteers.	5	4	3	2	1

Part 4 - (Practice)				
No.	Descriptions	Answers		Remark
Q4.1	Do your family have any bed-net or LLIns to sleep?	Yes..............................1 No.................................2 Not sure......................98		If 2 (or) 98 => Q5.1
Q4.2	How many of bed-nets do you have?	Bed-nets being used ☐☐ Others (New) ☐☐ Total ☐☐		
Q4.3	Can you show me?	Checked.....1 Didn't check.........2	Checked.....1 Didn't check.........2	Checked....1 Didn't check.........2
Q4.4	When did you get these nets?	<6months..............1 6-12 months..2 12-24 months......3 24-36 months......4 36-60 months.......5 >60 months ....6 Don't know..........99	<6months..............1 6-12 months..2 12-24 months......3 24-36 months......4 36-60 months......5 >60 months ....6 Don't know..........99	<6months..............1 6-12 months..2 12-24 months......3 24-36 months......4 36-60 months.......5 >60 months ....6 Don't know..........99
Q4.5	Please check types of bed-nets by data collector.	LLINs Powernet ....2 Permanet ....3 JICA......................4 MoHS distribution..........5 Olyset ....6 Ordinary Bed-net Lace......................7 Army.....................8 No brand name........9 Hammock net ......10 Other................99 Specify_____ Don't know.................	LLINs Powernet ....2 Permanet ....3 JICA......................4 MoHS distribution..........5 Olyset ....6 Ordinary Bed-net Lace......................7 Army.....................8 No brand name........9 Hammock net ......10 Other................99 Specify_____ Don't know.................	LLINs Powernet ....2 Permanet ....3 JICA......................4 MoHS distribution..........5 Olyset ....6 Ordinary Bed-net Lace......................7 Army.....................8 No brand name........9 Hammock net ......10 Other................99 Specify_____ Don't know..................100
Q4.6	Are these nets already been treated by insecticides?	Yes.........2 No..............3 Not sure........100	Yes.........2 No..............3 Not sure........100	Yes.........2 No.............3 Not sure........100

Q4.7	Did you have done treating these nets by yourself?	Yes..............2 No................3 Not sure.............100 If 100, skip to Q4.9	Yes..............2 No................3 Not sure.............100 If 100, skip to Q4.9	Yes..............2 No................3 Not sure.............100 If 100, skip to Q4.9	
Q4.8	When was it?	Month............ ☐☐ Not sure...........100 more than 4 months 3 years already......99	Month............ ☐☐ Not sure...........100 more than 4 months 3 years already......99	Month............ ☐☐ Not sure...........100 more than 4 months 3 years already......99	
Q4.9	Were there anyone slept under these nets?	Yes..............2 No....................3 Not sure............100	Yes..............2 No....................3 Not sure............100	Yes..............2 No....................3 Not sure............100	
Q4.10	How do you think the advantages of using LLINs over ordinary bed-nets?	Can prevent mosquito bites .... 1 Able to combat mosquito .... 2 Able to kill mosquito .... 3 Able to kill other insects as well............... 4 Can have good sleep .... 5 Can prevent from malaria..................... 6 Other .... 98 Speify :_____ Don't know 99			
Q4.11	Have you ever discussed about bed-net among your family members?	always .... 1 sometimes.................................. 2 Never .... 3 Don't know 99			
Q4.12	Have you ever discussed about importance of sleeping under bed-net among your family members?	always .... 1 sometimes.................................. 2 Never .... 3 Don't know 99			

Treatment seeking pattern

No.	Descriptions	Answers		Remark
Q5.1	Have anyone in your family suffered any kind of fever in past 14 days?	Yes .... 1 No 2		If 2 => please skip to Q6.1
Q5.2	If yes, how many people?	....	▢▢	
Q5.3	Who are they?	Name : _____ ▢▢ Age :	Name : _____ ▢▢ Age :	
Q5.4	How did they suffer?	Fever .... 1 Malaria .... 2 Flu .... 3 Chills .... 4 Other .... 98 Specify : _____ Don't know 99	Fever .... 1 Malaria .... 2 Flu .... 3 Chills .... 4 Other .... 98 Specify : _____ Don't know 99	

No.	Descriptions	Patient 1	Patient 2
Q5.5	Did he/ she go to other service provider as well?	Yes .... 1 No .... 2 Not sure .... 99 If , please skip to Q5.7	Yes .... 1 No .... 2 Not sure .... 99 If , please skip to Q5.7
Q5.6	If not, why?	waiting for self relieve ...... 1 No enough money .... 2 Unable to travel .... 3 Don't know when can get treatment service..................... 4 Just a minor illness .... 5 by spirit/ buddha .... 6 By traditional medicine........... 7 Other .... 98 Specify : _____ Don't know............................ 99 If 99, please skip to Q5.8	waiting for self relieve ...... 1 No enough money .... 2 Unable to travel .... 3 Don't know when can get treatment service..................... 4 Just a minor illness .... 5 by spirit/ buddha .... 6 By traditional medicine........... 7 Other .... 98 Specify : _____ Don't know............................ 99 If 99, please skip to Q5.8
Q5.7	As a first time seeking treatment, where did he/she go?	Village health volunteer .... 1 Sub-center/ UHC/ RHC .... 2 Station Hospital.................... 3 Township hospital................. 4 Private clinic .... 5 Private lab .... 6 Pharmacy .... 7 Other shops .... 8 self-treatment/ .... 9 Self-treatment by traditional methods PHC drugs Other .... 98 Specify : _____ Don't know 99	Village health volunteer .... 1 Sub-center/ UHC/ RHC .... 2 Station Hospital.................... 3 Township hospital................. 4 Private clinic .... 5 Private lab .... 6 Pharmacy .... 7 Other shops .... 8 self-treatment/ .... 9 Self-treatment by traditional methods PHC drugs Other .... 98 Specify : _____ Don't know 99
Q5.8	After how many days of suffering illness, did he/ she receive/ seek treatment?	Soon after .... 1 after 1 day .... 2 after 2 days .... 3 after 3 days or more............. 4 Don't know................................ 99	Soon after .... 1 after 1 day .... 2 after 2 days .... 3 after 3 days or more............. 4 Don't know................................ 99

No.	Descriptions	Patient	Patient
Q5.9	When did he/ she start taking drugs after illness?	As soon after .... 1 After 1 day .... 2 After 2 days .... 3 After 3 days and more......... 4 Not remember.................. 99	As soon after .... 1 After 1 day .... 2 After 2 days .... 3 After 3 days and more......... 4 Not remember.................. 99
Q5.10	Did he/ she have malaria blood test?	Yes .... 1 No .... 2 Don't know...................... 99	Yes .... 1 No .... 2 Don't know...................... 99
Q5.11	If yes, when was it? (Before or after taking drugs?)	Before .... 1 After .... 2 Not remember.................. 99	Before .... 1 After .... 2 Not remember.................. 99
Q5.12	What kind of blood test did he/ she get?	RDT .... 1 Microscopy...........2 Not sure 99	RDT .... 1 Microscopy...........2 Not sure 99
Q5.13	Where did he/ she have this blood test?	Volunteers .... 1 VBDC staff .... 2 BHS ..... 3 Private Lab..........4 Clinic .... 5 Other .... 98 Specify : _____ Don't Know 99	Volunteers .... 1 VBDC staff .... 2 BHS ..... 3 Private Lab..........4 Clinic .... 5 Other .... 98 Specify : _____ Don't Know 99
Q5.14	How was the blood test result?	Malaria .... 1 Non-malaria .... 2 Don't know...................... 99	Malaria .... 1 Non-malaria .... 2 Don't know...................... 99

No.	Descriptions	Answers	Remark
Q5.15	In your community, what is the first preferred place to have treatment of malaria?	Volunteer (VHV) .... 3 RHC/ Sub-center .... 4 Township/ Station Hospital............................... 5 Private Clinic .... 6 Other health personel opening (Clinic) .... 7 AMW .... 8 Unregistered providers........ 9 Pharmacy .... 10 Other mini outlets .... 11 self treatment .... 12 traditionally Other .... 100 Specify : _____ Don't know... 101	
Q5.16	In your community, what is the first preferred place to have diagnosis of malaria?	VBDC staff .... 4 Volunteer .... 5 Sub-center/ RHC .... 6 Station/ Township hospital................................ 7 Private clinic .... 8 Other health personel opening (Clinic) .... 9 Malaria port .... 10 Border screening point .... 11 Unregistered provider.......... 12 Private Lab .... 13 Other .... 100 Specify : _____ Don't know how to confirm malaria .... 101 Don't know the place for diagnosis.......... 102	

Availability and involvement in health educational service			
No	Descriptions	Answers	Remark
Q6.1	Did you get any kind of health information regarding malaria from village health volunteers in last 6 months.	Yes .... 1 No .... 2 Not sure 99	If 2 (0r) 99 => Finish
Q6.2	What information did you receive from village malaria volunteers?	To sleep with LLINs ..... 1 To sleep with bed-net .... 2 To sleep with bed-net while outside village or in work place .... 3 To carry and sleep with bed-net while in forest................................ 4 To get the early diagnosis and treatment important to go to village health volunteer with prompt manner .... 5 Important to get treatment within 24 hours of fever..6 To take full course prescribed drugs . 7 To have blood test before any treatment .... 8 Dangerous of malaria .... 9 Fatal outcomes of malaria .... 10 Malaria transmitted by mosquito .... 11 Other .... 98 Please specify: _____ Not remember 99	
Q6.3	Have you ever been participated in any kind of malaria health talks, HE sessions, community dialogue, etc.	Focus group discussion .... 1 Community health talk .... 2 Other .... 98 Specify : _____ Not remember 99	

End of questionnaire

Please kindly acknowledge for patient participation!

APPENDIX B

KAP QUESTIONNAIRE (MYANMAR VERSION)

IDENTIFICATION

ကျေးရွာအမှတ် (1-6)	☐☐	အိမ်အမှတ်.........................	☐☐

အိမ်ထောင်ဦးစီး : _____	ဖြေဆိုသူအမည် : _____	☐☐
	မြို့နယ်	

ရွာအိုင်း : _____	ကျေးရွာ : _____

အိမ်သို့ အလည်သွားခြင်း	ပထမအကြိမ်	ဒုတိယအကြိမ်	တတိယအကြိမ်	နောက်ဆုံးအကြိမ်
နေ့စွဲ :	__/__/__	__/__/__	__/__/__	နေ့စွဲ : __/__/__ (ရက်/လ/ခုနှစ်)
တွေ့ဆုံမေးမြန်းသူအမည် :	_____			တွေ့ဆုံမေးမြန်းသူနံပါတ် : ☐☐
ရလဒ် ကုတ်နံပါတ် :	_____		_____	ရလဒ် ကုတ်နံပါတ် : ☐☐

နောက်အကြိမ် အလည်သွားမည့်အစီအစဉ် :		
နေ့စွဲ :	__/__/__ (ရက်/လ/ခုနှစ်)	__/__/__ (ရက်/လ/ခုနှစ်)	စုစုပေါင်းအလည်သွားရောက်သောအကြိမ် : ☐
အချိန် :	_____		

ရလဒ် ကုတ်နံပါတ်များ	အိမ်ထောင်စုစာရင်းအရေအတွက်ပါကိုပြည့်စုံအောင်ဖြည့်ပွက်ပါ၊
1 = ပြီးစီးသည်/ပြည့်စုံသည်၊	အိမ်ထောင်စုတွင်းရှိလူဦးရေစုစုပေါင်း : ☐☐
2 = အိမ်တွင်မည်သူမှမရှိပါ(သို့)ဖြေဆိုမည့်သူမရှိပါ	အသက် ☐☐
3 = ဖြေဆိုရန်ငြင်းဆိုသည်	အတန်းပညာ ☐
4 = လူမနေပါ	ကျား/ မ _____
5 = အခြား	လွန်ခဲ့သော ၂၈ ရက်အတွင်း ရွာပြင်သို့ ညအိပ်ညနေ သွားခဲ့ခြင်း - ရှိ/ မရှိ

ကြီးကြပ်ရေးမှူး	ကွင်းဆင်း အယ်ဒီတာ	ရုံးအယ်ဒီတာ	အချက်အလက်သွင်းသူ
အမည် : _____	အမည် : _____	အမည် : _____	အမည် : _____
ကုတ်နံပါတ် : ☐☐	ကုတ်နံပါတ် : ☐☐	ကုတ်နံပါတ် : ☐☐	ကုတ်နံပါတ် : ☐☐
နေ့စွဲ : __/__/__	နေ့စွဲ : __/__/__	နေ့စွဲ : __/__/__	နေ့စွဲ : __/__/__

အပိုင်း ၂ : ၄ုက်ဗျားဆေးဂါ အသိပညာ (Knowledge)

အမှတ်စဉ်	မေးခွန်းနှင့် အဖြေစစ်ခြင်း	ကုတ်နံပါတ်ရေးမှတ်ခြင်းဆိုင်ရာအမျိုးအစား	ကျော်သွားပါ
Q2.1	၄ုက်ဗျားဆေးဂါနှင့်ပတ်သက်သောရောဂါလက္ခဏာများမှာ အသ္ဘယ်နည်း။ အဖြေမှာတစ်ခုထက်မဖြစ်နိုင်ပါသည်။ပြောလာသောအ ချက်အားလုံးကို ပိုင်းပေးပါ။ ဆက်လက်၍ပြီးပေးပါ-အဖြေသောများရှိပါသလဲ စေသည်ဖြင့်	အဖျားထက်ခြင်း .... 1 ချမ်းတုန်ခြင်း .... 2 ခေါင်းကိုက်ခြင်း .... 3 ကိုယ်ဆွေ့ာကိုက်ခဲခြင်း .... 4 ချွေးထွက်ခြင်း .... 5 မောပန်းနွမ်းနယ်ခြင်း .... 6 အစားအသောက်ပျက်ခြင်း .... 7 ဝမ်းသွားခြင်း .... 8 အခြား .... 98 ဖော်ပြပါ : _____ မသိပါ 99	
Q2.2	အိမ်မှလူများအနေဖြင့်(သူတို့ဖော်ပြသောလက္ခဏာ များကိုဖော်ပြပြီး)ဤလက္ခဏာများကြောင့်၄ုက်ဗျား ဆေးဂါဖြစ်ပြီးအဖျားရောဂါဟုတ်ကြောင်း မည်ကဲ့သို့ သေချာစွာပြောနိုင်မည်နည်း။	အရင်ကအတွေ့ အတ္ုံ့အရ .... 1 လက္ခဏာများအရ .... 2 ဆရာဝန်စစ်ဆေးချက်အရ .... 3 HA/LHV/MW/PHS (ကျန်းမာရေးလုပ်သား)များ ဖြစ်စေးချက်အရ .... 4 ဆေးစစ်ချက်အရ(မှန်ပြားပေါ်တင်သွေးစစ်ခြင်း(သို့) အမြန်သွေးစစ်ချက်အရ) .... 5 အခြား .... 98 ဖော်ပြပါ : _____ မသိပါ 99	
Q2.3	လူများမည်သို့၄ုက်ဗျားရောဂါကူးစက်ပါသနည်း။ အဖြေမှာတစ်ခုထက်မဖြစ်နိုင်ပါသည်။ပြောလာသော အချက်အားလုံးကို ပိုင်းပေးပါ။ ဆက်လက်၍ပြီးပေးပါ-အဖြေသောများရှိပါသလဲ စေသည်ဖြင့်	ခြင်ကိုက်ခြင်း .... 1 စိမ့်ရေ/စမ်းရေကိုသောက်သုံးခြင်း .... 2 စိမ့်ရေ/စမ်းရေကိုချိုးခြင်း .... 3 တောတောင်တွင်းအလည်သွားခြင်း .... 4 ပင်လယ်တွင်းနေထိုင်ခြင်း/အိပ်ခြင်း/ဝါများခြင်း... 5 တောတောင်တွင်းနေထိုင်ခြင်း/အိပ်ခြင်း .... 6 ၄ုက်ဗျာသီစားခြင်း .... 7 အခြား .... 98 ဖော်ပြပါ : _____ မသိပါ 99	
Q2.4	၄ုက်ဗျားဆေးဂါကိုမည်ကဲ့သို့ကာကွယ်ကြသနည်း။ (မှတ်ချက်-အကယ်၍ "ခြင်ထောင်" ဟုဖြေဆိုပါက မည်သည့်ခြင်ထောင်အမျိုးဖြစ်သည်ကိုထက်ပေးပါ ဆေးစိမ်ထားသောခြင်ထောင်သုံးရန်သိမသိဖြစ် သည်) အဖြေမှာတစ်ခုထက်မဖြစ်နိုင်ပါသည်။ပြောလာသော အချက်အားလုံးကို ပိုင်းပေးပါ။	ခြင်ထောင်တွင်း၌အိပ်ခြင်း .... 1 ဆေးစိမ်သောခြင်ထောင် .... 2 ခြင်ဆေးခွေထွန်ခြင်း .... 3 ခြင်ဆေး .... 4 ခြင်ဆေးဖျန်းခြင်း .... 5 ဆေးလျက်ကြိုင်ရှို့ခြင်း .... 6 ပတ်ဝန်းကျင်ကိုသန့်ရှင်းခြင်း .... 7 ရေရပ်ပြောင်းရပ်ကောင်းမှုံခြင်း .... 8 အိမ်တွင်လေဝင်လေထွက်နှင့် အလင်းရောင်ကောင်း မှန်စွာရရှိခြင်း .... 9 လုံခြုံသောအဝတ်အစားကိုဝတ်ဆင်ခြင်း .... 10 သစ်တောအပြင်ဖက်တွင်နေထိုင်ခြင်း 11	

		အခြား 98	
		ဖော်ပြပါ : _____	
		မသိပါ 99	
Q2.5	၄က်ဖျားဆေးကိုဘယ်နှစ်ရက်ကြာသောက်ရမည်ဟုသိ ထားပါသနည်း?	ရက်အရေအတွက် .... ☐☐ မသိပါ 99	
Q2.6	ဤဒေသရှိပြည်သူများရဲ့ကုန်ဈေးကွန်းမှာဈေးကိုထိမိုက် စေသောအဓိကအကြောင်းအရင်းကိုဖော်ပြပါ။ [မလေးလာနှင့်] အဖြေတစ်ခုထက်မကရှိနိုင်ပါသည်။	ဝယ်ဝင်ငွေ .... 1 ၄က်ဖျား .... 2 အသက်ဖျားလမ်းကြောင်းဆိုင်ရာများမှခြင်း ...... 3 ကူးစက်မှုမဟုတ်သောရောဂါ ...... 4 အခြား .... 98 ဖော်ပြပါ : _____ မသိပါ 99	
Q2.7	အကယ်၍တစ်ဦးတစ်ယောက်အဖျားတက်ပါက သင့်အနေဖြင့်သူစမ်းရသည်ဟုထင်မည့်ဦးစားပေးရော ဂါသုံးမျိုးကိုဖော်ပြပါ။	၄က်ဖျား .... 1 ၄က်ဖျားမှလွဲ၍အခြားရောဂါ ...... 2 အခြား .... 98 ဖော်ပြပါ : _____ မသိပါ 99	
Q2.8	၄က်ဖျားဆေးဂါကိုကြားဖူးပါသလား။ အဖြေတွင် "မကြားဘူးပါ" ဖြေဆိုလာပါက၄က်ဖျား	ကြားဘူးသည် .... 1 မကြားဘူးပါ 0	
Q2.9	မည်သည့်ရောဂါလက္ခဏာများသည်စိုးများသည် ဟုသတ်မှတ်ပါသနည်း။ အဖြေမှာတစ်ခုထက်မဖြစ်နိုင်ပါသည်။ဖြေပြလာသောအ ရက်အားလုံးကိုပိုင်းအောပါ။ ထက်လက်ပြီးမေးပါ-အခြားဘာများစိုသေးသလဲ စသည်ဖြင့်	သတိမ္မေလျှော့ခြင်း .... 1 တင်ခြင်း .... 2 အသက်ရှိခြင်း .... 3 အလုန်ပူခြင်း .... 4 မျက်လုံးဝါခြင်း .... 5 အသားအမွေဖြစ်ဖြစ်ဝေါ်ဖြစ်ခြင်း ...... 6 ဖို့ခြင်း .... 7 အစားမစားခြင်း .... 8 မကြာမကအန်ခြင်း .... 9 ဝမ်းသွားခြင်း .... 10 အခြား .... 98 ဖော်ပြပါ : _____ မသိပါ 99	
Q2.10	၄က်ဖျားဆေးကိုသက်မှတ်ရက်အတိုင်းပြည့်အောင်မ သောက်ပါကမည်ကဲ့သို့ဖြစ်မည်နည်း	�’ဘာမှဖြစ်ပါ .... 1 တဖ်ပြန်များနိုင်သည် .... 2 ရောဂါမပျောက်ပါ .... 3 အခြား .... 98 ဖော်ပြပါ: _____ မသိပါ 99	
Q2.11	၄က်ဖျားဆေးကိုကုန်အောင်မ သောက်ပါကမည်ကဲ့သို့သိဖြစ်မည်နည်း	’ဘာမှဖြစ်ပါ .... 1 တဖ်ပြန်များနိုင်သည် .... 2 ရောဂါမပျောက်ပါ .... 3 အခြား .... 98 ဖော်ပြပါ: _____ မသိပါ 99	

အပိုင်း (၃) အသိအမှတ်ပြုလက်ခံခြင်း						
စဉ်၊	အကြောင်းအရာ	လုံးဝသဘောမ တူ	သဘောမတူ	ကြားနေ	သဘောတူ	အလွန်သဘော ၁တူ
Q3.1	ဂုဏ်များဆေရာဂါမဖြစ်အောင်ကာကွယ်နိုင် ပါသည်၊	5	4	3	2	1
Q3.2	ဆေးစိမ်ခြင်းဆောင်ခြင့်နှင့် အိပ်ခြင်းသည် ခြင်ကိုက်ခြင်းကို ကာကွယ်ရန် အကောင်းဆုံးဖြစ်ပါသည်၊	5	4	3	2	1
Q3.3	ဂုဏ်များသံသယရှိလျှင် ၂၄ နာရီအတွင်း စစ်ဆေးကုသမှုခံယူရန်လိုအပ်ပါသည်၊	5	4	3	2	1
Q3.4	အမြန်သွေးစစ်ကိရိယာအခြေသည် မှန်ပါ၊	1	2	3	4	5
Q3.4	ချမ်းတုန်များလျှင် ဂုဏ်များဟု သေချာစွာ သက်မှတ်နိုင်ပါသည်၊	1	2	3	4	5
Q3.5	ဂုဏ်များဆေရာဂါသည် မိမိဘာသာ ဆေးမိတို့ဖြင့် ကုသပျောက်ကင်းနိုင်သည်၊	1	2	3	4	5
Q3.6	ဂုဏ်များဆေးပေါင်းသည်သာ အကောင်းဆုံးဖြစ်သည်၊	5	4	3	2	1
Q3.7	ရောဂါသက်သာလျှင် ဆေးဆက်သောက်ရန်မလိုပါ၊	1	2	3	4	5
Q3.8	ဂုဏ်များဆေရာဂါအား သေချာစွာမကုလျှင် ပြင်းထန်ဂုဏ်များအခြေအနေအထင့်သို့ ပြောင်းသွားနိုင်ပါသည်၊	5	4	3	2	1
Q3.9	ပျင်းထန်ဂုဏ်များဖြစ်လျှင် အသက် သေဆုံးနိုင်ပါသည်၊	5	4	3	2	1
Q3.10	ကျေးရွာဆေးတနပ်ဝန်ထမ်းများ ထံတွင်ဂုဏ်များဆေရာဂါ သွေးစစ်ခြင်းနှင့် ကုသခြင်းများကို အခမဲ့လုပ်ဆောင် နိုင်ပါသည်၊	5	4	3	2	1

အပိုင်း ၄း အိမ်ထောင်စုအတွင်း အသုံးပြုသောခြင်ထောင် (Practice)			
အမှတ်စဉ်	မေးခွန်းနှင့်သန်းစစ်ခြင်း	ကုတ်နံပါတ်ရေးမှတ်ခြင်းဆိုင်ရာအမျိုးအစား	ကျော်သွားပါ
Q4.1	အိမ်တွင်အိပ်ရန်အတွက်ခြင်ထောင်(သို့)ပုခက်ခြင်ထောင်ရှိပါသလား	ရှိပါသည်.................................1 မရှိပါ....................................2 မသေချာပါ............................98	အကယ်၍ ၂ (သို့) 98 ဖြေပါက=> Q5.1
Q4.2	အိမ်တွင်ခြင်ထောင်အဘယ်နှစ်လုံးရှိပါသနည်း။ လက်ရှိမှာထောင်မအိပ်သောအလုံးကိုလည်းထည့်တွက်ပါ။	ထောင်အိပ်သောခြင်ထောင်အလုံးရေ : ☐☐ ပုခက်ခြင်ထောင်အလုံးရေ : .... ☐☐ စုစုပေါင်းခြင်ထောင်အလုံးရေ : .... ☐☐	
Q4.3	အိမ်တွင်ရှိသောခြင်ထောင်များကိုပြပါ။	အက်ဖြတ်ခဲ့သည်.....1 အက်မဖြတ်ခဲ့ပါ........2	အက်ဖြတ်ခဲ့သည်.....1 အက်မဖြတ်ခဲ့ပါ........2	အက်ဖြတ်ခဲ့သည်.....1 အက်မဖြတ်ခဲ့ပါ........2
Q4.4	မည်သည့်အချိန်ကခြင်ထောင်ကိုရရှိပါသနည်း	၆ လမတိုင်မီ.............1 ၆လမှတစ်နှစ်မတိုင်မီ..2 ၁နှစ်မှ ၂နှစ်မတိုင်မီ......3 ၂နှစ်မှ၃နှစ်မတိုင်မီ.......4 ၃နှစ်မှ၄နှစ်မတိုင်မီ......5 ၅နှစ်နှင့်အထက်...........6 မသိပါ.....................99	၆ လမတိုင်မီ.............1 ၆လမှတစ်နှစ်မတိုင်မီ..2 ၁နှစ်မှ ၂နှစ်မတိုင်မီ......3 ၂နှစ်မှ၃နှစ်မတိုင်မီ.......4 ၃နှစ်မှ၄နှစ်မတိုင်မီ......5 ၅နှစ်နှင့်အထက်...........6 မသိပါ.....................99	၆ လမတိုင်မီ.............1 ၆လမှတစ်နှစ်မတိုင်မီ..2 ၁နှစ်မှ ၂နှစ်မတိုင်မီ......3 ၂နှစ်မှ၃နှစ်မတိုင်မီ.......4 ၃နှစ်မှ၄နှစ်မတိုင်မီ......5 ၅နှစ်နှင့်အထက်...........6 မသိပါ.....................99
Q4.5	ခြင်ထောင်၏တံဆိပ်ကိုမေးပါ(သို့)အကဲတ်ပါ။အကယ်၍တံဆိပ်ကိုမသိပါကဖြေဆိုသူအားခြင်ထောင်ပုံအမျိုးအစားကိုပြပါ။	ဆေးစိမ်ခြင်ထောင် Powernet တံဆိပ်..........2 Permanet တံဆိပ်..........3 JICAတံဆိပ်.................4 ကျန်းမာရေးဝန်ကြီးဌာနမှပေးသောခြင်ထောင်.........5 Olyset တံဆိပ်...............6 ရိုးရိုးခြင်ထောင် တပ်ခြင်ထောင်................7 စစ်ခြင်ထောင်................8 တံဆိပ်မရှိပါ..................9 ဂွမ်းခြင်ထောင်(စီဗိုင်စီ)...10 အခြား......................99 ဖော်ပြပါ_____ မသိပါ....................100	ဆေးစိမ်ခြင်ထောင် Powernet တံဆိပ်..........2 Permanet တံဆိပ်..........3 JICAတံဆိပ်.................4 ကျန်းမာရေးဝန်ကြီးဌာနမှပေးသောခြင်ထောင်.........5 Olyset တံဆိပ်...............6 ရိုးရိုးခြင်ထောင် တပ်ခြင်ထောင်................7 စစ်ခြင်ထောင်................8 တံဆိပ်မရှိပါ..................9 ဂွမ်းခြင်ထောင်(စီဗိုင်စီ)...10 အခြား......................99 ဖော်ပြပါ_____ မသိပါ....................100	ဆေးစိမ်ခြင်ထောင် Powernet တံဆိပ်..........2 Permanet တံဆိပ်..........3 JICAတံဆိပ်.................4 ကျန်းမာရေးဝန်ကြီးဌာနမှပေးသောခြင်ထောင်.....5 Olyset တံဆိပ်...............6 ရိုးရိုးခြင်ထောင် တပ်ခြင်ထောင်................7 စစ်ခြင်ထောင်................8 တံဆိပ်မရှိပါ..................9 ဂွမ်းခြင်ထောင်(စီဗိုင်စီ)...10 အခြား......................99 ဖော်ပြပါ_____ မသိပါ....................100
Q4.6	ခြင်ထောင်ရှိသောအချိန်တွင်ခြင်သတ်နိုင်သောဆေးစိမ်ထားပြီးသားဟုတ်ပါသလား	ဟုတ်ပါသည်.........2 မဟုတ်ပါ.............3 မသေချာပါ.........100	ဟုတ်ပါသည်.........2 မဟုတ်ပါ.............3 မသေချာပါ.........100	ဟုတ်ပါသည်.........2 မဟုတ်ပါ.............3 မသေချာပါ.........100

Q4.7	မြင်ထောင်ရရှိသောအချိန်မှစပြီးမြင်သတ်နိုင်သောဆေးရည်စိမ်မြင်းပြုလုပ်ပါသလား။	ပြုလုပ်ပါသည်............2 မပြုလုပ်ပါ...............3 မသေချာပါ...............100 အကယ်၍မသေချာဟုဖြေပါက Q4.9 ကိုကျော်သွားပါ	ပြုလုပ်ပါသည်............2 မပြုလုပ်ပါ...............3 မသေချာပါ...............100 အကယ်၍မသေချာဟုဖြေပါက Q4.9 ကိုကျော်သွားပါ	ပြုလုပ်ပါသည်............2 မပြုလုပ်ပါ...............3 မသေချာပါ...............100 အကယ်၍မသေချာဟုဖြေပါက Q4.9 ကိုကျော်သွားပါ
Q4.8	မြင်ထောင်ဆေးရည်စိမ်သောနောက်ဆုံးအချိန်သည်မည်မျှကြာပြီနည်း။ အကယ်၍ဘာလထက်နည်းပါက "00" ဟုရေးပါ	လ..☐☐.......... မသေချာပါ............100 4 လထက်မကြာပြီ (၃၆ လ)ကြာပြီ.........99	လ..☐☐.......... မသေချာပါ............100 4 လထက်မကြာပြီ (၃၆ လ)ကြာပြီ.........99	လ..☐☐.......... မသေချာပါ............100 4 လထက်မကြာပြီ (၃၆ လ)ကြာပြီ.........99
Q4.9	လွန်ခဲ့သောညကျွန်မြင်ထောင်ခြင်းအိပ်သူရှိပါသလား။	ရှိပါသည်...............2 မရှိပါ.................3 မသေချာပါ............100	ရှိပါသည်...............2 မရှိပါ.................3 မသေချာပါ............100	ရှိပါသည်...............2 မရှိပါ.................3 မသေချာပါ............100
Q4.10	ဆေးရည်မစိမ်သောမြင်ထောင်နှင့်စာလျှင်ဆေးရည်စိမ်သားသောမြင်ထောင်၏အကျိုးကျေးဇူး ကားအဘယ်နည်း။ အဖြေမှာတစ်ခုထက်မဖြစ်နိုင်ပါသည်၊ ဖြေလာသော အကြောင်းရင်းရှိသမျှကိုပြပါ။	မြင်ကိုက်ခြင်းမှကာကွယ်နိုင်ခြင်း .... 1 မြင်ကိုမောင်းထုတ်နိုင်ခြင်း .... 2 မြင်ကိုသတ်နိုင်ခြင်း .... 3 အခြားအင်းဆက်ပိုးများကိုသတ်နိုင်ခြင်း .... 4 အိပ်၍ကောင်းခြင်း .... 5 ဂုက်များဆော့ဂဲကိုကာကွယ်နိုင်ခြင်း..................... 6 အခြား .... 98 ဖော်ပြပါ :_____ မသိပါ 99		
Q4.11	မိသားစုဝင်များသုံးစွဲရင်းများနှင့်ပက်ဖျားဆေရာ၌အကြောင်းပြောဖြစ်ပါသလားအကြာခကာကြာကြာ	မကြာဏက .... 1 ကြာကြာမှုတစ်ခါ .... 2 ဘယ်တော့မှမပြောဖြစ် .... 3 မသိပါ 99		
Q4.12	မိသားစုဝင်များသုံးစွဲရင်းများနှင့်မြင်ထောင်တွင်အိပ်ရမည့်အကြောင်းပြောဖြစ်ပါသလားအကြာကြာ	မကြာဏက .... 1 ကြာကြာမှုတစ်ခါ .... 2 ဘယ်တော့မှမပြောဖြစ် .... 3 မသိပါ 99		

ဂုက်ဖျားရောဂါသတ်မှတ်ခြင်းနှင့်ကုသမှု

အမှတ်စဉ်	မေးခွန်းနှင့် ဆန်းစစ်ခြင်း	ကုတ်နံပါတ်ရေးမှတ်ခြင်းဆိုင်ရာအမျိုးအစား		ကျော်သွားပါ
Q5.1	အိမ်တွင်လွန်ခဲ့သည့် ၂ပတ်အတွင်း၌အဖျားတက် သူရှိခဲ့ပါသလား။ ၿပီးခဲ့တဲ့ ၂ပတ်လောက်က အိမ်မှာဖျားတဲ့ လူရှိလား။	ရှိပါသည် .... 1 မရှိပါ 2		အကယ်၍ 2 ဖြေစိုပါက => Q57 ကျော်သွားပါ
Q5.2	အိမ်တွင်လွန်ခဲ့သည့် ၂ပတ်အတွင်း၌အဖျားတက် သူဘယ်နှစ်ဦးရှိခဲ့ပါသလဲ။ (အကယ်၍ ၂ဦးထက်ပိုပါကအများအပိုးအရွက်တွင်ရေးပါ) ဘယ်နှစ်ယောက်ဖျားလဲ။	အဖျားတက်သူဦးရေ	☐☐	
Q5.3	၂ပတ်အတွင်းဖျားခဲ့သူဖျားရဲ့ပါသနည်း။ ဘယ်သူတွေလဲ။	အမည် : _____ လိုင်းကုတ်နံပါတ် : .... ☐☐	အမည် : _____ လိုင်းကုတ်နံပါတ် : .... ☐☐	
Q5.4	(အမည်ဖော်ပြ)သူသည်မည်ကဲ့သို့ အဖျားမျိုး ဖျားပါသနည်း။ ဘယ်လိုပုံစံမျိုးဖျားဘာလဲ။	ဖျားတယ် .... 1 ဂုက်ဖျား .... 2 တုပ်ကွေး .... 3 ချမ်းတုံဖျားတယ် .... 4 အခြား .... 98 ဖော်ပြပါ : _____ မသိပါ 99	ဖျားတယ် .... 1 ဂုက်ဖျား .... 2 တုပ်ကွေး .... 3 ချမ်းတုံဖျားတယ် .... 4 အခြား .... 98 ဖော်ပြပါ : _____ မသိပါ 99	

အမှတ်စဉ်	မေးခွန်း	ပထမ လူ	ဒုတိယ လူ
Q5.5	(အမည်ဖော်ပြ)သူသည်ကုသမှုခံရန်အခြားသို့ သွား ပါသလား။ ဖျားတုန်းက ဘယ်ကိုသွားပြလဲ။	သွားပါသည် .... 1 မသွားပါ .... 2 မသေချာပါ .... 99 အကယ်၍ သွားပါက Q5.7 ကျော်သွားပါ	သွားပါသည် .... 1 မသွားပါ .... 2 မသေချာပါ .... 99 အကယ်၍ သွားပါက Q5.7 ကျော်သွားပါ
Q5.6	အ�’ဘယ်ကြောင့်(အမည်ဖော်ပြ)သူသည်အ ခြားနေရာသို့ကုသမှုယူရန်မသွား ပါသနည်း။ အဖြေမှာတစ်ခုထက်ပိုဖြစ်နိုင်ပါသည်။ဖြေလာ သောအချက်အားလုံးကို ပိုင်းပေးပါ။ ထက်လာက်ပြီးပေးပါ-အခြားဘာများရှိပါ သေးသလဲ စသည်ဖြင့်။ ဘာဖြစ်လို့မသွားတာလဲ။	အဖျားပျောက်ရန်စောင့်သည် ...... 1 ကုသမှုခံယူရန်ငွေမရှိပါ .... 2 စီးသွားလာရန်ခက်ခဲ .... 3 မည်သည့်နေရာတွင်ဆေးရှိသည်ကို မသေချာပါ .... 4 သိပ်မများသောကြောင့် .... 5 ဘာသာရေးကုထုံးဖြင့်ကု .... 6 တိုင်းရင်းဆေးဖြင့်ကု .... 7 အခြား .... 98 ဖော်ပြပါ : _____ မသိပါ .... 99 အကယ်၍ 99 ဖြေပါက Q5.8 ကို ကျော်သွားပါ	အဖျားပျောက်ရန်စောင့်သည် ...... 1 ကုသမှုခံယူရန်ငွေမရှိပါ .... 2 စီးသွားလာရန်ခက်ခဲ .... 3 မည်သည့်နေရာတွင်ဆေးရှိသည်ကို မသေချာပါ .... 4 သိပ်မများသောကြောင့် .... 5 ဘာသာရေးကုထုံးဖြင့်ကု .... 6 တိုင်းရင်းဆေးဖြင့်ကု .... 7 အခြား .... 98 ဖော်ပြပါ : _____ မသိပါ .... 99 အကယ်၍ 99 ဖြေပါက Q5.8 ကို ကျော်သွားပါ
Q5.7	(အမည်ဖော်ပြ)သူသည် ပထမအကြိမ် အများ ဖျောက်ရန်အတွက်ဆေးကုသမှုယူရန်မည်သ ည့်နေရာသို့သွားသနည်း။ (ပထမဆုံးသွားသောကျန်းမာရေးဌာန/ဆ ရာ) (ပထမဆုံးများတုန်းကဘယ်ကိုသွားပြလဲ။ဘယ် လိုကုသလဲ)	လူထုကျန်းမာရေးစောင့်ရှောက်ဌာန .... 1 ကျေးလက်ကျန်းမာရေးဌာန/ဌာနခွဲ .... 2 မြို့နယ်ဆေးရုံ .... 3 တိုက်နယ်ဆေးရုံ .... 4 ကိုယ်ပိုင်ဆေးခန်းဖွင့်ထားသော ဆရာ .... 5 ကိုယ်ပိုင်ဆိုက်ခွဲခန်း .... 6 ဆေးဆိုင် .... 7 ဈေးဆိုင်/ဈေး .... 8 ပိုဖီဘာသာအိမ်မှာကုသည် .... 9 တိုင်းရင်းဆေးဖြင့်ပိုဖီဘာသာကုသ သည် အိမ်သုံးဆေးဝါး အခြား .... 98 ဖော်ပြပါ : _____ မသိပါ 99	လူထုကျန်းမာရေးစောင့်ရှောက်ဌာန .... 1 ကျေးလက်ကျန်းမာရေးဌာန/ဌာနခွဲ .... 2 မြို့နယ်ဆေးရုံ .... 3 တိုက်နယ်ဆေးရုံ .... 4 ကိုယ်ပိုင်ဆေးခန်းဖွင့်ထားသော ဆရာ .... 5 ကိုယ်ပိုင်ဆိုက်ခွဲခန်း .... 6 ဆေးဆိုင် .... 7 ဈေးဆိုင်/ဈေး .... 8 ပိုဖီဘာသာအိမ်မှာကုသည် .... 9 တိုင်းရင်းဆေးဖြင့်ပိုဖီဘာသာကုသ သည် အိမ်သုံးဆေးဝါး အခြား .... 98 ဖော်ပြပါ : _____ မသိပါ 99
Q5.8	(အမည်ဖော်ပြ)သူသည်အဖျားဖြစ်ပြီး ဘယ်နှစ် ရက်အကြာတွင်ကုသမှုယူမှုဖြစ်ပါ သနည်း။ များပြီးဘယ်လောက်ကြာမှ ဆေးဝန်ပြလဲ။	ရက်အနည်းငယ်ကြာ .... 1 ၁ရက်ပြီးအကြာ .... 2 ၂ရက်ပြီးအကြာ .... 3 ၃ရက်နှင့်အထက် .... 4 မသိပါ 99	ရက်အနည်းငယ်ကြာ .... 1 ၁ရက်ပြီးအကြာ .... 2 ၂ရက်ပြီးအကြာ .... 3 ၃ရက်နှင့်အထက် .... 4 မသိပါ 99

အမှတ်စဉ်	မေးခွန်း	ပထမ လူ	ဒုတိယ လူ
Q5.9	(အမည်ဖော်ပြ)သူသည်အရှားတက်ပြီး သယ်နှံ့ရက်ကြာတွင်မဆေးဘဲ မသောက်ပါ သနည်း။ ရှာပြီးသယ်ရေနှကဆေးဆသောက်ပါလဲ။	ရက်အနည်းငယ်ကြာ .... 1 ၁ရက်ပြီးအကြာ .... 2 ၂ရက်ပြီးအကြာ .... 3 ၃ရက်နှင့်အထက် .... 4 မသိပါ 99	ရက်အနည်းငယ်ကြာ .... 1 ၁ရက်ပြီးအကြာ .... 2 ၂ရက်ပြီးအကြာ .... 3 ၃ရက်နှင့်အထက် .... 4 မသိပါ 99
Q5.10	(အမည်ဖော်ပြ)သူသည်ရုတ်ရှားမသွားဖစ် ဆေးပွဲပါသလား။ ရုတ်ရှားပိုရှိုရှိုသွားဖစ်သေလား။	စစ်ဖွဲ့ပါသည် .... 1 မစစ်ဖွဲ့ပါ .... 2 မသိပါ 99	စစ်ဖွဲ့ပါသည် .... 1 မစစ်ဖွဲ့ပါ .... 2 မသိပါ 99
Q5.11	(အမည်ဖော်ပြ)သူသည်ဆေးမသောက်မီနှင့် ဆေးသောက်ပြီး ရုတ်ရှား သွားဖစ်ဆေးဖွဲ့ပါ သလား။	ဆေးမသောက်မီ .... 1 ဆေးသောက်ပြီး .... 2 မသိပါ 99	ဆေးမသောက်မီ .... 1 ဆေးသောက်ပြီး .... 2 မသိပါ 99
Q5.12	(အမည်ဖော်ပြ)သူသည်မည်သို့သော ရုတ်ရှား သွားဖစ်ဆေးအပြုံပါသနည်။ ရုတ်ရှားပိုကိုသယ်လိနည်နဲ့စစ်သလဲ။	အမြန်စစ်ဆေးနည်း .... 1 စလိုက်/ပုံစံပြင်ဖြိုင်စစ်ဆေးနည်း ... 2 မသသရပါ 99	အမြန်စစ်ဆေးနည်း .... 1 စလိုက်/ပုံစံပြင်ဖြိုင်စစ်ဆေးနည်း ... 2 မသသရပါ 99
Q5.13	(အမည်ဖော်ပြ)သူသည်မည်သည့်ဆေးရာ တွင်ရုတ်ရှားပိုစစ်ဖွဲ့ပါသနည်။ သယ်ရေနေရာမှာစစ်ကာလဲ။	ကျေးရွာလက်ကျန်းမာရေးဝန်ထမ်း ထမ်း .... 1 VBDC ဝန်ထမ်း .... 2 အခြေခံကျန်းမာရေးဝန်ထမ်း ..... 3 ကိုယ်ပိုင်လွှင်ထားသောဓါတ်ခွဲခန်း ..4 ဆေးဝန်/သူနာပြ .... 5 အခြား .... 98 ဖော်ပြပါ : _____ မသိပါ 99	ကျေးရွာလက်ကျန်းမာရေးဝန်ထမ်း ထမ်း .... 1 VBDC ဝန်ထမ်း .... 2 အခြေခံကျန်းမာရေးဝန်ထမ်း ..... 3 ကိုယ်ပိုင်လွှင်ထားသောဓါတ်ခွဲခန်း ..4 ဆေးဝန်/သူနာပြ .... 5 အခြား .... 98 ဖော်ပြပါ : _____ မသိပါ 99
Q5.14	ရုတ်ရှားပိုသွားဆေးမြှာသယ်နည်း။	ရုတ်ရှားရှိသည် .... 1 ရုတ်ရှားမရှိပါ .... 2 မသိပါ 99	ရုတ်ရှားရှိသည် .... 1 ရုတ်ရှားမရှိပါ .... 2 မသိပါ 99

အမှတ်စဉ်	မေးခွန်းနှင့် ဆန်းစစ်ခြင်း	ကုတ်နံပါတ်ဖြေဆိုမှုခြင်းဆိုင်ရာအမျိုးအစား	ကျော်သွားပါ
Q5.15	သတ်မှတ်ထားသောချက်များဆေးလုံးဆေးရေ တိုင်းမသောက်ပါက မည်ကဲ့သို့ ဖြစ်မည်နည်း	သဘာမှုဖြစ်ပါ..............1 တစ်ပါဖြန့်ဖျားနိုင်သည်..............2 ရောဂါမပျောက်ပါ..............3 အခြား..............98 ဖော်ပြပါ: _____ မသိပါ..............99	
Q5.16	အကယ်၍မိမိတွင်တစ်ဦးတစ်ယောက်ချက်ရှု ့ဖြစ်သည်ဟုသံသယရှိပါကဘာမှလုပ်ရန်အတွ က်မည် သို့သွားမည်နည်း။	ရပ်ရွာကျန်းမာရေးစေတနာ့ဝန်ထမ်း (VHV) .... 2 ကျေးလက်ကျန်းမာရေးဌာန/ဌာနခွဲ .... 3 မြို့နယ်/တိုက်နယ်ဆေးရုံ .... 4 ဆရာဝန်များဖွင့်ထားသော(ဆေးခန်း) .... 5 အခြားကျန်းမာရေးလုပ်သားများဖွင့်ထားသော (ဆေးခန်း) .... 6 အရပ်ဆေးဆရာမ .... 7 အခြားသောဆေးကုသသူ(တရားဝင်မဟုတ်) .... 8 ဆေးဆိုင် (ဆေးတစ်မျိုးသာရောင်းသည်) .... 9 ဆိုင်/ဈေး (အမျိုးမျိုးရောင်းသည်) .... 10 မိမိအသာအိမ်တွင်ကုသည် .... 11 မိမိကိုယ်ကိုတိုင်ရင်းဆေးထိုးကုသည် အခြားနည်းလမ်း .... 99 ဖော်ပြပါ: _____ မသိပါ 100	
Q5.17	အကယ်၍မိမိတွင်တစ်ဦးတစ်ယောက်ချက်ရှု ့ဖြစ်သည်ဟုသံသယရှိပါကချက်များဟုသောရာ အောင်သွေးစစ်ရန်ရန်အတွက်မည်သို့သွားမ ည်နည်း။	VBDC ဝန်ထမ်း .... 3 ရပ်ရွာကကျန်းမာရေးစေတနာ့ဝန်ထမ်း .... 4 ကျေးလက်ကျန်းမာရေးဌာန/ဌာနခွဲ .... 5 မြို့နယ်/တိုက်နယ်ဆေးရုံ .... 6 ဆရာဝန်များဖွင့်ထားသော(ဆေးခန်း) .... 7 အခြားကျန်းမာရေးလုပ်သားများဖွင့်ထားသော (ဆေးခန်း) .... 8 လေ့ဆင်/ကားဂိတ်သွေးစစ်သောနေရာ .... 9 နယ်စပ်သွေးစစ်သောနေရာ .... 10 အခြားသောဆေးကုသသူ(တရားဝင်မဟုတ်) .... 11 ဖွင့်ထားသောကိုယ်ပိုင်ဓါတ်ခွဲခန်း .... 12 အခြားနည်းလမ်း .... 99 ဖော်ပြပါ: _____ ချက်များသွေးစစ်ခြင်းနှင့်ပတ်သက်၍မသိပါ .... 100 မည်သည့်နေရာတွင်သွေးစစ်ရမည်ကိုမသိပါ 101	

	လူထုနှင့်သက်ဆိုင်သောလုပ်ငန်းများတွင်ပါဝင်မှု		
အမှတ်စဉ်	မေးခွန်းနှင့် တန်းစဲခြင်း	ကုတ်နံပါတ်ရေးမှတ်ခြင်းဆိုင်ရာအမျိုးအစား	ကျော်သွားပါ
Q6.1	လွန်ခဲ့သော 6 လအတွင်းအကျန်းမာရေး စောတနာ့ဝန်ထမ်းဆီမှဂုဏ်များနှင့်ပတ်သက်၍ သတင်းအချက်အလက်များရရှိခဲ့ပါသလား။	ရရှိခဲ့ပါသည် .... 1 မရရှိခဲ့ပါ .... 2 မသေချာပါ 99	အကယ်၍ 2 (သို့) 99 => ပြီးပါပြီ
Q6.2	ကျန်းမာရေး စောတနာ့ဝန်ထမ်းဆီမှဂုဏ် များနှင့်ပတ်သက်၍မည်သည့်သတင်းအချက် အလက်များရရှိခဲ့သနည်း။ အဖြေမှာတစ်ခုထက်မဖြစ်နိုင်ပါသည်အဖြေပေါ်လာ သောအချက်အားလုံးကို ဝိုင်းပေးပါ ထက်လက်ပြီးပေးပါ-အခြားဘာများရှိပါသေး သလဲ စသည်ဖြင့်။	မြင်းထောင်တွင်း၌အိပ်ခြင်းသည်အရေးကြီးခြင်း ...... 1 ဆေးဖိမ်ထားသောမြင်းထောင်တွင်း၌အိပ်ဝင်ခြင်း .... 2 ဝရီးထွက်သောအပါတွင်မြင်းထောင်ကိုသယ်သွားပြီး မြင်းထောင်တွင်း၌အိပ်ခြင်း .... 3 တောသို့သွားသည့်အခါမြင်းထောင်သယ်သွားပြီး မြင်းထောင်တွင်း၌အိပ်ခြင်း .... 4 ဂုဏ်ဖျားရောဂါကုသရန်အတွက်ဂုဏ်ကျန်းမာရေး စောတနာ့ဝန်ထမ်း(သို့)ကျန်းမာရေးဌာနသို့ သွား ရောက်ရန် .... 5 ဂုဏ်ဖျားရောဂါကို ၂၄ နာရီအတွင်းအမြန်ကုသရန် ..6 ဂုဏ်ဖျားဆေးကိုပြီးပြည့်စုံသည်အထိသောက်ရန် . 7 ဂုဏ်ဖျားဆေးမဝသောက်မိစေဖစ်ရန် .... 8 ဂုဏ်ဖျားရောဂါသည်အန္တရာယ်ရှိသည် .... 9 ဂုဏ်ဖျားရောဂါကြောင့်သေဆေဖိုင်သည် .... 10 မြင်သည်ဂုဏ်ဖျားကိုပြန်နှံ့စေသည် .... 11 အခြား .... 98 ဖော်ပြပါ : _____ မှတ်မိတော့ပါ 99	
Q6.3	ဂုဏ်ဖျားရောဂါနှင့်ပတ်သက်ပြီး ဆွေးနွေးရန် အတွက်သင့်အနေဖြင့် ဖော်ပြထားသောလုပ်များ မှတွင်ပါဝင်ခဲ့ပါသလား။ ဂုဏ်ဖျားရောဂါအတွက်ဘာတွေလုပ်ဖူးလဲ၊ အဖြေမှာတစ်ခုထက်မဖြစ်နိုင်ပါသည်အဖြေပေါ်လာ သောအချက်အလက်အားလုံးကို ဝိုင်းပေးပါ၊ ထက်လက်ပြီးပေးပါ-အခြားဘာများရှိပါ သေးသ လဲ စသည်ဖြင့်။	အပေးအဖြေဆွေးနွေးပွဲကျန်းမာရေးပညာပေး ..... 1 ရုပ်ရှားစည်းဝေးပွဲ .... 2 အခြား .... 98 ဖော်ပြပါ : _____ မှတ်မိတော့ပါ 99	

တွေ့ဆုံမေးမြန်းခြင်းပြီးပါပြီ။

တွေ့ဆုံမေးမြန်းမှုအခွန်ပေးသည့်အတွက်ကျေးဇူးတင်ရှိကြောင်းပြန်လည်ပြောကြားပါ။

APPENDIX C

CASE RECORD FORM FOR MALARIA WORKERS (ENGLISH)

Township……………………………………..	Volunteer's name…………………………………
Date……………………………………………	Patient's name……………………………............

Patient's particular

Sex - Male ☐ Female ☐ Date (D/ M/ Y) ……………/…………/……………

Nationality - Myanmar ☐ Chinese ☐ Thailand ☐ Others ☐

Ethnic - Lisu ☐ Myanmar ☐ Kayin ☐ Shan ☐ Mon ☐

Kachin ☐ Kayan ☐ Chin ☐ Rakhine ☐ Other ☐

Occupation – Child/ Student ☐ Merchant ☐ Livestock ☐ Police/ Soldier ☐ Government ☐

Farmer ☐ Forest worker ☐ Mining ☐ Unemployed ☐ Other ☐

Education – Read & Write ☐ KG ☐ Primary ☐ Middle ☐
High school ☐ College/ University ☐ Graduated and above ☐

Clinical Features

Body Temperature …………………..Fever - Yes ☐ No ☐ If yes, no. of days…………………..

	Yes	No		Yes	No
Chills			Abdominal pain		
Malaise			Loss of appetite		
Muscle pain			Shortness of breath		
Headache			Coma		
Nausea			Convulsion		
Vomiting			Urine color changed		
Diarrhea			Other (……………………….)		

Is this patient pregnant? Yes ☐ No ☐ Don't know ☐

Diagnosis and Treatment

Blood collection - film ☐   filter paper ☐   not done ☐

RDT's result

Negative ☐   *P.f* ☐   *P.v* ☐

Microscopy result

Not seen ☐   *P.f* ☐   *P.v* ☐   *P.m* ☐   *P.o* ☐

Diagnosed by-   VHV ☐   Other ☐

Severity -   Un-complicated ☐   complicated / severe ☐

Malaria Treatment -

Referred ☐   DHA+PPQ ☐   Artemeter ☐   Lumefantrine ☐

Pyronaridine ☐   Artesunate ☐   Dihydroartemisinine ☐   Mefloquine ☐

Chloroquine ☐   Primaquine ☐   Tetracycline/ Doxycycline ☐   Quinine ☐

Other (Please specify) ☐ …………………………………

Past History of Malaria

Have you suffered malaria in past 12 months? -   Yes ☐   No ☐   Not sure ☐

If yes, number of episodes …………………………………

When was your last episode? ………………… (M) ……………………….. (Y)

Last malaria diagnosis - *P.f* ☐   *P.v* ☐   *P.m* ☐   *P.o* ☐   Not sure ☐

Where were you got treatment? -   Volunteer ☐   Hospital/ Clinic ☐   self-treatment ☐

Were all pills taken as prescribed?   Yes ☐   No ☐

Traveling History and Preventive Behaviors

Did you travel in last 14 days? -   Yes ☐   No ☐

If yes; - Village………………………….. Township …………………………City

…………………………………………….. State/ Region ……………………………………….

Country …………………………………………………

Has the malaria control program performed indoor residual insecticide spraying of your home in the last 12 months?

Yes ☐   No ☐   Not sure ☐

Did you ever sleep with bed-nets?

No ☐   Yes with LLINs ☐   Yes with ordinary bed-net ☐

If so; - everyday ☐   2-4 times per week ☐   1 time per week ☐   4-6 times per week ☐

APPENDIX D

CASE RECORD FORM FOR MALARIA WORKERS (MYANMAR)

မြို့နယ်..	စေတနာ့ဝန်ထမ်းအမှတ်...
ရက်စွဲ..	လူနာအမှတ်စဉ် ....

လူနာ၏ အကြောင်းအရာများ

လိင် - ကျား ☐ မ ☐ မွေးသက္ကရာဇ် (ရက်/ လ/ နှစ်) ..../ ..../ ....

နိုင်ငံသား - မြန်မာ ☐ တရုတ် ☐ ထိုင်း ☐ အခြား ☐

လူမျိုး - လီဆူး ☐ မြန်မာ ☐ ကရင် ☐ ရှမ်း ☐ မွန် ☐

ကချင် ☐ ကယန်း ☐ ချင်း ☐ ရခိုင် ☐ အခြား ☐

အလုပ်အကိုင် - ကလေး/ ကျောင်းသား ☐ ကုန်သည် ☐ မွေးမြူရေး ☐ ရဲ/ စစ်သား ☐ အစိုးရဝန်ထမ်း ☐

တောင်ယာ/ လယ်ယာ ☐ သစ်ခုတ် ☐ ရွှေတူး ☐ အလုပ်လက်မဲ့/ ပိုင်ရှင် ☐ နေ့စား ☐ အခြား ☐

ပညာအရည်အချင်း - ရေးတက်/ ဖတ်တက် ☐ မူကြို ☐ မူလတန်း ☐ အလယ်တန်း ☐

အထက်တန်း ☐ တက္ကသိုလ် ☐ ဘွဲ့ရ နှင့်အထက် ☐

ရောဂါလက္ခဏာများ

ကိုယ်အပူချိန် .... အဖျား - ရှိ ☐ / မရှိ ☐ ရှိခဲ့လျှင် (ရက်ပေါင်းမည်မျှ) ....

	ရှိ	မရှိ		ရှိ	မရှိ
ချမ်းတုန်ခြင်း			ပိုက်အောင့်/ ပိုက်နာခြင်း		
နံခြင်း			အစားအသောက်ပျက်ခြင်း		
ကြွက်သားနာကျင်မှု			အသက်ရှူမဝခြင်း		
ခေါင်းကိုက်ခြင်း			တက်ခြင်း/ အမြော့ဆဲ့ခြင်း		
ပျို့ခြင်း			အတိလစ်ခြင်း / မေ့ခြင်း		
အန်ခြင်း			ဆီးအရောင်ပြောင်းခြင်း		
ဝမ်းလျှောခြင်း			အခြား (................................)		

ကိုယ်ဝန်ရှိ/ မရှိ? ရှိ ☐ မရှိ ☐ မသိပါ ☐

သွေးစစ်ဆေးခြင်းနှင့် ကုသခြင်း

သွေးဖောက်စစ်ဆေးမှု - သွေးမှုန်ပြား ☐ သွေးစာရွက် ☐ မဖောက်ပါ ☐

အမြန်သွေးစစ်ကိရိယာ ဖြင့်စစ်ဆေးခြင်း အဖြေ -

ပိုးမတွေ့ ☐ ဖယ်ဆီပါရမ် ☐ ဗိုင်းဗက် ☐

အကူးအညှန်မှန်ပြောင်း အဖြေ -

ပိုးမတွေ့ ☐ ဖယ်ဆီပါရမ် ☐ ဗိုင်းဗက် ☐ မလေရီယေး ☐ အိုဗေး ☐

ငှက်ဖျားပိုးစစ်ဆေးသူ- စေတနာ့ဝန်ထမ်း ☐ ဆေးရုံ ☐

ငှက်ဖျားရောဂါအခြေအနေ - သာမာန် ☐ ပြင်းထန် ☐

ကုသခြင်းဆေးဝါးများ -

ဆေးရုံညွှန်ပို့ ☐ ဒိုင်ဟိုင်ဒရိုအာတီမီစနင်+ပိုင်ပါရာကွင်း ☐ အာတီမီသာ ☐

လုပီဖန်ထရင်း ☐ ပိုင်ရှိနဒရင်း ☐ အာတီဆူးနိတ် ☐ ဒိုင်ဟိုင်ဒရိုအာတီမီစနင် ☐

မက်ဖလိုကွင်း ☐ ကာလိုရိုကွင်း ☐ ပရိုင်မာကွင်း ☐ တက်ထရာဆိုင်ကလင်း/ ဒေါက်စီဆိုင်ကလင်း ☐

ကွီနင်း ☐ အခြား (ဖော်ပြပါ) ☐ ....

ငှက်ဖျားဖြစ်ပွားခဲ့မှုမှတ်တမ်း

လွန်ခဲ့သော ၁၂ လအတွင်း ငှက်ဖျားဖြစ်ပွားခဲ့မှု - ရှိ ☐ မရှိ ☐ မမှတ်မိ ☐

ရှိခဲ့လျှင် အကြိမ်အရေအတွက် ....

နောက်ဆုံးအကြိမ် ဖြစ်ပွားခဲ့မှု .... (လ) .... (နှစ်)

ပိုးအမျိုးအစား - ဖယ်ဆီပါရမ် ☐ ဗိုင်းဗက် ☐ မလေရီယေး ☐ အိုဗေး ☐ မမှတ်မိ ☐

ကုသခဲ့သည့်နေရာ - စေတနာ့ဝန်ထမ်း ☐ ဆေးရုံ/ ဆေးခန်း ☐ မိမိဘာသာ ☐

ညွှန်ကြားဆေးဝါးများအား အလုံးစုံ သောက်သုံးခြင်း? သောက်ပါသည် ☐ မသောက်ပါ ☐

ခရီးသွား မှတ်တမ်းနှင့် ကာကွယ်မှုဆိုင်ရာ အလေ့အထများ

လွန်ခဲ့သော ၁၄ ရက်အတွင်းခရီးသွားခြင်း- ရှိ ☐ မရှိ ☐

ရှိခဲ့လျှင် - ရွာအမည်................. မြို့နယ် .... မြို့အမည် ....

တိုင်းဒေသကြီး ....တိုင်းပြည်/ နိုင်ငံ ....

လွန်ခဲ့သော ၁၂ လအတွင်း ငှက်ဖျားရောဂါ ထိန်းချုပ်ရေး အဖွဲ့အစည်းများမှ အိမ်တွင်းခြင်းဆေး ဖြန်းခြင်းဆောင်ရွက်ခြင်း?

ရှိ ☐ မရှိ ☐ မသိ/ မမှတ်မိပါ ☐

ခြင်ထောင်ဖြင့်အိပ်ပါသလား?

မအိပ်ပါ ☐ ဆေးစိမ်ခြင်ထောင်ဖြင့်အိပ်ပါသည် ☐ ရိုးရိုးခြင်ထောင်ဖြင့်အိပ်ပါသည် ☐

အိပ်လျှင် - နေ့စဉ် ☐ တစ်ပါတ်လျှင် ၃-၄ ကြိမ် ☐ ၁ ကြိမ်သာ ☐ တစ်ခါတစ်ရံသာ ☐

APPENDIX E

CASE NOTIFICATION RECORD FORM

No.	Date	Reported by	Patients' particulars	Date and time of diagnosis	Date and time Reporting	Discrepancies between carbonless report (Yes/No)	Findings	Remark
1.			Name, age, sex, blood test result, treatment given, migrant/ resident, address					
2.								
3.								
4.								

APPENDIX F

ENTOMOLOGY CHECKLIST

No.	Date	Activities (Outdoor/ Indoor)	Places		Vectors Found		Remark
			Lat.	Long.	Species	#	
1.							
2.							

APPENDIX G

Informed Consent Form for KAP Survey (English)

Informed consent form for adults who reside in the-----------village, Banmauk Area, Sagaing Region for more than 14 days who we are inviting to participate in the assessment of Knowledge, Attitude and Practice towards prevention, diagnosis, and treatment of malaria.

Name of Principal Investigator	**- Dr. Pyae Linn Aung**
Name of Organization	**-** PhD Candidate
	Chulalongkorn University, Thailand
Name of Sponsor	- 90th Anniversary of Chulalongkorn University,
	Rachadapisek Sompote Fund

Title of the Project: "The Village Based Malaria Elimination Model to Interrupt Transmission of Malaria in Banmauk Township, Myanmar"

This Informed Consent Form has two parts:

• Information Sheet (to share information about the research with you)

• Certificate of Consent (for signatures if you agree to take part)

You will be given a copy of the full informed consent form.

PART I: Information Sheet

(1) Introduction

My name is Dr. Pyae Linn Aung, and I am studying for the Doctor of Philosophy in Public Health, College of Public Health Sciences, Chulalongkorn University. To fulfill the degree requirement, now I am doing a KAP assessment study regarding malaria diagnosis, treatment, and prevention among community people, which is a very common and basic essential thing to produce further control activities. I am going to give you information and invite you to participate in this assessment study. Before you decide, you can talk to anyone you feel comfortable with. There may be some words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have questions later, you can ask them of me, the study doctor or the staff.

(2) Purpose

Malaria is one of the most common and dangerous diseases in your areas and also in this region. The purpose of this study is to confirm that the KAP level in your community by means of a structured questionnaire.

(3) Type of Research Intervention and Procedure

If you are agreeing to participate, face to face interview will be conducted by using a structured questionnaire in a place where you are comfortable. It will take around 30 minutes. If you do not wish to answer any of the questions included in the survey, you may skip them and move on to the next question. The information recorded is confidential, and no one else except investigators will have access to the information documented in your questionnaire.

(4) Participant selection

We are inviting all household leader who with or without fever and has who matched with inclusion criteria for this study.

(5) Voluntary Participation

You have the right to choose not to answer the question that makes you feel uncomfortable or to withdraw from the project at any time and at any uncomfortable condition. The withdrawal from the project will not affect any rights you may get personally or officially.

(6) Duration

The procedure for all asking questionnaire for each individual will last less than 30 mins.

(7) Risks

By participating in this research it is possible that you will not be at greater risk than you would otherwise be. While the possibility of this happening is very low, you should still be aware of the possibility. We will give you a telephone number to call if you notice anything out of the ordinary, or if you have concerns or questions. You can also come to this health facility at any time and ask to see the Medical Officer.

(8) Discomforts

There will be no or little risk by participating in this research. You may feel uncomfortable while answering the questions but as the questionnaire will be asked

privately and it is less likely to happen. However, if you feel uncomfortable any time during the interview, you can stop answering and quit your participation.

(9) Benefits

Participating in this research will not directly beneficial to you but it is likely to help us find the answer to the research question. There may not be any other benefit for you but your participation is likely to help us find the answer to the surveillance study and this will benefit the community and to the future generations.

(10) Incentives

You will not be provided an incentive to take part in this study except for the reasonable amount of time compensation.

(11) Confidentiality

We will not be sharing the identity of those participating in this study. The information that we collect from this study will be kept confidential. Information about you that will be collected from the study will be put away and no-one but the team involved in the study will be able to see it. Any information about you will have a number on it instead of your name. Only the study team members will know what your number is and we will lock that information up with a lock and key.

(12) Sharing the Results

It will not be shared with or given to anyone. The knowledge that we get from this study will be shared with you before it is made widely available to the public. Confidential information will not be shared.

(13) Right to Refuse or Withdraw

You do not have to take part in this research if you do not wish to do so. You may also stop participating in the research at any time you choose. It is your choice and all of your rights will still be respected.

(14) Who to Contact

If you have any questions you may ask them now or later, even after the study has started. If you wish to ask questions later, you may contact any of the following: Dr. Pyae Linn Aung, Ph.D. Candidate, College of Public Health Sciences, Chulalongkorn University, Address: 135, PatheinMyay 5th Street, Dawbon, Yangon, Mobile: +95 9 518 7 520, Email: pyaelinnag@gmail.com.

This proposal has been reviewed and approved by Institutional Technical and Ethical Review Board, the University of Public Health, which is a committee whose task is to make sure that research participants are protected from harm. If you wish to find out more about the Committee, contact the secretary of the committee at University of Public Health, Yangon, No 246, Myoma Kyaung Street, Latha Township, Yangon, 11131. Office Phone +95 1395213, +951395214 ext: 23/25.

PART II: Certificate of Consent

I have been invited to participate in the assessment of malaria's KAP survey under the research project of "The Village Based Malaria Elimination Model to Interrupt Transmission of Malaria in Banmauk Township, Myanmar". I understand that it will involve me asking questionnaire to address KAP towards malaria diagnosis, treatment, and prevention. I am aware that there may be no benefit to either myself personally and that I will be compensated for my time. I have been provided with the name of an investigator who can be easily contacted using the number I was given for that person.

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this study and understand that I have the right to withdraw from the study at any time without in any way affecting my medical care.

Name of Participant_____

Signature of Participant _____

Date Day/month/year _____

If illiterate

A literate witness must sign (if possible, this person should be selected by the participant and should have no connection to the study team). I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Name of witness_____

Signature of witness _____

Date (Day/month/year) _____

I have accurately read or witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Name of Researcher_____

Signature of Researcher _____

Date (Day/month/year) _____

A copy of this Informed Consent Form has been provided to participant _____ (initialed by the researcher/assistant)

APPENDIX H

Informed Consent Form for KAP Survey (Myanmar)

စမ်းသပ်ခံပုဂ္ဂိုလ်၏ ခွင့်ပြုလွှာ (လူကြီး)

စစ်ကိုင်းတိုင်း၊ ဗန်းမောက်မြို့နယ်၊ ....ကျေးရွာတွင်နေထိုင်သူများ၏ "ကျေးရွာအဆင့် ၄ှက်ဖျားကူးစက်မှုပပျောက်ရေး ဆောင်ရွက်ခြင်း" အောက်မှ ကျေးရွာနေပြည်သူလူထု၏ လူနေမှုနှင့် စီးပွားရေးဆိုင်ရာ ဝိသေသလက္ခဏာများ၊ ၄ှက်ဖျားရောဂါနှင့်ပါတ်သက်၍ ဗဟုသုတ၊ အယူအဆ များနှင့် လိုက်နာလုပ်ဆောင်နေသည့် အချက်များ နှင့် ပက်သက်သော အချက်အလက်များအား ရှာဖွေခြင်း သုတေသနတွင် ပါဝင်ကူညီမည့် စမ်းသပ်ခံ ပုဂ္ဂိုလ်၏ ခွင့်ပြုလွှာပုံစံ။

အဓိကသုတေသီ ဒေါက်တာပြည့်လင်းအောင်

သုတေသနအဖွဲ့အစည်းအမည် ပါရဂူကျောင်းသား၊ ပြည်သူ့ကျန်းမာရေးပညာဌာန၊

ချူလာလောင်ကွန်းတက္ကသိုလ်

ထောက်ပံ့သည့် အဖွဲ့အစည်းအမည် ချူလာလောက်ကွန်းတက္ကသိုလ် နှစ် ၉၀ ပြည့်အထိမ်းအမှတ် အထောက်အပံ့

သုတေသနစီမံချက်အမည် ကျေးရွာအဆင့်၄ှက်ဖျားကူးစက်မှုလျှော့ချခြင်း

ကျွ်စမ်းသပ်ခံပုဂ္ဂိုလ်၏ ခွင့်ပြုလွှာတွင် နှစ်ပိုင်းပါဝင်ပါသည်။
၁) သုတေသနဆိုင်ရာရှင်းလင်းချက် (ပါဝင်စမ်းသပ်ခံများ သိသင့်သော အချက်များ)
၂)သိရှိကြောင်း မှတ်တမ်းတင် လက်မှတ်ရေးထိုးပုံစံ (ပါဝင်စမ်းသပ်ခံရန် သ�‌ဘောတူကြောင်း လက်မှတ် ရေးထိုးရန်)။ ပါဝင်စမ်းသပ်ခံများအနေဖြင့် သဘောတူသိရှိကြောင်းပုံစံမိတ္တူတစ်စောင် ရရှိပါမည်။

အပိုင်း (က) သုတေသနဆိုင်ရာရှင်းလင်းချက်

၁။ **နိဒါန်း ။ ။** ကျွန်တော် ဒေါက်တာပြည့်လင်းအောင်သည် ပါရဂူဘွဲ့ကျောင်းသားတစ်ဦးဖြစ်ပြီး ဘွဲ့ရရှိရန်လိုအပ်ချက်ဖြစ်သော စာတမ်းလုပ်ဆောင်ခြင်းအတွက် စစ်ကိုင်းတိုင်း ဗန်းမောက်မြို့နယ်တွင်

ကျေးရွာနေပြည်သူလူထု၏ လူနေမှုနှင့် စီးပွားရေးဆိုင်ရာ ဝိသေသလက္ခဏာများ၊ ငှက်ဖျားရောဂါနှင့်ပါတ်သက်၍ ဗဟုသုတ၊ အယူအဆ များနှင့် လိုက်နာလုပ်ဆောင်နေသည့် အချက်များ နှင့် ပက်သက်သော အချက်အလက်များအား ရှာဖွေခြင်း သုတေသနပြုလုပ်ရာတွင် ပါဝင် ဆောင်ရွက်နေပါသည်။ ပထမဦးစွာ ယခုပြုလုပ်မည့် သုတေသနလုပ်ငန်းအကြောင်း ရှင်းပြ ပါမည်။ ဤသုတေသနလုပ်ငန်းတွင် ပါဝင်ကူညီပါရန် ဖိတ်ခေါ်ပါသည်။ ထိုသို့ကူညီရန်အတွက်လည်း အခြား သူများနှင့်လည်း တိုင်ပင်နိုင်ပါသည်။ ဤရှင်းလင်းချက်တွင် ပါဝင်သော ပညာရပ်ဆိုင်ရာစကားလုံးများကို မရှင်း လင်းခြင်း၊ နားမလည်ခြင်းများရှိပါက သင်ကျေနပ်သည်အထိ ရှင်းလင်း ဆွေးနွေးပေးမည် ဖြစ်ပါသည်။

၂။ ရည်ရွယ်ချက်။ ။ မြန်မာနိုင်ငံတွင် အဖြစ်များပြီး အန္တရာယ်ရှိသော ရောဂါဖြစ်သည့် ငှက်ဖျားရောဂါကို သိရှိစေရန်အတွက် မျက်နှာချင်းဆိုင်မေးခွန်းမေးမြန်းဖြေဆိုခြင်းဖြင့် သုတေသနပြုလုပ်သွားမည် ဖြစ်ပါသည်။

၃။ သုတေသနလုပ်ငန်းဆောင်ရွက်ပုံ ။ ။ သင့်အား ဤသုတေသနတွင် ပါဝင်ရန် ဖိတ် ခေါ်မည်ဖြစ်ပါသည်။ သင်ပါဝင်ခဲ့ပါက တွေ့ဆုံ မေးမြန်းစဉ် သုတေတနပြုသူသည် သင်နှင့်အတူ အဆင်ပြေသည့်နေရာတွင် ထိုင်ကာ မျက်နှာချင်းဆိုင် အမေးအဖြေ တွေ့ဆုံ မေးမြန်း မည်ဖြစ်ပါသည်။ မေးမြန်းချိန် ၃၀ မိနစ် ခန့်ကြာမြင့်ပါမည်။ မေးခွန်းများအား သင်စတင်ဖြေဆိုပြီး သင်ဆက်လက်မဖြေဆိုလိုတော့ပါက အကြောင်းပြချက်တစ်စုံတစ်ရာ ပေးရန်မလိုတော့ပဲ သင့်အနေဖြင့်အချိန်မရွေးရပ်နိုင်ပါသည်။ အမေးအဖြေပြုလုပ် နေစဉ်အတွင်း တစ်စုံတစ်ရာနားမလည်ပါ က အားနာ တုံ့ဆိုင်းခြင်း မရှိပဲ ပြန်လည်မေးမြန်းနိုင်ပြီး ဖြေဆိုရန် ခက်ခဲပါက (သို့) မဖြေဆိုလိုပါက မဖြေဆိုလို ကြောင်း (သို့) မသိကြောင်း ပွင့်လင်းစွာပြောဆိုနိုင်ပါသည်။ ယနေ့တွင်သင်ဖြေဆိုထားသမျှအား လျှို့ဝှက် ထိန်းသိမ်းထားမည် ဖြစ်ပြီး သတင်းအချက်အလက်များအား သင့်ခွင့်ပြုချက်ရရှိမှသာလျှင် ဖော်ထုတ်မျှဝေ မည် ဖြစ်သည်။

၄။ သုတေသနတွင်ပါဝင်ရန်ရွေးချယ်ပုံ။ ။ ကျေးရွာအတွင်း ၁၄ ရက်ကျော် နေထိုင်ပြီး၊ အိမ်ထောင်ဦးစီး အစရှိသည့် သတ်မှတ်ထားသော စံနှုန်းနှင့် ကိုက်ညီသည့် ကျား၊မ မရွေး လူကြီးများအားယခုသုတေသနတွင် ပါဝင်ရန်ဖိတ်ခေါ်မည် ဖြစ်ပါသည်။

၅။ သုတေသနတွင်ပါဝင်လိုမှု ။ ။ ယခုသုတေသန တွင်ပါဝင်ကူညီခြင်းသည် မိမိ၏သဘောဆန္ဒအလျောက်သာ ဖြစ်ပါသည်။ ယခုသုတေသန တွင်ပါဝင်သည်ဖြစ်စေ၊ မပါဝင်သည်ဖြစ်စေ ကျန်းမာရေးစောင့်ရှောက်မှု ပေးရာတွင်ကွာခြားမည် မဟုတ်ပါ။ သုတေသနတွင်ပါဝင်ပြီးမှ မိမိဆန္ဒအလျောက် နှုတ်ထွက်လိုပါကလည်း နှုတ်ထွက်နိုင်ပါသည်။

၆။ ကြာမြင့်ချိန် ။ ။မေးခွန်းမေးမြန်းသည် မှာ မိနစ် ၃၀ ခန့်ကြာပါမည်။

၇။ အန္တရာယ်ရှိမှု ။ ။ ဤသုတေသနတွင်ပါဝင်ခြင်းကြောင့် သင့်တွင် ပုံမှန်ရှိနေသော အခြေအနေ မှ ပြောင်းလဲသွားမည် မဟုတ်ပါ။ သင့်အနေဖြင့် သုတေသနအဖွဲ့ကိုဆက်သွယ်နိုင်မည့် ဖုံးနံပတ် ပေးထားမည်ဖြစ်သလို မြို့နယ်ရှိ သုတေသနဆေးခန်းသို့ လည်းလာရောက်နိုင်ပါသည်။

၈။ စိတ်မသက်မသာဖြစ်မှု၊ ထိခိုက်နိုင်မှု နှင့် ကိုယ်စိတ် အနှောင့်အယှက်ဖြစ်စေမှုများ။
။ သင်နှင့် ပတ်သက်သည့် မေးခွန်းများတွင် ကိုယ်ရေးကိုယ်တာ အချက်အလက်များပါသောကြောင့် စိတ်အနှောင့်အယှက်ကြုံတွေ့နိုင်ပါသည်။ ထိုအခါ ယင်းမေးခွန်းကို မဖြေကြားဘဲထားနိုင်ပါသည်။

၉။ အကျိုးကျေးဇူး။ ။ ဤသုတေသနတွင် သင့်အား လက်တွေ့ချက်ခြင်း အကျိုးသက်ရောက်မှု မရှိသော်လည်း သုတေသနရလဒ်များကြောင့် လူသားအားလုံးနှင့် နောင်လာနောင် သားများအတွက် အဖိုးမ ဖြတ်နိုင်သော အကျိုးကျေးဇူးများရရှိနိုင်မည် ဖြစ်ပါသည်။

၁၀။ ကျေးဇူးတုံ့ပြန်မှု။ ။ ဤသုတေနသနတွင်ပါဝင်သူများကို အချိန်ကုန်ခံရမှုအတွက် လက်ဆောင်ပစ္စည်း ပေးခြင်း များ ပြုလုပ်မည် မဟုတ်ပါ။

၁၁။လျှို့ဝှက်ထားရှိမှု။ သုတေသနမှ ရရှိသော အချက်အလက်များကို သုတေသီအဖွဲ့ဝင်များမှလွဲ၍ အခြားသူများကို အသိပေးမည် မဟုတ်ပါ။ အချက်အလက်အလက်များကို မှတ်တမ်း တင်ရာတွင် သုတေသနတွင်ပါဝင်စမ်းသပ်ခံ သူများ၏ အမည်အစား လျှို့ဝှက်နံပါတ်များဖြင့်သာ မှတ်သားထားပြီး ယင်းမှတ်တမ်းများကို သေချာစွာ သော့ခတ်သိမ်းဆည်းထားပါမည်။

၁၂။ အဖြေများကိုမျှဝေခြင်း။ ။ သုတေသနမှရရှိသော ရလဒ်များကို ပြည်သူလူထုနှင့် စိတ်ပါဝင်စားသော သုတေသီများသိ ရှိနိုင်ရန် အတွက်တင်ပြပေးမည် ဖြစ်ပါသည်။

၁၃။သုတေသနတွင်ပါဝင်ရန်ငြင်းဆန်ခွင့်။ ။ သင့်အနေဖြင့်ဤသုတေသနတွင် ပါဝင်ခြင်း／ မပါဝင် ခြင်းကိုလွတ်လပ်စွာ လက်ခံခွင့်／ငြင်းဆန်ခွင့် ရှိပါသည်။

ထိုပြင်ပါဝင်ပြီးနောက်တွင်လည်း သင့်အနေဖြင့် အချိန်မရွေး သုတေသနတွင်ပါဝင်ခြင်း မှရပ်ဆိုင်းနိုင်ပါသည်။

၁၄။ ငြင်းဆန်သော်လည်းရပိုင်ခွင့်ရှိမှု။ ။ သုတေသနတွင် ပါဝင်ရန်ငြင်းဆန်ခြင်း၊ ပါဝင်ပြီးမှ ရပ်ဆိုင်းခြင်းကြောင့် စေတနာ့ဝန်ထမ်းငှက်ဖျားလုပ်သားထံမှ နှင့် အခြားကျန်းမာရေးဌာနများမှ ပုံမှန် ရရှိနေသော ကျန်းမာရေးစောင့်ရှောက်မှုများအား အဟန့်အတား ဖြစ်စေမည် မဟုတ်ပါ။

၁၅။ဆက်သွယ်ရန်။ ။ ဤသုတေသနလုပ်ငန်းနှင့် ပတ်သက်၍ မေးမြန်းဆွေးနွေးလိုပါက ဒေါက်တာ ပြည့်လင်းအောင်၊ ပါရဂူကျောင်းသား၊ ပြည်သူ့ကျန်းမာရေးပညာဌာန၊ ချူလာလောင်ကွန်းတက္ကသိုလ်၊ အမှတ် ၁၃၅၊ ပုသိမ်မြေ ၅ လမ်း၊ ဒါပုံမြို့နယ်၊ ရန်ကုန်မြို့၊ တယ်လီဖုံးအမှတ် ဝ၉၅၁၈၇၅၂ဝ သို့ဆက်သွယ် အကြောင်းကြား နိုင်ပါသည်။ ဤအဆိုပြုချက်သည် သုတေသနနည်းပညာနှင့် ကျင့်ဝတ်ကော်မတီ ပြည်သူ့ကျန်းမာရေးတက္ကသိုလ်၊ ရန်ကုန်၏ ဆန်းစစ်သဘောတူ အတည်ပြုချက်ရပြီးဖြစ်သည်။ အကယ်၍ သင်သည် ကော်မတီနှင့် ပတ်သက်၍ သိလိုသည်များရှိလျှင် အတွင်းရေးမှူး(ကော်မတီ)၊ ပြည်သူ့ကျန်းမာရေးတက္ကသိုလ်၊ရန်ကုန် အမှတ်(၂၄၆)၊ မြို့မကျောင်းလမ်း၊ လမ်းမတော်မြို့နယ်၊ ရန်ကုန် စာတိုက်သေတ္တာအမှတ်၊ ၁၁၃၁ ဖုန်း၊ ဝ၁-၃၉၂၁၃၁၊ ဝ၁-၃၉၂၁၃၄ ၊ လိုင်းခွဲ(၂၃)/လိုင်းခွဲ(၂၅)သို့ ရုံးချိန်အတွင်း ဆက်သွယ်နိုင်ပါသည်။

အပိုင်း (ခ) စမ်းသပ်ခံပုဂ္ဂိုလ်၏ သဘောတူညီချက်

ကျွန်တော် ၊ ကျွန်မသည် "ကျေးရွာအဆင့်ငှက်ဖျားကူးစက်မှုလျှော့ချခြင်း သုတေသနစီမံချက်" ၏ ကျေးရွာနေပြည်သူလူထု၏ လူနေမှုနှင့် စီးပွားရေးဆိုင်ရာ ဝိသေသလက္ခဏာများ၊ ငှက်ဖျားရောဂါနှင့်ပါတ်သက်၍ ဗဟုသုတ၊ အယူအဆ များနှင့် လိုက်နာလုပ်ဆောင်နေသည့် အချက်များ နှင့် ပက်သက်သော အချက်အလက်များအား ရှာဖွေခြင်း သုတေသနပြုလုပ်ရာတွင် ပါဝင်ရန် သဘောတူညီပါသည်။ သုတေသန၏ သဘောတရားအရ မျက်နှာချင်းဆိုင် မေးခွန်းမေးမြန်းဖြေဆိုခြင်းဖြင့် သုတေသနပြုလုပ်သွားမည်ဖြစ် ကြောင်းကိုလဲသိရှိပါသည်။ ဤသုတေသနတွင် ပါဝင်ခြင်း ဖြင့်အချိန်ကုန်မှုအတွက် ကိုယ်ကျိုးတစ်စုံ တစ်ရာရမည် မဟုတ်ကြောင်း သိရှိပါသည်။ အကြောင်းထူးရှိပါက ဆက်သွယ် ရမည့် သုတေသီ အမည်၊ လိပ်စာ နှင့် တယ်လီဖုံးနံပါတ်ကို ကောင်းစွာသိရှိပါသည်။

ဤသုတေသန၏ ရည်ရွယ်ချက်၊ သဘာဝနှင့် အကျိုးတရားများကို ကောင်းစွာ သဘောပေါက်ပါသည်။ မရှင်း လင်း သည်များကိုလည်း ကျွန်တော်၊ ကျွန်မကျေနပ်သည်အထိ ဖြေရှင်းရရှိပြီး ဖြစ်ပါသည်။ ကျွန်တော်၊ ကျွန်မ သည် မိမိ၏သဘောဆန္ဒအလျောက် ပါဝင်ရန် သဘောတူညီပါသည်။ ဤသုတေသနမှ မည်သည့် အကြောင်း ပြချက်မှ မပေးဘဲ အချိန်မရွေး နုတ်ထွက်ခွင့် ရှိကြောင်း သိရှိပါသည်။ ထိုသို့နုတ်ထွက် ခြင်း ကြောင့် ကုသခံစား ခွင့် တစ်စုံတစ်ရာ ဆုံးရှုံးမည် မဟုတ်ကြောင်း သိရှိပါသည်။

စမ်းသပ်ခံပုဂ္ဂိုလ်အမည် _____

လက်မှတ်၊ ရက်စွဲ _____

(စာတတ်မြောက်ခြင်း မရှိပါက စာတတ်မြောက်သော အသိသက်သေတစ်ဦးကို ရွေးချယ်ပါမည်။ ထိုအသိသက် သေကို စမ်းသပ်ခံပုဂ္ဂိုလ်ကသာ ရွေးချယ် ရပါမည်။ သုတေသီနှင့် သုတေသနအဖွဲ့ဝင်များ မဖြစ်ရပါ။)

ကျွန်တော်၊ ကျွန်မသည် ဤစမ်းသပ်ခံပုဂ္ဂိုလ်၏ သဘောတူညီချက်ကို သေချာစွာ ဖတ်ရှုပြီး သုတေသနလုပ်ငန်း တွင်ပါဝင်ကူညီမည့်သူကို သေချာစွာ မေးမြန်းပြီး ဖြစ်ပါသည်။ စမ်းသပ်ခံပုဂ္ဂိုလ် ၏ သဘောတူညီမှုကို လွတ်လပ်စွာ ဆုံးဖြတ်စေပါသည်။

အသိသက်သေအမည် _____ စမ်းသပ်ခံပုဂ္ဂိုလ်၏ လက်မပုံစံ

လက်မှတ်၊ ရက်စွဲ _____

စမ်းသပ်ခံ ပုဂ္ဂိုလ်၏ သဘောတူညီချက်ကို ကာယကံရှင်မှသော်လည်းကောင်း၊ အသိသက်သေမှတစ်ဆင့် သော် လည်းကောင်း သေချာစွာဖတ်ရှုစေပြီး ဖြစ်ပါသည်။ မေးမြန်းသော မေးခွန်းများကို လည်းကျေနပ်သည် အထိဖြေ ကြားပြီးဖြစ်ပါသည်။ စမ်းသပ်ခံပုဂ္ဂိုလ်ကို လွတ်လပ်စွာ ဆုံးဖြတ်စေပြီးမှ ဤသဘောတူညီချက်ကို ရယူခြင်း ဖြစ်ပါသည်။

သုတေသီအမည် _____

လက်မှတ်၊ ရက်စွဲ _____

စမ်းသပ်ခံပုဂ္ဂိုလ်၏ ခွင့်ပြုလွှာ မိတ္တူတစ်စောင်ကို သုတေသီ၏ သုတေသနအဖွဲ့ဝင် တစ်ဦးမှ လက်မှတ်ရေးထိုး ပြီး စမ်းသပ်ခံမည့် ပုဂ္ဂိုလ်သို့ ပေးအပ်ပါသည်။

APPENDIX I

Informed Consent Form (Adults) (English)

Informed consent form for adults who reside in the-----------village, Banmauk Area, Sagaing Region for more than 14 days who we are inviting to participate in the assessment of malaria parasites and species by RDT, microscopy, filter paper for PCR and HS-RDT.

Name of Principal Investigator	**- Dr. Pyae Linn Aung**
Name of Organization	**-** PhD Candidate
	Chulalongkorn University, Thailand
Name of Sponsor	- 90th Anniversary of Chulalongkorn University,
	Rachadapisek Sompote Fund

Title of the Project: "The Village Based Malaria Elimination Model to Interrupt Transmission of Malaria in Banmauk Township, Myanmar"

This Informed Consent Form has two parts:

• Information Sheet (to share information about the research with you)

• Certificate of Consent (for signatures if you agree to take part)

You will be given a copy of the full informed consent form.

PART I: Information Sheet

(1) Introduction

My name is Dr. Pyae Linn Aung, and I am studying for the Doctor of Philosophy in Public Health, College of Public Health Sciences, Chulalongkorn University. To fulfill the degree requirement, now I am doing a malaria prevalence study by active case detection approach for at least 3 times with 3 months interval, which is very common in this country. I am going to give you information and invite you to participate in this surveillance study. Before you decide, you can talk to anyone you feel comfortable with. There may be some words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have questions later, you can ask them of me, the study doctor or the staff.

(2) Purpose

Malaria is one of the most common and dangerous diseases in your areas and also in this region. The purpose of this study is to confirm that the true prevalence of malaria infection in your community by means of different malaria diagnostic tools.

(3) Type of Research Intervention and Procedure

This research involves the taking of the finger prick blood sample to detect malaria infection. The fever will be measured and then two or three drops blood will be taken from your finger under sterile condition onto an RDTs, piece of paper and on glass slides which will be used to find and count the parasite in the blood smear. In the meantime, you may feel pain when the needle sticks but this will go away very quickly. You may need to spend some time as a routine procedure done by malaria volunteer when you have a fever. 2-3 drops of fingertip blood will be collected for slide preparation and for filter paper spot collection. As a procedure of this study, the blood sample will be taken for two more times after 3 months from now and again after 6 months.

(4) Participant selection

We are inviting all adults who with or without fever and has who matched with inclusion criteria for this study.

(5) Voluntary Participation

Your decision to have you participate in this study is entirely voluntary. It is your choice whether to participate or not. If you choose not to consent, all the services you receive at this clinic/malaria post will continue and nothing will change. You may also choose to change your mind later and stop participating, even if you agreed earlier, and the services you receive at the clinic will continue.

(6) Duration

The procedure for all taking a sample from each individual will last less than 30 mins.

(7) Risks

By participating in this research, it is possible that you will not be at greater risk than you would otherwise be. While the possibility of this happening is very low, you should still be aware of the possibility. We will give you a telephone number to call if

you notice anything out of the ordinary, or if you have concerns or questions. You can also come to this health facility at any time and ask to see the Medical Officer.

(8) Discomforts

By participating in this research, it is possible that you may experience some discomfort such as a result of repeated blood sample taking from the finger's tip.

(9) Benefits

If you participate in this study, you will have the following benefits: any illnesses related to malaria or to the malaria treatment will be treated free. There may not be any other benefit for you but your participation is likely to help us find the answer to the surveillance study and this will benefit the community and to the future generations.

(10) Side Effects of anti-malaria medicines

There is no marked side effect. The uncommon side effects like headache, dizziness, weakness, muscle or joint pain, tiredness, difficulty falling asleep or staying asleep, vomiting, and loss of appetite may occur. Although the possibility is very unlikely, we will follow you closely and keep track of any unwanted effects or any problems. We may need to use some other medicine to treat the symptoms of the side effects or reactions. Or we may stop the use of one or more drugs.

(11) Incentives

You will not be provided any incentive to take part in this case study except to the reasonable amount of time compensation.

(12) Confidentiality

With this study, something out of the ordinary is being done in your community. It is not possible that if others in the community are aware because volunteers are checking malaria positive cases as usual. We will not be sharing the identity of those participating in this study. The information that we collect from this study will be kept confidential. Information about you that will be collected from the study will be put away and no-one but the team involved in the study will be able to see it. Any information about you will have a number on it instead of your name. Only the study team members will know what your number is and we will lock that information up with a lock and key.

(13) Sharing the Results

It will not be shared with or given to anyone. The knowledge that we get from this study will be shared with you before it is made widely available to the public. Confidential information will not be shared.

(14) Right to Refuse or Withdraw

You do not have to take part in this research if you do not wish to do so. You may also stop participating in the research at any time you choose. It is your choice and all of your rights will still be respected.

(15) Who to Contact

If you have any questions you may ask them now or later, even after the study has started. If you wish to ask questions later, you may contact any of the following: Dr. Pyae Linn Aung, Ph.D. Candidate, College of Public Health Sciences, Chulalongkorn University, Address: 135, PatheinMyay 5th Street, Dawbon, Yangon, Mobile: +95 9 518 7 520, Email: pyaelinnag@gmail.com.

This proposal has been reviewed and approved by Institutional Technical and Ethical Review Board, the University of Public Health, which is a committee whose task is to make sure that research participants are protected from harm. If you wish to find out more about the Committee, contact the secretary of the committee at University of Public Health, Yangon, No 246, Myoma Kyaung Street, Latha Township, Yangon, 11131. Office Phone +95 1395213, +951395214 ext: 23/25.

PART II: Certificate of Consent

I have been invited to participate in the assessment of malaria infection under the research project of "The Village Based Malaria Elimination Model to Interrupt Transmission of Malaria in Banmauk Township, Myanmar". I understand that it will involve me receiving blood sample collection for the purpose of RDTs examination, slide preparation and for filter paper spot collection. According to the procedure of this study, I realize that the blood sample collection will take place at least three times with 3 months interval. I have been informed that the risks are minimal and may include pain at the finger. I am aware that there may be no benefit to either myself personally and that I will be compensated for my time. I have been provided with the name of an investigator who can be easily contacted using the number I was given for that person.

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this surveillance study and understand that I have the right to withdraw from the surveillance study at any time without in any way affecting my medical care.

Name of Participant_____

Signature of Participant _____

Date Day/month/year _____

If illiterate

A literate witness must sign (if possible, this person should be selected by the participant and should have no connection to the study team).

I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Name of witness_____

Signature of witness _____

Date (Day/month/year) _____

I have accurately read or witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Name of Researcher_____

Signature of Researcher _____

Date (Day/month/year) _____

A copy of this Informed Consent Form has been provided to participant _____ (initialed by the researcher/assistant)

APPENDIX J

Information to be provided to the subject before taking biological material
(English)

"The Village Based Malaria Elimination Model to Interrupt Transmission of Malaria
in Banmauk Township, Myanmar"

The following information should be provided to the subjects before collecting the biological material from them.

Type of sample, how it will be obtained

If you agree with an agreement to participate, your/your child's personal information such as name, age, sex, and address will be recorded. Then the blood sample will be collected from your fingertip to find malaria parasite by RDT and on a slide as usual by a volunteer but this time collected more on filter paper. You will ask to participate 3 times on that day, after 3 months and 6 months for follow up routine sample collection. At this time all household members will be check with RDT and Microscopy.

Type of consent to be obtained (Explain briefly)

Consent/Assent will be obtained. Your sample will be used for this research.

Whether identity will be retained or not? (Explain briefly)

The identity of the sample will be retained with code. The code will be linked between your personal and research data. If you agree to use your sample in future research, the sample will be retained for one year with code only. If you don't agree, the code will be removed and destroyed at the end of the study.

How will confidentiality be ensured?

Your samples, personal and clinical information and results will be retained by code to keep your personal identity as a secret. The samples will be kept securely by the researcher. Only the researchers will know the code list and how to link and access the research data. We will keep confidential your name, any other person and information about you.

CONSENT FOR USE OF HUMAN BLOOD, BODY FLUIDS FOR TISSUE GIVEN FOR RESEARCH

I consent the use of my/my child's specimen of blood for the following research project. Name of Project: "The Village Based Malaria Elimination Model to Interrupt Transmission of Malaria in Banmauk Township, Myanmar"

If any of my/my child's specimen is left over after this research project has been completed.

I give permission for the left-over sample to be kept for future research only for one year that is related to the research study, understanding that my/my child's identity has been removed from the sample.

Name of the participant   _____

Name of the parent or guardian   _____

Signature of participant/parent or guardian   _____

Date   _____

APPENDIX K

Informed Consent Form (Adults) (Myanmar)

စမ်းသပ်ခံပုဂ္ဂိုလ်၏ ခွင့်ပြုလွှာ (လူကြီး)

စစ်ကိုင်းတိုင်း၊ ဗန်းမောက်မြို့နယ်၊ .... ကျေးရွာတွင်နေထိုင်သူများ၏ ငှက်ဖျားရောဂါပိုးရှာဖွေခြင်း သုတေသနတွင် ပါဝင်ကူညီမည့် စမ်းသပ်ခံ ပုဂ္ဂိုလ်၏ ခွင့်ပြုလွှာပုံစံ။

အဓိကသုတေသီ ဒေါက်တာပြည့်လင်းအောင်

သုတေသနအဖွဲ့အစည်းအမည် ပါရဂူကျောင်းသား၊ ပြည်သူ့ကျန်းမာရေးပညာဌာန၊ ချူလာလောင်ကွန်းတက္ကသိုလ်

ထောက်ပံ့သည့် အဖွဲ့အစည်းအမည် ချူလာလောက်ကွန်းတက္ကသိုလ် နှစ် ၉၀ ပြည့်အထိမ်းအမှတ် အထောက်အပံ့

သုတေသနစီမံချက်အမည် ကျေးရွာအဆင့်ငှက်ဖျားကူးစက်မှုလျှော့ချခြင်း

ဤစမ်းသပ်ခံပုဂ္ဂိုလ်၏ ခွင့်ပြုလွှာတွင် နှစ်ပိုင်းပါဝင်ပါသည်။
၁) သုတေသနဆိုင်ရာရှင်းလင်းချက် (ပါဝင်စမ်းသပ်ခံများ သိသင့်သော အချက်များ)
၂)သိရှိကြောင်း မှတ်တမ်းတင် လက်မှတ်ရေးထိုးပုံစံ (ပါဝင်စမ်းသပ်ခံရန် သဘောတူကြောင်း လက်မှတ် ရေးထိုးရန်)။ ပါဝင်စမ်းသပ်ခံများအနေဖြင့် သဘောတူသိရှိကြောင်းပုံစံမိတ္တူတစ်စောင် ရရှိပါမည်။

အပိုင်း (က) သုတေသနဆိုင်ရာရှင်းလင်းချက်

၁။ **နိဒါန်း ။ ။** ကျွန်တော် ဒေါက်တာပြည့်လင်းအောင်သည် ပါရဂူဘွဲ့ကျောင်းသားတစ်ဦးဖြစ်ပြီး ဘွဲ့ရရှိရန်လိုအပ်ချက်ဖြစ်သော စာတမ်းလုပ်ဆောင်ခြင်းအတွက် စစ်ကိုင်းတိုင်း ဗန်းမောက်မြို့နယ်တွင် ကျေးရွာအဆင့်ငှက်ဖျားကူးစက်မှု လျှော့ချခြင်းအပေါ် သုတေသနပြုလုပ်ရာတွင် ပါဝင် ဆောင်ရွက်နေပါသည်။ ပထမဦးစွာ ယခုပြုလုပ်မည့် သုတေသနလုပ်ငန်းအကြောင်း ရှင်းပြ ပါမည်။ ဤသုတေသနလုပ်ငန်းတွင် ပါဝင်ကူညီပါရန် ဖိတ်ခေါ်ပါသည်။ ထိုသို့ကူညီရန်အတွက်လည်း အခြား သူများနှင့်လည်း တိုင်ပင်နိုင်ပါသည်။

ကြ၍ရှင်းလင်းချက်တွင် ပါဝင်သော ပညာရပ်ဆိုင်ရာစကားလုံးများကို မရှင်း လင်းခြင်း၊ နားမလည်ခြင်းများရှိပါက သင်ကျေနပ်သည်အထိ ရှင်းလင်း ဆွေးနွေးပေးမည် ဖြစ်ပါသည်။

၂။ ရည်ရွယ်ချက်။ ။ မြန်မာနိုင်ငံတွင် အဖြစ်များပြီး အန္တရာယ်ရှိသော ရောဂါဖြစ်သည့် ငှက်ဖျားရောဂါကို သိရှိစေရန်အတွက် သွေးစစ်ဆေးခြင်းနည်းအမျိုးမျိုးဖြင့် အနီးကပ်စောင့်ကြည့် သုတေသနပြုလုပ်သွားမည် ဖြစ်ပါသည်။

၃။ သုတေသနလုပ်ငန်းဆောင်ရွက်ပုံ ။ ။ သုတေသန တွင်ပါဝင်သူတိုင်းကို ကိုယ်အပူချိန်၊ တိုင်းတာမှတ်သားပေးမည် ဖြစ်ပါသည်။ သွေးဖောက်မည့်နေရာကို အရက် ပျံဆွတ်ဂွမ်းဖြင့် ဆေးကြောပြီး လက်ထိပ်ပိုင်းကို ညှစ်ကာ တစ်ခါသုံးသွေးဖောက်အပ်ဖြင့် ဖောက်ပါမည်။ သွေး မှန်ပြားတွင် သွေး၃စက်မှ၅စက်အထိယူဆေးဆိုးကာ အဏုကြည့်မှန်ပြောင်းဖြင့်ကြည့်ခြင်း၊ သွေးစစ်ကိရိယာ ဖြင့် စစ်ကြည့်ခြင်း၊ သွေးအားသွေးစုပ်စက္ကူဖြင့်သွေးယူခြင်းများပြုလုပ်ပါမည်။

သွေးဖောက်စစ်ဆေးခံရခြင်းကြောင့် အချိန်ပေးရခြင်း၊ သွေးဖောက်သော လက်ထိပ်နေရာတွင် နာကျင်ခြင်း များရှိနိုင်ပါသည်။ ထိုသို့နာကျင်ခြင်းမှာလည်း တစ်ရက်အကြာတွင် သက်သာ သွားပါမည်။ စေတနာ့ဝန်ထမ်းငှက်ဖျား လုပ်သားကို လေ့ကျင့်သင်ကြား မွမ်းမံသင်တန်းများ ပေးထားပြီးဖြစ်ပြီး ရွာတွင်သွေး ဖောက်စစ်ဆေးနေသည့် အတိုင်း ဖောက်ယူပါမည်။ သွေးမှန်ပြား နှင့် သွေးစုပ်စက္ကူ ပေါ်တင်ခြင်းသာပိုလာခြင်း ဖြစ်ပါသည်။ သုတေသန၏ သဘောတရားအရ ငှက်ဖျားသွေးဖောက်ယူခြင်းကို ယခုတစ်ကြိမ်အပါအဝင် ၃ လခြား၍ စုစုပေါင်း ၃ ကြိမ်တိတိ ဆက်လက်ဆောင်ရွက်မည်ဖြစ်ပါသည်။

၄။ သုတေသနတွင်ပါဝင်ရန်ရွေးချယ်ပုံ။ ။ ကျေးရွာအတွင်း ၁၄ ရက်ကျော် နေထိုင်ပြီး အသက် ၁နှစ်အထက်ရှိသော အစရှိသည့် သတ်မှတ်ထားသော စံနှုန်းနှင့် ကိုက်ညီသည့် ကျားမ မရွေး လူကြီးများအားယခုသုတေသနတွင် ပါဝင်ရန်ဖိတ်ခေါ်မည် ဖြစ်ပါသည်။

၅။ သုတေသနတွင်ပါဝင်လိုမှု ။ ။ ယခုသုတေသန တွင်ပါဝင်ကူညီခြင်းသည် မိမိ၏သဘောဆန္ဒအလျောက်သာ ဖြစ်ပါသည်။ ယခုသုတေသန တွင်ပါဝင်သည်ဖြစ်စေ၊ မပါဝင်သည်ဖြစ်စေ ကျန်းမာရေးစောင့်ရှောက်မှု ပေးရာတွင်ကွာခြားမည် မဟုတ်ပါ။ သုတေသနတွင်ပါဝင်ပြီးမှ မိမိဆန္ဒအလျောက် နုတ်ထွက်လိုပါကလည်း နုတ်ထွက်နိုင်ပါသည်။

၆။ ကြာမြင့်ချိန် ။ ။မေးခွန်းမေးမြန်းသည်မှ သွေးစစ်**ကိ**ရိယာမှ အဖြေထွက်သည် အထိ မိနစ် ၃၀ ခန့်ကြာပါမည်။

၇။ ဖြစ်ပေါ်နိုင်သည့် ဘေးထွက်ဆိုးကျိုးများ ။ ။ ဘေးထွက်ဆိုးကျိုးမရှိပါ။ ခေါင်းကိုက်ခြင်း၊ ခေါင်းမူးခြင်း၊အဆစ်/ကြွက်သားနာခြင်း၊ အိပ်မပျော်ခြင်း၊ နွမ်းနယ်ခြင်း၊ အန်ခြင်း၊ အစားအသောက်ပျက်ခြင်း အလွန်နည်းပါးစွာတွေ့ရတတ်ပါသည်။ ဖြစ်ပေါ်ပါကလည်း အနီးကပ်စောင့်ရှောက်ပေးပြီး လိုအပ်ပါက လက္ခဏာ သက်သာစေသည့် အခြားဆေးများပေးခြင်း၊ ငှက်ဖျားဆေး ဆက်မပေးခြင်းတို့ကို ပြုလုပ်ပါမည်

၈။ အန္တရာယ်ရှိမှု ။ ။ ဤသုတေသနတွင်ပါဝင်ခြင်းကြောင့် သင့်တွင် ပုံမှန်ရှိနေသော အခြေအနေ မှ ပြောင်းလဲသွားမည် မဟုတ်ပါ။ အမျိုးသားငှက်ဖျားရောဂါကုထုံး အတိုင်း အမျိုးသားငှက်ဖျားရောဂါတိုက်ဖျက်ရေးစီမံကိန်းမှ အသုံးပြုနေ သောဆေးများဖြစ်ပြီး ဘေးထွက်ဆိုးကျိုးမရှိပါ။ သင့်အနေဖြင့် သုတေသနအဖွဲ့ကိုဆက်သွယ်နိုင်မည့် ဖုံးနံပတ် ပေးထားမည်ဖြစ်သလို မြို့နယ်ရှိ သုတေသနဆေးခန်းသို့ လည်းလာရောက်နိုင်ပါသည်။

၉။ စိတ်မသက်မသာဖြစ်မှု၊ ထိခိုက်နိုင်မှု နှင့် ကိုယ်စိတ် အနှောင့်အယှက်ဖြစ်စေမှုများ။ ။ သင်နှင့် ပတ်သက်သည့် မေးခွန်းများတွင် ကိုယ်ရေးကိုယ်တာ အချက်အလက်များပါသောကြောင့် စိတ်အနှောင့်အယှက်ကြုံတွေ့နိုင်ပါသည်။ ထိုအခါ ယင်းမေးခွန်းကို မဖြေကြားဘဲထားနိုင်ပါသည်။

၁၀။ အကျိုးကျေးဇူး။ ။ သုတေသနတွင်ပါဝင်ခြင်းကြောင့် မိမိတွင်စွဲကပ်နေသော ငှက်ဖျားပိုးကို အမျိုးအမည်တိကျ စွာအချိန်တို အတွင်းသိနိုင်ခြင်း၊ သုတေသနရလဒ်များကြောင့် လူသားအားလုံးနှင့် နောင်လာနောင် သားများအတွက် အဖိုးမ ဖြတ်နိုင်သော အကျိုးကျေးဇူးများရရှိနိုင်မည် ဖြစ်ပါသည်။

၁၁။ ကျေးဇူးတုံ့ပြန်မှု။ ။ ဤသုတေသနတွင်ပါဝင်သူများကို အချိန်ကုန်ခံရမှုအတွက် လက်ဆောင်ပစ္စည်း ပေးခြင်း များ ပြုလုပ်မည် မဟုတ်ပါ။

၁၂။လျှို့ဝှက်ထားရှိမှု။ ။ စေတနာ့ဝန်ထမ်း ငှက်ဖျား လုပ်သား များမှပုံမှန် လုပ်ဆောင်နေသောလုပ်ငန်းဖြစ်၍ လူထု အတွင်းတွင် ထူးခြားမှုရှိမနေပါ။ သုတေသနမှ ရရှိသော အချက်အလက်များကို သုတေသီအဖွဲ့ဝင်များမှလွဲ၍ အခြားသူများကို အသိပေးမည် မဟုတ်ပါ။ အချက်အလက်အလက်များကို မှတ်တမ်း တင်ရာတွင် သုတေသနတွင်ပါဝင်စမ်းသပ်ခံ သူများ၏ အမည်အစား လျှို့ဝှက်နံပါတ်များဖြင့်သာ မှတ်သားထားပြီး ယင်းမှတ်တမ်းများကို သေချာစွာ သော့ခတ်သိမ်းဆည်းထားပါမည်။

၁၃။ အဖြေများကိုမျှဝေခြင်း။ ။ သုတေသနမှရရှိသော ရလဒ်များကို ပြည်သူလူထုနှင့် စိတ်ပါဝင်စားသော သုတေသီများသိ ရှိနိုင်ရန် အတွက်တင်ပြပေးမည် ဖြစ်ပါသည်။

၁၄။ သုတေသနတွင်ပါဝင်ရန်ငြင်းဆန်ခွင့်။ ။ သင့်အနေဖြင့်ဤသုတေသနတွင် ပါဝင်ခြင်း/ မပါဝင် ခြင်းကိုလွတ်လပ်စွာ လက်ခံခွင့်/ငြင်းဆန်ခွင့် ရှိပါသည်။ ထိုပြင်ပါဝင်ပြီးနောက်တွင်လည်း သင့်အနေဖြင့် အချိန်မရွေး သုတေသနတွင်ပါဝင်ခြင်း မှရပ်ဆိုင်းနိုင်ပါသည်။

၁၅။ ငြင်းဆန်သော်လည်းရပိုင်ခွင့်ရှိမှု။ ။ သုတေသနတွင် ပါဝင်ရန်ငြင်းဆန်ခြင်း၊ ပါဝင်ပြီးမှ ရပ်ဆိုင်းခြင်းကြောင့် စေတနာ့ဝန်ထမ်းငှက်ဖျားလုပ်သားထံမှ နှင့် အခြားကျန်းမာရေးဌာနများမှ ပုံမှန် ရရှိနေသော ကျန်းမာရေးစောင့်ရှောက်မှုများအား အဟန့်အတား ဖြစ်စေမည် မဟုတ်ပါ။

၁၆။ဆက်သွယ်ရန်။ ။ ဤသုတေသနလုပ်ငန်းနှင့် ပတ်သက်၍ မေးမြန်းဆွေးနွေးလိုပါက ဒေါက်တာ ပြည့်လင်းအောင်၊ ပါရဂူကျောင်းသား၊ ပြည်သူ့ကျန်းမာရေးပညာဌာန၊ ချူလာလောင်ကွန်းတက္ကသိုလ်၊ အမှတ် ၁၃၅၊ ပုသိမ်မြေ ၅ လမ်း၊ ဒေါပုံမြို့နယ်၊ ရန်ကုန်မြို့၊ တယ်လီဖုံးအမှတ် ၀၉၅၁၈၇၅၂၀ သို့ဆက်သွယ် အကြောင်းကြား နိုင်ပါသည်။ ဤအဆိုပြုချက်သည် သုတေသနည်းပညာနှင့် ကျင့်ဝတ်ကော်မတီ ပြည်သူ့ကျန်းမာရေးတက္ကသိုလ်၊ ရန်ကုန်၏ ဆန်းစစ်သဘောတူ အတည်ပြုချက်ရပြီးဖြစ်သည်။ အကယ်၍ သင်သည် ကော်မတီနှင့် ပတ်သက်၍ သိလိုသည်များရှိလျှင် အတွင်းရေးမှူး(ကော်မတီ)၊ ပြည်သူ့ကျန်းမာရေးတက္ကသိုလ်၊ရန်ကုန် အမှတ်(၂၄၆)၊ မြို့မကျောင်းလမ်း၊ လမ်းမတော်မြို့နယ်၊ ရန်ကုန် စာတိုက်သေတ္တာအမှတ်၊ ၁၁၁၃၁ ဖုန်း၊ ၀၁-၃၉၅၁၃၁၊ ၀၁-၃၉၅၁၃၄ ၊ လိုင်းခွဲ(၂၃)/လိုင်းခွဲ(၂၅)သို့ ရုံးချိန်အတွင်း ဆက်သွယ်နိုင်ပါသည်။

အပိုင်း (ခ) စမ်းသပ်ခံပုဂ္ဂိုလ်၏ သဘောတူညီချက်

ကျွန်တော် ၊ ကျွန်မသည် "ကျေးရွာအဆင့်ငှက်ဖျားကူးစက်မှုလျှော့ချခြင်း သုတေသနစီမံချက်" ၏ မြန်မာနိုင်ငံတွင် အဖြစ်များပြီး အန္တရာယ်ရှိသော ရောဂါဖြစ်သည့် ငှက်ဖျားရောဂါကို သိရှိစေရန်အတွက် သွေးစစ်ဆေးခြင်းနည်းအမျိုးမျိုးဖြင့် အနီးကပ်စောင့်ကြည့် သုတေသနပြုရာတွင် ပါဝင်ရန် သဘောတူညီပါသည်။ သုတေသန၏ သဘောတရားအရ ငှက်ဖျားသွေးဖောက်ယူခြင်းကို ယခုတစ်ကြိမ်အပါအဝင် ၃ လခြား၍ စုစုပေါင်း ၃ ကြိမ်တိတိ ဆက်လက်ဆောင်ရွက်မည်ဖြစ် ကြောင်းကိုလဲသိရှိပါသည်။ လက်ထိပ်မှ သွေးအနည်းငယ်ဖောက်ယူ သော အခါအနည်းငယ် နာသည်မှအပ အန္တရာယ်မရှိကြောင်း သိရှိပါသည်။ ဤသုတေသနတွင် ပါဝင်ခြင်း ဖြင့်အချိန်ကုန်မှုအတွက် ကိုယ်ကျိုးတစ်စုံ တစ်ရာရမည် မဟုတ်ကြောင်း သိရှိပါသည်။ အကြောင်းထူးရှိပါက ဆက်သွယ် ရမည့် သုတေသီ အမည်၊ လိပ်စာ နှင့် တယ်လီဖုန်းနံပါတ်ကို ကောင်းစွာသိရှိပါသည်။

ဤသုတေသန၏ ရည်ရွယ်ချက်၊ သဘာဝနှင့် အကျိုးတရားများကို ကောင်းစွာ သဘောပေါက်ပါသည်။ မရှင်း လင်း သည်များကိုလည်း ကျွန်တော်၊ ကျွန်မကျေနပ်သည်အထိ ဖြေရှင်းရရှိပြီး ဖြစ်ပါသည်။ ကျွန်တော်၊ ကျွန်မ သည် မိမိ၏သဘောဆန္ဒအလျောက် ပါဝင်ရန် သဘောတူညီပါသည်။ ဤသုတေသနမှ မည်သည့် အကြောင်း ပြချက်မှ မပေးဘဲ အချိန်မရွေး နုတ်ထွက်ခွင့် ရှိကြောင်း သိရှိပါသည်။ ထိုသို့နုတ်ထွက် ခြင်း ကြောင့် ကုသခံစား ခွင့် တစ်စုံတစ်ရာ ဆုံးရှုံးမည် မဟုတ်ကြောင်း သိရှိပါသည်။

စမ်းသပ်ခံပုဂ္ဂိုလ်အမည် _____

လက်မှတ်၊ ရက်စွဲ _____

(စာတတ်မြောက်ခြင်း မရှိပါက စာတတ်မြောက်သော အသိသက်သေတစ်ဦးကို ရွေးချယ်ပါမည်။ ထိုအသိသက် သေကို စမ်းသပ်ခံပုဂ္ဂိုလ်ကသာ ရွေးချယ် ရပါမည်။ သုတေသီနှင့် သုတေသနအဖွဲ့ဝင်များ မဖြစ်ရပါ။)

ကျွန်တော်၊ ကျွန်မသည် ဤစမ်းသပ်ခံပုဂ္ဂိုလ်၏ သဘောတူညီချက်ကို သေချာစွာ ဖတ်ရှုပြီး သုတေသနလုပ်ငန်း တွင်ပါဝင်ကူညီမည့်သူကို သေချာစွာ မေးမြန်းပြီး ဖြစ်ပါသည်။ စမ်းသပ်ခံပုဂ္ဂိုလ် ၏ သဘောတူညီမှုကို လွတ်လပ်စွာ ဆုံးဖြတ်စေပါသည်။

အသိသက်သေအမည် _____ စမ်းသပ်ခံပုဂ္ဂိုလ်၏ လက်မပုံစံ

လက်မှတ်၊ ရက်စွဲ _____ ▢

စမ်းသပ်ခံ ပုဂ္ဂိုလ်၏ သဘောတူညီချက်ကို ကာယကံရှင်မှသော်လည်းကောင်း၊ အသိသက်သေမှတစ်ဆင့် သော် လည်းကောင်း သေချာစွာဖတ်ရှုစေပြီး ဖြစ်ပါသည်။ မေးမြန်းသော မေးခွန်းများကို လည်းကျေနပ်သည် အထိဖြေ ကြားပြီးဖြစ်ပါသည်။ စမ်းသပ်ခံပြုပုဂ္ဂိုလ်ကို လွတ်လပ်စွာ ဆုံးဖြတ်စေပြီးမှ ဤသဘောတူညီချက်ကို ရယူခြင်း ဖြစ်ပါသည်။

သုတေသီအမည် _____

လက်မှတ်၊ ရက်စွဲ _____

စမ်းသပ်ခံပုဂ္ဂိုလ်၏ ခွင့်ပြုလွှာ မိတ္တူတစ်စောင်ကို သုတေသီ၏ သုတေသနအဖွဲ့ဝင် တစ်ဦးမှ လက်မှတ်ရေးထိုး ပြီး စမ်းသပ်ခံမည့် ပုဂ္ဂိုလ်သို့ ပေးအပ်ပါသည်။

APPENDIX L

Information to be provided to the subject before taking biological material (Myanmar)

သုတေသနတွင်ပါဝင်မည့်သူအားသွေးနမူနာများမယူခင် အကြောင်းကြားချက်

၁။ သွေးနမူနာ အမျိုးအစား၊ ရယူမည့်နည်း၊

သုတေသနတွင်ပါဝင်ရန် သဘောတူညီမှု ရယူပြီးနောက် သင်/သင့်ကလေး၏ အမည်၊ အသက်၊ လိင် နှင့် လိပ်စာတို့ကိုရယူပါမည်။ စေတနာ့ဝန်ထမ်းငှက်ဖျားလုပ်သားများ မှ ငှက်ဖျားပိုးရှိ/မရှိ သွေးအမြန်စစ်ကရိယာ ဖြင့် စစ်ဆေးနေကြသည့် အတိုင်းစစ်ဆေးမှု လုပ်ဆောင်မည်ဖြစ်ပြီး သုတေသနအတွက် သင်၏လက်ထိပ်မှ သွေးနှစ်စက်သုံးစက်အား သွေးစုပ်စက္ကူတွင် ထပ်မံရယူခြင်းသာ ပိုလာပါသည်။ တရှူးလုံးအား ဖြန့်ကြက်လေ့လာခြင်းကို ၃ လခြား၍ စုစုပေါင်း ၃ ကြိမ်တိတိပြုလုပ်သွားမည်ဖြစ်ပါသည်။။ ဤအချိန်တွင် အိမ်ထောင်စုဝင် အားလုံး အား သွေးအမြန်စစ်ကရိယာနှင့်သွေးမှုန်ပြားတို့ဖြင့် စစ်ဆေးမည်ဖြစ်ပါသည်။ င်းသွေးပြန်ကြောမှ သွေး လွှက်စားဇွန်း တဇွန်းခန့် ဖောက်ယူ ပါမည်။

၂။ စမ်းသပ်ခံပုဂ္ဂိုလ်၏ သဘောတူညီချက်

သုတေသနတွင်ပါဝင်ရန် သင်/သင်၏ကလေးအတွက် သင့်ထံမှသဘောတူညီချက် နှင့် ကလေး၏ သဘောတူညီချက် ရယူပါမည်။ သင့်/သင်၏ကလေးထံမှဖောက်ယူသော သွေးနမူနာများသည် သုတေသန ဆောင်ရွက်ရန် အတွက်သာဖြစ်ပါသည်။

၃။ အမှတ်အသားများကို သိမ်းဆည်းမှု ရှိ/မရှိ အခြေအနေ

သင့်/သင်၏ကလေး၏အမှတ်အသားများ ကို ကုတ်နံပါတ်ဖြင့်သာ မှတ်သားထားပါသည်။ ကုတ်နံပါတ်ဖြင့်သာ သင့်/သင်၏ကလေး၏ သုတေသန အချက်အလက်များကိုသိရှိနိုင်ပြမည်။သင်သဘောတူပါက ဤသုတေသန လုပ်ငန်းတွင် အသုံးပြုပြီးနောက် ကျန်ရှိနေသော သင့်/သင်၏ကလေး၏သွေးကို နောင်တွင် ပြုလုပ်မည့် သုတေသန လုပ်ငန်းများတွင် အသုံးပြုရန်ကုတ်ဖြင့်သာ ၁နှစ် သိမ်းဆည်းထားပါမည်။ သင်ခွင့်မပြုပါက သုတေသနလုပ်ငန်း အပြီးတွင် စွန့်ပစ်ဖျက်စီးပါမည်။

၄။ လျှို့ဝှက်ထားရှိမှု

သုတေသနမှ ရရှိသော အချက်အလက်များကို သုတေသီအဖွဲ့ဝင်များမှလွဲ၍ အခြားသူများကို အသိပေးမည် မဟုတ်ပါ။ အချက်အလက်အလက်များကို မှတ်တမ်း တင်ရာတွင် သုတေသနတွင်ပါဝင်စမ်းသပ်ခံ သူများ၏ အမည်အစား လျှို့ဝှက်နံပါတ်များဖြင့်သာ မှတ်သားထားပြီး ယင်းမှတ်တမ်းများကို သေချာစွာ သော့ခတ်သိမ်းဆည်းထားပါမည်။

သုတေသနတွင်ပါဝင်သော လူသားများထံမှ သွေး၊ ခန္ဓာကိုယ်မှ အရည်နှင့်တစ်သျှူးများကို သုတေသနတွင်အသုံးပြုရန် သဘောတူညီချက်

ကျွန်တော်/ကျွန်မ၏ သွေးကို အောက်ပါ သုတေသနလုပ်ငန်းတွင် အသုံးပြုရန် သဘောတူပါသည်။

သုတေသနလုပ်ငန်းအမည်။ "ကျေးရွာအဆင့်ငှက်ဖျားကူးစက်မှုလျှော့ချခြင်း သုတေသနစီမံချက်" ပြုရာတွင် ဤသုတေသနလုပ်ငန်းတွင် အသုံးပြုပြီးနောက် ကျန်ရှိနေသော ကျွန်တော်/ကျွန်မ၏သွေးကို နောင်တွင် ပြုလုပ်မည့် သုတေသနလုပ်ငန်းများတွင် အသုံးပြုရန် သိမ်းဆည်းထားခြင်းကို ခွင့်ပြုသော်လည်း ၁နှစ် ကာလကျော်လွန်ပါက စွန့်ပစ်စေလိုပါသည်။ ကျွန်တော်/ကျွန်မ၏ အမှတ်အသားများကိုလည်း ဖျက်ဆီး စေလိုပါသည်။

အမည် ....

မိဘ/အုပ်ထိန်းသူ ၏ အမည် ....

လက်မှတ် ....

ရက်စွဲ ....

APPENDIX M

Informed Consent Form (English)

Informed consent form for Parents/ Guardians of the child who resides in the-----------village, Banmauk Area, Sagaing Region for more than 14 days who we are inviting to participate in the assessment of malaria parasites and species by RDT, microscopy, filter paper for PCR and HS-RDT.

Name of Principal Investigator	**- Dr. Pyae Linn Aung**
Name of Organization	**-** PhD Candidate
	Chulalongkorn University, Thailand
Name of Sponsor	**-** 90th Anniversary of Chulalongkorn University, Rachadapisek Sompote Fund

Title of the Project: "The Village Based Malaria Elimination Model to Interrupt Transmission of Malaria in Banmauk Township, Myanmar"

This Informed Consent Form has two parts:

• Information Sheet (to share information about the research with you)

• Certificate of Consent (for signatures if you agree to take part)

You will be given a copy of the full informed consent form.

PART I: Information Sheet

(1) Introduction

      My name is Dr. Pyae Linn Aung, and I am studying for the Doctor of Philosophy in Public Health, College of Public Health Sciences, Chulalongkorn University. To fulfill the degree requirement, now I am doing a malaria prevalence study by active case detection approach for at least 3 times with 3 months interval, which is very common in this country. I am going to give you information and invite your child to participate in this surveillance study. Before you decide, you can talk to anyone you feel comfortable with. There may be some words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have questions later, you can ask them of me, the study doctor or the staff.

(2) Purpose

Malaria is one of the most common and dangerous diseases in your areas and also in this region. The purpose of this study is to confirm that the true prevalence of malaria infection in your community by means of different malaria diagnostic tools.

(3) Type of Research Intervention and Procedure

This research involves the taking of the finger prick blood sample to detect malaria infection. The fever will be measured and then two or three drops blood will be taken from your child's finger under sterile condition onto an RDTs, piece of paper and on glass slides which will be used to find and count the parasite in the blood smear. In the meantime, your child may feel pain when the needle sticks but this will go away very quickly. Your child may need to spend some time as a routine procedure done by malaria volunteer when your child has a fever. 2-3 drops of fingertip blood will be collected for slide preparation and for filter paper spot collection. As a procedure of this study, the blood sample will be taken for two more times after 3 months from now and again after 6 months.

(4) Participant selection

We are inviting all child who with or without fever and has who matched with inclusion criteria for this study.

(5) Voluntary Participation

Your decision to have your child participate in this study is entirely voluntary. It is your choice whether your child to participate or not. If you choose not to consent, all the services your child receive at this clinic/malaria post will continue and nothing will change. You may also choose to change your mind later and stop participating, even if you agreed earlier, and the services your child receive at the clinic will continue.

(6) Duration

The procedure for all taking a sample from your child will last less than 30 mins.

(7) Risks

By participating in this research, it is possible that your child will not be at greater risk than you would otherwise be. While the possibility of this happening is very low, your child should still be aware of the possibility. We will give you a telephone number to call if you notice anything out of the ordinary, or if you have concerns or

questions. You can also come to this health facility at any time and ask to see the Medical Officer.

(8) Discomforts

By participating in this research it is possible that your child may experience some discomfort such as a result of repeated blood sample taking from the finger's tip.

(9) Benefits

If your child participates in this study, he/she will have the following benefits: any illnesses related to malaria or to the malaria treatment will be treated free. There may not be any other benefit for your child but your child's participation is likely to help us find the answer to the surveillance study and this will benefit to the community and to the future generations.

(10) Side Effects of anti-malaria medicines

There is no marked side effect. The uncommon side effects like headache, dizziness, weakness, muscle or joint pain, tiredness, difficulty falling asleep or staying asleep, vomiting, and loss of appetite may occur. Although the possibility is very unlikely, we will follow you closely and keep track of any unwanted effects or any problems. We may need to use some other medicine to treat the symptoms of the side effects or reactions. Or we may stop the use of one or more drugs.

(11) Incentives

Your child will not be provided an incentive to take part in this study except to the reasonable amount of time compensation.

(12) Confidentiality

With this study, something out of the ordinary is being done in your community. It is not possible that if others in the community are aware because volunteers are checking malaria positive cases as usual. We will not be sharing the identity of those participating in this study. The information that we collect from this study will be kept confidential. Information about your child that will be collected from the study will be put away and no-one but the team involved in the study will be able to see it. Any information about your child will have a number on it instead of your child's name. Only the study team members will know what your child number is and we will lock that information up with a lock and key.

(13) Sharing the Results

It will not be shared with or given to anyone. The knowledge that we get from this study will be shared with you before it is made widely available to the public. Confidential information will not be shared.

(14) Right to Refuse or Withdraw

Your child does not have to take part in this research if you do not wish to do so. You may also stop participating in the research at any time you choose. It is your choice and all of your rights will still be respected.

(15) Who to Contact

If you have any questions you may ask them now or later, even after the study has started. If you wish to ask questions later, you may contact any of the following: Dr. Pyae Linn Aung, Ph.D. Candidate, College of Public Health Sciences, Chulalongkorn University, Address: 135, PatheinMyay 5th Street, Dawpon, Yangon, Mobile: +95 9 518 7 520, Email: pyaelinnag@gmail.com.

This proposal has been reviewed and approved by Institutional Technical and Ethical Review Board, University of Public Health, which is a committee whose task is to make sure that research participants are protected from harm. If you wish to find out more about the Committee, contact the secretary of the committee at University of Public Health, Yangon, No 246, Myoma Kyaung Street, Latha Township, Yangon, 11131. Office Phone +95 1395213, +951395214 ext: 23/25.

PART II: Certificate of Consent

I have been invited for my child to participate in the assessment of malaria infection under the research project of "The Village Based Malaria Elimination Model to Interrupt Transmission of Malaria in Banmauk Township, Myanmar". I understand that it will involve my child receiving blood sample collection for the purpose of RDTs examination, slide preparation and for filter paper spot collection. According to the procedure of this study, I realize that the blood sample collection will take place at least three times with 3 months interval. I have been informed that the risks are minimal and may include pain at the finger. I am aware that there may be no benefit to either my child personally and that I will be compensated for my time. I have been provided for

my child with the name of an investigator who can be easily contacted using the number I was given for that person.

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily for my child to participate as a participant in this surveillance study and understand that I have the right to withdraw from the surveillance study at any time without in any way affecting my medical care.

Name of Participant_____

Signature of Participant _____

Date Day/month/year _____

If illiterate

A literate witness must sign (if possible, this person should be selected by the participant and should have no connection to the study team).

I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Name of witness_____

Signature of witness _____

Date (Day/month/year) _____

I have accurately read or witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Name of Researcher_____

Signature of Researcher _____

Date (Day/month/year) _____

A copy of this Informed Consent Form has been provided to participant _____ (initialed by the researcher/assistant)

APPENDIX N

Informed Consent Form (Myanmar)

စမ်းသပ်ခံကလေး၏မိဘ/အုပ်ထိန်းသူ၏ ခွင့်ပြုလွှာ

စစ်ကိုင်းတိုင်း၊ ဗန်းမောက်မြို့နယ်၊ .... ကျေးရွာတွင်နေထိုင်သူများ၏ ငှက်ဖျားရောဂါပိုးရှာဖွေခြင်း သုတေသနတွင် ပါဝင်ကူညီမည့် စမ်းသပ်ခံကလေး၏မိဘ/အုပ်ထိန်းသူ၏ ခွင့်ပြုလွှာပုံစံ။

အဓိကသုတေသီ ဒေါက်တာပြည့်လင်းအောင်

သုတေသနအဖွဲ့အစည်းအမည် ပါရဂူကျောင်းသား၊ ပြည်သူ့ကျန်းမာရေးပညာဌာန၊ ချူလာလောင်ကွန်းတက္ကသိုလ်

ထောက်ပံ့သည့် အဖွဲ့အစည်းအမည် ချူလာလောက်ကွန်းတက္ကသိုလ် နှစ် ၉ဝ ပြည့်အထိမ်းအမှတ် အထောက်အပံ့

သုတေသနစီမံချက်အမည် ကျေးရွာအဆင့်ငှက်ဖျားကူးစက်မှုလျှော့ချခြင်း

ကျွန်ုပ်စမ်းသပ်ခံပုဂ္ဂိုလ်၏ ခွင့်ပြုလွှာတွင် နှစ်ပိုင်းပါဝင်ပါသည်။

၁) သုတေသနဆိုင်ရာရှင်းလင်းချက် (ပါဝင်စမ်းသပ်ခံများ သိသင့်သော အချက်များ)

၂)သိရှိကြောင်း မှတ်တမ်းတင် လက်မှတ်ရေးထိုးပုံစံ (ပါဝင်စမ်းသပ်ခံရန် သဘောတူကြောင်း လက်မှတ် ရေးထိုးရန်)။ ပါဝင်စမ်းသပ်ခံများအနေဖြင့် သဘောတူသိရှိကြောင်းပုံစံမိတ္တူတစ်စောင် ရရှိပါမည်။

အပိုင်း (က) သုတေသနဆိုင်ရာရှင်းလင်းချက်

၁။ နိဒါန်း ။ ။ ကျွန်တော် ဒေါက်တာပြည့်လင်းအောင်သည် ပါရဂူဘွဲ့ကျောင်းသားတစ်ဦးဖြစ်ပြီး ဘွဲ့ရရှိရန်လိုအပ်ချက်ဖြစ်သော စာတမ်းလုပ်ဆောင်ခြင်းအတွက် စစ်ကိုင်းတိုင်း ဗန်းမောက်မြို့နယ်တွင် ကျေးရွာအဆင့်ငှက်ဖျားကူးစက်မှု လျှော့ချခြင်းအပေါ် သုတေသနပြုလုပ်ရာတွင် ပါဝင် ဆောင်ရွက်နေပါသည်။ ပထမဦးစွာ ယခုပြုလုပ်မည့် သုတေသနလုပ်ငန်းအကြောင်း ရှင်းပြ ပါမည်။ ဤသုတေသနလုပ်ငန်းတွင် ပါဝင်ကူညီပါရန် သင့်ကလေးအား ဖိတ်ခေါ်ပါသည်။ ထိုသို့ကူညီရန်အတွက်လည်း အခြား သူများနှင့်လည်း တိုင်ပင်နိုင်ပါသည်။ ဤရှင်းလင်းချက်တွင် ပါဝင်သော ပညာရပ်ဆိုင်ရာစကားလုံးများကို

မရှင်း လင်းခြင်း၊ နားမလည်ခြင်းများရှိပါက သင်ကျေနပ်သည်အထိ ရှင်းလင်း ဆွေးနွေးပေးမည် ဖြစ်ပါသည်။

၂။ ရည်ရွယ်ချက်။ ။ မြန်မာနိုင်ငံတွင် အဖြစ်များပြီး အန္တရာယ်ရှိသော ရောဂါဖြစ်သည့် ငှက်ဖျားရောဂါကို သိရှိစေရန်အတွက် သင့်ကလေးအား သွေးစစ်ဆေးခြင်းနည်းအမျိုးမျိုးဖြင့် အနီးကပ်စောင့်ကြည့် သုတေသနပြုလုပ်သွားမည် ဖြစ်ပါသည်။

၃။ သုတေသနလုပ်ငန်းဆောင်ရွက်ပုံ ။ ။ သုတေသန တွင်ပါဝင်သူတိုင်းကို ကိုယ်အပူချိန်၊ တိုင်းတာမှတ်သားပေးမည် ဖြစ်ပါသည်။ သွေးဖောက်မည့်နေရာကို အရက် ပျံ့ဆွတ်ဂွမ်းဖြင့် ဆေးကြောပြီး လက်ထိပ်ပိုင်းကို ညှစ်ကာ တစ်ခါသုံးသွေးဖောက်အပ်ဖြင့် ဖောက်ပါမည်။ သွေး မှန်ပြားတွင် သွေး၃စက်မှ၅စက်အထိယူဆေးဆိုးကာ အကျုကြည့်မှန်ပြောင်းဖြင့်ကြည့်ခြင်း၊ သွေးစစ်ကိရိယာ ဖြင့် စစ်ကြည့်ခြင်း၊ သွေးအားသွေးစုပ်စက္ကူဖြင့်သွေးယူခြင်းများပြုလုပ်ပါမည်။

သင့်ကလေးအား သွေးဖောက်စစ်ဆေးခံရခြင်းကြောင့် အချိန်ပေးရခြင်း၊ သွေးဖောက်သော လက်ထိပ်နေရာတွင် နာကျင်ခြင်း များရှိနိုင်ပါသည်။ ထိုသို့နာကျင်ခြင်းမှာလည်း တစ်ရက်အကြာတွင် သက်သာ သွားပါမည်။ စေတနာ့ဝန်ထမ်းငှက်ဖျား လုပ်သားကို လေ့ကျင့်သင်ကြား မွမ်းမံသင်တန်းများ ပေးထားပြီးဖြစ်ပြီး ရွာတွင်သွေး ဖောက်စစ်ဆေးနေသည့် အတိုင်း ဖောက်ယူပါမည်။ သွေးမှန်ပြား နှင့် သွေးစုပ်စက္ကူ ပေါ်တင်ခြင်းသာပိုလာခြင်း ဖြစ်ပါသည်။ သုတေသန၏ သဘောတရားအရ ငှက်ဖျားသွေးဖေါက်ယူခြင်းကို သင့်ကလေးအား ယခုတစ်ကြိမ်အပါအဝင် ၃ လခြား၍ စုစုပေါင်း ၃ ကြိမ်တိတိ ဆက်လက်ဆောင်ရွက်မည်ဖြစ်ပါသည်။

၄။ သုတေသနတွင်ပါဝင်ရန်ရွေးချယ်ပုံ။ ။ ကျေးရွာအတွင်း ၁၄ ရက်ကျော် နေထိုင်ပြီး၊ အသက် ၁နှစ်အထက်ရှိသော အစရှိသည့် သတ်မှတ်ထားသော စံနှုန်းနှင့် ကိုက်ညီသည့် ကျားမ မရွေး လူကြီးများအားယခုသုတေသနတွင် ပါဝင်ရန်ဖိတ်ခေါ်မည် ဖြစ်ပါသည်။

၅။ သုတေသနတွင်ပါဝင်လိုမှု ။ ။ ယခုသုတေသန တွင်ပါဝင်ကူညီခြင်းသည် မိမိ၏သဘောဆန္ဒအလျောက်သာ ဖြစ်ပါသည်။ ယခုသုတေသန တွင်ပါဝင်သည်ဖြစ်စေ မပါဝင်သည်ဖြစ်စေ ကျန်းမာရေးစောင့်ရှောက်မှု ပေးရာတွင်ကွာခြားမည် မဟုတ်ပါ။ သုတေသနတွင်ပါဝင်ပြီးမှ မိမိဆန္ဒအလျောက် နှုတ်ထွက်လိုပါကလည်း နှုတ်ထွက်နိုင်ပါသည်။

၆။ ကြာမြင့်ချိန် ။ ။ မေးခွန်းမေးမြန်းသည်မှ သွေးစစ်ကိရိယာမှ အဖြေထွက်သည် အထိ မိနစ် ၃၀ ခန့်ကြာပါမည်။

၇။ ဖြစ်ပေါ်နိုင်သည့် ဘေးထွက်ဆိုးကျိုးများ ။ ။ ဘေးထွက်ဆိုးကျိုးမရှိပါ။ ခေါင်းကိုက်ခြင်း၊ ခေါင်းမူးခြင်း၊အဆစ်/ကြွက်သားနာခြင်း၊ အိပ်မပျော်ခြင်း၊ နွမ်းနယ်ခြင်း၊ အန်ခြင်း၊ အစားအသောက်ပျက်ခြင်း အလွန်နည်းပါးစွာတွေ့ရတတ်ပါသည်။ ဖြစ်ပေါ်ပါကလည်း အနီးကပ်စောင့်ရှောက်ပေးပြီး လိုအပ်ပါက လက္ခဏာ သက်သာစေသည့် အခြားဆေးများပေးခြင်း၊ ငှက်ဖျားဆေး ဆက်မပေးခြင်းတို့ကို ပြုလုပ်ပါမည်

၈။ အန္တရာယ်ရှိမှု ။ ။ ဤသုတေသနတွင်ပါဝင်ခြင်းကြောင့် သင့်ကလေးအားတွင် ပုံမှန်ရှိနေသော အခြေအနေ မှ ပြောင်းလဲသွားမည် မဟုတ်ပါ။ အမျိုးသားငှက်ဖျားရောဂါကုထုံး အတိုင်း အမျိုးသားငှက်ဖျားရောဂါတိုက်ဖျက်ရေးစီမံကိန်းမှ အသုံးပြုနေ သောဆေးများဖြစ်ပြီး ဘေးထွက်ဆိုးကျိုးမရှိပါ။ သင့်အနေဖြင့် သုတေသနအဖွဲ့ကိုဆက်သွယ်နိုင်မည့် ဖုန်းနံပတ် ပေးထားမည်ဖြစ်သလို မြို့နယ်ရှိ သုတေသနဆေးခန်းသို့ လည်းလာရောက်နိုင်ပါသည်။

၉။ စိတ်မသက်မသာဖြစ်မှု၊ ထိခိုက်နိုင်မှု နှင့် ကိုယ်စိတ် အနှောင့်အယှက်ဖြစ်စေမှုများ။ ။ သင့်ကလေးနှင့် ပတ်သက်သည့် မေးခွန်းများတွင် ကိုယ်ရေးကိုယ်တာ အချက်အလက်များပါသောကြောင့် စိတ်အနှောင့်အယှက်ကြုံတွေ့နိုင်ပါသည်။ ထိုအခါ ယင်းမေးခွန်းကို မဖြေကြားဘဲထားနိုင်ပါသည်။

၁၀။ အကျိုးကျေးဇူး။ ။ သုတေသနတွင်ပါဝင်ခြင်းကြောင့် သင့်ကလေးတွင်စွဲကပ်နေသော ငှက်ဖျားပိုးကို အမျိုးအမည်တိကျ စွာအချိန်တို အတွင်းသိနိုင်ခြင်း၊ သုတေသနရလဒ်များကြောင့် လူသားအားလုံးနှင့် နောင်လာနောင် သားများအတွက် အဖိုးမ ဖြတ်နိုင်သော အကျိုးကျေးဇူးများရရှိနိုင်မည် ဖြစ်ပါသည်။

၁၁။ ကျေးဇူးတုံ့ပြန်မှု။ ။ ဤသုတေသနတွင်ပါဝင်သူများကို အချိန်ကုန်ခံရမှုအတွက် လက်ဆောင်ပစ္စည်း ပေးခြင်း များ ပြုလုပ်မည် မဟုတ်ပါ။

၁၂။လျှို့ဝှက်ထားရှိမှု။ ။ စေတနာ့ဝန်ထမ်း ငှက်ဖျား လုပ်သား များမှပုံမှန် လုပ်ဆောင်နေသောလုပ်ငန်းဖြစ်၍ လူထု အတွင်းတွင် ထူးခြားမှုရှိမနေပါ။ သုတေသနမှ ရရှိသော အချက်အလက်များကို သုတေသီအဖွဲ့ဝင်များမှလွဲ၍ အခြားသူများကို အသိပေးမည် မဟုတ်ပါ။ အချက်အလက်အလက်များကို မှတ်တမ်း တင်ရာတွင်

သုတေသနတွင်ပါဝင်စမ်းသပ်ခံ သူများ၏ အမည်အစား လျှို့ဝှက်နံပါတ်များဖြင့်သာ မှတ်သားထားပြီး ယင်းမှတ်တမ်းများကို သေချာစွာ သော့ခတ်သိမ်းဆည်းထားပါမည်။

၁၃။ အဖြေများကိုမျှဝေခြင်း။ ။ သုတေသနမှရရှိသော ရလဒ်များကို ပြည်သူလူထုနှင့် စိတ်ပါဝင်စားသော သုတေသီများသိ ရှိနိုင်ရန် အတွက်တင်ပြပေးမည် ဖြစ်ပါသည်။

၁၄။သုတေသနတွင်ပါဝင်ရန်ငြင်းဆန်ခွင့်။ ။ သင့်ကလေး အနေဖြင့်၍သုတေသနတွင် ပါဝင်ခြင်း/ မပါဝင် ခြင်းကိုလွတ်လပ်စွာ လက်ခံခွင့်/ငြင်းဆန်ခွင့် ရှိပါသည်။ ထိုပြင်ပါဝင်ပြီးနောက်တွင်လည်း သင့်အနေဖြင့် အချိန်မရွေး သုတေသနတွင်ပါဝင်ခြင်း မှရပ်ဆိုင်းနိုင်ပါသည်။

၁၅။ ငြင်းဆန်သော်လည်းရပိုင်ခွင့်ရှိမှု။ ။ သုတေသနတွင် ပါဝင်ရန်ငြင်းဆန်ခြင်း ပါဝင်ပြီးမှ ရပ်ဆိုင်းခြင်းကြောင့် စေတနာ့ဝန်ထမ်းငုက်ဖျားလုပ်သားထံမှ နှင့် အခြားကျန်းမာရေးဌာနများမှ ပုံမှန် ရရှိနေသော ကျန်းမာရေးစောင့်ရှောက်မှုများအား အဟန့်အတား ဖြစ်စေမည် မဟုတ်ပါ။

၁၆။ဆက်သွယ်ရန်။ ။ ၍ဤသုတေသနလုပ်ငန်းနှင့် ပတ်သက်၍ မေးမြန်းဆွေးနွေးလိုပါက ဒေါက်တာ ပြည့်လင်းအောင်၊ ပါရဂူကျောင်းသား၊ ပြည်သူ့ကျန်းမာရေးပညာဌာန ချူလာလောင်ကွန်းတက္ကသိုလ်၊ အမှတ် ၁၃၅ ၊ ပုသိမ်မြေ ၅ လမ်း ဒေါပုံမြို့နယ်၊ ရန်ကုန်မြို့၊ တယ်လီဖုံးအမှတ် ၀၉၅၁၈၇၅၃၀ သို့ဆက်သွယ် အကြောင်းကြား နိုင်ပါသည်။ ၍ဤအဆိုပြုချက်သည် သုတေသနနည်းပညာနှင့် ကျင့်ဝတ်ကော်မတီ ပြည်သူ့ကျန်းမာရေးတက္ကသိုလ်၊ ရန်ကုန်၏ ဆန်းစစ်သဘောတူ အတည်ပြုချက်ရပြီးဖြစ်သည်။ အကယ်၍ သင်သည် ကော်မတီနှင့် ပတ်သက်၍ သိလိုသည်များရှိလျှင် အတွင်းရေးမှူး(ကော်မတီ)၊ ပြည်သူ့ကျန်းမာရေးတက္ကသိုလ်၊ရန်ကုန် အမှတ်(၂၄၆)၊ မြို့မကျောင်းလမ်း၊ လမ်းမတော်မြို့နယ်၊ ရန်ကုန် စာတိုက်သေတ္တာအမှတ် ၁၁၃၁ ဖုန်း၊ ၀၁-၃၉၅၁၃၁၊ ၀၁-၃၉၅၁၃၄ ၊ လိုင်းခွဲ(၂၃)/လိုင်းခွဲ(၂၅)သို့ ရုံးချိန်အတွင်း ဆက်သွယ်နိုင်ပါသည်။

အပိုင်း (ခ) စမ်းသပ်ခံကလေး၏မိဘ/အုပ်ထိန်းသူ၏ သဘောတူညီချက်

ကျွန်တော် ၊ ကျွန်မ ၏ကလေးသည် "ကျေးရွာအဆင့်ငှက်ဖျားကူးစက်မှုလျှော့ချခြင်း သုတေသနစီမံချက်" ၏ မြန်မာနိုင်ငံတွင် အဖြစ်များပြီး အန္တရာယ်ရှိသော ရောဂါဖြစ်သည့် ငှက်ဖျားရောဂါကို သိရှိစေရန်အတွက် သွေးစစ်ဆေးခြင်းနည်းအမျိုးမျိုးဖြင့် အနီးကပ်စောင့်ကြည့် သုတေသနပြုရာတွင် ပါဝင်ရန် သဘောတူညီပါသည်။ သုတေသန၏ သဘောတရားအရ ငှက်ဖျားသွေးဖောက်ယူခြင်းကို ယခုတစ်ကြိမ်အပါအဝင် ၃ လခြား၍ စုစုပေါင်း ၃ ကြိမ်တိတိ ဆက်လက်ဆောင်ရွက်မည်ဖြစ် ကြောင်းကိုလဲသိရှိပါသည်။ လက်ထိပ်မှ သွေးအနည်းငယ်ဖောက်ယူ သော အခါအနည်းငယ် နာသည်မှအပ အန္တရာယ်မရှိကြောင်း သိရှိပါသည်။ ဤသုတေသနတွင် ပါဝင်ခြင်း ဖြင့်အချိန်ကုန်မှုအတွက် ကိုယ်ကျိုးတစ်စုံ တစ်ရာရမည် မဟုတ်ကြောင်း သိရှိပါသည်။ အကြောင်းထူးရှိပါက ဆက်သွယ် ရမည့် သုတေသီ အမည်၊ လိပ်စာ နှင့် တယ်လီဖုန်းနံပါတ်ကို ကောင်းစွာသိရှိပါသည်။

ဤသုတေသန၏ ရည်ရွယ်ချက်၊ သဘာဝနှင့် အကျိုးတရားများကို ကောင်းစွာ သဘောပေါက်ပါသည်။ မရှင်း လင်း သည်များကိုလည်း ကျွန်တော်၊ ကျွန်မကျေနပ်သည်အထိ ဖြေရှင်းရရှိပြီး ဖြစ်ပါသည်။ ကျွန်တော်၊ ကျွန်မ သည် မိမိ၏သဘောဆန္ဒအလျောက် ပါဝင်ရန် သဘောတူညီပါသည်။ ဤသုတေသနမှ မည့်သည့် အကြောင်း ပြချက်မှ မပေးဘဲ အချိန်မရွေး နှုတ်ထွက်ခွင့် ရှိကြောင်း သိရှိပါသည်။ ထိုသို့နှုတ်ထွက် ခြင်း ကြောင့် ကုသခံစား ခွင့် တစ်စုံတစ်ရာ ဆုံးရှုံးမည် မဟုတ်ကြောင်း သိရှိပါသည်။

စမ်းသပ်ခံပုဂ္ဂိုလ်အမည် _____

လက်မှတ်၊ ရက်စွဲ _____

(စာတတ်မြောက်ခြင်း မရှိပါက စာတတ်မြောက်သော အသိသက်သေတစ်ဦးကို ရွေးချယ်ပါမည်။ ထိုအသိသက် သေကို စမ်းသပ်ခံပုဂ္ဂိုလ်ကသာ ရွေးချယ် ရပါမည်။ သုတေသီနှင့် သုတေသနအဖွဲ့ဝင်များ မဖြစ်ရပါ။)

ကျွန်တော်၊ ကျွန်မသည် ဤစမ်းသပ်ခံပုဂ္ဂိုလ်၏ သဘောတူညီချက်ကို သေချာစွာ ဖတ်ရှုပြီး သုတေသနလုပ်ငန်း တွင်ပါဝင်ကူညီမည့်သူကို သေချာစွာ မေးမြန်းပြီး ဖြစ်ပါသည်။ စမ်းသပ်ခံပုဂ္ဂိုလ် ၏ သဘောတူညီမှုကို လွတ်လပ်စွာ ဆုံးဖြတ်စေပါသည်။

အသိသက်သေအမည် _____ စမ်းသပ်ခံပုဂ္ဂိုလ်၏ လက်မပုံစံ

လက်မှတ်၊ ရက်စွဲ _____

စမ်းသပ်ခံ ပုဂ္ဂိုလ်၏ သဘောတူညီချက်ကို ကာယကံရှင်မှသော်လည်းကောင်း၊ အသိသက်သေမှတစ်ဆင့် သော် လည်းကောင်း သေချာစွာဖတ်ရှူစေပြီး ဖြစ်ပါသည်။ မေးမြန်းသော မေးခွန်းများကို လည်းကျေနပ်သည် အထိဖြေ ကြားပြီးဖြစ်ပါသည်။ စမ်းသပ်ခံပြုဂ္ဂိုလ်ကို လွတ်လပ်စွာ ဆုံးဖြတ်စေပြီးမှ ဤသဘောတူညီချက်ကို ရယူခြင်း ဖြစ်ပါသည်။

သုတေသီအမည် _____

လက်မှတ်၊ ရက်စွဲ _____

စမ်းသပ်ခံပုဂ္ဂိုလ်၏ ခွင့်ပြုလွှာ မိတ္တူတစ်စောင်ကို သုတေသီ၏ သုတေသနအဖွဲ့ဝင် တစ်ဦးမှ လက်မှတ်ရေးထိုး ပြီး စမ်းသပ်ခံမည့် ပုဂ္ဂိုလ်သို့ ပေးအပ်ပါသည်။

APPENDIX O

Information to be provided to the subject before taking biological material

(Myanmar)

သုတေသနတွင်ပါဝင်မည့်သူအားသွေးနမူနာများမယူခင် အကြောင်းကြားချက်

၁။ သွေးနမူနာ အမျိုးအစား၊ ရယူမည့်နည်း၊

သုတေသနတွင်ပါဝင်ရန် သဘောတူညီမှု ရယူပြီးနောက် သင်/သင့်ကလေး၏ အမည်၊ အသက်၊ လိင် နှင့် လိပ်စာတို့ကိုရယူပါမည်။ စေတနာ့ဝန်ထမ်းငှက်ဖျားလုပ်သားများ မှ ငှက်ဖျားပိုးရှိမရှိ သွေးအမြန်စစ်ကရိယာ ဖြင့် စစ်ဆေးနေကြသည့် အတိုင်းစစ်ဆေးမှု လုပ်ဆောင်မည်ဖြစ်ပြီး သုတေသနအတွက် သင်၏လက်ထိက်မှ သွေးနှစ်စက်သုံးစက်အား သွေးစုပ်စက္ကူတွင် ထပ်မံရယူခြင်းသာ ပိုလာပါသည်။ တစ္ဆာလုံးအား ဖြန့်ကြက်လေ့လာခြင်းကို ၃ လခြား၍ စုစုပေါင်း ၃ ကြိမ်တိတိပြုလုပ်သွားမည်ဖြစ်ပါသည်။။ ၍အချိန်တွင် အိမ်ထောင်စုဝင် အားလုံး အား သွေးအမြန်စစ်ကရိယာနှင့်သွေးမှုန်ပြားတို့ဖြင့် စစ်ဆေးမည်ဖြစ်ပါသည်။

၂။ စမ်းသပ်ခံပုဂ္ဂိုလ်၏ သဘောတူညီချက်

သုတေသနတွင်ပါဝင်ရန် သင်/သင်၏ကလေးအတွက် သင့်ထံမှသဘောတူညီချက် နှင့် ကလေး၏ သဘောတူညီချက် ရယူပါမည်။ သင့်/သင်၏ကလေးထံမှဖောက်ယူသော သွေးနမူနာများသည် သုတေသန ဆောင်ရွက်ရန် အတွက်သာဖြစ်ပါသည်။

၃။ အမှတ်အသားများကို သိမ်းဆည်းမှု ရှိ/မရှိ အခြေအနေ

သင့်/သင်၏ကလေး၏အမှတ်အသားများ ကို ကုတ်နံပါတ်ဖြင့်သာ မှတ်သားထားပါသည်။ ကုတ်နံပါတ်ဖြင့်သာ သင့်/သင်၏ကလေး၏ သုတေသန အချက်အလက်များကိုသိရှိနိုင်ပြမည်။သင်သဘောတူပါက ၍သုတေသန လုပ်ငန်းတွင် အသုံးပြုပြီးနောက် ကျန်ရှိနေသော သင့်/သင်၏ကလေး၏သွေးကို နောင်တွင် ပြုလုပ်မည့် သုတေသန လုပ်ငန်းများတွင် အသုံးပြုရန်ကုတ်ဖြင့်သာ ၁နှစ် သိမ်းဆည်းထားပါမည်။ သင်ခွင့်မပြုပါက သုတေသနလုပ်ငန်း အပြီးတွင် စွန့်ပစ်ဖျက်စီးပါမည်။

၄။ လျှို့ဝှက်ထားရှိမှု

သုတေသနမှ ရရှိသော အချက်အလက်များကို သုတေသီအဖွဲ့ဝင်များမှလွဲ၍ အခြားသူများကို အသိပေးမည် မဟုတ်ပါ။ အချက်အလက်အလက်များကို မှတ်တမ်း တင်ရာတွင် သုတေသနတွင်ပါဝင်စမ်းသပ်ခံ သူများ၏ အမည်အစား

လျှို့ဝှက်နံပါတ်များဖြင့်သာ မှတ်သားထားပြီး ယင်းမှတ်တမ်းများကို သေချာစွာ သော့ခတ်သိမ်းဆည်းထားပါမည်။

သုတေသနတွင်ပါဝင်သော လူသားများထံမှ သွေး၊ ခန္ဓာကိုယ်မှ အရည်နှင့်တစ်သျှူးများကို သုတေသနတွင်အသုံးပြုရန် သဘောတူညီချက်

ကျွန်တော်/ကျွန်မ၏ ကလေး၏ သွေးကို အောက်ပါ သုတေသနလုပ်ငန်းတွင် အသုံးပြုရန် သဘောတူပါသည်။

သုတေသနလုပ်ငန်းအမည်။ "ကျေးရွာအဆင့်ဌက်ဖျားကူးစက်မှုလျှော့ချခြင်း သုတေသနစီမံချက်" ပြုရာတွင် ဤသုတေသနလုပ်ငန်းတွင် အသုံးပြုပြီးနောက် ကျန်ရှိနေသော ကျွန်တော်/ကျွန်မ၏ ကလေး၏ သွေးကို နောင်တွင် ပြုလုပ်မည့် သုတေသနလုပ်ငန်းများတွင် အသုံးပြုရန် သိမ်းဆည်းထားခြင်းကို ခွင့်ပြုသော်လည်း ၁နှစ် ကာလကျော်လွန်ပါက စွန့်ပစ်စေလိုပါသည်။ ကျွန်တော်/ကျွန်မ၏ ကလေး၏ အမှတ်အသားများကိုလည်း ဖျက်ဆီး စေလိုပါသည်။

အမည် ....

မိဘ/အုပ်ထိန်းသူ ၏ အမည် ....

လက်မှတ် ....

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AWARD RECEIVED	1. Prospect Burma scholarship (2014-2015) 2. Travel bursary award to attend the first World Malaria Congress (1-5 July 20188, Melbourne, Australia) 3. Travel bursary award to attend the Global Health Security Conference (18-20 June 2019, Sydney, Australia) 4. Research Scholarship (2018-2019) - 'The 90th year Anniversary of Chulalongkorn University, Rachadapisek Somphot Fund'