Integrated Vector Management for Malaria Control

Malaria is a parasitic disease transmitted by *Anopheles* mosquitoes. To be successful, malaria control programs must employ coordinated strategies that attack the *Anopheles* mosquito population using vector control methods, and *Plasmodium* parasites using effective anti-malarial drugs.

This dual strategy is the basis of international programs to improve malaria prevention and control. Vector control interventions, including insecticide-treated nets (ITNs) and indoor residual spraying (IRS), are a central element of the programs supported by the Roll Back Malaria Partnership, the Global Fund to Fight HIV/AIDS, Tuberculosis and Malaria, and the recently announced, U.S.-funded President's Malaria Initiative.

The key concepts of integrated vector management (IVM) are simple

- Each vector control method is appropriate in specific physical and social settings.
- The most effective strategy often involves using more than one method and targeting each method to the settings in which it is most appropriate.
- Using a variety of mosquito control methods and insecticides is necessary to prevent or address problems with vector resistance. Over the long run, integrated strategies may also reduce dependence on chemical methods.

The World Health Organization has published guidance on IVM and maintains an essential library on malaria vector control methods; please consult its "Global Strategic Framework for Integrated Vector Management" (WHO/CDS/CPE/PVC/2004.10) and http://www.who.int/whopes/en/ for further information.

RTI Support for Integrated Vector Management

RTI International provides technical and management support to malaria vector control programs in a growing list of countries in Africa and Asia. RTI also supports continued technical development of IVM through collaboration with international institutions, operations research, and dissemination of research and program results.

Indoor Residual Spraying

In Angola, Tanzania, Uganda, and Zambia, RTI is helping ministries of health establish or expand their capacity to deliver IRS programs in areas prone to malaria epidemics. As part of the first-year "jump start" activities under the President's Malaria Initiative, RTI will help national and provincial health departments protect approximately 2.5 million people in southern Angola, on the islands of Zanzibar, and in a highland district in Uganda. These activities represent the first wave of a renewed commitment from the U.S. Agency for International Development (USAID) to support the use of IRS as part of malaria control programs in Africa in the appropriate physical, social, and institutional settings.

Insecticide-Treated Nets

Usage rates of ITNs are often low, even in areas where they have been widely distributed or marketed. In the Lira District of northern Uganda, RTI is working to increase the effective use of long-lasting ITNs in camps for internally displaced persons. The program interventions include promoting community awareness and education on malaria prevention and providing long-lasting ITNs; helping individual households hang their nets in an efficient and functional manner; and following up with frequent inquiries and additional education by trained Community Outreach Resource Persons. This activity is funded by the U.S. Centers for Disease Control and Prevention under the

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President's Malaria Initiative with the dual objective of reducing the malaria disease burden and refining methods to enhance the effectiveness of key interventions.

Environmental Management and Larvicides

RTI International helped established an international collaboration of research institutions to investigate the potential of larval control methods for reducing malaria transmission in urban areas, arid zones, and highlands in Africa. In Eritrea, RTI demonstrated the efficacy of environmentally safe bacterial larvicides and then implemented a 2-year program to establish protocols for their routine use. In Uganda, RTI supported the use of environmental management methods by local government and community teams. The project demonstrated that simple interventions such as improving drainage around kitchen gardens, filling depressions in roadway tracks, and draining borrow and brick pits reduced malaria prevalence by 11% and 36% at study sites in Kampala and Jinja. USAID and the Bill and Melinda Gates Foundation are currently co-funding a large-scale program using similar strategies in Dar es Salaam, Tanzania. These projects are providing important evidence of the great potential for using environmental management and larval control methods to reduce malaria in areas of seasonal and low-level transmission.

A Comprehensive Program in Eritrea

The National Malaria Control Program (NMCP) in Eritrea has established a comprehensive malaria vector control program that makes extensive and appropriate use of the full range of control methods. The program is designed to meet specific national and local needs: it emphasizes ITNs and environmental management throughout the country, while using IRS and larvicides as supplemental strategies in specific settings. RTI and its partners have provided support to this program during a 7-year period, helping the NMCP refine, target, and evaluate its interventions. A recent analysis demonstrated that each of the vector control methods had a measurable, incremental impact on reducing malaria incidence.

The IVM Task Order Contract

RTI International is the lead contractor for the only USAID contract providing IVM services. RTI's partners for this project include leading international institutions such as Tulane University, Liverpool Associates in Tropical Health, the Swiss Tropical Institute, the University of Durham (UK), the Medical Research Council of South Africa, and the Columbia University International Research Institute for Climate Prediction.

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