A Malaria Elimination Guide to Targeted Surveillance and Response in High-Risk Populations

Module 1: Planning Targeted HRP Surveillance and Response

The Malaria Elimination Initiative

The Malaria Elimination Initiative is an initiative of the UCSF Institute for Global Health Sciences.

shrinkingthemalariamap.org
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<th>Description</th>
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<tr>
<td><strong>Active case detection (ACD)</strong></td>
<td>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 (ACD) can consist of screening for fever followed by testing of all febrile patients or as testing of the target population without prior screening for fever.</td>
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<tr>
<td><strong>Case, index</strong></td>
<td>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.</td>
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<tr>
<td><strong>Case, locally acquired</strong></td>
<td>A case acquired locally by mosquito-borne transmission. Note: Locally acquired cases can be indigenous, introduced, relapsing or recrudescent; the term “autochthonous” is not commonly used.</td>
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<tr>
<td><strong>Case, imported</strong></td>
<td>Malaria case in which the infection was acquired outside the area in which it is diagnosed. The origin of imported cases can be traced to a known malarious area outside of the area to which the case has travelled.</td>
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<tr>
<td><strong>Case investigation</strong></td>
<td>Collection of information to allow classification of a malaria case by origin of infection, i.e. imported, indigenous, induced, introduced, relapsing or recrudescent.</td>
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<tr>
<td><strong>Case notification</strong></td>
<td>Compulsory reporting of all malaria cases by health units and health care providers to either the health department or the malaria control program, as prescribed by national laws or regulations.</td>
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<tr>
<td><strong>Catchment area</strong></td>
<td>A geographical area defined and served by a health programme or institution, such as a hospital or community health centre, which is delineated on the basis of population distribution, natural boundaries and accessibility by transport.</td>
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<tr>
<td><strong>Chemoprophylaxis</strong></td>
<td>Administration of a medicine, at predefined intervals, to prevent either the development of an infection or progression of an infection to manifest disease. Examples include seasonal malaria chemoprevention (SMC), Intermittent Preventative Treatment in pregnancy (IPTp), and Intermittent Preventative Treatment in infants (IPTi).</td>
</tr>
<tr>
<td><strong>Confirmed malaria case</strong></td>
<td>Malaria case (or infection) in which the parasite has been detected in a diagnostic test, i.e. microscopy, a rapid diagnostic test or a molecular diagnostic test.</td>
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<tr>
<td><strong>Focus group (FG)</strong></td>
<td>A group of people who participate in a facilitated discussion intended to elicit in-depth information for qualitative research in a specific population.</td>
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<td><strong>HBMM</strong></td>
<td>Health, Border and Mobility Management</td>
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<td><strong>HMIS</strong></td>
<td>Health Management Information System</td>
</tr>
<tr>
<td><strong>High-risk population (HRP)</strong></td>
<td>Groups of people who share socio-demographic, geographic and/or behavioral characteristics that place them at higher risk of infection, such as low utilization of health services and interventions, or behaviors associated with increased exposure to Anopheles mosquitoes, the vector of malaria parasites.</td>
</tr>
<tr>
<td><strong>Importation rate</strong></td>
<td>Rate of influx of parasites via infected individuals or infected <em>Anopheles</em> spp. mosquitoes. Note “Infected individuals” includes residents infected while visiting endemic areas as well as infected immigrants.</td>
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<tr>
<td><strong>Incidence, malaria</strong></td>
<td>Number of newly diagnosed malaria cases during a defined period in a specified population.</td>
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<tr>
<td><strong>Key Informant, Key Informant Interview (KII)</strong></td>
<td>A key informant is someone selected for an in-depth interview because of their perceived knowledge, lived experience or expertise around a particular subject (i.e. local high-risk populations).</td>
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<tr>
<td><strong>MMP</strong></td>
<td>Mobile and migrant population: Persons who move from one area to another (whether internally or across international borders) for short period of time (mobile) or in changing their permanent residence (migrant). Defining time periods for this movement vary, but mobile populations are often defined as those that move within the last 6 months and migrant populations as those that have moved in the past 6-12 months.</td>
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<tr>
<td><strong>NMCP, NMEP</strong></td>
<td>National Malaria Control Program, National Malaria Elimination Program</td>
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<tr>
<td><strong>Passive Case Detection (PCD)</strong></td>
<td>Detection of malaria cases among patients who, on their own initiative, visit health services for diagnosis and treatment, usually for a febrile illness.</td>
</tr>
<tr>
<td><strong>Qualitative data</strong></td>
<td>Descriptive data that typically describes the attributes of properties of an object or subject and is not numerical in nature. This may include information from interviews, direct observation or written documents.</td>
</tr>
<tr>
<td><strong>Reactive case detection (RACD)</strong></td>
<td>A form of active case detection (ACD): screening and testing provided to a subset of a population in a given area in response to the detection of an infected person (i.e. the index case). Traditionally carried out among index case household members and households within a given radius.</td>
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<tr>
<td><strong>RDT</strong></td>
<td>Rapid diagnostic test</td>
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<tr>
<td><strong>Slide positivity rate (SPR)</strong></td>
<td>Proportion of blood smears found to be positive for <em>Plasmodium</em> among total blood smears examined.</td>
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<tr>
<td><strong>Suspected malaria case</strong></td>
<td>Illness suspected by a health worker to be due to malaria, generally on the basis of the presence of fever with or without other symptoms.</td>
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<tr>
<td><strong>TLS</strong></td>
<td>Time location sampling</td>
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Definitions were produced from UCSF Malaria Elimination Initiative with reference to WHO terminology.
Overview of the HRP Guide

The High-Risk Population (HRP) Guide provides a set of approaches for NMCPs and NMEPs to:

- Review transmission patterns and surveillance gaps
- Gather detailed epidemiological evidence on risk factors and behaviors of populations likely at high-risk for malaria
- Adapt surveillance activities
- Track epidemiological trends in HRPs
- Improve targeting of interventions

The HRP Guide contains four modules that, when used in sequence, aim to incorporate evidence, tracking, and targeting of HRPs in broader surveillance and response strategies.

**Module 1:** Planning Targeted HRP Surveillance and Response

**Module 2:** Identifying Risk Factors Using Case-control Studies

**Module 3:** Monitoring Malaria Transmission and Intervention Coverage

**Module 4:** Adapting Reactive Case Detection

This guide is designed to be used by National Malaria Program Managers, Monitoring and Evaluation officers, and their implementing partners, including non-governmental organizations, and researchers in countries with low malaria transmission. For more details on the broader HRP Guide, read *A Malaria Elimination Guide to Targeted Surveillance and Response in High-Risk Populations: Introduction.*
Overview of Module 1: Planning Targeted HRP Surveillance and Response

Module 1 guides the step-by-step implementation of a formative review to gather, update, review, and analyze current knowledge of HRPs. It provides guidance in analyzing existing case data and qualitatively assessing characteristics and risk behaviors, and organizing systems of potential or known HRPs such as travel and work patterns (seasonality, occupation, transit), social network connectivity and other factors that will help to optimize implementation of Modules 2–4.

This formative assessment includes three components:

1. Steps to undertake a systematic analysis of existing data to determine available evidence on HRPs
2. Qualitative data collection tools to plan effective studies or interventions in suspected or known HRPs
3. Steps to map and enumerate potential venues for time-location sampling (Module 3) and active and reactive case detection (Module 4)

Figure 1: Generating and using evidence: steps in the surveillance cycle for targeting HRPs
We recommend that all steps in this module are carried out to help plan targeted surveillance and response. This activity should require no more than 2–3 months to implement, depending on the format of existing data.

Module 1 consists of operational guidelines, example protocols and thematic guides for data collection tools to help programs and partners design, implement, and interpret the activities.

**How to Use Module 1**

The Module 1 guide is intended to provide step-by-step operational guidance (i.e., standard operating procedures, or SOPs) for project staff during the design and implementation of a formative assessment of malaria. If you would like to print or adapt this guide, a word document version is available upon request. Please contact mei.ucsf.edu.

This guide presents practical guidance for conducting a formative review of high-risk populations by following a seven-step process:

- **Step 1:** Review the objectives of the formative assessment
- **Step 2:** Develop and adapt the protocol
- **Step 3:** Develop and adapt the data collection instruments
- **Step 4:** Implement component 1 (Review existing data and information systems)
- **Step 5:** Implement component 2 (Rapid qualitative data collection)
- **Step 6:** Implement component 3 (Mapping access points)
- **Step 7:** Analyze and use the data

**Other Helpful Tips**

- Review this guide during staff training to ensure understanding of roles and responsibilities.
- It is helpful for each staff member to carry a copy of this guide with them while in the field.
- Any procedural changes should be documented in writing and attached to this guide.
- Regular practice sessions and refresher courses help maintain quality of data.
- The field staff should be regularly given the opportunity to request clarifications about the implementation of this guide.
Introduction to the HRP Formative Assessment

What is a Formative Assessment of Malaria HRPs?

A formative assessment of malaria high-risk populations (HRPs) is a process by which different approaches are used to collect information to summarize what is known, believed and done in relation to populations at high-risk of malaria. This assessment is intended to provide information to national malaria control and elimination programs (NMCPs and NMEPs) rapidly in order to modify and guide existing and future surveillance strategies and interventions that target suspected or known HRPs.

In this module, we will provide guidance for three formative assessment components:

1. **The systematic review of existing surveillance data** to determine evidence on HRPs
2. **Qualitative data collection** to plan interventions for suspected or known HRPs
3. **Mapping and enumeration** of potential venues and transit points for time-location sampling (TLS, described in detail in Module 3) and/or to assess potential access points for NMCPs wishing to set up routine surveillance and provide targeted interventions to HRPs

Tools to be used in the formative assessment will include:

- **Review of existing data and information systems**: A desk review of available literature (e.g., manuscripts, reports and compiled data) and active and passive surveillance data routinely collected by a malaria control or elimination program. This will consist of a review of data repositories and information systems used to collect and house these data, and can also require data collection through a registry review. Include a review of associated data where available, including data on forestry, agriculture, labor, migration and climate, as they may explain certain patterns of transmission.

- **Key informant interviews (KIIs)**: These are in-depth interviews of individuals who are selected for participation based on their expert knowledge and experience working with the target populations. The interviews are comprised of open-ended questions around certain themes and typically last between 1–2 hours.

- **Focus groups (FGs)**: These are semi-structured interviews conducted with several individuals at a time, under the direction of a moderator (Kreuger and Casey 2000). FGs can provide information quickly from a particular group. This may be the target population (i.e., cross-border travelers or night-time security guards) or others in the community who may provide useful insight (i.e., community health workers or local surveillance officers). One example of this is through participatory rapid appraisal, where teams work together with potential high-risk communities to map out risks, behaviors, and needs. In addition to being planned in advance to inform specific aims, FGs can also be used flexibly to explore issues that were raised by key informants or were observed by staff in the field.

- **Venue and mobility mapping**: Mapping all venues in locations or areas where members of suspected or known HRPs congregate or spend time or transit through. This provides physical maps and listings of venues where members of the population can be accessed for venue-based surveillance and response, such as TLS surveys (Module 3) and venue-based interventions.

- **Enumeration**: Enumeration of HRPs is the process of systematically observing and counting the number of HRP members present during high-attendance times at venue or transit locations (i.e., using a clicker or other counting device). This provides information on how many HRP members could potentially be accessed at each venue and is a necessary step toward planning TLS surveys.

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Figure 2. Components of the formative assessment of malaria in high-risk populations

**Component 1: Review existing data**

<table>
<thead>
<tr>
<th>Activity/Data source</th>
<th>Desk Review</th>
<th>Outputs</th>
</tr>
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<tbody>
<tr>
<td>Data Sources</td>
<td></td>
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<tr>
<td>Reports</td>
<td>Publications</td>
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<td>Academic researchers</td>
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<td>Registries</td>
<td>HMIS</td>
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<tr>
<td>Case investigation</td>
<td>Proactive screening</td>
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</tbody>
</table>

- **Empirical evidence to help identify HRPs (age, gender, occupation, geographical area, etc.)**
- Profiles of case characteristics
- Fine resolution incidence maps
- Existing evidence to help identify HRPs (travel history, occupation, and potentially exposure history)

When reviewing the existing data, identify any data gaps or missing variables. Note data quality and the frequency and location in which data are reported (i.e. health facility or during investigation).

**Component 2: Rapid qualitative data collection**

<table>
<thead>
<tr>
<th>Activity/Data source</th>
<th>Focus group discussions</th>
<th>Key informant interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outputs</td>
<td></td>
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</tbody>
</table>
- Suspected or known characteristics of HRPs, including: travel patterns, malaria knowledge/prevention, connectivity and ways to access

**Component 3: Mapping access points**

<table>
<thead>
<tr>
<th>Activity/Data source</th>
<th>Venue mapping</th>
<th>Enumeration</th>
</tr>
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<tbody>
<tr>
<td>Outputs</td>
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</table>
- Locations and times at which HRP are present
- Operational information for carrying out time-location sampling (Module 3) or targeting interventions
**Why Conduct a Formative Assessment?**

A formative assessment is a critical first step in planning for effective malaria surveillance and response amongst HRPs and should be carried out relatively quickly (maximum of 2–3 months). The WHO Surveillance, Monitoring, and Evaluation Manual provides an overview for routinely assessing surveillance systems for accuracy, reliability, completeness, precision, timeliness and integrity. Assembling and assessing available evidence on HRPs is a critical component, especially in low transmission settings. Evidence on the size, type and location of HRPs, known risk factors, organizations working with HRPs, and security and other operational factors related to HRPs should all be collected when possible to inform surveillance approaches.

Regular review of existing surveillance data provides a starting point to update evidence on changing transmission patterns, suspected or known HRP groups, and determine potential gaps in surveillance and information systems.

Qualitative data collection is used to draw on the unique knowledge held by members of HRPs and key community informants based on their perspectives and lived experience, as well as direct observation by formative phase staff.

**Who Should Conduct a Formative Assessment?**

A formative assessment can be carried out by an NMCP/NMEP or partner, with technical support from external experts with specialized skills as needed. Tasks such as planning, budgeting and writing the protocol can be accomplished by project staff who are familiar with the context and epidemiology. However, national program staff are often too busy to undertake many aspects of these activities and can benefit greatly from collaborating with technical partners with expertise in malaria elimination and social/qualitative research methods. Whether partners are involved at the inception of the survey or at key points in the process, such as training or data analysis, it is important that they are familiar with the design of the activities and data limitations.

Whether an NMCP/NMEP or partner conducts the formative assessment, it is important to engage target community leaders before the assessment begins. Hold community meetings or other forms of participatory appraisal with the populations of interest, so that they are engaged and supportive of the process and have the opportunity to contribute their knowledge and expertise.

**How can the Formative Assessment address MMPs?**

Mobile and migrant populations (MMPs) are persons who move from one area to another (whether internally or across international borders) for short periods of time (mobile) or in changing their permanent residence (migrant). Defining time periods for this movement vary, but mobile populations are often defined as those that move within the last 6 months and migrant populations as those that have moved in the past 6-12 months. MMPs are specific HRPs that can contribute to the movement of parasites between higher and lower transmission areas and challenge malaria elimination efforts. MMPs may be less likely to access or use health services, so that infections may be missed by surveillance systems at their points of origin or destination. The tremendous diversity among MMPs requires a detailed understanding in order to mount an effective health-sector response.

The formative assessment activities described in this module are an important first step: they help to determine precisely which MMP subgroups may be at risk for malaria, where and how they become exposed, where and how to effectively intervene and...
how to incorporate highest-risk MMPs into surveillance and monitoring systems.

This formative assessment approach aligns with the International Organization for Migration’s Health, Border and Mobility Management (HBMM) framework, specifically HBMM activities 1 (needs assessment and data collection) and 3 (data analysis and risk mapping). Although primarily designed for rapidly expanding outbreaks, the HBMM framework on mobility and threats along the mobility continuum provides a useful complement to this toolkit. Also, see the HBMM framework for guidance on how to incorporate mobility information into the formal surveillance system.

In addition to this guide, two World Health Organization reports provide valuable insights and guidance based on work with MMPs in the context of malaria in the Greater Mekong Region.  


6 World Health Organization. Decision-tree framework for selecting study methods for malaria interventions in mobile and migration populations. 2015.
Step 1. Review the Objectives of Formative Assessment

The overall objective of the formative assessment is to inform effective planning and implementation of malaria surveillance and response strategies in HRPs. Findings from the review of existing data can help to narrow the focus of qualitative data collection (in terms of geography, target populations and scope) as well as inform future studies or piloting of novel surveillance and response strategies.

**Purpose of the Formative Assessment**

The overarching purpose of the formative assessment is to help malaria programs to develop and improve information on transmission patterns and potential HRPs, livelihood behaviors and risk practices, use of prevention, health-seeking and availability of healthcare and venue attendance patterns. This information will inform future studies or proposed intervention designs, define high-risk inclusion criteria and important factors to measure in HRPs, and fine-tune questionnaire wording.

As structured in this module, the formative assessment has three components. This flexible structure acknowledges that programs are at different stages of knowledge and experience about HRPs and allows for more targeted program-specific use cases. For example, programs in southern Africa may want to use this approach to learn more about cross-border travelers, while programs in other settings may be more focused on learning about forest-goers. Depending on the experience and needs of the malaria program, only one or two of the components may need to be used by a given program. However, it is recommended that programs consider all three components, in order to update their understanding of HRPs and potentially challenge long-held assumptions.

**Component 1: Reviewing existing data**

Review existing data to define spatio-temporal and sociodemographic patterns of malaria risk, as well as written or other quantitative information pertaining to suspected or known HRPs.

Specific objectives for the **review of existing data** include:

1. To define spatial and temporal malaria transmission patterns within the area of interest
2. To review case profiles from regularly collected surveillance data, including sociodemographic, occupational, travel characteristics
3. To identify potential gaps in information collected through the surveillance system
4. To review other contextual data such as from forestry, agriculture, labor, migration, climate, etc, for understanding the organizing systems of populations and influences upon them
5. To collate evidence from published and unpublished manuscripts and NMCP reports in order to identify suspected or known HRPs

Based on the findings from the review of existing data, develop specific objectives for the FGs and KIIs. Below, we provide sample objectives for FGs, KIIs, and venue mapping and enumeration.

**Component 2: Rapid qualitative data collection**

Conduct rapid qualitative data collection with suspected or known HRPs and individuals who interact with them through focus groups and key informant interviews, to inform planning for future studies or active surveillance strategies.

Specific objectives for **focus groups and key informant interviews include**:

1. To describe the context of malaria risk amongst the general population and potential HRPs (such as some MMPs), as well as any important subgroups that may require special procedures to access or survey
2. To identify surveillance gaps (due to low treatment seeking or access) and gaps in malaria prevention strategies in specific HRPs
3. To understand perceptions around malaria health services, and factors that act as barriers/opportunities for treatment seeking and case detection in HRPs
4. To provide operational and logistical information how best to access and deliver surveillance and response to specific HRPs; and to anticipate the likely community response to targeted malaria elimination efforts
Component 3: Mapping access points
Conduct venue identification and mapping in preparation for Module 3 (TLS sampling frame) or for implementation of active surveillance strategies aimed at specific HRPs.

Specific objectives for venue mapping and enumeration include:

1. To develop an exhaustive list of all venues where specific HRPs may be found, including transit points, at each of the potential survey or intervention sites
2. To determine days and times when specific HRPs are likely to be present at each venue in sufficient number to warrant recruitment for monitoring activities
3. To provide information on where and when surveillance and response interventions may optimally reach specific HRPs

Adapting Formative Objectives
First review the objectives stated above and confirm whether they are realistic, focused and relevant to the data that are available and top priorities for the malaria program and research activities. The objectives above are easily adapted to conform to whichever HRPs are suspected or known to be important in maintaining local transmission, and particularly those who may benefit from more targeted or alternative surveillance and response strategies (i.e., students studying outside at night, cross-border travelers, security guards, fisherman, etc.). Where high quality data on HRPs already exists and resources/timelines are limited, objectives may focus on operational and logistical data collection. In some contexts, evidence to identify potential HRPs may be weak. In these circumstances, it may be preferable to adapt the aims of Component 2 to explore activities and populations that community members and key informants perceive to be at higher risk of malaria.

The formative objectives should reflect a clear focus on the main goal of programmatic and operational research objectives. Often, you will have several objectives in mind for the focus groups and key informant interviews, such as understanding perceptions of existing health care facilities and barriers to their use, while at the same time collecting information on how best to access and deliver surveillance and response to suspected or known high-risk populations. If your qualitative data collection has multiple purposes, decide which purposes are your highest priorities and make compromises in accordance with these principles and available resources for the activity.

If you are trying to compare this assessment with other knowledge, attitude and practice surveys (KAP) or malaria surveys/program activities, ensure that you use similar definitions and be clear about how your population is similar to or different from other populations that have been evaluated.

Contextualizing HRPs
In all contexts, some populations are at higher risk for malaria than others. The behaviors of certain populations may put them at greater risk for malaria due to increased exposure to the vector, and these groups can be defined and contextualized in a variety of ways, such as by occupation, sociodemographic group, or larger organizing system. When determining key research questions and gathering evidence about the HRPs in your locality, consider which defining approach will be most conducive for surveillance and response. Populations that can be classified by organizing system include those that can be defined by lifestyle or behavioral characteristics from a top-down perspective; for example, small scale commerce, nomadic agriculture, or the mining industry are all organizing systems under which populations may share similar characteristics that put them at greater risk for malaria. These broader systems can be used to determine possible access points and interventions. Alternatively, populations may be defined more granularly by the specific occupations, behaviors and/or locations most associated with malaria risk, and any other locations where they congregate. Appropriately defining and contextualizing HRPs is essential to optimizing access and improving surveillance.
Step 2: Adapt the Formative Assessment Protocol

Once you have reviewed and made any necessary changes to the objectives of the formative assessment, develop a protocol to guide implementation and record the goals, objectives, participants and methods that will be used. A sample protocol for the formative assessment has been included with this module, to provide a “blueprint” that can be reviewed and adapted for your specific context.

This protocol should clearly and concisely explain the purpose of the formative assessment. The protocol is an essential document that provides structure and organization for the formative assessment and acts as an internal working document, and may be submitted to a local institutional ethics review board if required in your context. Full ethics review is often not required for analysis of existing routine surveillance data alone but may be required for qualitative data collection, and can be included in the protocol for documentation purposes.

Review the Contents of the Formative Assessment Protocol

At a minimum, the protocol and supporting documents should include a description of the following elements:

- Title of the formative assessment
- Problem statement or background
- Overall aim and specific objectives
- Overview of methods
- Activity 1: review of existing data
  - Data collection and management methods
  - Data analysis plan
- Activity 2: qualitative data collection
  - Survey population and recruitment
  - Data collection and management methods
  - Sample size
  - Data analysis plan
- Activity 3: venue identification and mapping
  - Survey population and sample plan
  - Data collection and management methods
  - Sample size
  - Data analysis plan
- Plan for ethics review
- Plan for protecting confidentiality and observing informed consent
- Risks and benefits for participants
- Budget and timeline (workplan)
- Plan for utilization and dissemination of findings

The data collection forms, thematic guides for qualitative data collection, and a copy of any informed consent forms (if required) are also included in the annexes of the protocol. Sample forms are included in this module.

Determine Sample Size

In contrast to quantitative data collection through surveys, sample sizes for qualitative data collection are not typically set beforehand, but based on when data “saturation” is reached – the point at which additional data do not yield new insights or findings. A minimum of three FGs (with six to ten participants in each group) in each target population and approximately ten KIIs are typically considered adequate to reach data saturation. The sample size should be balanced against available resources, the timelines required for making operational decisions and the quality of existing data on HRPs. In settings where very rapid operational decisions are needed and some data on HRPs already exists, a shorter timeframe and more limited sample size should be adopted.

Determine Whether the Formative Assessment Needs Ethical Review

You will need to consider whether the formative assessment constitutes research on human subjects by any partner institution and whether it needs to be approved by one or more ethical review boards. Ethical review committees review research protocols to ensure that study procedures adequately protect participants. Whether an activity constitutes “research” within public health may depend on the context of data collection.
A review of existing programmatic data and published information often does not require ethical review, but qualitative data collection is often considered research and thus may require some type of ethical review.

**Conduct Informed Consent**

The interviewer should explain the purpose of the study and all risks and benefits to the participant before seeking the respondent’s agreement to be interviewed. Respondents have the right to decline to participate or to elect at any time to discontinue the survey, which the interviewer must respect. In some cases, oral consent may be appropriate, while other contexts require written and signed consent forms. Sample informed consent forms can be found in Appendix II.

Maintaining confidentiality of all participants is important and each person should be told that all information they provide will be kept confidential. Name-identifiers must be kept securely and separately from survey data, and code numbers can replace names for analysis. Confidentiality is also crucial to protect the identity of specific populations, such as foreign-born persons.

**Modify the Workplan**

It is difficult to set an accurate timetable for data collection activities, but it will be needed for budgeting and planning. A sample workplan, which includes a budget and timeline template, is available for download accompanying this guide. The workplan will need to be adapted in each setting and is dependent on:

- The number of focus groups and KIIs to be conducted
- The geographic location of study sites, travel and logistics
- The availability of the study population
- The ease of recruiting participants
- The size of the research team
- The experience of the research team (and time needed for training)

When adapting the timeline, you can further break-down each step into sub activities to adapt to your needs. This includes the schedule of focus group discussions, which are difficult to schedule far in advance, as they must be scheduled around participant availability. This may be on the weekends or in the early morning or late afternoon when they are free from their work duties.

Typically, it is realistic to schedule one to two focus group discussions or key informant interviews per team per day. If transcription happens the same day as the FG/KII, then only one per team per day is a realistic target. The timetable should allow for several hours for the team to debrief after each FG/KII.

A sample budget for the formative assessment is included in the workplan in the supporting documents. Individualized costs are shown per team, and the number of teams required per activity is based on scope and sample size in the sample protocol.

**Key points**

- Adapt the formative assessment protocol and design so that it is consistent with the purpose and objectives of your survey.
- Submit your protocol for ethical review if deemed necessary.
- Use the workplan to allot sufficient days or weeks to each step in the survey process and to track progress during data collection.
- Your budget plan should reflect the internal resources needed to design, conduct and manage the formative assessment activities, as well as any external consultants.
Step 3: Adapt the Data Collection Instruments

While it is not possible to develop one data collection tool that will be suitable in all settings, investigators can use the guidance provided here and sample (i) templates for the review of existing data (accompanying this guide, available for download), (ii) thematic guides and forms for focus group discussion and key informant interviews (accompanying this guide, available for download, and in Appendices I–III) and (iii) forms for venue enumeration (Appendices IV–VI).

Adapt Templates for Existing Data Review

In an elimination setting, passive reporting systems should move from collecting and reporting aggregated data to collecting rapid, disaggregated and individual case data. Surveillance indicators available from existing data often vary by country but should be collated and entered into data templates at the lowest level available (i.e. individual or aggregated to the lowest administrative level).

Before entering data into the sample data sheet, first conduct a review of what is currently being collected through the information systems and compare it with the sample template accompanying this guide. Think about ways to improve those forms and include missing variables if possible. A full review of available data should also help to determine the lowest level that data can be analyzed and guide adaptation of the sample template.

The sample data entry template provides a minimum essential set of indicators that aligns with those recommended in the WHO Surveillance, monitoring and evaluation manual, and includes:

<table>
<thead>
<tr>
<th>Clinical data</th>
<th>Residence and nationality</th>
<th>Demographics and risk factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of diagnosis</td>
<td>Province of residence</td>
<td>Imported/Local</td>
</tr>
<tr>
<td>Diagnostic method</td>
<td>District of residence</td>
<td>Travel destination</td>
</tr>
<tr>
<td>Test result</td>
<td>Sub-district of residence</td>
<td>(if any)</td>
</tr>
<tr>
<td>Species (if available)</td>
<td>Village of residence</td>
<td>Travel dates (if any)</td>
</tr>
<tr>
<td>Health facility name</td>
<td>Nationality</td>
<td>Malaria prevention used (if any)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td>» IRS</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td>» Net use (residence and travel)</td>
</tr>
</tbody>
</table>

Further data may be available from case investigations, which is outlined in the data collection forms accompanying this guide. The WHO Surveillance Manual provides a complete list of suggested indicators.

Determine the Key Research Questions

Before adapting the thematic guides, you will want to formulate the specific questions that you want to answer through data collection. Refer back to the objectives of your formative assessment that you have defined as a guide.

Based on these specific objectives, form lists of questions that you want answered. For each area of questioning, consider the existing data that will be needed or qualitative data that you might wish to find out. For example, if one area of inquiry is to provide operational and logistical information how best to access and deliver surveillance and response to MMPs, possible questions may be:

- To what extent are MMPs socially connected in their home country (i.e. do they know each other)? In their destination country?
- Are there specific locations where MMPs congregate at their source or destination? Are there specific people who might be missed at these locations?
- Would mobile and migrant respondents be receptive to surveillance and response

Interventions delivered through people they know (peer-referral) or at locations where they congregate (venue-based)? What might be potential barriers or opportunities for participation?

Consider existing frameworks to refine your research questions so that what you learn will build on other’s knowledge and experience. To shape questions related to MMPs, consider reviewing lessons learned from the Greater Mekong Subregion (GMS). A recent WHO report discusses different types of MMPs, common barriers to detecting and treating malaria cases in MMPs, and potential strategies to improve case detection in the GMS.8 Reviewing these potential ways of categorizing MMPs and alternative strategies may help you refine research questions to determine the best way forward in your context.

A second framework that can help develop research questions is “journey mapping”. Journey maps take many forms but all aim to describe a single individual’s path through a set of services and to understand how and why the individual engaged with or did not engage with services over time. For examples in the health arena, see citations below.9,10 In the malaria context, journey maps should ultimately serve to identify opportunities to improve surveillance and response. To develop journey maps as a part of formative assessment, adapt research questions to provide the data needed to chart how HRPs’ key life events have intersected with specific instances of exposure to risk and decisions about using preventive measures, health care services, testing, and treatment. Journey maps for MMPs can also be used quite literally, to visualize how specific travel routes intersect with risk and contact with health services and surveillance activities. In this sense, journey mapping is one way to gain insight about the “mobility continuum”11 through formative assessment.

Adapt Thematic Guides and Note-taker Templates for Qualitative Data Collection

The thematic guides provide a core set of themes and open-ended questions developed for qualitative data collection. A sample thematic guide is available for download with this module. Focus group thematic guides include examples for (i) forest workers, (ii) MMPs and (iii) people who frequent potentially high-risk venues between sundown and sunrise. Key informant interview guides explore a similar set of themes.

<table>
<thead>
<tr>
<th>FG Themes</th>
<th>KII Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Behaviors that lead to potential exposure to malaria</td>
<td>• Healthcare and malaria prevention service provision to HRPs</td>
</tr>
<tr>
<td>• Socio-demographic characteristics of HRPs</td>
<td>• Health concerns of HRPs</td>
</tr>
<tr>
<td>• Acceptability and feasibility of proposed survey procedures and sampling method</td>
<td>• Demographic characteristics of local HRPs</td>
</tr>
<tr>
<td>• Recommendations for survey procedures and sampling method</td>
<td>• Work</td>
</tr>
<tr>
<td>• Use and availability of healthcare and other services</td>
<td>• Travel</td>
</tr>
<tr>
<td>• Healthcare and malaria prevention service provision to HRPs</td>
<td>• Healthcare services sought by HRPs,</td>
</tr>
<tr>
<td>• Health concerns of HRPs</td>
<td>• Barriers to healthcare provision</td>
</tr>
<tr>
<td>• Demographic characteristics of local HRPs</td>
<td>• Identification of local health and other services to HRPs</td>
</tr>
<tr>
<td>• Work</td>
<td>• How to effectively conduct testing and treatment for malaria</td>
</tr>
<tr>
<td>• Travel</td>
<td></td>
</tr>
<tr>
<td>• Healthcare services sought by HRPs,</td>
<td></td>
</tr>
<tr>
<td>• Barriers to healthcare provision</td>
<td></td>
</tr>
<tr>
<td>• Identification of local health and other services to HRPs</td>
<td></td>
</tr>
</tbody>
</table>

Users will need to adapt the guides to fit their setting and may also choose to remove or alter questions. You should collect only the data required to answer the key research questions identified in the preceding step (Determine the key research questions). Include questions that give you information that you “need to know” for planning surveillance and response, rather than information that is “nice to know.” Ask yourself: How will we use this information in practice?

Review the thematic guides to ensure the following:

- Questions that are not relevant to the local context or consistent with the objectives of the assessment are removed.
- Themes and questions in the guide directly answer the key research questions identified in the previous step. If they do not, add questions to the guide.

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8 World Health Organization. Mobile and migration populations and malaria information systems. 2015.
9 Koski et al. (2017). An analysis of journey mapping to create a palliative care pathway in a Canadian First Nations Community: Implications for service integration and policy development Palliative Care: Research and Treatment, 10.
Module 1: Planning Targeted HRP Surveillance and Response

The MEI Malaria Elimination Toolkit

A Malaria Elimination Guide to Targeted Surveillance and Response in High-Risk Populations

- Variation in behaviors that may be important epidemiologically and operationally are carefully considered and accounted for in the questions (i.e. potential seasonality of behaviors, location where behaviors carried out, etc.).

If adding questions to the guide, carefully consider the framing of questions and how the responses will inform program activities or future surveys. Remember that your focus groups and interviews should never exceed 1–2 hours or participants will become fatigued.

A standardized note template should be created prior to FGs or KIs based on the specific research questions that will be addressed during the session (a sample template is located with the data collection tools accompanying this guide). This form should be adapted alongside the thematic guide and used to structure field notes for analysis.

Translate Thematic Guides

Translate all questions into the preferred local language that respondents will be comfortable using, and back translate in order to ensure that the meaning of each question is captured correctly.

Make a Data Analysis Plan

Setting up an analysis plan will help you examine the data thoroughly and ensure that the information links back to the objectives. A data analysis plan outlines the steps and conditions of analysis that will be conducted when the data are available. Steps in data management include:

1. Getting to know the data
2. Entering and cleaning the data
3. Analyzing the data
4. Interpreting the data

For each component of the formative assessment, your analysis plan should detail how you will carry out each step above and any software requirements.

Analysis of pre-existing data

An analysis of routinely collected data or data available in patient registries should focus on characterizing malaria transmission in terms of time, place and person to track changing trends and ensure optimal targeting of interventions. The sample templates provided with this guide contain basic auto-populating analysis tables based on the inputted data, however additional analyses to consider include:

- **Time:** Seasonal variation within years and changes in case numbers, incidence, and local vs imported cases across years.
- **Place:** Annual incidence rates can be calculated for the smallest geographical area (district, sub-district, constituency, village, etc.) for which there is case and population data, in order to identify high-risk locations. Spatial mapping of incidence data alongside contextual factors (by year) can provide insight into malaria trends over time and in relation to other factors influencing transmission (such as forestry, mining, climate, and migration). However, spatial mapping will require specialist geographic information system (GIS) software and technical assistance may be required. Please contact mei.ucsf.edu if this type of assistance is needed.
- **Person:** Socio-demographic and travel profiles of cases, stratified by importation status, can be analyzed using the pivot tables in the Excel templates provided with this guide or with public-domain software tools such as EpiInfo.

Analysis of qualitative data

Focus group discussions and key informant interviews can generate large amounts of qualitative data. The type, and depth, of analysis carried out will depend on the programs’ aims and capacity but should always include an analysis of field notes taken by the note-taker during FGs and KIs and added to during de-briefing sessions.

Although the formative assessment is not a formal qualitative research study, data analysis should be guided by grounded theory. This is a form of qualitative data analysis that uses a constant comparative method to generate theories of human behavior.

Grounded theory works as follows:

1. Produce transcripts of interviews and detailed notes.
2. Code data and identify potential analytic categories or themes.
3. Put together and compare data under the same categories or themes.
4. Associate categories that are alike.
5. Use relations among categories to interpret the data and generate hypotheses, that is, explanations about behaviors related to the aims of the formative assessment.
6. Intentionally search out data that may refute each hypothesis.

7. Present the results using examples from the data, as stored in interview transcripts or field notes.\textsuperscript{12}

Traditionally, detailed field notes should be entered onto a standardized template by the note-taker during sessions (sample form included with Data Collection Tools accompanying this guide). These notes should be discussed and summarized during a debriefing session immediately after each individual interview and focus group session, together with audiotapes. At this point, the Debrief Form (a sample template is located with the data collection tools accompanying this guide) should be completed. In contrast to the note-taker form, information entered into the Debrief Form should summarize key themes and information from each group pertaining to your predetermined research questions.

Venue notes from walk-throughs and venue verification (systematic observation) will be typed. All information generated from the formative assessment will be stored in a common word processing format in order to facilitate analysis. By comparing information in the Debrief Forms across FGs and KIs, you will be able to identify analytic categories or themes and compare information, with the ultimate aim of answering your key research questions. For example, if one key question is “Are there specific locations where MMPs congregate at their source or destination?,” you should be able to gain insight into the various venues where MMPs may be accessed in the study area.

Other themes that might emerge from the data can also be included in the analysis. Finally, recurring themes uniting the categories will be identified and provide descriptive statistics of the categories and coded themes. These data will aid in identifying the operational and logistical needs of conducting TLS in each location (e.g. identification of potential survey sites, determination of appropriate incentives).

While it is best practice to later transcribe and translate all audiotapes into English for reference and systematic analysis, the feasibility and value of doing a transcript-based analysis may depend on aims, resource availability, time constraints and technical capacity. This type of analysis involves transcription and full coded analysis of audio-files taken during

**Tips for successful pre-testing**

1. Let the respondents know you are pre-testing the survey instruments and that you would like their feedback if any questions are unclear.

2. The respondents are the experts when it comes to understanding the questions. However, you must ultimately decide which of their suggestions are useful and which are impractical.

3. Look at the responses to the questions in the thematic guide. Are the responses detailed as you were expecting? If not, check to see if the wording, positioning or delivery of the question is sufficient.

4. Are there a lot of “do not know” responses? This may indicate inappropriate wording.

5. Time how long it takes to complete one interview. If it exceeds 1.5 or 2 hours, consider cutting down and focusing your questions more.

**Key points**

- Review the type and level of existing data before adapting the data entry templates.
- Keep the thematic guides as short as possible and directly relevant to specific objectives – a long interview will tire respondents and interviewers.
- Do not ask about more than one issue in a single question.
- Phrase questions carefully and simply, so that everyone – including individuals with little formal education – can understand.
- If you are conducting focus group discussions among several distinct populations, tailor your guides to the information you need from each audience.
- Pre-test the thematic guides to ensure that they are easily understood by respondents.
Step 4: Implement Component 1: Reviewing Existing Data

Review of Existing Data and Information Systems

Collation and review of existing data from reports and publications as well as passive and active surveillance systems should be the first step in understanding transmission patterns, reviewing case profiles and identifying potential gaps in surveillance and response. If this step has already been done, it is possible to proceed directly to the next section, which outlines standard operating procedures for implementing qualitative data collection.

Recruit Field Staff for Data Review

Typically, minimal staff is needed to carry out the review of existing data. The Field Coordinator may be able to carry out all data collection activities. If a registry review is required or this person is short on time, he/she is likely to require additional support.

Collaboration with a local university and involvement of students for these activities is often an efficient way to conduct the review and build local capacity. A skeleton team of two students can conduct the reviews and data extraction alongside the Field Coordinator and under the supervision of more experienced program staff and/or researchers.

Prepare for Data Collection

Staff member: Field Coordinator/Leads

A series of meetings with NMCP/NMEP staff and partners should be used to identify key data sources for the formative review as well as plan for qualitative data collection. Attempt to identify all information that may be available locally for analysis or to help confirm findings from the FGs and KIs and to increase understanding of the HRP population.

Key questions that should be discussed

- What level are case data available centrally? (i.e. individual case reporting or aggregated by health facility or health district?)
  - Review all existing forms/databases and compare with data entry templates.
  - If data are individual-level, is the same information available for people testing negative for malaria? This information can serve as a retrospective control population, to provide a comparison group.
- If data are not individual-level, are there resources to do a registry review at health facilities? Are any additional data (i.e. place of residence, travel history or occupation) available in the registry books that are not captured at the higher level?
  - What other data (i.e. SPR, intervention coverage, etc.) are routinely reported and at what level?
  - What active surveillance is carried out, including case investigation, reactive case detection and proactive screening?
    - Review all forms used in this activity and compare with data entry templates.
  - Are there any reports or documents available with evidence based on prior reviews or data collection to suggest which populations are at highest risk? Any previous mappings of the target populations?
  - Has there been academic research conducted that might help to understand HRPs in this setting? Are there specific researchers who may be contacted as part of this review?

Meetings with NMCP/NMEP staff and partners should also be used as an opportunity to plan for any qualitative data collection, as described in Step 5: Implementing component 2 (Qualitative data collection).

Conduct Existing Data Review

Carry out a desk review

Staff member: Field Coordinator and/or data extractors

Following the planning meetings with the NMCP/NMEP, a full desk review should be carried out on all potentially relevant reports, publications and grey literature. This may include program reports, MIS/DHS reports, academic literature or unpublished data. In addition to information identified in the meeting, it is a good idea to search online bibliographic databases, like PubMed, for relevant publications.
**Material required**

- Computer and internet connection
- Copies of reports and relevant publications or grey literature, including:
  - Documents from governmental organizations, community organizations, and employers relevant to the target population (programmatic or annual reports, policy documents, meeting minutes, academic literature, conference proceedings, etc.)
  - Reports from qualitative or quantitative studies by regional, national or local academic institutions or consortia (including MIS/DHS reports and any reports or manuscripts)
  - Unpublished data from regional, national or local academic institutions or consortia
- Excel template ‘Desk review’ (available for download with this module)

**Procedures:**

1. Carry out a literature review in PubMed using the terms “malaria + high + risk + populations + [NAME OF COUNTRY]”. Look specifically for reference to any high-risk geographies or populations, in relation to behavioral, occupational or treatment-seeking factors.
2. Read all publications found, as well as reports and grey material identified through meetings with the NMCP/NMEP and partners.
3. Complete the Excel template ‘Desk review’ to provide an accessible summary of key findings and sources. Include aggregate data like slide positivity rate (SPR) and intervention coverage where available.

**Review passive surveillance data**

*Staff member: Field Coordinator and/or data extractors*

The aim of this activity is to describe data routinely collected through the passive surveillance system and identify existing evidence of HRPs in terms of demographics, place of residence, travel history or occupation. Sources of data may include the Health Management Information System (HMIS), other aggregated databases, or patient registries at health facilities. It is generally sufficient for data collection to cover a 2–3 year period.

If data are decentralized and it is decided that a registry review will add important information to data available centrally, then it is worth also extracting data for individuals testing negative for malaria. This can provide a direct comparison for case profiles.

Where these data are not available, census data may provide an appropriate comparison.

**Material required**

- HMIS or other centralized data from passive surveillance reporting
- Registries from health facilities
- Excel template ‘Passive surveillance data’ (available for download with this module)

**Procedures:**

1. Complete standardized data entry in the Excel template for each sheet:
   - Sheet 1: Column definitions
   - Sheet 2: Data entry

   Remember that data entry should be at the lowest level possible (individual if available). Fill out as much of the data entry sheet as possible. Indicators to be collected through passive surveillance are shown in Table 1 (next page). These are based on individual-level data, but you can adapt these data sheets to fit your context if individual level data are not available.

2. After data entry is complete, use the pre-formatted pivot tables on ‘Sheet 3: Analysis’ to summarize characteristics of malaria cases and non-cases (if available) by age, gender, location, and time.

**Review active surveillance data**

*Staff member: Field Coordinator and/or data extractors*

The aim of this activity is to describe data collected through any active surveillance activities, including case investigation, reactive case detection and any other mass screening activities. Often, more detailed data are collected during these activities and may provide more useful case profiles than the review of passive surveillance data. The assumption is that these data are all available at the individual level.

Although there is no straightforward comparison group to quantify risk factors, these data can still provide information on case characteristics and point towards suspected high-risk populations.

**Material required**

- Databases from case investigations, reactive case detection and other mass screening activities
- Standardized Excel template for ‘Active surveillance data’ (available for download with this module)
<table>
<thead>
<tr>
<th>Field Name</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical data</strong></td>
<td></td>
</tr>
<tr>
<td>ID</td>
<td>ID number</td>
</tr>
<tr>
<td>Date</td>
<td>Date of diagnosis (MM/DD/YYYY)</td>
</tr>
<tr>
<td>Year</td>
<td>Year (YYYY)</td>
</tr>
<tr>
<td>Age</td>
<td>Age of patient</td>
</tr>
<tr>
<td>Sex</td>
<td>Gender of patient</td>
</tr>
<tr>
<td>Facility</td>
<td>Health facility where patient was seen for testing</td>
</tr>
<tr>
<td>Tested</td>
<td>Tested for malaria</td>
</tr>
<tr>
<td>Test_res</td>
<td>Confirmed malaria case</td>
</tr>
<tr>
<td>Species</td>
<td>Malaria parasite species identified</td>
</tr>
<tr>
<td>Dx_method</td>
<td>Method of malaria testing</td>
</tr>
<tr>
<td>Fever_hist</td>
<td>History of fever in the last 30 days</td>
</tr>
<tr>
<td>Tx</td>
<td>Received treatment?</td>
</tr>
<tr>
<td>NP_tx</td>
<td>Treated according to national policy guidelines?</td>
</tr>
<tr>
<td>Referral_up</td>
<td>Was the patient referred to higher level facilities?</td>
</tr>
<tr>
<td>Death</td>
<td>Death of case</td>
</tr>
<tr>
<td>Dist_dx</td>
<td>District diagnosed</td>
</tr>
<tr>
<td>HF_dx</td>
<td>Health facility diagnosed</td>
</tr>
<tr>
<td><strong>Residence and nationality</strong></td>
<td></td>
</tr>
<tr>
<td>Province</td>
<td>Province</td>
</tr>
<tr>
<td>District</td>
<td>District</td>
</tr>
<tr>
<td>District_pop</td>
<td>Population of district where malaria test was done</td>
</tr>
<tr>
<td>Sub-district</td>
<td>Sub-district</td>
</tr>
<tr>
<td>Village</td>
<td>Village of residence</td>
</tr>
<tr>
<td>Residence</td>
<td>Address of patient</td>
</tr>
<tr>
<td>Nationality</td>
<td>Nationality</td>
</tr>
<tr>
<td>Dist_res</td>
<td>District of residence</td>
</tr>
<tr>
<td>Village_res</td>
<td>Village of residence</td>
</tr>
<tr>
<td>Constituency_res</td>
<td>Constituency of residence</td>
</tr>
<tr>
<td><strong>Demographics and risk factors</strong></td>
<td></td>
</tr>
<tr>
<td>Local</td>
<td>Local malaria cases</td>
</tr>
<tr>
<td>Imported</td>
<td>Imported malaria cases</td>
</tr>
<tr>
<td>Recent_travel</td>
<td>History of travel in the last 30 days</td>
</tr>
<tr>
<td>Travel_dest</td>
<td>Travel destination</td>
</tr>
<tr>
<td>Date_dep</td>
<td>Date of departure for travel (MM/DD/YYYY)</td>
</tr>
<tr>
<td>Date_ret</td>
<td>Date of return from travel (MM/DD/YYYY)</td>
</tr>
<tr>
<td>Prev</td>
<td>Malaria prevention used</td>
</tr>
<tr>
<td>IRS</td>
<td>Insecticide residual spray used</td>
</tr>
<tr>
<td>Net_res</td>
<td>Bednet used at home</td>
</tr>
<tr>
<td>Net_trav</td>
<td>Bednet used during travel</td>
</tr>
<tr>
<td>Occupation</td>
<td>Occupation</td>
</tr>
</tbody>
</table>
Procedures
1. Complete standardized data entry in the Excel template for each sheet:
   - Sheet 1: Column definitions
   - Sheet 2: Case investigations and RACD
     » Indicators include surveillance type, population type and size, site type, number of people screened per month, and detected cases per month.
   - Sheet 3: Mass screening
     » Indicators include surveillance type, population type and size, site type, number of people screened per month, number of fevers per month, and detected cases per month.
   - Sheet 4: Individual data entry (if available)
     » Enter individual level data (similar to the data collected for passive case detection) collected through case investigation, RACD or Mass screening, where available.
2. After data entry is complete, use the pre-formatted pivot tables in the ‘Sheet 4: Analysis’ tabs of the passive surveillance and active surveillance Excel documents to summarize characteristics of malaria cases and non-cases (if available) from each type of activity.

Improving Existing Information Systems for Identifying HRPs
By reviewing and taking stock of existing data from the information systems and registries available, are there any key pieces of data missing? You can cross reference the data indicators collected in your context with the WHO Surveillance Manual to add any variables to your existing information system and collect these data moving forward.

Key points
- Develop the analysis plan ahead of time, so that data can be collected at the level required for the analysis. Be sure to recruit technical support for as needed to adapt or analyze data.
- Use data collated centrally wherever possible to save time and resources.
- Registry reviews can provide detailed and useful information where data are not available centrally, and often are good projects for graduate students with an interest in public health.
Example from the field

Retrospective Data Review in Nepal

A review of existing data was carried out as part of a formative assessment in three historically-high burden districts in the Far West Terai in Nepal, between August and November 2016. This area shares a porous border with India and significant economic migration. Retrospective data collection covered the period between 2013 and 2016 and included 1640 case records reported through case-based surveillance, representing *P. vivax* (86.5%), *P. falciparum* (11.2%), and mixed infections (2.3%). While the total number of cases declined between 2013 and 2016, the proportion of imported cases increased significantly. Almost all *P. falciparum* cases in 2016 were reported as imported from India. Imported cases had two temporal peaks corresponding to when travelers commonly return back to Nepal for a month for agriculture activities (harvesting wheat and paddy cultivation) during April–June and return for festivals and rice-grain/paddy harvesting in September-October.

The distribution of imported and indigenous malaria cases between 2013 and 2016 overlapped and foci tended to occur in areas of low to mid population density. The decrease in incidence over time corresponded with tighter geographic foci of indigenous transmission. Statistical models showed that the number of indigenous malaria cases within a given VDC were directly and strongly related to higher levels of imported infections in the previous month, after adjusting for variation in rainfall, population density and year.
Step 5: Implement Component 2: Rapid Qualitative Data Collection

Engage Communities and Devise Participatory Methods

Before surveillance or research activities begin, it is important to build relationships with target populations and the larger community in the project area. Identify and inform community leaders of your plans to carry out any data collection and seek their advice on the best ways to access relevant communities or individuals as some HRP may be located geographically far or be engaged in illegal activities. Good coordination with community leaders is important to make sure aims, procedures and expected results are clearly communicated and that any problems or concerns are dealt with quickly.

Be sure to include key informants from both the target population and larger community, and maintain close coordination and communication with them throughout the process. Involving the community officials early can improve participation, reduce rates of refusal and ensure that your findings are seen as credible and put to use.

Consider ways to build in participatory methods to focus group activities wherever possible. For example, in Indonesia, focus groups carried out a mapping of worksites and potential venues on printed maps of the study district. There are rich resources around participatory methods to harness the knowledge of communities while ensuring that individuals in the community continue to be involved and remain updated on the process.

Illegal migrants, refugees, and displaced populations

There are well recognized limitations to surveillance approaches in illegal migrant and refugee populations. Implementation procedures should be adapted accordingly when working with these groups, and evidence should be gathered to determine how to best approach and engage illegal migrants, refugees, or other displaced or vulnerable populations. These populations may be more apprehensive to participate in malaria surveillance activities than others given their legal status, so it is especially imperative to focus on sensitivity during implementation and to understand the context of the population, showing respect for their values and experiences, and adapting procedures to the population. Collect only data that is necessary for specific research aims, use de-identified data, and store data safely to ensure the safety of the individuals at hand.

Military populations

In Southeast Asia, malaria risk areas are often located along international borders that experience a high density of population movement and deployment of military personnel. As a result, there is a growing recognition that civilian and military cooperation will be needed to advance national malaria elimination goals. Implementation of the HRP toolkit may be amended to identify high risk populations within the military units, assess high risk behaviors, and institute the appropriate measures of prevention (e.g. insecticide-treated uniforms, chemoprophylaxis, expanded pre-deployment screening), diagnosis, treatment, and enhanced surveillance. Active engagement and elimination goals will need to be well aligned between the Ministry of Health (MoH) and Ministry of Defense (MoD), via data sharing via weekly or monthly case counts; trainings provided by MoH for implementing reactive case investigation, vector control activities, directly observed therapy, and conducting microscopy. Challenges for engaging militaries include sensitivity of data, such as mapping of cases and related high-risk activities.

Choose Survey Dates and Timeline

Planning and preparation for focus groups and key informant interviews is crucial to their success.

Community officials can also help inform considerations for the survey timeline regarding the potential availability of respondents, particularly around harvest season, holidays, or variation in travel patterns throughout the year may make people less available or change the available population.

In choosing dates for qualitative data collection, other issues for study staff to consider include:

- How many days are needed for training moderator teams?
- How many days do you expect moderators to be in the field to conduct the planned FGs and KIs? Typically, 1–2 sessions can be planned per day for each team, but this may depend on timing of participant availability and whether transcription is carried out on the same day.
• How many days are needed for data entry and analysis?

Recruit Moderator Teams

FG discussions and KIIs are facilitated by a moderator team, which includes a field coordinator/moderator, and a note-taker.

The roles and responsibilities of these positions are described below and listed in Figure 3 on the next page.

Field Coordinator (may also be a Moderator)

Field Coordinators will be responsible for the day-to-day management of all activities, including data collection, quality assurance through regular debriefing, and correct management of data and records. The Field Coordinator will also be responsible for direct supervision of field staff, leading regular debriefing meetings, and reporting on progress.

Moderator

A skilled and experienced moderator is crucial in ensuring that participants are relaxed and encouraged to fully engage and participate in the discussion, particularly when participants include low-income or minority ethnic groups. The moderator will be a university-trained researcher, ideally with social sciences background, and fluent in the language of the study participants. The moderator must have a clear understanding of the research objectives and how to manage focus groups to ensure high quality information. Moderators will be responsible for facilitating focus groups and debriefing with the Field Coordinator. The moderator may have additional duties (transcribing or translating audio-files) as required.

Note-taker

The Note-taker is responsible for developing a written summary of the discussion, so that the main issues can be easily accessed during the debriefing. Note-takers will also be responsible for completing the enrollment forms, organizing the room and making note of the participants seating arrangements. Note-takers can be recruited from the local community or from university students, but must be fluent in the language of the study participants. The Note-taker has an important role, even if the sessions are recorded on audio, as they must recognize and record the essential issues in a fast moving group discussion. The summary will become part (or all) of the data used in the analysis.

All project staff must adhere to the ethical principles and standards when conducting the survey. Most importantly, they must respect and protect the privacy, confidentiality, and autonomy of participants. In addition, project staff should conduct themselves in a professional manner when interacting with participants, fellow staff members, and the general public.

Staff Training

Field staff will be trained by technical experts in mapping, observation, interviewing and facilitating group discussions. Field teams will participate in a three to five day training to develop skills in formative assessment procedures, including emphasis on safety, confidentiality, and dealing with ethical issues. To increase the capacity of organizations to conduct rapid assessments, additional staff may be invited to participate in the training.

The key training objectives for the moderator and note-taker are summarized in Figure 4 on the next page.
**Figure 3. Summary of field staff responsibilities**

**Field Coordinator**
- Ensure that field personnel are punctual and have a professional demeanor
- Manage expenses
- Ensure the availability of all survey materials
- Conduct daily debriefings and review field notes to assess the procedures for data collection, challenges, and how to improve data quality (from field notes and audio recordings)
- Supervise and monitor the work of the field teams, particularly early in data collection.
- Store documents (consent forms, field notes, enrollment and other forms) and audio files in a safe, secure place
- **In many cases, the Field Coordinator can be the same staff member as the Moderator**

**Moderator**
- Facilitate FGs and KIs to ensure engaged and participatory discussion and high quality information
- Ensure informed consent is obtained for all participants
- Reimburse participants for travel expenses as required
- Participate in daily debriefing meetings with the Study Coordinator and Note-taker
- Organize documents (consent forms, field notes, enrollment and other forms) and audio files in a safe, secure place until given to the Field Coordinator
- Transcribe/translate audio recordings (in some settings)
- **In many cases, the Moderator can be the same staff member as the Field Coordinator**

**Note-taker**
- Ensure that enrollment forms are correctly completed
- Complete a seating chart for participants
- Operate the audio recorder
- Develop a written summary of the discussion, emphasizing main themes and findings in a fast moving discussion as well as important body language and/or group dynamics
- Participate in daily debriefing meetings with the Field Coordinator and Moderator
- Transcribe/translate audio recordings (in some settings)

**Figure 4. Key training objectives for field staff**

**Moderator**
- Check fluency in the language of the discussion
- Check experience in group facilitation
- Provide overview of research objectives
- Conduct role play to observe natural ability for rapport development and stimulating discussion
- Train in introductory tasks for group discussion
- Revise ethical issues (i.e. consent and confidentiality)
- Train on group dynamic and encouraging discussion
- Practice listening, probing and follow-up questioning
- Instruct on focusing the discussion to meet research objectives
- Review timing and pacing of discussion
- Check literacy and fluency in the language of the discussion
- Provide overview of research objectives
- Develop note-taking guidelines (i.e. brief written document)
- Highlight the importance of note-taker’s record of the discussion
- Instruct on objective note-taking (no interpretation or judgement)
- Instruct on translation and transcription issues
- Train on recognition of body language and non-verbal signals of participants
- Conduct role-play to practice note-taking
- Instruct on use of audio recorder
Identify Community Gatekeepers and Sensitize Community

It is important to acknowledge any social structures that may exist in the study setting. Often, it is not appropriate to access community members without first seeking the endorsement of community leaders or employers. Acknowledgement of this protocol shows respect for local customs and can lead to valuable assistant with participant recruitment. Using local community members to introduce the study to and gather potential participants may increase participation rates.

Procedures
1. Meet with gatekeepers several days prior to the FG.
2. Describe the purpose of the study. Identify how the study will benefit the community and describe how information will be collected and used.
3. Seek endorsement with the study.
4. Seek assistance with participant recruitment.
5. Identify the required characteristics of participants.
6. Discuss a location for the group discussions.

Audio Recording

To protect the anonymity of participants, KIIs and FGs will not be video-taped. With the consent of participants, KIIs and FGs will be audio-taped to capture the discussion and for transcription purposes. However, prior to recording, participants will be instructed not to use their name, the name of other participants, or people who could suffer negative consequences if they are identified (e.g. they should not use the names of friends or employers involved in illegal activities, such as illegal forest work or border crossing; however, they could use an alias).

Recruitment of FG participants

Staff member: Field Coordinator/Moderator

FG participants are recruited opportunistically using snowball sampling or at gathering points. Methods for recruitment will depend on the specific sub-group of interest (forest workers, MMPs or people who frequent potentially high-risk venues between sundown and sunrise) and procedures outlines below may need to be adapted for your local context.

Each potential participant should be screened for eligibility upon first contact, either on the phone or at the location where he/she is recruited. The aim of eligibility screening is to ensure that all participants invited to participate in the FG are a part of the specific study population of interest.

Material required
- Paper copy of eligibility screening form and pen (Appendix I)

Procedures for recruitment through snowball sampling
1. Ask one of your key informants (e.g. community leaders, employers, health professionals) to identify an individual that meets the criteria as a member of the subgroup. Alternatively, use all index cases identified through passive surveillance as a starting point for steps 2–3.
2. Complete the eligibility screening form to determine if that person is eligible to participate in the FG.
3. If the person is eligible, introduce the study as per Box 1 and ask that person if would like to participate. If individual is eligible to participate in the FG, record his/her name and contact details to follow up for scheduling.
4. Then ask if they can provide contact phone numbers for others with similar characteristics to themselves that could be recruited for the study.
5. Complete additional rounds of sampling as needed until the sample size for the FG is reached.

Recruit Participants for Focus Group Discussions

Composition of FGs
Each FG will be comprised of 6–10 participants and be relatively homogenous in terms of relevant socio-demographic characteristics in order to encourage individuals to freely share their ideas and perceptions. If enough participants are available, aim to conduct:
- 2–3 FGs with 6–10 male members of the HRP group
- 2–3 FGs with 6–10 female members of the HRP group
- 1–2 FGs with 6–10 community health workers

If there is a wide range of ages within these groups that will dictate group dynamics, it may be necessary to stratify groups by age.
**Example script for phone call/venue recruitment**

“Hello. My name is.... and I come from [NMCP/ NAME OF INSTITUTION] and am currently working on a project connected to malaria risk in [DISTRICT] in collaboration with the [COLLABORATING INSTITUTIONS]. We are conducting a study about malaria risk in association with travel to other countries/forest work.

Snowball sampling only: Your friend, [insert name], recently participated in this study and provided your contact in case you are interested in participating. We would like to know more about how to better reach individuals who work or live in other countries that may be at higher risk for malaria. To do this, we want to carry out a group discussion ask questions about malaria and travel/forest work. Is this something you might be interested in?

[If they are interested, continue…]

I will ask you a series of simple questions now about your travel patterns/forest work to determine if you are eligible to participate. This will take only a few minutes. If you are eligible, we would like to schedule a time for you to participate in a discussion with other people from the community, which will take approximately 1.5 hours. We will not provide any incentive for participation in the study but will reimburse the cost of travelling to participate and provide snacks and refreshments.

**Recruitment at gathering points only:** We would like to know more about how to better reach individuals who work or live in other countries that may be at higher risk for malaria. To do this, we want to carry out a group discussion ask questions about malaria and travel/forest work. Is this something you might be interested in?

**Procedures for recruitment through gathering points:**

1. Ask one of your key informants (e.g. community leaders, employers, health professionals) to identify locations where members of the study population are likely to gather. For example, forest workers might be found at cafés near forest entry points, while MMPs may be found at bus stops or other transit points near border crossings. Other populations at high-risk due to specific recreational or occupational characteristics might be found at locations associated with outdoor night-time activities (e.g. bars) or their occupation (e.g. cattle markets/market stalls).

2. Go to the gathering point and use the below script in Box 1 on the next page to introduce the study.

**Organize the Focus Group Discussions**

**Select a venue**

*Staff member: Field Coordinator/Moderator*

The Field Coordinator will arrange for a venue to use for the focus groups. This will be one that is easily accessible to all participants and allows for privacy and free from distractions. Wherever possible, select a venue that maximizes the comfort of the focus group participants in terms of accessibility, privacy and air conditioning. Potential venues include: schools, community centres, health facilities, church halls etc.

The venue should be communicated to the participant during the invitation call and a reminder should be made the day before.

**Schedule a date and time**

*Staff member: Field Coordinator/Moderator*

Before making any calls for recruitment, the study team will have a list of dates for FGs, aiming to have 3 in each target population over the study duration. This list is flexible, if not enough people can attend, the date will be rescheduled.

As participants are called for the study, the field staff should determine their availability for the earliest provisional dates available. There should be a maximum of 10 participants signed up for each FG date, to allow for walk-ins on the day. There should be no fewer than six participants attending each FG, wherever possible. Focus group discussions typically last between 1–2 hours.
Coordinate transport
Staff member: Field Coordinator/Moderator

The Moderator should work with the field coordinator to make sure all participants have transport to and from the venue the day of the focus group. The Moderator and study coordinator should clearly communicate to the participant before-hand that they will be reimbursed for their transport costs so that there is no barrier to participation.

Prepare the necessary materials
Staff member: Moderator teams

Moderator teams must always have the necessary materials on hand to complete their daily tasks. The Field Coordinator will be responsible for replenishing these supplies during routine supervision and check-in visits.

The study team should have the following prepared in advance of the focus group:

- Audio recorder
- Topic guide
- Enrollment form (Appendix III)
- Informed consent forms (Appendix II)
- Thematic guide (accompanying this guide, available for download)
- Standardized Note-taking template (available for download with this module)
- Debrief form (available for download with this module)
- Flip chart paper
- Markers
- Pens
- Preprinted map of the area
- Name tags
- Refreshments
- Reimbursement log (Appendix VII)

Conduct a Focus Group Discussion

Pre-discussion
Staff member: Moderator and Note-taker

The moderator team should arrive to the venue 45–60 minutes before the start of the focus group in order to arrange the room and make sure all the materials are ready.

Procedures

1. When participants arrive, they should be welcomed and served refreshments. It is important for all members of the FG staff team to be friendly to participants but to avoid any conversation around the FG topics.

2. The Moderator should observe the participants to identify characteristics of participants (i.e. any particularly quiet or talkative participants). If possible the seating arrangements may be adjusted to manage these dynamics.

3. After taking their seats, participants can complete the enrollment form with the assistance of the Note-taker. This will include basic socio-demographic information about each participant.

4. The Note-taker should ensure that each participant has their name badge and is entered into the seating chart and assigned a unique participant ID, to ensure that individual contributions can be matched to participant numbers.

Introductory stage
Staff member: Moderator and Note-taker

The Moderator will provide a brief introduction of the survey. He/she will describe the objectives of the session, discuss that the session will be recorded, and address any questions or concerns the participants may have.

If any participants indicate that they are not happy to be recorded, the moderator should draw them aside and ask whether they are still interested in participating in the study. If yes, the moderator should inform the rest of the group that a recording will not be taken, but that the note-taker will take full notes of the discussion. The note-taker will then have to ensure that they take as full a report of the discussion as possible.

The moderator will then begin talking through the focus group guide explaining the importance of ground rules and what is to be expected of the group members during the discussion.

After the ground rules have been agreed, the moderator should continue with administering informed consent.

Administer informed consent
Staff member: Moderator

It is important that each eligible individual invited to participate in the FG fully understands all procedures and how the information will be used. The process of informed consent is a necessary ethical procedure.
preceding any data collection and no data should be analyzed if consent is not available.

The moderator can read the informed consent guidelines to the group, however, informed consent must be obtained from each individual, separately.

**Material required**
- Two copies of the Informed Consent form (Appendix II)
- Pen

**Procedures**
1. Following the script on the informed consent form (Appendix II), explain the purpose of this study and invite individuals to participate in the FG.
2. One by one, approach each individual and take out two copies of the informed consent for each participant.
3. Briefly review the study, answer any questions that the participant may have and obtain informed consent individually to participate in the focus group and to use audio recording.
4. For youth under the age of 18, informed consent will be obtained from a parent or guardian.
5. Have the patient sign both copies of the informed consent form.
6. Write in the participant ID number on both copies of the informed consent form. Return one to the participant.

**Participants who decline to participate**
If the participant declines to be part of the focus group during the informed consent process, they will not be allowed to participate. Thank them for their time.

**Conduct the focus group discussion**

*Staff member: Moderator and Note-taker*

The Moderator plays a key role in directing the discussion of the FG. During the discussion, the Moderator must continually assess whether the information will be sufficient to answer the research questions and re-direct or follow up on multiple contributions from individual participants. A well-trained Moderator is able to recognize when a group is not working well and re-focus the discussion.

**Material required**
- Audio recorder
- Thematic guide (accompanying this guide, available for download)

**Procedures**
1. Following informed consent, the Note-taker should switch on the audio recording and begin taking notes on the Standardized Note-taking template (accompanying this guide, available for download). The Moderator should verbally state the focus group ID and date, before beginning the FG.
2. The Moderator should ask each participant to introduce themselves in turn, in order of the seating chart and IDs, to relax the group and help distinguish voices in the audio recording.
3. The Moderator should then introduce the ice-breaker topic in the FG guide, before turning to the central research question.
4. Flip charts and maps to list and visualize travel patterns and outdoor activities will help to spark participation and input from participants.
5. If/when latecomers arrive; the field coordinator present or note taker should complete the enrollment form, give them a name badge and show them to a seat.
6. Participants should be allowed to leave the discussion briefly for a toilet break, but the moderator should try to manage this so that no more than one participant is absent from the discussion at any one time.

If participants wish to leave the group altogether, the moderator should ask them if they are happy for their contributions to be included in the research or whether they’d like to withdraw their contributions altogether. If the latter, this should be noted and at the data management and analysis stage, their comments should be removed from the transcripts as far as is feasible.

At the end of the discussion, the moderator should thank the participants, remind them of how the information will be used and how confidentiality will be maintained by the research team, and then offer the participants refreshments and the opportunity to be reimbursed for travel expenses (Appendix VII).
Recruit Key Informants

*Staff member: Field Coordinator*

Key informants serve as cultural experts, offering insight into the target population, behaviors that may lead to risk, venues, how to maximize study participation and what data should be collected to ensure the findings are meaningful and relevant.

Key informants will include individuals important to and well informed about HRPs in the proposed sites. Good key informants may not know everything there is to know about malaria or HRPs, but at a minimum they should be able to contribute to the study team’s understanding of the study population, how best to approach potential participants, whether planned study procedures are likely to work well, and to offer guidance on problems that staff may encounter implementing surveillance and response in these populations. A diverse group of key informants will be selected to fully tap the range of knowledge present in the community.

Examples of key informants include:
- Community leaders of each study site
- Leaders of the target population (e.g., employers of forest working groups)
- Researchers familiar with local HRPs
- Healthcare and other service providers
- Persons doing outreach work among HRPs

A list of key informants, along with contact information and key demographic and occupational characteristics, can be entered into the Key Informant Enrollment Form (Appendix III). This list can be used to track key informant recruitment and completion of interviews, as well as used alongside field notes to summarize and interpret perspectives from this group.

Conduct Key Informant Interview

After a brief introduction of the survey, the interviewer will obtain informed consent from the key informant participant. Trained staff and note-takers will conduct interviews using an interview guide. Interviews with key informants will be semi-structured and open-ended, allowing for detailed and in-depth discussions of issues.

Successful interviewing is an art and should not be treated as a mechanical process. Each interview is a new source of information, so make it interesting and pleasant. The art of interviewing develops with practice but there are certain basic principles that are followed by every successful interviewer. In this section you will find a number of general guidelines on how to build rapport with a respondent and conduct a successful interview.

**Interview the respondent alone**

The presence of other people during an interview can prevent you from getting frank, honest answers from a respondent. It is, therefore, very important that the individual interview be conducted privately and that all questions be answered by the respondent.

**Establish rapport**

Begin with an explanation of the purpose of the interview, the intended uses of the information and assurances of confidentiality. Often informants will want assurances that the interview has been approved by relevant officials. Except when interviewing technical experts, questioners should avoid jargon.

**Obtain consent**

You must obtain a respondent’s informed consent for participation in the survey before you begin an interview or audit form. Informed consent forms can be found in Appendix II. At the beginning of the interview guide there is a spot for noting that the individual has given consent. The statements explain the purpose of the survey. They assure a respondent that participation in the study is completely voluntary and that it is their right to refuse to answer any questions or stop the interview at any point. Be sure to read the informed consent statement exactly as it is written before asking a respondent to participate in the study.

**Record the participant unique ID and information**

While the key informant is signing the consent form, make sure all boxes at the top of the interview guide are filled out completely and correctly.

**Record the interview**

All KI interviews will be recorded in order to capture what the participant is saying that may not be caught by the note taker. The trained interviewer must ask the participants before starting the interview if it is okay to record them; this is part of the consent process. If the participant does not consent to being recording, it is important to reiterate that no personal information will be stored on the recording, and it will be kept anonymous. If they give their consent, turn on the audio recording device, state the unique ID of the focus group discussion clearly and begin the interview. If they still do not consent to...
being recorded, the note taker should be vigilant in taking as detailed notes as possible and make sure there is enough time between questions to write down everything said.

**Always have a positive approach**

Never adopt an apologetic manner, and do not use words such as “Are you too busy?” Such questions invite refusal before you start. Rather, tell the respondent, “I would like to ask you a few questions” or “I would like to talk with you for a few moments.”

**Sequence questions**

Start with factual questions. Do not change the wording or sequencing of the questions in the key informant interview guide. Questions requiring opinions and judgments should follow. In general, begin with the present and move to questions about the past or future.

**Phrase questions carefully to elicit detailed information**

Avoid questions that can be answered by a simple yes or no. For example, questions such as “Please tell me about malaria prevention?” are better than “Do you know about malaria prevention?”

**Use probing techniques**

Encourage informants to detail the basis for their conclusions and recommendations. For example, an informant’s comment, such as “The malaria program has really changed things around here,” can be probed for more details, such as “What changes have you noticed?” “Who seems to have benefited most?” “Can you give me some specific examples?”

**Maintain a neutral attitude**

Interviewers should be sympathetic listeners and avoid giving the impression of having strong views on the subject under discussion. Neutrality is essential because some informants, trying to be polite, will say what they think the interviewer wants to hear.

**Never suggest answers to the respondent**

If a respondent’s answer is not relevant to a question, do not prompt her/him by saying something like “I suppose you mean that...Is that right?” In many cases, she/he will agree with your interpretation of her/his answer, even when that is not what she/he meant. Rather, you should probe in such a manner that the respondent herself/himself comes up with the relevant answer. You should never read out the list of coded answers to the respondent, even if she/he has trouble answering.

**Assure confidentiality of responses**

If the respondent is hesitant about responding to the interview or asks what the data will be used for, explain that the information you collect will remain confidential, no individual names will be used for any purpose and data will only be available to the members of the study team. Also, you should never mention other interviews or show completed questionnaires to your field coordinator in front of a respondent or any other person.

**Answer any questions from the respondent frankly**

Before agreeing to be interviewed, the respondent may ask you some questions about the study or why he/she was selected to be interviewed. Be direct and pleasant when you answer.

**Reimburse Travel Expenses**

Travel expenses should be reimbursed for all FG participants and key informants.

To reimburse travel expenses, the interviewer or assistant should use a participant reimbursement log which tracks: name of each participant, where they have travelled from, the mode of transport, whether they provided a receipt and the cost of transport (Appendix VI). The amount reimbursed should cover the return journey as well, if appropriate. The field workers should then give the cash sum to the participant and ask them to sign (or thumb-print) the form to indicate they have received the money.

**Ensure the Quality of Data Collected**

**Debrief sessions**

The field team managers and coordinators will meet with data collectors (field team members) daily to monitor progress and ensure quality. It is crucial to schedule sufficient time for daily debriefing sessions so that the notes can be discussed in depth, the audio recordings listened to as needed and the summary form completed with all key points from each FG/KII. In some cases, the summary form and notes may be the sole data source for analysis. Field managers and members from the analysis team will meet at least monthly to discuss study goals, progress, modifications, recruitment, data analysis, confidentiality and other issues or concerns. Any instances of protocol deviations or other problems identified during the meetings will be addressed by the investigators.
Data management and storage
All staff involved with handling and analyzing the data will be trained to adhere to all data collection, management and analysis procedures. Transcripts will be spot-checked against their recordings by study staff fluent in the interview languages to ensure accuracy. Socio-demographic data from the enrollment forms will double-entered and monitored by study staff to reduce errors.

Field visits for monitoring
In addition, in all stages of the formative assessment, a supervisory group comprised of key stakeholders will conduct field visits for quality assurance checks of all procedures.

Transcription and Translation
KIIIs and FGs, and note-taking during other formative activities will be conducted in the local languages. Transcription of qualitative data will be carried out as soon as possible by the analysis team. Transcribers will be fluent in the local languages. Should translation of all qualitative data into one principal language be required, audio recordings will be prepared using a direct meaning-based translation into that principal language or directly if the interviews are conducted in that principal language.

Key points
- Select target HRPs in light of evidence found through Component 1 (Review of existing data).
- It is key to make FG participants feel comfortable in order to encourage participation and active discussion – a skilled moderator will be important in achieving this as well as explaining the value of their contributions during the discussion.
- Good note-taking and immediate de-briefing sessions are critical to the analysis and use of data from FGs and KIIIs, particularly when a more formal analysis is not planned.
- Several practice FGs should be carried out in order for the moderator and note-taker to excel at their responsibilities.
Module 1: Planning Targeted HRP Surveillance and Response

Step 5: Implement Component 2: Rapid Qualitative Data Collection

Example from the field

Qualitative Study in Indonesia

In the malaria-eliminating district of Aceh, Indonesia, a qualitative formative assessment was conducted in 2016 to better understand risk and mobility patterns of high-risk populations, and to collect more detailed information around opportunities and barriers to access forest-going populations for surveillance and response. This qualitative assessment aimed to look deeper at findings from a previous study that identified risk factors through passive and reactive case detection in Aceh. The main findings of this previous study were that most all cases were adult males that traveled to the forest, relatively few cases were found around the index case household, and that there was ongoing transmission of Plasmodium knowlesi.

Focus group discussions and in-depth interviews were conducted in four study sites in Aceh (Lhoong, Kuta Cot Glie, Saree, and Krueng Sabee) followed by community mapping exercises to identify locations frequented by high-risk populations. In total 20 focus group discussions were conducted with 173 participants, which included malaria patients and co-workers, community health workers, community members living within and outside of the forest fringe. Seventy two key informant interviews were conducted with malaria patients, employers, community leaders, NGO workers, government authorities, community health workers and health staff.

Key themes that emerged from the qualitative assessment included insights into the different local high-risk forest worker populations, which included farmers, loggers, miners, forest rangers, their social networks, risk behaviors (sleeping in the forest without nets, evening work shifts, etc.), and health seeking behaviors. Based on these findings, peer-referrals and venue-based recruitment methods were proposed as areas for future investigation to target screenings.

Venue mapping during a focus group discussion in Aceh, Indonesia
Step 6: Implement Component 3: Mapping Access Points

Mapping and Enumeration

Prior to implementing any venue-based surveillance and response strategy (detailed in Module 4) or conducting a time-location sampling (TLS) survey (Module 3), it is necessary to conduct formative mapping and enumeration of HRP at specific venues. Mapping and enumeration of venues is an iterative process that builds on other formative methods (including KIIs and FGs).

Early identification of these venues can also serve as potential locations for recruiting participants for FGs and in-depth KIIs.

Proposed procedures include:

1. Mapping locations frequented by HRPs: this leads to a physical map and listing of venues
2. Identifying potential high-attendance times at these locations through interviews and focus groups
3. Determining the number of HRP members likely to be present during high-attendance times through direct observation (“enumeration”)

If the formative assessment leads to a decision to carry out a TLS survey, see Module 3 for guidance on preparing for and carrying out the survey, including how to select a representative sample of locations and times when HRPs will be enrolled, conducting the questionnaire and malaria testing at selected venues, and other key steps.

Map Existing Locations with HRP Venues

The following types of locations and areas will be mapped by drawing on existing data, local expert knowledge (including from KIIs and FGs), and direct observation:

- Areas where HRPs meet and interact with each other including religious institutions, work sites, border crossings, travel hubs, forest entry points, parks, street locations, markets, bars, restaurants, tea houses, as relevant
- Malaria and health services offered, both those used and not used by HRPs
- The main zones of activity of community-based organizations that work with HRPs
- Locations of potential barriers to the implementation of interventions; for example, areas off limits to health outreach due to security, policing or other restrictions

Hard copy maps and listings of locations can both be developed. However, no personal names should be included and the names of streets, roads and/or venues may be changed to protect the target population if there are concerns related to illegal activities.

Initial mapping should be conducted during the formative phase. If a TLS survey will be conducted, mapping information should be updated just before the survey begins (see Module 3).

Recruit Field Staff

The first steps of mapping—identifying potential HRP locations and potential high-attendance times at these locations—can be done during KIIs and FGs as a part of Component 2 (Qualitative data collection). Additionally, the field coordinator and 1–2 staff members (which may be the same staff who conducted qualitative data collection) are required to conduct venue verification visits and enumeration at each site.

Verify Venues

Following FGs and KIIs, formative staff will visit the potential venues identified. The purpose of the verification visits will be to:

- Confirm the location and details of how to access the site.
- Make a rough map of the venue and surroundings. Designate specific areas where venue-goers will be intercepted. Identify discrete places at or nearby the venue where participants will be interviewed and tested. Review these plans with the owner/manager. (See sample venue map in the Appendix V.)
• Determine safety and accessibility of the site for conducting surveys and other surveillance activities.

• Meet with venue officials (owner or managers) to:
  » Validate information on days and times of high attendance of HRPs obtained from KIIs and FGs
  » Confirm that the venue is still active, whether there are plans for closure, and whether there are times of the month or year when it typically closes
  » Determine any patterns in the types of individuals that tend to be present at the different days and times (e.g. due to work shifts, travel patterns or other patterns that may influence risk); information on patterns of attendance will be useful when planning surveillance
  » Obtain permission to conduct interviews and testing inside or outside the venue (whether as a part of routine surveillance or a TLS survey)

Conduct Enumeration

Enumeration is the process of directly observing and counting the number of individuals present at a venue during a particular time window, generally a time when high attendance is expected. The result of enumeration is a standardized count of patrons who belong to the HRP of interest.

There are two different standardized methods for obtaining a count of the number of individuals belonging to the target population who are present at a venue in a specific time period. Enumeration will be conducted at all potential venues using the enumeration summary form (Appendix IV).

• Type I enumeration should be used at venues exclusively attended by the HRP. For example, if forest workers are the HRP, then a forest mine would fit under Type I enumeration because all individuals present are likely to be part of the mining operation. In general, work sites are likely to fall under Type I. One or two staff members will count individuals attending each Type I venue during the specified high-attendance period.

• Type II enumeration should be used at venues attended by a “mix” of people. For example, a public market thought to be a good place to find forest workers would be a “mixed” venue, since many people who are not forest workers are likely to be present. Two staff members will conduct Type II enumeration. One will count individuals consecutively and one will systematically approach and briefly interview individuals to determine whether they belong to the HRP. A set of standard eligibility criteria should be used. However, it is important to consider how individuals may react when approached and asked such questions. If the venue is a public and/or primarily social space (e.g., a bar), is often best for staff to briefly engage the patron in conversation, clearly identify the project and affiliation, and then conduct the screening verbally in a conversational style, and upon retiring from the patron recording results on a log sheet.

It is best to conduct enumeration at all venues and from start to finish of each high-attendance period. However, if resources do not allow, enumeration may be conducted at a random sample of venues instead and/or during only part of the high-attendance period. For example if the high-attendance period is Wednesdays from 18:00 to 22:00 (4 hours), enumeration could be conducted for a shorter 30- or 60-minute period during this window. To extrapolate or “scale-up” the counts to estimate the number of HRPs present during the entire window, the field team will need to make a judgment:

• If individuals are constantly arriving and leaving, then the observed count should be scaled up. For example, if staff enumerated for 60 minutes of a 4-hour period, then multiply the count by 4).

• If mostly the same individuals seem to be present during the entire period, then the scale-up factor should be adjusted appropriately.

In both Type I and Type II enumeration, duplicate visits by the same individual should not be counted.

Following venue enumeration, all venues identified should be listed on the Sample universe of venues enumeration form (Appendix V) will be used to record all enumeration results. This list should be updated again during fieldwork prior to the survey and throughout a TLS study. Additional details are described in Module 3.

Optional: Develop the Venue Sampling Frame

If the mapping and enumeration supports the viability of a venue-based surveillance and response strategy or a TLS survey, then a preliminary sampling frame will be developed based on the information gathered through KIIs, FGs, mapping, verification visits and enumeration. The initial list of venues and
associated day-time periods are identified using the venue enumeration form (Appendix II). The list will then be reviewed by key stakeholders to provide an opportunity for additions and/or corrections.

**Review the venue sampling frame template**

The venue sampling frame is a complete list of venues and day-time periods at each venue (e.g., Rigos Gold Mine Tuesdays from 17:00 to 21:00) that are part of the HRP population. The sampling frame will also contain the additional information listed below and will be formatted as in Figure 5:

- Name of the venue
- Day, start time, and end time
- Location details or address of the venue
- Contact information of the venue owner/manager
- Number of HRP members expected during the VDT
- A unique venue ID
- A unique VDT ID

**Venue and VDT ID codes**

Each venue and day-time period (VDT) listed in the sampling frame should be assigned a unique ID. How to construct these IDs depends on the specific context. For more information and examples see section Venue and VDT identification codes of Module 3 (TLS Surveys).

Additional details on procedures to define VDTs are also provided in Module 3.

**Figure 5. Example format of a sampling frame for forest workers**

<table>
<thead>
<tr>
<th>Venue ID</th>
<th>Venue name</th>
<th>VDT ID</th>
<th>Day</th>
<th>Time</th>
<th># Forest workers expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>B001</td>
<td>Rigos Mine</td>
<td>B001-1</td>
<td>Wed</td>
<td>20:00–22:00</td>
<td>10–15</td>
</tr>
<tr>
<td>B001</td>
<td>Rigos Mine</td>
<td>B001-2</td>
<td>Thurs</td>
<td>20:00–22:00</td>
<td>8–10</td>
</tr>
<tr>
<td>B001</td>
<td>Rigos Mine</td>
<td>B001-3</td>
<td>Fri</td>
<td>19:00–23:00</td>
<td>15–20</td>
</tr>
<tr>
<td>E001</td>
<td>Smith Processing Plant</td>
<td>E001-1</td>
<td>Mon</td>
<td>05:00–08:00</td>
<td>40–60</td>
</tr>
<tr>
<td>E001</td>
<td>Smith Processing Plant</td>
<td>E001-2</td>
<td>Mon</td>
<td>12:00–16:00</td>
<td>30–40</td>
</tr>
<tr>
<td>C001</td>
<td>Ishowe Palm Plantation</td>
<td>C001-1</td>
<td>Mon</td>
<td>20:00–23:00</td>
<td>5–10</td>
</tr>
<tr>
<td>C001</td>
<td>Ishowe Palm Plantation</td>
<td>C001-2</td>
<td>Tues</td>
<td>20:00–23:00</td>
<td>5–10</td>
</tr>
<tr>
<td>C001</td>
<td>Ishowe Palm Plantation</td>
<td>C002-3</td>
<td>Thurs</td>
<td>08:30–10:30</td>
<td>20–25</td>
</tr>
<tr>
<td>C001</td>
<td>Ishowe Palm Plantation</td>
<td>C002-4</td>
<td>Thurs</td>
<td>20:00–23:00</td>
<td>5–10</td>
</tr>
</tbody>
</table>

**Key points**

- Review information from FGs, KIIs and direct observation to identify locations where HRPs are likely to be found.
- Map all venues within locations and areas on hard copy maps and develop comprehensive listings of venues.
- Verify all venues by visiting and talking with the owner/managers.
- Collect key information at each venue prior to enumeration such as approval to conduct surveys, location safety and accessibility.
Focus groups with community health workers and meetings with community leaders were used to identify and map potential high-risk locations ("venues") in selected rural areas of the Zambezi region of Namibia in 2015. This information was gathered as part of a formative assessment and planning phase for a malaria survey that used time-location sampling (TLS).

Focus group participants identified specific places where individuals regularly congregate in large numbers between sunset and sunrise that they felt met the predefined venue eligibility criteria. Several types of venues were identified, including bars, churches with evening services, and police camps. Subsequent data collection was focused on bar and church venues, as these were considered most likely to be accessible and to comprise the largest venue-going populations that could potentially be targeted for malaria prevention.

Best practice in formative assessment for TLS surveys is to gauge attendance levels to support planning the survey by directly observing the number of individuals present at suspected peak times at the venues identified (i.e., a process called "enumeration"). Due to time limitations, enumeration was not done through direct observation prior to the TLS implementation. Instead, information on peak days and times was obtained from venue owners and used to construct the VDT sampling frame.

Two challenges were encountered during the TLS implementation that highlighted key lessons for the formative assessment. First, there was lower than expected attendance and participation rates at some venues and times, which led to some VDTs being dropped from the sampling frame. Second, repeat visits to the same venues were necessary to meet the sample size within the low (25) number of venues identified. Both challenges highlighted the importance of allocating sufficient time and resources to conduct site verification visits and enumeration through direct observation during the formative. Enumeration visits would have helped to anticipate these challenges and plan for a longer data collection period, thus placing less burden on each individual venue.

---

**Example from the field**

**Venue Mapping and Enumeration in Namibia**

Focus groups with community health workers and meetings with community leaders were used to identify and map potential high-risk locations ("venues") in selected rural areas of the Zambezi region of Namibia in 2015. This information was gathered as part of a formative assessment and planning phase for a malaria survey that used time-location sampling (TLS).

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---

**A) the venue locations across the study area**

**B) detailed map of household distributions in relation to venues in the Seshke area**

**C) the locator map of Zambezi region**
Step 7: Analyze and Use the Data

The type of data analysis you will conduct will depend on the resources and capacity available and the needs of the program. Each component of the formative assessment will require a different analysis approach but the main aim is to answer the research questions you have defined in response to your specific objectives and inform programmatic objectives around targeted active surveillance strategies.

Implement the Data Analysis Plan

Go systematically through the data analysis plan outlined for each component of the formative assessment and developed in Step 3 of this module. Analyze the data collected during each activity in terms of the key points below.

Component 1: Existing data

Updated analyses of existing surveillance data and published reports and manuscripts provide important information on transmission patterns in relation to person, place and time. Profile malaria cases across time (annual and monthly) and in terms of species and individual characteristics, including: socio-demographic, travel history and occupational factors. If you have multiple years of data, you can calculate base rate changes between years. This will help to identify potential high-risk groups as well as document infection trends over time and seasonal patterns. The proportion of cases with specific socio-demographic characteristics can be compared to aggregate census data to identify whether age and gender are likely risk factors.

In addition, case numbers and local and imported incidence rates should be calculated for the smallest geographical area for which there is reliable population data (i.e. enumeration area or health catchment area). Where capacity exists, geographical maps of incidence rates can be generated and used to visually identify ‘hotspots’ of transmission as well as statically evaluate environmental correlates such as land cover, rainfall and proximity to water bodies. It is possible to use case-level geographical data from RACD to generate fine scale risk maps, such as done by DISARM, a platform supporting automated risk-mapping for disease surveillance and risk monitoring.

Component 2: Qualitative data

As outlined in the data analysis plan (Step 3), a briefer more focused analysis may be carried out based on note-taker forms and debriefing sessions or a more systematic qualitative analysis involving coded transcripts if resources allow. Whichever type of analysis is done, key emergent themes and underlying linkages between these themes need to be identified, in order to build up a picture and understand similarities and differences in behaviors and access to health services that lead to higher risk of malaria in target populations or offer opportunities to access them. The analysis should focus on answering the key research questions and ultimately inform programmatic action around packaging interventions for these populations, accessing them for screen and treat strategies and delivery of interventions, and overcoming barriers prevent equal health outcomes.

Component 3: Venue identification and mapping

The venue identification and mapping activities generate lists of venues and direct observations of these locations, to identify places and times in which HRPs can be accessed for surveillance and response. Analysis of these data should be straightforward to inform programmatic activities or feed into development of a structured sampling frame for TLS (Module 3).

Translate Findings into Action

Depending on the stated aim of the formative assessment, use the findings to directly inform planning for HRP surveillance and response strategies or plan for future studies. Accessing high-risk populations for screening and treatment, and delivering acceptable interventions should be a high priority. The findings from the formative assessment should be articulated in a final report and disseminated to all stakeholders in meetings.

Use the Data in Programming

The data from the formative assessment can be used in many ways to directly inform programming and also to build a strong evidence base to advocate for increased funding for operational research and surveillance activities. The data may also
provide information around messaging for high-risk populations and address barriers to accessing health services identified in the qualitative component.

The following are examples of how data collected during a formative assessment might be translated into actions for NMCPs.

**Use of data to design targeted active surveillance**
- Pilot surveillance strategies that have high acceptance, coverage and/or case detection rates in areas where the review of existing data identifies that it will have the most potential impact.
- Design surveillance strategies to avoid anticipated barriers or challenges and take advantage of opportunities identified by target populations (for example, border screening on the main road and separate from the post and using peer referral to raise awareness and acceptance).
- Implement surveillance strategies in specified venues where the target population is known to congregate.

**Use of data in advocacy**
- Educate political leaders and encourage them to back policies that will increase health access to high-risk groups.
- Use data to illustrate opportunities for targeted surveillance strategies and attract additional funding.

**Use of data to target communications and messaging**
- Identify community events or strategies through which to raise awareness of malaria prevention, symptoms and treatment.
- Identify factors affecting malaria treatment seeking that can be addressed through outreach campaigns.

---

**Key points**
- Remember to refer to your survey objectives, key questions and your data analysis plan for guidance through the data analysis phase.
- Use cross-tabulations to highlight differences between groups/categories of survey participants and compare case profiles to census data to identify demographic risk factors.
- Determine the findings which merit further studies or show promise for effective active surveillance and response strategies in high-risk populations.
- The survey report should contain enough detail for a layperson to understand the methods, results and implications.
- Organize a stakeholders’ meeting to disseminate results of the formative assessment and focus on key areas in which the results can be used to inform surveillance and response, advocacy and messaging to target populations.
A formative assessment was implemented in Champasak Province, Southern Laos, to identify and characterize populations at highest risk for malaria infection. The aim of the research was to better understand the demographics, occupations, seasonality of work, migratory patterns, health-seeking behaviors, social networks, and willingness to participate in targeted malaria interventions amongst high-risk populations (HRPs).

Formative findings suggested that the majority of HRPs are village-based Lao nationals who engage in a diverse set of forest-based and agricultural activities depending on the season. All levels of health staff reported that malaria was strongly linked to forest-going activities, but acknowledged that active outreach among HRPs could be challenging for some sub-groups, especially those involved in illegal or semi-legal activities. Health staff also reported challenges in interventions targeting ethnic minorities due to socio-cultural and linguistic barriers.

Contrary to general consensus, very few HRP congregation sites were identified. These findings suggested that venue-based surveillance – as successfully implemented in other settings – would be poorly aligned with the target populations and hence an ill-suited strategy.

However, this formative work revealed that village-based respondents and surveyed HRPs were highly welcoming of active malaria testing and treatment activities. Importantly, HRPs also expressed willingness to carry GPS loggers while in the forest to offer insight into their spatial and temporal movements, and a willingness to assist study staff in contacting their forest-going peers to facilitate further testing.

These study findings provided the basis for designing a package of targeted interventions being evaluated as part of a community-randomized implemented from 2017–2018. This study incorporated two types of test and treat activities, both using novel high-sensitivity RDTs. Peer navigators (who engage in forest-based activities themselves) were used to actively seek out HRPs in forested areas, rice fields, and other non-village sites, for focal test and treat activities. This strategy was supplemented by two rounds of community-based test and treat at the village level. Together these two active case detection strategies targeted both symptomatic and asymptomatic parasite reservoirs, with the aim of accelerating progress toward the 2030 national elimination goal.
## Survey Eligibility Screening Form for MMPs

Instructions: Complete the entire screening form for every potential study participant during the study period (“candidate”). Only questions that are not in brackets should be made to the participant. If the person is eligible to enter, continue with the informed consent and if the candidate consents, administer the survey questionnaire.

Note: The Informed Consent form should be adapted to meet any organizational/institutional requirements.

<table>
<thead>
<tr>
<th>[Unique ID]</th>
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</thead>
<tbody>
<tr>
<td>[Date]</td>
<td>_ _ / _ _ / _ _ _ _ (dd/mm/yyyy)</td>
</tr>
</tbody>
</table>

Does the candidate have confirmed malaria infection by microscopy and/or RDT?

- [ ] microscopy
- [ ] RDT
- [ ] neither → Participant is not eligible

*Note: only applicable if recruiting index cases at health facility*

“How old are you?”

- [ ] Age in completed years _____
- [ ] Under 18 years → Participant is not eligible

“Can you comfortably speak and understand the [study language of choice] language?”

- [ ] Yes
- [ ] No → Participant is not eligible

“Have you participated in a survey for this study before?”

- [ ] No
- [ ] Yes → Participant is not eligible

*Note: if recruiting imported index cases at a health facility as a “seed” for other MMPs, may restrict time period from past 7 to 60 days.*

“Did you spend the night outside of [study area] anytime in the past 60 days?”

- [ ] Yes
- [ ] No → Participant is not eligible

“Please tell me all of the places you spent at least one night outside of [study area] during this time period, and the primary reason for travel.”

*List district if within study country, list country AND region/province if outside of study country*

- Spending the night “in-transit” on the way to another place does not qualify as a destination to be listed. You must have a reason to be there other than just travelling through (i.e. visiting family, pilgrimage, work, recreation)

<table>
<thead>
<tr>
<th>Destination</th>
<th>Reason for travel</th>
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</table>

Are any of the travel destinations listed above either a) outside of study country or b) in the following list of districts?

*Refer below for list of eligible districts.*

[INSERT LIST OF HIGH-RISK DISTRICTS]

- [ ] Participant is eligible to participate as an MMP. Continue to informed consent.
- [ ] No → Participant is not eligible
Appendix II. Informed Consent

Note: The Informed Consent form should be adapted to meet any organizational/institutional requirements.

Formative Assessment to Characterize Imported Malaria and Identify Strategies for Accessing High-Risk Mobile and Migrant Populations in [country]

This is a research study focused on characterizing imported malaria cases in order to help [country] reach the goal of eliminating malaria. You are being asked to participate due to your knowledge of malaria and involvement in health work in [country], or because you tested positive at one of the health facilities participating in the study or were identified as a member of the mobile migrant populations by another individual who tested positive. The goal of this study is to not only characterize imported malaria but to also identify strategies for accessing high-risk mobile and migrant populations in [country].

This study is funded by ____________________________.
The Principal Investigators for this study are ____________________________ who are researchers at ____________________________________________.

Your participation is voluntary; if you have questions you may ask researchers, all of your responses will be anonymous and kept confidential. Please take your time to make your decision.

Confidentiality

If you agree to participate, you will be asked to participate in a one-on-one interview or discussion within a group of 6 to 10 individuals. A researcher will ask questions to assess potential risk factors for malaria including travel history and use of measures to protect against mosquito bites in your house. You can stop participating in the study at any time. Participation or refusal to participate in this study will not affect your medical care or access to public health services in any way. We will not inform anyone of your participation in the study and your name will be kept confidential by replacing it with a number/identifier that will be used throughout the study.

Consent

I am 18 years or older. □ Yes □ No

I understand that my participation is voluntary. □ Yes □ No

I understand that I do not have to answer questions I do not wish to answer and can stop the interview at any time. □ Yes □ No

I understand my name and other personal information will be kept confidential. □ Yes □ No

If you wish to be in this study, please sign or provide a thumb print below.

Date_________________________  Participant’s Signature/Thumb Print for Consent

Date_________________________  Witness signature (if participant does not speak/read English)

Date_________________________  Person Obtaining Consent – Printed Name
### Appendix III. Enrollment Forms

#### Focus Group Enrollment Form

<table>
<thead>
<tr>
<th>No.</th>
<th>Unique ID of Participant</th>
<th>Unique ID of Referring case/person</th>
<th>Age</th>
<th>Community position</th>
<th>Gender M/F</th>
<th>Occupation</th>
<th>Obtained consent? y/n</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</table>

#### Key Informant Enrollment Form

<table>
<thead>
<tr>
<th>Name</th>
<th>Gender</th>
<th>Date Approached</th>
<th>Successful contact?</th>
<th>Category of KI</th>
<th>Interested?</th>
<th>Interview arranged (date)</th>
<th>Contact No.</th>
<th>Location</th>
<th>Unique ID assigned (6 digits)</th>
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</table>
Appendix IV. Enumeration Summary Form

Forest Workers’ Malaria Survey

To be completed by the enumerator

Area name: _______________ Venue Name: _______________ Venue #: _____ Event #: _____

Team lead: _______________ Enumerator: _______________ Date of visit: _____ / _____ / 20__ __

Type of venue: ☐ Logging ☐ Mining ☐ Agriculture ☐ Processing plant ☐ Permit office
☐ Other-specify: _______________

VDT period: Day: M Tu W Th F Sa Su Start: ___:___ am pm End: ___:___ am pm

Actual enumeration period: Day: M Tu W Th F Sa Su Start: ___:___ am pm End: ___:___ am pm

(should be same as VDT period unless the sampling event was terminated early)

Observed # potential participants enumerated during enumeration period (number clicked): ___________

Draw area of intercept area or line in this space

Comments (weather, safety, etc)

Supervisor sign off: __________________________ Team sign off: __________________________
Appendix V. Sample Universe of Venues Enumeration Form

Use a new form for each interview, focus group, and venue verification visit.

Informant ID: ___________________________________________________________  Date: ___/___/_______

In which locations do members of the HRP that you are in contact with meet?

In what other places can we find more members of this HRP?

<table>
<thead>
<tr>
<th>Code</th>
<th>Location name</th>
<th>Address</th>
<th>Venue type</th>
<th>Operating days and hours</th>
<th>Peak days and hours (when attendance is greatest)</th>
<th>No. of forest workers who meet/work at this place during peak times</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Min</td>
</tr>
<tr>
<td>Example</td>
<td>Rigos Mine</td>
<td>Km. 70 of Highway 1</td>
<td>Mine</td>
<td>Th 6pm–8pm</td>
<td>Fr 6pm–10pm Sa 6pm–12am Fr 9pm–10pm Sa 8pm–11pm</td>
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Appendix V. Sample Universe of Venues Enumeration Form | 46
Appendix VI. Sample Venue Map

Name of venue: Rigos logging site
Venue ID: A010
Site verification visit: 03/04/2017
Map last updated: 05/04/2017

Notes:
Alternate intercept areas, in case of problems:

- Path to rest area (use fixed line enumeration)
- Sleeping quarters (after 6pm, proceed from #1 to #6)
## Appendix VII. Reimbursement Log

**Focus Group name:**

**Dates:**

**Country:**

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<th>Mode of transport</th>
<th>Receipt provided?</th>
<th>Cost of transport</th>
<th>Participant signature/thumb-print</th>
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