

## Vector Control Epidemiological Impact Evaluation Staff and Technical Assistance Request Guidance

### Introduction

- This is meant to be a guide for national malaria programs to inform requests for staff and/or technical assistance for evaluations of the impact of vector control interventions on malaria burden or transmission as part of Global Fund applications. The description of the positions/roles in the table below can be used to develop terms of references.
- This brief guide provides an overview of two common types of evaluations—using existing routine data sources and conducting cross-sectional or cohort studies. It also provides a description of the staff/technical assistance roles and the expected level of effort for these roles. Routine data sources have the advantage of allowing impact evaluations to be conducted at a lower cost, at a more granular level, and with greater breadth across the country than through cross-sectional and cohort studies. Evaluations using routine data sources are typically used to inform national and sub-national vector control decisions. Cross-sectional and cohort studies are roughly 10 times the cost of evaluations conducted using routine data sources, including increased LOE and staff level, but provide higher quality data that accurately capture trends in community-based malaria prevalence or incidence with more precision. Cross-sectional and cohort studies are generally conducted to produce generalizable results to inform both national and global decision-making.
- National malaria programs may want to prioritize vector control impact evaluations when new interventions, or new combinations of interventions are being introduced, when interventions are withdrawn, or when the program is actively considering a change in vector control strategy or policy and would like data to inform specific decisions. For example, in Burkina Faso, Rwanda, Mozambique, and Nigeria national malaria programs engaged the New Nets Project to conduct evaluations of new types of ITNs through a cross-sectional evaluation. In Cote d’Ivoire, the NMCP engaged PMI VectorLink to conduct an evaluation assessing the impact of IRS over the first two years of implementation using routine data sources. In Sierra Leone, the NMCP engaged PMI VectorLink to conduct an evaluation assessing the impact of co-deploying IRS and PBO ITNs compared to PBO ITNs alone using routine data sources.

### Types of evaluation and technical assistance guidance

#### **Using existing routine data sources (\$150,000 USD to \$300,000 USD)**

Through well-designed evaluations using routine epidemiological, entomological, and/or programmatic data sources, national malaria control programs (NMCPs) can gain important insights into the impact of vector control interventions. Although these observational evaluations are not as methodologically rigorous as cluster-randomized control trials, or other data collection methods tailored to evaluation questions, using these routine data sources can allow NMCPs to conduct impact evaluations relevant to their own context at a lower cost, a more granular level, and with greater geographic range across the country than commonly available through other designs. These types of evaluations, which utilize routine surveillance data sources, are important sources of information as NMCPs develop sub-national level stratification plans and context-specific intervention packages. Ideally a subnational tailoring taskforce will be constituted and can provide guidance on the type of staffing already available and the additional support that needs to be budgeted and requested.

Common existing data sources that can be used to support evaluations include:

1. **Health Management Information Systems (HMISs)**, including confirmed malaria cases, malaria suspects, total suspects tested for malaria, total outpatient visits, confirmed malaria cases diagnosed by community health workers, pregnant women and infants receiving ITNs through health facilities, and population, by age and health facility.
2. **National Logistics Management Information Systems (LMISs)** for RDT and ACT stock and commodity data, to determine if stockouts are influencing trends in confirmed malaria cases.
3. **ITN distribution data** from program implementation, including ITN type and the number of ITNs distributed and population protected by location.
4. **Post-ITN campaign surveys**, such as end user or durability monitoring surveys.
5. **IRS campaign data** from program implementation, including structures sprayed and population protected.
6. **Entomological data** from routine entomological monitoring from the NMCP and research and implementing partners.
7. **Existing population survey data** from [Malaria Indicator Surveys](#), [Demographic and Health Surveys](#), [Malaria Behavioral Surveys](#), or other population-based surveys that contain data on [malaria-related indicators](#).
8. **Population estimates**, such as national censuses, [WorldPop](#) or [GRID3](#) projections.
9. **Climate, weather, and ecology data** from either national or geospatial sources.
10. **Data quality assessments** from national systems or assessments, [WHO surveillance assessment toolkit](#), the [Routine Data Quality Assessment Tool](#), or other tools.
11. **Other programmatic data** that may affect the vector control interventions, such as, but not limited to seasonal malaria chemoprevention, mass drug administration, or other health services expansion programs.

In order to carry out a vector control evaluation using existing routine data sources, we propose the following positions with responsibilities, required experience, and level of effort. These are meant as a guide and reflect the staffing needed to complete the evaluation and generate an evaluation report. These roles could be combined if one person has relevant experience in multiple areas. Ideally, each of the positions listed below would be based either with a national malaria program or local research institution. They may also be placed within broader MOH units and shared across programs. Programs may want to consider prioritizing a full-time data manager/analyst staff position placed within the national malaria program. This full-time position would not only support evaluation activities but would also support data compilation for other data-related activities, such as subnational tailoring, malaria program reviews, and annual program reporting, among others.

In addition to using data sourced directly from existing systems, national programs could consider using 'enhanced' routine data collection, defined as retrospective data collection directly from health facility registers or prospective data collection using data collection staff placed at health facilities to collect register data, and additional study data, as village of residence or travel history) throughout the evaluation period. These techniques would have additional associated costs, estimated between an additional \$100,000 -USD \$200,000 USD in addition to the routine evaluation costs, but may help address data quality concerns and/or provide important information at a more granular level or on

migration/displacement. Information from recently completed data quality audits can be used to help determine whether this approach should be pursued.

### Technical assistance staffing

| Position             | Responsibilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Required experience                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | LOE (days)* |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Epidemiologist       | <ol style="list-style-type: none"> <li>1. Work with NMCP, other stakeholders, or a subnational tailoring committee to determine key evaluation questions that support policy and programming, evaluation timeline, and data available.</li> <li>2. Develop an evaluation plan or protocol; submit to IRB for review and approval.</li> <li>3. Review data submissions by data manager/analyst.</li> <li>4. Guide data manager/analyst in implementing exploratory analyses and initial visualizations to support the analysis.</li> <li>5. Work with data manager/analyst and statistician to conduct statistical analyses.</li> <li>6. Write final report.</li> <li>7. Support NMCP with dissemination of results (national stakeholder meetings, conferences and/or publications) and using the evidence to inform national decisions (including malaria strategic plans, national malaria program reviews, Global Fund applications and other key documents).</li> </ol> | <ul style="list-style-type: none"> <li>● Advanced degree in public health, epidemiology, or statistics with experience working in data analysis relevant to malaria.</li> <li>● Experience with epidemiology of vector-borne diseases and spatial epidemiology. Familiarity with entomological data and indicators.</li> <li>● Experience with disease mapping.</li> <li>● Proficiency using software to clean, manage, analyze, and visualize data (e.g. Excel, R, Stata, SAS, SPSS, Python, PowerQuery, PowerBI, Tableau, ArcGIS).</li> </ul> | 30-50 days  |
| Data manager/analyst | <ol style="list-style-type: none"> <li>1. Implement a landscape of mapping of key implementation partners and stakeholders with relevant data.</li> <li>2. Develop data templates to inform partners on the type and details of data required for submission.</li> <li>3. Develop efficient mechanism for data sharing (e.g., online shareable folders, DropBox, data repositories, etc.).</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>● Experience in conducting filing, cleaning, and linking large data sets.</li> <li>● Experience with data sets for technical malaria control interventions, general health policy, global strategies, and good practices in health systems management.</li> </ul>                                                                                                                                                                                                                                        | 50-80 days  |

| Position                                                                    | Responsibilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Required experience                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | LOE (days)*                       |
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|                                                                             | <ol style="list-style-type: none"> <li>4. Track data submissions.</li> <li>5. Assemble submitted data into a structured format for each required data indicator.</li> <li>6. Implement basic data validation and cleaning.</li> <li>7. Document data quality and share data quality review findings with stakeholders.</li> <li>8. Work with the analysis team on advanced data validation and corrections.</li> <li>9. Conduct exploratory analyses and develop visualizations, as needed, to support analysis.</li> <li>10. Develop methods (i.e., unique IDs, standardized naming conventions) to link and integrate datasets for analysis.</li> </ol> | <ul style="list-style-type: none"> <li>● Demonstrated experience of working within a diverse team on data collection, cleaning, and transforming data sets.</li> <li>● Proficiency using software to clean, manage, analyze, and visualize data (e.g. Excel, R, Stata, SAS, SPSS, Python, PowerQuery, PowerBI, Tableau, ArcGIS).</li> <li>● Experience with DHIS2.</li> <li>● Residency in country of support is a major advantage.</li> <li>● Basic analysis and mapping skills and experience with GIS are desirable.</li> </ul> |                                   |
| Statistician                                                                | <ol style="list-style-type: none"> <li>1. Advise on sample size/power calculations and the most appropriate statistical tests to inform the evaluation plan.</li> <li>2. Review preliminary model outputs.</li> <li>3. Review final analysis and support interpretation of the results.</li> </ol>                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>● Strong background in statistical models used in evaluation of community-level interventions.</li> <li>● Proficiency using software to conduct statistical analyses (e.g. R, Stata, SAS, SPSS).</li> <li>● Strong skills in a range of epidemiologic study designs.</li> <li>● Knowledge of malaria vector control interventions and evaluations using routine data (preferred).</li> </ul>                                                                                                | 10-25 days                        |
| Facility Data Collector (1 per facility)<br>(Enhanced data collection only) | <ol style="list-style-type: none"> <li>1. Based in health facilities, collect and record health register data and any additional study data, such as village of residence or travel history.</li> <li>2. Review data and discuss with health facility staff any anomalies in data or recording processes. Document these anomalies as part of the dataset.</li> <li>3. Protect the confidentiality of patient identifying information in registers at all times.</li> </ol>                                                                                                                                                                               | <ul style="list-style-type: none"> <li>● Experience in data collection and recording</li> <li>● Knowledge, familiarity with health systems data and registers.</li> <li>● Experience with digital data collection tools preferred.</li> </ul>                                                                                                                                                                                                                                                                                      | Full-time, full evaluation period |
| Data collection supervisor                                                  | <ol style="list-style-type: none"> <li>1. Oversee facility data collectors.</li> <li>2. Conduct routine visits to health facilities to assess facility data collector performance and to conduct</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                               | <ul style="list-style-type: none"> <li>● Experience in data collection and recording.</li> <li>● Experience in supervising health systems data collection efforts.</li> </ul>                                                                                                                                                                                                                                                                                                                                                      | Full-time, full                   |

| Position                        | Responsibilities                                                                                                                                                                                                                                                                                                                                      | Required experience                                                                                                                                                                                                                                                                        | LOE (days)*       |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| (Enhanced data collection only) | <p>data quality audits, comparing collector entered data against facility registers.</p> <p>3. Conduct regularly remote reviews of data from facility data collectors to ensure timeliness, completeness, and accuracy, and provide feedback.</p> <p>4. Protect the confidentiality of patient identifying information in registers at all times.</p> | <ul style="list-style-type: none"> <li>● Experience with data sets for technical malaria control interventions, general health policy, global strategies, and good practices in health systems managements.</li> <li>● Experience with digital data collection tools preferred.</li> </ul> | evaluation period |

\*LOE are estimates depending on the number, complexity, and cleanliness of incoming datasets and the complexity of the evaluation design.

### **Cross-sectional or cohort studies (\$1 million USD to \$3 million USD)**

If planned correctly, cross-sectional or cohort studies can be used to collect reliable data at the individual or household level on indicators of interest within a study population for the evaluation question(s) at hand. For example, to assess the impact of a new intervention or combinations of interventions, cross-sectional surveys can collect reasonably precise estimates of malaria prevalence and intervention coverage in the study population at a regular interval. Cohort studies, which follow members of the study population regularly over time with repeated visits, can be used to assess the impact of new interventions or combinations of interventions on the incidence of malaria infections and clinical cases. These results can clearly measure the incremental effects of various intervention strategies on reductions in malaria transmission and case burden and can therefore also be used in robust evaluations of incremental cost-effectiveness as well.

When planning a cross-sectional or cohort study, some things that may influence the scope and cost of the study include:

1. Comparisons of interest (treatment groups or outcomes).
2. Timing of transmission season(s) and intervention(s).
3. Frequency of data collection.
4. Sample size to detect effect and statistical approaches.
5. Sampling approach.
6. Age group(s).
7. Inclusion/exclusion criteria.

In addition to the roles listed above, which are required for evaluations from routine data, we propose the following additional positions with responsibilities and required experience for cross-sectional or cohort studies. These are meant as a guide. Cross-sectional or cohort studies are typically very labor and resource intensive and usually require full-time positions for the duration of the study. The number of people serving in each position depends on the scale of the study.

| <b>Position</b>   | <b>Responsibilities</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Required experience</b>                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Study coordinator | <ol style="list-style-type: none"><li>1. Help draft, lead implementation of, and ensure compliance with protocols and standard operating procedures.</li><li>2. Establish and maintain positive working relationships with partners.</li><li>3. Liaise with the project partners to implement planned evaluation activities.</li><li>4. Document and follow up on important actions and decisions from meetings.</li><li>5. Set up data reporting systems and ensure monthly data flow.</li></ol> | <ul style="list-style-type: none"><li>● Experience conducting health research activities.</li><li>● Familiarity with malaria programs.</li><li>● Experience interfacing with and navigating governmental and nongovernmental organizations.</li><li>● Demonstrated effective project management and organizational skills.</li><li>● Ability to work with a variety of partners with minimal supervision.</li></ul> |

| Position                 | Responsibilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Required experience                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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|                          | <ol style="list-style-type: none"> <li>6. Work with administrative contacts to facilitate contractual and financial reporting requirements.</li> <li>7. Maintain and monitor project plans, project schedules, budgets, and expenditures.</li> <li>8. Correspond closely with project leadership and provide updates on project progress and issues.</li> <li>9. Monitor start-up activities closely, assess project risks (issues and provide solutions where applicable) and troubleshoot problems as they arise.</li> <li>10. Conduct field visits to surveillance sites to ensure adherence to established protocols.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>● Excellent written and oral communication skills.</li> <li>● Team-oriented and ability to facilitate productive working relationships inside and outside the organization.</li> <li>● Residency in country of support is a major advantage.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Interviewer/field worker | <ol style="list-style-type: none"> <li>1. Implement regular household visits and adhere to all the relevant study protocols.</li> <li>2. Participate in training about the cohort study and perform well on a post-training assessment.</li> <li>3. Report for fieldwork on time each working day. Devote working hours to assigned responsibilities.</li> <li>4. Visit all assigned households, locate the correct study participants, and conduct interviews. Use project-supplied tablets to conduct the interviews and record the responses. Test participants for malaria using rapid diagnostic tests if needed and provide antimalarial treatment if needed.</li> <li>5. Follow interview procedures according to what is described during training.</li> <li>6. Protect the confidentiality of study participants at all times.</li> <li>7. Complete the minimum number of interviews per day set by the Research Team Lead.</li> <li>8. Support community participation in the study by building respectful relationships with community members and participants.</li> <li>9. Promptly inform his/her Research Zone Lead of any challenges, problems, or incidents that occur with study participants or within the study community.</li> </ol> | <ul style="list-style-type: none"> <li>● High school certificate desirable.</li> <li>● Familiarity with how to operate electronic devices such as phones, tablets, or computers essential.</li> <li>● Experience with antimalarial testing using rapid diagnostic tests and treatment with antimalarial treatment desirable (e.g., working as a community health worker, working for a health center, or working on a malaria research study).</li> <li>● Strong skills in communicating with community members and building rapport is essential.</li> <li>● Must be able to speak local language(s) fluently and read and speak English fluently.</li> <li>● Knowledge and behaviors that support equality, diversity, and inclusive practice.</li> </ul> |

| Position              | Responsibilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Required experience                                                                                                                                                                                               |
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|                       | 10. May include overnight stays in remote study clusters during the work week.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                   |
| Field work supervisor | <ol style="list-style-type: none"> <li>1. Spot-check to be sure that the correct households as well as the correct respondents within the households were interviewed.</li> <li>2. Review each questionnaire to ensure it is complete and consistent.</li> <li>3. Observe some interviews to ensure that the questions are being asked and in the right manner, and the answers are being recorded correctly.</li> <li>4. Meet with interviewers daily to discuss performance and provide future work assignments.</li> <li>5. Help resolve any problems that interviewers might have with finding the assigned households, understanding the questionnaire, or dealing with difficult respondents.</li> </ol> | <ul style="list-style-type: none"> <li>● In addition to required experience of a field worker, the field work supervisor should have previous experience working on cross-sectional or cohort studies.</li> </ul> |
| Local guide           | <ol style="list-style-type: none"> <li>1. Serve as a liaison between the study team and local community.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>● One per study community: should be a trusted community leader familiar with the intervention and the study</li> </ul>                                                    |

\*LOE are estimates depending on the number, complexity, and cleanliness of incoming datasets and the complexity of the evaluation design.

Conclusion: Evaluations of Vector Control (or other malaria interventions) require resources and planning. This document serves as a resource for budgeting and staff planning for vector control evaluations. Either to inform the impact of new or removed interventions, or as a way to inform subnational planning, well conducted and staffed evaluations are necessary to provide arguments and evidence for vector control planning and decision making.

### **Resources for planning vector control evaluations**

[Ashton RA, Bennett A, Yukich J, Bhattarai A, Keating J, Eisele TP, 2017. Methodological Considerations for Use of Routine Health Information System Data to Evaluate Malaria Program Impact in an Era of Declining Malaria Transmission. \*Am J Trop Med Hyg\* 97 \(3 Suppl\): 46–57.](#)

[Ashton RA, Prosnitz D, Andrada A, Herrera S, Yé Y, 2020. Evaluating malaria programmes in moderate- and low-transmission settings: practical ways to generate robust evidence. \*Malar J\* 19: 75.](#)

[Evaluation Task Force of Roll Back Malaria's Monitoring and Evaluation Reference Group. \(2019\). Framework for Evaluating National Malaria Programs in Moderate and Low Transmission Settings. Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina.](#)

[Gertler, Paul J.; Martinez, Sebastian; Premand, Patrick; Rawlings, Laura B.; Vermeersch, Christel M. J.. 2016. Impact Evaluation in Practice, Second Edition. Washington, DC: Inter-American Development Bank and World Bank. © World Bank. <https://openknowledge.worldbank.org/handle/10986/25030> License: CC BY 3.0 IGO](#)

[Mortality Task Force of Roll Back Malaria's Monitoring & Evaluation Reference Group. 2014. Guidance for Evaluating the Impact of National Malaria Control Programs in Highly Endemic Countries. Rockville, MD, USA: MEASURE Evaluation.](#)