Optima Malaria

Optima Consortium for Decision Science, Burnet Institute and The World Bank

Designed to help national decision-makers, programme managers, and funding partners achieve maximum impact with the funding available for a country's malaria responses.

Features and functions

Optima Malaria is a quantitative tool that can provide practical advice to governments to assist with the allocation of current or projected budgets across malaria control, treatment and testing programmes, including:

- long-lasting insecticide-treated nets (LLINs);
- indoor residual spraying (IRS);
- artemisinin combination therapy;
- intermittent presumptive treatment during pregnancy (IPTp);
- seasonal mass chemoprevention (SMC) in children;
- larval source management (LSM);
- mass drug administration (MDA); and
- behaviour change communication (BCC).

The model contains an underlying epidemic model of *P. falciparum*/*P. vivax* transmission, and can estimate the impact on incidence and mortality of scaling-up combinations of malaria control programmes and related interventions.

For a given budget, the model uses a mathematical optimization algorithm to determine the funding allocation between programmes that minimizes disability-adjusted life years (DALYs) lost due to the disease, number of deaths, or other relevant outcomes.

The model also contains a geospatial component to account for heterogeneity in ecology, the burden of disease and past investment in different regions of the country. This allows funding allocations to be determined specifically in relation to the requirements of individual regions, as well as how national budgets or additional investments should be optimally distributed between regions.

How the tool helps Country Teams

The Optima Malaria model can be of value to country stakeholders in several ways:

- Determines resource allocation of malaria investment for different levels of investment, leading to optimal outcomes for a given country.
- Projects medium- to long-term impacts of current investments.
- Through its integrated analysis of long-term financial implications, the Optima Malaria tool can make the case for appropriate domestic investment.
- Estimates the feasibility and cost of achieving the WHO *Global Technical Strategy for Malaria 2016–2030* and Roll Back Malaria Partnership *Action and Investment to Defeat Malaria 2016–2030* (AIM) – for a malaria-free world.
- Provides confidence among donors and stakeholders that funding is being used in a way that maximizes impact.

Time needs

To get the most out of an Optima Malaria analysis, national monitoring and evaluation experts and other partners should run the model jointly with trained experts from the Optima Consortium and associated development partners. This will maximize capacity development while also enabling national experts to benefit from the expertise gained from working with Optima in other countries. We advise that key development partners should be engaged in this analysis for joint ownership of the results.

Data availability varies between countries and strategic planning cycles as well as resource mobilization activities, and there is flexibility for shortening or extending the process in line with requirements and availability of key in-country participants.

Time and technical assistance (TA) needs vary:

- A new, full Optima study led by the Optima Consortium without Ministry of Health engagement will take a moderate amount of time (four to twelve weeks).
- A new, full Optima study conducted with full engagement with the national Ministry of Health will take a longer amount of time (three to four months of TA, but over six to nine months overall).
- As more Optima-Malaria country studies are completed, future studies will be easier and quicker.

Table 1: Optima Malaria country specific data requirements.

Parameter	Defined for
Human parameters	
Malaria-attributable deaths	Each region and population group
Malaria incidence	Each region and population group
Malaria prevalence	Each region and population group
Testing numbers	Each region and population group
Treatment numbers	Each region and population group
Intervention parameters	
Coverage of LLINs, IRS, IPTp, SMC, LSM, MDA, BCC	Each region and population group
Unit costs of LLINs, IRS, IPTp, SMC, LSM, MDA, BCC	Each region and population group
Saturation coverage of LLINs, IRS, IPTp, SMC, LSM, MDA, BCC (i.e. maximum achievable coverage due to logistic constraints for delivery or ecological factors making some areas unsuitable).	Each region and population group

Data requirements

The user generates a country-specific Optima Malaria data entry spreadsheet in Excel. The user then enters epidemiological, programmatic and financial data corresponding to Table 1 left, which allows the model to calibrate for each population group and geographical region. Where data are missing, national averages are assumed; however, the higher quality of the input data, the more reliable the analysis.

The key risk population groups are not fixed and numerous user-defined population groups may be used, however the default is to model children 0–5 years, pregnant women and the rest of the population for each region.

Optima Malaria contains a set of default data from a range of sources, including the United Nations Population Division, Cochrane reviews and other academic literature. These values are pre-loaded for the user but can be changed or updated for specific scenario analyses.

Advantages

- Serves a range of specific purposes for optimized malaria resource allocation, prioritization and evaluation.
- Capacity for long-term financial commitment analysis.
- Rigorous analysis of impact of malaria control programmes into decision-making processes.
- Evaluated and projected medium- to long-term impacts of current investments of intra-disease allocations (choosing between different malaria interventions).
- Able to produce results quickly for target setting or resource allocation decisions (was especially designed for this purpose).
- Suitable for facilitating inter-disease allocations (i.e. between different diseases)

Limitations

- Underlying model is not as complex as other tools for addressing biology within individuals and network dynamics.
- Not a bottom-up costing or budgeting tool, but it can inform optimized investment.