Shifting the paradigm on evaluating interventions

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Innovations in vector control and vector surveillance

February 2022

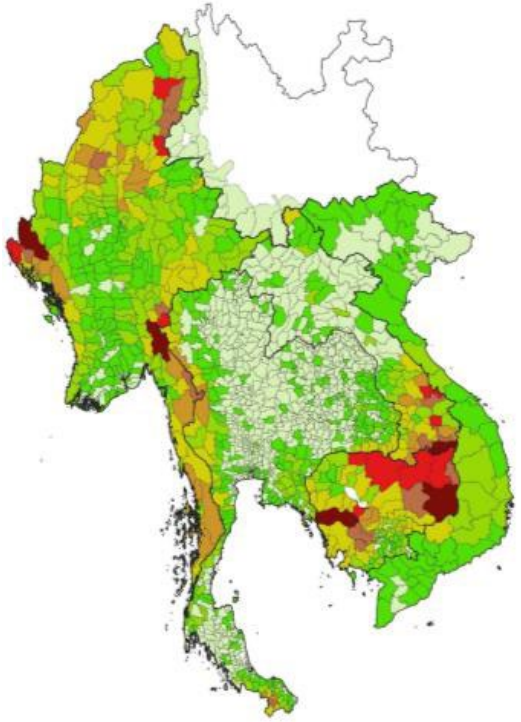
VCWG, Ghana

Project BITE is working to shift the paradigm on protection from mosquito borne diseases

1. Understanding gaps in protection
2. Taking a staged approach to intervention evaluation
3. Evaluating interventions based on their mode of action

Understanding the problem and defining the question

Cambodia: Persistent transmission among forest goers, forest dwellers, and forest rangers



How do we target and tailor our intervention strategies to forest malaria transmission?

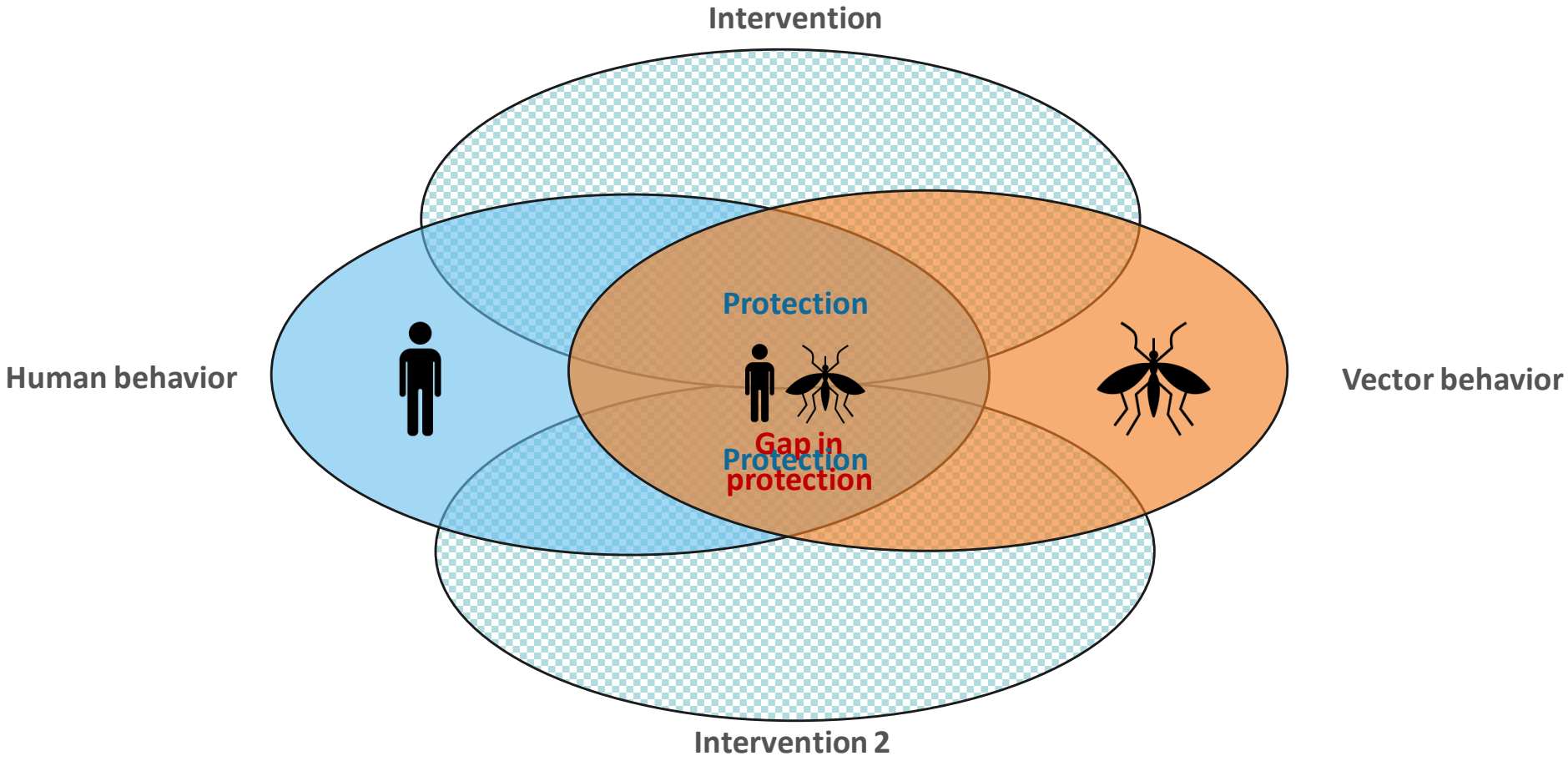
1 Understanding gaps in protection

Where and when are people getting exposed to mosquito bites? Answering this question allows for:

- Targeting and tailoring
- The use of multiple intervention paradigms and products

Definition of “gap in protection”

Used to describe a circumstance when an individual and/or household is potentially exposed to malaria infection (i.e., an infective mosquito bite) due to a lack of effective and/or adequate protective or preventive intervention in place to reduce that exposure to mosquito bites.



Forest transmission as an example

Where are people spending time?

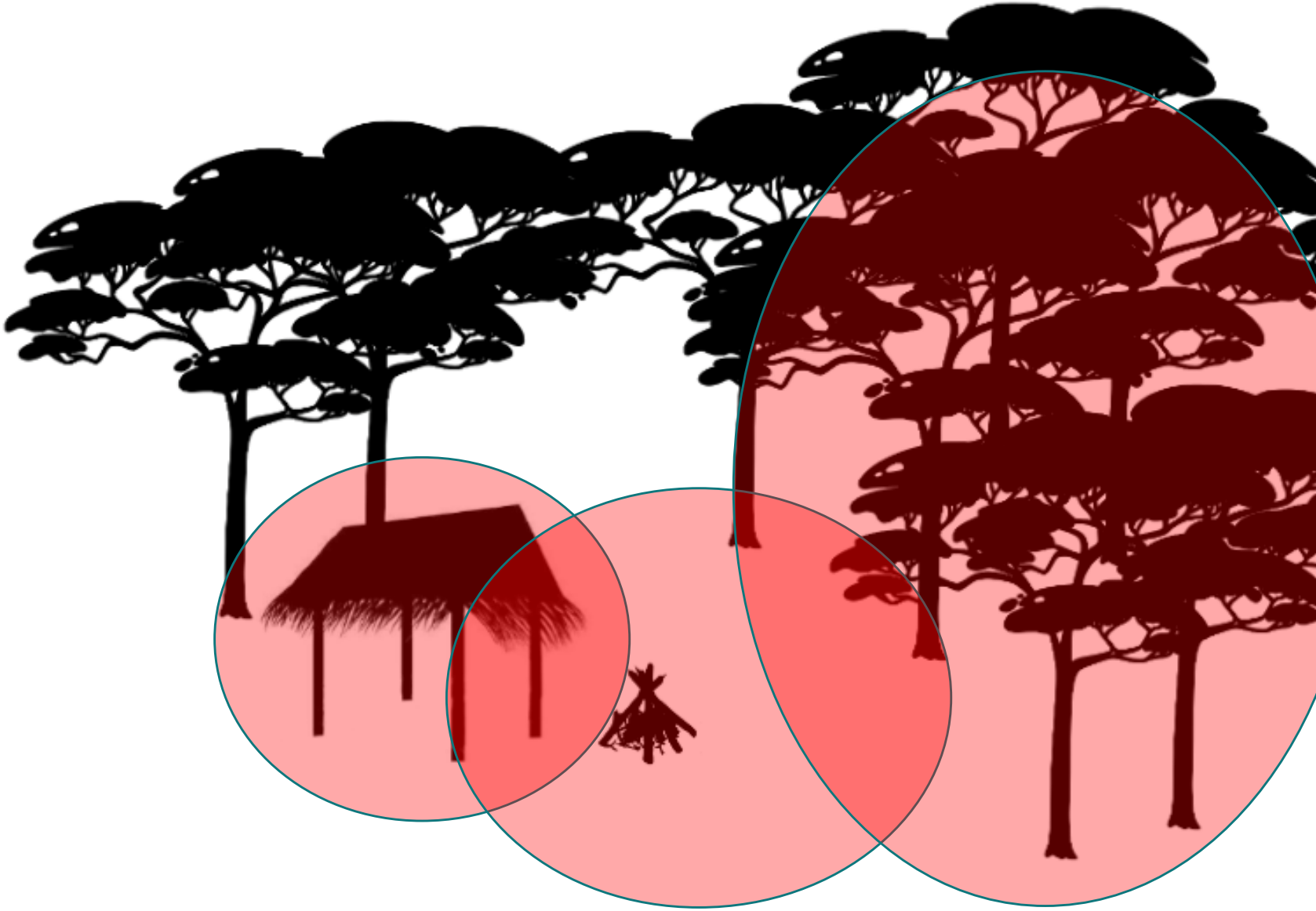
What are they doing?

When are the mosquitoes biting?

What products fit in these spaces and times?

Forest pack that addresses each / all spatial and temporal exposures

Exposure space and activity	Intervention type

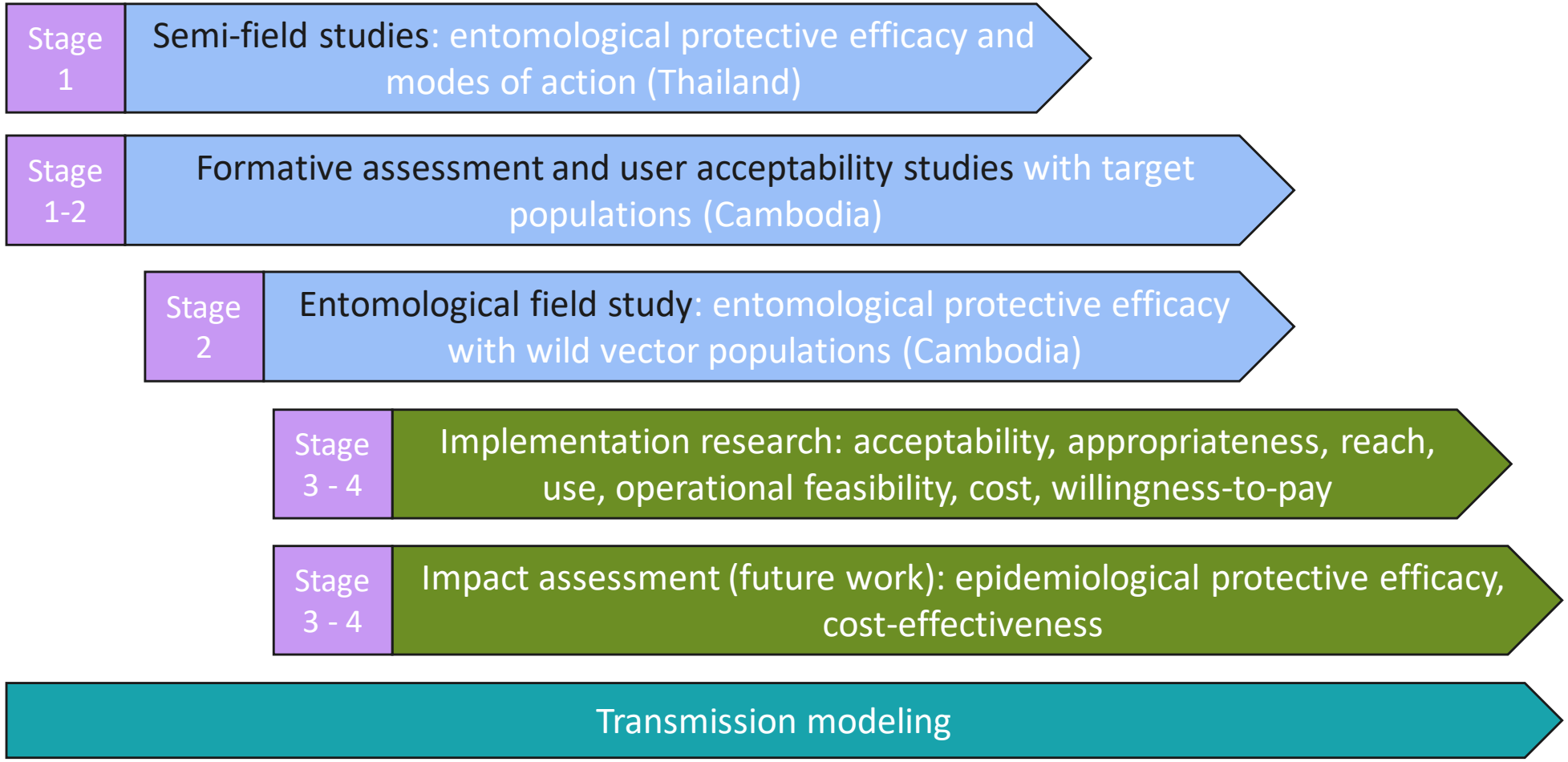


2 Taking a staged approach to intervention evaluation

- WHO considerations – evidence-based decision-making
- Responsible and ethical
- Cost effective
- Allows the evaluation of multiple paradigms and products
- Allows for ***targeting and tailoring***
- Allows community input
- Understanding remaining gaps in protection

Staged approach to evidence generation within Project BITE

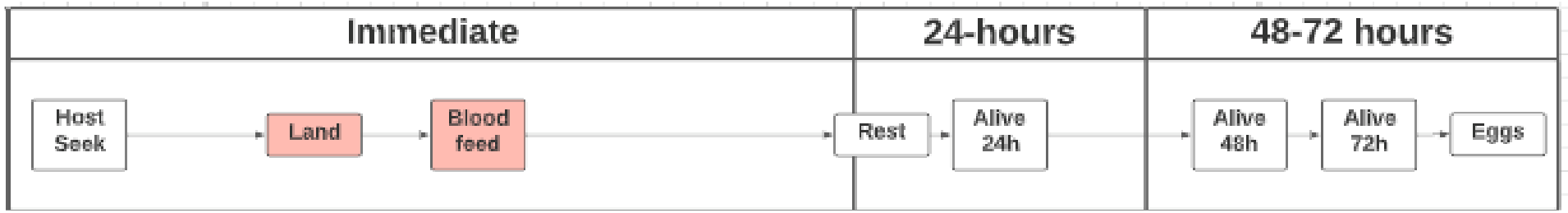
Inspiration: Framework for rapid assessment and adoption of new vector control tools. Vontas, Moore, Kleinschmidt, et al., Trends in Parasitology, 2014.



3 Evaluating interventions based on their mode of action – secondary endpoints

- Fair to the intervention
- Targeting and tailoring
- Understanding intervention-related gaps in protection

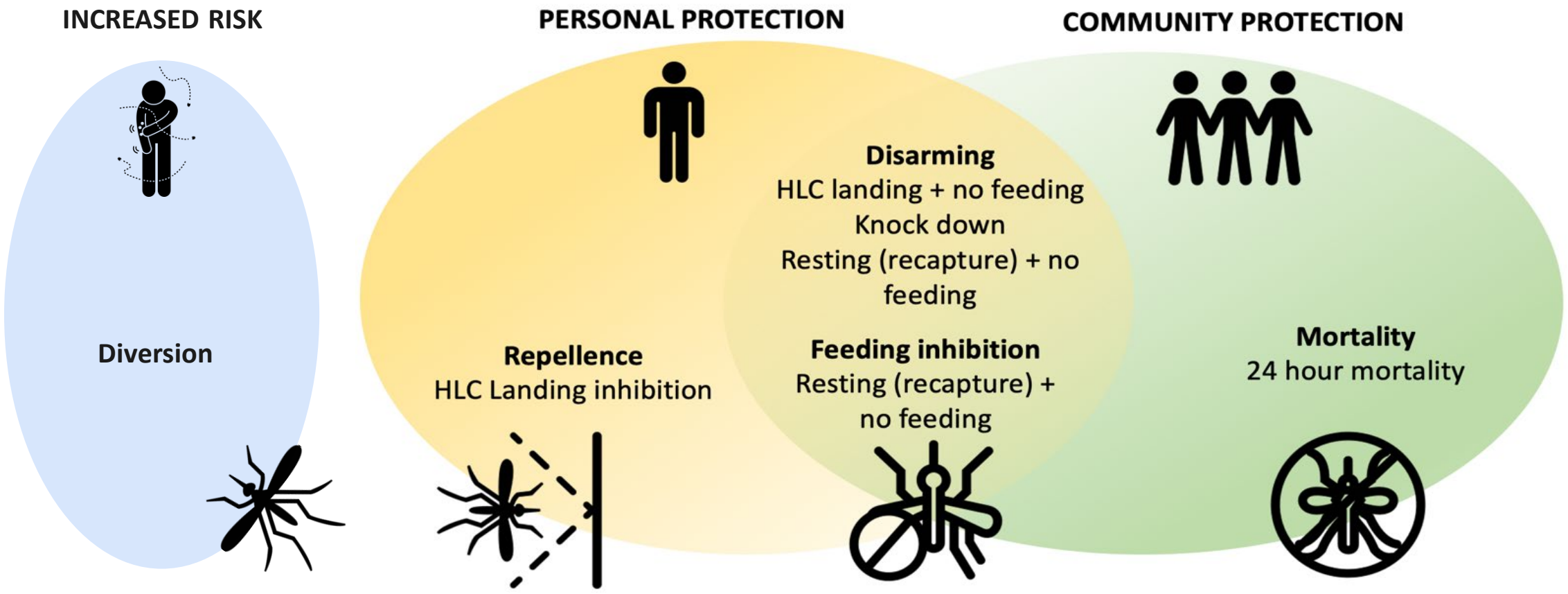
Secondary endpoints



Outcome measures and associated MoAs (Thailand)

Alongkot (Boi) Ponlawat

Theeraphap Chareonviriyaphap



NOT just landing!!!

Entomology Field Study Mondulkiri, Cambodia
October – November 2021

Paradigms integrated:

- **Understanding gaps in protection**
  - Cambodia forest transmission
  - Product MOAs fit these gaps

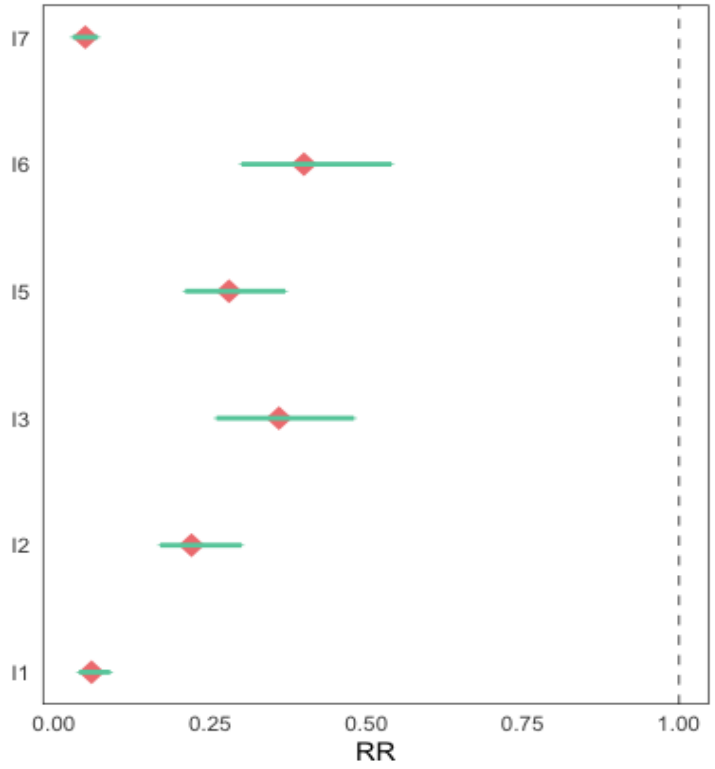
- **Taking a phased approach**
  - Problem / question understood
  - Controlled SFS data supports evaluation

- **Evaluating interventions based on their mode of action – secondary endpoints**
  - Not just biting
  - Community impact with multiple interventions

Results from the entomological field study

Dyna Doum

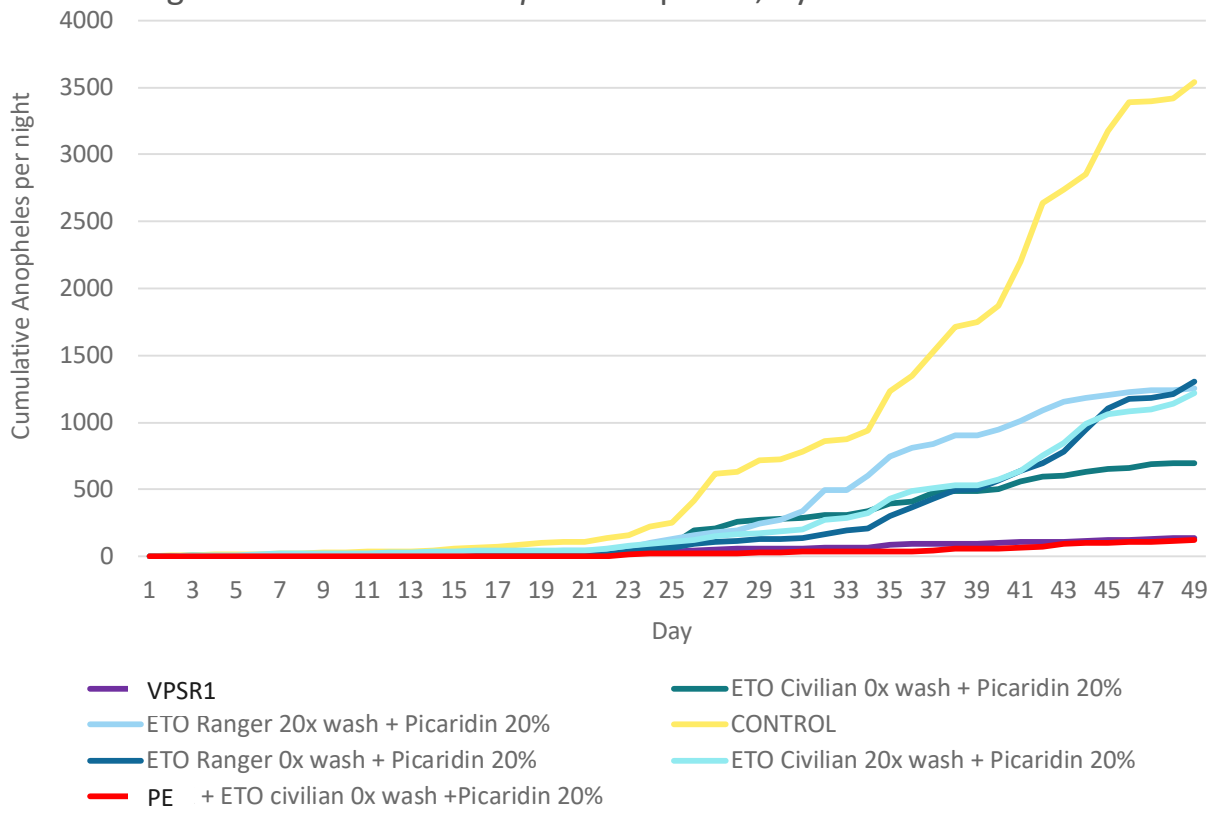
Figure 1. Risk of mosquito landing for each intervention compared to control



I1 – VPSR1 new
I2 – ETO x0wash CIVILIAN (short sleeves, long trousers) + PICARIDIN20%
I3 – ETO x20wash RANGER + PICARIDIN20%
I4 – Control
I5 – ETO x0wash RANGER + PICARIDIN20%
I6 – ETO x20wash CIVILIAN (short sleeves, long trousers) + PICARIDIN20%
I7 – Combined interventions: PE (new) + ETO x0wash CIVILIAN + PICARIDIN20%

- All six interventions significantly reduced risk of landing by at least 50%
- The VPSR1 alone and the combination of three products reduced mosquito landings by nearly 95%

Figure 2. Cumulative *Anopheles* captures, by intervention or control



Next steps for Project BITE

1) Understanding gaps in protection

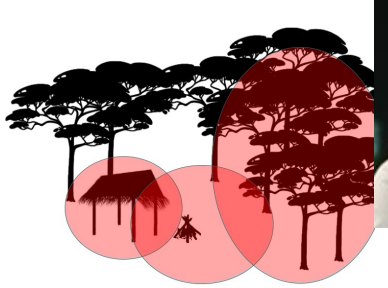
2) Taking a staged approach to intervention evaluation

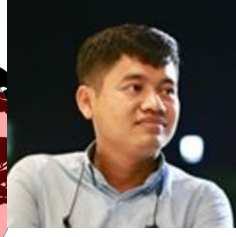
a) SFS (complete), b) Field (Complete)

3) Evaluating interventions based on their mode of action

a) SFS (learning by doing), b) Gaps in protection,

Implementation research in Cambodia Sep 2022 – Feb 2023





Dyna Doum

- Distribution by local government / implementation partners (high transmission Sep – Dec 2022)
  - Forest pack :
    - topical repellent and passive VPSR; etofenprox treatment for clothing
    - delivered by local government / implementer
- Active *P. falciparum* hotspots (Cambodia)

Primary aim:
To assess intervention reach, fidelity, acceptability, appropriateness, coverage, and use of BITE tools among high-risk populations

Secondary aims:
Exposure risks, safety, gaps in protection, economic studies, operational feasibility, facilitators and barriers to potential scale-up

Building Partnerships
Creating Solutions
Saving Lives

Australian Government

Department of Foreign Affairs and Trade

Malaria Elimination Initiative

UCSF

Institute for Global Health Sciences

WWF

Swiss TPH

Swiss Tropical and Public Health Institute