

**YANGON UNIVERSITY OF ECONOMICS
MASTER OF PUBLIC ADMINISTRATION PROGRAMME**

**A STUDY ON MALARIA CONTROL ACTIVITIES
AMONG MIGRANT WORKERS
(A CASE STUDY OF KYAIKTO TOWNSHIP)**

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ABSTRACT

This study was conducted to assess malaria situation among migrant workers working in the private sectors and to identify the needs to strengthen malaria control activities for migrant workers. The study was conducted with desk review of secondary data and qualitative interviews with interview guide in the field. Purposive sampling is conducted for the primary research and consists of 18 key informant interviews with business leaders and governmental and private sector key actors. The malaria risk is highest among the workers of rubber plantation and gold mine due to their timing of working hours, working place, seasonal pattern of work, high number of migrant workers, not getting enough preventive, diagnostic and treatment measures. Among these two types of high risk workers, the workers from gold mines show higher risk than those of rubber plantation because predominantly migrant population, high mobility of its workforce, hard-to reach area and site of work closed to forest and seasonal pattern of work nature. Another challenge is that the total numbers of its workforce is not only unknown but also unrecognized.

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LIST OF ABBREVIATIONS

ACT	Artemisinin-based Combination Therapy
AIDS	Acquired Immunodeficiency Syndrome
AMW	Auxiliary Midwife
BCC	Behavioral Change Communication
CBR	Crude Birth Rate
CDR	Crude Death Rate
CoV	Cut-off Village (Migrant Settlement)
CSR	Corporate Social Responsibility
DKBA	Democratic Karen Buddhist Army
DOT	Directly Observed Treatment
DPCD	Department of Perennial Crops Development
DP	Department of Planning
DoPH	Department of Public Health
EDPT	Early Diagnosis and Prompt Treatment
GAD	General Administration Department
GDP	Gross Domestic Product
GMS	Greater Mekong Sub region
HA	Health Assistant
HA1	Health Assistant 1
HE	Health Education
HIV	Human Immunodeficiency Virus
ICMV	Integrated Community Malaria Volunteer
IEC	Information Education and Communication
IMR	Infant Mortality Rate
INGO	International Non-Governmental Organization
IOM	International Organization for Migration
IP	In-patient
IRS	Indoor Residual Spraying
ITN	Insecticide Treated Net
KNU	Karen National Union
LC	Large Cluster (migrant settlement)

LHV	Lady Health Visitor
LLIN	Long Lasting Insecticide-treated Net
LNGO	Local Non-Governmental Organization
MDR	Multi Drug Resistance
MIMU	Myanmar Information Management Unit
MMP	Mobile and Migrant Population
MMR	Maternal Mortality Rate
MW	Midwife
NGO	Non-governmental Organization
NMCP	National Malaria Control Programme
NMSP	New Mon State Party
OPD	Out Patient Department
P.f.	<i>Plasmodium falciparum</i>
PHS	Public Health Supervisor
PPP	Public-Private Partnership
RDT	Rapid Diagnostic Test
RHC	Rural Health Centre
RPPA	Rubber Planters and Producers Association
SC	Small Cluster (migrant settlement)
SH	Station Hospital
SME	Small and Medium Enterprise
SOP	Standard Operating Procedure
Sub-RHC	Sub Rural Health Center
TB	Tuberculosis
TH	Township Hospital
U5 MR	Under 5 Mortality Rate
UN	United Nations
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VBDC	Vector Borne Disease Control
VHV	Village Health Volunteer
WHO	World Health Organization

CHAPTER I

INTRODUCTION

1.1. Rationale of the Study

Malaria remains a threat in the Greater Mekong Sub region and is a top health priority Myanmar, accounting for 75 per cent of malaria cases in the region. Recently, the emergence of artemisinin resistance in the region has become a major concern for the global health community. Progress made in the global malaria situation in the last decade is now threatened by the emergence of resistance to artemisinin. The situation in Myanmar is critical to the global containment of resistance with has a far higher burden of disease than the rest of the Mekong combined, low levels of investment in malaria control, and extensive migration (WHO, 2013).

The health and economic impacts of artemisinin resistance is substantial and the global malaria mortality could increase by 25 per cent and productivity losses during illness and following death may exceed US\$ four billion annually. There is an urgent need to contain malaria in the malaria endemic areas. Donors have recognized the pivotal role of Myanmar in the efforts. Multilateral and bilateral donors have recognized the need and importance of this fight, with the Global Fund (GF), United States Agency for International Development (USAID), Bill and Melinda Gates Foundation and others donors investing heavily in the malaria control efforts (WHO, 2013).

An information mapping exercise is integral as a first step to gain a deeper understanding of the current landscape of potential stakeholders and partnerships for malaria treatment and prevention efforts. Progress can best be achieved when efforts are coordinated and reinforced throughout all sectors, from governmental nongovernmental, private sector to community level.

The rubber growing area of Mon State holds at least one third of country's total rubber plantation areas and is the main agricultural sector in Kyaikto Township. The uncontrollable and fluctuating rubber price is the major challenge among the rubber tree growers. Though it is not representing all of the growers in the local

area, rubber planters and producers' association is the sole organized body for many of the rubber growers in each township. Most of its workforce is migrants from Ayeyarwaddy and Bago Regions. The malaria incidence among them is also significantly reduced in recent years due to malaria control efforts by National Malaria Control Program (NMCP) as well as INGOs and LNGOs. However, low Health education and lack of proper health care services are major gaps among this population.

Another important private sector in Kyaikto is gold mine business. The business itself is unlicensed and situated in the hard-to-reach and ethnic armed group controlling areas. Its workforce is also untouched by not only government health care services but also those of NGOs. Many of the malaria cases are also reported from those workforces who are highly mobile with predominantly migrant population. Most of them are from Bago Region. Some of the sites of gold mine businesses are contributing to the malaria hotspots where it is close to Shwekyin in Bago Region and Hpapun in Kayin State.

Quarry and road construction businesses were also found in Kyaikto and its workforce is mainly made up of migrants from Yangon and Ayeyarwaddy Regions. There is no systemic Corporate Social Responsibility (CSR) activity reported among the business sectors participated. The businesses are contributing financial support to the community development of the villages concern, such as building schools, road, piping drinking water, donation in religious activities, mostly for the visibility purpose. There is no specific health-related CSR activity including malaria.

Although malaria incidence is decreasing in Kyaikto Township, many malaria cases are still found in the work sites and migrant workers from these worksites are high risk groups for malaria transmission due to the nature of their work. At the same time, there are still gaps in mapping of migrant sites and provision of malaria testing and treatment services to these sites. This thesis studies malaria situation and existing malaria services in Kyaikto Township and also presents health needs and malaria risk factors among migrant workers in different private sectors in Kyaikto Township.

1.2 Objectives of the Study

This study aims to assess malaria situation among migrant workers in Kyaikto Township and to identify the needs to strengthen malaria control activities for migrant workers.

1.3 Methods of the Study

The methodology consists of a desk review of secondary data and qualitative interviews with interview guide in the field. Sources of secondary data, for the mapping of the public sector, include the Myanmar Information Management Unit (MIMU), nongovernmental organizations (NGOs) websites and publications made available online. The desk review is strengthened and supplemented with primary research.

Purposive sampling is conducted for the primary research and Key Informant interviews are conducted with 18 participants who are business owners and governmental and private sector key actors who have a high degree of familiarity with local practices and understanding of malaria situation.

Regarding migrant information, data are collected from Township Administrators, Department of Planning and Township Medical Officers. In addition, private business owners are asked for seasonal migration pattern. Migrant information is also obtained from IOM office.

1.4 Scope and Limitations of the Study

This study focused on common private sector sites found in Kyaikto Township such as rubber plantations, gold mines, quarry and road construction and the respondents includes officials from Government departments (i.e. Township Public Health Department, Department of Perennial Crops Development, Department of Planning), private sectors (company managing staff, Work place supervisor etc.) and staff from NGOs and UN Agencies who are working in Kyaikto Township in Mon State.

It was unable to conduct interviews with rubber production workers in detail in Kyaikto Township but could meet with the members of rubber planters and

producer's association and some owners in individual basis. It was unable to observe some gold mine sites as many of them are operating illegally in hard-to-reach areas.

1.5 Organization of the Study

This study is organized into five chapters. Chapter I is an introduction chapter and consists of The rationale of the study, objectives of the study, method of the study, scope and limitations of the study and organization of the study. Chapter II deals with the literature review of benefits and challenges of migration, risks of malaria among migrants and factors influencing malaria services for migrant populations. In Chapter III, overview situation of migration, malaria situation and health status in Mon State is explained. In Chapter IV, results from Key Informant Interviews are presented and conclusion and recommendations are discussed in Chapter V.

CHAPTER II

LITERATURE REVIEW

2.1 Overview of Migration

Migration is the movement of people from one place to live in another. Emigrants leave their country, while immigrants enter a country. Migration impacts on both the place left behind, and on the place where migrants settle. People have many reasons why they might want to move from one place to another. The reasons may be economic, social, political or environmental. For migration to take place there are usually push factors and pull factors at work. Push factors are the reasons that make someone decide to move. This is their own experience of life in one place which gives them good reasons to leave it. Often push factors are negative things such as unemployment, crop failure, droughts, flooding, war, poor education opportunities or poor services and amenities. Pull factors, on the other hand, are the expectations which attract people to the new place (Migration Data Portal, 2019).

They are usually positive things such as job opportunities, a better standard of living, better education or better healthcare. Many people choose to migrate. These are voluntary migrants. Many are economic migrants. Other voluntary migrants include older dependents who want to live somewhere warm and sunny in their retirement. However, many other people have no choice and are forced to leave their homes. These are involuntary migrants. Their lives and homes may be in danger due to war or a natural disaster. These people are also called refugees.

People migrate for a number of reasons. The reasons and causes for migration would normally fall under these areas:

- i. Environmental – Better climate, calamities, and natural disasters are examples of environmental causes or reasons.
- ii. Economic – Moving to find work or moving to follow a particular career path is an example of economic cause or reason.

- iii. Cultural – Religious freedom and education is an example of cultural cause or reason.
- iv. Political – Civil war or escaping from political persecution is an example of political cause or reason.
- v. Social – Moving for a better quality of life or moving closer to a family member or friend is an example of a social cause or reason.

Given the five basic causes or reasons for migration, people think of the pros and cons, the advantages and disadvantages of moving or staying. People also think not only of the opportunity and the actual conditions of that new location, but also of the opportunities nearby which are attractive. There are also factors that they need to consider as well as the travel costs, the travel time and distance, the mode of transportation and terrain, and lastly, yet not the least, the cultural barriers and biases. Reasons for migration can be divided to two factors:

- a) Push Factors – These are reasons for leaving a place, which is called emigrating, because of certain difficulties like food shortage, war, flood, calamities, etc.
- b) Pull Factors– These are reasons for moving into a place, which is called immigrating, because of an aspiration, dream, or something desirable like abundance in food supply, a better climate, more freedom, etc.

People are either pulled or pushed to migrate. Either they involuntarily or voluntarily migrated. Push factors are the reasons why people leave an area. They are usually involuntary or forced migrations such as crop failure, drought, and flooding, high crime, lack of services, lack of safety, poverty, and war. Pull factors are the reasons why people are attracted or pulled to a particular area. They are usually voluntary migrations such as better services, good climate, higher employment, lower risk from natural hazards, more fertile land, more wealth, political stability and safer, less crime (Migration Data Portal, 2019).

2.2 Migration and Health

Migration places individuals in situations which may impact their physical and mental well-being. Conditions surrounding the migration process can increase the vulnerability to ill health. This is particularly true for those who migrate involuntarily, fleeing natural or man-made disasters. Impacts have multiple determinants and may

change over time. Migration also cuts across economic and social policies, human rights and equity issues, development agendas, and social norms – all of which are relevant to migration health (Kristiansen, Mygind, and Krasnik, 2007).

In light of the 2030 Sustainable Development Agenda, data at the nexus of migration and health are critically important to monitor the Agenda's progress, including specific progress on the health-related goal and targets to ensure that “no one is left behind” irrespective of their legal status. Health is defined as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, 2006). This definition applies equally to migrants as it does to non-migrants. Health is also a basic human right and an essential component of sustainable development; being and staying healthy is a fundamental precondition for migrants to work, to be productive and to contribute to the social and economic development of their communities of origin and destination.

2.3 Factors Influencing Health of Migrants

The concept of migration and health encompasses the idea that there are various factors and conditions that influence the health of migrants. These factors and conditions are referred to as social determinants of health. Migration, among other factors, is considered a social determinant of health for its potential to impact health. There are various levels of social determinants of health, which range from the general socioeconomic, legal, cultural, environmental, and physical environments to individual factors such as lifestyle, age, hereditary, and behavioral factors that impact the health of migrants (see Figure 2.1). There may be differences in the disease profiles and health risk factors between migrant and host populations, or inequalities in the access/uptake of preventive interventions and in treatment outcomes based on migration (Migration Data Portal, 2019).

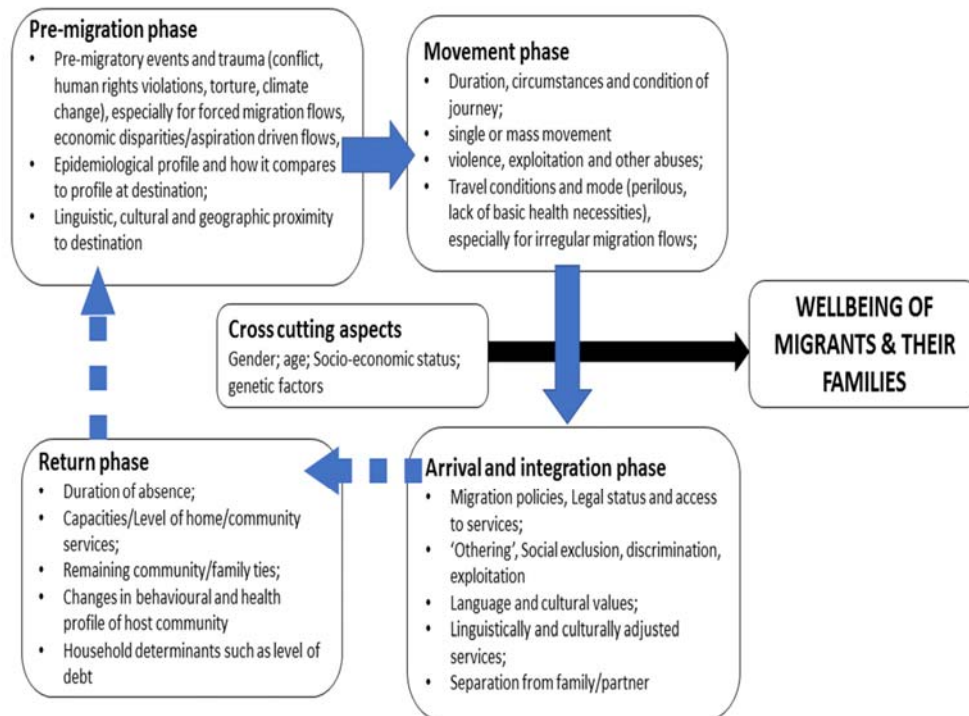
The relationship between migration and health is complex, and its impact varies considerably across migrant groups, and from person to person within such groups. Conditions surrounding the migration process may exacerbate health vulnerabilities and risk behaviors such as the case of a victim of sex trafficking through transnational networks. Conversely, it can be an enabler for achieving better health trajectories, such as the case of a newly arrived refugee as part of a humanitarian settlement programme accessing treatment for a chronic disease. Due to the lack of legal status, stigma, discrimination, language, cultural barriers and low-

income levels, irregular migrants may be excluded from accessing primary health care services, vaccination campaigns and health-promotion interventions (Migration Data Portal, 2019).

A small but growing body of research evidence points to varying gradients of benefits and risk factors for the health of migrants (and their families) through the stages of migration (see info- graphic below). The process of migration includes different phases (pre-departure, travel and transit, destination and integration, and return), where the health of migrants can be affected or be positively enabled. The impacts of migration on the health of migrants and on public health are intertwined throughout these phases, each exerting differing conditions. The increasing pattern of “circulatory migration” moving between immune and non-immune populations also adds a further challenge with respect to the prevention and control of emerging infectious diseases (Migration Data Portal, 2019).

Figure 2.1

Factors influencing the health and well-being of migrants and their families along the phases of migration



Source: Migration Data Portal, 2019

The process of migration includes different phases (pre-departure, travel and transit, destination and integration, and return), where the health of migrants can be affected or be positively enabled. The impacts of migration on the health of migrants and on public health are intertwined throughout these phases, each exerting differing conditions. The increasing pattern of “circulatory migration” moving between immune and non-immune populations also adds a further challenge with respect to the prevention and control of emerging infectious diseases.

As the numbers of people moving between countries increases globally, the variety of motivations and conditions for mobility, as well as the socioeconomic context and political climate in which this mobility occurs, adds to the complexity of responding to health challenges faced by migrants in their sending, transit and receiving countries. In addition to the phases of the migration process, some migrants are also placed in detention, jails, and other closed facilities due to national migration policies. Detention most often affects asylum-seekers, refugees, displaced populations, trafficked persons or irregular migrants. Health-related vulnerabilities can increase due to various factors such as the lack of access to health services, inadequate hygiene and sanitation within densely populated living spaces, inadequate nutrition and violence. The length of detention has been associated with the severity of mental disorders and psychosocial issues.

Some migrant workers, especially those with low level skills, are employed in sectors often amongst the most dangerous, difficult and demeaning (3Ds), with low wages, hazardous and harsh working conditions, and a lack of status recognition, social protection and occupational health rights. Migrants’ access to health services has increasingly been a key indicator of people-centered, rights-based, inclusive and equitable health systems that aim at reducing health inequities, but the social exclusion of vulnerable migrant groups continues to be common in the absence of explicit affirmative policies (Migration Data Portal, 2019)

2.4 Reviews on Previous Studies

Hlaing, Wai, Oo et al (2015) studied on mobility dynamics of migrant workers and their socio-behavioral parameters related to malaria in Tier II, Artemisinin Resistance Containment Zone, Myanmar and it was published in BMC Public Health journal. They identified that the estimated population of the 1,899 migrant groups categorized into three on the nature of their work setting was 56,030. Bago region was

the commonest reported source of origin of migrant groups as well as their transit. Malaria volunteers were mostly within the reach of category 1 migrant groups (43/66, 65.2 %). Less stable migrant groups in category 3 had limited access to malaria information (14.7 %) and malaria care providers (22.1 %), low level of awareness and use of long-lasting insecticide-treated nets (46.6 and 38.8 %). Also, they had poor knowledge on malaria prevention on confirming suspected malaria and on using artemisinin combined therapy (ACT). Within two weeks prior to the survey, only 16.5 % of respondents in all categories combined reported acute undifferentiated fever. This study recommended that mobility dynamics of migrant groups was complex and increased their vulnerability to malaria. This phenomenon was accentuated in less stable areas. Even though migrant workers were familiar with rapid diagnostic tests for malaria, ACT still needed wide recognition to improve practices supportive including the use of appropriate personal protection. High mobility calls for re-designation of tier II townships to optimize ACT resistance containment.

Soe, Thi and Aye (2017) studied on socioeconomic and behavioral determinants of malaria among the migrants in gold mining, rubber and oil palm plantation areas in Myanmar and it was published in *Infectious Disease of Poverty Journal*. This study identified that majority of participants were male, Bamar nationals, married and with primary basic education level and below. The mean duration of migratory work was 4.51 years. 43.1% of them gave definite previous history of malaria within last two years during migration. 92.9% (377/406) of them always used bed nets. Malaria determinants found were male gender, habit of going out at dawn, usual sleeping indoors, torn bed net or net with large hole(s), habit of not always sleeping under a bed net at night, alcohol drinking and failure to attend malaria health talks. This study highlighted that it is warranted to launch an effective health education programme for malaria, and to encourage the proper use of insecticide-treated bed nets, blankets and/or muffers and mosquito repellents to reduce the occurrence of malaria among the migrants.

Guyant, Canavati, Chea et al (2015) studied on malaria and the mobile and migrant population in Cambodia: a population movement framework to inform strategies for malaria control and elimination and it was published in *Malaria Journal*. They identified the different activities and related risks to appropriately target and tailor interventions to the highest risk groups. The framework has been used to

develop more targeted behavior change and outreach interventions for MMPs in Cambodia and its utility and effectiveness will be evaluated as part of those interventions.

MMPs are biologically more vulnerable to malaria because they often come from non-forested areas where they are not exposed to malaria, to forested areas where they are. Compared to the local population who will have developed a relative immunity to malaria through repeated exposure, non-immune travellers and migrants, bitten by an infected mosquito, have a higher risk of becoming parasitaemic, having a high parasitaemia, clinical malaria, severity and death (Prothero et al, 1977).

Education and knowledge are key factors in influencing malaria prevention and treatment-seeking behaviour although the relationship between knowledge and behaviour is complex and the result of the interaction of social, cultural and economic factors (Bourdier, Bunnary, and Penh, 2010). Mobile and migrant population are less likely to be aware of existing health services than local long term residents (Jitthai et al, 2013) and if they arrive from non-malaria areas are less likely to have heard health education messages for malaria than local population living in malaria transmission areas (Bourdier, Bunnary, and Penh, 2010). In the Mekong Subregion, poor knowledge of malaria transmission and prevention has been shown to be a risk factor of malaria infection (Chaveepojnkamjorn, and Pichainarong, 2004).

Wai, Kyaw, Oo et al (2014) studied on spatial distribution, work patterns, and perception towards malaria interventions among temporary mobile/migrant workers in artemisinin resistance containment zone and it was published in BMC Journal. They identified that the primary reasons for the limitation in access to formal health services for suspected malaria within 24 hours were identified to be scattered distribution of migrant aggregates, variable working hours and the lack of transportation. Only 19.6% of respondents reported working at night from dusk to dawn. Among study populations, 73% reported a perceived risk of contracting malaria and 60% reported to know how to confirm a suspected case of malaria. Moreover, only 15% was able to cite correct antimalarial drugs, and less than 10% believed that non-compliance with antimalarial treatment may be related to the risk of drug resistance. About 50% of study population reported to seeking health care from the public sector, and to sleep under ITNs/LLINs the night before the survey. There was a gap in willingness to buy ITNs/LLINs and affordability (88.5% vs. 60.2%) which may affect their sustained and consistent use. Only 32.4% across all aggregates

realized the importance of community participation in effective malaria prevention and control. This study recommended that Community-based innovative approaches through strong collaboration and coordination of multi-stakeholders are desirable for relaying information on ITNs/LLINs, rapid diagnostic test, and artemisinin combination therapy and drug resistance successfully across the social and economic diversity of mobile/migrant aggregates in Myanmar.

Naing, Whittaker and Tanner (2018) studied on Inter-sectoral approaches for the prevention and control of malaria among the mobile and migrant populations and it was published on Malaria Journal. This study identified that numerous stakeholders were involved in the intersectoral actions to defeat malaria amongst MMPs but there is a dearth of information on how these stakeholders shared roles and responsibilities for implementation and about the channels of communication between-and-within the partners and with the MOH/MOPH. The intersectoral collaborations contributed to improvement in knowledge about malaria, initiation and promotion of bed nets utilization, increased access to diagnosis and treatment in a surveillance context and contributed towards a reduction in malaria transmission. Overall, a high proportion of the targeted MMPs was equipped with correct knowledge about malaria transmission and interventions targeting the use of bed nets utilization were two times more likely to reduce malaria incidence amongst the targeted MMPs than the non-users. The various intersectoral actions were often more vertically organized and not fully integrated in a systemic way within a given country or sub-national administrative setting. This study recommended that interventions supported by the multiple stakeholders had a significant impact on the reduction of malaria transmission amongst the targeted MMPs. Well-designed studies from different countries are recommended to robustly assess the role of intersectoral interventions targeted to MMPs and their impact on the reduction of transmission.

CHAPTER III

OVERVIEW OF MIGRATION AND MALARIA STATUS IN MYANMAR

3.1 Malaria Situation in Myanmar

The malaria situation in Myanmar is rather complicated, because of its heterogeneity and parasite resistance, and the declared elimination goal is still distant because the rapidity in achieving the goal is influenced by the relatively high burden of malaria, a suboptimal national health systems and technical/operational constraints. The likely emergence of artemisinin resistance in Myanmar calls for urgent actions at national and regional levels. The best strategy for coping with the problem of MDR and artemisinin resistance in Myanmar is to aim for the elimination of *P. falciparum* over recent years Myanmar has made a significant progress in reducing malaria morbidity and mortality. The number of deaths and cases of malaria has dropped significantly from, respectively, 1707 and 516,041 in 2005 to 37 and 182,616 in 2015, reflecting a substantial improvement in case management, particularly at the periphery and among populations at risk of malaria. Due to funding support from Global Fund and other donors, data from 2012 onwards is robust and demonstrates a steady and impressive reduction in caseload year by year. Since 2012 the incidence of reported malaria has dropped by 49% from 8.09 in 2012 to 4.16 per 1000 population in 2015. The goal of the previous National Strategic Plan 2010-2016 was to reduce malaria morbidity and mortality by at least 60% by 2016 relative to 2007 figures. By 2015 morbidity and mortality were down by respectively 65% (in 2007 there were 520,887 cases and in 2015 there were 182,616 cases) and 97% (in 2007 there were 1,261 deaths and in 2015 there were 37 deaths) relative to 2007 (NMCP, 2016).

3.2 Mobile and Migrant Populations and Malaria

MMPs (Mobile and Migrant Populations) that move either within a GMS country or between these countries for temporary work and national security forces posted along borders are among the highest risk groups for malaria infection. Unfortunately, given the difficulty in reaching and tracking these workers, there is usually poor surveillance of malaria in these groups. MMPs are biologically more vulnerable to malaria because they often come from malaria-free areas where they are not exposed to the disease, to forested areas where they are. Compared to the local population who will have developed a relative immunity to malaria through repeated exposure, non-immune travelers and migrants have a higher risk of becoming infected, having a high parasitaemia with clinical malaria, severity and death. Analysis should be carried out on a regular basis within the country to identify the main MMP groups and their areas to be targeted for interventions.

The mapping exercises and available outcomes of operational research among these populations should be utilized to update approaches to address MMPs for malaria elimination at national level. National focal points can be appointed by NMCP to coordinate activities directed towards MMPs. NMCP will collaborate with other sectors, such as Ministry of Foreign Affairs and the Department of Immigration, the Department of Tourism, Department of Forestry, state/region/township administration and partners' organizations involved to appropriately target these populations at risk. Cross-border activities should take into consideration specific interventions for MMPs. IEC/BCC activities should be considered for ethnic minority groups and at the working sites of large-scale deployment of mobile population groups using VHV. Military and police personnel deployed inside and travelling outside the country, who are considered the most easily accessible MMP group, should be targeted for engagement. Industries supporting employment of MMPs, forestry, plantation and farming, construction, and tourism in at-risk areas should be engaged in malaria elimination and prevention.

To address MMPs' malaria-related issues, especially in the context of malaria elimination the following approaches and measures are recommended:

- 1) Ensuring and intensifying DOT approach provided by VHV/ICMV with malaria patients cards based on SOPs;
- 2) Mapping formal and informal work sites and hard-to-reach populations for malaria prevention using SOPs;

- 3) Intensifying case detection at development sites and hard-to-reach populations and identifying/training mobile vendors to provide health education and referral services;
- 4) Setting up malaria screening points at bus stations along international borders and working with cross-border bus companies to provide messages about malaria prevention;
- 5) Developing treatment and prevention guidelines for MMPs as well as a simplified version for use by VHVs/ICMVs;
- 6) Assessing the efficacy of impregnated clothes and repellents among MMPs in rubber plantations;
- 7) Conducting IRS in outbreak areas, providing forest prevention kits and education to migrant workers and repellents to soldiers;
- 8) Working with immigration officers and police to explain public health messages, advocating for collaboration with key decision-makers and employers of migrants by explaining the cost-benefit of having healthy workers;
- 9) Training of trainers in IEC, BCC and community mobilization skills tailored to MMPs;
- 10) Updating and standardizing monitoring and evaluation tools to incorporate MMP indicators and improving monitoring of MMP interventions;
- 11) Strengthening cross-border information exchange in Myanmar and other neighboring GMS countries based on Mekong Basin Disease Surveillance coordination mechanism and Mekong Malaria Elimination Hub.

It is critical to differentiate between different types of MMPs, based on their key characteristics and risks that would help to determine the most effective strategies to target and reach these populations with the most appropriate elimination interventions. Ongoing challenges include characterizing and defining MMPs; developing an intervention and surveillance strategy, adapted to the country's conditions; responding to the local needs; and better targeting these hard-to reach populations by technically sound and sustainable measures within the country.

Thus, better understanding of the various groups of MMPs and the situations which place them at risk of malaria is required, in order to develop targeted behavior change and outreach interventions for MMPs. There is an urgent need to develop appropriate and accessible malaria services for MMPs in different settings in the

context of malaria elimination. In addition, in the context of universal coverage and access to basic health services, these remote and often marginalized populations (socially, economically or geographically) should be able to have an easy access to adequate and affordable health care.

3.3 Demography of Mon State

Mon state is 11th largest in area among 15 regions/states of Myanmar and the total area is 12,296 square kilometers. It also has more than two million populations and recognized as 9th most populated region. It has a population of 2,050,282 and the population density is 167*/square kilometer based on 2016 census data. However, it is the 4th region among the highest density of population in the country. The most common races are Mon, Bamar and Karen. Most of them are Buddhist. Other religions such as Christian, Hindu and Islam are also found.

3.4 Economy of Mon State

In Mon state, Gross Domestic Product (GDP) by sector, highest GDP is from the agricultural sector, 28 per cent of total GDP including rubber plantation. Other smaller but important sectors are trading (19 per cent), transportation (16 per cent), industry (15 per cent), meat and fishery (8 per cent), construction (7 per cent) and mining (0.3 per cent). The GDP figure of Mon state in 2016-2017 could be viewed in Table 3.1.

Table 3.1 GDP Figure in Mon State

Sector	Per cent of GDP in 2016	Per cent of GDP in 2017
Agriculture	27.55	27.60
Meat and Fisheries	8.49	8.36
Forest	0.17	0.18
Mining	0.33	0.31
Industry	15.61	15.26

Electricity	0.83	0.90
Construction	8.43	8.03
Transportation	16.20	17.09
Communication	2.07	1.43
Finances	0.06	0.05
Social & Management	0.68	0.63
Rental & Other Services	1.64	1.62
Trading	17.94	18.55

Source: National Planning Department, Mon state, 2018

Mon state is traditional well-known for its abundant rubber plantation field in Myanmar. Mon state has 478,627 acres in 2018 and contributes 36 per cent of total country's rubber growing areas which is about half a million acres. Out of those rubber plantation areas, 68 per cent of these areas are mature enough for rubber production. Majority of the rubber trees in Mon state are older in age, average 15-20 years and many of them are local breed. As a result, although the total rubber plantation areas across the Mon state are high, the rubber production is modest among states/regions. The overall acres of rubber plantation are steadily increased year by year in Mon state but its total growing in acres is, recently more tightly competitive with other rapidly rubber growing regions such as Karen, Tanintharyi, Bago and Shan states. Being as a more populated region, Mon State has limited land area for growing rubber in future so the prospect of rubber plantation is limited.

3.5 Migration in Mon State

In Mon State, most internal seasonal migrants were from within Mon State, while migrants from outside are mostly year-round temporary (with or without family) in nature. Migrant numbers from the Dry Zone in Mon State are low compared to neighboring Bago and Delta Region, particularly Ayeyarwady. Migration from the Delta is reported to have increased after cyclone "Nargis". IOM (2013) also

reports that most immigration to Mon State is intraState; however, the townships of Mawlamyine and Mudon attract migrants from all over the country and Kyaikmaraw from Bago (East and West). Most of the migrants in the study sites had temporary settlements- Mawlamyine (65%), Mudon (70%) and Kyaikmaraw (73%). The migration pattern depends on the sector of work which, in turn, depends on the origin of the migrant workers. While migrant workers from the Delta region are mostly involved in fisheries and rubber plantation, migrants from the Dry Zone are involved in construction work, brick factory, and to some extent on rubber plantation. Some migrant workers have also found work in various factories in the area such as water purification plants, chili factory, tire factory etc. Work in brick factories is seasonal in nature, lasting for 4 months from November to February. Work in construction, factories, rubber plantations is more permanent in nature. However, even migrant workers in brick factories might not necessarily be seasonal as they might stay in the area and find work elsewhere during the offthe season – road construction, paddy fields etc.

The IOM study (2013) on the Mobile and Migrant Population (MMP) in selected townships in Mon State reported that the major occupation of the MMP, in addition to fishing and related business, isplantation and hillside agriculture: Mudon (45%); Kyaikmaraw (57%); Mawlamyine (61%). Other employment/industry sectors include construction, factories, and trading. Information was collected through focus group discussion with rubber plantation workers and interviews with rubber and fisheries private sector actors, township officials and other government officials, NGOs and international organizations working in the area.

Not all rubber plantations are large. Almost 50% are smallholder plantations with <5 acres of land, which are taken up as a family enterprise. As tapping is highly labourintensive and requires certain skills, hiring of labour is common among rubber plantation owners. Migrants are predominantly young men between 20-50 years of age. Tappers are generally older compared to seasonal migrants working in weeding, clearing bushes, due to the skills requirement. About 5 families of yearround temporary migrant families are required for tapping 30 acres of rubber plantation. Therefore, temporary migrant families are mostly afforded by large plantation owners with 10 acres or more. Smallholders depend on seasonal migrants from nearby townships (from Bilin in Mudon Township and from Chaungzon in Kyeikmaraw Township). The origin of outofState migrants is Yangon, Bago and the Delta region.

Rarely, migrants from the Dry Zone work in rubber plantations in these two townships.

It is generally believed that migration exposes the migrant population to high risks of diseases such as malaria, tuberculosis, HIV/AIDS, etc. due to mobility and work environment. Foreexample, work in forests and plantations are considered high risk occupations for malaria infection (IOM, 2013); thus, working in mines and rubber would expose migrants to such risks. It is particularly so in rubber plantations, as most work is done during night time. It is also believed that HIV/AIDS is high among migrant populations and in populations in border areas. Thus, migration seems to have negative impact on the health of the migrant workers. However, exposure to high risks not necessarily means higher mortality. The actual negative impact would depend on access to public health services and the ability of migrants to afford those costs. An IOM study (2013) on access to public health by mobile and migrant population conducted in all the 10 townships in Mon state indicates that migrants had access to public health facilities within 15-30 minutes by car with the costs between 5000-8000 Kyat.

3.6 Malaria Situation in Mon State

In Mon State, the morbidity and mortality of malaria is sharply dropped recent years and the malaria mortality is nearly zero at the moment. Many of the health care providers in the affected area believed that the positive result is mainly due to the effectiveness of malaria control programme, implementing by the government health department and supported by many INGOs/LNGOs/IOs in various malaria activities. Undeniably, other background factors such as deforestation, change in weather and, though need proved evidence, probably change in inhabitant behaviors of the vector. Effective use of malaria control services by the people from the affected areas are also contributing to the present outcome figures of malaria.

According to the morbidity and mortality data of Mon State for 2018, there were total 290 outpatient malaria cases were detected at the out-patient department (OPD) of government hospitals and 72 malaria cases were hospitalized for treatment. Among the hospitalized malaria cases, there were 7 cases of severe malaria with complications such as cerebral malaria and one malaria death occurred in 2018 due to the complications. In terms of diagnosis methods, 4,814 blood slides are examined by microscopy and total 82 malaria cases were detected while 53,380 tests were done by

Rapid Diagnosis Test (RDT) and total 280 cases were detected. It was also noted that diagnosis by microscopy is gradually decreasing yearly from 2013 to 2018 while diagnosis by RDT is increasing year by year.

There is a decreasing malaria trend from 2013 to 2018 with the significant reduction of cases year by year but there was an increase of malaria cases in 2018 compared to 2017 data. This increase of cases in 2018 was noted at the out-patient department and most of these cases were detected by RDT. Malaria positivity rate is also reducing significantly from 12% in 2013 to 0.6% in 2018.

Table 3.2: Malaria incidence in Mon State – NMCP data (2013-2018)

Indicators	2013	2014	2015	2016	2017	2018
Malaria cases (OP)	4,385	1,306	658	319	174	290
Malaria cases (IP)	895	583	360	200	88	72
Cerebral+ Severe Malaria	137	59	46	23	11	7
Malaria Death	10	2	0	0	1	1
Blood Slide Examined	12,180	18,394	12,345	5066	4607	4814
Positives (Microscopy)	1,448	684	459	201	107	82
RDT Tested	35,165	29,119	29,487	38109	35793	53380
Positives (RDT)	4,221	1,281	710	318	155	280
Blood Positive Rate (%)	12	4.1	2.8	1.2	0.6	0.6

Source: Data from National Malaria Control Program (2019)

In terms of INGO data, 3,195 blood slides were examined by microscopy and 42 malaria cases were detected in 2018. In addition to this, 92,202 tests were done by RDT and 1,066 cases were detected. It was noted that the number of RDT tests done and the number of positive cases detected by INGOs is higher than that of NMCP

indicating more contribution of INGOs in malaria case detection and treatment in Mon State. The malaria positivity for 2018 is 1.1% for INGOs which is also higher than that of NMCP i.e.0.6%.

Table 3.3: Malaria incidence in Mon State – INGO data (2013-2018)

Indicators	2013	2014	2015	2016	2017	2018
Blood Slide Examined	-	-	-	3755	5458	3195
Positives (Microscopy)	-	-	-	21	94	42
RDT Tested	122,028	105,098	115,058	154796	142980	92202
Positives (RDT)	5,309	1,850	1,627	1286	869	1066
Blood Positive Rate (%)	4.4	1.8	1.4	0.8	0.64	1.1

Source: Data from National Malaria Control Program (2019)

By analyzing township wise malaria incidence for 2018 with combined data from NMCP and INGOs, it was noted that Ye Township has the highest malaria incidence in Mon State (769 cases) which was followed by Bilin Township (142 cases) and Kyaikto Township (110 cases). In other townships, the number of malaria cases is lower than 100 and malaria activities in these townships are moving from control phase to elimination phase.

Table 3.4 Township wise Malaria incidence (2018)

Township	NMCP		INGOs	
	Examine	Positive	Examine	Positive
Bilin	7863	77	20548	142
Chaungzon	3251	3	111	0
Kyaikmaraw	5133	6	10762	18
Kyaikto	5137	12	14532	110
Mawlamyine	2546	6	1302	11
Mudon	5725	12	5036	5
Paung	5119	8	4209	6
Thanbyuzayat	4659	20	3130	21
Thaton	6077	14	7211	26
Ye	12100	197	28736	769
MGH+ WCH+State OPD	584	7	-	-
Total	58194	362	95397	1108

Source: Data from National Malaria Control Program (2019)

3.7 Malaria Service Providers in Mon State

Vector Borne Disease Control Unit (VBDC), which is supported by DoPH, Ministry of Health and Sports is the key service provider and is assisted by respective INGOs/LNGOs in the study area. In general, major three players involved in the Malaria control activities are:

- (1) VBDC
- (2) INGOs/LNGOs
- (3) Others players

3.7.1 Vector Borne Disease Control (VBDC)

Under the supervision of DoPH, VBDC is the key main player in the malaria activities in local area. It performs preventive, early diagnosis and prompt treatment (EDPT) and promotive activities in Malaria. In specific, the major activities of DoH in Malaria are listed:

- (1) Preventive Measure
 - a) Distribution of LLINs
 - b) IRS
- (2) EDPT
 - a) Free of charge blood testing with RDT through basic health workers-midwives (MWs), auxillary midwives (AMWs) and village health workers (VHWs)
 - b) Administer free ACT plus primaquine (stat) to those *Plasmodium falciparum* (p.f) positive in RDT, chloroquine and primaquine (14 days) to those *Plasmodium Vivax* positive in RDT
 - c) Microscopic examination in Hospital and those selected cases of RDT negative
- (3) Promotive measure
 - a) Health Education to community

Most of the Malaria activities of the DoPH is primarily targeted to those communities in general, both urban (ward) and rural (village) setting under the government's administrative department, through its primary health care workers, and government's health facilities such as Sub-rural health center (Sub-RHC), RHC, SH, and TH. Its activities do not cover those hard to reach areas, various ethnic armed groups' controlling areas and general workforce who are out of village administration and many of them are migrant workers.

3.7.2 INGOs/LNGOs in Mon State

Non-governmental organizations have a remarkable role in Malaria activities of DoPH. In Mon State, the following are the identified INGOs/IOs/LNGOs in relation to Malaria activities in affected community. The organizations and their

activities in selected townships are seen in Table 3.3. Although their activities have varied their coverage of geographic areas is very limited so far.

Table 3.5 NGOs and their activities in Malaria Control (Mon State)

Organization	Activities	Township	Villages Covered
International Organization for Migration (IOM)	Health Education LLINs/ITD Distribution RDTs ACT Mobile Clinic	Ye, Thanbyuzayat, Thaton, Bilin, Kyaikto, Kyaikmaraw and Mudon	210
Myanmar Medical Association (MMA)	Health Education RDTs	Bilin, Kyaikto	56
Medical Action Myanmar (MAM)	Health Education LLINs RDTs ACT Mobile Clinic, IECs	Paung, Kyaikmaraw, Mudon, Ye	120
American Refugee Committee (ARC)	Health Education LLINs RDTs ACT Fixed Clinics/Facilities	Bilin, Ye	100
Total			486

Source: Data from INGOs/LNGOs (2018)

3.7.2.1 International Organization for Migration (IOM)

Established in 1951, IOM, an international organization for migrant population, has 149 member countries at the moment. Myanmar is also 149th member country. IOM opened an office in 2005 in Yangon. Now it has six office branches -

Mawlamyine, Ye, Myawaddy, HpaAn, Bogale, and Mawlamyinegyun in the country. The main activity of IOM is health care projects in Tuberculosis (TB), HIV, malaria, and basic health care and reducing natural disaster. Its project areas in Mon are in Ye, Thanbyuzayat, Thaton, Bilin, Mudon, Kyaikmaraw, and Mawlamyine.

Being a major malaria player among NGOs in Mon state, IOM has a variety of Malaria activity in all five townships. It provides health education (HE), distributing LLINs, RDT, and ACT to those RDT positive cases, opening mobile health clinics. It covers highest numbers of villages, total 110 in all five townships. In order to provide malaria services to those migrant workforce populations, it also gives health care services including HE, distributing LLINs, malaria testing, opening microscopic examination, malaria treatment for the migrant workers in the project areas. Major challenge is it is unable to provide services in hard-to-reach areas especially areas under controlled of ethnic armed groups and estimate the exact number of migrant workers.

3.7.2.2 Myanmar Medical Association (MMA)

The medical professional association of Myanmar, also known as MMA which is composed of over 17,000 medical practitioners all over the country, actively contributing health care of the community in Mon state since 2012. Through Global Fund project in Bilin, covering 86 villages and by The Nippon Foundation, covering 76 villages in Kyaikto. Part of their activities including malaria services such as HE, RDTs through mobile clinics. There is no specific project for migration workers. Except the areas covered are some hard-to-reach, there is no specific challenges in implementing mobile clinics. It feels that PPP should focus on those businesses which have high risk of malaria. Moreover, it is important to make understood about PPP to those business owners. Those organizations which are doing malaria activity should initiate PPP first.

3.7.2.3 Medical Action Myanmar (MAM)

In 2010, by beginning its activities, MAM has now five office branches with 100 staff in the country. The major areas of MAM are malaria, TB, and Basic health care. It is active in Tanintharyi, Karen and Mon states. In Mon state, Ye, Kyaikmaraw, Mudon and PaungTownship are project areas of MAM. In Ye township, its activities started in 2013, including some preventive and treatment of malaria, such as HE, LLINs, RDT, ACT, home visits, awareness raising, support AMW with

medications, referral and distributing Information Education Communication materials (IECs) covering 20 villages in the areas. There is no specific project for migrant workers.

The challenge is in some areas of the project, for example, some areas closed to Kyaikto Township are difficult to reach. The areas for supporting PPP by MAM are logistics of the supply chain (procurement, storage, and distribution).

3.7.3 Other players

Even the other players have smaller in size of their contribution, noticeably; they are in obvious way in contributing a major drawback in malaria activities. They include various types of quack (illegal medical practitioners) especially in the rural areas. Not only those villagers of poorly educated and under hardship but also many migrant workers rely on their incorrect and abusive use of malaria medication. By communicating in local ethnic language, Mon, those players easily get the trust from local people. It is also their strength. Those quacks are such as ex-medical corps, former health workers, low level health care staff and so forth. Improper and non-systematic use of antimalarial medication such as Artemisinin and ACT by those illegal practitioners are another contribution for the Artemisinin resistant and possibly ACT resistance in future.

CHAPTER IV

SURVEY ANALYSIS

4.1 Survey Profile

Mon state is 12th largest in area among 15 regions/states of Myanmar and the total area is 12,296 square kilometers. It also has more than two million populations and recognized as 9th most populated region. It has a population of 2,050,282 and the population density is 170*/square kilometer based on 2014 census data. However, it is the 4th region among the highest density of population in the country. The most common races are Mon, Bamar and Karen. Most of them are Buddhist. Other religions such as Christian, Hindu and Islam are also found. There are two districts and eleven townships in Mon State and KyaiktoTownship is situated in Thaton District. It is 947.2 square kilometers wide and has a population of 143,417. There are 6 wards, 35 village tracts and 76 villages under General Administration Department and Department of Public Health data.

According to health indicators data in Mon State, the Crude Birth Rate in 2018 is 17 per 1000 population which is more or less the same in 2017. The Crude Death rate is reduced from 7 per 1000 population in 2014 to 5 in 2018. Infant Mortality Rate is also reduced from 19 per 1000 live births in 2014 to 10 in 2018. Under 5 Mortality Rate is significantly reduced from 25 per 1000 live births in 2014 to 12 in 2018 but Maternal Mortality Rate for 2018 is 1 per 100,000 live births which is the same in 2014 and 2018. Generally, most of the health indicators are improved from 2014 to 2018.

Table 4.1 Health Indicators of Mon state (2014-2018)

Indicators	2014	2015	2016	2017	2018
Crude Birth rate (CBR)	17	18	18	17	17
Crude Death rate (CDR)	7	6	6	5	5
Infant Mortality rate (IMR)	19	13	11	10	10
Under 5 Mortality rate (U5 MR)	25	17	14	13	12
Maternal Mortality rate (MMR)	1	1	1	1	1

Source: Department of Public Health, Mon State, 2019

The health infrastructure and health care staff of Kyaikto Township can be viewed in Table 4.2 and Table 4.3. Regarding public health infrastructure in Kyaikto Township, there is one 50 bedded Township Hospital and one 16 bedded Station Hospital. At the village level, there are 7 RHCs (Rural Health Centers), 28 sRHCs (Sub Rural Health Centers). There are also 19 private clinics and maternity clinics.

Table 4.2 Health Infrastructure in Kyaikto Township

Health Infrastructure	Number of facility
Township Hospital	1
Station Hospital	1
RHC	7
Sub-RHC	28
Private Clinics and Maternity Clinics	19

Source: Township Public Health Department, Kyaikto, 2019

Regarding health manpower appointed for medical services in Kyaikto Township, there are 8 medical doctors and 23 nurses at the hospitals. For the public health services, one HA1 (Health Assistant-1), 8 HAs (Health Assistant), 6 LHV's (Lady Health Visitor), 7 PHS (Public Health Supervisors) and 40 Midwives are appointed.

Table 4.3 Health Manpower in Kyaikto Township

Health Manpower	Number of staff
Doctor	8
Nurse	23
HA1	1
HA	8
LHV	6
PHS	7
Midwife	40

Source: Township Public Health Department, Kyaikto, 2019

In Kyaikto, the type and estimated workforce of each business included in this study is mentioned in following Table 4.4. The main types of private sector site in Kyaikto Township are rubber plantation and gold mine and estimated workforce are 13,500 for rubber plantations and 1,224 for gold mines.

Table 4.4 Estimated workforces of selected private sectors in Kyaikto Township

District	Township	Sector	Workers (Estimate)
Thaton	Kyaikto	Rubber	13,500
		Gold Mine	1,224
		Total	14,724

Source: Collected Data from contacted businesses in Kyaikto Township

4.2 Survey Design

It was a cross-sectional exploratory study using qualitative methods and 18 participants were interviewed. Purposive sampling is conducted for the primary research and consists of interviews with key actors who have a high degree of familiarity with local practices and understanding of malaria situation.

Regarding migrant information, data are collected from Township Administrators, Department of Planning and Township Medical Officers. In addition, private business owners are asked for seasonal migration pattern. Migrant information is also obtained from IOM office.

4.3 Basic Characteristics of the Respondents

Study population includes government officials, private sector representatives from businesses and associations and staff from non-governmental organization (NGOs). Interviewed governmental departments are Government Administrative Department (GAD), Department of Public Health (DoPH), Department of Perennial Crops Development (DPCD), and Department of Planning (DP). In the business sector, rubber plantation, gold mine, quarry and road construction are included. For NGO side, International Organization for Migration (IOM) is the key organization which is implementing malaria project in Kyaikto Township so IOM staffs are also included in the interviews. Regarding the participants for KII interviews, 5 government staff from different departments, 6 participants from rubber plantation sites, 2 participants from gold mines, 1 participant from quarry and 1 participant from road construction are included.

Table 4.5: Allocation of participants for KII interviews

Government (GAD/DOPH/ DPCD/DP)	INGOs	Rubber Plantation	Gold Mine	Quarry	Road Construction	Total
5	3	6	2	1	1	18

4.4 Nature of Businesses

4.4.1 Rubber Plantations

For the rubber plantation sites, supervisors, managers and business owners as well as government staff from Government Administrative Department, Department of Perennial Crops Development and Department of Planning were interviewed and findings and outputs of the interviews are noted as below.

The rubber plantation business is commonly found in Kyaikto Township. The total acres of rubber plantation 34,139 and total workforce in the rubber plantation could be estimated by one worker in one acre of mature rubber plantation. By this calculation, Kyaikto has at least 34,000 (7% of total plantation in Mon State) rubber plantation workers in rubber tapping season which ranged from September to May, total nine months in a single calendar year. In Kyaikto Township, the total number of workforce among contacted rubber plantation businesses is estimated to be 13,500. Total six rubber plantation businesses and Rubber Planters and Producers Associations (RPPA) were interviewed during the field work.

The cyclical work of rubber tapping in rubber plantation depends not only on the age of the tree but also on the season. Varied with the species and the type of soil and inputs, the rubber tapping could start when the rubber trees become mature; it is usually possible 4- 6 years after the rubber tree is grown. Once matured, depending on the raining pattern, the rubber tapping season ranged from September to May. During that period, rubber tapping is done by the rubber plantation workers in the field. The day-work of rubber tapping begins at midnight until 11 am next day- rubber tapping at midnight, or 1 am; finished tapping work at 4-5 am; collecting the rubber latex between 6-9 am; mixing the latex with formic acid to solidify; making raw rubber sheets through the latex-formic acid mixture during 9-11 am. Each raw rubber sheet is usually weighted between 3-4 pounds depending on market requirement. As a result of interview findings, rubber price is sometimes very low, i.e. the market price of one pound of raw rubber sheet was 700-900 kyats in 2019. Usually, rubber planters mainly rely on China market and also sell with raw material products as raw rubber sheet (concentrated latex) for factory of making tire for automobiles. There are very limited value-adding activities for rubber manufacturing products in Myanmar until now. Currently, the rubber wood market is running by producing of oldest rubber trees which are over 30 years old. According to the field findings, the main rubber wood collectors and buyers are come from Yangon to produce mainly furniture.

4.4.2 Gold Mines

For the gold mines, supervisors, managers and business owners as well as government staff from Government Administrative Department and Department of Planning were interviewed and findings and outputs of the interviews are noted as below.

Although the business of gold mine is not crucial contribution to the GDP of Mon for various reasons, partially due to its illegality and the business sites are in the gray areas. The nature and context of the business is also complex. It is found that these business sites are having many problems including covert nature of business, unlicensed status, and health issues of the workforce which is mainly composed of migrant workers. Kyaikto have such gold mine businesses and one from Kyaikto was interviewed.

The activity of gold mine business is busiest from late monsoon season, November until next summer, May. Where those mine sites used heavy machinery halt the work at the end of April to avoid rain which could disturb the transportation of the machinery. The working nature of gold mine depends on the size the business. Majority of median and small scale gold mines are operating by manual laboring process but large scale mines are by using heavy machineries such as bulldozer, articulated loader, backhoe and hydraulic escalator etc.

If the gold mine company would like do a mining business in a place, it requires to buy the area from the landlord. Based on the availability of gold, the price of land is ranged from 2-10 million kyats per acre. The gold mine company has to contribute the community development by providing 30,000-50,000 kyats per month and to the military, who are responsible for the security of the area. In addition, the company doing business has to pay some fee, 300,000-500,000 kyats per month for those ethnic armed groups in the area- Karen National Union (KNU). If there is dispute between the company and the landlord, KNU comes in for the settlement.

4.4.3 Quarry and Road Constructions

For the quarry and road construction sites, one manager from each business as well as government staff from Government Administrative Department and Department of Planning was interviewed and findings and outputs of the interviews are noted as below.

In yearly basis, the quarry work business starts from October to May when the monsoon coming. It begins with recruiting workers, and rock-mining and road paving in November. There are various sizes of stones for road paving produced: 6 - 9 inches; 2-4 inches; 3 inches; and 1-2 inches etc. The construction companies buy the variety of stones based on the size of the paving stones they require. Some bigger

construction companies have their own quarry work place for construction and road paving activities

4.5 Work Force and Contribution of Migrant Population

Regarding the distribution of workforce, the following findings are noted during the interviews with participants from private sector and staff from INGOs.

For rubber plantations, most of the rubbers tapping workers are females and those making rubber sheets are male workers. The sex ration of rubber plantation workers is, depending on the location and the size of the business, varied. The common age range of the workers is from 20-45 years. Majority of the rubber plantation workers in studied townships are migrants coming from Ayeyarwaddy and Bago region (Shwekyin and Daik Oo). Some are from another township of Mon state. The peak season of migrant workers coming to Mon state is during the rubber tapping seasons as mentioned. Usually, they come with their dependent family. The main reasons of migration are scarce of work opportunities and low income in their native places, unfavorable pattern of climate changes, for example, late monsoon, drought etc. High seasonal employment opportunity among the variety of business activities in Mon state acts as a pull factor. On the other hand, those native people of Mon state go abroad, for example, Thailand to get employed.

Most of the workers stayed in the rubber growing field. For the resources, they depend on the nearby village and some are a sort of like cut-off village settlement¹ (CoV). However, they do not totally receive the health services from those villages because they are not registered in the respective village. If the rubber field is near to the main road, they stay like either small cluster² (SC) or large cluster³ (LC) and depending on the facilities from the nearest town.

For the gold mines, depending on the size of the gold mine and the use of heavy machinery, the number of workers is varied. Different size of the gold mine business and the estimated workforce could be seen in table 4.5. Most of the workers are migrants from Shwekyin, Bago region. Many of them have long working experience in gold mine. The owner provides shelters for their workers and cash for

food. The majority of the workers are between 15-45 years old and male and femaleration of 7:3. If the gold mine is near to the village, they stay like CoV. If they are away from the village, they are in either small or large cluster-getting the health services from ‘quack’ or nearest town.

Regarding the size of business for gold mines, the site is categorized as ‘large’ if the area of gold mine is more than 10 acres. If the area of gold mine is between 3 to 10 acres, it is categorized as ‘medium’ and is categorized as ‘small’ if the area is less than 3 acres.

Table 4.6: The business size of gold mine and the estimated workforce

No.	Business size	Areas in acres	Estimated workforce
1	Large	Above 10 acres	100
2	Medium	3- 10 acres	70
3	Small	Under 3 acres	90

Source: Interviews with owner/focal persons of gold mine businesses in Kyaito

For quarry and road construction, majority are from other regions such as Yangon and Ayeyarwaddy. Migrant workers bring their family along with them. Most of them stay as small or large cluster but all of them get the health services from nearest town.

4.6 Daily Wage

Regarding the daily wages of migrant workers, the following findings are noted during the interviews with participants from private sector.

For the rubber plantation workers, the daily wage is defined either by the number of trees tapped or daily wage. For number of trees, the tapping wage is ten kyats per tree (1,000 kyats per 100 trees by the rate of 2019) or for daily wage, a worker could earn 4,000-4,500 kyats for tapping of average 400-500 trees in a single day.

For the gold mine workers, the lowest daily wage ranged from 3,500- 4,500 kyats per day according the skill of the worker. The salary of other staff: a supervisor, 300,000 kyats; a clerk, 200,000 kyats; gold rinsing and gold sieving worker, 150,000 kyats, and driver (truck carrying sand), 200,000 kyats each. For those workers skillful

in looking for gold track could earn 500,000 kyats per month. Depending on size of the business, the gold mine workers have to work on eight hour or 12 hour shift in a day.

Table 4.7 Average Salary of Gold Mine Workers

No.	Type of worker	Average salary (in Kyats)
1	Gold rinsing and sieving worker	150,000
2	Driver	200,000
3	Supervisor	300,000
4	Skilled worker	500,000

Source: Interviews with owner/focal persons of gold mine businesses in Kyaito

For the quarry and road construction, the workers are daily wagers earning average 3500-4,500 kyats per day.

4.7 Health Seeking Behavior

Regarding health seeking behavior of migrant workers, the following findings are noted during the interviews with participants from private sector, government staff from Department of Public Health and staff from INGOs.

Throughout the tapping season, almost all of the workers including their family stay in the huts built by the owner in the rubber plantation field. Most of workers in the rubber plantation sites usually suffer from seasonal common colds, ache and pain and loose motions. When they get ill, they go to nearest RHC/Sub RHC, private clinic or government's hospital for treatment. Some visit to 'quacks'. In the villages near to the rubber plantation fields, though not legal, those ex-military people provide medical treatment to those workers. They are known as 'Say-Hmu' in these areas.

The goldmine workers as well as quarry and road construction are reported to suffer from seasonal common cold, ache and pain and get treatment in the nearest health care services such as RHC/ Sub-RHC, private clinic or township hospitals. Some visit to 'quacks'.

4.8 Malaria Risks and Need of Malaria Services

Regarding malaria risks and need of malaria services, the following findings are noted during the interviews with participants from private sector, government staff from Department of Public Health and staff from INGOs.

Most of the rubber tapping work in the field is done after midnight until early morning next day so due to the nature of work, the rubber plantation workers exposed to the mosquito biting and the risk of contracting malaria is very high among them. During the past 10-15 years, malaria was commonly seen in the rubber plantation workers but it is now rare to find the malaria cases among them. The possible reasons are better accessibility of proper malaria treatment, health education done by DoPH and NGOs, distribution of LLINs, blood testing and treatment. Other contributing factors may be deforestation which makes the habitant area of the malaria vectors narrower than before. But some of the rubber plantation sites still don't have access to any health education session, LLINs, blood test or treatment. These rubber plantation fields are far away from the town and sometimes they are not listed under the administration of the nearest village.

Situated in the deep forest away from the urban area, lack of health care services and assistance by INGOs, low health education level and health practices among workers who are mostly migrants are the contributing factors to the higher risk for the malaria among those gold mine workers. Kyaikto Township where there are more gold mines existed and adjacent to another endemic area, Shwegyin, Bago region reported of more malaria cases. Moreover, these areas are also hard-to-reach and under the control of KNU so health care staff (government/NGOs) is difficult to come in and help those gold mine workers.

Among the quarry and road construction workers, the incidence of malaria is reported to be rare now in compare to the past. Due to their work place is near to major road and the working hours are in the day time, the malaria risk is low in general. However, those workers who enter the forest nearby for other reason such as working as rubber tapper, looking for firewood are also high risk of contracting malaria. Undeniably, their low health education is also contributing factor.

“In our quarry work place, malaria is in low risk, but for those of our workers who enter the forest looking for firewood still has high risk of malaria.”

(A manager from road construction company)

As mentioned, among the various workforces in private sector, according to the key informant interviews with health care staff and business sector with the highest risk group are:

- (1) Rubber plantation workers
- (2) Gold mine workers

These workforce groups including their dependent families, composed mainly of migrant population, are in lack of basic health care services such as health education, malaria prevention and treatment. As a result, many of these people have to take treatment from quacks in the area. Poor in health education, improper and incorrect treatment of malaria and poverty are major causes for high risk of malaria among those workforces.

“Because we don’t know the exact number of them (migrant workers) in our township, and they are constantly mobile and the employers do not inform about them so there are gaps...”

(Interview with government health staff)

There are many villages in Kyaikto which are totally under control of some ethnic armed groups such as DKBA and KNU. In these areas the health care of the residents including those workforces under various private sectors which are actually co-businesses of ethnic armed groups, for instance gold mining is taken care by those controlled group. The extent and exact magnitude of malaria risk and incidence is yet unknown in these areas. According to the preliminary observation by the government health care staff in nearby areas, these special areas are more severe in morbidity and mortality than those areas under the government administration. Insufficient and less effective health care system in these areas is one of the reasons. Unable to perform basic health care activity by government’s health care staff in these areas is another reason to consider.

“In those hard to reach villages and insecure area, drug resistant malaria is reported. Because people from those areas got malaria treatment but they fail to take full course as prescribed.”

(Interview with government health staff)

4.9 Malaria Knowledge

Regarding malaria knowledge among migrant workers, the following findings are noted during the interviews with participants from private sector, government staff from Department of Public Health and staff from INGOs.

The general health knowledge among the workers from various business sectors are reported to be relatively low. Especially, among those rubber plantation workers and gold mine workers, while majority of them are migrant, their knowledge on general health and malaria is very doubtful to be enough and complete because many of them has wrong knowledge and ill-informed about the malaria. The unregistered and illegal status of most of the workers from rubber plantation or gold mines also contribute them to exempt from attending to those health education sessions conducted by government health care staff or NGOs in the areas.

Concerning with the knowledge on ACT and drug resistant malaria, not only the workers but the business owners are not fully aware and recognized about the seriousness of the association between development of drug resistant malaria and non-systematic use of ACT. Moreover, they do not perceive the fact that the reduction in incidence of malaria in their workforce, on the other hand, could contribute to the economic development of the country.

“As people drink purified water instead of stream water, there will be no more malaria.”

(Interview with a business owner)

“We are not registered in this village and therefore not entitled, it means, we are not invited to attend health education sessions.”

(Interview with a supervisor of a rubber plantation business)

4.10 Malaria Prevention

Regarding malaria prevention among migrant workers, the following findings are noted during the interviews with participants from private sector, government staff from Department of Public Health and staff from INGOs.

Many of the business sectors, especially the rubber planters and producers' associations in emphasize that the availability of those preventive measures by their workers such as LLIN is very low due to various reasons so far. Being migrants and not registered in village administrative setting is one of the reasons for those rubber

plantation workers while the hard-to-reach, illegality are other reasons for those gold mine workers short of getting those preventive measures. Fundamentally, many of the government health care staff and NGO activities are just to cover those areas of village community which are under administrative setting, excluding those hard- to-reach or small or big cluster areas where most of the migrant workers stay with their families.

“What we need is a bed net, that’s all.”

(A member of Rubber Planters and Producers Association)

“Nets are distributed in the village/ward, not in the rubber plantation field.”

(A member of Rubber Planters and Producers Association)

4.11 Malaria Treatment

Regarding malaria treatment among migrant workers, the following findings are noted during the interviews with participants from private sector, government staff from Department of Public Health and staff from INGOs.

Majority of the workers from different private sectors have to get medical treatment from nearest and available health care services. Sometimes, these places are government’s basic health facilities such as RHC, or Sub-RHC, or Station/Township Hospital. However sometime, they visit available but illegal, and unskilled ‘quack’ in their local area. Many rely on those ‘unknown’ medicines from the drug shops, prescribed by the drug shop’s owner. A few could reach to the nearest town and consult with medical professional. Low health education, accessibility, and affordability are the barriers for getting systematic proper treatment for the illnesses including malaria. Treating with ‘quack’ and incomplete course on administration of antimalarial drugs are contributing factors for those drug resistant cases in malaria.

“As the workers have low income, they can’t afford to visit doctors. They just buy drugs from betel shop.”

(Interview with a member of Rubber Planters)

“We take those ‘6 tablets’ whenever we are sick.”

(Interview with a supervisor in a gold mine company)

4.12 CSR Activity

For CSR activities for malaria control among migrant workers, the following findings are noted during the interviews with participants from private sector and government staff.

Among rubber plantation businesses, the CSR activity is not specifically defined or properly planned. Based on the nature of business, contribution to the welfare of the community concern such as donation is the most common activity reported among those rubber plantation businesses interviewed. Only contributing to the community development by donating cash, supporting building school are visible activities of the gold mine businesses in the respective areas. There is no specific CSR activity but only contributing to the community development by donation cash is found in quarry and road construction.

Among the business sectors interviewed, PPP is totally an unknown new concept. Many are willing to take part in the PPP activities or programme if these activities are aiming to help their employees in some way. The most common commitment is to take role in non-financial support such as transportation, logistics, supervising and organizing their workers for any health related activities either preventive, curative or promotive aspects. Many are reluctant to contribute financial assistance. However, a few would suggest contributing financial support to the any PPP programme. On the other hand, some of the business sectors, for example from quarry and road construction do not think Malaria is important problem to be aware among their workers. While those workers from rubber plantation and hidden and unrecognized gold mine workers do yet have a high risk for malaria so far. Still, the most severe cases of malaria including drug resistant cases are reported from those hard-to-reach and illegal gold mines.

“I have no idea what PPP is. This is first time I heard about it.”

(Interview with a manager of a rubber plantation business)

4.13 Potential for Private Public Partnerships

For private public partnerships for malaria control among migrant workers, the following findings are noted during the interviews with participants from private sector and government staff.

The rubber plantation businessmen are interested in PPP collaboration. The areas they could contribute are transportation, logistic arrangement and gathering of workers for any health activities. Some of the owners of rubber plantation are willing for financial contribution in PPP. They suggest doing PPP initiated by NGOs with the guidance of the public sector in the local area. If the PPP activities and programmes are planned, it should start in township level with the discussion with RPPAs because these associations cover the whole townships and Mon state. They also feel that it is the most suitable partner for those rubber plantation workers and their family.

In concerning with the improving of the wellbeing of their workers, many owners and focal persons of the gold mine businesses are generally interested in PPP. If PPP projects implements, they would like to get the information in advance because the gold mine businesses need to prepare and manage the workforce earlier before the actual activity started. They are willing to support the PPP activities in logistic, transport, gather the workers in part-time basis. They would also like to share some financial contribution to an extent.

“We have interest to do PPP because it may help our workers have better access to health care.”

(Interview with a focal person of a gold mine company)

Almost all the local government’s department of health agreed that the PPP model is the best way for the long-term malaria control and elimination programme in the country. Thanks to the fact that they noticed the unmet needs of the workforce especially among high-risk migrant workers in the affected areas. They pointed out the potential important steps and suggestions in PPP in malaria. Some of them are as follow:

- 1) Improve the existing social security system to support the workforce which could make PPP more effectively
- 2) Help PPP by department of health in technical role such as training on health education, preventive and treatment measures, research activities, data collection on identify the population of the migrant workers in the area, reporting and monitoring and evaluating process

“If social security system is improved in its functioning level, PPP approach is also more effective. So government should focus more on supporting role in it”

(Interview with a government health staff)

CHAPTER V

CONCLUSION

In general, Mon state is one of the most populated regions in Myanmar and the agricultural sector makes the highest contribution to its Gross Domestic Product (GDP) in Mon state. Other important sectors are industry, transportation, and trading. In private sector, the businesses studied are rubber plantation, gold mine, quarry and road construction and the studied businesses are more of local small and medium enterprises.

5.1 Findings

The rubber growing area of Mon state holds at least one third of country's total rubber plantation areas and is the main agricultural sector in Kyaikto. The uncontrollable and fluctuating rubber price is the major challenge among the rubber tree growers. Though it is not representing all of the growers in the local area, rubber planters and producers' association is the sole organized body for many of the rubber growers in each township. Most of its workforce is migrants from Ayeyarwaddy and Bago region. The malaria incidence among them is also significantly reduced in recent years. However, low Health education and lack of proper health care services are major gaps among this population.

Another important private sector in Kyaikto is gold mine business. The business itself is unlicensed and situated in the hard-to-reach and ethnic armed group controlling areas. Its workforce is also untouched by not only government health care services but also those of NGOs. Many of the malaria cases are also reported from that workforce who is highly mobile with predominantly migrant population. Most of them are from Bago region. Some of the sites of gold mine businesses are contributing to the malaria hotspots where it is close to Shwekyin in Bago Region and Hpapun in Kayin State. Quarry and road construction businesses were also interviewed. Its workforce is mainly made up of migrants from Yangon and Ayeyarwaddy regions.

Although the types of businesses studied are varied in nature, the majority of their workforce is composed mainly of migrant population. The sex ratio is depending on the type and location of businesses, for instance, in rubber plantation, male to female ratio is ranged from 3:7 to 7:2. In gold mine businesses, male to female ratio is 7:3. Varied with the type of business sector, the most common areas of their origin are from Ayeyarwaddy, Bago and Yangon regions. Some of them are from different townships of Mon state. The major reasons of migration are, as push factors, scarce of employment opportunities in their native regions, unfavourable climate pattern changes, for example, late monsoon, drought etc. and as a pull factor, seasonal employment opportunities are high in Mon state among the variety of business activities. Many of them are staying in their work places with their dependent family until end of the working season. Depending on the type of business and location of work site, some are staying in SC or LC, while some are in CoV. The major challenge concerning with the migrant workers is, at the moment, no official and updated data source for the location and the size of migrant workers in government's departments.

The whole Mon state is recognized as one of the highest risk areas of malaria including artemisinin resistant malaria in Myanmar. However, at the moment, the morbidity and mortality of the malaria in Kyaikto is sharply declining and malaria trend is moving towards elimination. The improving statistics in malaria is the result of the high collaborated actions of National Malaria Control Program under DoPH and the supportive role of the various stakeholders including international and local non-governmental organizations (INGOs/LNGOs) in the area. Regarding to the malaria status, Mon is in better position except in some hard-to-reach and special areas controlled by ethnic armed groups. Nonetheless, the incidence of malaria, both morbidity and mortality among these workforces are also sharply declining recent years; the risk of malaria is still high in some kind of workforce.

The malaria risk is highest among the workers of rubber plantation and gold mine due to their timing of working hours, working place, seasonal pattern of work, high number of migrant workers, not getting enough preventive, diagnostic and treatment measures. Among these two types of high risk workers, the workers from gold mines show higher risk than those of rubber plantation because predominantly migrant population, high mobility of its workforce, hard-to reach area and site of work closed to forest and seasonal pattern of work nature. Another challenge is that the total numbers of its workforce is not only unknown but also unrecognized.

5.3 Recommendations

To strengthen malaria control efforts to mobile and migrant populations, the following interventions are proposed:

1. To establish a fundamental platform for malaria control activities

- a. Collect the updated data on exact location and size of the population of migrant workers in the area (Migrant Mapping)

The major challenge concerning with the population of migrant workers is, at the moment, no official or reliable and updated data source either in government's departments or NGOs. As this qualitative study is limited to the sample size and type of businesses, it is urgently required to do the identification of location and exact size of the population of migrant workers. This effort should be the result of best collaboration between public, private and NGOs player in the areas concerned.

- b. Strengthen the social welfare mechanism for the workers to improve the welfare status of the workforce in general

Currently, the social welfare status of all the workers is insufficient including health care benefits. Partly, it is due to low interest or negligence of the business owners to follow the regulation of social security system for their employees' welfare. So for the more practical aspect at the moment, it is suggestible local business owners encouraging improving social protection mechanisms (such as provision of health care and commodities, referral and emergency funds etc.) for their workers as much as possible. These actions could be supported by the active INGO/LNGOs especially in health related sector in the areas.

- c. Provide health care services to those migrant workers in hard-to-reach areas, for example, gold mine workers

The gold mines are doing business in the hard-to-reach and ethnic armed group controlling areas with illegality. The workplaces are also closed to or situated in malaria endemic area and the health care service providers either from government or NGOs could not access to

the area easily. As a result, the risk of malaria in those migrant workers in that sector is higher than other sectors. To assist those workers in this business sector, to get trust and support from those ethnic armed group is required. For example, initiating any malaria programme with the local community and then approaching and negotiating with the gold mine businesses to begin a malaria programme through mobile health service team in the workplace is one way to consider. Despite of directly dealing with the ethnic armed group, another option to consider is to access these workers by reaching through various means without going to their workplace – for example, through targeting supply routes or transport routes by opening a mobile screening point and providing malaria services required.

- d. Trust building with the key non-state actors in the areas and negotiate with them for the implementation of the malaria programme:

As significant percent of areas are under the control of ethnic armed groups in Kyaikto, it is open to find a way to implement malaria programme along with them by building partnership with some INGOs players who are already working in these areas, for example in health or development sector. At the moment, more practical and safer option is to deal with health units of those armed groups and agree for any feasible malaria programme which should focus mainly on providing preventive, and treatment measures. In addition, the capacity building of those health care staff of these areas can also be included in the programme if necessary.

2. To strengthen preventive measures to control malaria effectively

For any preventive measures in malaria, HE, distribution of LLINs should be done for all of the workers. It should be under the collaboration action between public and private sectors. Private sector is more favourable in role of arranging logistic, gathering workers for any health promoting activities in general. Some of the business owners are in role of contributing financial support to those preventive activities. One important issue is it requires to ensure all the workers especially those migrant workers and their dependent family members getting enough any preventive measures and properly use of any item distributed. To

grow the effective health practice among those workers, for example, sleeping under bed net or LLINs all the time, in the HE session for all the workers, it needs to focus on promoting the behaviour of sleeping under the bed nets all the time whenever such distributing activities take part. Any feedback of the workers, any problem in using those measures should also be addressed accordingly. The public sector especially DoPH will be more on the active role of technical aspect of these activities, such as supervision and monitoring of these activities, ensuring behavioural modification of malaria risk practice. INGOs/LNGOs will also involve in the preventive measures-helping the workers to get these items sufficient.

3. To strengthen early diagnosis and prompt treatment of malaria cases

Currently, most of the workforce is lack of proper and systematic treatment for malaria due to various reasons. This issue should be addressed seriously because it contributes the drug resistant malaria in these high risk areas. To encourage and provide the RDT to all those workers who get fever is a real challenge because it requires a large number of health care staff or trained volunteers to be present in the respective local work places. Otherwise, as the workers are unaffordable to get such treatment and easily end with ‘quack’ or improper treatment which could lead to disastrous outcome or drug resistant malaria in long term.

Recognizing those RDT positive cases and to provide ACT in full course without fail is another issues in diagnostic and treatment component. All the process in diagnostic and treatment component should be free of charge or in a very reasonable cost because many of the workforces are in unaffordable status. This kind of support could be achieved by the joint effort of private and public sector. While private sector contributes logistic, financial part and the public sector provides the materials needed, such as RDT and ACT medication, and technical training to those heath volunteers in the workplaces. Experienced INGO/LNGO could also take part in these activities too.

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APPENDICES

Annex 1: Governmental Respondents Interview Guideline

KII Guide line for GAD and other Government Departments
(Including Township Public Health Department, Department of Perennial Crops Development, Department of Planning, etc.)

Current activity of Infrastructure in Township

1. How many large scale agriculture companies in this district (Rubber, Oil Palm etc.)?
2. What is the Potential Land Use-Plan in this district? i.e. Forest company Mining company
3. Do you know of future plans to develop the areas? Can you give more information on who is doing what activities and the duration of their activities (current and future plans)?
 - a. Agriculture:
 - b. Mining:
 - c. Oil & Gas:
 - d. Energy: (hydropower or other)
 - e. Transport:
 - f. Construction
 - g. Others

Health and Malaria (TMO)

Are there any current health related programs in your area? When did they start? Who are involved in the programs? What are they doing?

1. How do you know about current Malaria status in this township? Describe on it? (Any change in occurrence/seasonal pattern/death rate)
2. Is Malaria a priority health concern in your area? Why or why not?
3. Where are the risk areas and what specific population at risk in your township? (E.g. migrant, women, children)
4. What type of business or type of job will more risk to malaria? (e.g. rubber plantation workers, mining workers etc.)
5. Where did they (employees) go for their Malaria treatment? (Government/ Private/ quack and other)
6. What kind of activities in relation to Malaria by the private sector in your area? (Prevention, Treatment, Promotion, Community based activities) Describe it?
7. Future prospect?
8. Describe about Malaria drug resistant condition in this area? (Artemisinin resistant Malaria)
9. What type of measures your township does for the Artemisinin resistant Malaria? (ITN, IRS, Insecticide, HE, RDT, IEC distribution)

10. Who are doing what? (what Organizations-Government- MOH/NGO/private sector)

Provide to whom?

11. Would you think their Malaria activities are effective? Why or why not?

12. How can the programs be improved?

13. Is there any gap in the Malaria programme?
(Cooperation/Implementation/Sustainability etc.)

14. Any need especially for the employees including migrant workers from private sector?

15. Any recommendation (action/activity) to meet the need? How?

Concerning with Migrant population

1. What do you about migrant population in your township?

2. If yes, where are they? What are they doing? (occupation) Where are they coming from? The reason of migration? What about their size? (estimated population-by sex, age group)

3. How they get the health care services? From whom? (Government-MOH/NGO/private sector)

4. How about the risk of Malaria in that population? Why?

5. What is the Artemisinin resistant Malaria condition in this group?

6. Where do they get the Malaria services in the area?

7. What are the challenges for the programs for the Malaria services?

CSR activities

1. Do you know of companies that run CSR programs (current, past or planned)? What details do you know of the programs? For example, which companies, are their CSR programs doing what types of sector focus (E.g. health, development, environmental, social, their geographical scope, and how are they implemented)

2. Is there any Malaria programme in their CSR activity related to health?

3. How are they doing?

4. Any gap in the activity? Why?

5. How to overcome it?

6. Any prospect in activity related to Malaria in your area?

Private Public Partnerships

1. Do you know about Private Public Partnership (PPP) programme? In Malaria?

2. Would your Department be interested in cooperating in a region-wide PPP program to combat malaria? Why or why not?

3. If yes, what role would the Department be interested in fulfilling, e.g. technical (skill), financial (resources) or coordination, implementer, etc.?

4. What conditions would **need** to be satisfied in order for the Department to participate in such an initiative?

5. What would be the best or most effective way to cooperate with the Private Public Partnership (PPP) strategy in reduction of the incidence of Malaria in

the future? Please elaborate on your opinion. (In terms of how to implementation, stakeholders, project sustainability)

THANK YOU for taking the time to participate in this interview.

Is there any other information that you think we should know about this community?

Do you have any questions about this interview, or what we talked about?

We appreciate you help in this process.

Annex 2: Non-governmental Respondents Interview Guideline (KII Guide line for NGOs and UN Agencies)

Organization Profile

- a. Head Office, Year of Establishment
- b. No of Countries that the organization has been working on
- c. Year of Establishment in Myanmar
- d. No of Branches
- e. No of Staffs –Organization Structure
- f. Major Activities
- g. Project Areas

Question Guide

1. What is your organization activity for Malaria in this area in details? (prevention/diagnosis/treatment or promotion)
2. What was the coverage of your activities in this area? (when, who, what, where)
3. Any specific Malaria program/project for migrant population/ migrant workers?
4. Do you have any limitation or difficulties in project implementation? What could be done to overcome these limitation or difficulties?
5. What are the services and community needs in terms of health and Malaria incidence in this area?
6. Do you have any limitation or difficulties in project implementation? What could be done to overcome these limitation or difficulties?
7. What are the government policies in dealing with Malaria in this area?
8. How closely do you cooperate with the government agencies in your work? Please describe any roles and responsibilities.
9. How can the government agencies support your work in Malaria treatment and reduction more?
10. Do you have any cooperation with the private sector during the project implementing years? If yes,
 - In which sector/area?
 - Can you describe the partnership?
 - How is it working? (Your organization's role/their role)
 - What are the needs to fulfill?
11. What are the organization's future plans for Malaria projects (including for migrant population)?
12. If the organization could receive support from the private sector, what ways could they best assist in your work on Malaria? E.g. Financial resources, technical skill, training on procurement, best practices, help with distribution of materials, etc.

THANK YOU for taking the time to participate in this interview
Is there any other information that you think we should know about this
community?
Do you have any questions about this interview, or what we talked about?
We appreciate you help in this process.

Annex 3: Private Sector Respondents Interview Guideline
KII Guide line for Private Sectors
(Company managing staff, Work place supervisor etc.)

A. Corporate Social Responsibility (CSR)

1. When you apply for your business license do you need to include social targets (health and education)?
2. Do you have Environmental and Health Impact assessments in your organization? If yes, does it impact on your business? Please specify. How do you use these studies to mitigate risks in the business?
3. Does your company currently have CSR activities? (E.g. health, development, environmental, social, their geographical scope)
4. If your company does not have CSR activities, can you explain why?
5. If yes, how are you implementing?
6. Any success? Any difficulties in g them, etc.?
7. What are the plans to expand on the CSR work?
8. Is there any Malaria programme in your CSR activity related to health? (Any preventive, diagnosis, treatment, and promotion etc.)
9. How do you implement?
10. What kind of Malaria programme and services has been providing?
 - Is equal chance male or female?
 - Local/Migrant?
 - Permanent/daily wages?
 - Employee/their dependent (Families)
11. Do you know about Malaria drug resistant condition? If yes, as a result of your experienced how do you think Artemisinin based Combination Therapy (ACT)(e.g. coartum, *padonma*)?
12. Any ACT services available in these areas?
13. Do you think Malaria is a serious health issue in this area? Should more businesses by participating in efforts to combat the spread of Malaria?
14. Do you have any Malaria prevention program for your staffs, their families and communities? If yes, how is the program implemented, what are the challenges/constraints? If possible, can you let us know the costs of this Malaria?
15. Any prospect in activity related to Malaria?
16. If no, are the companies interested in developing Malaria control program for your staff? Why or why not?
17. Would the company be interested in contributing to a region-wide program to combat Malaria? Why or why not?
18. What conditions would need to be satisfied in order for the company to participate?
19. What role would the company be interested in fulfilling? And How?

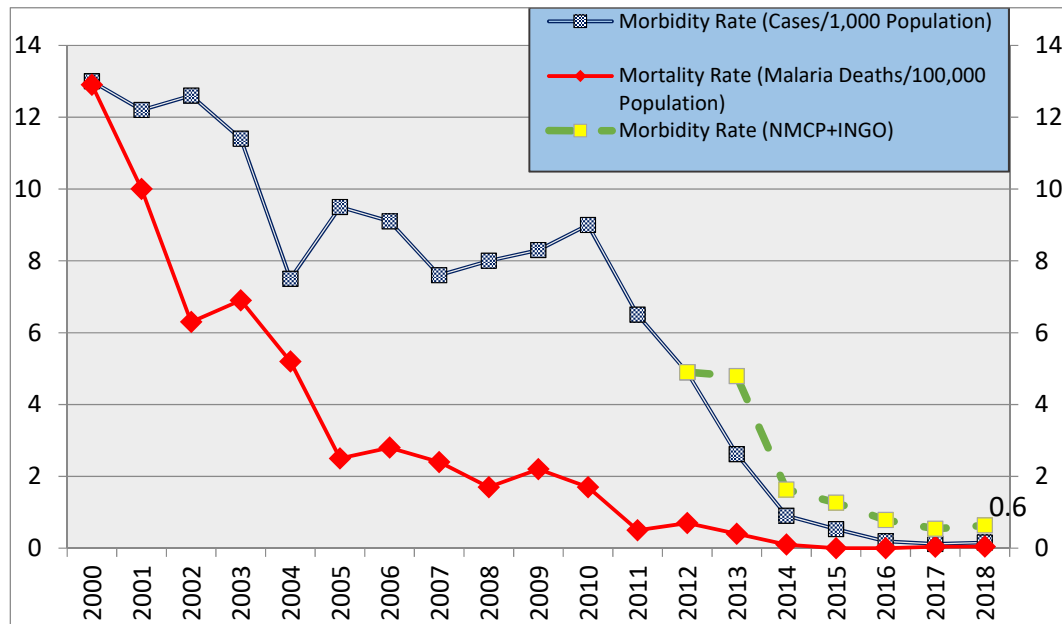
B. Private Public Partnerships (PPP) in Malaria

1. Do you know about Private Public Partnership (PPP) programme? In Malaria?
2. Would your Department be interested in cooperating in a region-wide PPP program to combat malaria? Why or why not?
3. If yes, what role would the Department be interested in fulfilling, e.g. technical (skill), financial (resources) or coordination, implementer, etc.?
4. What conditions would **need** to be satisfied in order for the Department to participate in such an initiative?
5. Would you like to be on conduct your own activities or work in cooperation with others such as INGOs, LNGOs and governmental departments? In which ways would you like to cooperate with others? If you do not want to cooperate with other groups, why?
6. Would your company be interested in the following ways:
7. Providing training programs to the community or malaria NGOs on an area of the company's expertise, e.g. procurement, value chain, distribution of goods
8. Providing monetary contribution to the groups working on malaria containment
9. Other ideas
10. What would be the best or most effective way to cooperate with the Private Public Partnership (PPP) strategy in reduction of the incidence of Malaria in the future?

THANK YOU for taking the time to participate in this interview
Is there any other information that you think we should know about this community?

Do you have any questions about this interview, or what we talked about?
We appreciate you help in this process.

Annex 4: Malaria Trend in Mon state (2000-2018)



Source: Data from National Malaria Control Program, Mon State (2019)

Annex 5: Map showing the areas of gold mine activity between Kyaikto (Mon state) and Shwekyin (Bago region) where malaria risk is reported to be high

