

# The MEI Malaria Elimination Toolkit

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## Tool: Entomological Surveillance Planning

### Key messages

Since 2015, progress in malaria control has stalled, with plateauing and increasing transmission in many places. Understanding why and where transmission is persisting, ensuring effective vector control, and monitoring trends are critical to accelerating progress. In this context, the role of entomological surveillance is more important than ever.

In response to malaria program demand, the UCSF Global Health Group's MEI and the University of Notre Dame led the development of an **Entomological Surveillance Planning Tool (ESPT)**. The ESPT aligns with and aims to distill WHO guidance into an operational decision-support tool for national malaria programs to **support cost-effective, locally tailored, and evidence-based vector control**. The ESPT also incorporates guidance from the President's Malaria Initiative (PMI) and other technical partners and resources. Further, the updated Malaria Eradication Research Agenda (malERA) highlighted the need for minimal essential entomological data that are **collectable and actionable** for national malaria programs, and the ESPT responds to this call by identifying and defining minimum essential indicators.

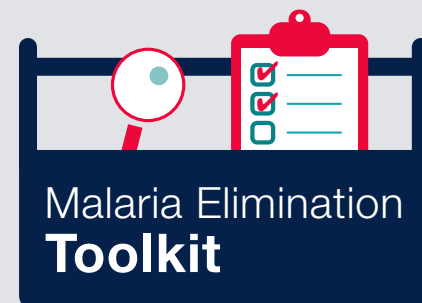
The ESPT has several use case scenarios: annual entomological surveillance planning, capacity gap analysis, training framework for entomological surveillance, field and laboratory data collection, integrated data analysis, program-oriented transmission investigations, and intervention evaluations. To support these applications, the ESPT provides a step-by-step guide on what field and laboratory data are necessary to answer priority questions, as well as specific guidance on selecting the appropriate field sampling methods for addressing program questions appropriately and effectively. The ESPT also provides a framework for integration and joint analysis of epidemiological and entomological data.

To reduce malaria burden and achieve elimination, a **shift in mindset** is needed to identify gaps in protection and drivers of transmission at the local level, and to target and tailor solutions accordingly. The ESPT supports this **targeting and tailoring** of interventions.

### About the Toolkit

The MEI Malaria Elimination Toolkit is a set of proven tools and approaches to help malaria endemic countries accelerate progress toward malaria elimination. Developed by the Malaria Elimination Initiative (MEI) at the University of California, San Francisco (UCSF), the toolkit addresses the unique challenges faced by national malaria programs in heterogeneous transmission settings. These tools have been used successfully at the national and/or subnational levels, leading to important changes in malaria policy and practice.

Technical assistance is available to support the tailoring and implementation of all MEI tools. Please visit our website [shrinkingthemalariamap.org](http://shrinkingthemalariamap.org) or contact us for more information at [mei@ucsf.edu](mailto:mei@ucsf.edu).



## What is entomological surveillance?

Entomological surveillance is the collection of entomological data over space and time. In the context of mosquito surveillance, entomological surveillance is essential to understand vector species composition, specific population dynamics, and behavioral traits that affect disease transmission and intervention effectiveness over time. The World Health Organization (WHO) Global Technical Strategy 2016–2030 outlines five core vector control elements to accelerate elimination:

1. Maximize the impact of vector control
2. Maintain adequate entomological surveillance and monitoring
3. Manage insecticide resistance and residual transmission
4. Strengthen capacity for evidence-driven vector control
5. Implement malaria vector control in the context of integrated vector management

Entomological surveillance is central to all five elements, and data generated from entomological surveillance should guide intervention selection, targeting, tailoring, and deployment in space and time. Further, entomological surveillance can provide a framework to evaluate complementary strategies and tools.

## What is the Entomological Surveillance Planning Tool?

The ESPT is a **decision-support tool** for planning entomological surveillance activities, interpreting entomological data, and guiding programmatic vector control decisions. The ESPT prioritizes entomological surveillance indicators and activities across transmission settings, geographic areas (sentinel sites versus transmission foci), and levels of program capacity. The ESPT considers how these indicators and activities influence national malaria program decisions about entomological surveillance planning and vector control response.

The ESPT includes practical approaches and priority indicators (i.e., minimum essential indicators) to help answer program questions about local transmission drivers, gaps in protection with current vector control interventions (e.g. insecticide resistance, outdoor biting, etc.), and selecting supplemental vector

control interventions to address gaps in protection. In turn, these data, in combination with epidemiological and other data, help programs tailor vector control solutions, reduce vector populations and human-vector contact, and drive down transmission. The ESPT also includes indicators and methods to improve understanding of human behavior as it relates to increased exposure to infectious mosquito bites, and to high risk populations (HRPs) that may be contributing to transmission but not accessing malaria preventative and treatment services. Such indicators and methods are also considered alongside relative costs of entomological surveillance activities since most countries are working with limited resource envelopes.

## Who should use this tool and how?

This ESPT is for national malaria program managers, vector control officers, program entomologists, surveillance officers, and M&E officers to use in collaboration with their implementing, technical, and research partners. The ESPT is also for individuals involved in planning entomological surveillance activities and interpreting entomological surveillance data at any country level, such as provincial and district levels.

For entomological data to be useful for malaria program decision-making, data should be collected with a specific programmatically-relevant question(s) in mind. Once a national malaria program's priority questions are established, the tool will guide the user through distinct modules to determine the indicators necessary to answer the question(s), the appropriate sampling methods and sampling design, and the sites for sampling. The ESPT also supports the user in making decisions in the context of available capacity and resources, including both human and financial.

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The Malaria Elimination Initiative (MEI) at the University of California San Francisco (UCSF) Global Health Group believes a malaria-free world is possible within a generation. As a forward-thinking partner to malaria eliminating countries and regions, the MEI generates evidence, develops new tools and approaches, disseminates experiences, and builds consensus to shrink the malaria map. With support from the MEI's highly skilled team, countries around the world are actively working to eliminate malaria.

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