Entomological Surveillance Planning Tool

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**.

- To reduce malaria burden and achieve elimination, a shift in mindset is needed toward local problem-solving. To support this shift, and 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. The updated Malaria Eradication Research Agenda (malERA) highlights the need for minimal essential entomological data that are collectable and actionable for national malaria programs. The ESPT responds to this call by identifying and defining minimum essential indicators and advocates for program ownership of entomological surveillance activities and vector control decision-making.

- The ESPT helps to identify gaps in protection, or limitations with current prevention measures, by collecting and

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.

The MEI recognizes that implementing any new tool or approach can be challenging. Technical assistance is available to support the tailoring and implementation of all MEI tools. Please visit our website shrinkingthemalariamap.org or contact us for more information at mei@ucsf.edu.

integrating priority entomological data with other data, such as climatic, epidemiological, and human behavioral data. This data in turn can support decisions on **targeting and tailoring** vector control to address the human-vector contact point (i.e., where transmission occurs). The tool also supports programs to reorient routine entomological surveillance activities, foci and outbreak investigations, and receptivity monitoring inareas preventing malaria reestablishment based on priority programmatic questions.

What is entomological surveillance?

Entomological surveillance is the collection of entomological data over space and time. In the context of malaria, 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? Why is it Useful?

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 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.

Who should use this tool and how?

The 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 provincial and district levels. The MEI recognizes that implementing any new tool or approach can be challenging. Technical assistance is available to support the tailoring and implementation of all MEI tools.

The ESPT can be used to support various programmatic activities, including annual entomological surveillance planning and training, outbreak and other investigations, and intervention evaluation. 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 effectively addressing program questions. The ESPT also provides a framework for integration and joint analysis of epidemiological and entomological data.

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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