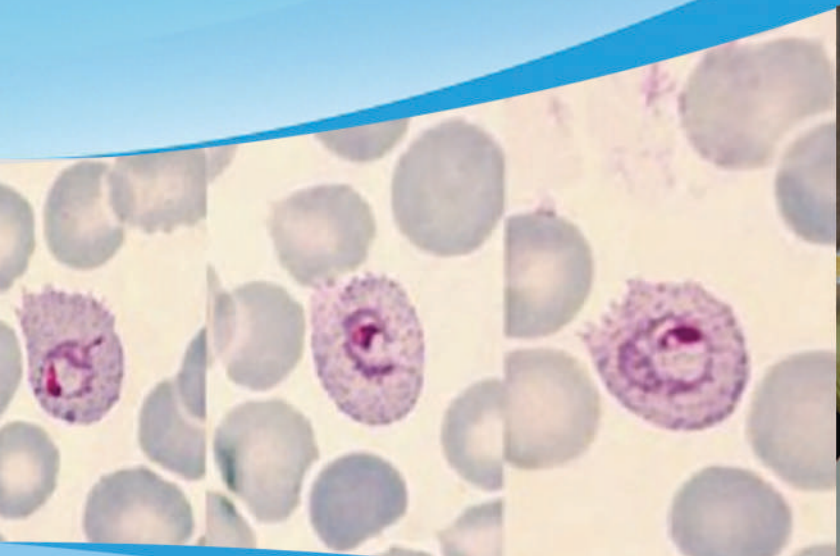
Manual for Parasitological Surveillance in Prevention of Re-introduction / Re-establishment of Malaria in Sri Lanka



ANTI – MALARIA CAMPAIGN
MINISTRY OF HEALTH AND INDIGENOUS MEDICAL SERVICES
SRI LANKA

2019

Manual for Parasitological Surveillance in Prevention of Re-introduction / Re-establishment of Malaria in Sri Lanka

Anti-Malaria Campaign
Ministry of Health

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Sri Lanka had been in the Prevention of Re-introduction (POR) phase of Malaria since 2016. Parasitological surveillance plays one of the most vital roles in sustaining the POR phase in Sri Lanka, considering the proximity to malaria endemic countries and the receptivity still present in certain areas of the country. The manual for parasitological surveillance in prevention of re-introduction / re-establishment of Malaria in Sri Lanka is expected to provide the much needed guidelines to fulfil the change in main objectives of surveillance in the POR phase.

The procedures mentioned in the guideline has been in the development over the last few years. The Anti – Malaria Campaign (AMC) is grateful for all the AMC headquarters staff and the regional malaria officers for their contribution over the years in developing these procedures that are included in this manual.

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The core working group of the AMC consisted of Dr. Prasad Ranaweera (Acting Director), Dr. Muzrif Munaz (Consultant community physician), Ms, Kumudu Gunasekara (Parasitologist) Dr. Sumudu Karunaratna (Registrar in community medicine), Dr. Gayan Yasantha (Senior Registrar in Information technology), Dr. Harshini Vitharana, Dr. Priyanganie Silva, Dr. Sarangi Jayasena, Dr. Shyamalie Rathnayake, Dr. Ranusha Silva, the entomologists; Mrs. Jeewanie Harischandra, Mrs. Priyadharshani Somasekaran, Mrs. Mihirini Hewawitharana and Mr. Thilan Fernando. We acknowledge the contributions by former AMC HQ staff, Dr. H D B Herath, Dr. J Hamsananthy, Dr. Dewanee Ranaweera and Dr. Manonath Marasinghe. We are grateful for all the regional malaria officers and other technical support group members for sharing their expertise to make this a richer document.

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The AMC gratefully acknowledge the technical guidance and support provided throughout by the GFATM team, WHO Sri Lanka office in producing this manual.

Abbreviations and acronyms

ACD	Active case detection
AMC	Anti – malaria campaign
APCD	Activated passive case detection
CRC	Case Review Committee
DOTS	Directly observed treatment short course
EA	Entomology assistants
LLIN	Long lasting insecticidal net
MLT	Medical laboratory technician
MMC	Malaria mobile clinics
MOH	Medical officer of Health
RDT	Rapid diagnostic test
RMO	Regional malaria officer
RRT	Rapid response teams
PCD	Passive case detection
PHFO	Public health field officer
PHLT	Public health laboratory technician
SOP	Standard operating procedures
TSG	Technical support group for prevention and re-introduction of Malaria
WHO	World Health Organization

Glossary (adapted from the WHO Surveillance, Monitoring & Evaluation Reference Manual)

Annual blood examination rate	The number of people receiving a parasitological test for malaria per 1000 population per year.
Endemic	Applied to malaria when there is an ongoing, measurable incidence of cases and mosquito-borne transmission in an area over a succession of years
Case detection	One of the key activities of surveillance operations, involving a search for malaria cases in a community. *Note: Case detection is a screening process in which the indicator is either the presence of fever or epidemiological attributes such as high-risk situations or groups. Infection detection requires use of a diagnostic test to identify asymptomatic malaria infections.*
Case detection, Active	Detection by health workers of malaria cases at community and household levels, sometimes in population groups that are considered at high risk. Active case detection can consist of screening for fever followed by parasitological examination of all febrile patients or as parasitological examination of the target population without prior screening for fever.
Case detection, Re-active	Active case detection may be undertaken in response to a confirmed case or cluster of cases, in which a population potentially linked to such cases is screened and tested (referred to as “reactive case detection”)
Case detection, Proactive	Active case detection may be undertaken in high-risk groups, not prompted by detection of cases (referred to as “proactive case detection”).
Case detection, Passive	Detection of malaria cases among patients who, on their own initiative, visit health services for diagnosis and treatment, usually for a febrile illness.
Case investigation	Collection of information to allow classification of a malaria case by origin of infection, i.e. imported, indigenous, induced, introduced, relapsing or recrudescent. *Note: Case investigation may include administration of a standardized questionnaire to a person in whom a malaria infection is diagnosed and screening and testing of people living in the same household or surrounding areas.*

Case follow-up	Periodic re-examination of a malaria case. It may involve blood examination and treatment if the patient did not respond to previous medicines. Case follow-up is part of surveillance.
Case, imported	Malaria case or infection in which the infection was acquired outside the area in which it is diagnosed.
Case, index	A case of which the epidemiological characteristics trigger additional active case or infection detection. The term “index case” is also used to designate the case identified as the origin of infection of one or a number of introduced cases.
Case, indigenous	A case contracted locally with no evidence of importation and no direct link to transmission from an imported case.
Case, induced	A case the origin of which can be traced to a blood transfusion or other form of parenteral inoculation of the parasite but not to transmission by a natural mosquito-borne inoculation.
Case, introduced	A case contracted locally, with strong epidemiological evidence linking it directly to a known imported case (first-generation local transmission).
Case, locally acquired	A case acquired locally by mosquito-borne transmission *Note: Locally acquired cases can be indigenous, introduced, relapsing or recrudescent.*
Case, malaria	Occurrence of malaria infection in a person in whom the presence of malaria parasites in the blood has been confirmed by a diagnostic test. *Note: A malaria case can be classified as indigenous, induced, introduced, imported, relapsing or recrudescent and as symptomatic or asymptomatic. In settings where malaria is actively being eliminated or has been eliminated, a “case” is the occurrence of any confirmed malaria infection with or without symptoms.*
Case management	Diagnosis, treatment, clinical care and follow-up of malaria cases.
Case notification	Compulsory reporting of detected cases of malaria by all medical units and medical practitioners, to either the health department or the malaria elimination service (as laid down by law or regulation).
Case relapsing	Malaria case attributed to activation of hypnozoites of *P. vivax* or *P. ovale* acquired previously.

Case-based surveillance	Every case is reported and investigated immediately.
Case, suspected	An individual whose clinical symptoms suggest that they have malaria. *Note: A suspected case cannot be considered as a malaria case until parasitological confirmation.*
Malaria epidemic	Occurrence of malaria cases in excess of the number expected in a given place and time.
Malaria focus	A defined and circumscribed area situated in a currently or formerly malarious area that contains the epidemiological and ecological factors necessary for malaria transmission. *Note: Foci can be classified as active, residual non-active or cleared.*
Malaria elimination	Interruption of local transmission (reduction to zero incidence of indigenous cases) of a specified malaria parasite species in a defined geographical area as a result of deliberate activities. Continued measures to prevent reestablishment of transmission are required. *Note: The certification of malaria elimination in a country will require that local transmission is interrupted for all human malaria parasites.*
Malaria incidence	The number of newly diagnosed malaria cases during a specified time in a specified population.
Malaria prevalence	The number of malaria cases at any given time in a specified population, measured as positive laboratory test results.
Population at risk	Population living in a geographical area where locally acquired malaria cases have occurred in the past three years.
Rapid diagnostic test	An antigen-based stick, cassette or card test for malaria in which a colored line indicates that plasmodium antigens have been detected.
Quality assurance	The maintenance and monitoring of the accuracy, reliability and efficiency of laboratory services. QA addresses all the factors that affect laboratory performance, including test performance (internal and external quality control), the quality of equipment and reagents, workload, workplace conditions, training and supervision of laboratory staff and continuous quality improvement. It includes procedures put in place to ensure accurate testing and reporting of results.

Quality control	Assessment of the quality of a test or a reagent. QC also encompasses external QC and reagent QC. External QC is a system in which routine blood slides are cross checked for accuracy by a supervisor or the regional or national laboratory. Reagent QC is a system for formal monitoring of the quality of the reagents used in a laboratory.
Receptivity	Receptivity of an ecosystem to transmission of malaria. *Note: A receptive ecosystem should have eg. The presence of competent vectors, a suitable climate and a susceptible population.*
Recrudescence	Recurrence of asexual parasitaemia of the same genotype(s) that caused the original illness, due to incomplete clearance of asexual parasites after anti-malarial treatment. *Note: Recrudescence is different from re-infection with a parasite of the same or different genotype(s) and relapse in P. vivax and P. ovale infections.*
Relapse	Recurrence of asexual parasitaemia in *P. vivax* or *P. ovale* infections arising from hypnozoites persist in the liver.
Residual transmission	Persistence of transmission after good coverage has been achieved with high-quality vector control interventions to which local vectors are fully susceptible. *Note: Both human and vector behaviour is responsible for such residual transmission.*
Slide positivity rate	Proportion of slides found positive among the slides examined.
Surveillance	Surveillance is the continuous and systematic collection, analysis and interpretation of disease-specific data, and the use of that data in the planning, implementation and evaluation of public health practice.
Transmission season	Period of the year during which mosquito-borne transmission of malaria infection usually takes place.
Vector control	Measures of any kind against malaria-transmitting mosquitoes intended to limit their ability to transmit the disease.
Vulnerability	The frequency of influx of infected individuals or groups and/or infective Anopheline mosquitoes. *Note: Also referred to as "importation risk". The term can also be applied to the introduction of drug resistance in a specific area.*

1. Introduction

Sri Lanka was endemic for malaria for centuries and successfully eliminated malaria with the last indigenous case being reported in October 2012 (1). Sri Lanka was certified as malaria-free by the World Health Organization (WHO) in September 2016. In December 2018, one introduced case of malaria was reported, the index case being a foreign migrant worker, and the Anti-Malaria Campaign (AMC) was able to restrict transmission to this single case (2).

During the pre-elimination and elimination phases of malaria in Sri Lanka which was officially launched in 2009, surveillance was a key intervention as recommended by the WHO (3). Since 2008, with the reduction of the number of cases reported in the country cases were categorized as “indigenous” and “imported”. With the transition from the pre-elimination to the elimination phase, case investigation and follow up were initiated. Since then the surveillance system was further strengthened with the appointment of a Case Review Committee (CRC) by the Technical Support Group (TSG) for the AMC to provide oversight in disease surveillance, notification, case investigation and response and case classification. The CRC reviews all cases prior to classifying cases and confirms the classification.

Surveillance is “the continuous and systematic collection, analysis and interpretation of disease-specific data, and the use of that data in the planning, implementation and evaluation of public health practice” (4). The Global Technical Strategy for Malaria 2016-2030 includes surveillance per se as a key pillar in the control, elimination and prevention of re-introduction/re-establishment of malaria. The AMC made surveillance an integral part of the malaria elimination and prevention of re-establishment programme. The routine activities to be conducted if a malaria infection is detected are summarized in Figure 1 (scope of work) (5).

The purpose of this manual is to document activities and standard operating procedures related to parasitological surveillance in the prevention of malaria re-introduction/ re-establishment phase in Sri Lanka. The various aspects of parasitological surveillance are described separately. Entomological surveillance is described in the Guidelines for Entomological Surveillance for Malaria Vectors in Sri Lanka (6) and Standard Operating Procedures for Entomology (7).

2. Methodology

A desk review of the relevant documents (references 1-11) was conducted. Key personnel of AMC Headquarters and a few Regional Malaria Officers (RMO) were interviewed. The manual was compiled based on current practices deployed by the AMC in the prevention of re-introduction/ re-establishment phase in a devolved health system. Based on new developments, the activities outlined in this manual may be changed.

The draft manual was reviewed by the TSG of the AMC. The final document was prepared based on the comments provided by AMC HQ, RMOs, the TSG and the Ministry of Health.

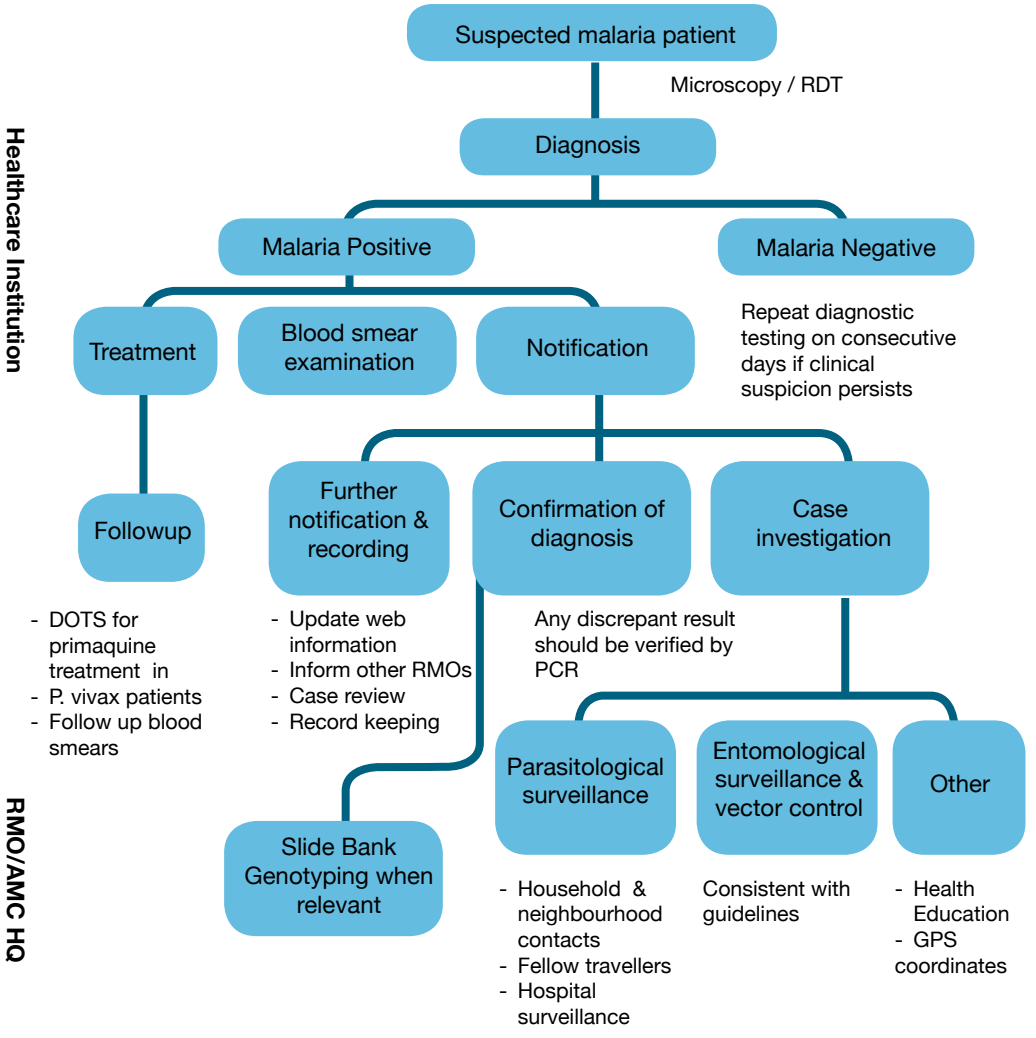


Figure 1: Flow chart of activities to be performed when a malaria patient is reported.

Source: Scope of work to be performed when a malaria patient is reported (4).

3. Parasitological Surveillance

Parasitological surveillance in prevention of re-establishment of malaria phase may be broadly divided into Passive Case Detection (PCD) and Active Case Detection (ACD) (Figure 2). Passive Case Detection is “detection triggered by patients seeking care for their illness from clinicians working in static health facilities” (4). Achive Case Detection is “the detection by health workers of malaria infections at community and household level in population groups that are considered to be at high risk” (4). Active case detection can be conducted as fever screening followed by parasitological examination of all febrile patients or as parasitological examination of the target population without prior fever screening (4).

Parasitological surveillance for malaria in Sri Lanka includes screening of individuals attending medical institutions and screening of populations based on vulnerability and receptivity risk. In the public sector PCD is done at medical institutions. Activated Passive Case Detection (APCD) was done in the past when malaria was endemic; it comprised screening all fever cases for malaria at medical institutions. APCD is also conducted when an introduced or indigenous case is detected as when an introduced case was reported in December 2018 (2). Village level screening is done by Active Case Detection (ACD) through Mobile Malaria Clinics (MMCs) and contact tracing (8).

Passive Case Detection is the most important method of detection of malaria cases. The AMC recommends screening all fever patients with a travel history to a malarious country for malaria. At present, approximately 182 medical institutions, located predominantly in the dry and intermediate zones of the country have a PHLT and/or a PHFO (8).

Active case detection through MMCs are carried out in high risk areas and among vulnerable populations. These methods are mainly used to facilitate early detection of malaria cases (including asymptomatic parasite carriers) thereby reducing the possibility of transmission.

Screening potential blood donors and donor blood for malaria is another important function done by the PHLTs attached to the AMC. This accounts for approximately 40% of total blood films screened. Screening of all donor blood for malaria before transfusion is mandatory in Sri Lanka.

Screening for malaria is also done in laboratories in the private sector hospitals and clinics using either microscopy or Rapid Diagnosis Tests (RDTs). When a patient is detected in the private sector, the AMC should be informed immediately by telephone.

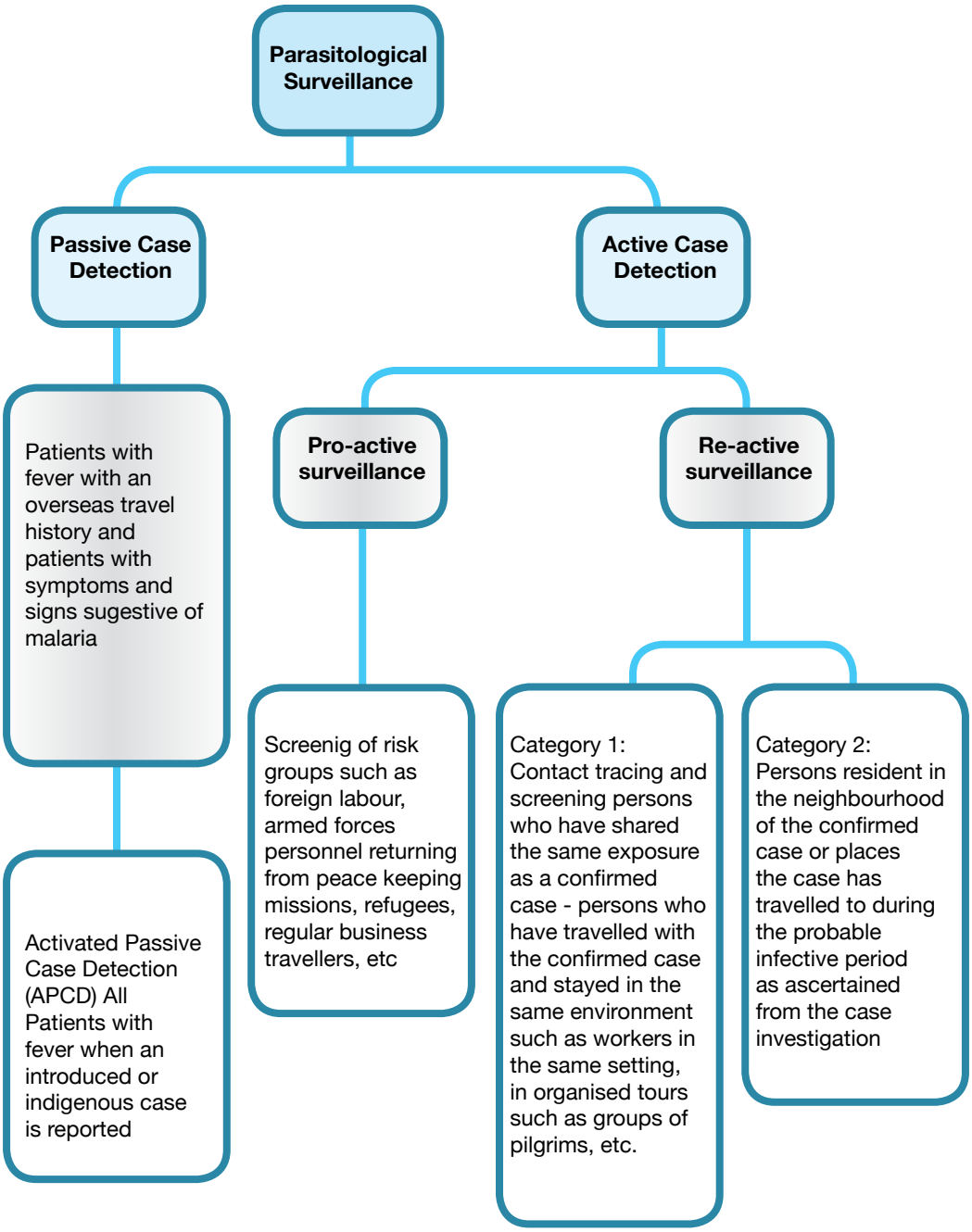


Figure 2: Schematic representation of parasitological surveillance for malaria in prevention of re-introduction/ re-establishment phase in Sri Lanka

3.1 Diagnosis of a malarial infection

The diagnosis of a malarial infection is the starting point of a series of activities that should be conducted for

1) Treatment of the patient,
2) Commence case investigation,
3) Response to prevent further spread of the disease,
4) Case classification, and
5) Recording events for monitoring and evaluation purposes.

Microscopy is the main diagnostic method while RDTs are also being used as a supplementary tool (8). Standard operating procedures for microscopy and for performing RDTs, developed by the AMC should be followed (10, 11). The template for the malaria diagnosis report is given in Annex 1. All confirmed malaria cases should be treated according to the national treatment guidelines (9).

At medical institutions:

1. In every suspected case of malaria, laboratory confirmation by microscopic examination of blood smears and/or RDT is mandatory prior to initiation of anti-malarial treatment.

2. Blood should be collected for further investigations prior to the administration of anti-malarial medicines;

    - In all malaria patients diagnosed by microscopy or RDT. Blood for PCR should also be collected and sent to AMC reference laboratory. Validation of the test results by PCR is not necessary to initiate treatment.

    - In patients who have to be treated on the basis of clinical suspicion as a life saving measure without laboratory confirmation of malaria. Blood should be collected according to the guidelines issued by the Department of Health (General Circular No. 02-112/2014 issued by the Director General of Health Services).

4. If microscopy and RDT are negative but the clinical features are strongly suggestive of malaria, a minimum of three blood smears/RDTs should be examined on three consecutive days and whenever possible the diagnosis needs to be verified by a PCR test.

5. If a RDT is positive, the photograph of the test strip should be sent to AMC HQ using any available technology (email, picture messaging services) whenever a possible.

At Regional Malaria Office

Whenever a malaria patient has been reported, the RMO should take measures to confirm the diagnosis by microscopic examination of blood smears and RDT.

1. If a blood smear has been examined, RMO should validate the result by the regional Public Health Laboratory Technician trained on Quality Assurance and Quality Control of malaria microscopy (QA/QC PHLT) and send the blood smear with the comments of the QA/QC PHLT to the AMC HQ reference laboratory. Blood for PCR should also be collected and sent to AMC reference laboratory.

2. If only a RDT has been performed the result has to be confirmed by microscopy. The photograph of the test strip should be sent to AMC HQ using any available technology. RMO staff should immediately prepare blood smears, perform another RDT and collect blood for PCR. RMO should send the performed RDTs, blood smears and blood for PCR to the AMC HQ.

3. In the event of any patient being treated without laboratory diagnosis, blood should be tested by RDT and microscopy and collected for PCR as early as possible.

At Anti Malaria Campaign Headquarters

Laboratory results of every patient reported in the country should be re-confirmed at AMC HQ.

1. If the initial positive blood smear is available (with or without the RDT result), the presence of malaria parasite, species and density must be confirmed at the AMC reference laboratory. Any discrepant result with initial microscopy and/or regional validation should be resolved by PCR if needed.

2. If the initial blood smear is negative, and the RDT performed at that time is positive, they should be cross checked at AMC reference laboratory. If the discrepancy persists, RDT result should be verified by PCR. (If clinical symptoms are suggestive, treatment initiation need not be delayed until verification of results). Microscopy, RDT, and collection of blood for PCR should be performed according to the SOPs and guidelines issued by the Department of Health (General Circular No. 02-112/2014 issued by the Director General of Health Services).

Table 1. gives the algorithm to be followed in case classification when discrepancies exist between microscopy and RDT test results.

Table 1. Steps to be taken when discrepancies exist between microscopy and RDT test results

Rapid Diagnostic Tests	**Microscopy**	
	Negative	**Positive**
Negative	1. If highly suspicious of malaria, repeat testing for 3 consecutive days. 3. Look for other differential diagnosis. 4. Follow up the patient. 5. If fever does not resolve by 7 days, re-test for malaria.	1. Consider as a case and treat according to National Treatment guidelines (9). 2. Perform a PCR to re-confirm diagnosis.
Positive	1. Send a photograph of the test strip to RMO and AMC HQ by any available technology. 2. If the patient is symptomatic, has had a recent infection and/or partially treated, the patient should be treated as a case of malaria. Refer to Annex 2 of SOW. 3. Repeat testing for 3 consecutive days. 4. Perform PCR. 5. If PCR or microscopy becomes positive, treat as a case. If PCR and microscopy is negative, such a case is not recorded as a case for surveillance purposes and documentation.	1. Consider as a confirmed case.

• If symptoms are suggestive (fever and travel history), treatment can be initiated with quality assured microscopy and / or RDT.

• As a life saving measure, treatment can be initiated, without waiting for diagnosis confirmation, after obtaining blood samples.

All malaria cases diagnosed by microscopy or RDT, and any suspected malaria cases in all healthcare institutions in the country (includes both public and private sectors) should be notified to the nearest Regional Malaria Office and/or AMC HQ by telephone immediately.

At medical institutions

1. Any patient suspected/diagnosed of having malaria should immediately be notified via telephone to the RMO and AMC HQ by the ward doctor/laboratory technician. In addition, it should be notified to the Medical Officer of Health (MOH) of the area where the patient resides following the standard notification procedure (Form H544) (Annex 2).

2. Laboratory technician in the institution should enter the details of the diagnosed malaria patients in the Positive Case Register maintained at the institution / laboratory and initiate entering the H/AMC/P4 and H/AMC/P5 forms.

At RMO Office /AMC HQ

1. Basic details of the diagnosed patients should be entered in the web-based database within 24 hours by the area RMO/ Surveillance Medical Officer–AMC. The database should be updated and completed as and when the RMO gets further details.

2. All malaria patients should be notified to RMOs/MOHs of the areas where patient had stayed at least one night during;
   a. the present clinical illness before the completion of initial three days of anti-malarial medicines,
   b. the two weeks preceding the onset of current clinical episode, by the area RMO/ Surveillance Medical Officer or AMC HQ as early as possible, at least within 48 hours.

3. If the patient is staying in a different RMO region during the follow up period (up to 42 days for a *P. falciparum* infection and up to 1 year for a *P. vivax* or *P. ovale* infection), the RMO of that region should be informed by the RMO/Surveillance Medical Officer or AMC HQ who provided care for the patient during the current episode of malaria.

4. Patient information should be entered into the Positive Case Register maintained at the RMO Office (in the case of patients reported to AMC HQ, the Parasitologist should enter the data into the Positive Case Register maintained at Central laboratory). In addition H / AMC/P4 and 5 forms should be maintained.

5. Information on all malaria patients should be entered in the National Malaria Case Register maintained at the AMC HQ with a unique identification number. A file should be maintained for each case with all the relevant information. Information pertaining to all the patients reported /followed up in a particular RMO region should also be maintained at that RMO office.

6. Each case should be reviewed by the CRC of the TSG and case classification should to be comfirmed and certified by the committee.

The contact numbers of the Redional Malaria Offices are given below.

AMC HQ hotline: 0117 626 626
AMC HQ: 0112 588 408, 0112 368 173, 0112 868 174
AMC HQ Email: antimalariacampaignsl@gmail.com

District	Office	Fax
Ampara	063-2223464	063-2222279
Anuradhapura	025-2221844	025-2225658
Badulla	055-2229560	055-2222430
Batticoloa	065-2222931	065-2224401
Colombo	011-2519284	011-2519284
Embilipitiya	047-2230301	047-2230116
Hambantota	047-2258135	047-2220381
Jaffna	021-2227924	021-2229971
Kandy	081-2210687	081-2233061
Kalmunai	067-2220206	067-2220206
Kegalle	035-2223480	035-2222511
Killinochchi	021-2285517	021 2285931
Kurunegala A	037-2222193	037-2222352
Kurunegala B	037-2222193	037-2222278
Maho	037-2275254	037-2275254
Mannar	023-3239547	023-3239547
Matale	066-2222295	066-2222483
Monaragala	055-2276698	055-2276698
Mullaitivu	021-2060007	
Polonnaruwa	027-2226018	027-2223253
Puttalam	032-2265319	032-2265185
Trincomalee	026-2222584	026-2222584
Vauniya	024-2222954	024-2222982

The AMC website has details of the Regional Malaria Officers and their contact numbers (http://www.malariacampaign.gov.lk/index.php/en/contact-us/rmo-offices).

3.2 Passive Case Detection (PCD)

Passive case detection is the detection of malaria cases among the people who based on their own initiative visit a health facility or health care provider to get treatment, usually with febrile illness (see Figure 3).

Objective of PCD in prevention of re-introduction / re-establishment phase	To identify malaria infections and provide complete treatment for clearance of infection as soon as possible in order to alleviate symptoms and prevent progression of disease, and to prevent further spread of disease.
Who should be tested	All persons with a travel history to a malaria endemic country presenting with fever. Persons with a past history of malaria within the past 1 year. Persons with symptoms and signs of malaria. Persons with fever for 7 days in whom no other cause for the fever has been established. Persons from an area where a malaria case has been reported recently.
How	By microscopy or RDTs and treating any positive cases according to the National Treatment Guidelines. Where discrepant results are obtained confirmation of diagnosis should be carried out by PCR (see Table 1).
Where	In government healthcare institutions and in private healthcare institutions where diagnostic facilities are available. If a case is suspected in an institution where diagnostic facilities are not available, refer to a place with diagnostic facilities.

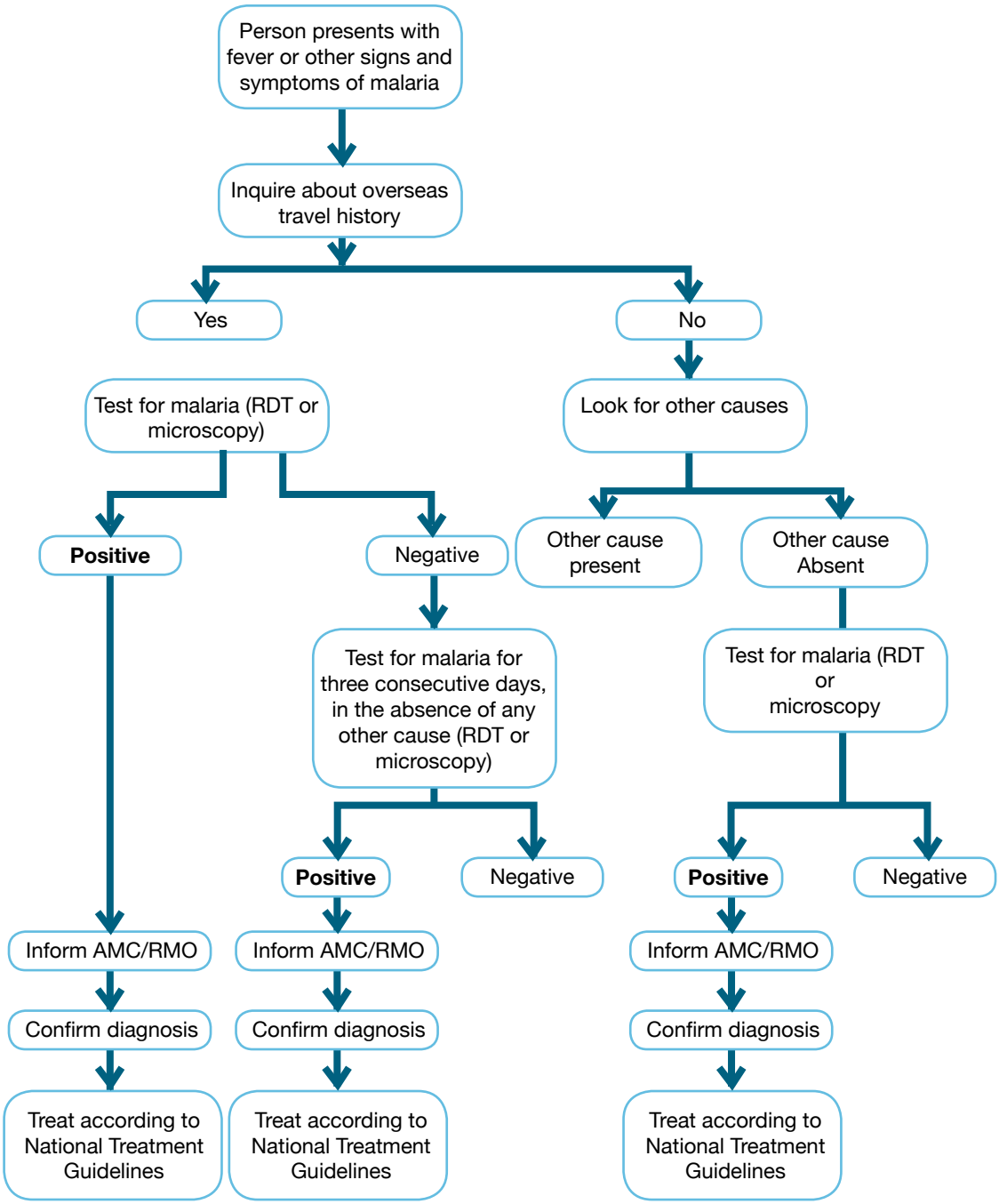


Figure 3: Schematic representation of Passive Case Detection for prevention of re-introduction/ re-establishment of malaria in Sri Lanka.

Passive case detection should be carried out at all government healthcare institutions and in private healthcare institutions where diagnostic facilities are available, as given in table 2.

Table 2. Process of PCD to be followed in government healthcare institutions.

		PHLT	
		Present	**Absent**
Public Health Field Officer (PHFO)	Present	Carry out microscopy and/or RDT and report as given in the SOPs for microscopy.	In institutions where a MLT is present, the MLT can perform microscopy or RDT examination after the PHFO takes the blood smear. Where there is no MLT, the PHFO will take the blood smear and send it to the RMO office or another institution which has a PHLT for microscopy. If the PHFO is trained in RDT examination, (s) he may perform RDT. However, a blood smear should be taken and the blood smear and the RDT should be sent to the RMO office. When there is no PHLT and MLT, the actions taken by the PHFO in a case of a positive finding should be conveyed to the RMO by telephone immediately. The RMO shall make suitable arrangements to transport the slides to the relevant institution
	Absent	PHLT to take blood smear and carry out microscopy and/or RDT and report as given in the SOPs for microscopy. (10, 11)	In institutions where a MLT is present, the MLT can take a blood smear and perform microscopy or RDT examination and report as given in the SOPs (10, 11)

		PHLT	
		Present	Absent
Public Health Field Officer (PHFO)			**Where there is no MLT, the MO may** 1. Inform the RMO that there is a suspected malaria patient. If the MO has access to RDTs, perform the RDT examination. If RDT is unavailable, the RMO will make suitable arrangements to send a PHFO or PHLT either from the Regional Malaria Office or from a nearby hospital to take the blood smear. Microscopy should be done and the report sent to the institution within 6 hours of blood smear collection. The referring medical officer should be informed of the result by telephone; a hard copy of the report should be sent later. 2. In emergencies as a life saving measure, the MO shall take a blood sample to an EDTA bottle, inform RMO and initiate treatment.
	Absent	PHLT to take blood smear and carry out microscopy and/or RDT and report as given in the SOPs for microscopy. (10, 11)	In institutions where a MLT is present, the MLT can take a blood smear and perform microscopy or RDT examination and report as given in the SOPs (10, 11)

3.2.1 PCD in private sector institutions

Passive case detection is carried out in private sector clinics and hospitals using either microscopy or RDTs. Private sector healthcare institutions are advised to follow guidelines and standard operating procedures of the AMC for microscopy and performing RDTs. (10, 11). The AMC should provide training to staff in private sector institutions who are performing diagnostic testing for malaria.

Private sector healthcare institutions performing malaria testing should

1. **Comply with AMC guidelines for testing, notification and management**
2. **Use WHO pre-qualified products for malaria testing (contact AMC for advice)**
3. **Notify RMO or AMC HQ immediately by telephone if a positive case is detected.**

3.2.2 Activated Passive Case Detection (APCD)

Activated passive case detection comprises screening of all fever patients who come to a health care institution irrespective of whether they have symptoms and signs of malaria or suspected of having malaria. This practice was done in Sri Lanka in the past in malaria endemic regions during the malaria control phase. In the prevention of re-introduction/re-establishment phase it has to be carried out whenever 1) an introduced case or 2) an indigenous case of malaria is reported. It should be done in all areas where the index cases reside in or have travelled to during their infectious period as determined by their clinical history. APCD can be done in both public and private healthcare facilities, but mainly done only in public health facilities, unless strongly indicated.

3.3 Active Case Detection (ACD)

Active case detection is the detection of malaria cases by health workers at community or household level, or sometimes in population groups that are considered to be at high risk (Figure 3). ACD can be conducted as fever screening followed by parasitological examination of all febrile patients, or as parasitological examination of target populations without prior fever screening. ACD is important to fill gaps in the PCD system, to detect both asymptomatic and symptomatic malaria infections as early as possible, and provide prompt and effective treatment and immediate response to prevent secondary cases. There are 2 types of ACD (see Figure 3):

1. Proactive Case Detection (PACD): may be undertaken in high risk groups, not prompted by detection of cases;
2. Reactive Case Detection (RACD): undertaken in response to a confirmed case or cluster of cases, in which populations potentially linked to such cases are screened and tested.

All confirmed malaria cases should be treated with anti-malarial drugs according to the national treatment guidelines (9) and followed up to ensure that the infection is completely cured.

Objective of ACD	Detection of symptomatic or asymptomatic malaria cases at community and individual levels that are not detected through passive case detection.
When and who	1. When persons arrive in the country after travelling overseas to malaria endemic countries. 2. When there is a high risk of transmission due to receptivity and/or vulnerability, i.e. in response to risk of transmission in a previously malarious area after an index case has been detected. 3. Screening of risk groups such as foreign labour, armed forces personnel returning from peace keeping missions, refugees, regular business travelers, etc
Where	This screening would be done in port of entries or at any other place where these people could be reached. In vulnerable and at risk communities, areas with high receptivity, development projects, areas where foreign labour congregate, areas in which re-settled persons reside, contacts of cases, areas where malaria cases have travelled and resided overnight, etc. The areas and populations to be screened may change with time and information on new risk groups.
How	By using microscopy or RDT and treating any positive case according to the National Malaria Treatment Guidelines.
Responsible organization	RMOs and AMC HQ.

3.3.1 Proactive Case Detection (PACD)

Proactive case detection is useful in special population groups that are considered vulnerable to the importation of malaria cases. Proactive case detection will focus on identified risk groups using microscopy or RDT. Risk group screening sessions should be conducted among high risk populations and in areas with high vulnerability and high receptivity. Vulnerable groups include returning refugees, foreign labour, Sri Lankan armed forces personnel returning from overseas peace keeping missions, foreign refugees, business travelers to and from malaria endemic countries, fishermen and gem traders visiting African countries, pilgrims to India and Myanmar, and other groups that would be identified in the future.

PACD is generally done through mobile malaria clinics and through referrals to RMO offices and AMC HQ using microscopy and/or RDTs. Please refer Annex 3 for the SOP for a Mobile Malaria Clinic. Risk group screening should be conducted by RMOs and AMC HQ.

Objective of PACD	Searching for additional malaria cases in vulnerable populations for importation of malaria cases residing in receptive areas.
Who	Persons with a known exposure to a malarial infection, i.e., travelers returning from malaria endemic countries.
When	On return of travel groups. In areas with increased receptivity these in which vulnerable populations reside.
Where	Any convenient place
How	By using microscopy or RDTs and treating any positive cases according to the National Malaria Treatment Guidelines.
Responsible organization	RMOs and AMC HQ

3.3.2 Reactive Case Detection

Reactive case detection is the active detection of malaria infections once a case or a cluster of cases are reported. This should be done through house-to-house visits in response to an index case. RACD is important in the prevention of re-introduction/re-establishment of malaria to detect early possible local spread of infection in the community. RACD must be initiated as soon as possible within two days of receiving notification of a case. The responsibility of initiating RACD lies with the RMO of the district where the patient is residing at the time of notification or has travelled to during the illness, and the Surveillance Officer, AMC.

An apparently imported, relapsing or recrudescent case, especially in an area with low receptivity, might trigger less RACD. If an index case is considered to be due to local transmission, RACD should be more extensive (Table 3). After a review of the data of the reported case, RACD should be planned. Information (age, sex, occupation, etc) of the index case(s) should be available from the detailed history taken during the case investigation. The number of houses in the area and other geographic data should be mapped and RACD planned.

RACD may be done as primary screening and secondary screening. The purpose of a primary screening is to detect any infections which would have been generated by the same source as that of the index case, and that is if the index case was locally acquired. Therefore, if a local acquisition of the infection can be excluded there is no reason to do a primary screening. When indicated, primary screening should be done as soon as the case is notified (within 24 hours).

The purpose of the secondary screening is to detect any infections that may have been generated by the index case through onward mosquito transmission from the index case to another person in the locality. It will also detect any cases that may have been missed during the primary screening. Secondary screening should be started 14 days after the primary screening.

I . Types of RACD: indications for primary and secondary screening

The decission whether to conduct a primary screening or not, is based on the origin of the index case, whether it was imported or locally acquired.

The need for primary screening would depend on whether

1) The index case was likely to have been acquired abroad (an imported malaria case) In which case a primary screening would not be warranted.
2) The possibility of the index case having been acquired locally cannot be excluded. In which case there may be others who may have got infected by the same source and therefore a primary screening is warranted.

The following general principles provided by WHO could serve as a useful guide in arriving at a decision:

- The usual delay between an infectious mosquito bite and a primary clinical attack is 7–30 days. The minimal incubation period (i.e. from inoculation to onset of symptoms) of malaria in humans is about 7 days for *P. falciparum* and 10 days for *P. vivax* infection. Thus, detection of malaria parasites within 0 –7 days for *P. falciparum* or 0–10 days for *P. vivax* of arrival in country would indicate that the person was infected before arriving.

- When the time between returning from travel to an endemic area and detection of malaria infection increases beyond 6 months, the probability that the case is truly due to an imported infection starts to decrease The probability that the case is due to local transmission increases.

- If a person lives and works in a place in which there has been no local malaria transmission for many years, with adequate surveillance, and the person travelled to an area of known transmission within 6 months of documented infection, classification of the case as “imported” is straight forward.

- If the area has had no malaria for more than 3 years and has reasonable surveillance or has no known appropriate vectors, local transmission is unlikely.

The other factor that would determine whether primary and/or secondary screening is warranted is the receptivity in the area in which the index case was either resident, or travelled to, in Sri Lanka and stayed overnight, because this would determine the risk of onward transmission. A proxy of receptivity would be

1) The area being previously malaria endemic and therefore likely to have receptivity and
2) The prevalence of *An. stephensi*, the recently introduced potential urban vector of malaria in the area, and
3) The findings of entomological surveillance carried out in the relevant area(s) in response to the index case which would indicate if malaria vectors are prevalent.

Table 3 (A – C) could serve as a general guide for, and provide indications on which to decide whether a primary and/or secondary screening is required in response to an index case depending on whether the onset of symptoms of the patient was within 7 days of arrival in Sri Lanka (acquisition by local transmission is unlikely) (Table 3A); or after 7 days of arrival when acquisition by local transmission cannot be excluded (Table 3B); or had not travelled overseas in the past 12 months (Table 3C).

In addition to the factors given in Table 3 which uses previous endemicity as a proxy for receptivity, the results of entomological surveillance conducted in the relevant areas must be used as a further aide to estimate receptivity.

Table 3. **(A – C). Indications for primary and secondary surveillance depending on the likely origin of the index case.**

(A) Index case developed symptoms of malaria within 7 days *(P. falciparum)* – 10 days *(P.vivax)* of arrival in Sri Lanka (i.e. very likely an imported case)*

Area of residence and/or travelled to within Sri Lanka		Need for	
		Primary surveillance	Secondary surveillance
Previously endemic area (receptive)		-	+
Previously non-endemic area	*An. stephensi* prevalent (receptive)	-	+
	An. stephensi negative (receptivity absent or low)	-	-

*This table should also apply to a relapse or recrudescent index case

(B) Index case developed symptoms of malaria after 7 days (*P. falciparum*) - 10 days (*P.vivax*) of arrival in Sri Lanka (possibly an imported case but local acquisition cannot be excluded)

Area of residence and/or travelled to within Sri Lanka		Need for	
		Primary surveillance	Secondary surveillance
Previously endemic area (receptive)		+*	+
Previously non-endemic area	*An. stephensi* prevalent (receptive)	+*	+
	An. stephensi negative (receptivity absent or low)	- **	+

* Although 7 days (in case of *P. falciparum*) and 10 days (in case of *P. vivax*) is the most stringent criterion to exclude a local acquisition, the other criteria bulleted above should also be considered to estimate the probability that the index case could have been acquired locally, and if the probability is low, a primary screening may not be warranted in any of these instances.

** If entomological surveillance demonstrates the presence of malaria vectors or potential vectors primary surveillance may be indicated here.

(C) Index case has not travelled overseas in the past 1 year (very likely locally acquired infection – introduced or indigenous case)

Area of residence and/or travelled to within Sri Lanka		Need for	
		Primary surveillance	Secondary surveillance
Previously endemic area (receptive)		+	+
Previously non-endemic area	*An. stephensi* prevalent (receptive)	+	+
	An. stephensi negative (receptivity absent or low)	+	+

If the case is a relapse or a recrudescent infection the guidelines that would apply for primary and secondary infection are as for an imported case (Table 3A)

II. Description of screening procedures

- In all primary and secondary screening the area to be screened has to cover the radius corresponding to the *Anopheles* flight range from the nearest vector breeding sites (approximately 500 meters radius) in the immediate neighbourhood surrounding the index case residence (or where the case has travelled to within the country and stayed overnight), unless informed otherwise by entomological surveillance data.
- In the relevant screening area the entire population –all members of households/ neighbours/local residents should be screened.
- All fever patients in areas should also be screened.
- In a situation where the risk of local transmission is considered to be particularly high, approximately 100 people should be screened. If the defined area has less than 100 people, the radius of the screening area should be extended until 100 persons are screened.
- For obvious reasons, in the situation indicated in Table 3C where the index case was very likely to have been an indigenous or introduced case the extent and speed of both primary and secondary screening may have to be enhanced.

An awareness programme on the symptoms of malaria, methods of prevention and the importance of testing for malaria if someone develops fever should be carried out during RACD.

Objective of RACD	1. To detect any malaria infections/ cases that may have originated from the same source as the reported case. 2. To detect infection/cases that may have arisen from the index case. 3. To communicate and create awareness of the local population and staff of the health institutions in the area on the risk of malaria.
When	After investigation of a malaria case
Where	Index case household, neighbours, residents of places visited by index case.
How	By using microscopy/RDT kits for screening and treating any positive cases according to the national malaria treatment guidelines. (9)
Responsible organization	Surveillance unit of the AMC/RMO responsible for case surveillance. Overall responsibility for reactive case surveillance is vested with consultant on surveillance/M&E at AMC/HQ. Arranging screening & awareness programme through relevant MOHs by PHI/PHFO AMC Awareness program: RMO / Medical officer AMC Parasitological screening: Parasitologist Blood filming PHLT/PHFO Microscopy: MLT/PHLT

RACD should always be carried out with an awareness programme on malaria.

4. Case investigation and response

Case investigation involves collection of data regarding a confirmed malaria case, specifically patient information, patient travel history, possible contacts and medical history to assess response interventions. Case investigation should be initiated within 24 hours of notification of a case. Information generated from a case investigation allows the classification of a case by origin of infection. In prevention of re-introduction/re-establishment phase, case investigation is important to determine whether the patient has contracted the disease overseas or locally. It also assesses factors that may lead to onward transmission

The investigation consists of:

- *Obtaining a detailed case history:* Patient demographic and contact information and clinical details on the current infection such as onset date, species, treatment etc.

- *Obtaining a travel history: patients travel history* categorized in to international over the past 12 months (over the past 2 weeks) and local. Previous malaria history, blood transfusion history, family members malaria history, and contact history (international and local).

- *Reviewing past malaria cases from the area:* Histories of all malaria cases reported from the area within the past three years should be reviewed to assess whether local transmission is taking place and whether the locality needs to be classified as a focus of transmission.

- *Assessing potential response:*

    - ✓ Assessing the logistics for parasitological surveillance such as number of households in the area, population of the area, potential places to conduct parasitological surveillance etc.

    - ✓ Conducting RACD based on guidelines given in Tables 3 and 4.

- ✓ Conducting PACD based on information derived from the detailed case history. Conducting parasitological surveillance may require coordination of activities with RMOs of different regions.

- ✓ Conducting entomological surveillance to assess receptivity according to the guidelines for entomological surveillance of malaria vectors in Sri Lanka (6) and Standard Operating Procedures for Entomological Surveillance (7) of the AMC by the relevant RMO/AMC HQ. The entomological investigation has to be initiated within 48 hours of reporting the case, in an area of approximately 500m radius of the residence of malaria patient.

Malaria case investigation teams (or rapid response teams, RRTs) should be established in all RMO regions. Each RRT should comprise a PHFO, PHLT, PHI, EA, and a Surveillance Officer. The relevant officers (area RMO/ where RMOs are not available, Surveillance Medical Officer – AMC HQ) in the district where patient was staying at the time of notification should take the responsibility of the initial case investigation. H-M/Sur-01 form should be used for entering data from the case investigation. All malaria patients should also be investigated by the relevant staff in areas where patient had stayed at least one night during period mentioned in section 3.4.2. Coordinators of the regions at AMC HQ should assist and facilitate case investigation activities. Duly filled case investigation form (H-M/Sur-01) (Annex 4) should be submitted to AMC HQ within a maximum of two weeks of the case notification.

4.1 Response

The response to prevent onward transmission of infection will depend on the vulnerability and receptivity of the area. The response to be mounted which will primarily focus on vector control should be discussed by the relevant RMO and AMC. vector control activities that should be initiated are given in the “Guidelines on Entomological Surveillance and Vector Control when a malaria case is reported” by relevant RMO/AMC HQ. In addition, the following activities should be conducted:

- Mobilize community support for case investigation and response.

- Raising awareness of the community regarding the potential for spread of malaria in the area, preventive measures to be taken, to get tested for malaria if a person develops fever and the importance of taking the full course of treatment if infected with the malaria parasite.

- If an introduced or an indigenous case is reported,

    - Health authorities of the area should be immediately notified.
      Through PDHS/RDHS all the local health institutions will be informed. Line Ministry institutions will be informed through the Director General of Health Service (DGHS).

    - All public and private medical practitioners and healthcare institutions in the area should be alerted to the malaria case reported and advised to carry out APCD. This may require issuing special circulars by the DGHS. Guidelines will be shared with the private practitioners through the public-private partnerships maintained by the RMO.

    - The assistance of the media should be sought to inform the public of potential onward transmission of infection.

5. Case Classification

Preliminary case classification will be undertaken by the AMC technical staff as the response to a confirmed case will depend on the case classification. Once the case investigation is completed, all results of the case investigation should be presented to the CRC of the AMC for subsequent review and confirmation. Classification is based on the characterization of the case using information collected during the investigation (i.e. travel history, infection history) and an understanding of the different intervals in the life cycle of malaria parasites. The case may be classified as imported, introduced, indigenous, induced, or recrudescence/relapse of *P.vivax* and *P.ovale.* (Table 4).

Table 4. Classification of malaria cases

Case Classification	Epidemiological significance
Imported	Not locally acquired
Introduced	Locally acquired
Indigenous	Locally acquired
Induced	Not locally acquired
Relapse/recrudescence	Either

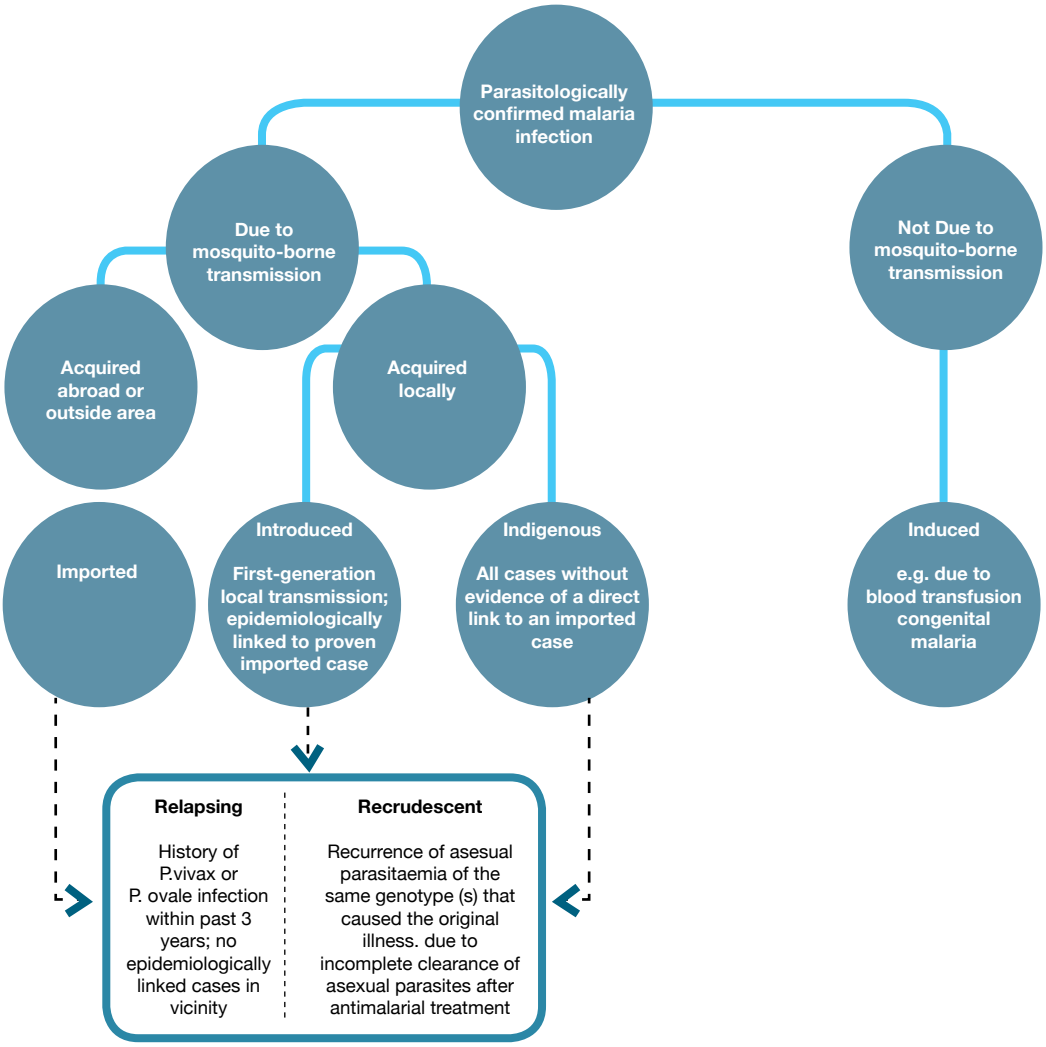


Figure 4. Classification of Malaria cases

Source: Framework for malaria elimination. Geneva: World Health Organization; 2017 (http://apps.who.int/iris/bitstream/10665/254761/1/9789241511988-eng.pdf).

The main factors to consider when deciding whether a case is imported or locally acquired are the travel history of the patient and the incubation time of the parasite (7-21 days). If the patient has not travelled overseas within the last one year, then the case should usually be classified as 'locally acquired' after excluding relapse and recrudescence. If the patient has travelled overseas to a malaria endemic country or region within the past 12 months and there is no malaria transmission where the patient resides or has travelled to within the country, the case is most likely to be an imported case.

Once the case is reviewed by the CRC, the details have to be entered in the Malaria Case Register at AMC HQ and signed off by a member of the CRC.

6. Foci Investigation & Response

A malaria focus is defined as a locality situated in a receptive malarious area with the continuous or intermittent epidemiological and ecological factors necessary for malaria transmission. Once a case of locally acquired malaria has been detected, a focus investigation should be carried out within 7 days.

A locally acquired case indicates that local transmission has occurred. Foci investigation and response measures including parasitological surveillance should be carried out as given below.

1. Reactive case detection that screens the population within 500m - 1km radius of the emergence of each case. Both primary and secondary screening should be done.

2. Treating all cases according to national treatment guidelines (9).

3. All fever cases reporting to healthcare institutions should be screened for malaria (APCD).

4. Mapping where transmission occurs, vector breeding locations and risk populations in the focus area;

5. Conduction entomological surveillance as given in the national guidelines.

6. Evaluating vector control activities and providing supplementary vector control if required (LLIN top up).

7. Describing the vector species present, their abundance, where they are located and their feeding behavior.

Any additional cases of malaria that are detected during RACD within the focus needs to undergo a full and separate case investigation process.

6.1 Focus Classification

Malaria foci are described and delimited in order to identify areas in which appropriate interventions should be deployed or maintained. A focus investigation is conducted by the RRT to determine the response measures necessary to eliminate or prevent re-establishment of transmission. Based on the case investigation classification and the epidemiological history of locally acquired cases in the foci, a focus can be classified into one of three classifications as given below.

Table 5. Classification of malaria cases

Focus	Definition	Response
Active	A focus with ongoing transmission. Locally acquired case(s) have been detected within the last 12 months.	• Investigation and response 1km around index case • RACD according to guidelines • APCD in healthcare institutions • Mapping & describing of vectors (larval & adult), their breeding & behavior (if not collected within previous 3 years) • Mapping of at risk populations • Vector control assessment (LLINs and/or IRS) & response • Community mobilization through established village and other public networks.
Residual non-active	Transmission interrupted recently within 1-3 years. The last locally acquired case(s) was detected at least 12 months ago.	• APCD in healthcare institutions • Mapping & describing of vectors (larval & adult), their breeding & behavior (if not collected within previous 3 years) • Mapping of at risk populations • Vector control assessment (LLINs and/or IRS) & response
Cleared	A focus with no local transmission for more than 3 years. A focus with absence of locally acquired cases for at least 3 years, where only imported/relapsing/ recrudescent/induced cases may occur in the last 12 months.	• Continue with case investigation and response.

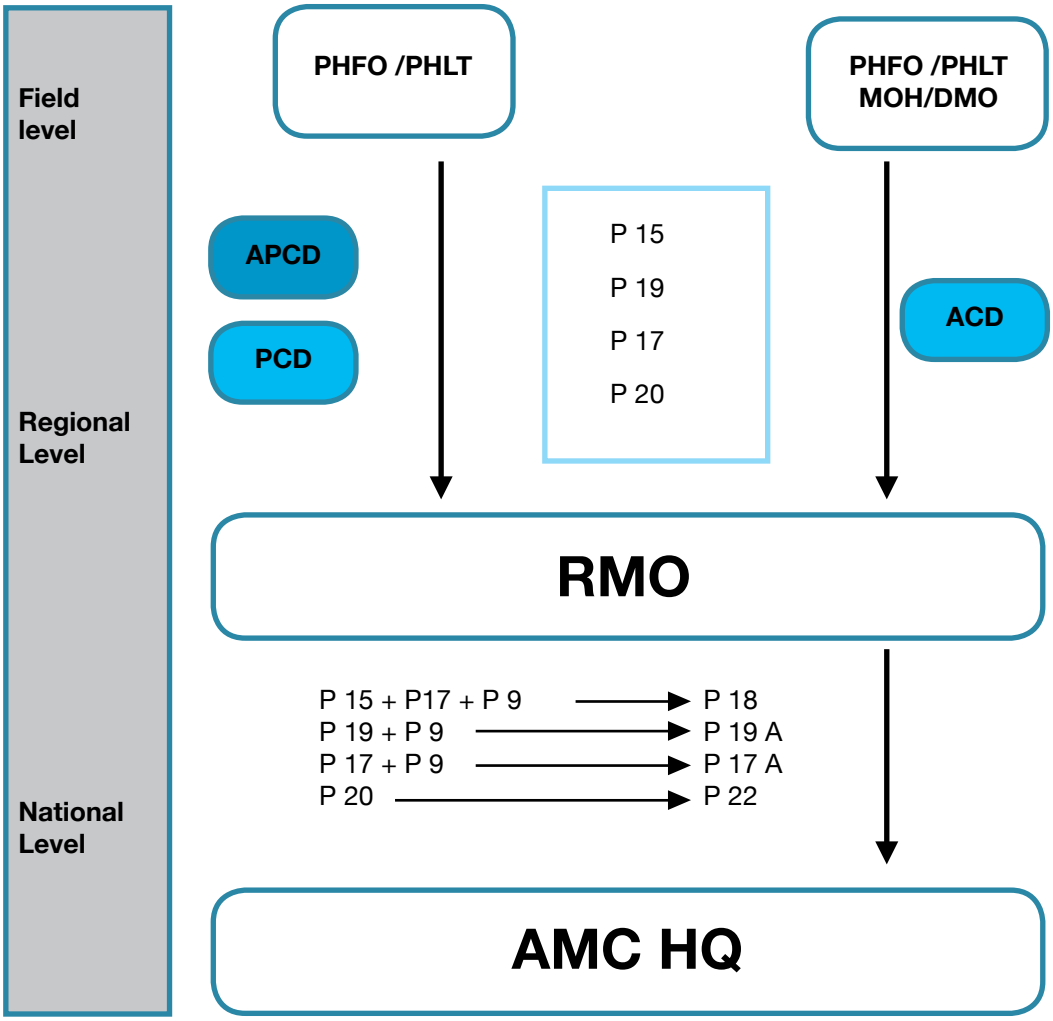
7. Data Flow

Inventory of Data Collection Forms:

Form No.	Title of the form	Purpose and a brief description	Who is responsible for filling
H/AMC/P 1	Daily record of blood smears	Details of screened persons by each PHLT.	PHFO & PHLT
H/AMC/P 2	Weekly record of malaria patients	Weekly return of blood smears conducted, with details of type of diagnosis if positive, gender, age and treatment started.	PHFO
H/AMC/P 3	Monthly record of malaria patients	Monthly summary of APCD/ ACD/ PCD blood smears submitted to RMO by PHFO.	PHFO
H/AMC/P 4	Report on treatment of P. falciparum patients	Follow up screening of Malaria patients.	PHFO/ PHLT
H/AMC/P 8	Monthly consolidated Report of Malaria Case Investigation	Monthly return of diagnosed patients.	RMO/ MOH
H/AMC/P 9	Monthly Malaria Surveillance – Private Sector	Return of monthly diagnosed patients with Malaria by the private sector.	PHFO
H/AMC/P 15	Blood Smears Examination Report	Monthly summary of blood smears examined by MOH region of screened persons.	MLT/PHLT
H/AMC/P 17	Daily Blood Smear Examination Record	Work performance of PHLTs.	PHLT
H/AMC/P 17a	Summary of daily blood smear examination Record	Monthly return of work performance of PHLTs, sent to AMC HQ by RMOs.	RMO
H/AMC/P 18	Summary of Monthly Blood Smear Examination	Monthly summary of APCD/ ACD/ PCD submitted to AMC HQ by RMOs.	RMO
H/AMC/P 19	Blood Examination by RDT	Details of screened persons (Age category, gender, outcome of the test).	PHFO/PHLT

H/AMC/P 19A	Summary of blood examination by RDT	Monthly return of persons screened by RDTs sent to AMC HQ by RMO.	RMO
H/AMC/P 20	Monthly Statement - Active Case Detection	At the field level - No. screened with fever and non-fever patients filled by PHFO.	PHFO
H/AMC/P 20b	Monthly Statement - APCD	At the health institution level – No. screened with fever and non-fever patients filled and sent to RMO Office by PHFO.	PHFO
H/AMC/P 21	Positive from all Sources	All details (Including gender and age category) of all persons screened by MOH areas in a particular RMO region.	RMO
H/AMC/P 22	Monthly Statement of Blood Smear Collection by Villages	Annual return (consolidated monthly summaries) of screened according to villages in a MOH region, sent to RMO.	PHFO

Data Flow Chart



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Annex 1 - Malaria Diagnosis Report

Anti Malaria Campaign
Ministry of Healthcare, Nutrition and Indigenous Medicine
Public Health Complex, 555/5, Elvitigala Mawatha, Colombo 5
Tele: (011) 2368173/4, (011) 7626626 (Hotline)

Requesting physician :

Institution :

Ward :

Identification No. :

Name of the Patient :

Age :

Sex :

Address :

AMC Reference No. :

Sample receipt date :

Test performed date :

Results

Microscopy: Species :
Stages :

Density :

RDT: Species :

PCR: Species :

Tests performed by : Microscopy
RDT
PCR

Certified by :

Annex 2

බෝවෙන රෝග පිළිබඳ නිවේදනය
தொற்றுநோய் பற்றிய அறிவிப்பு
NOTIFICATION OF A COMMUNICABLE DISEASE

ආයතනය / நிலையம் / Institute ..... රෝගය / நோய் / Disease .....

රෝගියාගේ නම*
நோயாளியின் பெயர்
Name of Patient .....

සැදුණු දිනය
ஆரம்பித்த திகதி
Date of Onset .....

*ළමා රෝගීන්ගේ මව/පියා/භාරකරුගේ නම පහසින් සඳහන් කරන්න
நோயாளி சிறுவராயின் பெற்றோர்/பாதுகாவலர் பெயர்
Peaditric patients- Name of Mother/Father/Guardian

ඇතුලත් කළ දිනය
அனுமதித்த திகதி
Date of admission .....

.....

ඇද ඉහපත් අංකය
கட்டில் சிட்டை இல.
B.H.T. No. .....

වාට්ටුව
விடுதி
Ward .....

වයස
வயது
Age .....

ස්ත්‍රී/පුරුෂ භාවය
பால்
Sex .....

රසායනාගාර වාර්තා (සිබෙනම් පමණක්)
முக்கிய ஆய்வு முடிவுகள் (பெறக்கூடியதாக இருப்பின்)
Laboratory Results (If available) .....

රෝගියාගේ නිවසේ ලිපිනය (මහජන සෞඛ්‍ය පරීක්ෂකට නිවස සොයා ගැනීමට හැකිවන පරිදි)
நோயாளியின் வீட்டு விலாசம் (நோயாளியின் வீட்டை அடையாளம் காண்பதற்கு வசதியாக)
Home'address of Patient (To trace the patient's residence by the Public Health Inspector)

.....

.....

.....

රෝගියාගේ නිවසේ දුරකථන අංකය
நோயாளியின் வீட்டு தொலைபேசி இல
Patient's Home Telephone No. .....

දනුම් දෙන්නාගේ අත්සන அறிவிப்பாளரின் கையொப்பம் Signature of Notifier	නම பெயர் Name	තත්ත්වය அந்தஸ்து Status	දිනය திகதி Date
.....	.....	.....	.....

කරුණාකර බෝවෙන රෝග පිළිබඳ දැයිස්තුව සඳහා පසුපිට බලන්න
மறுபக்கத்திலுள்ள அறிவிக்கப்படவேண்டிய நோய்களின் பட்டியலைப் பார்க்கவும்
Please see overleaf for the list of Notifiable Diseases.

දැනුම් දිය යුතු බෝවන රෝග ලැයිස්තුව
அறிவிக்கப்பட வேண்டிய நோய்களின் பட்டியல்
List of Notifiable Diseases

(Approved by the Advisory Committee on Communicable Diseases on 11th February 2005)

"අ" කාණ්ඩය	பிரிவு A	Group-A
• කොලරාව	• வாந்திபேதி	• Cholera
• මහාමාරිය	• பிளேக் (கொள்ளை நோய்)	• Plague
• කහ උණ	• மஞ்சள் காய்ச்சல்	• Yellow Fever
"ආ" කාණ්ඩය	**பிரிவு B**	**Group-B**
• උග්‍ර ශිථිල පක්ෂඝාත රෝගය	• இளம்பிள்ளை வாதம் / சடுதியான தளர்ச்சி வாதம்	• Acute Poliomyelitis / Acute Flaccid Paralysis
• පැපොල රෝගය	• கொப்பளிப்பான்	• Chicken pox
• ඩෙංගු උණ / ඩෙංගු රක්තපාත උණ	• டெங்கு காய்ச்சல் / டெங்கு குருதிப்பெருக்கு காய்ச்சல்	• Dengue Fever / Dengue Haemorhagic Fever
• ගලපටලය	• தொண்டைக் கரப்பன்	• Diptheria
• රක්ත අතීසාරය	• வயிற்றோட்டம்	• Dysentary
• මස්තිෂ්කප්‍රදාහය	• மூளைக்காய்ச்சல் (என்செபலைடிஸ்)	• Encephalitis
• ආන්ත්‍රික උණ	• நெருப்புக்காய்ச்சல் (குடல் காய்ச்சல்)	• Enteric Fever
• ආහාර විෂවීම	• உணவு நச்சுத் தன்மை	• Food poisoning
• මානව ජලභීතිකා රෝගය	• விசர்விலங்குக்கடி நோய்	• Human Rabies
• ලෙප්ටොස්පයිරෝසිස්	• லெப்டோஸ்பைரோசிஸ்	• Leptospirosis
• මැලේරියාව	• மலேரியா	• Malaria
• සරම්ප	• சின்னமுத்து	• Measles
• මස්තිෂ්ක වටල ප්‍රදාහය	• மூளைக்காய்ச்சல் (மெனின்ஜைடிஸ்)	• Meningitis
• කම්මුල්ගාය	• கூகைக்கட்டு	• Mumps
• රුබෙල්ලා (ජර්මන් සරම්ප) • සංජානීය රුබෙල්ලා රෝගය	• ருபெல்லா/ருபெல்லா நோயுடன் பிறப்பு	• Rubella / Congenital Rubella Syndrom
• සරල සන්තතික උණ	• 7 நாட்களுக்கு மேல் தொடரும் சாதாரண காய்ச்சல்	• Simple Continued Fever of over 7days or more
• පිටගැස්ම	• ஏற்புவலி	• Tetanus
• නවජන්ම පිටගැස්ම	• பிறந்த முதல் மாதத்தில் ஏற்புவலி	• Neonatal Tetanus
• ටයිෆස් උණ	• தைபசுக் காய்ச்சல்	• Typhus Fever
• වෛරස් යකෘත් ප්‍රදාහය	• வைரசு ஈரல் அழற்சி	• Viral Hepatitis
• කක්කල් කැස්ස	• குக்கல்	• Whooping Cough
• ක්ෂය රෝගය	• கசநோய்	Tuberculosis
• ලීෂ්මේනියාසිස්	• லெயிஷ்மேனியாசிஸ்	• Leishmaniasis
• ලාදුරු	• தொழுநோய்	• Leprosy

කරුණාකර මෙතනින් නවන්න / இங்கே மடிக்கவும் / Please Fold Here

රා. සේ. පි. / அரச சேவை / O. S. S

සෞඛ්‍ය වෛද්‍ය නිලධාරී

சுகாதார வைத்திய அதிகாரி

THE MEDICAL OFFICER OF HEALTH

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Annex 3

Anti-Malaria Campaign
SOP for conducting a Mobile Malaria Clinic.

SOP title:	**Conducting a mobile malaria clinic**				
SOP No.		**Revision No.**	**0.0**	**Effective Date**	**01.01.2020**
Replacement no.		**Dated**		**Page no.**	
Prepared by:	**Parasitologist, Anti Malaria Campaign**			**Date**	**08.08.2019**
Approved:	**Director, Anti Malaria Campaign**			**Date**	**15.12.2019**

1. BACKGROUND:

These Standard Operating Procedures describe the procedure of conducting a mobile malaria clinic.

2. PURPOSE:

This procedure is intended for use by the relevant central and regional staff of the Anti-Malaria Campaign.

3. SCOPE:

These Standard Operating Procedures describe the procedure of conducting a mobile malaria clinic.

4. REQUIREMENT:

4.1. Items that need to be collected by the PHLT/PHFO

4.1.1. H/AMC/P1 forms
4.1.2. Pens (red, blue)
4.1.3. Pencil
4.1.4. Laboratory coat
4.1.5. Gloves
4.1.6. Sharps bin
4.1.7. Clinical waste/garbage bag
4.1.8. Blood lancets
4.1.9. Alcohol swabs
4.1.10. Cotton wool
4.1.11. Glass slides

4.1.12. FTA cards/ filter papers
4.1.13. mRDT
4.1.14. Methanol to fix the thin blood smears
4.1.15. Paper for table top
4.1.16. Giemsa stock solution
4.1.17. Buffered distilled water
4.1.18. Drop bottles
4.1.19. Distilled water (if distilled water is not available in sufficient amounts clean water to wash the stained slides)
4.1.20. Staining racks
4.1.21. Drying racks
4.1.22. Measuring cylinders (10-25ml)
4.1.23. Beaker to fix blood smears 50ml
4.1.24. Microscope
4.1.25. Anisol/immersion oil
4.1.26. Lens tissue
4.1.27. Microscope mirror (optional)
4.1.28. Slide carrying boxes
4.1.29. Adhesive tape
4.1.30. Timers
4.1.31. Wire cord for the power supply
4.1.32. Cover to prevent blood smears from insects (optional)
4.1.33. Empty bottles to bring the waste water generating from washing the stained blood smears

4.2. Items that need to be available at the place where the MMC is conducted

4.2.1.1. A Table (Minimum)
4.2.1.2. Three chairs (Minimum)
4.2.1.3. Electricity (Optional)
4.2.1.4. Water supply (Optional)

5.1 MMC for PACD

5.1.1 In the case of a mobile malaria clinic conducted as a PACD, the PACD plan should be entered in to the advance programme for the respective month.

5.1.2 The RMO, Relevant officers at AMC HQ should obtain the necessary permission from respective authorities (RDHS/DAMC) to the advance programme.

5.1.3 Whenever possible the advance programme regarding the MMC should be sent to relevant MOOH for their information.

5.1.4 When there is a need to conduct a mobile malaria clinic, the RMO or Surveillance Officer should liaise with the relevant MOH, to obtain the necessary facilitation to send the team conducting the mobile malaria clinic to the required location.

5.2 MMC for RACD

5.2.1 If a mobile clinic is needed to be conducted as a response to a malaria case that has been reported, the officer responsible to organize the MMC should take immediate measures to organize the MMC within 2 days.

5.2.2 The RMO, Relevant officers at AMC HQ should obtain the necessary permission from respective authorities (RDHS/DAMC) to conduct the MMC.

5.2.3 The RMO or Surveillance Officer should liaise with the relevant MOH, to provide the necessary facilitation to send the team conducting the mobile malaria clinic to the required location.

5.3 Preparing for the MMC

5.3.1 The Officer responsible for organizing the MMC should inquire the expected number of individuals that are to be screened and decide number of PHLTT/ PHFOO needed for that MMC and the number of days needed for the MMC and inform the relevant staff.

5.3.2 The officer who would be responsible for organizing the MMC should inquire about the suitability of the location/ facilities available for the MMC team to carry out the MMC.

5.3.3 The PHLT/PHFOO should obtain the necessary approval

5.3.4 The PHLT/ PHFO should obtain sufficient stocks of glass slides, blood lancets, giemsa stock solution, anisol buffer distilled water and other necessary items in sufficient amounts.

5.3.5 The PHLT should inspect the quality of the microscope that would be used for the MMC and clean it if necessary.

5.3.6 If possible, the MOH in the relevant area or PHI/PHFO/ PHLT should made an awareness in the area before commencement of the MMC, and ensure that sufficient facilities are available for the team conducting the MMC.

5.4 Conducting the MMC

5.4.1 When the team visit the place the PHLT/PHFO should prepare the place to suit to conduct the blood smear preparation, staining and examination.

5.4.2 The smear preparation area, staining and drying area and examination area should be identified and separately demarcated according to the feasibility and suitability of the place (figure 1?).

5.4.3 If the MMC is being conducted at a work site/place (e.g. a factory), whenever possible measures should be taken to screen group by group to facilitate smooth functioning of the work carried out at the site and also for smear preparation staining and examination.

5.4.4 PHFO (or the PHLT if there is no PHFO) should write the names and the relevant details of each individual in the H/AMC/P1 form and immediately prepare thick and thin blood smears of that person.

5.4.5 Slides should be allowed to air dried, taking care to prevent flies ants and other insects from eating the blood smears, and accumulation of dust while the slides are being dried.

5.4.6 Labelling of the thin blood smear should be done immediately with a lead pencil as soon as the thin smear is dry, before proceeding to prepare the next blood smear. If necessary blood should also be taken from the same finger prick to perform the RDT and for FTA/filter papers for PCR and further assays

5.4.7 The PHLT should prepare the working solution of Giemsa stain based on the requirement in that location.

5.4.8 Results should be informed to relevant authorities in the relevant H/AMC/P1 form.

Procedural Note:

All examined blood smears should be kept in a slide box until selection for QA/QC

Related SOP:

- SOP on Bio-safety in Handling Blood Specimens and Disposal of Infectious Waste Materials
- SOP on Cleaning And Storing of Microscope Slides
- SOP on Preparation of Thick and Thin Blood Smears for Diagnosis of Malaria
- SOP on Preparation of Working Solution of Giemsa stain and Staining of Blood Smears for diagnosis of malaria parasites
- SOP on Reading of Malaria Blood Smear and Parasite Quantitation
- SOPs on Interpretation, Recording and Reporting of Results
- SOP for malaria Rapid Diagnostic Test Kits

Malaria case investigation form

Annex 4

H - M / Sur 4

A	Generalinformation		
A.1	Date of notification to RMO/AMC HQ	A.3	Date of commencement of case investigation
A.2	District of detection	A.4	History providedby: Patient /Parent/ Other, specify
B	PatientInformation		
B.1	Name ofpatient		
B.2	Age	Gender: M / F	Civil status: Married / Single
B.3	Nationality: Sri Lankan / Non Sri Lankan		If non Sri Lankan, Country of origin: purpose of travel to SL:
B.4	NIC		PassportNo
	Occupation:		

B.6	Address in Sri Lanka	Present home address	Temporary address
B.7	District MOH Area GN Area GPS Co-ordinates		
B.8	Contact Details	Patient	Relative
C	Place of clinical management: Health care institution / Other (specify)		
		Health Care Institution 1	Health Care Institution 2
C.1	Name & District of the Institution		
C.2	Name of the Consultant		
C.3	Ward		
C.4	Government / Private		
C.5	BHT No		
C.6	Date of Admission		
C.7	Date of Discharge		

D	ClinicalPresentation				
D.1	Presenting complaint	Symptoms: Fever / Chills / Rigor / Headaches / Nauseaandvomiting /Bodyaches / reducedurine output / impaired consciousness Other (specify).....			
		Signs: Temperatures: Weight: GCS: ..... BP: Pulse Rate:_Respiratory Rate: ..... Liver: enlarged /not spleen: enlarged / not other (specify)			
D.2	Date of on set of current illness:				
D.3	Place of on set of symptoms				
	Sri Lanka	District	GNArea	MOH	
	Abroad	Country	State/Region		
D.4	Clinical condition of the patient at the time of case investigation				
E	Prior health care seeking behavior				
E	Prior health care seeking behavior				
E.1	Whether the patient had sought medical advice before attending to the place where the diagnosis was made? Yes / No.				
	If yes, Place of seeking treatment	Places	Dates	Contactdetails (if available)	
F	Places visited during the current illness				

F.1	Did the patient travel overnight awayf rom home during; The 2 weeks prior to the on set of current clinical episode and during the current illness before completion of initial three days of anti-malaria treatment? (If yes, provide exact places visited, dates)				
	Travel overnight away - Address		Dates		Contact details (if available)
G	History of Risk factors during past 12 months				
G.1	Travel history				
	Does the patient have recent travel history to known malaria endemic country (ies) Yes / No				
	If yes, Name the malaria end emic country / countries visited during past 12 months				
	Country	Region/State/ Address	Date of Arrival in Sri Lanka	Date of Departure from Sri Lanka	Duration of stay in that country
	Type ofpreventivemeasures takenduring above-mentioned travel to ben demic countries: Mosquito nets / Mosquito repellent cream / Mosquito vaporizer / protective clothing / chemo prophylatic medicines				
	Has the patient taken malaria chemoprophylaxis? Yes / No				If yes, Name of the medicine
	Has the patient completed malaria chemo prophylaxis? Yes / No				
	If No Reason				
G.2	**Travel Contacts**				
	People travelled to the malaria endemic country and returned with the patient;				
	Name		Address		Phone No.
G.3	Past history of malaria				
	Does the patient have past history of malaria during past 3 years? Yes / No				
	If Yes, Where did the patient get the previous attack of malaria during past 12 months?				
	Country		state / province		
	What was the malaria species the patient had previous?				
	What is theclinical classification: Uncomplicated / Severe				

	Remarks			
G.4	Blood transfusion			
	Does the patient have blood transfusion within past 3 months? Yes / No			
	If yes, Where did the patient get blood transfusion within past three months?			
	Sri Lanka		Abroad	
	Place (If in SL specify)		Date of transfusion	
	Remarks			
G.5	Contact history			
	Any contact with a malaria positive patient within past three months? Yes / No			
	If yes, Where did that patient get malaria - Please specify? Place: Sri Lanka / Abroad Date:			
	If that person (s) is / areliving in Sri Lanka, please give the details of the person			
	Name	Relationship to the patient	Address	Contact No.
I	Basic Investigations			
	WBC/DC Hb% Platelet count CRP	Liver functions SGPT SGOT GGT s. Bllirubin Renal Functions BU SCr	**Imaging** **CXR** **USS** **CT/MRI**	**Other**
H	Detection of current malaria episode			
H.1	Case detected by MLT / PHLT / Other (specify)			
H.2	Type of detection Passive case detection / Activecase detection / APCD / Contact screening / Blood bank screening / Population - based survey/ Other (specify)			
H.3	Place of detection Govt. Hospital Lab / PrivateHospital Lab / Medical Faculty Lab / Portsofentry / AMC-HQ / AMC- Regional Office /			

K	Antimalarial treatment				
K.1	Antimalarial treatment after confirmation of the diagnosis				
	Antimalarial	Dosage	Date of commencement	Date of completion	Sideeffects
K.2					
K.3	G6PD test		Normal / G6PDdeficient / Inconclusiveresults / Notdone		
K.4	Clinical classification		Uncomplicated / Severe: Features ofseveremalaria:		
K.5	Treatment response		Responded / Resistant		
K.6	Treatment outcome		Cured / Resistant / Died		
J	Laboratory diagnosis for malaria				
J.1	Laboratory diagnosis for malaria before confirmation by AMC :Done / Not Done				
	If done what are the tests and results of the tests done for malaria				
	Test	**Results**	**Date performed**	**Place/Lab**	
J.2	Confirmation of diagnosis by AMC				
	Test	**Date**	**Results**		
	RDT		Positive /Negative / Inconclusive	If RDT positiveHRP2+/ pLDH+/Both+	
	Microscopy		Positive / Negative / Inconclusive	Species / Stages / Density	
	PCR		Positive/Negative	If PCR Positive Genus/ Species	
History obtained By					
Name		Date		Signature	

L	Parasitologicalsurveillance				
L.1	Primary screening				
	Highriskcategories	Date screen	No. screened	No. withfever	Positives*
	Travelcontacttracing				
	House holdmembers				
	Vicinity (within1km)				
	Otherpossiblesites fortransmission				
	*Ifpositive Identification No in the National Case Register				
	Comments				
L.2	Secondary screening				
	Highriskcategories	Date screen	No. screened	No. withfever	Positives*
	Travelcontacttracing				
	House holdmembers				
	Vicinity (within1km)				
	Otherpossiblesites fortransmission				
	*Ifpositive Identification No in the National Case Register				
	Comments				

M	EntomologicalSurveillance			
M.1	PlacesIdentified	Location1	Location2	Location3
M.1.1	District			
M.1.2	MOHarea			
M.1.3	Localities investigated			
M.1.4	Datesof investigation			
M.1.5	GPSCoordinates			
M.2	**Finding of Primary or secondary vector from Entomological surveillance**			
M.2.1	Adult Sampling Primary vector Secondary vector	Positive/Negative Positive/Negative	Positive/Negative Positive/Negative	Positive/Negative Positive/Negative
M.2.2	Larval Surveys Primary vector Secondary vector	Positive/Negative Positive/Negative	Positive/Negative Positive/Negative	Positive/Negative Positive/Negative
M.2.3	Response			
M.2.3	Recommendations given			

N.3	Finalclassification of malaria according tomodeof transmission: Indigenous / Imported / Relapse / Introduced /
	IfIndigenous, District of origin of malaria:
	If Imported, Country oforigin:
	If Relapse
	Date of onset of primary infection
	District / Country oft ransmission of primary infection
	Place of diagnosis of primary infection
	Place of treatment of primary infection
	Reason for relapse
	If Introduced
	Case number of the primary infection
	Country of transmission of primary infection
	Date of detection of primary infection
	Place of treatment of primary infection
	Place of case investigation of primary infection
	If induced
	Mode of transmission to this patient: Blood transfusion / Other (specify).....
	Reason for classification asabove:-
	Date of Classification
	Classified by
	Reviewed by
	Remarks

Name & Signature of the Malaria Surveillance officer		
Name	Date	Signature

Notes

Please report any modifications or feedback regarding the content to AMC Headquarters on a quarterly basis within the year 2020.

Endorsement by:

MANUAL FOR PARASITOLOGICAL SURVEILLANCE IN PREVENTION AND RE-INTRODUCTION/ RE- ESTABLISHMENT IN SRI LANKA

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