



DIME BRIEF

Evidence for combating malaria

The Development Impact Evaluation Initiative is a World Bank program to support government agencies in adopting a culture of real time, evidence-based policy-making. The objective of the initiative is not simply to measure results, but to compare the effectiveness and cost-effectiveness of alternative interventions to help programs learn how to improve their performance over time. DIME works with 300 agencies in 72 countries to improve knowledge, quality of operations and country capacity for impact evaluation-based policy-making.



Though this disease can be prevented and treated, globally it causes 243 million cases and 863 thousand deaths each year.

Malaria

With over half of the world at risk, malaria is a leading cause of morbidity and mortality in many developing countries. This is especially striking, as the disease is both preventable and treatable. In fact, the causal link between the use of anti-malarial services and improved health outcomes is well established. To date, however, the evidence on which service delivery channels are most effective and on how individual preventive and treatment behavior can be affected is extremely limited.

The World Bank, through its Malaria Control Booster Program, has joined an ambitious global campaign to control malaria. The Malaria Impact Evaluation Program is one of the ways the World Bank is contributing to better understand how innovations in service delivery, and subsidized provision of prevention and treatment, impact health-seeking behavior, health status, school performance, labor productivity, and socio-economic status. Via impact evaluation, we learn how to enhance the delivery of key disease control and treatment services, and strengthen healthcare systems to maximize the benefits of interventions on health and welfare. Evaluation also helps us do this more cost-effectively and equitably. This note reviews current evidence from impact evaluation at the Bank and from other sources on some important questions that face malaria control programs.

How does free provision compare to cost sharing?

Due to their high cost, anti-malarial treatments are subsidized to make them affordable to those that need them the most. Selecting the optimal level of subsidization, and understanding whether free provision distorts behavior, are important for program design.

An impact evaluation in Kenya (Cohen and Dupas 2007) shows that, contrary to expectations, cost sharing does not seem to improve targeting of Insecticide Treated bed Nets (ITNs) toward those in greatest need, and that women who paid for their ITNs are no more likely to use them than those who receive them free of charge.

In the same vein, Hoffman, Barrett and Just (2007) find no evidence that donated goods are re-sold for cash in Uganda. The authors compare households that were randomly assigned to receive either a free ITN (or cash to purchase an ITN) to households given the opportunity to purchase ITNs using their own resources. Their main findings are that very few households who received free nets go on to resell them, and that liquidity constraints, rather than undervaluation, explain the limited use of nets.

Further work in Kenya (Cohen, Dupas, and Schaner 2010) is mapping out consumer response by randomly assigning different prices for treatment to different households, and examining the effect of subsidy levels on health-behavior. The results will help target ACT subsidies more effectively.



Does malaria prevention increase school performance and labor productivity?

Impact evaluation is starting to establish that malaria prevention is a powerful tool to improve school performance and labor productivity on infected populations. Understanding the economic impacts of health investments will help further justify health expenditures.

In a randomized study in Kenya, Clarke et al. (2008) find that only a one year Intermittent Preventative Treatment (IPT) of school-children significantly increased their scores on attention tests and reduced by half their probability of becoming anemic (see Box).

The ongoing randomized experiment in Nigeria (Dillon et al. 2008) gave individuals access to ACTs, the first line anti-malarial drug. The study will provide a precise measure of the direct effect of malaria infection on the productivity and income of agricultural workers with and without access to effective treatment.

Because prevention affects labor productivity, households may allocate preventive resources accordingly. Hoffman et al. (2007) indeed find that nets purchased by men tend to be used by the household's primary income earner, whereas those purchased by women tend to be used by household members perceived to suffer from malaria most frequently. The proportion of children under five sleeping under a net, for example, was found to be 20% higher when the net was purchased by a woman.

Preventive treatment improves cognitive development in school age children

Clarke et al. (2008) conduct a stratified, cluster-randomized, double-blind placebo controlled trial in 30 primary schools in western Kenya.

Schools were stratified into three groups according to school examination performance in previous years.

This enabled the authors to ensure that differences in school quality and socioeconomic environment were not driving their results.

From each school-performance stratum, ten schools were randomly selected, and within each stratum schools were randomly allocated to one of six coded drug groups

Assignment to the treatment groups using randomization ensured that there were no systematic differences that would bias estimates and undermine the validity of causal findings.

The placebo control was necessary to ensure that there was no placebo effect biasing the results upward. Also known as the Hawthorne effect, this bias can result when participants exert additional effort, or otherwise change behavior, merely as a result of being "observed."

The Government of Kenya now has evidence that malaria prevention in school can improve classroom concentration. This has led to the allocation of more resources towards school-based malaria control and other preventive health interventions.

How to improve service delivery?

Malaria-endemic countries are engaged in major efforts to distribute and deliver long-lasting insecticidal nets (LLINs) and ACTs to their populations. Effective distribution requires a good understanding of delivery channels, and what determines adoption and usage of LLINs and ACTs.

Results from a randomized study in Zambia (Friedman et al. 2008) show that a new public sector distribution system was successful in increasing access to effective pediatric malaria treatment. In the eight districts where it was introduced, availability of pediatric anti-malarials increased from 247 to 345 days per year. Nationwide scale-up could save 18,000 children and 2,000 adults from dying of malaria by 2015 (see Box on next page).

New distribution model improves availability of pediatric anti-malarial

An impact evaluation conducted in 2009 compares the effectiveness of two alternative models to address breakdowns in the public sector drug supply chain.

This evaluation was a collaboration between the World Bank, the Government of Zambia, John Snow Inc., Crown Agents, the Massachusetts Institute of Technology, and the MIT-Zaragoza Logistics Program.

The more successful of the two models simply docked drug shipments at district storage facilities, eliminating the need to unpack and repackage shipments.

In the districts where the supply chain improvements were introduced, pediatric malaria drugs are now available 345 days a year. In control districts, they are only available 247 days a year.

"The difference between life and death can be painfully simple in rural areas," said Vledder, Senior Health Specialist leading the project. "Our work has focused on identifying the best way to get drugs to the right place at the right time, maximizing the effectiveness of every public health dollar spent in the process, and delivering tangible results."

Beyond malaria control, it addresses a common bottleneck found in the health systems of low-income countries: the delivery of essential drugs to the population.

A study by Meghir et al. (2008) in Nigeria will examine innovations in malaria service provision through community-directed interventions (CDIs); and public-private partnerships (PPPs) with patent medicine vendors (PMVs), small-scale private purveyors of drugs and related goods. A series of impact evaluations of these interventions in the states of Akwa Ibom, Anambra, and Gombe, will inform the scale-up of critical operational decisions for the second year of the government program. Specifically the study will examine the effectiveness and cost-effectiveness of the CDI and PPP interventions, jointly and in isolation, in improving malaria prevention and case management, and changes in health status, productivity, and socioeconomic outcomes.

Finally, an evaluation in India will consider alternate delivery mechanisms through non-state channels, and will systematically vary information provided to households receiving mosquito nets, as well as exposure to motivation for and monitoring of use. Ninety-six villages and constituent households surveyed at the baseline will be divided into treatment and control groups. An additional 48 villages from non-selected sub-districts will serve as additional controls, which will be less subject to any potential spillovers from treated villages. Results will enable policy makers to understand which delivery approaches are more effective.

Building on past successes to eliminate malaria

Can multiple malaria control strategies used in combination eliminate the burden of malaria? After its unique successes in controlling malaria, through a combination of treatment, larval control, ITN distribution, and prompt and effective epidemic response, Eritrea has been experimenting with indoor residual spraying (IRS) with insecticide, to move the country towards malaria elimination. Forthcoming results from Keating et al. will measure the additive impact of IRS over existing malaria control interventions in 117 treated villages on behavioral, health, and socioeconomic outcomes.

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