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

Module 4: Adapting Reactive Case Detection

The Malaria Elimination Initiative

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

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### Acronyms and Key Terms

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<th>Acronym</th>
<th>Definition</th>
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<tbody>
<tr>
<td>CHW</td>
<td>Community health worker</td>
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<tr>
<td>DBS</td>
<td>Dried blood spot</td>
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<tr>
<td>ID</td>
<td>Identifier</td>
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<tr>
<td>PPS</td>
<td>Probability proportional to size</td>
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<tr>
<td>SB-RACD</td>
<td>Socio-Behavioral Reactive Case Detection</td>
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<tr>
<td>SRS</td>
<td>Simple random sampling</td>
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<tr>
<td>TLS</td>
<td>Time-location sampling</td>
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<tr>
<td>UPC</td>
<td>Unique Participant Code</td>
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<tr>
<td>VDT</td>
<td>Venue-day-time period</td>
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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 4: Adapting Reactive Case Detection

What is Module 4?
Module 4, Adapting Reactive Case Detection, Socio-behavioral reactive case detection (SB-RACD), provides a framework and approach for targeted screening of specific sites and social contacts as part of routine surveillance, based on a set of risk criteria applied to an initial, or index case identified at a health center or in the community. This form of active case detection can also be called "socio-behavioral reactive case detection (SB-RACD)". Module 4 will be useful in contexts where transmission occurs away from home, such as in the forest, worksites, or travel destinations, and where household RACD is likely to have a low case yield. Implementation of this approach can improve targeted surveillance and response in known high-risk and hard-to-reach groups.

Module 4 is designed to guide surveillance staff in adapting reactive and active case detection to high risk populations who may be challenging to access through routine community and household visits. The guide describes SB-RACD where high-risk individuals are identified, tested and treated through peer networks or specific locations ("venues") where they congregate. This guide should be adapted to the specific goals and context of the high-risk population of interest and findings from formative assessment. The guide is written for a target population of forest workers, but can be adapted for use with other similar target populations.

Figure 1: Generating and using evidence: steps in the surveillance cycle for targeting HRPs

- **Step 1. Assess existing and new data to identify, tailor and target interventions for HRPs**
  - Module 1: Planning Targeted HRP Surveillance and Response

- **Step 2. Establish risk factors and characterize suspected HRPs**
  - Module 2: Identifying Risk Factors Using Case-control Studies

- **Step 3. Implement ongoing surveillance to monitor trends in HRPs**
  - Module 3: Monitoring Malaria Transmission and Intervention Coverage

- **Step 4. Adapt surveillance and response strategies and continuously refine targeted interventions based on surveillance findings**
  - Module 4: Adapting Reactive Case Detection

Ongoing surveillance allows malaria programs to ensure that surveillance and prevention strategies are based on the most up-to-date transmission and operational information.
This guide will cover:

- Assessments that should be conducted prior to implementing SB-RACD
- Procedures for case interviews, including screening for eligibility for SB-RACD and eliciting information on worksites and co-worker referrals
- Procedures for pre-screening worksites and contacts
- Procedures to test and interview workers at high-risk worksites (venue surveillance) and other peer co-workers who are more easily contacted in the community where they live, away from worksites (peer network surveillance)
- Roles and responsibilities of staff
- Forms for data collection

Other Helpful Tips

- Review the guide during staff training to ensure understanding of roles and responsibilities.
- It is helpful for each staff member to carry a copy of the operations guide with them at all times.
- Any procedural changes should be documented in writing and attached to the operations guide.
- Regular practice sessions and refresher courses help maintain quality of work. The field staff should be regularly given the opportunity to request clarifications about the implementation of the operations guide.
Active case detection (ACD) is the WHO-recommended 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. Usually, reactive case detection is conducted in households in close proximity to the location of the index case, due to the potential for geographic clustering. However, in settings where the primary risk factors for malaria transmission include occupational exposure and other behaviours such as working in the forest, reactive case detection needs to be adapted to those individuals, populations, and locations at highest risk. This guide presents the key considerations and procedures for adapting reactive case detection to these high risk populations, using the example of forest workers, based on evidence that the majority of transmission occurs in the forest, and cases among forest workers may be missed by passive and other forms of malaria surveillance in place.

SB-RACD is a form of active surveillance, designed to identify cases among high-risk forest workers who may have had a common exposure with an index case at shared forest worksites, by employing specialized follow-up methods determined to be appropriate for this population through formative assessment. These follow-up methods include:

- Conducting testing at forest worksites where cases have recently worked
- Following up with individual forest work co-workers using contact information provided by the index case

To plan for SB-RACD, a formative assessment phase should be carried out, which includes mapping worksites and determining the feasibility and logistical requirements of surveillance through venues or peer networks. Steps for conducting the formative assessment are detailed in Module 1 of the HRP guide. Stringent safeguards will be implemented to restrict access to all forms and documentation to ensure confidentiality of all data collected from cases and contacts. SB-RACD is a part of routine surveillance; however, if conducted by a research organization, ethical considerations such as informed consent may need to be incorporated.

SB-RACD will be triggered for any index case that is diagnosed at a participating health facility who has any risk factors determined through Modules 1 and 2. In the case of forest workers, a useful criterion is if the patient reports working in the forest or forest-fringe (that is outside of any village) and was present there anytime between sundown and sunup in the past 60 days. These criteria can be adapted based on the local context and population of interest, and as a result of findings from Module 1 and 2 of this guide.

Once SB-RACD is triggered, designated staff will attempt to find and test other forest workers who worked (or currently work) at the forest worksites where the index case was in the past 60 days, and thus may have similar exposure to malaria. Staff will try to find these other forest workers within a set time period through peer networks or venues. The purpose of the time window is to ensure that individuals found at venues or through peer networks are likely to have been exposed during the same period and that testing is done in time to quickly identify and treat any secondary infections. A time window of 7 days may be appropriate where *P. falciparum* predominates and a longer period may be more appropriate where *P. vivax* is more common.

**Peer networks**

In this method, staff ask the index case to provide contact information (name, telephone numbers, and household location) of any co-workers who worked with them at the same worksite between sundown and sunup, or traveled with them, in the past 60 days. Staff then follow-up with these “peer referrals”, pre-screen them to confirm they were at one of these sites or traveled with the index case and are willing to be tested and provide information about their potential exposure, and arrange a convenient meeting place to undergo testing and the brief interview.

Forest-goers may also be actively recruited for malaria testing through peer navigators (PNs) – forest workers who seek out their peers to encourage testing and treatment. Peer navigators are community members with full-time, paid positions, who have shared socioeconomic status, racial/ethnic identity, language and ‘lived experience’ as target groups.
Venues

In addition to the above, staff will ask index cases for information about all worksites in the forest or forest fringe where they were present at any time between sundown and sunup in the past 60 days. Staff will pre-screen the worksite by contacting worksite officials (owner/manager); if the worksite is safe and accessible to visit, a minimum number of usual workers (usually at least 6) are expected to be there at the time of the field visit, and the officials authorize the visit, staff will travel to the worksite and offer testing and a brief risk interview to all workers present. If the worksite cannot be visited, staff will coordinate with the officials to arrange an alternate location where workers from the site can be tested and interviewed within the 7-day time limit.

Participants who test positive by RDT will receive their test results immediately and, if positive, will receive treatment on-site, as well as information on local prevention and testing services.

When Is SB-RACD Recommended?

Active surveillance through venues is appropriate when potentially high-risk individuals tend to work, sleep, or congregate at locations that are identifiable and where it is safe and feasible to conduct malaria testing and treatment. Active surveillance through peer networks is appropriate when members of the high-risk population tend to know one another and are willing and able to refer others by providing contact information, and a venue may or may not be identifiable or accessible. These approaches can be applied together to reach the most individuals at potential risk as possible and are not mutually exclusive.

While details ultimately depend on local conditions, SB-RACD could be appropriate for the populations below (potential venues are listed after each):

- Forest workers - at forest worksites, sleeping camps, processing plants, permit offices, supply stores
- Truck drivers – at common rest stops, weighing stations and border crossings
- Agricultural workers – at worksites and roads leading to works sites
- Construction workers - at worksites
- Security guards - at worksites
- Miners – at mining camps
- Fishing populations – at fishing camps
- Seasonal migrant workers – at border crossings or worksites

The basic steps for conducting SB-RACD are:

Preparation

1. Conduct formative assessment
2. Conduct fieldwork immediately prior to SB-RACD implementation

SB-RACD Implementation

1. Interview and screen cases to determine if they are eligible for SB-RACD.
2. Elicit information from cases regarding worksites and co-worker referrals in the past 60 days.
3. Pre-screen worksites and peer network contacts for eligibility.
4. Venue investigations: Travel to eligible worksites to conduct parasitological testing and a brief interview of all eligible workers present. If the worksite is not accessible, arrange an alternative location with venue officials (if applicable).
5. Peer follow-up: Meet each peer network contact at an agreed-upon convenient location that has conditions to ensure confidentiality. Conduct parasitological testing and a brief interview.
6. Conduct specimen collection, dried blood spot (DBS) preparation, malaria rapid diagnostic testing (RDTs), and provide treatment for individuals who test positive during these site visits/meetings.

Complete the above procedures within a set timeframe (e.g., 7 days after diagnosis of the index case), in order to increase the chances of detecting new cases linked with the case and limit onward transmission.

A flowchart of the detailed steps is presented in Appendix I.

This guide was developed in order to ensure consistent and rigorous case finding methods. Adherence to these procedures will ensure that targeted case finding is carried out effectively and appropriately for the target high-risk population.
Step 1. Preparing for SB-RACD

Conduct a Formative Assessment

A Formative Assessment should be carried out before finalizing the SB-RACD protocol and this SB-RACD operations guide. You can find a separate protocol and operations guide for formative assessment in Module 1 of this Guide. Formative assessment is an important step for planning SB-RACD and other targeted surveillance strategies in high-risk populations. It will help determine key information, including:

1. An understanding of past trends in malaria cases
2. Whether the size of the high-risk population is large enough to warrant SB-RACD
3. Whether members of the population may be missed by current surveillance (due to asymptomatic infections or limited testing)
4. Willingness of individuals to participate in SB-RACD, obstacles to participation and ways to overcome them
5. Information about exposure needed to develop an operational definition of the high-risk population for surveillance (e.g., seasonal workers who travel from [Insert place] to work in gem mines in [Insert place])
6. Whether surveillance through venues and/or peer networks is likely to be feasible and effective
7. An initial mapping of venues and estimates of attendance levels to support planning and determine staffing requirements
8. Additional operational information:
   » Gatekeepers who may facilitate or impede access to the population
   » Measures needed to provide adequate confidentiality, privacy or legal protections due to any illegal or stigmatized behaviors or mistrust.
   » Minimum incentive levels, if any, required for participation
9. Preferences for testing locations, hours and profile of SB-RACD staff

Review the Rationale for SB-RACD

The formative assessment for the forest worker example population included direct observation, mapping, and enumeration of places where forest workers gather (including forest worksites), interviews with forest work employers, forest rangers, community leaders, and health leaders and other key informants and focus groups with forest workers and health workers.

In the forest workers example, surveillance through venues and peer networks appears to be feasible to identify forest travel groups linked to the index case.

With respect to venues, the formative assessment revealed:

- Where forest worksites are located.
- Forest work employers appear interested in their workers receiving testing.
- Forest workers expressed interest in being tested if approached at their worksites.
- Few worksites would be off limits to conducting RACD (due to safety and accessibility).

With respect to peer networks, the formative assessment revealed that:

- Forest workers tend to work and travel in groups and know co-workers/travelers by name.
- Individuals are generally willing to refer others for testing.

Other RACD methods, namely household RACD, are likely to miss forest workers in this area due to their extensive work and travel away from the household; previous experience with household RACD has not identified many additional cases and suggests that cases are clustered more by risk behavior (forest work) than household location.

Passive surveillance may also miss cases among forest workers because:

- Many forest workers reported presenting to public health facilities only when symptoms became severe.
- To avoid a trip back to the nearest facility, workers frequently take antimalarial medications with them to worksites and self-medicate when ill.
• Some forest work employers reported sending their workers to private clinics, which are not involved in case reporting.

Adapt the Objectives

The objectives below are specific to forest workers, but 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.). Review the objectives below and adapt them to fit the findings of your own formative assessment. 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 aims of implementing SB-RACD as a routine part of malaria surveillance are:

• To expand case finding to include other forest workers who may have had similar exposure to the index case.
• To identify forest work locations where transmission may be occurring, and where it may be beneficial to improve access to regular testing and/or prevention items.
• To enhance the national capacity to conduct targeted surveillance among high-risk populations in order to identify and eliminate remaining reservoirs of malaria.

Identify the Target Population

SB-RACD is a form of active case detection that targets a specific high-risk subgroup. To be included in SB-RACD, index cases and contacts must meet specific criteria to ensure they belong to the target risk group (forest workers) and have exposures that could potentially increase malaria risk. Example criteria for forest workers are listed below, and should be adapted to suit the needs of the local situation.

SB-RACD eligibility criteria

Individuals must meet all of the following criteria to be included in SB-RACD, either as a case or contact:

• All individuals:
  » Age 15 years or older
  » Provides informed consent to participate

• Index cases:
  » Tests positive for malaria by RDT or microscopy or other national diagnostic standard at a participating health facility or by a community health worker.
  » Worked in the forest or forest-fringe in the past 60 days (the purpose of this time window is to increase the chance that infection is actually due to forest work)
  » Was at a forest worksite sometime between sundown and sunrise in the past 60 days, whether working or sleeping

• Peer network referrals:
  » Knows the index case by name
  » Was with the index case at a forest or forest-fringe worksite in the past 60 days
  » Worked at this site and was present there sometime between sundown and sunrise in the past 60 days

• Venue referrals:
  » Present at a forest or forest fringe worksite during a venue investigation
  » Worked at this site in the past 60 days
  » Worked at this site and was present there sometime between sundown and sunrise in the past 60 days

Exclusion criteria

• All individuals:
  » Previous participation as an index case in the past 30 days (since in a short time span co-workers and worksites are unlikely to have changed significantly)
  » Not capable of providing informed consent (e.g., due to sleep deprivation or under the influence of alcohol or drugs)

• Referrals:
  » Previous participation in any SB-RACD investigation in the past 30 days

After 30 days, an index case or contact can again be included in SB-RACD, either as a case or contact. Repeat participation is allowed due to the possibility of malaria re-infection or relapse. Nationality and citizenship should not be the basis for excluding anyone because malaria may affect foreigners working in the area and they may be involved in transmission.

For purposes of eligibility above, “work” is defined as follows: the individual is being paid to be at the loca-
tion and/or is producing or extracting materials (e.g., gold, teak wood, fruits, vegetables, animals) primarily for sale or personal use.

**Worksite (“venue”) eligibility criteria**

Staff will approach forest workers at worksites at specific times. Surveillance through venues will only be carried out at worksites that meet the criteria below:

- SB-RACD has not been conducted at the venue in the past 30 days
- The venue is geographically accessible
- It is safe for surveillance staff to conduct testing at the venue
- Permission is provided by the venue owner/manager (if applicable)
- The number of workers expected at the time of the investigation is at least 6 (See Box 1 below on Choosing a minimum expected number of workers for venue-based surveillance.)

**Box 1. Choosing a minimum expected number of workers for venue-based surveillance**

Venue-based surveillance activities should set a minimum number of expected participants for a venue to be considered eligible for logistical reasons, to avoid wasting valuable staff time and resources at venues where there are few workers. Consider setting a minimum of six expected workers.

However, there is no fixed rule and in some settings a lower or higher figure may be appropriate. Choose a minimum that makes sense for your context by reviewing the enumeration counts and other information you have about expected numbers of workers collected during formative assessment.

Be careful not to set a threshold that is too high. A high threshold might exclude subgroups that may be relevant to transmission, such as family work groups or informal workers.

**Define the Geographic Area for SB-RACD**

Based on the findings from the formative assessment venue mapping, define the areas in which SB-RACD will be implemented. To illustrate using the forest worker SB-RACD example, the included geographic areas were chosen based on these factors:

- Passive surveillance, case investigation or case-control study (Module 2) suggests risk factors related to forest work in this location.
- Formative assessment suggests there are many forest workers present in the forest during mosquito biting hours.
- Formative assessment suggests surveillance through venues or peer networks to be viable methods for following up with and testing forest co-workers, given that most forest worksites in the area are safe and accessible to conduct testing, venue owners/managers interviewed suggest they are willing to support malaria testing, and interviews with forest workers suggest they are willing to be tested and refer co-workers for testing.

The SB-RACD approach should be piloted at a small number of health facilities and once implementation issues have been addressed, rolled out to others. Participating health facilities will identify the index cases that will trigger SB-RACD.

There is no residential requirement for index cases or contacts; cases and contacts should be included regardless of where they live as long as they meet the eligibility criteria.

**Determine Staffing Needs**

Staffing will depend on the number of cases that are expected over time and the number of worksite and peer contacts that will need follow-up. Below are factors to consider to help determine staffing requirements. Use findings from formative assessment to come up with rough estimates of each figure.

**Time needed to:**

- Travel to and from each forest worksite
- Travel to and from meeting places with peer contacts in the community
- Carry out testing and the brief survey (usually 30 to 60 minutes)
- Pre-screen a worksite owner and peer contact (usually about 20 minutes, if they can be contacted by phone)
For example, in an SB-RACD pilot in Indonesia, a single field team of 3 people was able to follow-up with 3 to 5 peer contacts per day. The same team could visit at most one worksite per day given that most were 2–6 hours from the clinic where staff were based. And after accounting for the time to travel to and from worksites, the 3-person team was able to test and interview at most 10 workers per day.

A basic field team to carry out a venue investigation should consist of:

- Local coordinator
- Interviewer
- Nurse/lab technician
- If available, an entomologist should accompany the team to conduct an entomological investigation around venues

A basic field team to carry out a peer investigation should consist of:

- Interviewer
- Nurse/lab technician

The size of field teams to conduct venue investigations should be planned based on the number of forest workers that are expected to be present. Take into account the time required to complete procedures (testing and interviewing) per person. These times should be estimated during pilot testing.

SB-RACD will be successful only if each team member understands and follows correct procedures, described below.

Staff Roles and Responsibilities

**Staffing overview**
Staff should be designated to carry out the key SB-RACD activities listed below.

**Coordination and supervision**
A SB-RACD team lead should be designated who will have overall responsibility for the strategy and be involved in supervision of case procedures (at health facilities) and SB-RACD investigations (in the field). Additional local coordinators should be designated for each area/district/region where SB-RACD is implemented to manage and supervise local field teams. Surveillance officers, time allowing, may be good candidates for the coordination roles.

**Case procedures**
Existing staff and health facilities, such as nurses and/or laboratory technicians, will most likely be able to carry out the case procedures, including identifying newly diagnosed cases, assessing their eligibility for SB-RACD, and identifying worksites and co-worker referrals.

**Pre-screening**
Pre-screening requires contacting venue officials and peer referrals by phone to determine whether to proceed to carrying out site visits, testing and brief interview. These phone calls can most likely be done by existing staff, such as nurses or surveillance officers. However, if there are many cases, worksites or contacts, pre-screening may need to be assigned to a local coordinator or other designated staff member.

**Carrying out SB-RACD investigations**
Additional staff will most likely be required to staff field teams that travel to worksites and other meeting places with peer-referrals and to carry out testing and brief interview. Teams should include at least one individual able and authorized to conduct malaria testing. In some settings, existing community health workers (CHWs) may be good candidates to staff field teams.

**Combining staff roles**
In settings with few or infrequent cases and small worksites, certain roles may be combined. For example, the interviewer and nurse/lab technician roles can be combined and carried out by a CHW, nurse, or surveillance officer.

**Detailed staff responsibilities and tasks**
Below are the specific responsibilities and tasks that should be assigned to each SB-RACD team member.

**SB-RACD Coordinator**
The Coordinator or team lead is responsible for the overall SB-RACD strategy, supporting and supervising Local Coordinators, overall monitoring, reviewing regular progress reports from local SB-RACD teams, and resolving exceptional issues that arise. The SB-RACD Coordinator is responsible for data management, quality assurance and reporting. The SB-RACD role could be filled by a district health officer (DHO) or M&E officer.

Specific tasks include:

- Working closely with local coordinators to ensure adequate preparations locally, including contracting with local partners and coordinating invoicing for equipment and supplies.
- Training and conducting refresher trainings for field teams on SOPs, data collection and tracking forms, and other materials
- Providing onsite supervision and support to ensure strict adherence to protocols
- Coordinating with local coordinators to problem solve and facilitate resolutions to field challenges
- Coordinating with local coordinators to ensure quality data collection and adherence to timelines
- Real time data management
- Conducting quality assurance of interview and laboratory data
- Developing minimum monthly report summaries of progress and challenges
- Managing and supporting the local coordinators
- Liaising and communicating with all local stakeholders (health offices, other partners) to ensure strong partnerships for surveillance activities
- Supporting field team hiring
- Supporting local ethical approval submission and extensions (if applicable)

**Local Coordinator(s)**

Each Local Coordinator is responsible for the day-to-day management of all SB-RACD activities in their local area (e.g., a district), including selecting cases and organizing SB-RACD visits, data collection (interviews and biological specimens), quality assurance blood draw, administering malaria treatment, and management of data and records. The Local Coordinator is also responsible for direct supervision of other local field staff.

Specific tasks include:

- Ensuring adequate site preparations, including procurement of supplies, materials, and equipment for health facilities and SB-RACD visits.
- Maintaining inventory of supplies, materials, incentives, receipts and equipment.
- Overseeing scheduling of SB-RACD investigations.
- Managing overall day-to-day operations and data collection.
- Ensuring proper documentation of all SB-RACD activities, using the tablets, spreadsheets and/or forms
- Reviewing, tabulating, and reconciling forms and logs used in the field. Review errors with field staff.
- Overseeing documentation of data errors.
- Reporting any deviation from these SOPs or problems in the field to the SB-RACD coordinator within 48 hours of occurrence
- Data file management and reporting
  » Enter data from data collection form(s), if applicable, into an electronic format
  » Maintain data files and logs
  » Produce progress reports used by the field team and SB-RACD Coordinator to monitor progress
  » Communicate with SB-RACD Coordinator on a regular basis regarding irregularities in forms or other data

**Interviewers**

Interviewers should be designated at health facilities (for case procedures) and for field work (for interviewing contacts). They work under the supervision of local coordinator and are responsible for:

- Case eligibility screening
- Case brief interview to elicit worksites and co-worker referrals
- Pre-screening worksites and peer referrals
- Brief interview with contacts in the field
- Administering informed consent (if applicable)

Specific tasks include:

- Accurately documenting information from all interviews, consent forms and tracking forms
- Ensuring that case and contact IDs are entered onto forms and match the ID label put on the malaria tests and blood samples
- Administering eligibility screening, pre-screen, and interviews with cases and contacts
- Maintaining data integrity (i.e., all data collected accurately and represents the information provided by cases and contacts).
- Complying with guidelines for maintaining safety, data security, and confidentiality.
- Implementing local safety procedures and report field incidents to the Local Coordinator immediately.

**Nurse/Lab Technicians**

Nurse/lab technicians work under the supervision of local coordinator and are responsible for:

- Taking blood samples from contacts using venipuncture and finger-sticks
• Creating slides and DBS for analysis
• Filling out the laboratory forms
• Properly storing and transporting the samples
• Conducting daily inventory of all lab supplies, and communicate with the Local Coordinator when any supplies are low or need to be replenished
• Performing RDT in sites where contacts are showing clinical symptoms of malaria
• In cases of positive malaria results, administering the appropriate treatment
• Recording laboratory and treatment information on tracking forms

Ethical and professional conduct
Surveillance staff must adhere to ethical principles and standards when conducting SB-RACD. Most importantly, they must respect and protect the privacy, confidentiality, and autonomy of cases and contacts. In addition, staff should conduct themselves in a professional manner when interacting with cases and contacts, fellow staff members, and the general public.

Conduct Fieldwork Prior to SB-RACD Implementation

Finalize referral mechanisms
Meet with key staff from health facilities where contacts who test positive will be referred. Ensure health facility staff are aware of the SB-RACD strategy and timeline. Review the process for referring participants and the services they will receive.

Pilot test
Pilot test all of the procedures and forms on 6-10 individuals who are members of the target population. The pilot testing should realistic; complete as much of the procedures as possible. Test out the procedures on cases and contacts, including all steps. Fill out all forms. At each step, note any problems. Correct procedures and forms as needed.

If possible, carry out a pilot test at an actual venue.

Work with the community
Ensuring a good relationship with the target population and the larger community can improve participation of cases and contacts. Here are some steps that can prove useful:

During formative assessment:
• Inform community leaders of plans for SB-RACD and seek their advice.
• Include key informants both from the target population and the larger community.
• Hold a community meeting to discuss the proposed surveillance strategies and elicit approaches to improve and ensure community participation.

During SB-RACD implementation:
• Each month, contact 2-3 of the key informants who were interviewed during the formative assessment to get their sense of how the tracing and testing efforts are being perceived by the community and whether there are any problems that may need to be addressed.
• Before and after each SB-RACD investigation, contact venue officials to discuss the investigation. Close coordination will ensure any problems are identified and addressed promptly.
• If there are regular meetings of community leaders, community members, or members of the target population (e.g., a forest workers’ group), consider making a presentation at the meeting periodically, perhaps every 1 to 6 months (depending on how often SB-RACD investigations are occurring), to describe aims, progress and challenges, and to seek input.

Engaging peer navigators
In some settings, it may be useful to directly engage the community in malaria surveillance through the recruitment of ‘peer navigators,’ who are identified members of the high risk group who can participate in surveillance activities and help to ensure RACD approaches are targeting the right individuals and locations, as well as improve community acceptability. The peer navigator approach has been used with substantial success for HIV surveillance.¹

Step 2. Implement SB-RACD Case Procedures

All patients with suspected malaria should be parasitologically diagnosed as per national guidelines, and, if confirmed, will be defined as an index case. Recommended WHO case definitions are given below. Local surveillance definitions may also be considered.

**Case definitions for active elimination area**

**Suspected malaria case**

An individual whose clinical symptoms suggest that he or she may have malaria. This suspicion triggers the process of parasitological confirmation and the subsequent decision on whether or not to treat the individual for malaria. A suspected malaria case cannot be considered a malaria case until parasitological confirmation. Criteria must be established to define which patients attending health facilities (whether public or private) should be given a parasitological test. Common criteria include:

- all febrile patients from malaria foci, especially during the transmission season;
- people with a history of malaria in the past 3 years and any increase in body temperature;
- people who have fever within 1 year of having visited a malaria-endemic area (domestic or foreign) – this is sometimes extended to 3 years for areas at risk of *Plasmodium vivax*;
- patients with fever, malaise and chills;
- people with anaemia of unknown cause;
- patients with hepatomegaly or splenomegaly (or both); and
- recipients of blood donations who have fever during the 3 months after the transfusion.

**Uncomplicated malaria case**

All persons with parasitaemia (including gametocytaemia only), regardless of the presence or absence of clinical symptoms.

- It is possible that some patients who test negative by microscopy or RDT have very low levels of parasitaemia that are detectable only by more sensitive techniques, such as polymerase chain reaction (PCR) testing. Microscopy or RDT might have to be repeated if no other source of fever is identified and the symptoms continue.

- Such low levels of parasitaemia are generally considered not to be clinically significant in most settings, and diagnostic testing with microscopy or RDT should allow adequate tracking of malaria trends.

Screen Case for SB-RACD Eligibility

Following malaria diagnosis, designated health facility staff should screen the case to determine whether criteria are met for initiating SB-RACD. A sample screening form appears in Appendix I.

Before interviewing an index case

Always have a fresh folder with blank copies of the following forms on hand when interviewing an index case:

- Case eligibility screening form (Appendix I)
- Interview with cases to identify venues and contacts (Appendix II)
- Pre-screen forms (Appendices IV & V)
- PR-1 and VB-1 tracking forms (Appendices VI & VII)

Assign index case ID

Assign a unique ID to the index case by following the procedures in the section on Unique Identifiers. Record the ID on the Case Eligibility Screening Form.

Eligibility screening interview

Collect the information on the form (Appendix I). The screening questions should be adapted to meet the specific eligibility criteria defined by for SB-RACD.

1. Record the case’s complete name and place of residence (village, town, city).
2. Review the patient’s records to verify there is a positive malaria diagnosis.
3. Go through the rest of the interview form to assess eligibility criteria on age and forest work.
4. If the case meets all eligibility criteria, administer informed consent following the procedures described above. Record the case’s ID on the consent forms.
5. If consent is required, and the case does not provide consent, SB-RACD will not be conducted. Thank them for their time.

Elicit Information on Venues and Co-worker Referrals

Materials needed:

- Form VB-1
- Form PR-1
- Pen

Procedure

1. Interview the case to elicit information on all forest worksites where the case has been in the past 60 days. Use the questionnaire form in Appendix III (Interview with cases to identify venues and contacts). Follow the detailed instructions at the top of the form. In brief:
   - Complete one form per worksite. Number the worksites consecutively (e.g., 1, 2, 3, etc.). A unique ID will be assigned later if eligible for SB-RACD.
   - Calculate the risk score for each site. The risk score is used to prioritize worksites, so that highest risk sites are considered first and lowest risk sites last. The risk score should be calculated by summing up the risk “points” listed next to specific responses. For example, the form assigns 2 risk points to worksites where the case reports mosquitoes at the place of work or sleep.
     - For each question, record the number of risk points (e.g., 2) in the last column.
     - At the end of the interview, sum up the risk points to get the total risk score for the worksite.
   - Determine if the worksite is eligible for venue surveillance based on the items on the form. If the worksite is eligible, record the following information onto form VB-1:
     - Risk score: The total summed risk score for the worksite. The team should visit venues with higher rankings first.
     - Location/address: Ask the case for all the information needed to find the worksite.
     - Venue type: Based on the case’s response to the question about the primary kind of work at the worksite.
     - Venue officials name & phone: Ask the case the best way to contact the employer, owner, manager, or other individual whose permission would be needed to visit the worksite. If there is none, write none.
     - # Workers expected: Based on the case’s response to the question about the primary kind of work at the worksite.
   - If co-worker referrals are mentioned, record their names and contact information on form PR-1.
   - Record the name and village of residence of each co-worker referral on the form.

2. Determine if the worksite is eligible for venue surveillance based on the items on the form. If the worksite is eligible, record the following information onto form VB-1:
   - Risk score: The total summed risk score for the worksite. The team should visit venues with higher rankings first.
   - Location/address: Ask the case for all the information needed to find the worksite.
   - Venue type: Based on the case’s response to the question about the primary kind of work at the worksite.
   - Venue officials name & phone: Ask the case the best way to contact the employer, owner, manager, or other individual whose permission would be needed to visit the worksite. If there is none, write none.
   - # Workers expected: Based on the case’s response to the question about the primary kind of work at the worksite.
   - If co-worker referrals are mentioned, record their names and contact information on form PR-1.
   - Record the name and village of residence of each co-worker referral on the form.
• Record as many forms of contacting the referral as possible (phone numbers, primary address, other addresses, etc.).

4. Record the index case’s unique ID, name, and village of residence onto the VB-1 and PR-1 forms.

5. Assign a unique venue ID to each worksite you listed on the VB-1 form. Following the procedures in the section on Unique Identifiers.

6. Calculate and record the deadline date for completing SB-RACD onto the VB-1 and PR-1 forms. The deadline is 7 days from the diagnosis of the index case. After 7 days, no further testing or interviewing of contacts should be conducted.

Pre-screen Worksites and Peer Network Contacts

After case procedures are completed, SB-RACD staff should contact and pre-screen all worksites and individual co-worker referrals to determine whether or not to go forward with testing and interviews.

Box 2. Maximize coverage through venues and peer networks

SB-RACD field teams should attempt to achieve complete coverage of all forest workers who work or worked at any of the same worksites mentioned by the index case in the past 60 days, and who were there anytime between sundown and sunrise. Teams should follow-up at all worksites and all individual co-worker/peer referrals mentioned by the case in order to achieve as high coverage of potentially exposed contacts as possible, through both venues and peer networks to maximize coverage.

When a worksite or referral passes pre-screen, schedule the time, place and other details of a visit to conduct testing and brief interview.

Peer pre-screen

To pre-screen a co-worker referral, use the PR-2 form. Pre-Screen all co-worker referrals mentioned by the index case by following the steps below:

1. Check whether the contact already participated in any SB-RACD investigation in the past 30 days by reviewing names of previous participants on past PR-1 and VB-2 forms. If someone with the same name and village is on these forms in the past 30 days, do not continue with pre-screen.

2. Call the contact by phone to conduct pre-screen and, if eligible, schedule a meeting.

3. If the contact is not reachable by phone, ask help from the venue official, midwife or community leader to get in touch with the contact.

4. Once on the call, describe the purpose of testing and the brief interview.

5. Then go through the screening form (Appendix V) to determine if the contact appears to meet pre-screen criteria (see text box below). Explain that participation is voluntary, confidential and includes a brief interview and free testing for malaria, with treatment if needed. Emphasize that testing is important because of working at the same site as the index case, even if the contact does not feel ill now.

6. If the contact passes the pre-screen, schedule a time and place to meet that is convenient for the contact and where confidentiality can be ensured (e.g., the contact’s home, a health facility, a confidential room at a coffee shop).

7. Emphasize that you will ask additional questions at the start of the meeting to confirm whether surveillance staff can provide free testing.

8. Record whether the contact passed the pre-screen on form PR-1. If not, record all reason code(s) on the form that apply.

9. Record the date and location of the scheduled visit on form PR-1.

Peer pre-screen criteria

Schedule a meeting only when a co-worker referral appears to meet all of these criteria:

- Age 15 or older
- Knows the index case by name
- Worked with the index case in the forest or forest fringe in the past 60 days
- Willing to meet for a brief interview, free malaria testing and treatment
- Can meet within the deadline (7 days from diagnosis of the index case)
Box 3. Using incentives to improve participation – key considerations

In settings where cases or contacts are hesitant to participate in SB-RACD, incentives may be needed. Reasons that individuals may be hesitant may include:

- fear of blood draw
- the belief that a person who feels healthy doesn’t need testing
- suspicions of how the blood sample will be used (e.g., that testing is actually for illicit drug use or HIV)

Incentives can help overcome such barriers. They may be non-monetary—token gifts such as a prevention item or items appreciated by the target population (e.g., a small flashlight for forest workers).

Incentives should be appealing enough to encourage participation without being so attractive that they lead to manipulation (i.e., referring friends who did not work at the same worksite in the time frame stipulated). Use formative assessment to identify potential barriers, and what types of incentives may be needed.

When incentives are used, consider adding “insider knowledge” questions to pre-screening. These are questions very specific to the setting and type of forest work used to determine whether the person truly belongs to the target population (e.g., logger, farmer), to guard against manipulation. Interviewers should never reveal to contacts that they are being screened for eligibility or reveal the specific criteria.

Venue pre-screen criteria

Schedule and conduct a venue investigation only when a worksite appears to meet all of these criteria:

- A venue investigation has not been conducted at the site in the past 30 days
- At least 6 workers are expected to be present, including support staff, such as cooks, drivers or assistants
- The site is safe and accessible (or an alternative location can be arranged)
- A venue official (owner, manager) grants permission (if applicable)
- The visit can be conducted within the deadline (7 days from diagnosis of the index case)
Step 3. Conduct Follow-up at Venues and with Contacts

Venue Investigations

A venue investigation at an eligible worksite can be conducted as soon as a site passes pre-screen. If multiple worksite pass pre-screen, aim to visit highest-risk worksite first, based on the risk score assigned to the venue during the interview with the case.

The team should complete testing and interviewing at all worksites (or alternative locations arranged with venue officials) within 7 days of the date of diagnosis of the index case. Complete the steps below:

Prepare for the visit
1. Before going to the worksite, the local coordinator should fill out the top part of enrollment form VB-2 with details of the site and the index case.

Travel to the site
2. The local coordinator, interviewer, and nurse/lab technician should travel to the site.
3. Once the team arrives at the site, the local coordinator should announce their arrival to the venue official, if available.

Set up at the site
4. The team should then set up a confidential area where they can draw blood and conduct the brief interview.
5. The local coordinator should work with the venue official to identify all workers present at the worksite in order to invite all of them to participate. The objective is to achieve 100% coverage of all workers present during the visit.

Complete procedures with each worker at the site
6. Once a worker has agreed to discuss participation, the local coordinator should accompany the participant to the interview area.
7. The local coordinator should then screen the individual for eligibility, using the first section of the brief interview (Appendix IX).
8. Confirm whether the individual has already participated in SB-RACD in the past 30 days (See Box 1). If so, do not conduct testing or interview again. However, do enter the worker on form VB-2 with code for previous participation.
9. Whether eligible or not, add details of the individual to the enrollment form VB-2.
10. If not eligible, record the reason using the codes at the bottom of the form. If enrolled, write the participant’s ID code on the form.
11. The interviewer then administers the remaining sections of the brief interview. For guidance, see Appendix XII (Guidance on conducting brief interviews with contacts).
12. The interviewer accompanies the participant to the lab area.
13. The nurse/lab technician sets up the slide and the dried blood spot slide with the appropriate ID codes and forms.
14. The nurse/lab technician takes blood (finger prick) and prepares microscopy slide and DBS.
15. If the contact has malaria symptoms, the nurse/lab technician performs a RDT and provides treatment if positive.
16. Lastly, the local coordinator gives the participant informational materials on malaria, an incentive (if applicable), records the participant signature in the logbook, and thanks the participant for their time.

Conduct repeat visits if needed
17. If there are too many workers at the site to include during one visit, the team should consider returning to include as many workers as possible within the allowed time period.

Peer Investigations

If the co-worker referral passes pre-screening, the field team should meet with the referral and complete testing and brief interview within 7 days of the date of diagnosis of the index case. Follow these steps:

Travel to the meeting location
1. The interviewer and the nurse/lab technician should travel to the agreed upon meeting point. For safety it is important that at least two team members are present.
2. The team should arrive 15 to 30 minutes early to ensure that conditions ensure confidentiality.

Confirm eligibility
Once the contact arrives, the interviewer should screen for eligibility using the first section of the brief interview questionnaire, even if the contact already passed pre-screen by phone. Be sure to confirm that the individual has not already participated in SB-RACD in the past 30 days (See Box 4.)

3. If the participant is not eligible, thank the participant for their time and end the visit.

**Conduct interview and blood draw**

4. If eligible, the interviewer conducts the brief interview. For guidance on best practices for interviewing, see Appendix XII (Guidance on conducting brief interviews with contacts).

5. The nurse/lab technician organizes the slide and DBS with the appropriate forms.

6. The nurse/lab technician takes blood (finger prick) and prepares the slide and DBS samples.

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**Box 4. Detecting repeat participation within 30 days**

As part of the eligibility section of the brief interview, when an individual says they already participated in the past 30 days, the interviewer should ask additional questions to determine if the person:

- Was actually tested for malaria and/or interviewed as a part of SB-RACD in the past 30 days (and not thinking of something else that may have happened to them)
- Was an index case or contact

Follow these guidelines to avoid collecting data that are unlikely to lead to new cases or provide new information:

1. An index case who is later encountered as part of SB-RACD should not be tested or interviewed again within 30 days.

2. A contact who is tested and/or interviewed as a part of SB-RACD:
   » Should not be tested or interviewed again as a part of the same or any other SB-RACD investigation, within 30 days.
   » Should be considered as a potential index case if he/she presents to a health facility with malaria later.

---

**Depart the referral**

7. Lastly, the interviewer gives the referral informational materials on malaria, an incentive (if applicable; and have the referral sign the incentive log), and thanks the referral for their time.

The key steps to conducting SB-RACD investigations are summarized in Figure 2.

---

**Figure 2. Key steps to carry out SB-RACD investigations**

<table>
<thead>
<tr>
<th>Venue investigation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before venue investigations</strong></td>
</tr>
<tr>
<td>- Contact venue owner/manager</td>
</tr>
<tr>
<td>- Prepare materials</td>
</tr>
<tr>
<td><strong>At a venue investigation</strong></td>
</tr>
<tr>
<td>- Greet venue owner/manager</td>
</tr>
<tr>
<td>- Ensure conditions at venue are safe to conduct the survey</td>
</tr>
<tr>
<td>- Set up interview area</td>
</tr>
<tr>
<td>- Determine intercept strategy (list of workers or designate intercept areas or lines)</td>
</tr>
<tr>
<td>- Approach potential participants</td>
</tr>
<tr>
<td>- Intercept potential participants</td>
</tr>
<tr>
<td>- Forward contact to interview area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Venue and peer investigations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Each contact</strong></td>
</tr>
<tr>
<td>- Check eligibility status</td>
</tr>
<tr>
<td>- Create contact ID</td>
</tr>
<tr>
<td>- Administer informed consent</td>
</tr>
<tr>
<td>- Administer the questionnaire</td>
</tr>
<tr>
<td>- Take blood samples</td>
</tr>
<tr>
<td>- Create slides and DBS</td>
</tr>
<tr>
<td>- Perform rapid diagnostic test</td>
</tr>
<tr>
<td>- If malaria positive, administer treatment and provide referral if applicable</td>
</tr>
<tr>
<td>- Provide prevention materials and incentives (if applicable) and thank contact</td>
</tr>
<tr>
<td><strong>After each investigation</strong></td>
</tr>
<tr>
<td>- Debrief meeting with field staff</td>
</tr>
<tr>
<td>- Review all records of each contact</td>
</tr>
<tr>
<td>- Store all forms, documents, and test results in a secure, restricted-access location</td>
</tr>
</tbody>
</table>
| - If using electronic data capture (e.g., tablets):
  - Make a backup copy of all electronic files (tracking forms, interviews)
  - Send data files to data manager (within 24 hours of the investigation) |
| **Weekly or monthly** |
| - SB-RACD coordinator and field team meet to review plans, progress and lessons learned |
Specimen Collection, Testing, and Treatment

Adapt local lab procedures for specimen collection, testing, and treatment. Appendix II of Module 2 provides sample guidance and procedures for specimen collection, slide preparation, rapid tests, return of results to participants and the treatment protocol. Consider procedures for storage and transport of specimens and quality assurance measures. Furthermore, consider providing referrals to appropriate health facilities for any positive contacts, treatment on-site for any RDT-positive contacts, and conducting a follow-up visit to provide results, treatment and referral to any slide- or PCR/LAMP-positive contacts.

Monitoring and Supervision of SB-RACD

Monitoring and supervision of all aspects of SB-RACD—including case procedures and contact tracing—are critical to ensure that the strategy is being carried out as planned and to solve any unexpected problems.

The Local Coordinator:

- Observes 10% of all interviews with cases and contacts, including consent (if applicable) and recording (or data entry) of responses
- Reviews all forms from cases and contacts for consistency and completeness
- Prepares a weekly report to track monthly and cumulative figures (see Figure 3)

Monitoring reports should be shared with the SB-RACD team lead and field team staff each month and discussed during monthly SB-RACD review meetings.
**Figure 3. Sample data to include in monthly SB-RACD report**

<table>
<thead>
<tr>
<th>Case procedures</th>
<th>Past Month</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index cases found eligible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eligible index cases who participated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worksites identified by cases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Referrals provided by cases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venue surveillance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worksites pre-screened within the deadline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worksites that passed pre-screen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worksites that were visited within the deadline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workers present at the worksite during the visit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workers present who were found eligible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eligible workers who were tested</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eligible workers who were interviewed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tested workers who were found to have malaria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workers with malaria who were provided treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reasons worksites were not eligible:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer network surveillance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Referrals pre-screened within the deadline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Referrals that passed pre-screen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>List of reasons referrals were not eligible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eligible referrals who were tested</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eligible referrals who were interviewed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tested referrals who were found to have malaria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Referrals with malaria who were provided treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reasons referrals were not eligible:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incidents in the field and resolution:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suggestions for improving the strategy:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Debrief sessions**

The local coordinator and field team should meet briefly (30-60 minutes) after each field visit (to a worksite or to meet with a referral) to monitor progress and quality and discuss any issues with field procedures.

**SB-RACD monthly review meetings**

The SB-RACD team lead, local coordinators and field teams should meet monthly to discuss goals, progress, modifications, data issues, confidentiality and other issues or concerns. Any instances of deviations from the SOP or other problems identified during the meetings should be addressed. In settings where there are ≥ 3 investigations per week, weekly meetings should be considered.
Create Unique Identifiers

Unique identifiers facilitate analysis and verification of surveillance data and monitoring of results and outcomes.

**Case ID**

Each index case should be assigned an ID that identifies the health facility of diagnosis and a consecutive number assigned to each case at that facility. The ID is not unique to the individual: if the same person returns with a new diagnosis after a few months, he/she will receive a new consecutive number. The case ID will be linked to all worksites and contacts who are tested and/or interviewed in response to the SB-RACD investigation triggered by the case.

For instance:
- VA1 represents the 1st venue identified in the catchment area of health facility A
- VA2 represents the 2nd venue identified in the catchment area of health facility A
- VB3 represents the 3rd venue identified in the catchment area of health facility B

**Venue Investigation ID**

Each venue should be assigned an ID that reflects the case that triggered the investigation and the specific venue. The investigation ID is different from the venue ID because there might be several investigations at the same venue.

Examples of investigation ID codes:

<table>
<thead>
<tr>
<th>Case ID</th>
<th>Venue ID</th>
<th>Investigation ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA001</td>
<td>VA1</td>
<td>CA001.VA1</td>
</tr>
<tr>
<td>CA001</td>
<td>VB2</td>
<td>CA001.VB2</td>
</tr>
<tr>
<td>CA002</td>
<td>VA1</td>
<td>CA002.VA1</td>
</tr>
<tr>
<td>CA002</td>
<td>VA2</td>
<td>CA002.VA2</td>
</tr>
<tr>
<td>CA002</td>
<td>VB3</td>
<td>CA002.VB3</td>
</tr>
</tbody>
</table>

For instance:
- CA001.VA1 is the venue investigation that was triggered by case CA001 at the 1st venue in catchment area A.
- CA001.VB2 is the venue investigation that was triggered by case CA001 (the same case as above) at the 2nd venue in catchment area B. Note the catchment area where the case was diagnosed can be different from the catchment area of the venue. In this instance, the case was diagnosed at health facility A and reported working at a worksite located in the catchment area of health facility B.
- CA002.VA1 is the venue investigation that was triggered by case CA002 at the 1st venue in catchment area A. Note this is the same worksite where case CA001 triggered an investigation; thus both cases (CA001 and CA002) reported work at the same worksite, triggering two investigations at that same site.

**Venue ID**

Each worksite (venue) should be assigned a venue ID that reflects the location (in terms of the health facility catchment area). A venue should receive only one ID that does not change even if the same venue is mentioned by different cases.

Examples of venue ID codes:

<table>
<thead>
<tr>
<th>Health facility (catchment area)</th>
<th>Venue consecutive number</th>
<th>Venue ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>VA1</td>
</tr>
<tr>
<td>A</td>
<td>2</td>
<td>VA2</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>VB1</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>VB2</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
<td>VB3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Health Facility</th>
<th>Consecutive number for cases at the facility</th>
<th>Case ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>CA001</td>
</tr>
<tr>
<td>A</td>
<td>2</td>
<td>CA002</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>CB001</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>CB002</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
<td>CB003</td>
</tr>
</tbody>
</table>
Venue Contact ID

Each contact who is tested and/or interviewed during a venue investigation should be assigned an ID that reflects the investigation ID (which in turn identifies the case that triggered the investigation and the venue where screening took place. This ID is not meant to be a unique person identifier and does not uniquely identify the individual; the same worker who is encountered at two different worksites will get assigned two different IDs.

However, the worker ID does allow testing and interview data to be linked; and allows these data to be linked with data from the case and with other data from the same venue. These linkages are important to support analysis.

This kind of ID supports confidentiality because it does not contain the individual person’s name or other identifying information. However, the person’s name appears on the tracking form so that positive test results can be returned to the right person and that person can be offered treatment.

<table>
<thead>
<tr>
<th>Investigation ID</th>
<th>Worker tested/interviewed at the investigation</th>
<th>Worker ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA001.VA1</td>
<td>1</td>
<td>CA001.VA1.1</td>
</tr>
<tr>
<td>CA001.VA1</td>
<td>2</td>
<td>CA001.VA1.2</td>
</tr>
<tr>
<td>CA001.VA1</td>
<td>3</td>
<td>CA001.VA1.3</td>
</tr>
<tr>
<td>CA001.VA1</td>
<td>4</td>
<td>CA001.VA1.4</td>
</tr>
<tr>
<td>CA002.VA2</td>
<td>1</td>
<td>CA002.VA2.1</td>
</tr>
<tr>
<td>CA002.VA2</td>
<td>2</td>
<td>CA002.VA2.2</td>
</tr>
<tr>
<td>CA002.VA2</td>
<td>3</td>
<td>CA002.VA2.3</td>
</tr>
</tbody>
</table>

For instance:
- CA001.VA1.3 represents the 3rd worker tested or interviewed at investigation CA001.VA1; from the worker ID, it is clear that this worker was encountered at venue VA1, the first venue in health facility A’s catchment area; and the case that triggered the investigation was CA001, the first case at health facility A.

Peer referral ID

Each referral tested or interviewed as a part of peer network surveillance should be assigned an ID which reflects the index case that triggered the investigation. This ID is not meant to be a unique person identifier and does not uniquely identify the individual; the same person who is referred by two different cases will get assigned two different IDs. Also, the same person traced through peer network surveillance could also be encountered at a venue, in which case he/she would get assigned a referral ID and a worker ID that are different.

<table>
<thead>
<tr>
<th>Case ID</th>
<th>Referral consecutive number</th>
<th>Referral ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA001</td>
<td>1</td>
<td>CA001.1</td>
</tr>
<tr>
<td>CA001</td>
<td>2</td>
<td>CA001.2</td>
</tr>
<tr>
<td>CA002</td>
<td>1</td>
<td>CA002.1</td>
</tr>
<tr>
<td>CA002</td>
<td>2</td>
<td>CA002.2</td>
</tr>
<tr>
<td>CA002</td>
<td>3</td>
<td>CA002.3</td>
</tr>
</tbody>
</table>

For instance:
- CA001.1 is the 1st referral to be referred by case CA001 (the 1st case at health facility A)
- CA002.3 is the 3rd referral to be referred by case CA002 (the 2nd case at health facility A)
Review Safety Procedures

General Principles
- Always carry an official badge, credential or identity card
- Plan ahead
- Always be alert
- Use common sense

Plan ahead
- Have an emergency contingency plan
- Know what to do well ahead of time
- Know who to contact in an emergency
- Adopt a code word to use in case you need the help of a work colleague
- Be aware of what’s going on around you
- Position yourself closer to the exit than interviewees
- Be friendly but also careful if you suspect anything
- Pay attention to your sixth sense

Common sense
- Limit the quantity of valuable items on site
- Do not carry guns
- Do not work under the influence of alcohol or drugs
- Do not offer or accept gifts from participants or any people visiting the office
- Interrupt the interview at any moment in case of threat

Aggressive participants
- Use calming techniques
- Let aggressive interviewees pour their heart out
- Look for opportunities of interaction
- Listen and acknowledge the participants concerns
- Avoid being defensive
- Reply to legitimate complaints
- Lower your voice tone and volume

Sexual harassment
- Remind the interviewee the purpose of the interview
- If they persist in harassing then terminate the interview
- Avoid letting them feel shame

Drunk or intoxicated interviewees
- They are not eligible if they are incoherent during eligibility screening
- If they become incoherent after this time, then thank them for their time and terminate the interview

Protect electronic equipment
- When not in use, electronic equipment should be stored in a safe location
- Do not leave electronic equipment unattended
- Do not leave interviewees alone in any room with notebooks and cell phones
- Send encrypted data electronically at the end of each business day

Adverse events
An adverse event is any event that causes serious physical or psychological damage to an interviewee or a staff member. Examples are:
- Violation of confidentiality
- Harassment or violence
- Negative reaction from the community (loss of job as a result of participating in testing or interview)

Notification of adverse events:
- In case of an adverse event, notify the relevant people/institutions
- Fill out a report of adverse event form

Biosafety
Measures to be followed during handling of any potentially infectious material:
- Always be aware of what you are doing
- Always wash your hands before and after handling any infectious materials
• Always use individual protection equipment like nurse’s gowns and gloves to prevent contamination when conducting any activities
• Do not eat, drink and smoke during blood collection
• Use basic protective measures
• Prevention of pricks, cuts and scratches
• Protection of wounds and lesions on skin and mucous membranes
• Control contamination of work surfaces by following disinfection procedures
• Properly dispose biohazard waste

Precautions
• Always wear gloves and glasses when handling infected or potentially infected materials or when there is a possibility of exposure and/or contact with this type of material.
• Dispose (in appropriate containers) of used gloves, whether they are knowingly contaminated or not.
• Do not touch the eyes, nose, mouth, other mucous membranes and the skin with the gloves.
• Do not leave the work area wearing gloves.
• Immediately wash your hands with plenty of soap after any contact with infected or potentially infected material, and after finishing work. If this contact takes place when wearing gloves, immediately remove the gloves and wash your hands with plenty of soap.
• Do not open or close doors or handle personal objects while wearing gloves.
• Always use your gown protecting your clothes and wear closed shoes. Do not leave the work area wearing your gown. Try to disinfect your gown with a disinfectant solution before washing.
• Leave the gown overnight in a receptacle completely covered with a disinfectant solution. Wash it the following morning.
• Always keep the work room clean, dry, with good ventilation and free from unnecessary materials and furniture.
• Disinfect (with a disinfectant solution based on sodium hypochlorite, see at the end of this section) the work surface (bench or table) whenever you finish a procedure and at the end of the work day.

• Avoid using cutting objects (blades, knives or scissors) to open packages or other purposes. In order to collect samples securely, follow the instructions included in this guide to the letter.
• Never use your mouth. Always use appropriate accessories (for example, pipette bulbs).
• Follow all the technical procedures in order to minimize the chance of creating aerosols, droplets and spills.

Droplets/spills and accidents
• In case of droplets and spills of potentially infected materials
• Initially cover with absorbent materials (gauze, cotton or toilet paper)
• Pour a disinfectant solution around the area and then over the absorbent material (gauze, cotton or toilet paper) and wait 10 minutes
• After that time has elapsed, remove the mix of droplet or spill and the absorbent material and place it in a recipient for contaminated materials
• Clean the surface again with a disinfectant solution
• Always wear gloves when following these procedures
• Immediately wash wounds from needle pricks or other puncture objects, cuts, and skin that has been contaminated by droplets or spills from samples, with plenty of soap and water
• Immediately communicate all accidents (pricks, cuts), droplets/spills involving direct contact of the skin with potentially infected materials to the health unit director
• Whenever possible, provide counseling to the injured person and provide a medical evaluation (including HIV testing on the spot and after four weeks)

Handling and disposal of contaminated materials and waste
• Needles from blood collection systems must be placed in the receptacle for puncture materials (provided specifically for the duration of the survey). When full, the receptacles should be incinerated.
• Gloves and other materials used for blood collection must be placed in the plastic bag for biological waste.
Appendix I: SB-RACD Flowchart

1. Malaria dx → Screens eligible for SB-RACD?
   - Case screening form Appendix II
   - Yes → Interview to elicit worksites & contacts
     - Venues & contacts interview Appendix III
   - No → Eligible contacts mentioned?
     - Yes → Eligible worksites mentioned?
       - Yes → Use venue and peer network surveillance together to maximize coverage of all potentially exposed co-workers
       - No → Any contacts pass pre-screen?
         - Yes or reachable* → PR Pre-screen Appendix V
         - No → Any work pass pre-screen?
           - Yes → VB Pre-screen Appendix IV
           - No → PR-1 tracking form Appendix VIII and Contact brief interview Appendix IX
     - No → Any contacts pass pre-screen?
       - Yes or reachable* → Schedule & conduct meetings: Testing + interview
         - PR-1 tracking form Appendix VIII
       - No → Roll-up to return results, Case investigation
         - PR-1 tracking form Appendix VIII
   - No → Highest risk venues first
2. Peer Network Surveillance
3. Venue Surveillance
   - Schedule & conduct venue visits:
     - Testing + interview
     - VB tracking forms Appendix VI & VII and Contact brief interview Appendix IX
   - Roll-up to return results, Case investigation
     - VB-2 tracking form Appendix VII

*PR contacts unreachable by phone should be visited at home or at other known locations

7-day time limit to complete SB-RACD
Appendix II: Case Eligibility Screening Form

- Follow steps 1-3 below to determine if a malaria case is eligible to participate in SB-RACD.
- If the case is not eligible for SB-RACD, record the corresponding code on the SB-RACD case log.

Name:

Village/town/city of residence:

<table>
<thead>
<tr>
<th>Step 1. Review the individual’s malaria test result</th>
<th>Eligible</th>
<th>Ineligible (code)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Does the individual have a positive malaria diagnosis by RDT, microscopy, or LAMP?</td>
<td>☐ Yes</td>
<td>☐ No (D)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2. Ask the individual the following questions:</th>
<th>15 or older</th>
<th>14 or younger (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. What is your age?</td>
<td>☐ Yes</td>
<td>☐ No (A)</td>
</tr>
<tr>
<td>C. In the past 60 days, did you work at any place that is in the forest or forest fringe?</td>
<td>☐ Yes</td>
<td>☐ No (W)</td>
</tr>
<tr>
<td>D. In the past 60 days, were you at any of these places anytime between sundown and sunup, either working or sleeping?</td>
<td>☐ Yes</td>
<td>☐ No (W)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 3. If the individual passes all of the above eligibility criteria, administer informed consent:</th>
<th>Eligible</th>
<th>Ineligible (code)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. Did the case consent to participate in SB-RACD?</td>
<td>☐ Yes</td>
<td>☐ No (R)</td>
</tr>
</tbody>
</table>
Appendix III: Interview with Cases to Identify Venues and Contacts

Instructions: Conduct this interview with index cases that have screened eligible for SB-RACD.

1. Fill out the table for each worksite mentioned. For example, if the case mentions 3 worksites you should fill in 3 tables, one for each site.
2. Use question #24 to determine if the venue/worksite is eligible to proceed to venue pre-screen.
3. If so, calculate the total risk score for the worksite (question #25) by summing up the numbers in the last column.
4. If the case mentions any co-worker referrals (question #26), record contact information (names, phone numbers, etc.) on form PR-1.
5. After completing the interview with the case, move on to the next step: pre-screen worksites and co-worker referrals.

Case Name: ___________________ Case ID: ___________________

“Think about all of the places where you worked in the forest or forest fringe in the past 60 days between sundown and sunup. I will ask you about each of these places, beginning with the worksite where you worked most recently.”

Worksites #______ (use consecutive numbering: 1, 2, 3, etc.)

<table>
<thead>
<tr>
<th>#</th>
<th>Question</th>
<th>Record response</th>
<th>Enter points for risk score (Gray cells only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name of worksite</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>If the worksite doesn’t have a name, think of a memorable detail to distinguish it from other places where you worked, such as “mining site by river” or “logging site deep forest”</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Where is this worksite located?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Country</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Province</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>District</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Sub-district</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Nearest village</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>What kinds of transport did you take to get to [PLACE] from the nearest village?</td>
<td>1. By foot/walked</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. By motorcycle/moped (2–3 wheel vehicle)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. By car/truck (4 or more wheel vehicle)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Other, specify:____________________</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>How long did it take you travel to [PLACE] from the nearest village?</td>
<td>____ days OR</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>____ hours OR</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>____ min</td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Options/Instructions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>How many nights did you spend at [PLACE] in the last 60 days?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>When was the last time you were at [PLACE] between sundown and sunup?</td>
<td><em><strong>/</strong></em>/_____</td>
<td></td>
</tr>
</tbody>
</table>
| 11 | What is the main kind of work that is done at [PLACE]?                    | 1. Logging                             
2. Mining                                
3. Farming or plantation work           
4. Cattle raising or breeding           
5. Hunting                              
6. Fishing                              
7. Other, specify: _______               |
| 12 | Is this worksite managed by an employer?                                  | 1. Yes                                 
0. No                                    |
| 13 | How far is [PLACE] to the nearest road (in kilometers)?                   | _______ Number                        |
| 14 | Were you bitten or bothered by mosquitoes at the place where you did work at [PLACE]? | 1. Yes (2 points)                     
0. No (0 points)                        |
| 15 | Did you see any monkeys/macaques around the place where you did work at [PLACE]? | 1. Yes, show the pictures and specify (1 point) 
0. No (0 points)                        |
| 16 | What, if anything, did you do to protect yourself from mosquitoes while you WORKED at [PLACE]?: | 1. Chemoprophylaxis/ Medicine Specify:__________ 
2. Bed net                              
3. Hammock net                          
4. Mosquito repellent or coil           | 0 points if response is 1–4           |
5. Wearing covering clothes            
6. Fire                                  
7. Other, specify__________              
8. Nothing                               | 1 point if response is 5–8            |
| 17 | Did you sleep while in [PLACE]?                                          | 1. Yes                                 
0. No                                    |
| 18 | Where did you sleep while in [PLACE]?:                                   | 1. In a hammock tied to a tree        
2. Tent                                  
3. Plastic makeshift tent                | 2 points if not a stucture (responses 1–3) |
4. Hut                                   
5. Barracks                             
6. House                                 
7. Other, specify:__________              | 0 points if a structure (responses 4–6) |
| 19 | Were you bitten by mosquitoes in the place where you SLEPT while in [PLACE]?: | 1. Yes (2 points)                     
0. No (0 points)                        |
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 20 | What, if anything, did you do to protect yourself from mosquitos while you SLEPT at [PLACE]?
|   | Record whatever the participant says, even if you do not believe it helps prevent malaria. | 1. Chemoprophylaxis/ Medicine
   | Specify:_____________
|   | 2. Bed net 
|   | 3. Hammock net 
|   | 4. Mosquito repellent or coil 
|   | 5. Wearing covering clothes 
|   | 6. Fire 
|   | 7. Other, specify___________ 
|   | 8. Nothing 
|   | 0 points if an effective method (responses 1–4) 
|   | 1 point if not an effective method (responses 5–8) 
| 21 | How many other people typically slept in the same structure with you or near where you slept while in [PLACE]?
|   | Number of people: ______
| 22 | Do you think anyone is working at [PLACE] now or will be sometime in the next 7 days?
|   | 1. Yes, now (venue eligible) 
|   | 2. Yes, in the next 7 days (venue eligible) 
|   | If within next 7 days, ask when 
|   | 2a. When: ______
|   | 0. No, site is not active (not venue eligible) 
| 23 | How many people typically work at [PLACE] at one time?
|   | Number of people: ____ (Must be ≥6)
| 24 | Eligible to conduct venue pre-screen?
|   | Yes, only if all of the following are true: 
|   | • Place is located in [SB-RACD Area] 
|   | • People are expected to be working there now or in the next 7 days (#22 =1 or 2) 
|   | • There are typically at least 6 people working there (#26 ≥ 6)
|   | 1. Yes 
|   | 0. No 
| 25 | If eligible to conduct Venue pre-screen, 
|   | SUM UP RISK SCORE: 
|   | Risk score total: 
| 26 | How many other people do you know by name who have worked at [PLACE] in the past 60 days and who live in [Name of SB-RACD area]?
|   | Number of co-worker referrals: __________
|   | Record contact information on form PR-1 for all co-workers mentioned.

---

**Peer Network Surveillance**

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**A Malaria Elimination Guide to Targeted Surveillance and Response in High-Risk Populations**
Appendix IV: Venue Pre-screen

- Pre-screen each worksite mentioned by the case by following the steps below.
- If the venue fails pre-screen, record the corresponding code on form VB-1.

<table>
<thead>
<tr>
<th>Step 1. Review SB-RACD records to determine:</th>
<th>Passes pre-screen</th>
<th>Fails pre-screen (code)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Has an investigation already been conducted at the venue in the past 30 days?</td>
<td>☐ No</td>
<td>☐ Yes (P)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2. Contact venue officials (owner, manager) to determine the following. If there are no officials or they are not available, contact peer referrals or community leader:</th>
<th>Passes pre-screen</th>
<th>Fails pre-screen (code)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Is the venue accessible and safe to conduct an investigation?</td>
<td>☐ Yes</td>
<td>☐ No (A)</td>
</tr>
<tr>
<td>C. If not safe or accessible, can an alternate location be arranged in the next 7 days?</td>
<td>☐ Yes</td>
<td>☐ No (A)</td>
</tr>
<tr>
<td>The venue passes Step 2 if either B or C are Yes.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 3. If the venue passes Steps 1 and 2, continue to the questions below:</th>
<th>Passes pre-screen</th>
<th>Fails pre-screen (code)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D. Will at least 6 workers be at the site (or alternative location) during the next 7 days?</td>
<td>☐ Yes</td>
<td>☐ No (E)</td>
</tr>
<tr>
<td>E. Does the venue official provide permission (if applicable)?</td>
<td>☐ Yes</td>
<td>☐ No (R)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 4. Result of pre-screen. Does the venue pass Steps 1, 2 and 3?</th>
<th>Passes pre-screen</th>
<th>Fails pre-screen</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>☐ Yes</td>
<td>☐ No</td>
</tr>
</tbody>
</table>
Appendix V. Peer-referral Pre-screen

- To pre-screen each co-worker referral mentioned by the index case follow the steps below.
- If the contact passes pre-screen, schedule a meeting to do testing and the brief interview.
- If the contact fails pre-screen, record the corresponding code on form PR-1.
- If the contact cannot be reached by phone, try to approach him/her at the household or other known location.

<table>
<thead>
<tr>
<th>Step 1. Ask the contact the following questions:</th>
<th>Passes pre-screen</th>
<th>Fails pre-screen (code)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. In the past 30 days, did anyone ask to interview you and test you for malaria? If yes, follow up to determine: did this person really participate in an SB-RACD investigation in the past 30 days?</td>
<td>□ No</td>
<td>□ Yes (P)</td>
</tr>
<tr>
<td>B. What is your age?</td>
<td>□ 15 or older</td>
<td>□ 14 or younger (A)</td>
</tr>
<tr>
<td>C. Do you know [name of index case]?</td>
<td>□ Yes</td>
<td>□ No (C)</td>
</tr>
<tr>
<td>D. In the past 60 days, did you work with [name of index case] at any place that is in the forest or forest fringe?</td>
<td>□ Yes</td>
<td>□ No (W)</td>
</tr>
<tr>
<td>E. In the past 60 days, were you at any of these places anytime between sundown and sunup, either working or sleeping?</td>
<td>□ Yes</td>
<td>□ No (W)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2. If the contact passes all questions in Step 1, continue to ask:</th>
<th>Passes pre-screen</th>
<th>Fails pre-screen (code)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F. Does the contact agree to meet to be tested for malaria and complete a brief interview?</td>
<td>□ Yes</td>
<td>□ No (R)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 3. Result of pre-screen. Does the contact pass all questions above?</th>
<th>Passes pre-screen</th>
<th>Fails pre-screen (code)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□ Yes</td>
<td>□ No</td>
</tr>
</tbody>
</table>
Appendix VI. Worksite Tracking Form (VB-1)

Health Facility:___________________ Index Case: ID_______ Name_______________________________
Village________________________________________

Date case diagnosed: ___/___/___ Deadline for SB-RACD follow-up (7 days after diagnosis): ___/___/___

**Worksites**

Instructions: 1) List all worksites mentioned by case, highest risk score first. 2) Conduct pre-screen. 3) Schedule and conduct investigation(s), highest risk first.

<table>
<thead>
<tr>
<th>Venue ID</th>
<th>Risk score</th>
<th>Location/address</th>
<th>Venue type (code)¹</th>
<th>Venue officials Name &amp; phone</th>
<th># workers expected</th>
<th>Passed pre-screen?²</th>
<th>Investigation(s) scheduled and completed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes □ No Code:__</td>
<td>1. scheduled <strong>/</strong>/__ completed <strong>/</strong>/__ #tested: ___ 2. 3. Investigation conducted at: □ worksite □ alternative location □ Not conducted.³ Code:_______</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes □ No Code:__</td>
<td>1. scheduled <strong>/</strong>/__ completed <strong>/</strong>/__ #tested: ___ 2. 3. Investigation conducted at: □ worksite □ alternative location □ Not conducted.³ Code:_______</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes □ No Code:__</td>
<td>1. scheduled <strong>/</strong>/__ completed <strong>/</strong>/__ #tested: ___ 2. 3. Investigation conducted at: □ worksite □ alternative location □ Not conducted.³ Code:_______</td>
</tr>
</tbody>
</table>

1 Worksite type: M=mine; L=logging; A=agriculture (farm or plantation); C=cattle; O=other (Specify)
2 Failed pre-screen codes: P=SB-RACD already conducted in past 30 days; A=inaccessible or unsafe; R=venue refused (could not arrange alternate location); E=< 6 workers expected;
3 Did not conduct visit codes: F=could not find location; W=no workers present/available during visit O=other (Specify)
<table>
<thead>
<tr>
<th>#</th>
<th>Worker information</th>
<th>Steps during 1st encounter</th>
<th>Lab &amp; follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Date</td>
<td>Name</td>
<td>Age</td>
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<td>15</td>
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</tbody>
</table>

Individuals who already participated in SB-RACD in past 30 days: Fill out Worker Info section only - Do not test/interview - Fill out Previous Participation Form.

Eligibility codes: P=participated in past 30 days; A=age<15 years; W=does not meet worker or "sundown-to-sunrise" criteria; R=refused.
### Appendix VIII. Peer Network Contact Tracking Form (PR-1)

**Health Facility:** ____________________  **Index Case:** ID_______  **Name:** ____________________  
**Village:** ____________________  
**Date case diagnosed:** ___/___/___  **Deadline for SB-RACD follow-up (7 days after diagnosis):** ___/___/___

#### Co-workers Contacts

Instructions: 1) List all co-workers mentioned by case. 2) Contact co-worker to conduct pre-screen. 3) Schedule and conduct peer investigation.

<table>
<thead>
<tr>
<th>#</th>
<th>Co-worker referral information</th>
<th>Village of residence</th>
<th>Passed pre-screen?</th>
<th>Meeting dates</th>
<th>Partici-pant ID assigned</th>
<th>Lab &amp; follow-up</th>
<th>RDT Tx provided</th>
<th>Tx provided</th>
<th>Slides</th>
<th>LAMP provided</th>
<th>Tx provided</th>
<th>Tx provided</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Name &amp; phone</td>
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</tbody>
</table>

- **Steps during 1st encounter**
- **Brief interview**
- **RDT Tx provided**
- **Slides | LAMP Tx provided**
- **Lab & follow-up**

**Individuals who already participated in SB-RACD in past 30 days:** Fill out Co-Worker info section only - Do not test/interview - Fill out Previous Participation Form.

**Ineligibility codes:** P=participated in past 30 days; A=age<15 years; C=does not know case; W=does not meet worker or “sundown-to-sunrise” criteria; R=refused.
## Appendix IX. Brief Interview Form for Contacts

### Section 0. Identifiers

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Skip pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Date of interview</td>
<td>DD / MM / YYYY</td>
</tr>
<tr>
<td>2</td>
<td>Index case ID</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Worksite ID (venue surveillance only)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Name of participant</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Participant ID</td>
<td></td>
</tr>
</tbody>
</table>

### Section 1. Eligibility screen

#### Peers only

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th>1. Yes</th>
<th>0. No</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Do you know [index case’s name]?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>In the past 60 days, did you work with [index case’s name] at any place that is in the forest or forest fringe?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>In the past 60 days, were you at any of these places anytime between sundown and sunup, either working or sleeping?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Venue only

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th>1. Yes</th>
<th>0. No</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Are you working here at [name of worksite] now or have you worked here in the past 60 days?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>In the past 60 days, have you been here at [name of worksite] anytime between sundown and sunup, either working or sleeping?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### All participants

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th>1. Yes</th>
<th>0. No</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Administer Informed Consent</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Participant provided informed consent?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Please tell us your reasons for not giving consent. (select all that apply)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Do not prompt.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Eligibility criteria

All participants must:
- be aged 15 years or older
- provide informed consent (Q7=yes)

Also:
- Peer network participants must respond Yes to questions 2, 3 and 4
- Venue participants must respond Yes to questions 5 and 6

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th>1. Yes</th>
<th>0. No</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Is respondent eligible by these criteria?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If no, thank respondent and end interview.
### Section 2. Demographics

15 Participant gender
   1. Female
   2. Male
   3. Other (specify: ____)

16 What countries are you a citizen of?
   1. [Insert country presently in]
   2. [Insert common travel or malaria-endemic destinations]
   3. Other (specify: ____)

17 Where is your main place of residence, where you maintain a household and usually live?
   List:
   Province
   District
   Sub-district
   Village

18 How long have you lived at this residence?
   1. Less than 3 months
   2. 3-6 months
   3. 6 months – 1 year
   4. 1 year or more

19 What is the highest level of education that you have attended or completed?
   1. No education
   2. Elementary/primary school
   3. Junior high school
   4. Senior high school
   5. Higher than senior high school

20 What is your main occupation or income generating activity?
   1. Professional/technical/managerial
   2. Teacher
   3. Small business/retail
   4. Government staff
   5. Factory labourer
   6. Logger
   7. Miner
   8. Farmer
   9. Plantation worker
   10. Cattle breeder
   11. Fisherman
   12. Fisherman
   13. Military personnel
   14. Forest ranger
   15. Police
   16. Construction
   17. Other: specify: ________

### Section 3. Malaria history

21 Have you been ill with fever at any time in the past 6 months?
   1. Yes
   0. No

22 Have you been ill with fever at any time in the past 2 weeks?
   1. Yes
   0. No
<table>
<thead>
<tr>
<th>Question</th>
<th>Response Options</th>
<th>Notes</th>
</tr>
</thead>
</table>
| 23 The last time you had fever, did you seek advice or treatment for the illness from any source? | 1. Yes  
0. No                                                               | -Q7                            |
| 24 The last time you had fever, where did you seek advice or treatment from? Select all that apply Anywhere else? PROBE TO IDENTIFY EACH SOURCE | 1. Pharmacy  
2. Health center  
3. Private clinic  
4. Private nurse/midwife (home-based)  
5. Traditional healer  
6. Public hospital  
7. Private hospital/laboratory  
8. In the home only  
9. Other: specify                                                                 |                                |
| 25 What treatment, if any, did you receive?                               | 1. DHA/Pip  
2. Chloroquine  
3. Quinine by mouth  
4. IV Quinine  
5. Primaquine (1 day)  
6. Primaquine (14 days)  
7. Artesunate amodiaquin  
8. Artesunate mono  
9. Sulfadoxin pyrimethamin  
10. Other (specify)  
11. Received treatment, but don’t know what kind  
12. No treatment received  
If no treatment, skip to Q8                                                                 |                                |
| 26 Did you complete that treatment?                                      | 1. Yes  
0. No                                                             |                                |
| 27 The last time you had fever, did you receive a blood test for malaria? | 1. Yes  
0. No                                                             | If no, skip to Q9               |
| 28 Were you diagnosed with malaria?                                      | 1. Yes  
0. No  
88. Don’t know                                                      |                                |
| 29 Why didn’t you receive a blood test for malaria the last time you had fever? | 1. Could not get permission to go for care  
2. Cost of medical consult too expensive  
3. Cost of testing too expensive  
4. Cost of treatment too expensive  
5. Health facility too far / transport too expensive  
6. Not able to travel alone  
7. Did not know where to go for testing  
8. Did not trust health providers  
9. Did not trust malaria testing  
10. Did not think testing was necessary  
11. Other: specify                                                                 |                                |
## Section 4. Travel

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
</table>
| 30 How long have you been in [SB-RACD area] | ____ days  
| | ____ months  
| | ____ years |
| 31 Have you spent any nights elsewhere in the past 8 weeks? | 1. Yes specify:______  
| | 0. No |

## Section 5. Intervention use

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
</table>
| 32 What, if anything, did you do to protect yourself from mosquitos while you WORKED at [name of worksite]? | 1. Chemoprophylaxis/ Medicine (specify)  
| | 2. Bed net  
| | 3. Hammock net  
| | 4. Mosquito repellent or coil  
| | 5. Wearing covering clothes  
| | 6. Fire  
| | 7. Other (specify)  
| | 8. Nothing |
| 33 Where did you sleep while in [name of worksite]? | 1. In a hammock tied to a tree  
| | 2. Tent  
| | 3. Plastic makeshift tent  
| | 4. Hut  
| | 5. Barracks  
| | 6. House  
| | 7. Other (specify) |
| 34 What, if anything, did you do to protect yourself from mosquitos when you SLEPT in [name of worksite]? | 1. Chemoprophylaxis/ Medicine (specify)  
| | 2. Bed net  
| | 3. Mosquito repellent or coil  
| | 4. Wearing covering clothes  
| | 5. Fire  
| | 6. Other (specify)  
| | 7. Nothing  
| | 99. Decline to answer |

## Section 6. Lab results (to be completed by nurse / lab technician)

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
</table>
| 35 RDT result | 1. Positive  
| | 2. Negative |
| 36 Referred to health facility | 1. Yes  
| | 0. No |
| 37 Reason not referred |  |
| 38 DBS collected | 1. Yes  
| | 0. No |
| 39 Reason no DBS |  |
| 40 LAMP results | 1. Positive  
| | 2. Negative |
X. Checklist of supplies for SB-RACD Investigations

- Information from the Immediate Health Facility
  - Notification Log for Malaria Cases and Controls
- Consent forms for Socio-behavioral RACD
- Backpack
- Tablet
- Tablet charger
- Paper copies of questionnaires
- Slides and slide-box
- Dried Blood Spot (DBS) cards
- 250uL microtainers
- 3mL EDTA vacutainers
- Gloves
- Alcohol swabs
- Lancets
- Syringes
- Butterfly needles
- Cotton or gauze

- Biohazard plastic bag (red)
- Plastic bag for other trash (black)
- Sharps container
- Coolbox with frozen gelpacks
- RACD barcodes
- Pencils, pens, and permanent markers (sharpies)
- Backup paper questionnaires
- Clear plastic zip bags for samples
- Drying racks for slides and DBS
- Vouchers

If the field team needs to stay overnight at worksite:

- Tent
- Malaria protection equipment (bednet, coils, spray)
- Food/water
- Flashlights
Appendix XI. Script for Contacting Venue Officials for Pre-screen

1. Check records to determine if venue has already been conducted at this site in the past 30 days. If so, do not continue with Pre-Screen. If unsure, contact venue officials to confirm.

2. Hello, my name is ______ from [name of health facility] in [name of district/locale]. I am calling you because we recently had a case of confirmed malaria in a patient who says he/she worked at one of your forest worksites. This health facility is part of a malaria control strategy for forest workers, in coordination with the [name of local health authority, i.e., district health office], to understand more about malaria in this area. As a part of this strategy, we are coordinating with forest worksites to provide free malaria testing and treatment to all workers at worksites linked to new cases, even if they are not sick now, because many people with malaria do not have symptoms. This involves a brief interview with forest workers at the worksite to help us understand forest malaria. May I please ask you a few questions to help us decide about conducting testing at your worksite?

3. First, can you please clarify your position or role at [name of worksite]?

4. The patient said the worksite was [name of worksite] at [location of worksite] and the type of work is [type of worksite]. Is this correct?

5. Has a health facility already tested workers from this worksite? [If so, gather more information to confirm if it was in the past 30 days. If venue surveillance was not done in the past 30 days, continue.]

6. Will there be people working at this site between now and [deadline date for SB-RACD]? [If so, continue.]

7. Approximately how many people will be working at this site between now and [deadline date for SB-RACD]? Please count anyone working there, even support staff such as cooks, drivers and assistants. [Record number on Form VB-1. If 6 or more, continue.]

8. With your permission, we will send a health team to your worksite as soon as possible to offer a free malaria test and conduct a brief interview with all workers present at the site during the team’s visit, whether healthy or sick. This will last about 45 minutes with each worker. The purpose of the interview is to understand malaria risk at home and worksites. Free treatment will be provided if a worker is found to have malaria. The team may need to visit more than once to include all workers. But testing must be done before [deadline date for SB-RACD]. Can you tell me how we can get to your worksite and if it would be safe?

9. If not safe: I understand it will not be safe for us to travel to the worksite. However, is there another place where we can test and interview the workers, such as a camp where they sleep or an office where they usually meet away from the worksite? Our goal is to test and interview as many workers as possible before [deadline date for SB-RACD].

10. What are the days and times when will we be able to reach the most workers? [Continue scheduling and coordinating details. Record details on Form VB-1.]

Closing statement if not eligible:

Thank you for speaking with me. We are unable to conduct malaria surveillance at this worksite at this time, because of our standard procedures about where surveillance should be conducted. We appreciate your cooperation. Sometime in the future we may contact you again if another patient mentions previous work for you.
Appendix XII. Guidance on Conducting Brief Interviews with Contacts

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. Follow general guidelines below on how to build rapport with the contact and conduct a successful interview.

Building Rapport

The contact’s first impression of you will influence her/his willingness to cooperate. Be friendly, respectful and smile as you introduce yourself. You will also be given a letter (and an identification badge to wear at all times) that states that you are working with the [name of institution or organization] on malaria surveillance.

Assure Confidentiality

If the person is hesitant about responding or asks what the data will be used for, explain that the information you collect will remain confidential, their name will not be used for any purpose, and all information will be grouped together for statistical analysis and reports about malaria by the [name of institution or organization]. This information will help them to prevent malaria.

Never mention information from other interviews or show completed interview forms in front of a contact or anyone else.

Interview the Contact Alone

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

Answer Questions Frankly

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

The person may also be concerned about the time or length of the interview. If they ask, tell them that the interview usually takes about 30 to 60 minutes.

Individuals who work in the forest may be concerned that you will ask them about illegal activities or testing for drug use. Explain to them that:

- Testing is for malaria, not illegal drug use, or other diseases
- They will not be asked about illegal activities, only forest work; if the forest work they are engaging in is illegal, they will not be asked any of those details and they can choose not to provide any details at any time.
- Remind the respondent that the interview is completely confidential and you will not be sharing any of the information with anyone outside of the surveillance team.

Interviewees may ask questions or want to talk further about the topics you bring up, such as indoor residual spraying or how to use a mosquito net. It is important not to interrupt the flow of the interview, so tell them that you will be happy to answer their questions or to talk further after the interview. After the interview is over, if you feel comfortable doing so, you may answer basic health or other questions to the best of your ability while informing the person that you are not a nurse, doctor or expert on the topic. Give the person the health information materials and refer them to local health staff for more information.

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 contacts, trying to be polite, will say what they think the interviewer wants to hear.

If the respondent gives an unclear answer, try to probe in a neutral way, asking questions such as the following:

- “Can you explain a little more?”
- “I did not quite hear you. Could you please tell me again?”
- “There is no hurry. Take a moment to think about it.”
Never Suggest Answers

If a contact'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.

Do Not Force Participants to Answer Questions

If the respondent is reluctant or unwilling to answer a question, explain once again that the same question is being asked of many respondents and that the answers will all be merged together. If the respondent is still reluctant, select the “Refused to answer” option on the question and proceed as if nothing had happened. Remember, the respondent cannot be forced to give an answer.

Phrase Questions Carefully

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 benefitted most?” “Can you give me some specific examples?”