The Entomological Surveillance Planning Tool (ESPT)
Evaluating interventions based on functionality and gaps in protection
We are not where we want to be…

Comparison of global progress in malaria case incidence, considering two scenarios: current trajectory maintained (blue) and GTS targets achieved (green)

Source: WHO estimates
We are not where we want to be...
We are not where we want to be…

A lack of data on what the problem is!!!

- **Global - number of malaria cases (millions)**

Source: WHO estimates
What is the actual problem?

- Transmission only happens when mosquito and human (behaviors) overlap
- Interventions only take advantage of specific mosquito behaviors!
- We need to quantify the spatial and temporal protective efficacy of an intervention within the context of overall transmission
- What are THE GAPS IN PROTECTION when using a specific intervention?
**Gap in protection**

- A circumstance when an individual is potentially exposed to an infective mosquito bite due to a lack of effective and/or adequate protective or preventive intervention in place.

- Gaps in protection can be directly identified/quantified by understanding how interventions interact with local humans and vectors.

- LLINs and IRS,
  - Vector bionomic traits
  - spaces and times where interventions are not effective
  - Sub-optimal usage or coverage, etc.
What is the Entomological Surveillance Planning Tool?

A decision-support tool for planning entomological surveillance activities, interpreting entomological data, and guiding programmatic vector control decisions.

1. Gap-filling in operational guidance for entomological surveillance
2. WHO and PMI global normative guidance
3. Question-based minimum essential entomological indicators targeted at decision-making
4. Integration of entomological, epidemiological, human (etc.) data
ESPT

Entomological Surveillance Planning Tool (ESPT)

The Malaria Elimination Initiative

UCSF Institute for Global Health Sciences

shrinkthemalarimap.org

THE MEI MALARIA ELIMINATION TOOLKIT

What is your question(s)?

What are the minimum essential indicators to answer your question(s)?

What are the appropriate and available sampling methods to accurately answer your question(s)?

What sites should be selected for sampling?

What sampling design will yield the minimum essential data?

What human and infrastructural capacity and funding is available?

Iterate process until feasible plan is formulated. Refer to Module 6 for data management and Modules 7, 8, and 9 for decision trees to support plan development.
A focus on Minimum Essential Indicators

LLINs

Vector occurrence

Vector density

Seasonality

Biting Behaviors

Resting location

Insecticide Resistance

Place

Time

Resistance frequency

Resistance status
A focus on Minimum Essential Indicators

- IRS
  - Vector occurrence
  - Vector density
  - Seasonality
  - Biting Behaviors
  - Resting location
  - Insecticide Resistance
    - Place
    - Time
    - Resistance frequency
    - Resistance status
A focus on Minimum Essential Indicators

**LLINs and IRS**

- Vector occurrence
- Vector density
- Seasonality
- Biting Behaviors
- Resting location
- Insecticide Resistance

Changes in Composition
- Place
- Time
- Resistance frequency
- Resistance status

Changes in Behavior

Emergence Spread

and... interventions intrinsically change transmission
Example ESPT question: Are LLINs an effective tool in “X” setting?

Entomological indicators: Species, Behaviors, Insecticide resistance profile

Human Behaviors (April Monroe)

Interventions

Human Behavior

Protection

Exposure

Vector Behavior
We can measure where and when exposure occurs

Where is exposure occurring over a night?

Spatial Repellants
Topical Repellants
Larval Source Mgmt

Spatial Repellants
Topical Repellants

> LLIN use

Intervention protection is also quantified
What did the program decide?

Human behavior adjusted exposure to mosquito bites

Collection period 1
- LLIN distribution + Social and Behavior Change Communication (SBCC)

Collection period 2
- Total awake not under bednet (inside)
- Total asleep not under bednet (inside)
- Total awake not under bednet (outside)
I changed dates to more general collection periods to keep it agnostic

Tatarsky, Allison; 09.04.2021
Summary

We need a paradigm shift where we focus on

- Where and when interventions work
- Where and when interventions do NOT work
- How transmission adapts to interventions

We need to know WHERE and WHEN present transmission is coming from – the problem!

The ESPT supports this shift for programmatic entomological surveillance activities