1. INTRODUCTION

Home-based management of malaria (HMM) is an integral part of malaria case management within the overall Roll Back Malaria (RBM) strategy. The essence of this strategy is to provide access to pre-packed quality antimalarial drugs within 24 hours of the onset of fever through a network of community resource persons, and to improve malaria detection and community knowledge of malaria and its treatment.

The Papua New Guinea National Malaria Control Program (NMCP) Strategic Plan articulates the need to introduce home-based diagnosis and treatment services in order to improve access to quality malaria diagnosis and appropriate treatment. These guidelines are based on the national malaria treatment policy and aim to standardize HMM interventions throughout the country and provide for quality by providing a set of recommendations and regulations for care of patients with malaria at the community level.

2. RATIONALE OF INTRODUCING HOME BASED MANAGEMENT OF MALARIA

Although a concerted effort is being made to improve access to health facilities through the National Health Plan 2011-2020 and through the Rural Primary Health Services Delivery Project, additional efforts are needed in order for the government to eventually achieve maximum population coverage. Indeed the National Health Plan calls for a “back to basics” approach. The plan highlights a need to focus on the most efficient and evidence-based strategies to meet the needs of the growing population and stop further deterioration of health services.

It is believed that only approximately 60% of aid posts, designed to serve rural populations, are functioning. Therefore, there is a need to expand medical services to community level particularly in those areas where aid posts are not functioning.

HMM is a strategy to deliver lifesaving curative interventions for people suffering from malaria in settings where access to facility based services is limited. It is meant to complement and extend the reach of public sector clinical health services.

Evidence for the need for HMM in Papua New Guinea (PNG) is provided in a 2010 nationally representative quantitative survey on malaria control strategies as follows:

- 61% (n=2,271) of households surveyed reported having at least one case of malaria in a child younger than age 5 in the previous year.
- 48% (n=2,019) of caregivers surveyed reported they would use traditional medicine to address their child’s fever before seeking treatment elsewhere. From these, 21.3% (n=929) cited the reason as the distance to a health facility. Indeed, among caregivers surveyed whose children had fever in the previous two weeks who did not seek

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1 NDqH, NMCP strategic plan 2009-2013, p9
2 While the national treatment protocol focuses the treatment of malaria in health facilities, these guidelines discuss the case management of malaria at the community level.
3 Papua New Guinea: Malaria Tracking Results Continuously Study Evaluating Malaria Control Strategies Amongst High- and Low-Risk Populations, 2009-10, Population Services International
treatment from a health care facility, 20% (n=339) did not do so because they had instead used traditional medicine.

- Only 20% (N=1,720) of caregivers surveyed reported being able to reach a health facility for treatment within 10 minutes. Thirty percent travel between 11 and 30 minutes, 10% between 31 and 59 minutes, and 24% 1.5 hours. The mean cost of travel to health facility for those who traveled by PMV, car or boat was 7.50 PGK (N=177). However, 85.3% (n=1,965) travel by foot.
- Of caregivers who had children younger than age 5 with fever in the previous two weeks, only 54.3% (n=1,240) sought treatment from a health facility the same day or on the following day. This was significantly higher in high-risk areas (61.1%, n=787) than low-risk areas (44%, n=453).
- 16.4% (n=1,959) of caregivers had purchased malaria drugs in order to be prepared for future fever episodes in their children (presumably fearing the inability to reach a health care facility).

Therefore, there exists a need for complementary approaches that would increase prompt access to appropriate malaria diagnosis and treatment, particularly among children younger than age 5.

That said, the National Department of Health (NDoH) must consider carefully the merits of each intervention articulated within the NMCP Strategic Plan based on the epidemiology of the disease burden.

### 3. GOAL OF HMM INITIATIVES IN PAPUA NEW GUINEA

The goal of HMM in PNG is to reduce malaria morbidity and mortality with the purpose of increasing appropriate use of Artemisinin-based Combination Therapy (ACT) among people of all ages in target communities.

The objectives are as follows:

- To strengthen diagnosis of malaria (using rapid diagnostic tests [RDTs]) at the community level.
- To increase access to pre-packaged ACT for patients with confirmed malaria in the community.
- To improve quality of service provision by community based drug distributors.
- To increase informed demand for health care for community members suffering from fever.

### 4. ROLE OF COMMUNITY BASED DISTRIBUTORS

Extending diagnosis and treatment of malaria beyond public clinical health facilities down to the community level requires a network of CBDs. CBDs must be trained in proper diagnosis using RDTs, recognition and assessment of malaria symptoms including danger signs, accurate

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4 In Papua New Guinea, the ACT is Artemether-Lumefantrine (AL). In the PNG public sector, this product is called Mala-1.

5 Community based distributor (CBD) is used throughout this document to represent HMM implementers. These can be volunteers or paid workers.
administration of pre-packaged treatment by weight, referrals for severe cases of malaria and non-falciparum malaria (or illnesses not stemming from malaria that cannot be addressed through HMM), drug storage (Mala-1 and paracetamol), record keeping, and the introduction to basic behavior change communications approaches and tools. CBDs must be adequately supported and supervised.

Selection of the villages and the CBDs requires identification of community need and proper planning. To ensure ownership of HMM, meetings must be conducted by the implementing organization at the provincial and district levels to sensitize the relevant health authorities and health managers and solicit the support of the various stakeholders. Their input into the selection of program implementation areas is a requirement to ensure targeted communities are informed and agree to the intervention. Thereafter, the implementing organization should provide quarterly reports to the relevant provincial and district authorities and should conduct a briefing meeting for the same on an annual basis. The goal of this meeting will be to provide the health authorities with information on project progress in their communities.

The process by which the volunteer CBDs are selected is paramount to the success of the program. A 2007 World Health Organization document on lessons learned in HMM states, “The fact that they were selected on the basis of the communities’ own criteria meant that people felt at ease visiting them…” Therefore, the CBDs must be selected by their own communities – with assistance from the implementing organization - through a participatory, transparent process. Minimum standards include numeracy, some ability to read and write in basic English, stability within the community and an enthusiastic attitude toward preventing and treating malaria.

Each CBD must be asked to sign a CBD agreement, which should also be signed by the community leader, the relevant CBD supervisor and the implementing organization. No person should be allowed to be a CBD unless this document is signed.

The ratio of CBDs to households is dependent upon the operating environment, particularly since population density varies wildly throughout Papua New Guinea. In deciding how many households a CBD should be assigned to, implementers must consider the distance a village resident must travel to reach the CBD, the distance CBD Supervisors must travel to supervise each CBD, and the distance to the referring health facilities.

5. DIAGNOSIS

The new malaria treatment protocol says all suspected cases of malaria must be confirmed through microscopy or RDTs before treatment is given. As such, all CBDs implementing HMM must be trained to use RDTs and to recognize the danger signs for severe malaria (for prompt referrals).

It is important to note that use of RDT is not recommended for treatment follow-up, as some of the tests will remain positive for weeks following effective antimalarial treatment due to parasite antigens remaining in the blood.
6. TREATMENT

In PNG, HMM focuses only on treating uncomplicated confirmed cases of malaria with Artemether-Lumefantrine (AL). Non-falciparum cases of malaria, severe cases (as represented by danger signs) of malaria, and anything not involving malaria must be referred to the health facilities. The following section discusses how trained CBDs must manage various uncomplicated malaria cases in the community.

6.1. Patients with uncomplicated falciparum malaria infection

For patients with uncomplicated falciparum malaria (fever or history of fever and RDT positive for falciparum malaria), the CBD must provide AL per the national weight-based protocol, observe the first dose and instruct the patient to take all doses as instructed.

One exception is provided for patients weighing less than 5 kg. These children shall be provided the first dose of AL (1/2 the tablet) as a pre-referral treatment and should be urgently referred to the nearest health facility for further investigation and medical supervision. AL as a pre-referral treatment will prevent treatment delays that could result in death.

Community based management treatment protocol for AL

<table>
<thead>
<tr>
<th>Days and doses</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;5  5 - 14.9</td>
</tr>
<tr>
<td>Day 1</td>
<td></td>
</tr>
<tr>
<td>1st dose at 0 hours</td>
<td>1/2 1 2 3 4</td>
</tr>
<tr>
<td>2nd dose after 8 hours</td>
<td>- 1 2 3 4</td>
</tr>
<tr>
<td>Day 2</td>
<td></td>
</tr>
<tr>
<td>3rd dose after 24 hours</td>
<td>- 1 2 3 4</td>
</tr>
<tr>
<td>4th dose after 36 hours</td>
<td>- 1 2 3 4</td>
</tr>
<tr>
<td>Day 3</td>
<td></td>
</tr>
<tr>
<td>5th dose after 48 hours</td>
<td>- 1 2 3 4</td>
</tr>
<tr>
<td>6th dose after 60 hours</td>
<td>- 1 2 3 4</td>
</tr>
</tbody>
</table>

Note: Before providing AL, the CBD must weigh the person; AL dosing is based on body weight. Organizations implementing HMM are advised to supply the CBDs with weight scales appropriate for adults, and weight scales appropriate for babies.

6 The baby must be administered the first dose (1/2 tab) as a pre-referral treatment and then be referred to the health facility for further investigation and medical supervision.
6.2. Patients with uncomplicated non-falciparum or a mixed infection

The national malaria treatment protocol recommends treating non-falciparum (P. vivax, P. ovale, P. malariae) or a mixed variety of these cases with AL and primaquine. The provision of primaquine by the CBD is not recommended. Therefore all non-falciparum malaria detected by the CBD will be provided AL and given a referral to the health facility for primaquine treatment.

6.3. Uncomplicated malaria in pregnancy

As AL is not recommended for use in the first trimester of pregnancy, CBDs must be trained to inquire about pregnancy and refer RDT confirmed malaria to a health facility. RDT-positive pregnant women with uncomplicated malaria in the second and third trimester will be treated in accordance with the national treatment protocol (AL according to body weight). All CBDs should be trained to inquire with women between the ages of 15 and 49 as to the likelihood that they could be pregnant and within the first trimester.

6.4. Paracetamol

If the patient temperature is over 38°C, he/she should also be given paracetamol to lower the patient’s temperature, in addition to Mala-1. However, babies younger than 3 months of age should not be given paracetamol. Paracetamol should be given per the below guidelines:

- Under 10 kg: 2½ ml 4 times a day until fever is gone
- 10 kg-19.9 kg: 5 ml 4 times a day until fever is gone
- 20 kg-29.9 kg: 7½ ml 4 times a day until fever is gone
- 30 kg or more: 10 ml 4 times a day until fever is gone

7. COMPLIANCE

If uncomplicated malaria is confirmed through an RDT, the CBD must do the following:

- Immediately provide AL to the patient and observe the first dose of AL (in accordance with clause 6 above).
- Explain to the caregiver/patient when to take the next and following doses of AL.
- Orient the caregiver/patient to come back or to report to the nearest health facility should danger signs arise, such as lethargy, persistent vomiting, convulsions, loss of consciousness, rapid respiratory rate, etc.
- Explain the importance of completing a full course of AL as prescribed.

One way to ensure treatment compliance is for the CBD to visit the patients who are within a reasonable walking distance each morning and each evening until the medication is complete. In this way, the CBD could observe the caregiver administering the treatment to the child or the patient taking the medicine. However, this cannot be guaranteed in all cases due to logistical and geographic challenges inherent to PNG.
8. REFERRAL

Safe and effective HMM will require CBDs to adhere carefully to referral criteria. In addition to cases discussed in the treatment section above, the following cases should be considered as danger signs/situations and should not be managed in the village, but referred urgently to the nearest health facility for further evaluation and appropriate medical attention:

- children younger than 2 months of age
- any patient who has had a fever for 7 or more days
- inability to drink or eat anything
- convulsions
- lethargy or unconsciousness
- vomiting everything
- 1st trimester pregnancy
- inability to sit or stand up
- Patients with fever but with negative RDT results

HMM depends on the RDT result. A negative result from a properly performed RDT should raise suspicion of an illness other than malaria; these patients should be referred to clinical facilities for appropriate management.

HMM programs interested in providing paracetamol to patients without malaria may do so. However, the national malaria treatment protocol only dictates that it is to be administered to patients testing positive for malaria with a fever of 38 degrees or higher.

Other cases needing referral are:

- Patients who do not respond to treatment within 48 hours.
- Patients who have had a complete course of weight-appropriate AL within the past four weeks and are presenting again with fever.
- Those with non-falciparum or mixed malaria (per the above).
- Women within the first trimester of a pregnancy with confirmed malaria (per the above).

Note: It is crucial to explain to the CBD through training that the referral of a patient to a health facility does not mean they have failed. Communities will appreciate their services when they refer a patient in a timely fashion as opposed to treating a very sick person that is beyond their capacity to treat that then dies.

Before referral, it is important that caretakers are briefly counseled on the severity of illness, the need for referral, and the importance of getting the correct treatment at the health facility as soon as possible (there should be a way of identifying and addressing the fears, questions or concerns of the caretaker regarding referral). However, assessing the need for a referral in situations in which severe disease or danger signs are present should not take a lot of time or delay referral.

A patient who is referred should go to a health facility in a timely manner using their own resources. It is therefore important for the HMM implementing organization to establish linkages between health facilities and CBDs operating in their catchment areas to facilitate and ensure
referred cases are dealt with correctly. The referral health facility should provide feedback (via a counter referral system given to the patient) to the CBD on each referred case. As such, the referral facility should ask the referred patient to revisit the CBD for appropriate follow up once back in their own community.

9. COUNSELLING

HMM requires CBDs to advise the caretaker/patient on the following:

- How to give/take the drugs at home.
- The importance of completing all the doses (drugs) as instructed, even when the patient seems to have improved.
- The importance of continuing to eat and drink even during the illness for fast recovery.
- How to prevent malaria through nightly use of mosquito nets and through prompt treatment-seeking behaviors.

10. DRUG AND RDT STORAGE

The CBDs and communities need to know that the drugs will be adversely affected if they are not stored appropriately in their home. It is therefore important that the drugs are kept in the following way:

- In dry, clean places in the house (if the place is damp, drugs should be kept in a cupboard, box or on a surface material which does not allow water to pass through).
- Away from extremes of heat, cold and direct sunshine.
- Separate from the other items in the house.
- Away from children & animals.
- Away from water (drugs suspected to have come in contact with water must not be used for treatment and should be exchanged for new stock).

The CBDs must ensure proper storage of RDTs as well to maintain their quality. RDTs should be kept in cool conditions (below 25°C) and not be directly exposed to the sun.

Where possible, CBDs should be given a plastic or wooden drug box in order to keep their stock safe and secure from the elements.

Each HMM program needs to establish how the CBDs will receive a regular supply of adequate drugs and RDTs, particularly since the drug distribution system has challenges unique to each province and district in PNG. In order to ensure accountability, CBDs should keep adequate records of RDTs and drugs collected and used, including details of cases treated (gender, age, weight and AL dosage used). Good record-keeping will allow proper management of the supply system, including distribution and use of medicines and supplies. It will also help in the evaluation of the impact of the intervention as well as the quality of the CBDs’ trainings.

11. SUPERVISION AND MONITORING

CBDs are not professional health workers, thus should not be left on their own without support or supervision.

a) Aim of supervision
The aim of this supervision should be to improve the quality of services provided by the CBDs. This supervision should also strengthen linkages between the CBD, the community and the formal health sector, as well as promote community participation.

The objectives of the supervision should be:

- To strengthen the skills of the CBDs for giving appropriate treatment and referral.
- To support the CBDs in proper RDT/drug storage and quantification.
- To support the CBDs in proper record keeping.
- To replenish supplies of the various stocks (RDT/drugs and reporting/referral forms)
- To promote community participation in the strategy for prevention and response.

The supervision should be more supportive of CBDs and not used for fault finding.

Implementing organizations should develop a CBD supervision plan. Relevant supervision checklists/tools should be available as well as any supplies (e.g. drugs, recording forms/registers) to deliver to the CBDs. A team involving government health officials (district and provincial managers) and relevant CBO/NGO staff should be involved in the supervision process.

In addition to supervision meetings/visits and where logistics and budget allow, quarterly or semi-annual supervision meetings should be organized for all CBDs whereby supervisors offer general feedback, provide refresher training, and respond to questions and problems that have arisen during the course of the program activities.

12. REPORTING

Reporting against key indicators is crucial to measuring the success of HMM. As of the writing of this document, the sole mandatory indicator for HMM in PNG is that found in the performance framework for the relevant principal recipient of the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) for the Round 8 Phase 2 malaria grant. This indicator is “number of people with access to antimalarials through home based management of malaria.” All HMM programs in PNG should contribute to this target on behalf of NMCP, particularly if they are receiving drugs necessary for HMM implementation from NDoH.

Other indicators implementing organization can consider tracking, as budget allows, are as follows:

- # and % of children younger than age 5 with fever in the past two weeks who receive a malaria test through HMM
- # and % of children younger than age 5 with fever in the past two weeks who received antimalarial treatment through HMM
- Number and % of target communities with active CBDs performing
- Number and % of trained CBDs with stock of pre-packaged ACT during supervisory visit
- Number and % of trained CBDs with no reported stock-out of antimalarial drugs lasting more than 1 week at any time during the past 3 months
- Number and % of CBDs receiving monthly/quarterly supervision visits
- Number and % of CBDs who can accurately describe treatment procedures for a 2-year-old child to a supervisor during a supervisory visit
- Number and % of CBDs who are able to list for a supervisor during a supervisory visit at least 3 danger signs that require referral to health facility
- Number of mothers/caregivers receiving monthly/quarterly visits by CBDs supervisors to determine treatment adherence and satisfaction with HMM

The following indicators could also be measured through a population-based survey:
- Parasite prevalence: % of children aged 6-59 months with malaria infection (detection of parasitemia by microscopy
- % mothers/caregivers seeking a CBD who found CBD at first visit
- % mothers/caregivers who report that the CBD explained (a) treatment schedule (b) adverse reactions at time of dispensing ACT
- % of completed referrals (of those recommended for referral)
- % of mothers/caregivers who correctly cite fever as the principal symptom of malaria
- % of children with fever whose mother/caregiver seeks care within 24 hours
- % of caregivers who cite CBD as an accepted source of malaria treatment
- % of mothers/caregivers who agree with the statement “malaria is a serious threat to children”
- % of mothers/caregivers who disagree with the statement “it is important to first try to bring fever in a small child down with a steam bath or traditional herbs before seeking other treatment”
- % of mothers/caregivers who believe that pre-packaged ACT is an effective malaria treatment for children younger than age 5
- % of mothers/caregivers who know that all fevers should be tested for malaria prior to ACT being administered
- % of mothers/caregivers who agree with the statement “antimalarial medicines are inexpensive”
- % of mothers/caregivers who reported completing the ACT treatment regime prescribed to their child

Whenever possible, HMM implementing organizations need to work with the established health system to harmonize reporting systems with the National Health Information System (NHIS). As the role of the CBD is to provide an extended public sector reach for basic health needs within communities, referral health facilities should be encouraged where possible to visit CBDs either regularly or during patrols and collect data from the CBDs to add into their NHIS. In this manner disease information is better represented within a catchment area for use by the NDOH performance monitoring framework. This visit by the HF can also build relationships and provide feedback. When the merits of sustained HMM implementation in PNG have been considered, NDoH may choose to revise facility NHIS forms to accommodate HMM data in order to delineate disease trends at varying sites of access.

In all cases HMM data should be collected independently by the HMM implementing organization and aggregated separately to assist with program evaluation.

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7 The age of 2 is arbitrary. Any age below 5 could be identified.
13. CBD MOTIVATION

Most research and lessons learned on community case management interventions (HMM is part of a community case management approach) throughout the world have identified the keys to success as proper supervision and CBD motivation. Motivation is assisted through appropriate CBD selection, supervision, training, social marketing mechanisms that allow the CBD to earn a small income or other incentives.

Social marketing approaches allow the CBD to charge a fee for diagnosis, service or for drugs. This is done not in order to make a profit for the implementing organization, but only to provide a small incentive to the CBD. When social marketing techniques are utilized, it is important to get buy-in from the relevant communities on how much to charge for services, diagnosis, drugs or all.

Other forms of motivation can consist of one-time-only “gifts” for the CBDs, such as a training certificate, a T-shirt announcing their status in the community, gum boots, solar-powered lanterns, long lasting insecticide treated nets, radio, water storage container, umbrella, solar-powered mobile phone charger or a mobile phone. These motivational items can not only help the CBDs perform, but also assist them in preventing disease within their individual family home, particularly in the case of a LLIN for the prevention of malaria and in the case of a safe water storage container for the protection of household water for the prevention of diarrhea.

HMM implementers are discouraged from outright paying CBDs a salary. This is not a sustainable model that could be taken to scale in PNG.

14. PARTNERSHIP

Implementation of a HMM program often requires strong partnerships with various stakeholders. Several categories of partners need to be identified for use throughout the process. These are mainly:

- Communities – They are at the heart of the strategy and should be well sensitized to understand the rationale of the intervention and their role in it.

- CBDs - They are selected by the community from among their own ranks.

- Health facilities and health service managers – The health workers attached to health facilities within the HMM catchment area should be sensitized and involved in the HMM strategy. As well, a few representative health care workers from each relevant health care facility within the HMM catchment area should be included in the CBD training. This is critical since they will be responsible for treatment of the referred severe cases and non-falciparum or mixed malaria cases requiring primaquine. They must be familiar with the intent and processes (such as CBD referral forms).

- Local government leaders – Government leaders have a big role to play in the introduction and sustainability of HMM. They should be sensitized to appreciate the rationale, the process of introduction, their possible roles in the implementation and sustainability of the strategy to ensure ownership.
• National level – NDoH will draw the strategic document for implementation and ensure that it brokers partners to support the strategy. Such officials will also create policies, as necessary, to support this intervention.

• Development partners – Some of the roles that development partners could play are:
  o Liaising with district and provincial government health authorities.
  o Sensitizing the communities for community ownership of the strategy.
  o Explaining the tasks involved in the implementation process and the rationale behind the strategy.
  o Training of the CBDs.
  o Training of select health workers from relevant health care facilities attached to the HMM program in order to provide support and to receive referrals.
  o Monitoring and supervising CBDs.
  o Facilitating drug distribution and strengthening related systems.