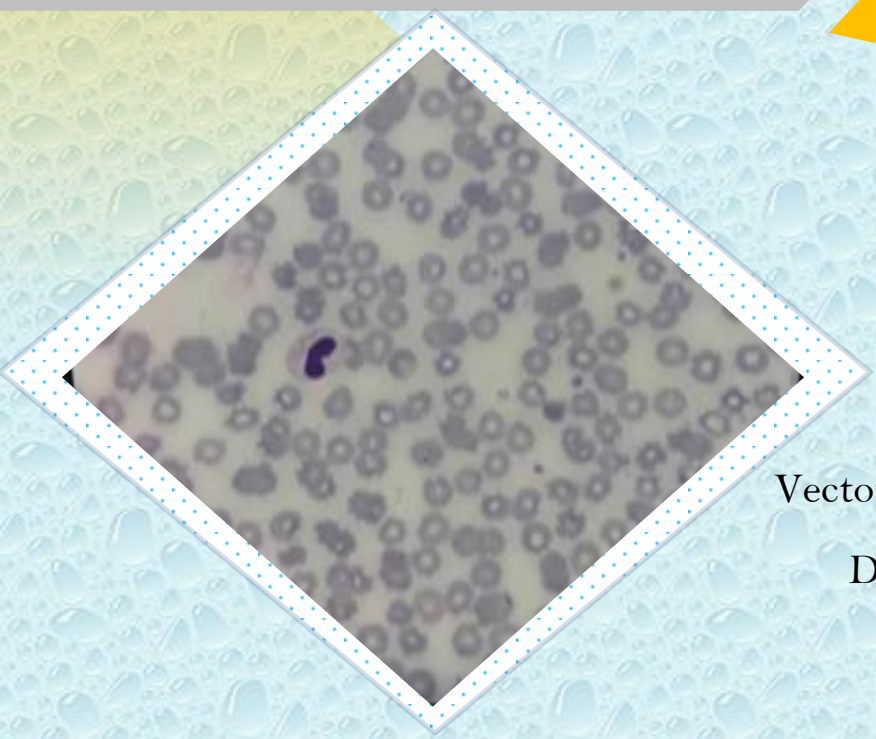
Ministry of Health
Royal Government of Bhutan

Surveillance and Response Guideline Towards Malaria Elimination in Bhutan

Revised Second Edition , 2020



Vector Borne Disease Control Program,
Department of Public Health, Gelephu

Foreword

The WHO Global Technical Strategy for malaria 2016-2030 outlines transformation of malaria surveillance into a core intervention as one of the three main pillars to achieve malaria elimination. Bhutan has made remarkable progress since embarking on national malaria elimination journey in 2013. As program tackles the last mile challenge of malaria elimination with the revised strategic plan, it is imperative that national elimination effort is supported by a strong and robust malaria surveillance and response system. A strong and functional surveillance system will be critical to achieve malaria elimination in the country by 2022 and WHO certification by 2025, as envisaged in the revised National Strategic Plan for Malaria Elimination and prevention of re-introduction 2020-2025. Towards this end, revision of the second edition of surveillance guideline was carried out in 2020 to align with the core principles and surveillance activities recommended in WHO Malaria Elimination Frame work 2017 and the WHO external review of national malaria surveillance conducted in 2017 and 2019.

This revised guideline is expected to guide the malaria surveillance activities for both the officials at the field level and central program level to respond to any malaria case detected in the country in more effective and efficient manner. More importantly, as the country nears malaria elimination and WHO certification as malaria free Bhutan, this guideline will facilitate in continual review and preparation, at both the national and district level, towards collectively working to meet the surveillance standard and necessary prerequisites of WHO certification processes to declare malaria-free country.

This revised guideline is a product of multiple consultations amongst program officials and experts from different backgrounds. I wish to express my sincere appreciation and gratitude to all the officials involved for their valuable contributions in the revision of this important document. I know this document will be of paramount importance to guide and drive our malaria elimination efforts to ultimately achieve our collective vision of 'Malaria-free Bhutan'.

Dr.Karma Lhazeen

Director

Department of Public Health,

Ministry of Health.

Preface

The revision of the Second Edition of Surveillance and Response Guideline towards Malaria Elimination in Bhutan was carried out to align with the WHO Framework for Malaria Elimination 2017, Global Technical Strategy for Malaria 2016-2030 and the recommendations of the WHO external review conducted in 2019. This revised guideline primarily focuses on case based surveillance and response following 1-3-7 strategy to respond to any malaria case. More importantly, as the country nears malaria elimination and WHO certification as malaria free Bhutan, this guideline will facilitate in continual review and preparation, at both the national and district level, towards collectively working to meet the surveillance standard and necessary prerequisites of WHO certification processes to declare malaria-free country.

Similarly, this guideline will serve as a guiding document for both the health workers and program officials in rendering interventions in a more effective and efficient manner eventually leading to the attainment of the elimination target by 2022 in line with the National Strategic Plan for Malaria Elimination 2020-2025.

This revised guideline is a product of multiple consultations amongst program officials and experts from different backgrounds. Therefore, the program would like to extend our sincere gratitude to all the officials involved in the revision of this important document for their valuable contributions.

Contents

List of Figures and Tables

Acronyms

ACD	Active Case Detection
ACT	Artemisinin-based Combination Therapy
PHC	Primary Health Care
CAG	Community Action Group
CQI	Continuous Quality Improvement
DHO	Dzongkhag Health Officer
DHIS	District Health Information System
DOT	Directly Observed Treatment
DRRT	Dzongkhag Rapid Response Team
GPS	Global Positioning System
IEQAS	International External Quality Assurance System
IQC	Internal Quality Control
IRS	Indoor Residual Spray
KM	Kilometer
LLIN	Long-Lasting Insecticidal Treated Bed Net
M & E	Monitoring & Evaluation
NEQAS	National External Quality Assurance System
NEWARS	National Early Warning Alert and Response System
NMRL	National Malaria Reference Laboratory
NMSP	National Malaria Strategic Plan
PACD	Proactive Case Detection
PCD	Passive Case Detection
PCR	Polymerase Chain Reaction
RACD	Reactive Case Detection
RCDC	Royal Centre for Disease Control
RDT	Rapid Diagnostic Kit
TAGME	Technical Advisory Group for Malaria Elimination
VDCP	Vector Borne Disease Control Program
WHO	World Health Organisation

Glossary (Adapted from WHO surveillance, Monitoring and Evaluation reference manual)

Case detection	One of the activities of surveillance operations concerned with the search for malaria cases in a community. *Note:* Case detection is a screening process, using as indicator either the presence of fever or epidemiological attributes such as high-risk situations or groups. Infection detection requires the use of a diagnostic test to identify asymptomatic malaria infections.
Malaria case	Occurrence of malaria infection in a person in whom the presence of malaria parasites in the blood has been confirmed by microscopy or RDT. It does not preclude asymptomatic infection. *Note:* A suspected malaria case cannot be considered a malaria case without the parasitological confirmation.
Active Case Detection	Detection by health workers of malaria cases at community and household level, sometimes in population groups that are considered at high risk. 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. *Note:* 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") or it may be undertaken in high-risk groups, not prompted by detection of cases (referred to as "proactive case detection").
Passive case detection	Detection of malaria cases among people who go to a health facility on their own initiative to get treatment, usually for fever.
Case investigation	Collection of information to allow classification of a malaria case by origin of infection, i.e. imported, indigenous, induced, introduced or relapsing.

Imported malaria case	Malaria case or infection in which the infection was acquired outside the area in which it is diagnosed.
Locally acquired case	A locally acquired case is one that is due to mosquito-borne transmission and is acquired within the area of investigation (e.g. country, district or focus). Locally acquired cases can be indigenous, introduced or relapsing.
Index case	A case whose 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.
Indigenous case	A case acquired locally with no evidence of importation or no direct link to transmission from an imported case.
Introduced case	A case acquired locally, with strong epidemiological evidence linking it directly to a known imported case (a first generation local transmission).
Induced case	A case whose origin 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.
Relapsing case	Malaria case attributed to activation of hypnozoites of *P. vivax* or *P. ovale* acquired previously. *Note:* The latency of a relapsing case can be > 6–12 months.
Entomological Inoculation Rate	Number of infective bites received per person in a given unit of time, in a human population. *Note*: This rate is the product of the "human biting rate" (the number of bites per person per day by vector mosquitoes) and the sporozoite rate (proportion of vector mosquitoes that are infective). At low levels of transmission, the estimated entomological inoculation rate may not be reliable, and alternative methods should be considered for evaluating transmission risk.
Focus, malaria	A defined and circumscribed area situated in a currently or formerly malarious area that contains the epidemiologic and

	ecological factors necessary for malaria transmission.
Malaria elimination	Interruption of local transmission (reduction to zero incidence) of a specified malaria parasite in a defined geographic area as a result of deliberate efforts. Continued measures to prevent re-establishment of transmission are required.
Malaria eradication	Permanent reduction to zero of the worldwide incidence of infection caused by human malaria parasites as a result of deliberate activities. Interventions are no longer required once eradication has been achieved.
Malaria reintroduction	Malaria reintroduction is the occurrence of introduced cases (cases of the first-generation local transmission that are epidemiologically linked to a confirmed imported case) in a country or area where the disease had previously been eliminated
Malaria-free	Describes an area in which there is no continuing local mosquito-borne malaria transmission and the risk for acquiring malaria is limited to infection from introduced cases.
Population at risk	Population living in a geographical area where locally acquired malaria cases have occurred in the past 3 years.
Receptivity	Receptivity of an ecosystem to transmission of malaria. Note: A receptive ecosystem requires presence of competent vectors, suitable climate, susceptible population, etc.
Transmission, re-establishment	Renewed presence of a measurable incidence of locally acquired malaria infection due to repeated cycles of mosquito-borne infections in an area in which the transmission had been interrupted. Note: A minimum indication of the possible re-establishment of transmission would be the occurrence of three or more indigenous malaria cases per year in the same focus for three consecutive years.
Vectorial capacity	Number of new infections that the population of a given vector would induce per case per day at a given place and time,

	assuming that the human population is and remains fully susceptible to malaria.
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 introduction of drug resistance to a specific area.

Introduction

Bhutan has made a remarkable progress in prevention and control of malaria since the establishment of malaria control program in the country in 1960s. The number of cases dwindled rapidly over the last few decades; from the historic high of 39,852 cases in 1994 to a mere total of 42 cases with just two indigenous cases in 2019.

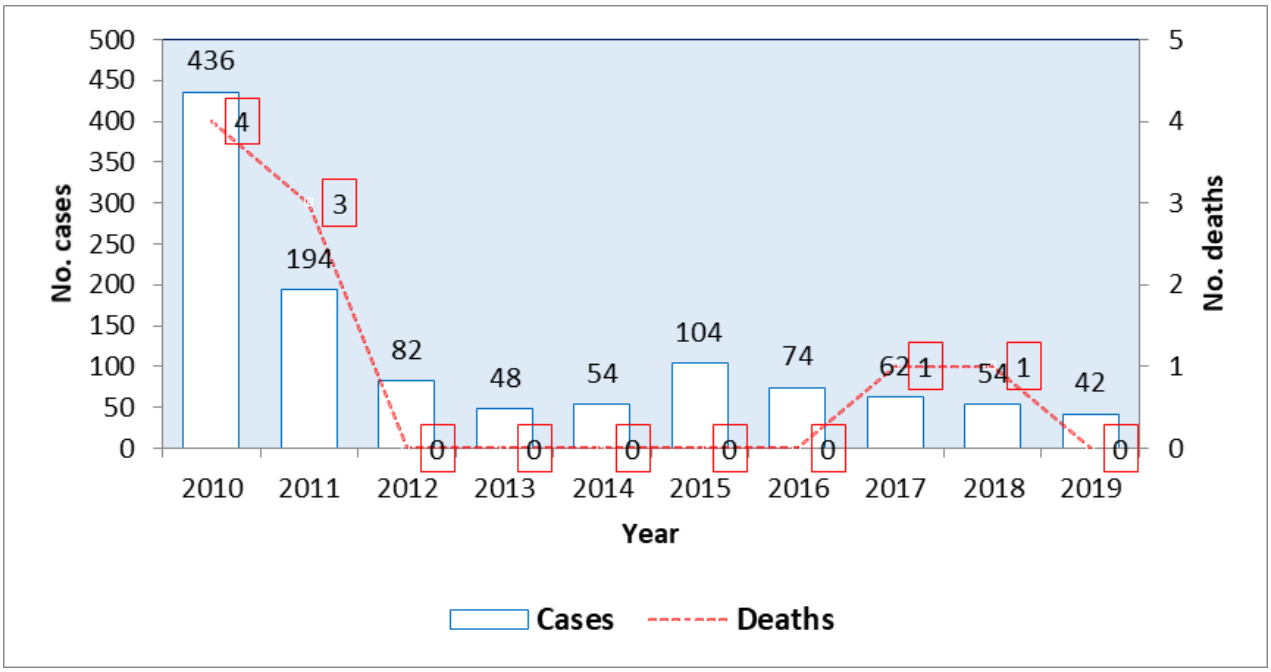


Figure 1: Trend of malaria morbidity and mortality from 2010-2019

This impressive decline in the incidence of malaria is attributed to implementation of evidence based program interventions. The key interventions implemented currently by the program are three-yearly rounds of mass distribution of long-lasting insecticidal nets (LLIN), focal indoor residual spraying (IRS), prompt diagnosis and case management, and case-based surveillance and response. With rapid decline in malaria incidence and API of less than 1/1000 population since 2010 and based on the recommendations from the joint WHO monitoring mission report, 2013, Bhutan embarked on malaria elimination path since 2014 with a goal to achieve interruption of indigenous malaria transmission by 2018. Despite consistent decline in overall malaria incidence and burden and aggressive pursuit of elimination goal, the interruption of

local transmission was missed in 2018 due to the complex challenges posed by porous and open border with India in the southern region. The focal transmission of malaria is now confined in districts located close to the malaria endemic areas of Assam and West Bengal, India.

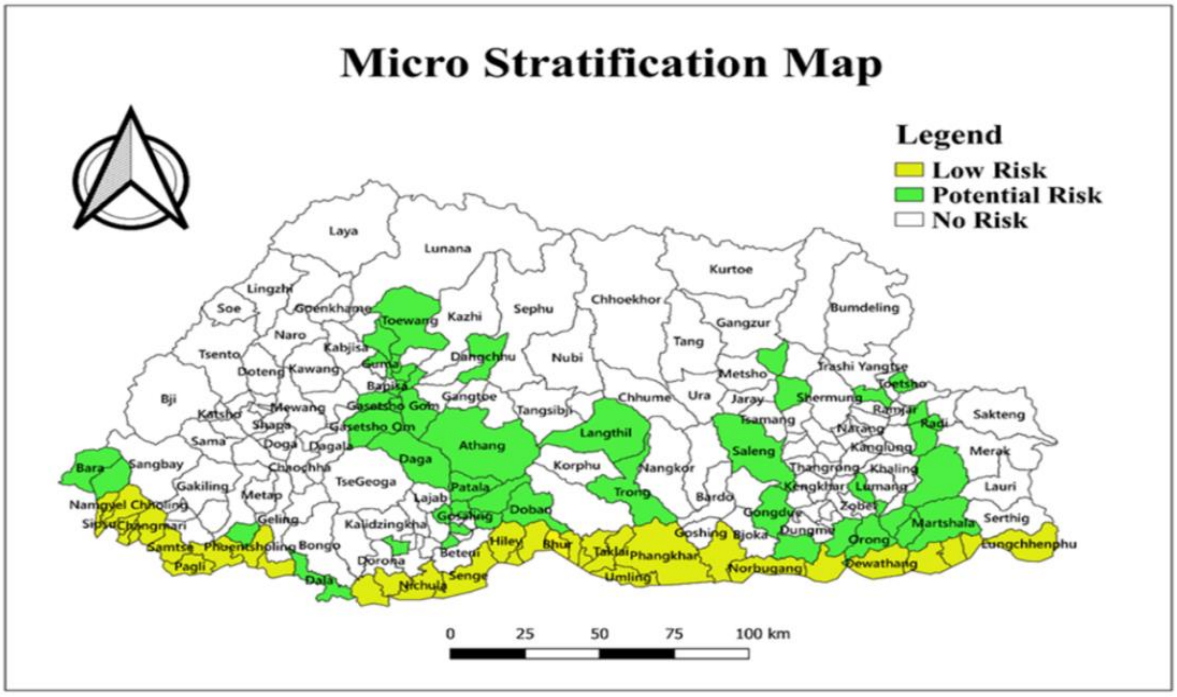


Figure 2: The updated micro-stratification of malaria transmission risk in Bhutan

After program review by WHO in 2018 and surveillance program for malaria in 2019 by external experts team from WHO, the national strategic plan for malaria elimination and prevention of re-introduction was revised (2020-2025) to incorporate new strategic interventions to further strengthen cross border malaria and surveillance system. This revised strategic plan has laid major focus to enhance malaria surveillance and response system for targeted implementation of preventive interventions.

As Bhutan endeavors to reach the goal of malaria elimination, surveillance will be an indispensable intervention which should become core intervention as per the **WHO Framework for Malaria Elimination 2017**. Bhutan has adopted and implemented 1-3-7 strategy to tackle the malaria cases where a single case is taken as an outbreak and all investigations and responses are being conducted within 7 days of the case detection. The monitoring and evaluation of the malaria surveillance system will be prioritized to continually strengthen the surveillance system to inform and guide the national elimination goal. The National Committee for Disease Elimination (NCDE) will provide

policy guidance and support to the programs while Technical Advisory Group for Malaria Elimination (TAGME) will provide technical backup and guidance to the elimination efforts.

Malaria Surveillance

Surveillance refers to on-going systematic collection, collation, analysis and interpretation of disease specific data, and the use of the data collected for program planning and evaluation of public health practice. The GTS 2016-30 frameworks for malaria elimination has transformation of malaria surveillance into core intervention as one key pillar (Figure 3). The revised NSP has prioritized program action to strengthen the overall malaria surveillance activities and monitoring mechanism.

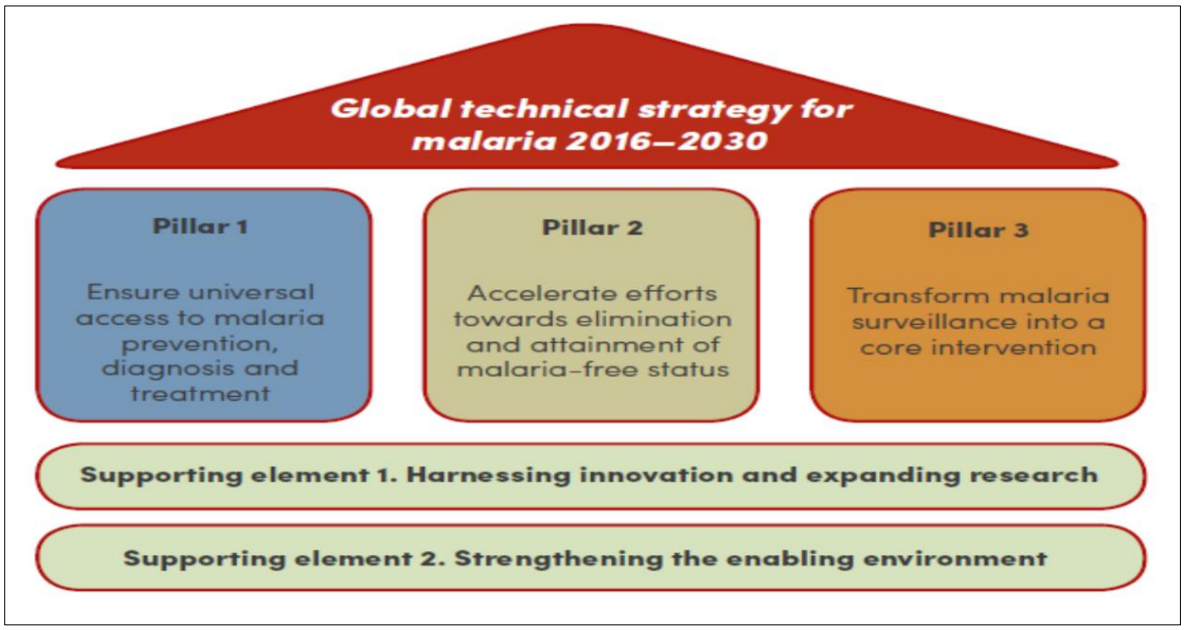


Figure 3: The WHO global technical strategic framework for malaria elimination

In the elimination setting, integrated surveillance with response is essential to ensure focused intervention in the targeted focus, thereby interrupting local transmission of malaria. The main purpose of this guideline is to provide assistance in conduct and documentation of surveillance activities starting from case detection, notification, case investigation, classification and foci response to ultimately achieve national malaria elimination goal by 2022 and WHO certification by 2025.

Purpose of the surveillance

The objective of a malaria surveillance system in the elimination phase is to detect all malaria infections and ensure that they are radically cured as early as possible so that they do not generate secondary cases. This is accomplished by:

1. Identification of focal transmission area usually based on the reports of confirmed malaria cases from public and private sector health facilities. Each malaria case is then investigated to determine whether it was locally acquired or imported and, if so, from where.
2. When a focus of local transmission is detected, the characteristics of transmission are documented by conducting a focus investigation (environmental, social and economic and entomological investigations). Control and surveillance activities are then intensified in the focus.

Aims and objectives

This surveillance guideline serves as one of the interventional tools to achieve malaria elimination in Bhutan by 2022 with the following objectives:

1. Detection of all cases of malaria, including asymptomatic infections, as early as possible
2. Provide prompt diagnosis and treatment as per National malaria treatment protocol
3. Prevention of onward transmission from each case through rapid detection and initiation of radical treatment and, if needed, vector control measures
4. To identify, investigate and respond to all transmission with appropriate measures to terminate transmission cycle as early as possible
5. Prevention of reintroduction and re-establishment of malaria in residual non-active and cleared foci

Case Definitions

A suspected case of malaria is defined as any patient (resident or traveler) presenting with fever or history of fever from the endemic areas and with no other obvious cause.

This suspicion triggers the process of parasitological confirmation by microscopy or RDT and the subsequent decision on whether to treat the individual for malaria.

Common criteria for suspicion of malaria in elimination settings include:

- Residents of endemic areas (high to low transmission) and active foci in elimination areas: patients with fever or a recent history of fever (or any other symptom considered related to malaria like chills, headache, etc.);
- Residents in non-endemic areas with very-low transmission or maintaining zero transmission: patients with unexplained fever and a history of travel to areas at risk of malaria, either within the country or abroad.
- People with a history of malaria in the past 3 years and fever or recent history of fever;
- People who have fever within 1 year of having visited a malaria-endemic area (domestic or foreign) – this is sometimes extended to 3 years for areas at risk of P. vivax
- Patients with fever, malaise and chills; people with anaemia of unknown cause; patients with fever of unknown aetiology; patients with hepatomegaly or splenomegaly (or both); and
- Recipients of blood donations who have fever during the 3 months after the transfusion.

A **confirmed malaria** case is a case in which the presence of parasites or antigens in the peripheral blood has been demonstrated, with or without symptoms.

A **malaria case (uncomplicated)** is symptomatic malaria parasitaemia without signs of severity or evidence of vital organ dysfunction.

A **malaria case (severe)** is symptomatic malaria parasitaemia with signs of severity or evidence of vital organ dysfunction, which includes:

- Prostration (inability to sit), altered consciousness, lethargy or coma
- Difficulty in breathing
- Severe anaemia (Haemoglobin < 7mg/dl)
- Generalized convulsions/ fits
- Inability to drink/vomiting

- Dark or limited production of urine
- Jaundice

Laboratory Diagnosis of Malaria

Diagnosis of malaria infection is the starting point for series of activities which include treatment initiation, case notification and investigation, response measures to prevent further transmission, case classification and recording of event for monitoring and evaluation of the program. Microscopy and RDTs are the main method of diagnosis used and positive to either of the two is considered to initiate treatment. In addition to the above diagnostic tools, PCR testing is recommended resolve the diagnosis of discrepant case by microscopy or RDT as well as to monitor emergence of drug resistance, compliment case classification and understand the population dynamics of parasite species. For this dry blood spot (DBS) sample should be collected before initiation of malaria treatment. The DBS sample should be properly dried and labeled before sending it to RCDC. To ensure quality of malaria diagnosis, national guideline on IQC, EQAS and CQI for malaria has been developed and must be adhered to. The Standard operating procedures (SOPs) on IQC must be displayed at work station and strictly followed by laboratory technicians. IQC can be maintained by weekly monitoring of the giemsa working solution, daily microscope maintenance and review of all blood smears at the end of each week. Standard operating procedures for microscopy and for performing RDTs, developed by the VDCP should be followed. Antimalarial drugs should be available in all the health centers and treatment should be given as per the National Guideline on Diagnosis and treatment of Malaria in Bhutan 2020, fifth edition.

Surveillance and Reporting: Roles & Responsibilities

Early detection followed by rapid and radical treatment of malaria case is one of the key components of malaria surveillance in the elimination setting. This reduces the risk of further transmission in the communities and also allow for timely provision of interventions. All health facilities and private diagnostic center should ensure timely reporting of the case to the DHO and program.

1. Health Centres in malaria risk areas:

In malaria low risk and potential risk areas, clinicians should advise all febrile cases to be screened for malaria. The parasitological diagnosis for confirmation will be carried out by laboratory officials. Malaria technicians and DMS should ensure timely notification and coordinate all the investigations as described in respective SOPs.

2. Health Centers in malaria risk-free areas:

In malaria risk-free areas, clinicians should advise all febrile cases with travel history to/from malaria risk areas, including those within Bhutan, to be screened for malaria. In health centres without Laboratory/Malaria Technician; malaria slides from positive cases should be prepared and sent to the nearest health centre where there is malaria/laboratory technician for microscopy to determine parasite stage and count. Case notification and investigation should be carried out by the diagnosing health centre and communicated to VDCP within 24 hours of case detection.

3. Private Diagnostic Centres

The Private Diagnostic Centres upon diagnosis of any malaria cases should immediately refer the patient to the nearest health centre for initiating treatment and case notification.

4. Dzongkhag Health Officer and DMS

DHO should monitor all the surveillance and the response activities carried out in their respective districts in a timely manner in consultation with the Chief Medical Officer (CMO) of the respective Dzongkhag. DMS should verify, analyze the data and coordinate the response activities and ensure onward reporting to the relevant authorities. Dzongkhag level database of cases and focus should be maintained by DMS. Periodically DMS should update DHO on malaria surveillance activities.

5. VDCP & NRML, RCDC

VDCP should maintain national malaria surveillance database and conduct necessary review and update - Detailed case register database, Individual case files, foci register. In event of outbreak with surge of cases, VDCP will coordinate activities and support the health centres with diagnostic kits, supplies, drugs and other logistics. The final case and focus classification should be done at the VDCP by case classification sub-committee and reviewed by TAGME. The VDCP will develop strong M&E mechanisms and review

field activities from time to time. NMRL at RCDC will oversee and implement national quality assurance system for malaria diagnosis. It will be a reference lab for molecular studies for confirmatory diagnosis of discrepant diagnosis by microscopy/RDT, conduct anti-malaria drug resistance studies and genotyping.

Surveillance Approaches

There are two types of surveillance for detection of malaria infection - Passive and Active. Any malaria positive case detected through surveillance should lead to a series of activities that should be completed to ensure that the intended objectives is achieved.

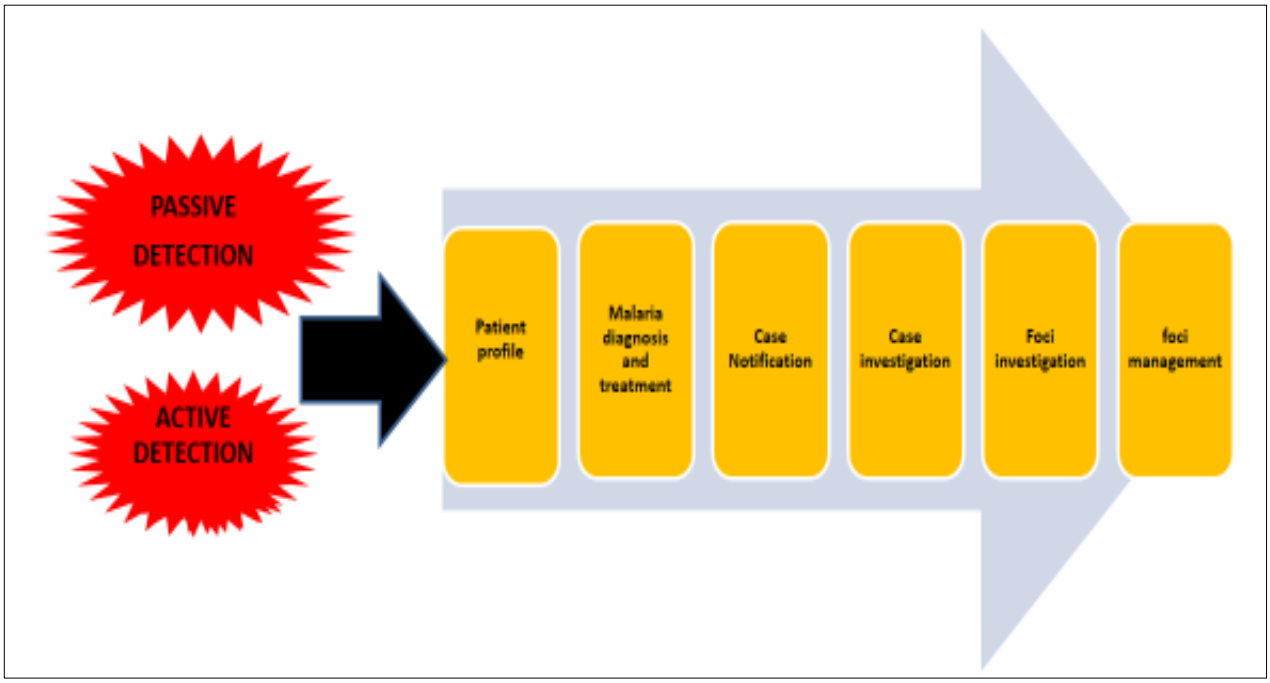


Figure 4: Case-based surveillance and series of activities in malaria elimination stage

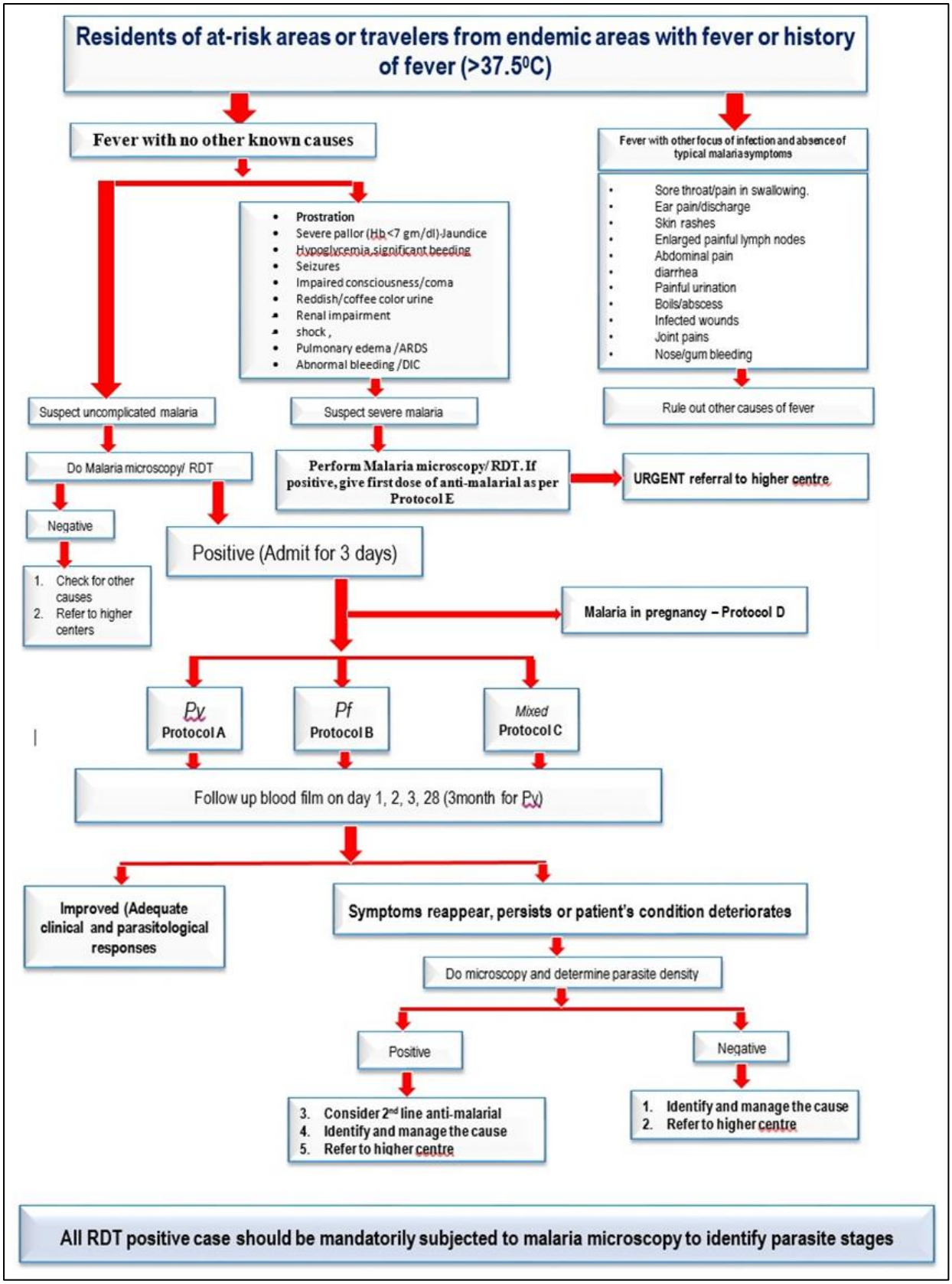


Figure 5: Algorithm for screening of fever cases for diagnosis of malaria and treatment at health facilities

Passive Case detection

The malaria case detection when a person presents to healthcare facility with clinical signs and symptoms is called passive case detection. Most malaria infections in low transmission settings produce fever periodically where people have no malaria immunity. Passive case detection should therefore lead to the detection of most malaria infections. The functional healthcare services and good access to health facility is important for good passive case detection in active transmission foci and is preferable to periodic visits by mobile team. However, in hard-to-reach areas with active transmission, periodic visits by mobile team of health workers is recommended. The passive surveillance for malaria is conducted by public health facilities, military health centres and private diagnostic centres.

Table 1: Action plan for passive case detection

Objective of PCD	To identify malaria infections and provide prompt treatment as per national treatment protocol
Who	All febrile cases; • Residence in malaria risk areas. • Who have travel history to high risk areas/countries • Coming from high risk areas/countries
Where	• Public health facilities • Military hospitals • Private diagnostics centres
How	By microscopy or RDTs
Responsible	Clinician - To advise the diagnosis Laboratory staff – To perform the diagnosis

Active Case Detection

Apart from identifying cases through passive surveillance, an active case detection must be strengthened during the elimination phase to increase the sensitivity of the surveillance system. Active case detection is a complementary strategy that involves the detection by health workers of malaria infections at community and household level in population groups that are considered to be at high risk. Active case detection can be categorized into **proactive and reactive case detection**.

Proactive case detection (PACD)

- PACD is done in high risk groups such as migrant workers, mobile populations, vulnerable groups and hard to-reach populations, irrespective of whether a case is reported or not. For elimination of malaria it is important to ensure that there are no residual cases in communities through adequate screening in high risk transmission areas, vulnerable population and in active foci. At the program level, the performance at case detection will be measured using ABER which is established at 20 percent. The DMS and local health authorities should identify the high risk areas and population in their locality on the basis of local surveillance data and in consultation with VDCP and conducted targeted PACD.
- The line list of the targeted population by household should be prepared with the assistance of local authorities.
- There should be complete coverage of the target population. People from organizations associated with the target population should be included in the lists, e.g. temporary developmental sites labourers, Indian migrant workers, seasonal labourer etc. People, who may not be recorded in the existing household lists, should also be covered.
- The DMS/DHO at district level should develop micro plan of visits, and the targeted population should be informed of the dates and times they will be visited. It should be timed when family members are most likely be at home (before or after work or school).
- A RDT should be conducted and people confirmed with malaria are treated immediately, and cases and foci are investigated epidemiologically.
- A register of all people whose blood has been taken during active case detection should be completed. It should include the identification number of the household, the name of the head of the household, address, person's name, age and other risk factor information (e.g. occupation, insecticide-treated net ownership and use, indoor residual spraying in the past year), date blood taken, type of testing and results (species, stages, density, presence of gametocytes).

The malaria screening conducted in expatriate workers for work permit at the point of entries should be separately maintained and categorized as **Medical screening.**

Table 2: Action plan for PACD

Objective of PACD	Detection of symptomatic or asymptomatic malaria infection at community and individual levels based on perceived risk.
Who	All high risk groups; • Migrant workers. • Hard-to-reach areas. • Vulnerable population in receptive areas.
When	During high transmission season
How	By RDTs or microscopy
Responsible	DMS/MT - to identify the high risk groups Laboratory person – to perform the screening of malaria

Reactive Case Detection

RACD is important surveillance strategy in elimination phase of malaria to detect early any possible local spread of infection in the community. RACD should be initiated within 24-48hrs of notification of a case. This responsibility is entrusted with DMS/MLT/CMO/HA and epidemiologist, VDCP.

Reactive case detection is always in response to a confirmed case or cluster of cases in a locality. It should be initiated and completed by the local investigating team. This reactive search for additional cases should be conducted in a systematic approach guided by epidemiological information about the most probable location of the source of infection. The subsequent epidemiological information should assist in a more directed investigation through house-house searching of cases around the index case. The scale of RACD will depend on type of case (imported vs local) and malariogenic potential of local area which should be obtained during case investigation and will inform the planning. RACD is more extensive if the index case has evidence of local transmission and limited in scale if the case is imported, relapsing or recrudescent case, especially in an area with low receptivity (potential and free-risk districts).

Table 3: Action plan for RACD

Objective of RACD	To detect additional infection and interrupt onward transmission of malaria in a focus due to a confirmed case.
Who	All the residents in the focus and residents of places visited by index case
Where	Around 0.5km radius of the likely location of an index case in a transmission focus.
How	By RDTs or microscopy
Responsible	DHO/MO/DMS/MT/HA - to lead the team Laboratory person – to perform the RACD

RACD screening can be primary or secondary based on probable origin of index case – locally acquired or imported;

1. Primary screening is done to detect any additional infections that may have been generated by the same source as index case (evidence of local transmission). Primary screening is not required in clear imported case. This should be done within 24 hours

2. Secondary screening is done to detect any additional infections that may be generated by index case via mosquito vectors. It may also detect infection missed during primary infection and should be conducted after 14 days of primary screening.

The following general principles from WHO can be used to facilitate decision making on case classification;

- The usual incubation period range after 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 9-14 days for P. falciparum and 12-17 days for P. vivax infection. Thus, detection of malaria infection within 9 –14 days for P. falciparum or 12–17 days for P. vivax of arrival in country should indicate imported nature of infection.

- If the time period between return from travel to endemic area and detection of malaria infection is more than 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 the case is resident in the area without malaria transmission for many years and supported with adequate surveillance, and the person travelled to an area with known malaria transmission within six months of detection, it is highly likely to be imported infection.

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

Table 4: Case and strata wise response

Index case characteristics	Risk strata	RACD	Focus follow up
1. Imported, relapse or recrudescent	No risk	Not required except co-travelers	Not required
	Potential risk	Not required except for co-travelers	Fever surveillance on day 21 for Pv & on day 28 for pf
2. Introduced/indigenous/Induced and Imported**	Low risk	Required	Fever surveillance on day 21 for Pv & on day 28 for pf
** For imported cases detected within 7 (Pf) and 10 (Pv) days of arrival from outside the country, immediate RACD is not required if probability of index case being local origin is low.			

When the index case has strong evidence of local transmission - indigenous or introduced case- , the extent and speed of both RACD and fever surveillance 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.

Case Notification/Reporting

As malaria is one of the notifiable diseases, all confirmed malaria cases must be notified immediately through NEWARS and updated in DHIS2 malaria tracker system which is a national malaria database within 24hrs. Notification form VDCP/Malaria Surveillance/Form 1/V3 (Annexure 1) must be used for recording and notification. In addition, monthly zero malaria reporting from health centers should be updated in DHIS2 when there are no cases detected in the preceding month.

Case investigation & classification

All case investigation should be undertaken within 24 to 48 hours and completed within 72hrs for every confirmed case of malaria detected by the health centers using standard case investigation form VDCP/Malaria Surveillance/Form 2/V3 (Annexure 2) by trained and competent staffs. Malaria case investigation teams at district or sub-district level should be initiated and conducted by respective DMS/MLT with full support of DHO and health facility in-charge. In districts/ health facility without DMS/MLT, CMO/HA should initiate and conduct case investigation and reporting. An investigation should also be conducted by the concerned staffs in location where patient has history of overnight stay during period of probable exposure. The technical support and facilitation will be provided from VDCP when required and requested to assist in field investigation. The duly completed case investigation form (VDCP/Malaria Surveillance/Form 2/V3 should be submitted to the DHO and program within two weeks of notification using DHIS2.

The case investigator should perform the following to obtain accurate and adequate information of the every malaria case:

- ***Detailed case history:*** Patient demographic and contact information and clinical details on the current infection such as onset date, species, and treatment received, etc. The geo-location of the likely source of infection should be collected.
- ***Detailed travel history:*** The travel history of case is both inside and outside Bhutan should be recorded with dates of travel and return. The travel history can be categorized into travel within 2 week, six months and within past 12 months. The

biological information of different parasite species (**table 5)** can be used to guide in calculating the probable period of infection.

Table 5: Critical observable intervals for *P. falciparum* and *P. vivax*

Interval	*P.falciparum*	*P. vivax*
Incubation period in non-immune host	9-14 days	12-17 days or 6-12 months when preceded by hypnozoites

- ***Other past details:*** Obtain previous malaria history, blood transfusion history and family members' malaria history.
- ***Review recent malaria in the local area*****:** Obtain information of all malaria cases reported from the area within the past three to five years to assess local transmission and focus status of the area.
- ***Plan appropriate response measures:***
    - Assess the logistics for parasitological surveillance such as number of households in the area, population of the area, potential places to conduct parasitological surveillance etc. informed through case and foci investigation findings
    - Do RACD as per guidelines given in Table 4. The target and extent of RACD may be informed by the information derived from the detailed case history and this should be conducted in coordination with local officials
    - As per the vector surveillance guidelines and SOPs, conduct entomological surveillance to assess receptivity of an area by malaria technician/entomologist. The entomological investigation has to be initiated within 48 hours of reporting the case, in a radius of approximately 500m of the residence of malaria patient.

The cases should be classified into imported, indigenous, induced, introduced and relapsing based on the source of infection, epidemiological linkage and travel history. However, the initial case classification is not final and binding. It can be reclassified based on the findings from the focus investigation and other epidemiological and

entomological findings. If the case is not confirmed with certainty whether the case was imported or locally acquired, it is necessary to collect information from additional sources such as co-workers, neighbors, friends, etc. The final case review and classification will be carried out by case review subcommittee of TAGME.

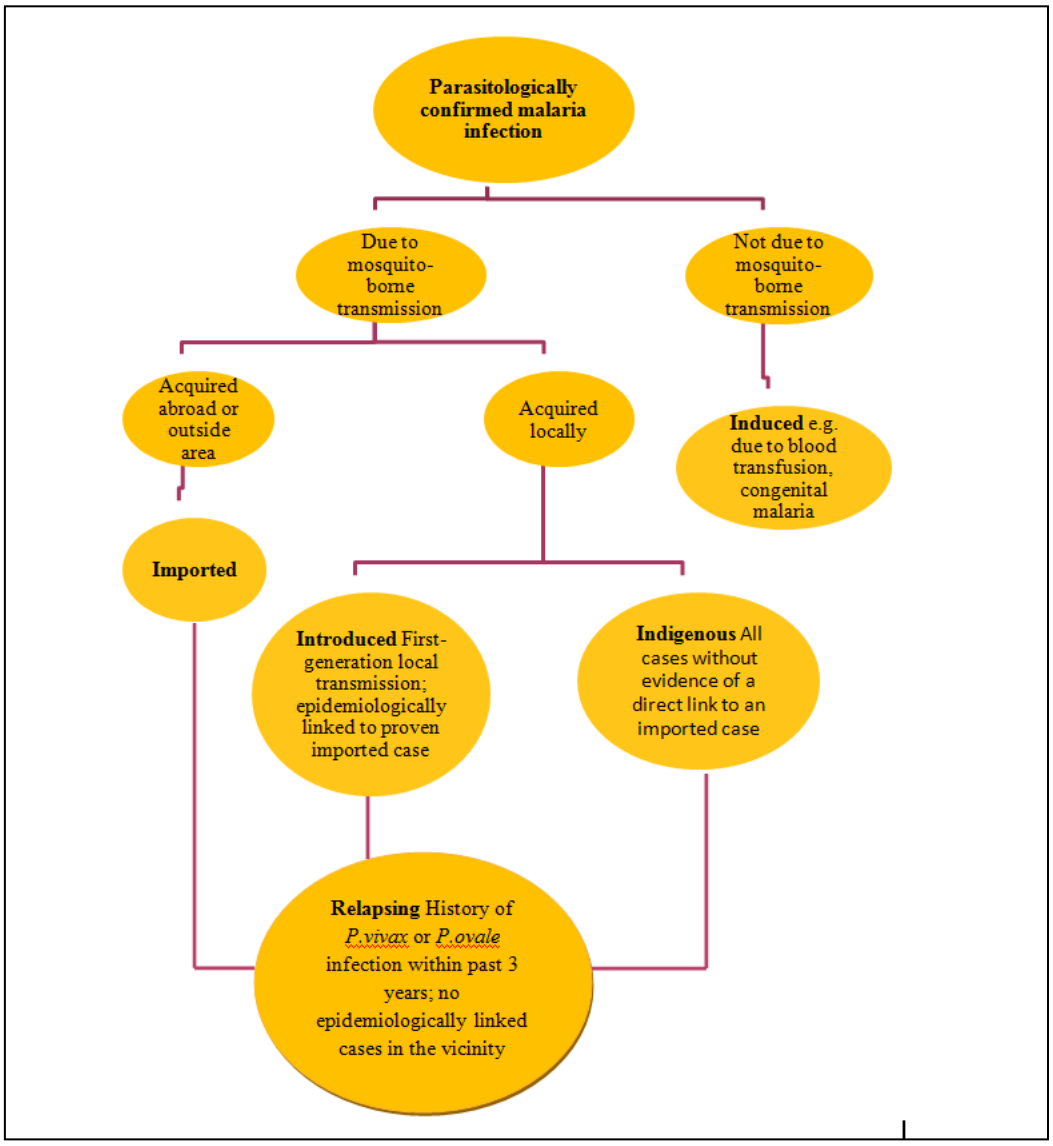


Figure 6: Classification of malaria cases

In addition to above figure, the following conditions should be considered:

Indigenous

- Locally acquired because of presence of ongoing transmission in an area within 12 months without direct link to an imported case.
- parasite is acquired from an introduced case

Introduced

- a case which can be directly linked to an imported case
- a case in an area without malaria for the past 12 months and no established link to any of the locally acquired cases in the country but presence of frequent and high influx of multiple migrant workers.

Imported

- a case in an area without malaria for the past 12 months but with close proximity to border settlements with possibility of parasite introduction through vectors
- a case with travel history to malaria endemic countries within 12 months without any evidence of link to a local transmission

Case Follow-up

Since the strategy is geared towards malaria elimination in the country, it is mandatory for all health centers to conduct follow-up of all cases according to the National Treatment Protocol using the follow-up form (Annexure 3: VDCP/Malaria Surveillance/Form 3/V3). The follow-up is mainly done to ensure DOTs, observe adverse reaction to primaquine and timely detection of relapse.

Focus Investigation, Response & Classification

Once a locally acquired malaria case has been detected in a receptive area, focus investigation is required to delineate and characterize the area and populations at risk. The investigation is more extensive if a new focus is identified, whereas in known active focus, the detection of a new case will only trigger a new focus investigation if its features (parasite species or location) differ from those of previously detected cases. The focus investigation will then identify the main features of the location, including population at risk, identification of actual or potential breeding sites, identification of likely vectors and their densities. A GPS tool must be used to gather data.

Foci investigation and response measures along with RACD should be carried out as given below;

- Mapping where transmission occurs, vector breeding locations and risk populations in the focus area;
- Conducting entomological surveillance as per program vector surveillance guidelines.
- Evaluating vector control activities and providing supplementary vector control if required (LLIN top up).
- Describing the vector species present, their abundance, where they are located and their feeding behavior.
- The socioeconomic conditions and access to healthcare in the locality

The findings from focus investigation should be able to determine if the local transmission is occurring and assist in both final classification of focus and case. Based on the case investigation, classification and epidemiological history of locally acquired cases in the foci, a focus can be classified into one of the three classifications given in **table 6** including activities and response required for each type of focus but individual judgment based on evidence gathered will be more intelligent approach. Focus investigation and responses has to be completed within 7 days from the date of case detection.

The following forms and SOPs are to be used:

1. SOP Focus investigation VDCP/SOP/Sur/no.03/V2

2. Focus investigation form VDCP/Malaria Surveillance/Form 4/V3

3. RACD form

4. Checklist for household investigation during focus investigation

5. Focus follow-up form

Table 6: Recommended Minimum Standards for Focus Response

Focus definition	Operational criteria	Activities recommended
1. Active - focus with ongoing transmission.	Indigenous case(s) have been detected within 12 months	• Investigation and response around 500m-1km radius • RACD according to the guideline • Mapping of breeding sites, describing vectors(Larva & adults) • Mapping of population at risk • Vector control assessment and response • Community mobilization • PACD based on risk assessment
2. Residual Non-active - Transmission interrupted recently (1–3 years ago).	Transmission interrupted within 1- 3 years. Last indigenous case detected at least 12 months ago.	• RACD according to the guideline • Mapping of breeding sites, describing vectors(Larva & adults) • Mapping of population at risk • Vector control assessment and response • PACD based on risk assessment
3. Cleared - A focus with no local transmission for more than 3 years and which is no longer considered residual non-active.	A focus with no indigenous case(s) for more than 3 years, where only imported or/and relapsing/ recrudescent cases or/and induced cases may occur in the current calendar year.	Continue with case investigation and response

The focus classifications will be updated annually in the month of January. The status of a focus is also reviewed as new cases appear and field investigations are undertaken. The results of focus investigations are compiled and maintained at national level in the 'Focus register' and a summary of the status of all national foci is updated at annually.

Epidemic Preparedness and Response

Malaria epidemic is defined as an unusual surge in the incidence of malaria in populations which is in excess of normally expected pattern in the locality computed from past data. While large epidemics are generally easy to define, small epidemics may be difficult to distinguish from expected seasonal and periodic variations. In elimination stage, occurrence of a **single** case of malaria, that is **locally transmitted,** and confirmed by microscopic examination or rapid diagnostic test, is considered as an outbreak. Surveillance is case-based and used as interventional tool. The investigation should be initiated as soon as a case is detected. The detection of a case activates the first level rapid response team.

This section provides a guideline on the composition of rapid response team, roles of team members and criteria for activation and outbreak response and management. As key part of the surveillance during elimination, any unusual increase in febrile cases or suspected events with high likelihood risk of malaria transmission should be investigated and reported as event in NEWARS and to DHO, VDCP. Such events should be immediately verified by local DMS/MLT/CMO/HA. The RRT composition, responsibilities, and actions, follow-up and reporting are mentioned in respective SOPs.

1. SOP Case investigation VDCP/SOP/Sur/001/V1

2. SOP Focus investigation VDCP/SOP/Sur/002/V2

Surge Capacity for Health Centers without Malaria Technicians

If any health center lacks capacity for outbreak response i.e. without Medical Technicians (Malaria Technicians) or logistics to manage VBDs outbreak, the health center should notify to the DMS/DHO and Program immediately for further actions. The district/ hospital level RRT as per national outbreak response and management manual is responsible to initiate response and management of outbreaks. For vector borne disease outbreaks like malaria, malaria technician or entomologist, as appropriate will be part of the local/national RRT member.

Rapid Response Team at Dzongkhag Level - Chief Medical Officer/Medical officer, Dzongkhag Health Officer., Dzongkhag Malaria Supervisor and Malaria Technician/ Lab. Technician

The rapid response team at the dzongkhag level will be activated when health centers under their dzongkhag are unable to control the outbreak or in times of multiple sporadic outbreaks. The team will carry out the same activities as above along with treatment at site, shipment of slides, etc. The team should notify the program if extra support in the containment of the outbreak is required. The key roles and responsibilities are;

- ✓ Conduct weekly review and analysis of data
- ✓ Monitor malaria trend using epi-week from cases reported via DHIS2
- ✓ Any outbreaks or unusual event suspected should be verified and reported immediately to RCDC and VDCP
- ✓ Maintain contingency plan to investigate and management epidemics
- ✓ Review and conduct assessment of entomological, epidemiological, meteorological, population movement or socioeconomic activities situation in respective jurisdiction

National RR Team:

1. Chief Program Officer, CDD/EHD
2. Clinician
3. Laboratory Officer, RCDC
4. Epidemiologist, MOH
5. Entomologist, VDCP
6. Program officer, VDCP
7. Any relevant member from the Dzongkhag/Health center team

The national RRT gets activated as and when surge capacity is deemed necessary or on the request of Dzongkhag RRT. The existing activities of VDCP will be focused at the outbreak area. They will analyze, verify, follow up and provide timely feedback to reporting centers, Dzongkhags and higher authorities in the MoH.

Communication

Communication should be an ongoing process from the first day of notification till the final investigations are over. It should include findings and measures taken to contain the outbreak. The diagram below is a recommended channel and flow of communication during outbreaks.

Line of communication during outbreak

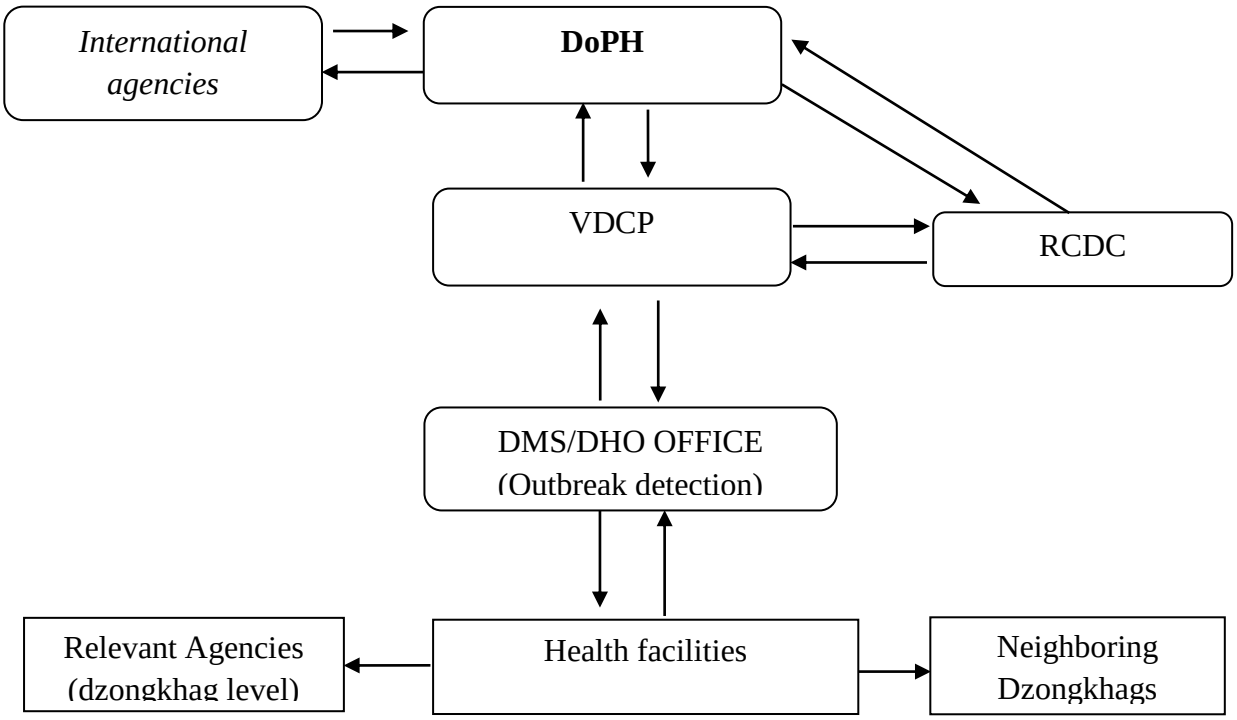


Figure 7*: Communication flow chart*

Data Documentation, Analysis & Management

Proper data collection, recording and management and analysis should be done at all levels; Health centers, DHO/DMS and VDCP. The case and focus investigation data should be reviewed for accuracy and completeness, collated and analyzed to determine the origin of infection and arrive preliminary case and foci classification. The information unit at the Programme should review and analyze the case report received within a week and conduct follow ups with respective health facilities as required. The

central program will provide the findings as feedback to all reporting health centers. The surveillance focal point in the program shall record and maintain updated central national malaria database both electronically and in hard copies for the period of 5 years. The DMS/DHO will maintain proper district level malaria database, both in electronic and in hard copies.

At dzongkhag level, DHO/DMS should provide timely feedback report to respective PHCs and hospitals. The surveillance system for malaria should be strengthened at all levels during elimination and POR phases.

At national level, VDCP should provide timely feedback to the concerned health facility/Dzongkhag as and when cases are reported. Monthly feedback should be prepared by the information unit and disseminate to all the reporting units to acknowledge the report and recommendations to improve surveillance system. The feedback is also to reinforce health staff efforts to continue to actively participate in the surveillance system. Informal feedback by phone and email should also be used regularly and especially upon detection of confirmed malaria case.

The following documents should be maintained at all levels- district, health centre and Program.

- Individual color code case files
- Case summery
- Case notification form
- Copy of verification of diagnosis
- Case follow up and treatment form
- Case investigation form
- Focus investigation form
- RACD report
- Case GIS map
- Focus follow up
- Foci register
- Details and summary reports of entomological investigations conducted

In addition, VDCP should maintain the following documents to meet certification requirement for malaria elimination

- National malaria case register – Database
- Annual reports of the national malaria programme
- Reports of reviews of the programme including Global Fund reviews
- National Strategic Plan for malaria elimination
- National M&E plan.
- Case and focus registries.
- Details of routine entomological surveillance activities.
- Central program health structures and staffing;
- National malaria laboratory quality assurance data;
- Entomological surveillance data;
- Guidelines and SOPs

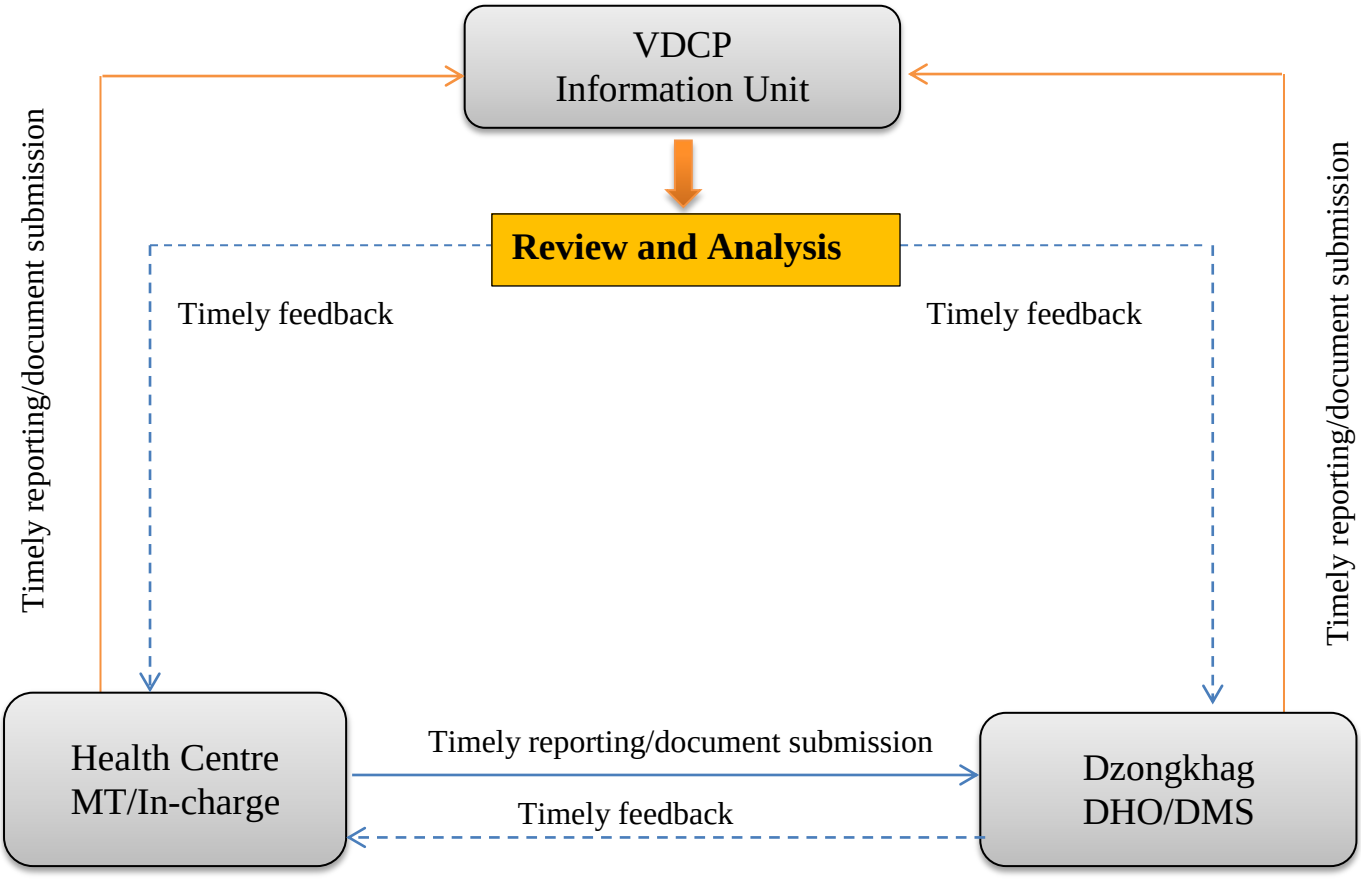


Figure 8*: Reporting and Feedback flow chart*

Surveillance Monitoring & Evaluation Plan

The program will establish and operate strong and robust M & E plan, as a key component of case-based malaria surveillance and response system to track progress and conduct on-going improvement of malaria surveillance system. Monitoring of surveillance performance at every operational level is important to review surveillance performance in detection, reporting and responding to malaria case. The surveillance M&E indicators is shown in table 7. The monitoring of surveillance will be conducted by the DHO/DMS at district level and surveillance unit from VDCP at the national level. Further, the WHO external expert committee as well as national sub-committee of TAGME (CRC) will be fielded to conduct independent assessment and evaluation of the surveillance performance annually. The surveillance performance review and recommendation for improvement will be presented and discussed during TAGME meetings.

Table 7: Key indicators for M&E of malaria surveillance activities

Indicator	Target	Data Source	Measurement	Responsible staff/ agencies
Percent of malaria cases notified within 24 hours	100%	DHIS2/NEWARS	Within 24 hours (DHO and VDCP)	DMS/MLT & Concerned health facility in-charge
Percent of expected zero malaria report received from health centers	100%	DHIS2	Monthly	DMS/MLT & Concerned health facility in-charge
Percent of positive malaria cases referred from Private diagnostic centers	100%	Malaria case register of Private Diagnostic Centers	Within 24 hours to Health center	PDC & HC

		/Health Centers		
Percent of confirmed malaria cases fully investigated and classified within 72hrs	100%	DHIS2	Within 72 hours	DHO&VDCP
Percent of confirmed case with completed investigation and classification information	100%	DHIS2	Case investigations and classification form completed	Health centre/VDCP
% of foci fully investigated (malaria focus investigation form completed, including data from an entomological investigation) and registered (on register, with maps of each focus)	100%	DHIS2	Completed investigation form within 7 days from the day of notification	MT/HC In-charges/CMO/ DMS/ DHO /VDCP
Percent of health centres with Malaria Technician reporting vector surveillance	100%	DHIS2	Monthly	MT/DMS/VDCP
Percent of sentinel sites monitored for insecticide resistance	100% (4 sites)	DHIS2	2 years	VDCP/health centre
Annual Blood Examination Rate by district and focus (detected passively and actively)	>20% in active and low risk districts	DHIS2, district database	Annual	DMS/DHO/VDCP

Time from first symptom (fever) to first contact with the health system	Within 48hrs	DHIS2 – Malaria case investigation database	Annual	DHO, Hospitals and VDCP
Time from first contact to testing	Within 24 hrs	DHIS2 – Malaria case investigation database	Annual	DHO, Hospitals and VDCP
Time from positive test result to start of treatment	Same day	DHIS2 – Malaria case investigation database	Annual	DHO, Hospitals and VDCP
Percent of health centres provided training/refresher training on malaria microscopy & QA/QC	>100%	NMRL,RCDC	Annual	VDCP/NMRL
Percent of malaria testing lab participating in a blinded rechecking	>80%	NMRL, RCDC	Monthly	NMRL/health centre
Percent of malaria testing lab participating in a panel testing	>80%	NMRL, RCDC	Bi-annually	NMRL/health centre

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Annexures

Annexure 1. SOP for Case Investigation

SOP No.	Title	Version No.	Total Pages
VDCP/SOP/Sur/Mal/01	SOP -Case investigation	1.0	5

Distribution:	Program officials, District Malaria Supervisors/ technicians, District Health Officers and health centers in all malaria risk areas.

Issue Date	Effective Date		Review Period
			3 yearly
Function	**Name**	**Designation**	**Signature**
Prepared by	VDCP		
Reviewed and Verified by	TAGME		
Approved by	Dr. Karma Lhazeen	Director	

REVISION SUMMARY

Version No	Effective Date	Reason for Change	Details of the change

1. **Scope:**

This SOP is applicable to be followed during epidemiological investigation of all confirmed cases of malaria.

Objective:

To provide guidance to a staff involved in epidemiological investigation of a malaria case for uniform and systematic conduct of case investigation and assist district and program level supervisors to effectively monitor the case investigation activities.

2. **Responsibilities:**

The procedures specified in the SOP are intended to be followed by outbreak investigation team (Malaria technicians, DHO/CMO, Health facility staffs, or program officials) responsible for conducting investigation of a malaria case

3. **Pre requisites:**
   a) Case investigation form (CIF version 3)
   b) Surveillance guidelines/ manual
   c) Stationaries (Pen, Notepad)
4. **Procedures:**
   a. The malaria technician/ health facility should review and verify the diagnosis of a notified malaria case on the same day of notification
   b. Once the diagnosis and location is confirmed, the pre-identified team should prepare and proceed to the field
   c. The team should inform and meet local authorities to brief about the investigations
   d. The investigator should identify and visit the patient at his house
   e. Greet the patient and assess the readiness of the patient for interview.
   f. The investigator should explain the patient about the purpose and objectives of the visit
   g. Physical and mental states of the patient should be considered while assessing the readiness.

h. Interview the patient/ guardian to obtain detailed information as per the CIF to obtain the required details (Demographic, health center, clinical, treatment history, travel and past episodes of malaria details) as follows:

i. **Clinical presentation**:

- Obtain the onset date of illness. If the exact date of onset of illness is not known, document the most probable period of symptom onset. Example, last week or 4-5 days back etc.
- Other secondary events in time may be explored which might have occurred when the symptoms developed and associate with the onset of symptoms.

j. **Laboratory diagnosis**

Microscopy- Mention the correct parasite stage and density. Parasite stage can reveal the duration of the illness and risk of onward transmission in the community. Parasite density of day zero is used as baseline for monitoring drug efficacy

RDT- All RDT positives should be subjected to microscopy test to determine parasite stage and density

PCR- DBS is collected from all positive cases. At this stage it is not required to mention the test result of the PCR, which can be updated later.

G6PD test- When available, G6PD test should be performed for all Pv cases in order to avoid adverse events associated with primaquine.

k. **Prior health seeking behavior**

- The information here includes medical advice sought that leads to self and over the counter treatment before visiting any health facility.

l. **Past History**

Recent past history of Pv without a link to any known case(s) may indicate relapse. Therefore, information such as when the last infection occurred, what species and whether the patient has taken complete treatment should be gathered.

m. **Blood transfusion**

The information here is to rule out any induced infection through other parenteral routes and blood transfusion.

n. **Travel history** Patient travel history is divided into within country and outside country.

- Obtain detailed travel history both within and outside the country within two weeks, 6 months and one year
- Mention specific place and dates of travel and return if there is travel history
- Line-list all travel companions (travel contacts) if the current infection has been linked to travel.
- Whether the patient has travelled or not, travel history should be verified from other secondary sources (neighbors, friends, co-workers)

o***. Patient house investigation:***

- Inform the head of the household of proposed visit through VHW or CAG member.
- Engage VHW/CAG members during entire investigation
- After reaching the index household, use **VDCP/Malaria Surveillance/Form 1/V3** to perform investigation and proceed with the procedure M1-O accordingly.
- Take geo-location of the index case using mobile standing outside the house for buffering 0.5Km radius around index case (for Focus circumscribing).
- Within the index house, check all bedrooms and potential mosquito resting places for adult resting and collect all using mouth aspirators/suction tubes and introduce in netted cups for identification and recording.
- Check *Anopheline* breeding sources around the index case house.
- Take geo-locations of habitats using mobile if *Anopheline* larvae are present.
- Collect all 4^{th} instars larvae in transportation vials, label breeding sites wise for identification and recording.
- Prepare for detailed focus investigation.

p**.Case Classification**

- The epidemiological information (clinical, travel, past history, any contact with a known case, blood transfusion) and environmental, socio-demographic and entomological information obtained as part of focus investigation should be reviewed to arrive at appropriate case classification.

Annexure 2. SOP for Focus Investigation

SOP No.	Title	Version No.	Total Pages
VDCP/SOP/Sur/Mal/02	SOP- Focus Investigation	2.0	7

Issue Date	Effective Date	Review Period
		3 yearly

Function	Name	Designation	Signature
Prepared by	VDCP		
Reviewed and Verified by	TAGME		
Approved by	Dr. Karma Lhazeen	Director, DoPH	
Distribution:	All VDCP Technical staff, District Malaria Supervisors, District Health Officers, Medical Officers, In-Charges of health facilities, Field Malaria Technicians in all malaria risk areas.		
Location	VDCP		

REVISION SUMMARY

Version No	Effective Date	Reason for Change	Details of the change
2 (2020)		**WHO recommendation**	

1. **Scope:**

   This SOP describes the requirement of **Focus Investigation** after detecting a malaria case, required components of human resource, equipment, procedures, forms completeness, review at various levels, record maintenance and timely reporting and subsequent focus follow up.

2. **Objective:**

2.1. To provide guidance on timely, complete and effective focus investigation for prevention of onward malaria transmission within the communities through adequate detection of sources of infection.

3. **Responsibilities:**

3.1. It is the responsibility of all investigators performing case investigations to follow this SOP and use the associated Foci Investigation Forms to submit the investigation report.

3.2. It is the responsibility of the Team Leader to ensure that the correct version of this SOP is in place at the investigation site and correct instructions has been given to all investigating members.

3.3. All investigators are responsible to ensure that this SOP is correctly followed during the time of focus investigation.

4. **Definitions:**

4.1. **Malaria Case-** Confirmed malaria case either by RDT or microscopy regardless of presence or absence of symptoms.

4.2. **Focus-** Circumscribed area that currently contain epidemiological and ecological factors necessary for malaria transmission. In our case this could be either Chiwog or demarcated/buffered area of 0.5Km radius around the index case.

4.3. **Index case-** A case of which the epidemiological characteristics trigger focus investigation/RACDs.

5. **Principle:**

5.1. It is an investigation triggered by occurrence of a malaria case in a locality after confirming that the patient got infection in that area through **Case Investigation** and mandated to catch any reservoirs and interrupt onward transmission.

5.2. The investigation should be completed within 7 days after the case detection depending on case classification.

5.3. In an area with high receptivity and vulnerability, occurrence of a malaria case with unascertained origin of infection also requires focus investigation.

6. Pre requisites:

6.1. Human Resource:

i. DHO/Facility In-Charge as overall supervisor
ii. DMS to lead for malaria screening
iii. 2 Malaria Technician; one will lead for vector surveillance
iv. Lab. Technician
v. 2 Insect Collectors
vi. VHW/CAG members

6.2. Equipment for malaria screening:

i. Lab. coats and official name tags
ii. Sufficient diagnostic test kit
iii. Glass slides and lancets
iv. 70%sprit swaps
v. Hand gloves
vi. Disposable syringe
vii. What-man filter paper
viii. Zip-lock back
ix. Sharp box
x. Labeling paper
xi. Pencil
xii. Bio-hazards back

6.3. Vector surveillance and control equipment

i. Gum boots and official name tags of individual investigators
ii. Entomology dissection microscope
iii. Entomological tool box containing all essential surveillance equipment
iv. Mosquito suction tubes
v. Adult cage/netted plastic cups
vi. Torches
vii. Larval scoops with handle
viii. Larval trays (white)
ix. Larval transportation vials with tight fitting caps
x. Pipettes

xi. Cotton wool

xii. Fine tip permanent marker pen

xiii. Labeling paper

xiv. Sugar

xv. Larval feed

xvi. Larval rearing cups

6.4. **Forms: (All Annexed)**

i. VDCP/SOP No.3/V2

ii. Checklist for household investigation during malaria focus investigation

iii. VDCP/Malaria Surveillance/Form 4/V3

iv. RACD form No. 4.1 or RACD Register maintained at BHU

7. Process Map in Flow chart:

7.1. Not Applicable

8. Procedures:

8.1. **Preparation for focus investigation**

8.1.1. Create 0.5Km buffer around the index case for detail investigation

8.1.2. Prepare line list of household, population enumeration and logistic and team arrangements for vector surveillance and screening/RACD.

8.1.3. Inform communities in the focus areas of proposed date for screening of all household members through VHW/CAG/Tsogpa.

8.2. ***Focus details:***

8.2.1. Fill the checklist form by asking the heads of the households or during household visits.

8.2.2. Use checklist to record all information from B1-B7. These should be considered within the circumscribed focus.

8.3. ***Accessibility and connectivity:***

8.3.1. Direct observation and record accordingly in D1-D4

8.4. ***Vector Control:***

8.4.1. Use the checklist and retrospective exploration of most recent intervention coverage from health facility for filling from E1-E5 accordingly.

8.5. ***Environmental assessment:***

8.5.1. Observe and fill F1-F9 accordingly

8.5.2. Under house types, consider mainly walls of the houses where members of the families sleep.

8.5.3. Construction and developmental activity sites are example private house constructions, projects like road, school and other constructions where migrant workers are employed and stay within the focus area.

8.5.4. Major farming activities include agricultural activities where most of the communities in the focus are involved such as paddy cultivation, paddy harvest, crop guarding, cattle herding, daily wage working etc.

8.6. ***Parasitological Assessment***

8.6.1. This involves analysis of screening/RACD done in the focus.

8.6.2. Under this fill form from G1 to G7 accordingly.

8.7.***Entomological Assessment***

8.7.1. The team needs to do night biting collection in the index house and in 1-2 nearby houses to understand vector species prevalence.

8.7.2. Identify all samples collected immediately the next day and record species identified in the form.

8.7.3. Preserve samples in absolute (100%) ethanol for vector incrimination with leveling (Place, Date, Collectors, Indoor or outdoor, PCR Samp.).

8.7.4. Do a thorough larval survey in the focus area and record types of breeding sites, geo-locations of each site positive for *Anopheline* larvae (Latitude. Longitude).

8.7.5. Samples should be collected for species identification as larvae or after adult emergence and record species.

8.8.***Focus Classification***

8.8.1. Refer surveillance guideline for focus classification.

8.9.***Focus response***

8.9.1. This entails what interventions the team has initiated (Not necessarily) and record J.1 to J.10 in the form if done.

8.9.2. IEC/BCC should be mandatory during focus investigation door to door or during gathering just before the community screening in the focus start.

8.9.3. Depending on transmission risk factors such as season, housing, occupation, community activities, population movement, level of malaria awareness, presence of migrants, closeness of border settlement etc., recommend focus follow up on day 21 for *P. vivax* and day 28 for *P. falciparum*.

8.9.4. If the team finds any other significant findings and observations, can note in the space provided in the form.

8.9.5. Attach geo-map of focus with spatial distribution of case(s).

8.9.6. Finally enumerate the investigation team members.

9. Form review after completion of investigation:

9.1.**Health facility level**: Right after completion of any case investigations, all investigators involved and In-charge of the facility CMO/MO/HA/ACO should sit together and review the completeness of the investigation forms and presence of all supporting forms/documents to be accompanied with investigation forms thoroughly and reach a consensus. The punching in the DHIS2 system should be exactly as in the form and undertaken by a trained staff followed by report submission and filing.

9.2.**At district level**, DHO, CMO, DMS and Lab. In-charge should sit together after receiving the report of any case investigation forms and review for completeness and relevance and give their feedback if required immediately to health facility with copy to central program.

9.3.**At program level**, Data Manager/GIS Technician will call for case investigation form/DHIS2 system report immediately. There should be a team comprised of representative from Entomology, Epidemiology, Parasitology, Data Manager and a Program Officer. Feedback should be given immediately to DMS and Malaria Technician of concern health facility.

Annexure 3. SOP for Integrated Drug Efficacy Surveillance

SOP No.	Title	Version No.	Total Pages
VDCP/SOP/Sur/Mal/03	SOP- iDES	1.0	3

Issue Date	Effective Date	Review Period
		3 years

Function	Name	Designation	Signature
Prepared by	VDCP		
Reviewed and Verified by	TAGME		
Approved by	Dr. Karma Lhazeen	Director	
Distribution:			
Location			

REVISION SUMMARY

Version No	Effective Date	Reason for Change	Details of the change

1. Scope:

The SOP describes procedure on monitoring of antimalarial drugs on every malaria confirmed case as a part of routine surveillance through iDES standard protocol.

2. Objective:

The objective of this SOP is to ensure standard method to carry out integrated Drug Efficacy Surveillance (iDES) for malaria treatment response and DOT monitoring.

3. Responsibilities:

It is the responsibility of the staff appointed or identified (Malaria technicians, Lab. Technicians, Technologist and Health assistants) working at different level of health facilities to follow the SOP while carrying out the iDES procedure.

4. Requirement:

4.1.Equipment

- Compound microscope

4.2.Lab consumables

- Giemsa Stain
- Glass slide
- Blood lancet / Syringes
- 70 % alcohol

4.3.Form

- Standard iDES form

5. Procedures:

5.1. On day 0:

a. The laboratory staff should identify the patient diagnosed with malaria and explain the procedures on follow up and monitoring requirements as per the national treatment guideline
b. Collect blood in EDTA tube and prepare DBS sample before administering the malaria treatment
c. Complete the detailed information as per the national treatment guideline

5.2. Follow up:

d. The patient must be followed up to assess for presence of fever (other sign and symptoms if presence) and collect blood smear on Day 1, 2, 14 and 28 for Pf & Day 1, 2, 14, 28, 90 (3 month) and 360 (1yr) days for PV.
e. All follow up should be done through **examination of blood smear,** not by malaria RDT.
f. Collect additional DBS sample if the parasites are present during the follow up days.

g. There should be a proper communication channel within or between the health facilities on information sharing in case of patient's transfer so that the follow up on every malaria case in not missed.
h. In iDES form, the patient lost to follow up should be clearly mentioned.
i. The DOT for primaquine should be monitored till Day 14 through verification of DOT form completed by the DOT provider.
j. The verified DOT form should be collected and attached along with iDES form.

5.3. Documentation:

k. DOT form accompanied with iDES form must be filed in their respective case files as per the malaria surveillance and national treatment guideline. (Hard Copy)
l. The data should be updated on DHIS2 after every follow up.
m. Copy of complete iDES report should be submitted to VDCP office.

MALARIA CASE NOTIFICATION FORM
MINISTRY OF HEALTH
VECTOR BORNE DISEASE CONTROL PROGRAMME

Tick (✓) where appropriate.

A	**Patient Information**		
A.1	Date of Notification:	A.2	Name of health center:
A.3	Dzongkhag:	A.4	BTC No:
A.5	Unique code:	A.6	Name of patient:
A.7	Age/sex:	A.8	Nationality:
A.9	Occupation:	A.10	Category: N1 [ ] N2 [ ] N3 [ ]
A.11	Mobile/Telephone No:	A.12	Name of the head of the family:
A.13	Date of onset of Symptoms:	A.14	Date of Diagnosis:
A.15	Is the case referred from private diagnostic centre? Yes: [ ] No: [ ]		
B	**Present address:**		
B.1	Village:	B.2	Chiwog:
B.3	Gewog:	B.4	Dzongkhag:
B.5	**Permanent address:**		

C	**Diagnostic test & Result (*Tick*):**						
C.1	Method of diagnosis	P.f		P.v		Mixed	Others (*Specify*)
		Positive	Negative	Positive	Negative		
	Microscopy						
	RDT						
	PCR Sample Collected: Yes: [ ] No: [ ]						

C.2	Patient admitted: Yes: [ ] No: [ ]	`C.3	Case Severity: Uncomplicated [ ] Severe malaria [ ]
C.4	Is the case being referred to next higher health facility: Yes [ ] No [ ]	C.5	If yes, where is the case being referred:

Remarks if any:

……
……
……

Notified by:	**Designation:**	**Signature:**

MALARIA CASE INVESTIGATION AND CLASSIFICATION FORM
MINISTRY OF HEALTH
VECTOR BORNE DISEASE CONTROL PROGRAMME

Tick (✓) where appropriate

A	**Patient Information**			
A.1	BTC No:	A.2	Unique code:	
A.3	Name of Health Facility:	A.4	Date of case investigation:	
A.5	Name of patient:	A.6	Age:	Sex:
A.7	Nationality:	A.8	Passport no./CID no.:	
A.9	Category: N1 [ ] N2 [ ] N3 [ ]	A.10	Occupation:	
A.11	Education level:	A.12	Contact No:	
A.13	Head of the family:	A.14	Date of Admission:	
A.15	Date of Discharge:			
B	**Present address**			
B.1	Village:	B.2	Chiwog/Demkhong:	
B.3	Geog/Thromde:	B.4	Dzongkhag:	
C	**Clinical presentation**			
C.1	Presence of symptoms : Yes[ ] No[ ]		If yes, tick symptoms present: • Fever Yes [ ] No [ ] • Chills and rigor Yes [ ] No [ ] • Headache Yes [ ] No [ ] • Joint pain Yes [ ] No [ ] Others (specify)…….	
C.2	Date of onset of illness:	C.3	Place of onset of illness:	
C.4	Date of diagnosis:	C.5	Method of case detection: • Passive: [ ] • Reactive: [ ] • Proactive: [ ] • Medical Screening: [ ]	

D	**Laboratory diagnosis of Malaria (tick):**			
D.1	Method of diagnosis	Date	Results	
	RDT		Positive [ ] Negative [ ]	If RDT positive Pv [ ] Pf [ ] Mixed [ ]

	Microscopy		Positive [ ] Negative [ ]	Species	Stages	Parasite count:
	PCR		Positive [ ] Negative [ ]	If PCR Positive Genus/ species		

D.2	**G6PD Test Result**	**Normal [ ]**	**G6PD deficient [ ]** **Not done [ ]**

E	**Prior health seeking behavior**			
E.1	Whether the patient had sought the following interventions for the current illness before the diagnosis:			
	Interventions	Yes/No	Date	Place:
	Local healer			
	Religious intervention			
	Pharmacy shops			
	Self treatment			
	Prior health visit			
	Others, specify:			
	Any other comments:			

F	**Past History**
F.1	Past history of malaria infection: Yes [ ] No [ ]
F.2	**If yes,** When…….. Species: ……..
F.3	Place of treatment (hospital:
F.4	Was the treatment completed? Yes [ ] No [ ]
F.5	If no, reason for incomplete treatment:
G	**Blood transfusion**
G.1	Does the patient have blood transfusion within the past 3months: Yes [ ] No [ ]

G.2	If yes, where did the patient get blood transfusion within past 3 months?			
	Bhutan		Abroad	
	Place:	Date of transfusion:	Place:	Date of transfusion:

G.3	Remarks:

H	**Travel history within Bhutan**
H.1	Does the patient have travel history within Bhutan? Yes [ ] No [ ]
H.2	**If yes**

Travel period	Date of travel	Dzongkhag	Village/Chiwog /Thromde	Date of return	Specify preventive measures taken, if any(Chemo prophylaxis, Mosquito net, repellents, protective clothing, etc)
Past 2 weeks					
Past 6 months					
Past 12 months					

I	**Travel contacts**
	Lists of co-travellers (People who travelled and returned with the patient from malaria risk areas)

Name	Address	Phone No.

J	**Travel history to outside country**
J.1	Does the patient have travel history to outside Bhutan? Yes [ ] No [ ]
	If yes

Travel period	Travel date	Country	Name of places visited	Date of return	Specify preventive measures taken, if any

J.2						Chemo prophylaxis, Mosquito net, repellents, protective clothing, etc.
	Past 2 weeks					
	Past 6 months					
	Past 12 months					

K	**Travel contact**		
	People travelled to the malaria endemic country and returned with the patient:		
	Name	Address	Phone number

L	Had the patient travelled in between the onset of symptom and diagnosis? Yes [ ] No [ ]		
	If yes, places visited:…….. **……**		
M	**Immediate investigation in the index household**		
M.1	Total members in the index household:	M.2	Total members screened:
M.3	Total members positive:	M.4	No. of sleeping places:
M.5	No. of LLINs displayed:	M.6	Age of LLINs:
M.7	No. of household members who slept under a net the previous night:		
M.8	No.of household members who had fever in the past one month:		
M.9	No. of household members who had malaria in the past three months:		
N	**Type of the index household**		
N.1	Mud plastered [ ] Cement plastered [ ] wood [ ] Bamboo [ ] Others, specify:		

N.2	Indoor *Anopheline* density:	N.3	IRS done in the past 6 months? Yes [ ] No [ ]

O	Types of breeding sites found around the index house:		
	Breeding type	**Anopheline species**	**Geo-coordinates**

P	**Case classification**
P.1	**The case is classified as:** Indigenous [ ] Introduced [ ] Imported [ ] Induced [ ] Relapsing [ ] Recrudescent [ ]
P.2	What evidence was used to classify this case?
P.3	Does the current case classification require focus investigation? (State reason)
P.4	**Treatment outcome** :**Cured [ ] / Died [ ]**
	Case investigated by:

	Name	**Designation**	**Date**	**Signature**

INTEGRATED DRUG EFFICACY SURVEILLANCE FORM
MINISTRY OF HEALTH
VECTOR BORNE DISEASE CONTROL PROGRAMME

Name of health center: ..…… Dzongkhag:…… BTC No: ……
Unique code:……..
Name of patient:……Age/sex…… Pregnant: Yes [ ] No [ ]
Nationality:…… Occupation: ……..…… Mobile/Telephone No:…….

Due dates	D0 …../...../…	D1 …./..../…	D2 …../…./…	D14 .../..../…	D28 ../..../…	3 months ../..../…	1 year ..…/…./..	Remarks
Actual visit date								
Temperature (ºC)								
Species Pf (+ve/-ve)				Not required		Not required		
Parasite count								
DOT treatment-Pf	ACT+PQ *	ACT	ACT					
	Yes / No	Yes / No	Yes / No					
Species *Pv*(+ve/-ve)								
Parasite count								
*DOT treatment-Pv	CQ+PQ	CQ+PQ	CQ+PQ	PQ				
	Yes / No	Yes / No	Yes / No	Yes / No				
Vomiting within 30 mins of drug intake	Yes / No	Yes / No	Yes / No					
Other drugs (Specify)								
Follow-up visits by:								
**DBS taken or not?	Yes / No							

****Note: DBS should be taken before initiation of treatment**
***PQ DOT Day3 to 13 to be reported in separate DOT form by DOT provider.**

Name & Signature
In-charge of Laboratory unit

Name & signature of CMO

DIRECTLY OBSERVED TREATMENT (DOT) FORM
MINISTRY OF HEALTH
VECTOR BORNE DISEASE CONTROL PROGRAMME

A	**Details of the Patient**		
A.1	Name:	**A.2**	Age/sex
A.3	Village:	**A.4**	Chiwog:
A.5	Gewog:	**A.6**	Dzongkhag:
A.7	Contact Number:		
B	**Details of treating health center**		
B.1	Name of health center :	**B.2**	Dzongkhag:
B.3	Phone number:		
B.4	Three Days Admission: Completed [ ] Not completed [ ]		
B.5	Primaquine as per the age of patient handed to DOT provider: Yes [ ] No [ ]		

C	**DOT Provider details and proof of DOT**				
C.1	**Days**	**Date of DOT**	**Time for DOT**	**Signature of DOT Provider**	**Monitoring**
	Day 3				Verified by Malaria Technician / Lab Technician By Name & Signature Date……..
	Day 4				
	Day 5				
	Day 6				
	Day 7				
	Day 8				
	Day 9				
	Day 10				
	Day 11				
	Day 12				
	Day 13				

C.2	Name of DOT provider:	C.3	Village/School/Town/Residence:
C.4	Contact Number:	C.5	Gewog:
C.6	Chiwog:	C.7	Dzongkhag:

We have successfully completed DOT with primaquine as advised by the clinician without dark colored urine, pallor, fatigue shortness of breath and jaundice.

DOT Provider's signature Signature of In-charge/CMO/MS

Note: The laboratory technician who has followed up the patient should submit a copy of this filled up form to VDCP and keep a copy in the laboratory.

MALARIA POSITIVE VERIFICATION FORM
MINISTRY OF HEALTH
VECTOR BORNE DISEASE CONTROL PROGRAMME

Report on Verification of positive case by Level I or II Technicians			
A	Patient Information		
A.1	**Name of health center:**	**A.2**	**Dzongkhag:**
A.3	**Name of patient:**	**A.4**	**Age/sex:**
A.5	**BTC No:**	**A.6**	**Date of Diagnosis:**
B	**Diagnostic test & Result:**		

B.1	**Method of Diagnosis**	**P.f**		**P.v**		**Mixed**	**WBC**	**Parasite**	**Others**
		Stage	Negative	Stage	Negative	Stage			
	Microscopy								

B.2	Parasite count:……../µl of blood

Name: Designation: Date: Signature

MALARIA FOCUS INVESTIGATION
MINISTRY OF HEALTH
VECTOR BORNE DISEASE CONTROL PROGRAMME

A	**Focus investigation**		
A.1	Date of Focus Investigation:	A.2	Unique code:
A.3	Name of index case:	A.4	BTC No:

B	**Focus details**		
B.1	Name of the village:	B.2	Chiwog/Demkhong:
B.3	Gewog/Thromdey:	B.4	Dzongkhag:
B.5	Total households in the focus:	B.6	Total Population in the focus:
B.7	GPS coordinates (8 digits) index case: Latitude:…….. Longitude: ……..... Altitude:……..... Accuracy::……		

C	**Previous focus classification**
C.1	Date of previous classification:
C.2	Previous classification: Active [ ] Residual non-active [ ] Cleared [ ] Non-receptive [ ]

D	**Accessibility and Connectivity**		
D.1	Name of the nearest health facility:		
D.2	Distance of the village from the nearest health facility (KM):		
D.3	Road connectivity: Yes [ ] No [ ]	D.4	Electricity: Yes [ ] No [ ]

E	**Vector control**		
E.1	Routine IRS done in the village: Yes [ ] No [ ]		
E.2	If yes, when was the last IRS done:		
E.3	Name of the insecticide used:	E.4	LLINs distributed? Yes [ ] No [ ]
E.5	If yes, when was the last mass LLINs distributed:		

F	**Environmental assessment**
F.1	Focus type: Rural [ ] Urban [ ] Peri-urban [ ] Forest [ ]

F.2	Type of settlement: Clustered[ ] Scattered [ ]		
F.3	Is there any construction or developmental activities undergoing in the focus: Yes [ ] No [ ]. If yes, please list.		
F.4	Major farming activities during the focus investigation? (Please list out)		
F.5	Are there migrant workers presently staying in the focus: Yes [ ] No [ ]		
F.6	Were there migrant workers in the focus during the past 1month: Yes [ ] No [ ]		
F.7	Is the village located close to international border? Yes[ ] No [ ]		
F.8	If yes, name of the neighboring town/village:		
F.9	Distance of the international bordering town/village from the index village:		
G	**Parasitological assessment**		
G.1	Does cross-border population movement occur in the village: Yes [ ] No [ ]		
G.2	Has there been any public/community gathering(s) or major events in the focus within past 1 month?(if yes, please list out)		
G.3	No. of people with fever in the village:		
G.4	Total nationals(N1) screened:	G.5	Total no. of migrant workers:
G.6	Total migrant workers screened:	G.7	Total positive:
H	**Entomological assessment**		
H.1	Prevalence of Anopheline Mosquitoes: Yes [ ] No [ ]	H.2	If yes, type of species:
			Suspected vector:
			Justification:
H.3	Type of breeding site and species breeding within 500m radius of the Chiwog: *Ex. Stagnant pool, stream margins..*		

	Breeding Type	Anopheline Species	Latitude	Longitude

I	**Focus classification after investigation**		
	Active [ ] Non active residual [ ] cleared [ ]		
J	**Focus response**		
J.1	IRS done: Yes [ ] No [ ]	J.2	If yes, total number of household sprayed:
J.3	Name of insecticide used:		
J.4	LLINs distributed? Yes [ ] No [ ]	J.5	If yes, total number of LLINs distributed:
J.6	Any larvicides applied? Yes [ ] No [ ]	J.7	What larvicide was used?
J.8	Any larval source reduction activities done? Yes [ ] No [ ]		
J.9	IEC/BCC done? Yes [ ] No [ ]	J.10	Focus follow up required? Yes [ ] No [ ]
Any other significant findings and observations:			
*Attach GIS map of focus with spatial distribution of cases, breeding sites, households.			

Sl.no	Name	Designation	Signature

C	**Accessibility and connectivity**:		
C.1	Name of the nearest health facility:	C.2	Distance of the village from the nearest health facility (KM):
C.3	Road connectivity: Yes [ ] No [ ]	C.4	Electricity: Yes [ ] No [ ]
D	**Vector control:**		
D.1	Routine IRS done in the village: Yes [ ] No [ ] (*If no, Go to D.5*)		
D.2	When was the last IRS done:	D.3	Name of the insecticide used:
D.4	Household IRS coverage (Percent):	D.5	LLINs distributed? Yes [ ] No [ ]
D.6	If yes, when was the last mass LLINs distributed:	D.7	Percent household with at least one LLINs:
D.8	% population protected by LLINs (based on the national guideline)		
E	**Environmental assessment:**		
E.1	Focus type: Rural [ ] Urban [ ]	E.2	Type of settlement: Clustered[ ] Scattered [ ]
E.3	Types of Houses (Numbers) Mud: …….. Cement brick: …….. Wood: …….. Stone and Mud: …….. Bamboo: ……. Others: …….		
E.4	Is there any construction or developmental activities undergoing in the focus: Yes [ ] No [ ]. If yes, please list.		
E.5	Major farming activities during the focus investigation? (Please list out)		
E.6	Are there migrant workers presently staying in the focus: Yes [ ] No [ ].		
E.7	Were there migrant workers in the focus during the past 1month: Yes [ ] No [ ].		
E.8	Is the village located close to international border? Yes[ ] No [ ]	E.9	If located close to international border, name of the neighboring town/village:

E.10	Distance of the international bordering town/village from the index village:			
F	**Parasitological assessment:**			
F.1	Does cross-border population movement occur in the village: Yes [ ] No [ ]			
F.2	Has there been any public/community gathering(s) or major events in the focus within past 1 month?(if yes, please list out)			
F.3	No. of people with fever in the village:	F.4	Total nationals(N1) screened:	
F.5	Total no. of migrant workers:	F.6	Total migrant workers screened:	
F.7	Percent population screened:	F.8	Total positive:	
G	**Entomological assessment:**			
G.1	Prevalence of Anopheline Mosquitoes: Yes [ ] No [ ]	G.2	If yes, type of species:	
			Suspected vector:	
			Justification:	
G.3	Type of breeding site and species breeding within 500m radius of the Chiwog: *Ex. Stagnant pool, stream margins..*			
	Breeding Type	Anopheline Species	Latitude	Longitude
H	**Focus classification after investigation**			
	Active [ ] Non active residual [ ] cleared [ ]			

I	**Focus response**		
I.1	IRS done: Yes [ ] No [ ]	I.2	If yes, total number of household sprayed:
I.3	Name of insecticide used:	I.4	LLINs distributed? Yes [ ] No [ ]
I.5	If yes, total number of LLINs distributed:		
I.6	Any larvicides applied? Yes [ ] No [ ]	I.7	What larvicide was used?
I.8	Any larval source reduction activities done? Yes [ ] No [ ]		
I.9	IEC/BCC done? Yes [ ] No [ ]	I.10	Focus follow up required? Yes [ ] No [ ]
I.11	Any other significant findings and observations:		
*Attach GIS map of focus with spatial distribution of cases, breeding sites, households.			

Sl.No	**Name of investigation Team:**	Designation	Signature

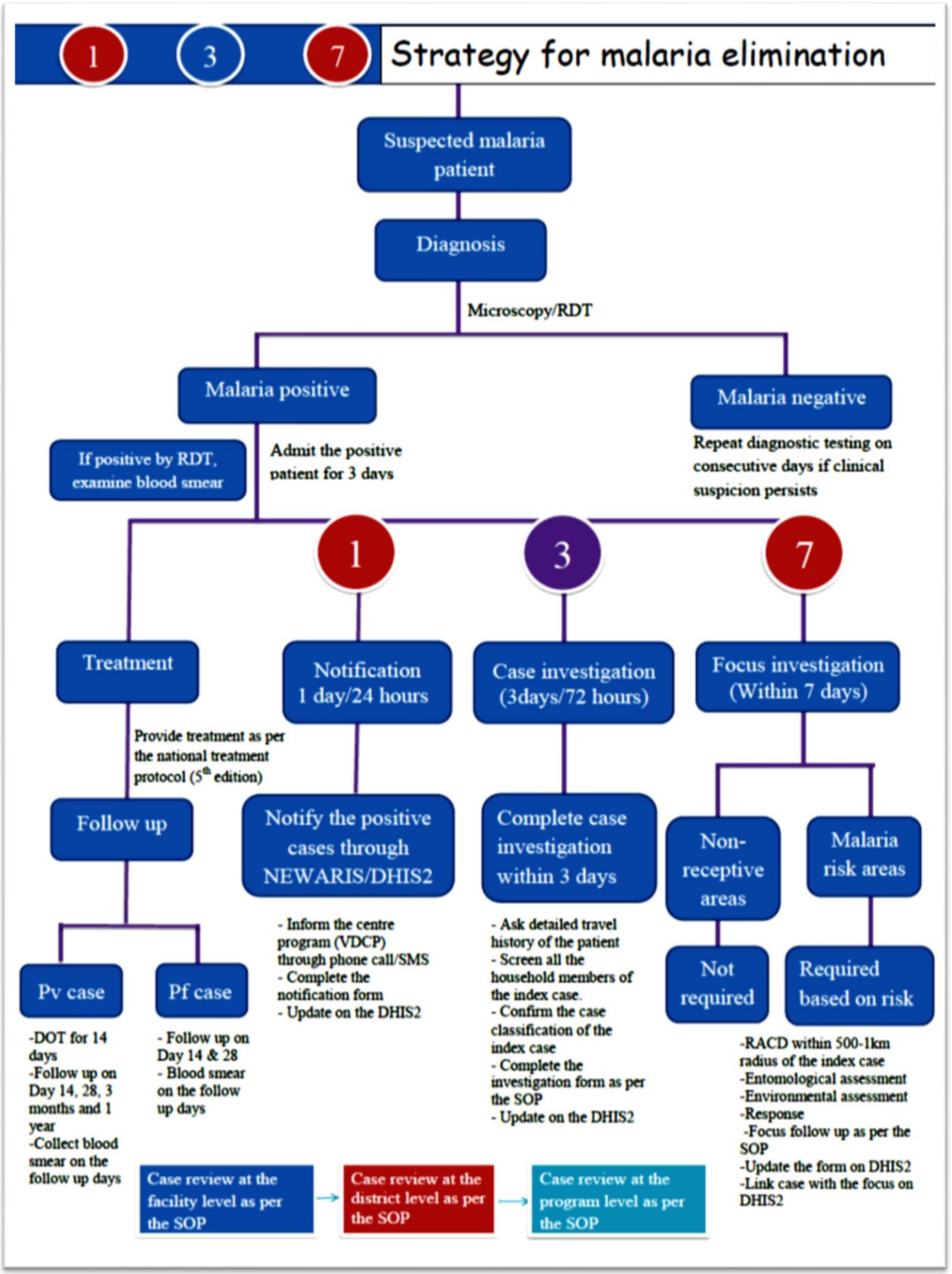
REACTIVE CASE DETECTION (RACD) FORM
MINISTRY OF HEALTH
VECTOR BORNE DISEASE CONTROL PROGRAMME

A	**Foci Information**		
A.1	Name of Focus:	A.2	Dzongkhag:
A.3	Name of Index case:	A.4	Total No. of House hold in the focus (0.5 km radius):
A.5	Total population in focus:	A.6	Total population screened:
A.7	Total positive:		

B	**REACTIVE CASE DETECTION (RACD) Details**					
Sl. No	**Date**	**Name**	**Age & Sex**	**Address**	**Result**	**Remarks (fever history, past malaria, etc.)**

FOCUS FOLLOW-UP FORM
MINISTRY OF HEALTH
VECTOR BORNE DISEASE CONTROL PROGRAMME

A	Focus Information				
A.1	Name of Focus:		A.2	Dzongkhag:	
A.3	Name of Index case:				
B	**Focus follow up action**				
B.1	Date of focus follow up:				
B.2	No.of people with fever:	**B.3**	No. of people screened:	**B.4**	Total positive:
Any other findings and requirement of additional interventions:					
Focus follow up done by:		Date:		Signature:	


1 3 7
Strategy for malaria elimination
Suspected malaria patient
Diagnosis
Microscopy/RDT
Malaria positive
Malaria negative
If positive by RDT, examine blood smear
Admit the positive patient for 3 days
Repeat diagnostic testing on consecutive days if clinical suspicion persists
1
3
7
Treatment
Notification 1 day/24 hours
Case investigation (3days/72 hours)
Focus investigation (Within 7 days)
Provide treatment as per the national treatment protocol (5th edition)
Follow up
Notify the positive cases through NEWARIS/DHIS2
Complete case investigation within 3 days
Non-receptive areas
Malaria risk areas
Pv case
Pf case
Not required
Required based on risk
- Inform the centre program (VDCP) through phone call/SMS
- Complete the notification form
- Update on the DHIS2
- Ask detailed travel history of the patient
- Screen all the household members of the index case.
- Confirm the case classification of the index case
- Complete the investigation form as per the SOP
- Update on the DHIS2
-DOT for 14 days
-Follow up on Day 14, 28, 3 months and 1 year
-Collect blood smear on the follow up days
- Follow up on Day 14 & 28
- Blood smear on the follow up days
-RACD within 500-1km radius of the index case
-Entomological assessment
-Environmental assessment
-Response
-Focus follow up as per the SOP
-Update the form on DHIS2
-Link case with the focus on DHIS2
Case review at the facility level as per the SOP
Case review at the district level as per the SOP
Case review at the program level as per the SOP