Malaria Decision Analysis Support Tool (MDAST): Evaluating Health, Social and Environmental Impacts and Policy Tradeoffs

Project Partner: Duke University

Progress Report to the World Health Organization

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Narrative:

During this initial phase covering the period of November 1st, 2009 to December 31st, 2009, we have convened our team at Duke, hired a part time program manager, and commenced research tasks. We have also had regular teleconferences with the University of Pretoria and the WHO regional office. Tasks undertaken during 2009 include a literature survey, collection of data from the literature to establish parameters, considered the operating frame work of the decision support tool, and tested initial models. This report describes 2 deliverables for the November-December 2009 period, as specified in the project workplan for Duke University.

Deliverable 1: Schematic Diagrams of Decision Support Tool

Based upon extensive discussions with the investigators and research team, we have developed working schematics of our decision support tool model. These are included in Annex 1. Figure 1 represents the decision analysis framework for systematically comparing alternative malaria control policy combinations. First, input parameters describe local contextual factors, such as social factors, environmental conditions, malaria endemicity, drug resistance, and parasitological indices. Second, the outcomes of malaria control policies – including health, environmental, and economic impacts – are derived from the input parameters based on relationships identified through the literature, expert interviews (called elicitations), and field-based experiments. Third, each policy combination can then be described in terms of its negative and positive impacts. Policy combinations can then be compared across user-selected metrics, including inputs (e.g., cost or personnel requirements) and outcomes (e.g., predicted malaria morbidity and mortality by age group or insecticide exposure). This last step provides decision-makers with a powerful, evidence-based tool for optimizing malaria control strategies.

Figure 2 presents a more detailed representation of the structure of the model and the connected elements. Based upon the parameters determined from the literature and experts in the field, the model will offer a variety of options for disease management and vector control to the decision maker, in addition to inputs for baseline data. The MDAST model calculates the outcomes of the health delivery strategy by combining parameters describing the malaria context with the health delivery decisions to generate estimates of the economic impacts, human health impacts, and environmental impacts.

Deliverable 2: Bibliography of Related Literature

We have completed an initial survey of the literature, compiled in the bibliography in Annex 2. These references capture important information on malaria prevalence, malaria control methods, modeling of the disease, and literature on infectious disease management, particularly with regards to
implementation science. We have cataloged over 500 references useful to the development of the MDAST and for the identification of the parameters to be used in the model. The studies were collected from refereed journals using PUBMED and other bibliographic services. Studies were also collected from WHO and other organizations via web searches. All of the literature is now stored on a searchable project website using the ENDNOTE software for easy access by team members. These references are listed in annex 2.

Annex 1: Schematic diagrams of the decision support tool

Annex 2: Bibliography of Related Literature.
ANNEX 1

Schematic diagrams of the decision support tool

Figure 1.

Figure 2.
ANNEX 2

Bibliography of related literature


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