Optimising the deployment of vector control tools against malaria

https://mint.dide.ic.ac.uk

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No longer a one size fits all for vector control

**Vector control interventions**

Then  - Only ITNs and/or IRS  
Now    - Pyrethroid resistance means now multiple ITNs classes, different IRS  
Future - Novel LLINs, IRS, ATSBs, LSM, spatial repellents …………..

**Efficacy and effectiveness varies between sites**

- RCTs and pilots are costly and time consuming and cannot be done everywhere  
- Experimental hut trials show how entomological impact varies  
- More effective products are often more expensive  
- Budgets limited

**Use of mathematical models**

- Models parameterized with hut trial data can recreate RCT results  
- Extrapolate results from RCTs to different locations with different entomology, epidemiology and history of malaria control
Move from “do they work” to “how well do they work”

Layering interventions essential to achieve malaria control goals

- Cost must always be considered
- Develop a framework to support evidence-base decision making
- Cost effectiveness analysis could be considered

Important to parameterise with quality local data

- Local entomology - level of pyrethroid resistance
- % mortality in discriminating dose assay most widely used
- Assay has high measurement error

Local epidemiology, history of vector control, costs

Currently model considers

- Pyrethroid only ITNs
- Pyrethroid-PBO ITNs
- annual IRS (long-lasting)
This tool is designed to help National Malaria Control Programs explore the most cost-effective option of deploying current World Health Organization (WHO) recommended mosquito net and IRS products for malaria control.

In this tool, a project is a collection of regions and a region is defined as a management unit - this could be an administration unit, province or village. For each region defined in the tool, there is a set of outputs summarizing the impact and cost effectiveness of intervention packages.

IRS is very local and usually conducted in a smaller region of a larger province or district. The model assumes that IRS is applied at random to the population so it is more appropriate to create separate IRS reports and non-IRS regions for this assessment and adjust population size accordingly.

For further guidance please see the User Guide in English or on français.

Create a project to get started

- Name: Project name
- Regions: First region, second region

Initial region setup information is mandatory. You can always add and remove regions later.
Site Inputs
- Population Size: 1000
- Seasonality of transmission: Seasonal
- Current malaria prevalence: High

Mosquito Inputs
- Preference for biting indoors: High
- Preference for biting people: Low
- Level of pyrethroid resistance: 80%
- Evidence of PBO synergy: Yes

Past Vector Control
- ITN population usage in last survey: 40% usage
- What was the estimated coverage of spray campaign (last year): 0% coverage

Intervention coverage potential
- Expected ITN population use given access:
  - 80% usage
- Expected IRS* coverage:
  - 70% coverage

Preprocurement and distribution
- When planning procurement, what number of people per net is used?: 1.9
- What percentage is your procurement buffer, if used?: 7%

Interventions
| Interventions          | Net use (%) | IRS* cover (%) | Mean cases averted per 1,000 people per year across 3 years | Total costs | Cost per case averted across 3 years |
|------------------------|-------------|----------------|-------------------------------------------------------------|-------------|-------------------------------------|
| Pyrethroid-PBO ITN only| 60%         | n/a            | 360                                                         | $3.17k      | $6.70                               |
| Pyrethroid LLN only    | 80%         | n/a            | 290                                                         | $2.80k      | $9.90                               |
| IRS* only              | n/a         | 70%            | 730                                                         | $17.51k     | $24.62k                             |
| Pyrethroid-PBO ITN with IRS* | 60% | 70%             | 750                                                         | $20.86k     | $27.30                              |
| Pyrethroid LLN with IRS* | 80%         | 70%            | 730                                                         | $20.17k     | $27.58                              |
| No intervention        | n/a         | n/a            | 0                                                           | $0          | reference                           |
Work in progress - feedback is very welcome!!

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