Entomological Surveillance Planning Tool (ESPT)
New Challenges, New Tools in Vector Control Workstream, RBM VCWG
February 8, 2018
Mövenpick, Geneva
Before DDT, malariologists were trained to be problem solvers; after DDT malariologists were trained to be solution implementers.

-José Najera, former WHO epidemiologist
An entomological surveillance planning tool (ESPT) is being developed to support problem solving and vector control decision making.
Rationale – why an ESPT?

1. Based on country demand

2. Lack of consolidated operational guidance for entomological surveillance

3. Growing need among programs for deeper understanding of transmission dynamics and gaps in protection to inform response

4. Efficient and ethical entomology and vector control more important than ever
Objectives of the ESPT

1. To support **gap-filling** in operational guidance for entomological surveillance
2. To **align** with and operationalize global normative guidance
3. To develop **minimum essential entomological indicators** to generate data that are **actionable** and **collectable**
4. To support national malaria programs in making **evidence-based decisions** on vector control
5. To deepen the **integration** of entomological and epidemiological surveillance and response
Entomological Surveillance Working Group (ESWG)
What is the ESPT (1/3)

Site selection

Indicators

Sampling methods

Minimum essential indicators (all should be documented by vector species, site, and date of collection)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Calculation</th>
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<tbody>
<tr>
<td>Vector species</td>
<td># Anopheles vector species / Total Anopheles collected / unit time</td>
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<tr>
<td>Sporozoite rate</td>
<td># sporozoite positive Anopheles / Total Anopheles tested</td>
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Supplementary indicators (all should be documented by vector species, site, and date of collection)

<table>
<thead>
<tr>
<th>Indicator</th>
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<tr>
<td>Malaria incidence</td>
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<tr>
<td>Index case investigation</td>
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<td>Rainfall and temperature</td>
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<tr>
<td>Timing of vector control interventions</td>
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<tr>
<td>Land usage</td>
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<tr>
<td>Vulnerability</td>
<td></td>
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<tr>
<td>ACT and RDT stocks</td>
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<tr>
<td>Available budget</td>
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Additional datasets for integrated analysis

- Malaria incidence
- Index case investigation (as available)
What is the ESPT (2/3)

Baseline surveys – what are the vectors in my country/district/etc. and what are their programmatically relevant behaviors and susceptibility to interventions?

Routine sentinel surveys – how are my vectors changing over time? Are my interventions working?

Focus investigation – what entomology should I do in a focus investigation in response to the trigger of an index case?

Other key programmatic questions: what is driving this outbreak? What should I monitor to prevent reestablishment of transmission?
What is the ESPT (3/3)

**Linking these investigations...**
- Vector species identification
- Time and place of biting
- Resting habits
- Host preference
- Insecticide resistance & bioefficacy of vector control interventions
- Larval habitat characterization

**With these investigations...**
- Case investigations
- Human behavior
- High risk populations

**And with these datasets...**
- Malaria incidence
- Rainfall and temperature
- ACT stocks
- Land usage
- Vulnerability
- Timing of interventions
- Available budget

...Using the appropriate sampling method...

- Analysis
- Interpretation
- Response options and considerations
Iterative process to evidence-based decision making

1. Look at your data
2. Identify your question
3. Formulate your hypothesis
4. Develop plan and protocol
5. Collect data
6. Analyze and respond

Target audience is NMCPs decision-makers and entomology/vector control implementers

And program partners
Potential use cases

- Annual entomological surveillance **planning and protocol development**
- Capacity gap analysis
- **Training framework** on entomological surveillance
- Program-oriented **transmission investigations**
- Field and laboratory **data collection**
- **Integrated data analysis**
- Intervention evaluations
- Others?
Vector bionomics and interventions

Behavior

Anopheles Species

Vector Species

Seasonality / Population dynamics

Biting Behaviors

Resting Behaviors

Host preference

Insecticide Resistance

Changes in Behavior

Changes in Composition

Changes
in Behavior

Emergence
and Spread

Intervention

IRS

ITN

Spatial Repellants

Endectocides

Larval Bionomics

Larval Control
Pilot sites + others TBD?
Outcomes of interest from pilot evaluations

**Primary:** ESPT-triggered vector control decision-making

**Secondary:**
- Acceptability and utility of the ESPT
- Cost per indicator in the ESPT
- Capacity for entomological surveillance
- Coverage of vector control interventions
- Knowledge of local vector bionomics and control
- Prioritization of minimum essential indicators
- Technical, operational, and financial feasibility of the ESPT
Thank you!

For questions, please contact
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The UCSF Global Health Group’s Malaria Elimination Initiative (MEI) accelerates progress towards malaria elimination in countries and regions that are paving the way for global malaria eradication.

www.shrinkingthemalariamap.org