The Center for High Impact Philanthropy
School of Social Policy & Practice | University of Pennsylvania

February 2009

Lifting the Burden of Malaria

An Investment Guide for Impact-Driven Philanthropy

Carol McLaughlin, Jennifer Levy, Kathleen Noonan, and Katherina Rosqueta

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Each of those deaths is avoidable.

Photo courtesy of Gene Dailey, American Red Cross, provided by VOICES for a Malaria Free Future.

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Malaria kills more than 5,000 people a day, primarily children in sub-Saharan Africa. Each of those deaths is avoidable due to the emergence of three pivotal developments. First, effective, low-cost tools now exist for malaria's prevention and treatment. Second, a consensus is emerging on a global strategy to combat the disease and overcome current delivery obstacles. Third, this global strategy is receiving increasing attention from an array of global players and donors.

Recent analyses show that there is a window of opportunity for philanthropists to build on existing support for malaria prevention and treatment. The effects of rapid scale-up in malaria-affected regions make funding now substantially more cost-effective than a continuation of the current funding trajectory. Such investment today could save twice as many lives for every dollar spent.

Philanthropists can prevent deaths from malaria in three ways:

- Remove the delivery constraints that prevent known cost-effective tools from getting to the communities who need them most
- Develop the human resources, management capacity, and information systems to sustain the long-term impact of malaria interventions
- Invest in innovation for new tools and delivery strategies that can move the global community closer to the goal of eliminating malaria as a public health problem

This guide provides examples of opportunities a philanthropist can support in each of these three areas. In several in-depth cases studies, we illustrate how nonprofits produce results in a specific location and then go a step further by assessing how much it cost to achieve those results.

At the end of this guide, we provide practical advice on how to get started, including how to evaluate potential investments, assess post-donation results, and use best practices for maximum impact.

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☆ *In-depth case study included in this section*

ABOUT THIS DOCUMENT

In this guide, we provide independent, practical advice on how to invest in malaria control in a way that maximizes the impact of philanthropic dollars. For this document, we combined our analysis of available research, policy analyses, and program evaluations with the insights of a diverse set of opinion leaders and practitioners.

Objective

The Center for High Impact Philanthropy seeks to define philanthropy's efficient frontier, where invested dollars create the most good. To accomplish this mission in malaria, and thereby support individual philanthropists in their capital allocation decisions, we set out to answer three key questions:

- What is a meaningful change (impact) to target?
- What activities lead to that meaningful change for communities suffering from malaria?
- How much does it cost to achieve that change?

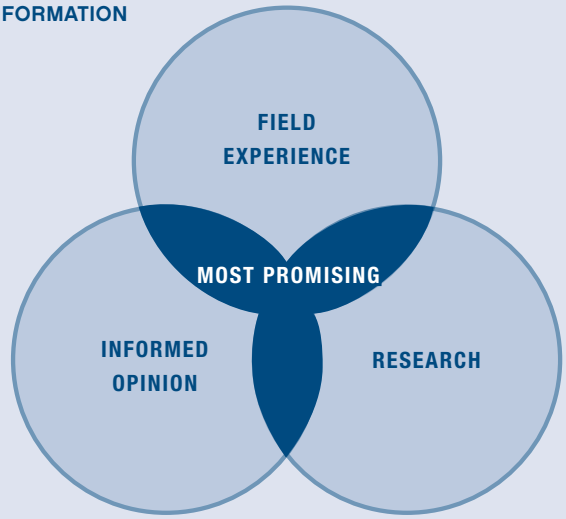
To find the answers, we used a multi-perspective, evidence-informed approach that relies on multiple sources of information (SEE DIAGRAM). These sources included research (e.g., peer-reviewed academic journals such as *Lancet* and *Cochrane Reviews*, and books such as *Disease Control Priorities in Developing Countries*); field experience (e.g., NGO program assessments, WHO publications); informed opinion and policy analysis (e.g., reports from Global Health Council, Roll Back Malaria strategies); and the insights of a diverse set of malaria researchers, policy makers, donors, and program staff.

This guide is the end result of our research and analysis. We translated our findings into practical guidance on which areas to target and how to get started, and included contact information for organizations and resources to help you along the way.

Our multi-perspective, evidence-informed approach

To meet our goal of providing smart, practical guidance to individual philanthropists, we synthesize the best available information from three domains: research, informed opinion, and field experience. By considering evidence from these three sources, we seek to leverage the strengths while minimizing the limitations of each. We believe the most promising opportunities exist where the recommendations of these three domains overlap.

SOURCES OF INFORMATION



FIELD EXPERIENCE
- Practitioner insights
- Performance assessments
- In-depth case studies

INFORMED OPINION
- Expert opinion
- Stakeholder input
- Policy analyses

RESEARCH
- Randomized controlled trials and quasi-experimental studies
- Modeled analyses (e.g., cost effectiveness)

Structure

This report is divided into five sections. In the first section, we describe the disease, its impact around the world, and effective tools for prevention and treatment. Second, we discuss known, effective, and cost-effective approaches that philanthropists can fund to treat and prevent the disease right now. Third, we outline ways in which philanthropists can strengthen health systems for longer-term impact. In the fourth section, we focus on ways to support innovation. Finally, in the last section, we provide tips on how to set a philanthropic strategy, evaluate investment ideas, assess post-donation impact, and apply best practices. Together, these five sections provide the fundamentals for developing a high impact giving strategy in malaria. For those who wish to delve more deeply into a specific area, we include a list of selected readings and web resources. (See page 72.)

Scope

In this report, we focus on strategies that not only seek to get the right tools into the hands of those who need them the most, but also work to develop the training, health systems, infrastructure, and education needed to ensure that the tools are effective. We have seen that supporting or creating programs that take a comprehensive approach to the problem can have a higher impact than funding single items such as bednets, preventive medications, or drugs for treatment.

Also keep in mind that the most effective strategies take a holistic view of the health of communities. Most of the models we profile address constraints that affect the control of many diseases, such as shortages of healthcare workers or the basic health education of mothers. Thus, smart investments to address malaria have the added impact of strengthening a community's ability to address other serious health conditions.

How to use this report

Philanthropists can use the information in this guide in three ways:

- *Fund one of the models we discuss or promote the entrepreneurial use of these models by other organizations.* All of the opportunities we highlight are good bets based on available evidence. (See page 68 for contact information for the example agents used in this guide.)
- *Support innovation to create a new model to address an issue outlined in the report.* There is plenty of room for innovation in malaria, as many problems remain in need of effective solutions, especially given the current health system constraints. However, it is important to watch out for ill-informed models or misguided vanity projects; these can be distracting and burdensome to national malaria plans and can cause unintended harm to already vulnerable communities. Furthermore, as malaria is an infectious disease that knows no borders, coordination of programs is essential. Thus, like all effective philanthropy, innovation should be shaped by a technical understanding of what the problems are, where the critical leverage points for intervention exist, what works and, just as importantly, what doesn't work. When choosing to support a new model, it is important to commit sufficient time and money to assess whether it will make a difference and to ensure that it will not have unexpected negative impacts.
- *Use the evidence that we present in this guide to test the value proposition of program models other than the ones we discuss here.* Our review of existing practices is not comprehensive. There are many other approaches and organizations that are making important contributions in malaria. If investing in a nonprofit or model that we have not discussed, assess whether the program's descriptions of the problems it addresses and the tools it uses are logically consistent with the evidence that we present in this document.

How we selected promising opportunities for philanthropists

Throughout this report, we provide case examples of promising programs, practices, and interventions to show how philanthropic investment can make a difference. For certain strategies we also provide in-depth case examples. These examples are in callout boxes marked with a special symbol (☆). Keep in mind that these examples are just some of the effective philanthropic opportunities available.

We selected the case examples using the following criteria:

- Targets what current data indicate are unmet needs
- Uses practices that are informed by the existing evidence base for what works
- Recognizes and insists on a set of core implementation components to ensure impact, but also demonstrates an ability to adapt to local contexts
- Has been (or is willing to be) examined by a neutral third party in the case of more mature programs

For case examples that are service delivery models, we reviewed available internal and external evaluations, assessing the rigor of the evaluations' methods and the statistical and practical relevance of the results. We also selected an exemplar organization that is implementing the model to illustrate results in a real world setting. We conducted interviews with the program's senior staff to learn how the program creates change, how much impact they expect their work to produce, and at what cost.

In addition to these case examples, we also make note of other promising practices and programs in **boldface** or **hyperlinked text**. These are models that we are still evaluating, but that we feel are worth noting based on publicly available information such as evaluations, cost-benefit analyses, and expert opinion.

For both the case examples and the brief descriptions, we used professional judgment to decide whether the evidence in total creates a clear signal of progress or potential impact. From this process, we developed the case examples of promising practices.

Future guides

This is part of a series of guides that the Center for High Impact Philanthropy is producing on global health and development. Future guides in this series will address topics such as income generation or basic education that impact health outcomes broadly as root causes of poverty.

To learn more about the Center for High Impact Philanthropy, please visit our website (**www.impact.upenn.edu**), call us at (215) 573-7266, or email us at **impact@sp2.upenn.edu**.

Refer a promising practice to the Center

We recognize that there are many programs that are making a difference in malaria (and global health in general) and welcome recommendations on models and organizations to consider for future guides. Individuals who wish to recommend a practice that is making a measurable impact in global health can visit our website (**www.impact.upenn.edu)** or call us at (215) 573-7266 for instructions.

I. THE NEED FOR PHILANTHROPIC INVESTMENT IN MALARIA CONTROL

Every thirty seconds a young child dies of malaria. The disease kills more than 5,000 people a day, primarily children in sub-Saharan Africa. Each of those deaths is avoidable. The disease is both a product and an underlying cause of poverty, creating a vicious cycle of poor health outcomes and underdevelopment. Fortunately, there are effective, low-cost tools available for the prevention and treatment of malaria, as well as an international consensus on a strategy to combat the disease.

After years of relative neglect, malaria is now receiving more global attention. There has been a rapid increase in funding for malaria control through efforts such as the Global Fund, the U.S. President's Malaria Initiative, and the World Bank Booster Program, as well as more funding for research, primarily from the Gates Foundation. This increase is not a signal for less philanthropic input, but more. Recent analyses have found that we could save 2.5 million more lives, prevent 430 million additional cases, and generate $50 billion more in economic output by accelerating malaria funding in Africa so that we reach targets in five years rather than over the current trajectory.[1] Individual philanthropists now have the opportunity to achieve more with their gifts. Meanwhile, there remain many unmet needs yet to be addressed.

Recent successes in Rwanda and Zanzibar have shown that malaria is not an intractable problem.[2] While comprehensive malaria control may be beyond the capacity of any individual philanthropist, much can be achieved through smart partnerships. Even a relatively modest donation can bring life-saving changes to individuals and communities when well coordinated with global efforts.

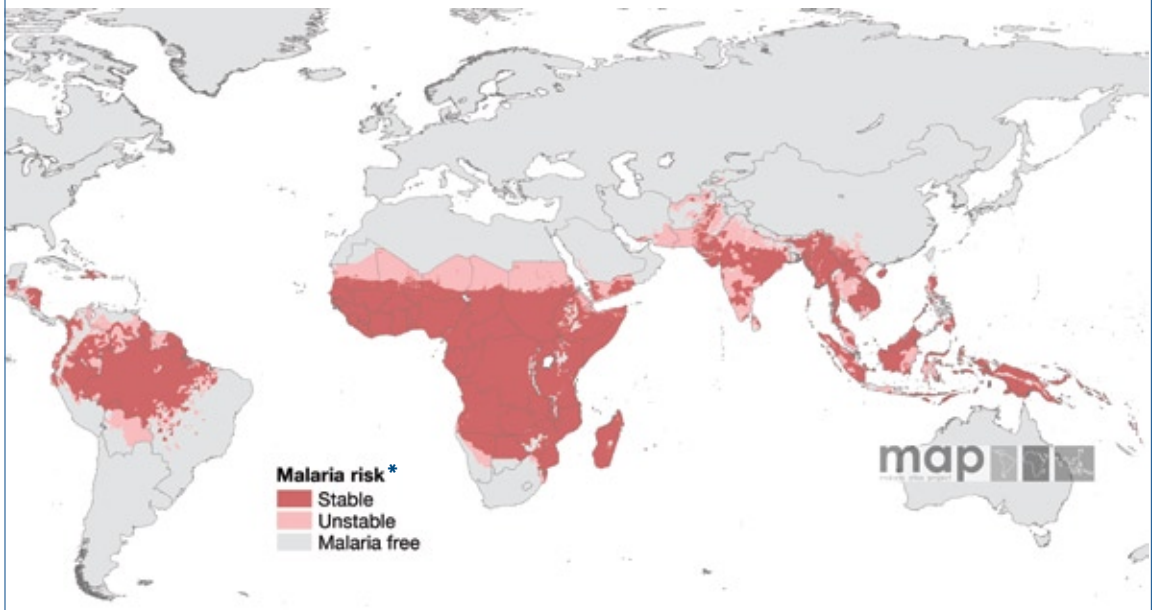
Malaria is a global priority for health and development

Malaria is a public health problem in over 100 countries worldwide, affecting almost 40% of the world's population. More than two billion people live in malaria-affected areas. There are about 230 million cases of the most dangerous form of malaria each year.[4] While malaria is present in the Americas, Asia, and the Middle East, tropical Africa bears nine-tenths of the disease's burden. Africa has only 20% of the global population at risk for malaria, but 89% of all cases, and 96% of all deaths from the disease.[5]

Certain groups of people are particularly susceptible to severe outcomes from the disease. The largest and most vulnerable groups are pregnant women and young children in sub-Saharan Africa. In this region, the disease is responsible for 18% of all deaths of children under five years of age.[6] (See Sinaly's story on p. 3, for an example of how this disease affects young children.) Many who live in highly-affected areas do become immune to the ravages of malaria by adulthood. However, this immunity comes at the cost of high rates of severe sickness and death in young children.

Malaria is an infectious disease commonly found in tropical and subtropical regions (see map on p. 2). Four species of blood parasites cause malaria. *Anopheles* mosquitoes carry and spread the most deadly form, *P. falciparum*. Those infected develop periodic fevers, chills, fatigue, and headaches, and many die. With prompt treatment, the disease is curable. However, even after treatment, reinfection is common. There is no commercially available vaccine, but several promising candidates are in field trials.

Who's at risk? The global distribution of malaria transmission risk[3]



**Stable malaria risk: a minimum average of one clinical case per 10,000 population per year. Unstable malaria risk: documented cases occur but at less than the stable rate (as defined above).*

Provided by Malaria Atlas Project (MAP)

Citations: Hay and Snow (2006). *PLoS Medicine*, 3(12): e473; Guerra *et al* (2007) *Malaria Journal* 6: 17; Guerra *et al.* (2008) *PloS Medicine* 5(2): e38.

Malaria is not only a source of suffering and death, but also an underlying cause of underdevelopment. Malaria puts economic pressure on already impoverished nations, while complicating their efforts to manage other health problems such as HIV/AIDS. Malaria has direct, indirect, and macroeconomic costs:

- The majority of *direct costs* (e.g., drugs for malaria treatment) come out of the pockets of people who are already poor or on the margins of poverty. The World Health Organization (WHO) estimates that 100 million people are impoverished each year as a result of their spending on health.[8] In many cases, families will avoid treatment or even diagnosis out of fear of not having the resources to pay for the costs.
- The poor also have to pay *indirect costs* in the form of time and productivity lost from work as a result of sickness or the need to care for sick children. This can mean one to five days lost per episode of malaria, several times per year. Sickness due to malaria is also a main cause of absenteeism in school; on average, 12 days are lost per primary school age child per year.[9] Absenteeism, together with neurological and physiological damage from the disease, can lead to poor educational outcomes that further perpetuate the cycle of poverty.
- The *macroeconomic costs* are also high. Economists have estimated that countries with malaria have a growth rate that is 1.3% lower per year than similar countries without malaria, controlling for other factors. When compounded over 25 years (1965 to 1990), this growth penalty is a major cause of underdevelopment.[11] Each year, malaria costs the African continent roughly $12 billion in lost productivity and GDP.[12]

Sinaly's Story: Mali, Western Africa[7]

In Mali, two million children under the age of five suffer from malaria each year. Of those, 100,000 will have a severe attack with life-threatening anemia, disability, neurological complications, or coma. Many will die. While there are four species of blood parasites that cause malaria, *Plasmodium falciparum* is responsible for the most severe form that causes the majority of mortality (death) and morbidity (sickness). Transmitted by the bite of infected female mosquitoes, malaria's onset can be quick. Though a $5 dollar bednet can prevent many malaria cases, once a child develops symptoms of malaria, decisive action is needed to diagnose and treat the disease.

One Malian mother named Aramata recounted the day her son became sick and rigid with a fever. She was working at her biscuit stand in the market and was summoned to the home of a traditional healer who was caring for her son Sinaly. When she entered through the small door, the elderly woman healer was boiling leaves for a medicinal tea and massaging Sinaly's clenched body, a sight that shocked Aramata.

Just hours before, her son had seemed healthy and happy. The traditional healer told Aramata that Sinaly's sudden illness was caused by malevolent spirits, and with the help of her special tea, she would be able to ease his convulsions.

"I had this feeling inside that this was not right and I should take my son to the local health center," said Aramata. Even though none of her other children had experienced symptoms such as this, Aramata was familiar with the effects of malaria and suspected her son's stricken posture might be due to the disease. As malaria parasites multiply inside a victim's red blood cells, they lead to high fevers, anemia, and possible cerebral malaria (impaired consciousness, convulsions, and coma).

"Any illness can kill a child, but among us, malaria is the one that kills the most children. It is at the root of so many illnesses," Aramata states grimly. "If a child dies with a stomach ache or a headache, often malaria is at the base of the problem. It is a fatal illness that is very dangerous." In fact, malaria is one of the leading causes of preventable childhood deaths worldwide.

Aramata was reluctant to offend the respected healer by removing the child from her care. But after a few moments of reflection, Aramata told the healer that Sinaly's illness was actually caused by her own failure to give him medicines she had forgotten to purchase at the health center, and that she must rush him there in order to fill the prescriptions. This explanation seemed to appease the healer, and Aramata took her son and quickly left for the health center.

With her son in her arms Aramata raced across the village to the health center. The health agents quickly diagnosed Sinaly's condition as malaria, which required an expensive treatment. Fortunately, Aramata's market business produced enough income to just cover the price of her son's drug therapy.

Aramata was grateful for the close proximity of a health center that is able to provide sufficient care in the case of emergencies such as Sinaly's.

Image by Amy Ellis, VOICES for a Malaria-Free Future

Today, despite known cost-effective tools to treat and prevent malaria, Aramata and Sinaly's success story is all too rare. Sinaly was one of the lucky ones. His mother was confident enough to trust her intuition and resourceful enough to find a way to take advantage of modern medicine (while not offending a respected local healer). Unlike many of the at-risk population, Aramata and Sinaly were fortunate enough to live in close proximity to a health center that had the proper medicine and trained personnel to quickly diagnose and treat Sinaly. Finally, Aramata had a successful enough business to have income ready to pay for the life-saving treatment.

Adapted from success story by Amy Ellis and Susan G. Walters. VOICES for a Malaria-Free Future. **http://www.malariafreefuture.org/news/success/mali_mother.php**

The global strategy to combat malaria

Given its importance as both a health and development issue, a global coalition of stakeholders has organized to develop a strategy to combat malaria. **The Roll Back Malaria Partnership** is a consortium of malaria-endemic nations, donors, implementers, and stakeholders that has built international consensus on a **Global Malaria Action Plan**. In this plan, there are four tools that are critical to malaria control: [13]

1. Case management (i.e., prompt diagnosis and treatment)
2. Long-lasting insecticide-treated bednets
3. Prevention in pregnancy with medications and bednets
4. Indoor residual spraying with insecticides

The goal of each national malaria control program is to increase access to these tools.

Table 1: Effective malaria tools at a glance

TOOL	CONSIDERATIONS
Case Management: Diagnosis	▪ Gold standard is the use of a light microscope; rapid diagnostics are also available. ▪ In remote areas, healthcare workers rely on clinical algorithms to make a presumptive diagnosis based on symptoms and age risk group. ▪ Current guidelines recommend presumptive treatment of children under the age of five who have a fever and live in a high-transmission area. Wider availability of quality diagnostic testing can make definitive diagnosis possible for children.
Case Management: Treatment	▪ Artemisinin-based combination therapy (ACT) is the preferred first-line regimen for *P. falciparum*. ▪ Optimal therapy depends on local drug resistance pattern. ▪ In most areas, chloroquine is ineffective due to widespread drug resistance.
Intermittent Preventive Treatment (IPT) in Pregnancy	▪ Pregnancy is a very high risk period for maternal and newborn complications. ▪ IPT involves administering at least 2 doses of an effective antimalarial drug during second and third trimester of pregnancy.
Long-Lasting Insecticide-Treated Bednets (LLITN)	▪ Bednets treated with a long-lasting (3 to 5 years) insecticide are now the prevention tool of choice, especially for children and pregnant women. ▪ LLITNs provide a physical barrier and an insecticide deterrent to night-biting mosquitoes. ▪ Maximum community health effects can be achieved if all children and adults sleep under nets to decrease reservoirs of the parasite.
Indoor Residual Spraying (IRS)	▪ IRS requires annual/semi-annual application of long-acting insecticides on walls. ▪ IRS stops mosquitoes from entering homes and kills those that land on treated surfaces. ▪ IRS is most appropriate where malaria transmission is seasonal rather than year-round, given costs and logistics. ▪ Optimal insecticide will depend on local mosquito sensitivity and feeding patterns.

The reality is straightforward. The power of existing interventions is not matched by the power of health systems to deliver them to those in greatest need, in a comprehensive way, and on an adequate scale.

– Margaret Chan, Director General, WHO[17]

The unit costs of these tools for malaria control are very low. For example, a course of ACT costs 60 cents for a child and less than two dollars for an adult with malaria. One long-lasting insecticide-treated bednet, which lasts three to five years and covers two children, costs about five dollars. Three doses of IPT medication for pregnant women cost less than 20 cents.[14]

Even when we combine the unit costs with necessary program costs such as community education, delivery, logistics, and monitoring, the total costs are still low compared to other disease investments. For example, the full implementation cost for bednets delivered through measles vaccine campaigns is $10 to $12 per bednet, which includes $5 to $7 for the net, $3 for logistics and delivery, and $2 for education and assessment.[15]

However, despite a growing and widespread consensus regarding the best tools to prevent and treat malaria, access to these life-saving interventions remains very low in most of the developing world. On average, these interventions cover less than a quarter of affected populations, a level far below what is needed for effective malaria control.[16]

There are two reasons for the low coverage. First, few developing countries (if any) have the domestic resources to fully fund a malaria control program. For example, to achieve bednet coverage for all children five years of age or younger, a low-income African country would have to spend more than 25% of its total health budget.[18] Meanwhile, out-of-pocket health costs – the primary source of current funding – are driving the poor deeper into poverty.[19] Second, even where outside funding for these tools exists, health system capacity constraints are keeping the tools out of the hands of those who need them and are interfering with their proper use.

The **Global Malaria Action Plan** outlines a strategy that consists of three stages for each affected country: scale-up for impact, sustained control, and elimination of the disease.

I believe that if you show people a problem, and then you show them the solution, they will be moved to act. The Global Malaria Action Plan lays out an achievable blueprint for fighting malaria – now it's time for the world to take action.

– Bill Gates, Co-Chair, Bill & Melinda Gates Foundation[20]

Different countries are at different stages in this strategy, but most are focused on the first stage, scale-up for impact. The objective of this stage is to rapidly achieve universal (100%) coverage of appropriate packages of interventions for at-risk populations. The current aim is for at least 80% consistent use of key malaria tools by at-risk communities, with the goal of decreasing the number of global malaria cases and deaths to 50% of the 2000 levels.[21] The key to the success of this effort is rapid scale-up of coverage and combinations of interventions tailored to local needs. After achieving scale-up, countries can then move into sustaining control efforts and, eventually, hopeful elimination of the disease.

How philanthropists can help

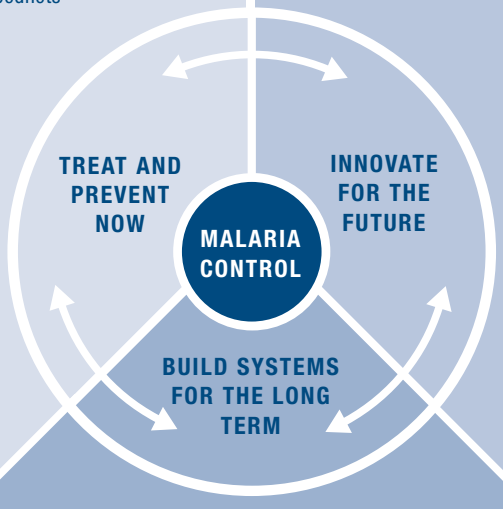
All stages of the global malaria strategy have an immediate, urgent, and unmet need for philanthropic funding. There are three strategic dimensions or *entry points* for philanthropists to consider:

1. **Treat and prevent now** - First, philanthropists can target barriers that interfere with the immediate delivery of cost-effective treatment and prevention tools to communities not yet reached by current efforts.
2. **Build systems for the long term** – Second, philanthropists can invest in the development of human and health system capacities (e.g., health workforce, management, data collection, and supply chain and logistics) that are necessary for the long-term sustainability and management of not only malaria, but also other health problems, including malnutrition and HIV/AIDS.
3. **Innovate for the future** - Third, donors can provide capital to support innovation in practice or research. For example, they can help researchers explore innovative ideas using new technologies (e.g., vaccines) or delivery models (e.g., private sector drug vendors) in pilots or demonstration projects. Once proven in a small project, a successful model can roll out to larger areas with the aid of government funding. These new discoveries are critical if we are to stay ahead of this ever-evolving disease and its increasing resistance to current drugs and insecticides. These discoveries can move the global community closer to the goal of eliminating malaria as a public health problem.

Three entry points and examples of recommended strategies

- Train community members and equip them with kits of essential drugs (such as ACTs for malaria) to extend the existing health system and reach those without access
- Piggyback on existing systems such as measles vaccine campaigns for delivery of bednets

- Support innovation for new tools such as vaccines, diagnostics, and mosquito control to improve outcomes and keep up with the ever-evolving malaria parasite and mosquito vector
- Harness the commercial sector to speed access to interventions or apply new technology (e.g., cell phones and PDAs to enable communication that leads to better prevention and treatment)



- Prepare future health leaders from malaria-affected countries to fill chronic health worker shortages and develop home-grown solutions that match local needs
- Create the information networks needed for tracking outcomes to prevent the spread of epidemics and limit drug resistance

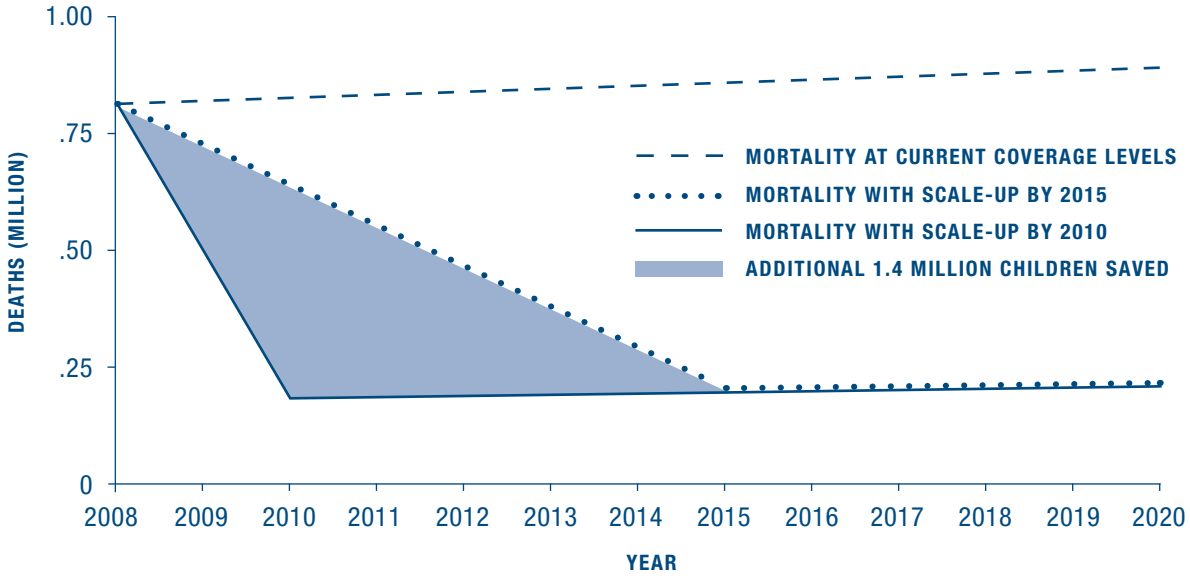
Philanthropic capital has several advantages over other sources of funding (e.g., government) in malaria control:

- Philanthropists have more flexibility. They are less constrained by political considerations. They can act more rapidly than government sources of funding, which is especially important in emergency situations such as the recent humanitarian crisis in Myanmar.
- Philanthropists can take more risks, both in terms of the innovative projects they support and the geographic locations they choose. For example, philanthropists can support organizations working in politically fragile states such as Sudan or the Democratic Republic of Congo where the immediate need is great. They can support innovation, not only in traditional R&D for drugs and vaccines, but also in new delivery strategies (e.g., private sector vendors), training programs (for management and logistics), and information networks (e.g., use of PDAs and cell phones).
- The scale of philanthropic funding is well matched to many smaller problems that are critical but are often overlooked by larger donor initiatives. For example, philanthropists can support key human resource training programs or NGO programs that educate and mobilize communities.

Why invest now

Several recent analyses indicate that now is the time for additional philanthropic investment. Philanthropists can take advantage of the recent global increase in malaria funding to achieve even more impact with their dollars. An analysis by McKinsey & Company found that more investment now would save "twice as many lives for every dollar spent," and that this is "an undeniable business rationale for rapid scale-up."[22] Similarly, a separate analysis that looked at 20 high-burden African countries using the Child Survival Impact model showed that meeting scale-up targets by 2010 rather than 2015 could save an additional 1.4 million children's lives (see graph below).[23]

Impact of scale-up on malaria mortality in 20 high-burden African countries[24]



Countries evaluated represent approximately 82% of global malaria mortality

Source: Global Malaria Action Plan 2008. Child Survival IMPACT model: developed by a consortium led by the Institute of International Programs at Johns Hopkins Bloomberg School of Public Health and based on work of the Child Health Epidemiology Reference Group (CHERG).

The Good News: Malaria control has excellent expected economic returns. If $4 billion is invested annually to control malaria in Africa, every dollar invested could enable the continent to regain three dollars in lost GDP.[10]

What makes this increased benefit possible are community health effects, whereby prevention and treatment in one household decrease the risk of infection to neighbors, as fewer people are now reservoirs of the malaria parasite. Increased access to prevention measures now means fewer cases and lower treatment costs in the future. The savings from rapid scale-up enable reinvestment in other health programs. Unfortunately, the amount of funding currently available to reach even the 2015 global malaria control targets is roughly one quarter of what is needed.[25] Thus, the need for funding remains urgent.

In Zambia, **MACEPA** (a partnership led by the nonprofit PATH) demonstrated the benefit that comes from a more rapid scale-up of interventions, coupled with actions to strengthen government capacity and infrastructure. Early reports in other countries show that the increase in funding is producing commensurate results in prevention and treatment. For example, after the rapid scale-up of prevention and treatment programs in Rwanda, Zanzibar, and coastal Kenya in 2006, the number of children admitted to hospitals with malaria has fallen by over 60% at many health facilities, with a corresponding drop in malaria deaths.[27,28,29] These are just a few of the examples that show that clear progress is occurring in areas most affected by malaria.

An analysis of returns per dollar invested reveals that a rapid scale-up plan is substantially more cost-effective than a continuation of the current funding trajectory. This is due to the benefits of community health effects and the significantly increased probability of success with a large-scale effort.

– McKinsey & Company and Malaria No More[26]

What are the best investments in malaria control?

In the sections that follow, we describe multiple, specific examples of models that you as a philanthropist can support in three areas: treat and prevent now, build systems for the long term, and innovate for the future.

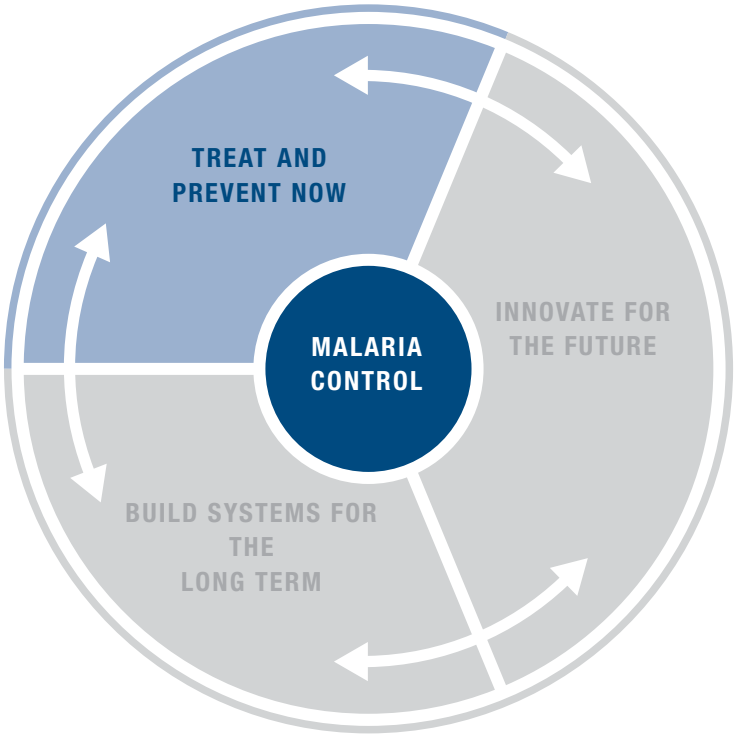
Investments in all three of these areas are essential. As such, you can consider a variety of factors in choosing one entry point over another. These factors include how long you are willing to wait to see an impact; how much tolerance you have for risk or uncertainty; how concrete an activity you wish to support; and how sustainable you want your impact to be.

Selecting a philanthropic focus will invariably involve tradeoffs. For example, increasing a remote region's access to medications will result in immediate and directly measurable outcomes (i.e., decreased suffering and death). However, this impact may not be sustainable over the long term without parallel investments in critical systems such as management and health information.

You may want to invest in these systems instead. Health system investments require a longer time horizon to come to fruition, and their results are more difficult to track. However, they address root causes of problems and will likely have a broad and lasting impact across many different health problems.

A third option is to give to innovative research or pilot programs. This option is likely to be most appealing to those philanthropists who are comfortable with a high degree of uncertainty and who are willing to take big risks. While this option can require large investments, the rewards can be equally large, and could effectively change the trajectory of malaria control across the entire globe, and bring elimination of the disease fully into the realm of possibility.

TREAT AND PREVENT NOW



STRATEGIES IN THIS SECTION

1. Extend existing health system capacity through community health workers

2. Enlist family members and community volunteers to educate communities

3. Piggyback on existing systems for delivery of bednets

4. Scale-up community and household access to new ACTs

5. Build training networks to prevent malaria in pregnancy

6. Assist the most vulnerable in areas of conflict or natural disaster

II. TREAT AND PREVENT NOW

The best way to save lives immediately is to close existing gaps in the delivery of effective malaria control interventions to communities. In this section, we first describe key malaria tools, how to think about their cost and impact, and how to increase access by supporting effective delivery programs. We then highlight six strategies that philanthropists can take to immediately have an impact in this area. For several models, we also include cost-impact profiles.

All of the in-depth case examples that we describe in this section have similar cost-impact profiles (~$1000 per child life saved or less). Keep in mind, however, that the actual impact of a philanthropic investment will depend in large part on local considerations such as the level of existing health system infrastructure, local costs, human resources, and the amount of malaria disease at baseline.

Overview of malaria tools

- ***Case management: prompt diagnosis*** – The most accurate method of diagnosing malaria is to use a light microscope to see, count, and identify the species of malarial parasites in a drop of the patient's blood. However, this approach is often not practical. At many front line health facilities there may be no electricity, the equipment may be too expensive, or the staff may lack the training to properly read the slides. In fact, in areas without a functional healthcare system, there may not even be a facility. In these cases, healthcare workers have to make a presumptive diagnosis based on symptoms (e.g., fever) and other factors such as age. Because of high prevalence of severe disease in children, and currently limited access to quality diagnosis, World Health Organization guidelines recommend presumptive treatment for children under the age of five who have a fever and live in an area of high malaria transmission.[30] In other settings, and with other age groups, healthcare workers provide treatment based on a confirmed diagnosis, if resources are available. Rapid diagnostic tests exist and are quite cost-effective,[31] but are not in wide use because of funding constraints and a lack of quality assurance systems. Increased funding for these rapid tests – and for systems to train health workers to accurately use them – could bring definitive diagnosis to all children and adults who present with symptoms of malaria, even in remote villages.

Image by Bonnie Gillespie, VOICES for a Malaria-Free Future

- ***Case management: prompt treatment*** - In general, the optimal drug therapy will depend on the malaria resistance pattern of the specific geographic region. Artemisinin-based combination therapy (ACT) is now considered the first-line regimen in the majority of malaria-afflicted regions. Artemisinin compounds have many advantages, including a rapid therapeutic response, with few side effects. By combining these compounds with other effective drugs, healthcare workers hope to prevent or delay the emergence of drug resistance. Chloroquine – the longtime standard treatment – is now considered ineffective in all but a few isolated regions due to widespread drug resistance. Resistance is also growing to other widely used medications such as SP (sulfadoxine-pyrimethamine) and amodiaquine.

- ***Prevention through the use of bednets*** - Bednets provide both a physical barrier and a chemical insecticide deterrent to night biting mosquitoes. Older conventional nets required reapplication of insecticide every six months. Newer bednets, known as long-lasting insecticide-treated mosquito nets (LLITNs), retain their effectiveness for three to five years, and are now the prevention tool of choice. Pregnant women and young children are especially in need of them. However, net programs are most effective if all people sleep under them in order to reduce human reservoirs of the parasite. As many families who have bednets do not use them, or fail to use them properly, continuous community education and regular communication programs are essential to realizing full impact.

Image by P Skov Vestergaard Frandsen 2007 via VOICES for a Malaria-Free Future

- ***Intermittent preventive treatment (IPT) in pregnancy*** - Infection with malaria during pregnancy – especially a first pregnancy – brings a high risk of complications for both newborns (such as low birth weight) and their mothers (such as severe anemia). Intermittent preventive therapy during pregnancy involves administering at least two doses of an effective antimalarial medication to pregnant women during the second and third trimesters.

- ***Indoor residual spraying (IRS)*** – When applied to the walls of homes on an annual or semi-annual basis, long-acting insecticides will repel mosquitoes from the home or kill those that land on a treated surface. In general, indoor residual spraying is currently most used in those settings where the malaria transmission season is short rather than year-round. This is because the insecticides last only several months and there are significant costs for the logistics and personnel required for each spraying cycle.

The only source of artemisinin is the Chinese wormwood plant

There are several effective insecticides available for use in residual spraying. DDT continues to be one of the most effective insecticides. In 2006, the World Health Organization gave DDT a "clean bill of health" for IRS, noting that "extensive research and testing has demonstrated that well-managed indoor residual spraying programs using DDT pose no harm to wildlife or to humans."[32] The main issue in indoor residual spraying is not whether DDT is safe, but whether IRS is appropriate for a given location. If it is, then DDT is just one option out of a variety of available insecticides. The most effective insecticide will depend on local conditions including mosquito sensitivity, mosquito feeding patterns, and country-specific insecticide policies. Given their complexity, indoor residual spraying programs require the existence of local infrastructure to support the program, plus the cooperation of the Ministry of Health.

Image by Bonnie Gillespie, VOICES for a Malaria-Free Future

Based on our research, analysis, and stakeholder interviews, we have seen that there is general global consensus on the effectiveness of these tools in malaria prevention and control. Complex analyses of the tools have shown that the best approach is to cover the majority of a target population (>95% coverage) with a location-specific mix of appropriate interventions.[33] The ideal combination of interventions will depend on the malaria transmission pattern (year-round vs. several months), drug and insecticide resistance, and the health infrastructure of the target setting.

Malaria tools are both inexpensive and cost-effective

The malaria tools are not only inexpensive, but also cost-effective (i.e., they provide high value for the expenditure). Health economists have found that the four key malaria control interventions have individual cost-effectiveness ratios significantly below $150 per disability-adjusted life year (DALY) averted, a benchmark considered highly cost-effective.[34] In other words, for less than $150, each intervention can regain a year of healthy life that might have been lost to malaria.

Disability-adjusted life year, or DALY, combines both survival and disability in one metric. One DALY is equal to a year of healthy life lost due to a health problem. It is used to quantify the burden of disease from specific causes in different regions, to calculate the cost-effectiveness of interventions, and to estimate the impact of actual public health programs.

Keep in mind that local factors can affect costs and impact (see formula on next page for factors that determine impact). These factors include the quality of the local health infrastructure, availability of inputs (including human resources), political instability, amount of malaria disease in the project area, drug and insecticide resistance, population demographics, scale of tool coverage, appropriate use, and interaction between interventions. Another caveat is that the cost-effectiveness figures do not consider the distribution of health benefits; the worst-off groups can be more costly to target, as they often live the farthest from available health services.

Nevertheless, the low cost of these outcomes is clear. For the sake of comparison, health interventions in the United States usually win approval for general funding if they are less than $50,000 per DALY averted (the cost-effectiveness ratio of dialysis for kidney failure – a U.S. benchmark). Even when compared to interventions for other major health problems in the developing world, rather than in the U.S., malaria tools provide excellent value for the money. A recent analysis by the Disease Control Priorities Project found that the package of malaria prevention tools is second only to immunizations in cost effectiveness.[37]

Selected cost-effectiveness ratios (CER) for malaria interventions[35]

INTERVENTION		CER (RANGE) - $US/DALY AVERTED
ITN	Insecticide-Treated Nets	5-31[+]
ACT	Artemisinin-Based Combination Therapy	8-20
IRS	Indoor Residual Spraying	9-34*
IPT	Intermittent Preventive Treatment In Pregnancy With Sulfadoxine-Pyrimethamine (SP)	16-35

[+] For example, for every $5-31 (range) invested in insecticide-treated bednets, one year of healthy life is saved.

*Field data from Kwa-Zulu Natal and Southern Mozambique suggest higher CER for IRS (119-132) if one considers only children under the age of five.[36]

How to think about impact from a malaria tool

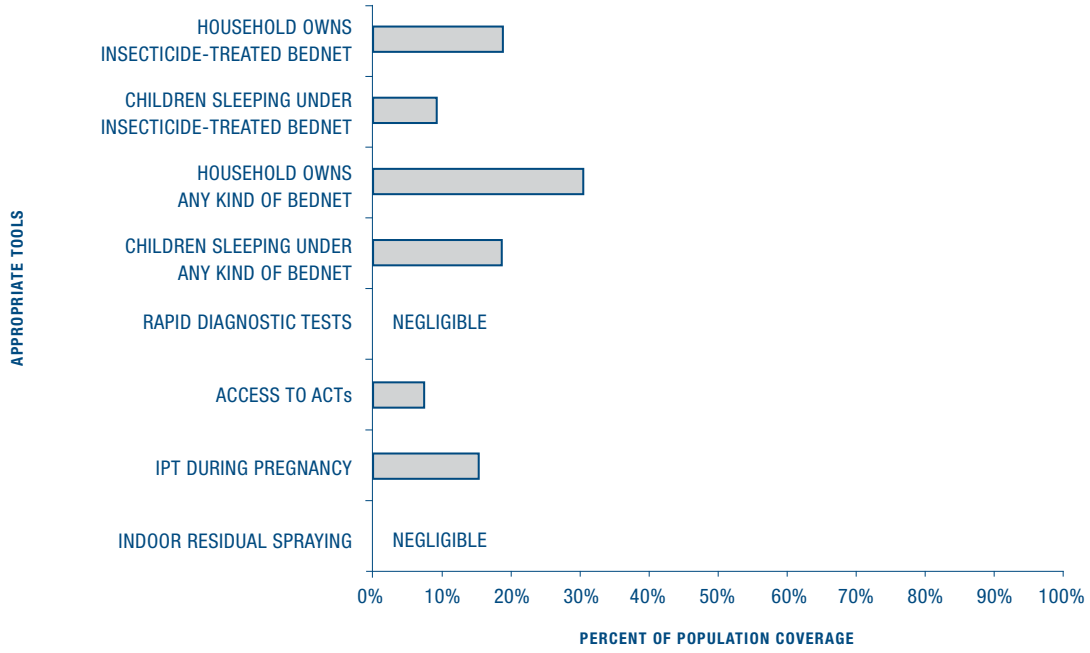
IMPACT = **TOOL EFFECTIVENESS** Protective effect under ideal conditions — *Example:* Bednets are 50% effective when used correctly X **REAL WORLD CONDITIONS** Influence of human behavior — *Example:* Bednets are used properly only 65% of the time X **ADDRESSABLE BURDEN** Predicted number of deaths & sickness in a community — *Example:* 13.5/1000 rural children die from malaria each year X **COVERAGE** Number/percentage of children or families that receive the tool — *Example:* 80% of families have a bednet after a program

Philanthropists can address the current gaps in the coverage of tools

Despite consensus on the appropriate tools to prevent and treat malaria, access to these life-saving interventions remains disturbingly low in most of the developing world. As the chart below illustrates, these tools are currently reaching less than a quarter of the population in need. In addition, those most in need are the rural poor, who often live miles from a working clinic.

This level of coverage is far below what is needed for effective malaria control.[39] There are two reasons for this coverage gap: the cost of providing enough of the tools to reach all communities in need, and the weak health system capacity of the worst-affected countries.

Chart 2: Coverage of tools in Africa



2006 data, average population coverage for sub-Saharan Africa[38]

Effective tool-delivery strategies

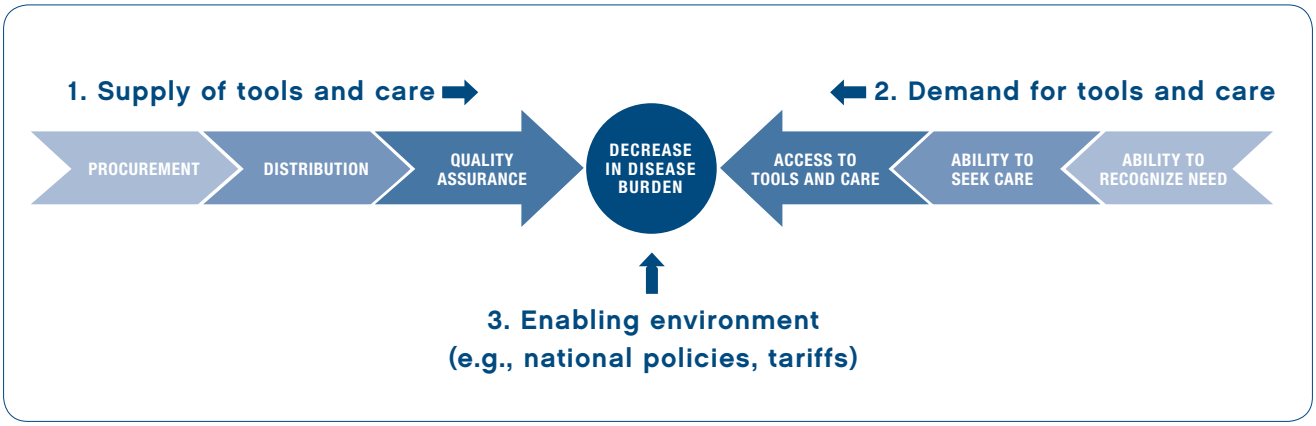
The main constraints limiting the distribution and use of these known cost-effective tools are the availability of and proximity to health services; inadequate community knowledge about appropriate use; and lack of trained personnel on both the national and community levels. A philanthropist can choose to target any one of these constraints.

Here is an example of what has to happen for a child with malarial fever to receive an appropriate dose of ACT. First, the child's caregivers must recognize the danger signs of malarial fever and seek appropriate care. Second, the child's family must have access to simple diagnosis and medication close to their home. Third, there must be a system in place that ensures that the medication is available, safe, and appropriate (i.e., not counterfeit, outdated, or ineffective in that particular region). Too often, unfortunately, some or all of these pieces are missing.

Developing an effective delivery program for prevention (e.g., bednets) or treatment (ACTs) will require addressing three factors: supply chain quality; demand and knowledge in the target community; and the enabling environment that supports or inhibits access (e.g., the national healthcare policy, tariffs on imported medications). Obstacles in any one of these domains can lead to more undiagnosed and untreated cases of malaria.

In this section, we provide six opportunities that address these constraints. Each of these models has a track record in increasing access to tools that we know to be effective. As each model targets a different aspect of the problem, they may complement one another, depending on the local constraints in a particular community. The first four examples are models that address specific constraints. The last two examples are models that help especially vulnerable and often-neglected populations.

Image by Bonnie Gillespie, VOICES for a Malaria-Free Future



STRATEGY 1

Extend existing health system capacity through community health workers

Image provided by Save the Children

In Africa, children often live 10 kilometers or more away from a health clinic. For example, the village of Kodae, in the remote region of Afar, Ethiopia, is 40 kilometers from the nearest health center. Without transportation, proper care in Kodae is a two-day walk away. Children in remote areas such as this often receive the care they need too late, or not at all. When they do receive treatment, it is often of unknown quality (e.g., unmarked pills sold at the market). Further complicating the problem are severe shortages of all types of health workers, including nurses, doctors, midwives, and assistants.

One promising solution is to extend the existing health system to reach remote regions by using a system of well-supervised community health workers. When mothers or other family members recognize malaria danger signs, these lay community health workers can enable treatment within 24 hours of symptom onset. They also act as village public health educators and as providers of a range of preventive services. Even in the most severe cases of malaria, lay health workers can save lives by providing an initial dose of ACT in the community, allowing patients to survive transport to the closest hospital.

Studies have demonstrated that lay health workers can be effective in improving outcomes for malaria treatment.[40] Large-scale research studies and demonstration projects (in Ethiopia and Burkina Faso) show that scaling up community and home management of malaria is both feasible and effective.[41,42] Ethiopia, for example, has a successful national program that uses community providers to deliver a broad package of essential health services.[43]

Philanthropists can support a **community case management (CCM)** program using lay health workers. **Save the Children** successfully implements this approach in Mali. This organization gives hard-to-reach populations the ability to treat malaria by training local health workers and providing community drug kits.

★ PROMISING PRACTICE:
Community case management of childhood illness – reaching the last quintile with life-saving treatments

PROBLEM: Many communities are far from clinics and do not have access to malaria treatment. At the same time, there are severe shortages of all levels of health workers. Combined with widespread drug resistance to chloroquine and limited access to new antimalarial medications, these factors can lead to fatal outcomes.

SOLUTION: Lay health workers and community-managed drug kits

SUCCESSFUL MODEL: In communities more than 5km from a healthcare facility, community health workers receive training and supervision so that they can safely provide essential health services. These health services include basic health education and prevention, as well as diagnosis, treatment, and/or referral for the most common life-threatening childhood illnesses, including malaria, diarrhea, and pneumonia. The community health workers are affiliated with established health clinics that provide training, supervision, and consistent drug supply. When feasible, the health clinics also enable timely transfer of sick children who need higher levels of care. Research studies support the use of both lay health workers and home-based care for malaria.[44]

EXEMPLAR AGENT: Save the Children - In partnership with the target country's Ministry of Health, Save the Children uses community case management (CCM) to deliver basic but critical interventions to those without access. Although most of its pilot CCM programs are less than five years old, mid-term evaluations indicate that the programs are on track to reach targets. Save the Children personnel have also taken a leadership role in collecting evidence for the model and sharing its core elements for use by other nongovernmental organizations.

RESULTS: In 2002, Save the Children initiated a community case management project in the Sikasso region of Mali, West Africa. The project gave villagers increased access to essential medications for malaria and diarrhea by establishing over 450 village drug kits and training 'kit managers' to treat patients and refer those with signs of severe illness to affiliated health centers. Household surveys showed that the use of appropriate malaria treatment for all children in the target area increased from 24% at baseline in 2002 to 56% in 2004. A recent mid-term evaluation of an expansion of the project to other districts showed that 50% of children treated for malaria in project districts received their therapy at the community level.[45] More recently, Save the Children has piloted the use of ACTs in the village drug kits using the CCM delivery platform.[46]

WHAT DIFFERENCE CAN THE MODEL ACHIEVE? Save the Children has set a number of targets for its expanded CCM project in Mali, which serves a target rural population of 990,000 people, including 250,000 children under the age of five.

2004-2009 (minimum) targets for change in intervention coverage in the target population:

- Children sleeping under a bednet the previous night: increase from 8% to 30%
- Children receiving therapy within 24 hours of fever onset: increase from 26% to 60%
- Pregnant mothers receiving at least one dose of IPT: increase from 7% to 70%

Estimated number of child lives saved if the project reaches its minimum targets:

- 2,500 (considering only the impact of the three malaria interventions)
- 3,200 (if we consider the doubled use of oral rehydration therapy for diarrhea treatment)

HOW MUCH DOES THIS CHANGE COST? About $1000 per additional child life saved, when including the impact of both malaria interventions and oral rehydration therapy for diarrhea. The cost rises to approximately $1350 if we only consider the impact of malaria interventions. The total cost for this five-year project is $3.3 million, or roughly $3 per child under the age of five per year in a population with 250,000 children.[47]

We based these figures on project data and targets from Mali 2004-2009 and the Lives Saved Calculator of CHERG/CSTS+.[48] The figures only include the estimated impact on deaths averted in children less than five years of age. They

Image provided by Save the Children

do not include the cost of medications and bednets, which the Ministry of Health and other partners (e.g., UNICEF, Red Cross) typically provide.

The model's cost efficiency arises from two sources. First, the model relies on partners for referral, commodities, and cost-sharing. Second, community health workers are addressing several different priority health issues at once.

ADDITIONAL BENEFITS: In addition to preventing death, the interventions decrease sickness and disability in children. Older children, pregnant women, and adults also benefit from decreased sickness and death. In addition, the community case management strategy commonly addresses pneumonia, a leading killer of children.[49] Health planners are now considering ways to adapt the strategy to deliver interventions to treat newborn infections, childhood malnutrition, and HIV/AIDS. This model also builds local capacity for reaching the poorest of the poor, who experience a disproportionate burden of illness and death.

CASE SNAPSHOT

Core practice – Community health workers bring life-saving treatments to families currently without access

Impact sought – Decrease childhood death and illness from malaria, diarrhea, and other common conditions

Change achieved (projected, Mali) – Additional % of target population with coverage: +22% (bednet use), +34% (prompt therapy), +63% (IPT pregnancy)

Program cost per child in target population – Average annual cost per child under the age of five (as reported by the nonprofit) is roughly $3

Estimated cost per impact – Roughly $1000 per additional child life saved for Mali program

*See page 70 for how we calculated cost per impact.

For more information about the Community Case Management model, see *Save the Children's* website: www.savethechildren.org or contact Timothy Rogers at (203) 221-4242 (TRogers@savechildren.org) or Dr. David Marsh at (413) 256-6805 (DMarsh@savechildren.org).

STRATEGY 2

Enlist family members and community volunteers to educate communities

Even when effective tools make it to rural communities, villagers may not use them, or may not use them properly (e.g., by converting bednets into dresses or fishing nets). Surveys of rural areas have shown a significant gap between bednet ownership and proper use. According to respondents, only 50% to 60% of bednets were in use the previous night.[50] The real world effectiveness of prevention measures is a driver of both the impact and the cost of an intervention. Researchers estimate that increasing use of bednets from current levels to 98% would decrease new cases and reduce treatment costs by half.[51]

Thus, delivering the tools is only half the problem. Equally important is that the members of the target community trust their healthcare providers, understand the importance of the malaria interventions, and know how to use these tools correctly.

The key to increasing the proper utilization of interventions is community education. Providing community education has long been difficult, in no small part because of the shortage of trained health professionals who can provide that education. Public health officials have also struggled with the broader problem of mobilizing and empowering rural communities, especially in areas where transportation and health infrastructure is poor. These problems present opportunities for philanthropists, who can invest in community health education and community mobilization efforts to help rural populations realize the potential of available interventions.

There is no question of the importance of community health education. If children are to benefit from available malaria treatment, for example, their parents must be able to recognize the danger signs suggestive of malaria and know how to seek prompt therapy.

Community health education programs provide the knowledge and skills that people need to make the best use of available services while helping these individuals become active participants in their own health decisions. In providing communities with basic knowledge of health issues, these programs also empower communities to develop their own innovative solutions.

Image provided by World Relief

There is evidence that such programs work. For example, programs in Ethiopia help village mothers recognize malaria symptoms in their children and subsequently respond to those symptoms by seeking appropriate care. A study in Ethiopia found that these programs resulted in a 40% decrease in malaria mortality.[52] However, there is general agreement that for community education programs such as these to produce results, they must involve the beneficiaries. Effective programs must combine the delivery of information and changes to behaviors with opportunities for dialogue, shared learning, and consensus-building.[53]

One promising practice has been to enlist family members and community volunteers to educate others on the importance and use of tools such as bednets. For example, **World Relief**'s **Care Group Model** has been successful in decreasing child mortality by mobilizing and educating communities through the creation of networks of health volunteers. World Relief originally developed this model in Mozambique; other groups have since replicated the model in other settings. In Rwanda, Care Groups have been linked with Community Case Management (p.17) to enable all households to access key interventions.

Image by Bonnie Gillespie, VOICES for a Malaria-Free Future

★ PROMISING PRACTICE:
Educating, mobilizing, and changing behavior in communities through volunteer networks

PROBLEM: When community members do not trust their health providers, do not understand the importance of effective malaria tools, or lack the skill to use those tools correctly, they often will underuse or misuse these tools. Key constraints to the regular use of malaria tools include shortages of trained health care workers, low rates of literacy in target populations, diverse cultural beliefs, and language barriers.

SOLUTION: Educate and empower the community to take appropriate actions to prevent malaria and seek treatment within 24 hours of symptom onset. Use a system of community volunteers and locally-tailored health messaging.

SUCCESSFUL MODEL: The **Care Group Model** is an innovative and effective way to convey health messages to large populations. This particular model has been unique in its ability to overcome the usual difficulties associated with training, supervising, and sustaining a large number of community volunteers, and is able to achieve universal coverage of households.

Programs using this model create a vast network of community volunteers that mobilize and educate their neighbors. For every 10 to 15 households, a volunteer mother is selected. A 'care group' consists of 10 to 15 volunteers. Each care group meets twice monthly with a staff health promoter to learn a new health message or skill focused on child survival. After the care group meeting, all volunteers are responsible for making individual visits to their assigned households near their home and teaching other mothers the health lessons that they learned in the care group. This volunteer-based saturation system ensures that behavior-change communications reach every household.

Care group meeting topics include the appropriate use of insecticide-treated bednets for malaria; oral rehydration therapy to treat diarrhea; breastfeeding; and when to seek care at health clinics (e.g., when a child has a fever).

EXEMPLAR AGENT: **World Relief** originally developed the Care Group model in Mozambique. World Relief and other NGOs (such as Food for the Hungry, Plan International, Curamericas, Red Cross, and Africare[54]) have since replicated the model in a diverse range of settings. The Mozambique project was the subject of an external impact evaluation that confirmed the positive health impact that the project had estimated using its own household survey.

RESULTS: World Relief's project in Gaza province, Mozambique mobilized 2,315 women to reach nearly 25,000 households in a rural district. An independent external evaluation of the Mozambique program found a 49% reduction in infant mortality and a 42% reduction in mortality among children under the age of five in the program communities.[55] In addition, the volunteer networks also implemented a health information system and collected vital events such as births, deaths, and childhood illness, thus filling a critical gap in reliable health data.

WHAT DIFFERENCE CAN THE MODEL ACHIEVE? Below are selected results of World Relief's Care Group program serving a rural population of 160,000 in Malawi (including 37,000 children) before and after a four-year program. In Malawi, malaria is responsible for about 30% of child deaths.

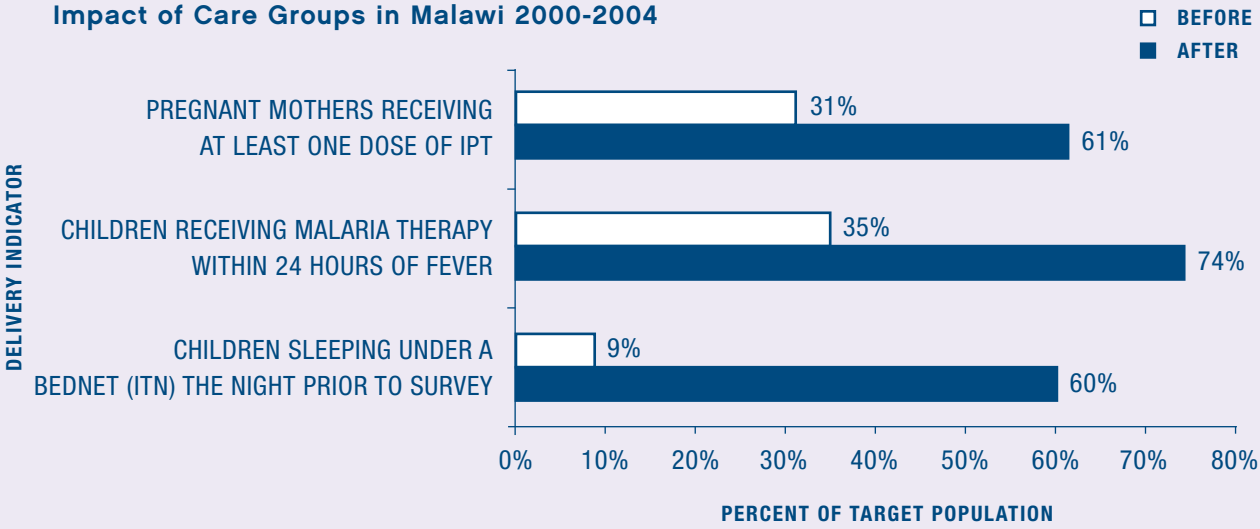
Estimated number of child lives saved:

- ~ 473 (considering only the impact of the three malaria interventions)
- ~ 1,114 (when also considering additional areas such as nutrition, breastfeeding, and pneumonia therapy that Care Groups address)

HOW MUCH DOES THIS CHANGE COST? About $1200 per additional child life saved, when including all of the child health interventions that the Care Groups addressed (~$2800 if we only consider the impact of the malaria interventions). The total cost for the four-year project in Malawi was $1.3 million or roughly $8 to $10 per child under the age of five per year in the target area. We do not include the cost of medications and bednets, as the Ministry of Health or other partners typically provide these. For these figures, we used project data from Malawi 2000-2004, the Lives Saved Calculator of CHERG/CSTS+, and data from the USAID Child Survival Grants Program.[56] The figures only include impact on deaths averted in children under five years of age.

ADDITIONAL BENEFITS: In addition to preventing death, Care Group interventions also decrease sickness and disability in children. Older children, pregnant women, and healthy adults also benefit from decreased sickness and death. Furthermore, the Care Group platform can introduce microcredit, literacy, and income-generating skills to rural women and households.

Impact of Care Groups in Malawi 2000-2004



CASE SNAPSHOT

Core practice – Reach all households with critical health education using mothers and household volunteers

Impact sought – Decrease childhood death and illness from malaria, diarrhea, and other common conditions

Change achieved (Malawi) – Additional % target population with coverage: +51% (bednet use), +39% (prompt malaria therapy), and +30% (IPT pregnancy)

Program cost per child in target population – Average annual cost per child under the age of five (as reported by the nonprofit) is about $8 to $10

Estimated cost per impact – Roughly $1200 per additional child life saved

For more information about the Care Group Model, see World Relief's website: www.worldrelief.org or contact Connie Fairchild at (443) 451-1938 (cfairchild@wr.org).

STRATEGY 3

Piggyback on existing systems for delivery of bednets

Bednet programs will have maximum impact and efficiency when all community members sleep regularly under them. High coverage of insecticide-treated bednets creates community health effects, which lead to fewer malaria cases, reduced treatment costs, and accelerated containment of the disease.

Given the lack of good roads or transportation, especially during the rainy season, getting bednets to rural communities in Africa is no easy task. An effective approach will use a combination of complementary channels, both public (free distribution) and private (commercial and local vendors), to efficiently and equitably distribute the nets.[57] One of the best ways to reach rural populations is to integrate malaria control into other health services such as integrated management of childhood illness (IMCI) or immunization programs.

Including the cost of transportation from manufacturers to the villages and of follow up by trained volunteers, the total price of getting each net to the hut is under $10. Since the net lasts five years and typically two children sleep under it, the protection is about $1 per child per year. Roughly every hundred nets in use will save the life of one child a year and prevent many dozens of debilitating occurrences of malaria.

– Jeffrey Sachs, writing about the Measles Initiative[58]

Large-scale childhood vaccine campaigns have been successful in reaching more than 90% of children in the most difficult locations, even in areas without a functioning health system. **The Measles Initiative** built on the success and logistics of vaccination campaigns to also deliver bednets and other child survival interventions (e.g., vitamin A, deworming medication) to a high percentage of the population.

Image by Bonnie Gillespie, VOICES for a Malaria-Free Future

The Initiative's "Hang Up" campaigns focus on getting bednets hung in all households over a short period of time after distribution. However, mass distribution campaigns are better suited to rapid scale-up than to maintaining coverage and ensuring the proper use of the tools.[59] For this reason, "Keep Up" campaigns have been added to ensure the proper use of the bednets over the long term. The "Keep Up" campaigns work especially well as part of routine prenatal or child health services. This twofold strategy has proven to be an excellent interim solution until governments are able to develop and strengthen their local health systems and infrastructure.

In 2008, several NGOs and donor partners supporting bednet distribution formed the **Alliance for Malaria Prevention** to meet the expanded goal of universal bednet coverage. The Alliance uses a range of integrated campaigns (including but not limited to measles vaccine campaigns) to reach all children and adults and fill critical gaps in logistical and technical support.

★ PROMISING PRACTICE:
Integrate bednet distribution with vaccination campaigns

PROBLEM: Getting bednets to remote areas is difficult, especially in areas where there are no functional health systems or transportation networks.

SOLUTION: Integrate bednet distribution with mass vaccination campaigns

SUCCESSFUL MODEL: In sub-Saharan Africa, mass vaccination campaigns against polio, measles, and tetanus reach over 90% of children in target populations. A cost-effective way to distribute bednets is to integrate them into these mass vaccination campaigns, taking advantage of their existing logistics. The model first integrates bednet distribution and malaria prevention education into existing vaccine campaigns. It ensures that families install the bednets during "hang up" campaigns, and makes sure that they continue to use them through "keep up" campaigns run by community volunteers.

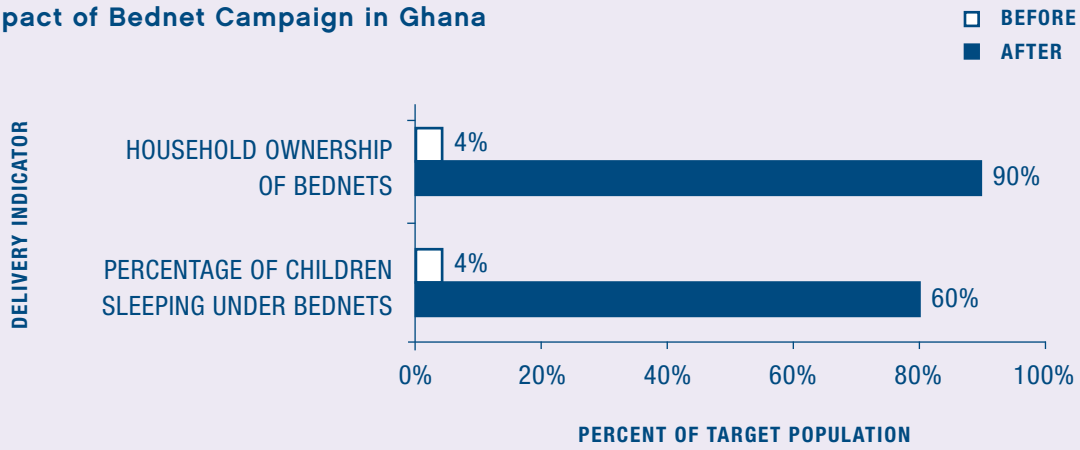
EXEMPLAR AGENT IMPLEMENTING THE MODEL: THE MEASLES INITIATIVE and the new expanded partnership, the **ALLIANCE FOR MALARIA PREVENTION**

The Measles Initiative is a partnership between the Red Cross, the United Nations Foundation, UNICEF, the U.S. Centers for Disease Control and Prevention, and the World Health Organization. Since 2001, it has supported the mass vaccination of over 600 million children in more than 60 countries. After its success in reaching more than 90% of the targeted age group during each campaign, the Measles Initiative began integrating other lifesaving interventions, including insecticide-treated bednets, into its campaigns. Children now receive a package of interventions: measles vaccine, Vitamin A, a dose of deworming medication (Mebendazole), and, at minimum, one free insecticide-treated bednet per household with children under five. The integrated delivery strategy is not only able to reach the poorest households, but is also able to keep distribution costs low.[60] In Ghana, for example, the marginal operational cost per net delivered was only $0.32. The Initiative now delivers bednets in over 15 countries.

WHAT DIFFERENCE CAN THE MODEL ACHIEVE? Based on data from Ghana, household ownership of bednets increased from 4% to over 90% after the campaign. The percentage of children sleeping under the nets increased from 4% to approximately 60%.[61]

This graph underscores the importance of moving from bednet ownership to sustained, proper use, as the current gap represents a critical missed opportunity for prevention. Community education programs (such as Care Groups, p. 22) can help close this gap.

Impact of Bednet Campaign in Ghana



HOW MUCH DOES THIS CHANGE COST? 100,000 bednets delivered through vaccine campaigns can save the lives of roughly 1,000 children.[62] With sustained and proper use, these bednets can save two to three times this number. Average costs are about $10 to $12 per long-lasting bednet delivered. This includes a $5 to $7 unit cost per net, $3 for delivery platform, logistics, and staff, and $2 for community education.[63]

Here are sample cost-per-impact profiles for such programs in two different African settings: Malawi ($580 to $870 per child life saved) and Ghana ($1560 to $2350 per child life saved). Assuming similar costs and coverage change achieved, the main driver of the difference in the profiles is the addressable burden from malaria at the outset of the project. Prevention programs are most efficient when they target the individuals most at risk (e.g., young children) and the communities with the most malaria cases and deaths at baseline (e.g., Malawi).

Assumptions behind the estimates:

- Use of long-lasting insecticide-treated bednet (LLITN); one child sleeps under each net; nets last 3 years; 60% of children actually sleep under the net (conservative estimates)
- Costs: $1 million dollar gift effectively covers the costs of distributing 100,000 bednets
- Impact is estimated only for decreased malaria death in children < 5 years old
- Range shown in impact estimates above reflects varying protective ability of bednet from 50% to 75%

ADDITIONAL BENEFITS: Bednets prevent sickness and disability due to malaria in both children and adults. Cost-impact estimates will improve markedly (and the number of lives saved will increase) if two children sleep under each net, and if nets are used properly for five to seven years. The number of lives saved could double or triple if there is consistent and proper use of the bednets each night.

CASE SNAPSHOT

Core practice – Deliver insecticide-treated bednets to all households using integrated campaigns

Impact sought – Decrease childhood death and illness from malaria

Change achieved (Ghana) – Additional % population who own bednets (+86%) and regularly use bednets (+56%)

Program cost per child in target area – Average $10 to $12 (cost of each long-lasting bednet delivered)

Estimated cost per impact – $500 to $2500 per additional child life saved (depending on the amount of malaria and the country demographics)

For more information on this model, see The Measles Initiative website: www.measlesinitiative.org/news.asp or contact Adrianna Logalbo, Deputy-Director, Partnership Alliances, at the U.N. Foundation by phone at (202) 778-3522 or by email at alogalbo@unfoundation.org. The new expanded Alliance for Malaria Prevention can be reached at allianceformalariaprevention@gmail.com.

STRATEGY 4

Scale-up community and household access to new ACTs (Artemisinin Combination Therapy)

Children are the most likely to die from malaria. Preventing their deaths requires making sure that when they become ill, they are rapidly treated with an effective antimalarial drug, and that they adhere to the full course of treatment.

Rising rates of drug resistance have led many countries to switch their policies to newer and more expensive medications, particularly artemisinin-based combination therapies (ACTs). As a result, the primary constraint to effective treatment in children is access to ACTs at the district and community level. Currently, the rates of use of ACTs are extremely low at less than 10%.

One reason for the very low ACT utilization rates is that public healthcare facilities are hard for many caregivers to reach, and these facilities are prone to intermittent drug shortages. As a result, caregivers often turn to the private sector instead, where they can find a limited supply of affordable ACTs along with other drugs of questionable quality and little to no quality control or oversight. In some areas of Africa, caregivers obtain roughly 75% of all antimalarial medications outside the public sector.[64]

Ultimately, many children receive the wrong regimen of the wrong drug or they receive the right drug too late. The resulting suffering and death is preventable.

One promising solution is to make prepackaged ACTs and appropriate information available in communities to ensure prompt and effective treatment. **Population Services International (PSI)** is piloting community access to ACTs in several African and Asian countries. They use an approach that involves both the public and commercial sectors to make effective tools available to large target populations on a national scale. PSI develops and markets ACTs that are prepackaged for easy administration. The packaging includes instructions in the local language as well as in pictures for those mothers and lay health providers with limited literacy. The challenge is getting ACTs to communities that need them.

The Global Malaria Action Plan 2008 identified the lack of project management and technical capacity at the country level as major obstacles to the delivery of effective malaria control interventions such as ACTs.[65] PSI's Malaria Control Associates program helps close this gap. It trains and places full-time employees within the national malaria control program to support governments in resolving implementation bottlenecks in planning, management, and financing.

★ PROMISING PRACTICE:
Overcome delivery bottlenecks and increase access to safe and effective malaria treatment

PROBLEM DESCRIPTION: Families most in need do not have timely access to quality malaria medication that works (i.e., artemisinin combination therapy (ACT)). Technological issues, manufacturing supply, and financing are no longer the primary constraints. From 2004 to 2006, annual production of new combination ACTs increased from 4 million to 100 million doses. Funding for malaria drugs from international sources such as the Global Fund increased tenfold in the last decade.[66] Instead, the primary challenge is now delivery. African countries need new investments to strengthen their capacity so that they can get the available ACTs into communities.

KEY CONSTRAINTS: Lack of trained persons in malaria-affected countries who can secure available funding and unblock implementation bottlenecks; counterfeit and poor quality drugs in the private sector; low literacy and knowledge at the household level.

PROMISING MODEL: Use malaria control associates to roll out ACTs to communities on a national scale. This model consists of two parts. First, develop national-scale programs that consider the entire value chain of ACT medication delivery, from drug procurement and culturally appropriate packaging to care-seeking and use by mothers in rural villages. Second, train a cadre of young professionals – malaria control associates – in each target country. The malaria control associates will work to ensure effective medication delivery by resolving implementation barriers as they come up at each step in the process. Associates will be primarily from the malaria-endemic nations themselves, and will assume country-level positions after training. The training includes time working with experienced malaria staff and an 11-month, multi-country apprenticeship in which the associates work on clearing the bottlenecks that interfere with efforts to scale-up access to new malaria medications.

Example of ACT packaging with pictorial instructions. Image provided by PSI Malaria Department

EXEMPLAR AGENT: Population Services International - PSI originally developed the new malaria associates model. It successfully piloted the model in southern Sudan, and plans to scale-up the model for use in other countries through their Malaria Capacity Project. PSI currently supports malaria control programs in over 30 countries, and has strong technical capacity to lead a training effort, particularly through their Kenya site. They have a long track record of planning and implementing national-level programs for malaria. They use both private and public sector channels to distribute bednets and medications. As an organization, PSI has shown a commitment to continuous measurement and evaluation (both internal and external) of their programs, including incorporation of cost and efficiency considerations. Additionally, they have extensive experience scaling-up pilot demonstration projects that have evidence of positive results.

WHAT DIFFERENCE COULD AN INVESTMENT IN THE MODEL ACHIEVE? *Predicted results:* PSI expects that over two years, a population of 2.5 million in each target African country will require 1.3 million treatments of ACT for community-based delivery (for children under five only). This will treat about half a million cases of malaria (rough estimate as treatment is presumptive), resulting in an estimated 11,000 child deaths averted per pilot area (range 7,000-14,500).[67]

HOW MUCH WOULD THIS CHANGE COST? Approximately $300 to $500 per child life saved, with additional benefits of decreased sickness and disability in many more children.[68] The estimate assumes a total cost of $3.5 million per pilot country for a two-year project, including medication costs. The malaria control associates component of the model has the most need of private funding, as several international sources are now willing to cover the medication costs. The malaria control associates component represents about 15% of the total costs at each site.

ADDITIONAL BENEFITS: Newly trained malaria control associates will not only work to increase medication access, but also overcome implementation barriers in the larger national malaria control strategy, thus improving access to bednets, indoor spraying, and prevention in pregnancy.

CASE SNAPSHOT

Core practice – Increase community access to ACTs through national scale programs, while using malaria control associates to overcome bottlenecks

Impact sought – Decrease childhood death and illness from malaria

Change achieved (projected) – Additional 45% of children with fever in target population receive prompt ACTs

Program cost per child in target population – Average $5 for two-year program

Estimated cost per impact – $300 to $500 per additional child life saved

For more information about piloting community access to ACTs and supporting local malaria control teams, see PSI's website: www.psimalaria.org or contact Khalisa Jacobs at (202) 572-4594 (kjacobs@psi.org).

STRATEGY 5

Build training networks to prevent malaria in pregnancy

Pregnant women are particularly vulnerable to malaria. More than 50 million pregnant women give birth in malaria-affected areas each year, leading to an estimated 10,000 maternal deaths and 3% to 8% of all infant deaths.[69] In areas with stable malaria (i.e., with high rates of transmission), chronic malaria can lead to anemia in pregnant women and low birth weight in newborns that can lead to sickness and death. In areas with unstable malaria (i.e., low transmission), pregnant women often do not have full immunity, and develop severe malaria at rates two to three times higher than non-pregnant women in the same areas.[70]

Thus, a priority in the global malaria strategy is to make intermittent preventive treatment, long-lasting insecticide-treated bednets, and prompt treatment available to all pregnant women, particularly in rural areas. The most cost-effective way to accomplish this is to integrate the delivery of malaria prevention tools (e.g., IPT, bednets) into general prenatal services, as more than 70% of women seek care at least once during pregnancy.[71] Prenatal visits are the ideal platform for not only distribution of the tools, but also education about their proper use.

Several obstacles interfere with this delivery strategy. First, there is a shortage of funding for programs that can train, supervise, and equip providers to fill this role. Second, in many areas, lay health workers (e.g., traditional birth attendants) are providing prenatal care and delivery, not physicians or nurses. These countries need additional support at the national level to effectively train lay prenatal providers to administer and educate mothers on malaria interventions. A third obstacle is the increasing resistance in many regions to sulfadoxine-pyrimethamine (commonly known as SP), the standard drug for intermittent preventive therapy. Funding is needed to support research projects to test newer medications, including ACTs, for prevention in pregnant women. Finally, countries also need help in developing information and communication networks so that they can rapidly disseminate new knowledge and practices to the field.

One organization, **JHPIEGO**, an affiliate of Johns Hopkins University, has taken a leadership role in addressing malaria during pregnancy. JHPIEGO has enabled African networks to overcome implementation bottlenecks, set up 'train the trainers' programs, and increase malaria prevention for pregnant women as part of quality prenatal care.

Women holding insecticide-treated bednets received during antenatal care in Madagascar. Image by Alisha Horowitz via Jhpiego

STRATEGY 6

Assist the most vulnerable in areas of conflict or natural disaster

Photo provided by David Robertson, Drive Against Malaria

War, internal conflict, or the aftermath of a natural disaster can bring an elevated risk of malaria in tropical areas. In these situations, the number of deaths from malaria can far exceed the number of deaths resulting from the emergency itself.[72]

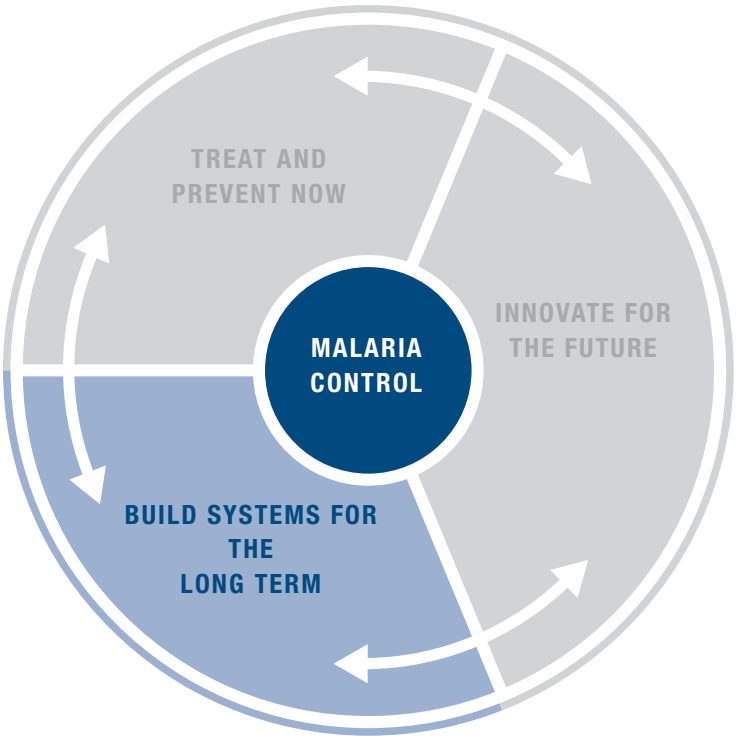
In Africa, such fragile states are home to the world's poorest communities and house one quarter of the entire sub-Saharan population. These states lack the government infrastructure or resources to effectively administer malaria prevention and treatment programs. They also account for 30% of all global deaths from malaria.[73] Because poor malaria control in one country can undermine the disease control efforts of its neighbors, there are many organizations and individuals eager to assist with both financial assistance and technical expertise.

In emergency situations, responders require unique strategies to meet immediate needs, set up prevention programs, and overcome the steep technical and logistical challenges that arise. Philanthropic funding can be fast and flexible for such efforts. Here are two effective models of programs that provide assistance with malaria control during humanitarian crises:

- **Médecins Sans Frontières/Doctors Without Borders** has a highly effective rapid response system of emergency medical care. In places such as Sierra Leone or Darfur, where war has displaced many individuals, the group provides effective malaria diagnosis and treatment. In collaboration with **Epicentre,** a field epidemiology center, MSF conducts rigorous operational research to develop best practices for crisis situations (e.g., defining the appropriate role of new rapid malaria diagnostic tests).[74]
- The **MENTOR Initiative**, based in the U.K., provides technical and disease control assistance to agencies working in areas in crisis. Through their unique operational relief model, the MENTOR team of specialists has implemented successful malaria control programs with the cooperation of local partners in fragile states such as Chad, Angola, and Liberia, as well as in countries hit hardest by the Indian Ocean earthquake in 2004.

The rapid diagnostic test shown here allows both professional and lay health workers to diagnose malaria quickly, allowing the patient to be treated effectively. Image provided by Western Pacific Regional Office, WHO.

BUILD SYSTEMS FOR THE LONG TERM



STRATEGIES IN THIS SECTION

7. Strengthen health system capacity through effective partnerships

8. Leverage existing financing resources for system-wide change

9. Create information networks to track outcomes, monitor resistance, and predict epidemics

10. Prepare future health leaders from malaria-affected countries

III. BUILD SYSTEMS FOR THE LONG TERM

In the previous section, we discussed models that address the current constraints to the immediate delivery of malaria tools. In this section, we look at ways to bolster the critical supporting health system to enable sustainable, long-term impact.

Disease-specific interventions (such as for malaria) should not be implemented in isolation from efforts to manage other diseases or conditions. Such vertical targeting by disease can lead to inefficient use of scarce human resources and infrastructure capacity, and can lead to unintended consequences. For example, children who receive bednets and malaria medication may still suffer because no one pays attention to diarrhea, an easily treatable condition.

Instead, malaria interventions should reach the regional and village level as part of health programs that are highly responsive to local needs and that work to increase the capacity of the overall healthcare system. In the long term, the most cost-effective way to reach populations in need is to integrate malaria control with other health services such as prenatal services and basic childhood care. For example, malaria control can be delivered through an IMCI (integrated management of childhood illness) or EPI (expanded program on immunizations) program that reaches remote areas.

Image by David Jacobs, PATH

Strengthening health systems lays the groundwork for reaching universal coverage of effective malaria interventions. In addition to service delivery and tools, key components of successful health systems include:[75]

- management/leadership
- financing
- information systems
- health workforce

Building these systems benefits not only malaria control, but also the prevention and treatment of other diseases. In this section, we present specific examples of how philanthropists can overcome current capacity constraints in each of these four essential health system components.

STRATEGY 7

Strengthen health system capacity through effective partnerships

National strategies are unlikely to be successful without careful attention to coordination with partners. These strategies also require strong leadership and governance from political leaders who can secure financial resources, align policies and tariffs with malaria control strategies, and help identify and remove bottlenecks as they arise.

One way a philanthropist can help is to work with programs that strengthen the ability of a country's Ministry of Health to plan, execute, and monitor its national malaria control strategy to ensure more sustained impact of health benefits. Supporting the local or regional health system enables the provision of malaria services as well as care for many other important health problems specific to the area.

PATH, an international nonprofit organization, has teamed up with the Ministry of Health and other key partners to successfully pilot such a program in Zambia. This program, the **Malaria Control and Evaluation Partnership in Africa**(**MACEPA**), brings together the resources of a diverse group of stakeholders to implement a coordinated and highly effective national malaria control program based on rapidly scaling up proven interventions.

Image by David Jacobs, PATH

★ PROMISING PRACTICE: Strengthen national leadership and management capacity to rapidly scale-up malaria interventions

In Zambia, the national government, together with the **MALARIA CONTROL AND EVALUATION PARTNERSHIP IN AFRICA** (MACEPA, a program at **PATH**), teamed up with a range of stakeholders to address the system constraints and hurdles to rolling out a comprehensive national malaria control program. Their goal is to decrease malaria incidence in Zambia by 75%.

Since 2006, Zambia has made substantial progress. Highlights include:[76]

- Distributing 5 million bednets
- Implementing two state-of-the-art national malaria indicator surveys to assess malaria burden and coverage (2006 and 2008)
- Rolling out rapid diagnostic testing in all districts
- Expanding and improving Zambia's household spraying program, reaching more than 500,000 homes in urban and surrounding areas, and exceeding the goal of 85% coverage
- Providing any pregnant woman seeking prenatal care at a public clinic with an insecticide-treated net for herself and for any child under age five years living with her

This work is achieving impact. Zambia's 2008 National Malaria Indicator Survey has provided conclusive evidence that the country's efforts are directly improving the health of the people. In just a few years, Zambia has raised the bar in malaria control and made rapid progress:[77]

- Since 2006, malaria parasite prevalence in children has been reduced by 50%
- Two-thirds of Zambian households are now covered with at least one insecticide-treated net or a recent indoor spraying
- More than 80% of pregnant women received at least one dose of preventive medicine, and more than 65% received two or more doses

Through committed leadership, a strong united partnership, and innovative approaches, Zambia is now a global leader in managing malaria control based on sound data and program accountability. Zambia is investing in approaches that will predictably eliminate malaria deaths and economic burden. Having developed the capacity to rapidly impact malaria, Zambia is well-positioned to move to the next phase of malaria control: eliminating the disease as a health and economic impediment. Critical next steps involve sustaining and building on these gains.

Now that this Gates Foundation-funded pilot of MACEPA has shown demonstrated results in Zambia, it has set up a Learning Community where other African governments can learn from one another and share their successes and challenges. Next steps include replicating this successful model in other interested African nations such as Tanzania, Ethiopia, Mozambique, and Malawi. Philanthropists could play a critical role in funding these new partnerships or supporting the Learning Community.

For more information about the MACEPA model, contact Benjamin Cheng at PATH (bcheng@path.org) or visit PATH's website: http://www.path.org/macepa.

STRATEGY 8

Leverage existing financing resources for system-wide change

In many countries, the public health system lacks the management and planning capacity it needs to successfully apply for and use available international malaria dollars.

Large international financing mechanisms such as the **Global Fund to Fight AIDS, Tuberculosis, and Malaria** require competitive applications and a clearly defined malaria control strategy. Governments need technical assistance in developing national malaria control strategies as well as in drafting proposals to major donors such as the Global Fund. Countries also need to develop local leaders who can work creatively to overcome logistical roadblocks and bottlenecks.

Image by Bonnie Gillespie, VOICES for a Malaria-Free Future

★ PROMISING PRACTICE: Tapping into the Global Fund platform of financing

The **GLOBAL FUND TO FIGHT AIDS, TUBERCULOSIS, AND MALARIA** ("Global Fund") currently provides more than 65% of international malaria funding, and is the main source of funding for malaria medications and control programs. It has developed a performance-based, demand-led model in which malaria-endemic countries develop a national malaria strategy and submit applications to the Fund based on their priorities and needs. However, the poorest and most needy countries often lack the technical capacity to put together competitive applications.

Private dollars can make a critical difference. For example, in the case of Equatorial Guinea, a private donation of $1 million dollars towards technical assistance led to the design and development of a national strategy. This strategy formed the basis for a successful application to the Global Fund for $26 million dollars to finance the national malaria program in the country.[78]

FOUR WAYS TO USE THE SCALE AND EFFICIENCY OF THE GLOBAL FUND'S FINANCING MECHANISM

1. Give to the Global Fund directly (see right for considerations)
2. Support on the ground organizations that can increase the capacity for successfully obtaining and implementing malaria control programs with Global Fund dollars. These NGOs work through the Country Coordinating Mechanisms (CCMs) which bring all relevant stakeholders together in each country. The contacts and membership for CCMs in all Global Fund grant countries are available in the country section of the Global Fund website: www.theglobalfund.org/programs/search.aspx?lang=en&component=Malaria
3. Support Friends of the Global Fund, which advocates and supports the mission of the Global Fund (see www.theglobalfight.org for U.S. "Friends" organization)
4. Support activities to build capacities and private sector partnerships inside the malaria-affected country through organizations such as the **GLOBAL BUSINESS COALITION ON HIV/AIDS, TUBERCULOSIS AND MALARIA** (www.gbcimpact.org/)

CONSIDERATIONS FOR PHILANTHROPISTS

Supporting Global Fund activities directly or indirectly has the following advantages for individual philanthropists:

- *Efficiency* – Leverages the Global Fund's performance-based, demand-led model, as well as its rigorous accountability/evaluation frameworks
- *Transparency* – Information about every Global Fund grant disbursement is publicly available on their website
- Ensures that supported programs are embedded in national responses to the diseases
- Has the advantage of providing support from within a large pool of funds:
  - Administrative costs are met by interest income on overall funding, allowing 100% of gifts to go directly to grants
  - Provides sustainability for grants
  - Provides potential exit strategy, if needed, for private donors

The primary tradeoff for individual donors directly supporting the Global Fund has been the loss of the ability to maintain contact with programs and recipient communities on the ground. Also, given the very large government donations to the Fund, individuals may not want their dollars to go into a 'big pot' where they might lose control of where money is invested and may be uncertain if their dollars have the most incremental impact in relation to the size of the donation.

In response to the unique needs of individual donors, the Global Fund has recently developed a new program for gifts of $1 million and over. When there is reciprocal agreement by recipient nations, this program can earmark such donations to particular country grants, creating a direct association with particular activities, and giving private donors the ability to follow the results. In addition, private donors can actively participate in the governance of the Global Fund through private sector or foundation 'constituencies,' each of which controls a seat on the Global Fund board.

For more information about these options, see the Global Fund website **www.theglobalfund.org/en/** or contact David Evans, Manager, Private Sector Resource Mobilization at **David.Evans@TheGlobalFund.org**, or by phone at (Geneva) +41 22 791 8231.

STRATEGY 9

Create an information network to track outcomes, monitor drug resistance, and predict epidemics

Information systems are critical for malaria-affected countries. National governments need integrated information systems to track patterns of malarial drug resistance and mosquito insecticide resistance so that they can quickly respond with appropriate changes in policy. They also need additional warning systems that would help them prevent and contain malaria epidemics by detecting outbreaks early, especially in war-torn areas and other situations with large numbers of refugees. Local and national malaria control efforts also need information systems to track project outcomes and allow rapid diffusion of new best practices to the field. It is especially crucial to get these new practices out to the most out-of-reach communities, where the majority of malaria deaths occur. All of these systems are in urgent need of funding.

Malaria control programs can also use health information systems to allocate resources more accurately based on a better understanding of the local burden of disease. By gathering data at the local level on the amount of sickness and death, the causes of the disease burden, and the cost of control, health programs can make evidence-based changes to their planning to improve efficiency. For example, the district health managers of the Tanzania Essential Health Interventions Program team reduced child mortality by 47% by setting priorities based on more accurate information.[80]

Philanthropists should also consider funding information systems that track resistance to first-line medications (ACTs) or insecticides. As malaria control programs expand, there will be a greater risk of emerging resistance to both prevention and treatment drugs. As scale-up of the interventions continues, malaria parasites and mosquitoes will be exposed to increasing amounts of drugs and insecticides; as a result, resistance to both will likely emerge over time without attention and clear policies. Preventing or delaying drug resistance could have a dramatic impact on global costs. By developing or expanding a world antimalarial information system, philanthropists can help malaria control programs manage this risk by implementing prudent policies (e.g., a ban on artemisinin mono-therapies as they lead to resistance), ensuring the availability of high-quality medications, monitoring proper use, and implementing robust monitoring systems.

Multi-drug resistant *P. falciparum*, which includes decreased sensitivity and possible resistance to artemisinin, has been recently found in Cambodia bordering Thailand.[79]

★ PROMISING PRACTICE:
Create/expand a world antimalarial resistance information network

PROBLEM: One major reason behind the failure of previous international campaigns to eradicate malaria in the 20th century was the emergence of drug-resistant malaria and insecticide-resistant mosquitoes. These same problems now threaten the large investment that the global community is making to roll-out effective new drug combinations to replace these failed drugs.

SOLUTION: By creating an antimalarial resistance information network, the global effort to control malaria will have a public resource to guide antimalarial drug treatment and prevention policies and to confirm and characterize the emergence of new resistance to antimalarial drugs. In this way, it will be able to contain the spread of resistance.

PROGRAM MODEL: The antimalarial resistance information network should consist of open-access global databases containing clinical, in vitro, molecular, and pharmacological data, and networks of reference laboratories that will support these databases and related surveillance activities.[81]

EXEMPLAR AGENT: There is currently an effort underway to develop such a network. The **WORLDWIDE ANTIMALARIAL RESISTANCE NETWORK (WWARN)** is an international group of scientists conducting research in the field of antimalarial drug resistance. WWARN will develop open, web-based tools to provide malaria control managers, surveillance programs, and policymakers with up-to-date evidence of temporal and geographic trends in antimalarial drug resistance at the global scale and in real time. Their goal is to get the right drugs, to the right people, at the right time.

Image by Bonnie Gillespie, VOICES for a Malaria-Free Future

For more information, see the WWARN website: www.wwarn.org/home/.

STRATEGY 10

Prepare future health leaders from malaria-affected countries

Image by Bonnie Gillespie, VOICES for a Malaria-Free Future

Malaria-endemic countries have a shortage of skilled leaders in management, healthcare, and operations, and not enough trained workers to carry out malaria control initiatives. These countries need individuals with financial, organizational, and program management expertise. They also need people with technical knowledge in malaria-specific domains, such as entomology, as well as the nurses, doctors, and community health workers required to provide care.

One reason for the shortage of talent is the brain drain effect. Once they obtain the skills and training they would need to serve their communities, many people relocate to a region or country where the pay, professional development, or quality of life is better. Closing the workforce/talent gap will require reducing the attrition of skilled professionals, expanding the workforce, and strengthening the skills of both the professionals and the lay workforce.[82] Here are three specific ways in which philanthropists can help. Not only do these examples provide initial local training and job opportunities, but they also provide the ongoing professional development needed to retain key health workers in malaria-affected countries.

First, philanthropists can strengthen and develop African training institutions (e.g., universities, research centers) by supporting them directly or funding efforts to partner (or 'twin') them with universities in resource-rich countries. For example, the **Infectious Disease Institute (IDI)** in Kampala, Uganda, has developed training programs to support the entire spectrum of workforce needs in malaria. They have well-established collaborations with many U.S. and European universities for joint research and human resource capacity building for the region. **The Fogarty International Center**, an arm of the U.S. National Institutes of Health, has a long track record of enabling collaborative research training initiatives between institutions in the U.S. and the developing world. For example, its support of the **Malaria Research and Training Center (MRTC)** at the University of Bamako, Mali, has allowed hundreds of trainees from Africa and around the world to engage in malaria research, particularly on vaccine development. Additional philanthropic support for these programs through the Fogarty Center would allow expansion of training efforts to encompass additional countries and more trainees.

Second, philanthropists could work with Schools of Public Health in malaria-affected nations to set up field training programs in operations and service delivery. Programs to get an MPH-trained problem solver at every district in a malaria-endemic country would go a long way to address the workforce/talent capacity shortage for malaria and other health problems. For example, the **John P. Grant School of Public Health at BRAC University**, in Dhaka, Bangladesh, has developed an innovative model interfacing research, delivery, and education through community–based training. The School is based out of BRAC, a comprehensive health and development organization, and links research centers in Bangladesh, the U.S., and Europe to train the next generation of public health leaders from around the world.

Third, philanthropists can support a regional training network so that malaria-affected nations can learn from each other. For example, the **ACTMalaria Network** currently operates in 12 Asian countries. It provides collaborative training and capacity building to help member countries develop a strong regional malaria control initiative. There is a need to strengthen similar networks in Africa.

Examples of Successful Training Initiatives

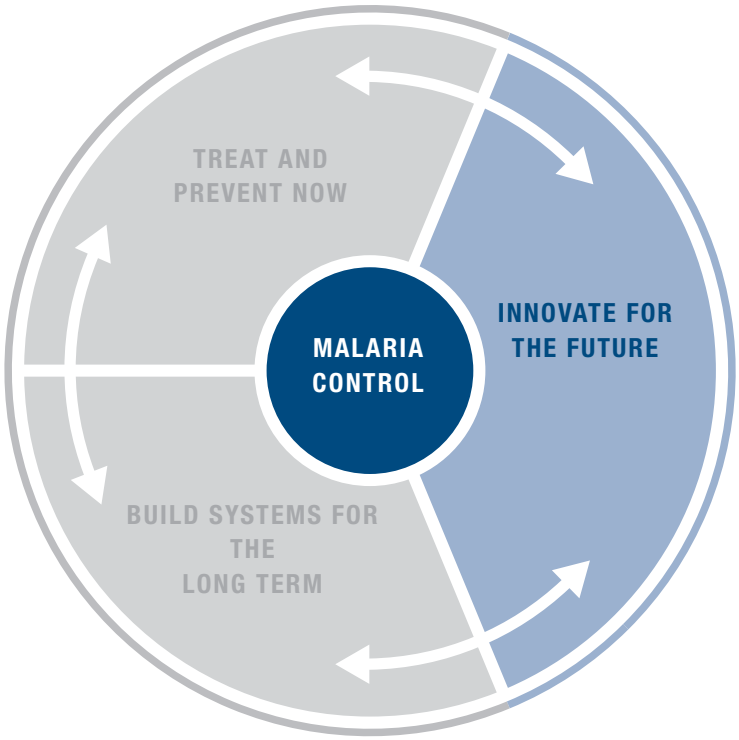
- **Infectious Diseases Institute, Uganda** – This program trains health professionals in infectious diseases and lab/data management. Participants have come from 27 countries in Africa to learn new tools and technology that will help them effectively provide care in infectious diseases. This program includes a malaria-specific component, called the Joint Uganda Malaria Program, which trains participants on malaria management (i.e., treatment, prevention, lab diagnostics), data collection, and surveillance and monitoring.
  http://www.accordiafoundation.org/aaf/JointUgandaMalariaTrainingProgram.html
  E-mail: **mtraining@idi.co.ug**

- **Fogarty International Center: Global Infectious Disease Training Program** – This program offers training to applicants from both the U.S. and developing countries to enhance research training in infectious disease. Its goal is to increase the number of researchers and support staff working on infectious diseases in developing countries.
  http://www.fic.nih.gov/programs/training_grants/index.htm
  Contact: Dr. Barbara Sina, Program Director
  Telephone: (301) 402-9467

- **John P. Grant School of Public Health at BRAC University** – It partners with International Centre for Diarrheal Disease Research, Bangladesh. This school of public health currently enrolls students from around the world for a one-year MPH program that includes a two-month rural internship.
  http://www.bracuniversity.ac.bd/I&S/sph/index.htm
  E-mail: **minfo@bracu.ac.bd** (general information)

- **Malaria Research and Training Centre (MRTC)University of Bamako, Mali** – Created within the Department of Epidemiology of Parasitical Diseases at the University of Mali (now the University of Bamako), the MRTC is involved in research directed at the development and testing of appropriate strategies for the eventual control of malaria and the reduction of the burden of disease in the people of Mali, the region, and all of Africa.
  http://obtoure.africa-web.org/

INNOVATE FOR THE FUTURE



STRATEGIES IN THIS SECTION

11. Support innovation for new tools

12. Innovate by harnessing the potential of the private sector or applying new technology

IV. INNOVATE FOR THE FUTURE

In this section, we highlight key areas where capital is needed for the discovery of new tools and improved delivery methods.

We still do not fully understand the disease, and many of the key questions in basic science, clinical medicine, and operational research (i.e., how to effectively deliver tools to communities) remain unanswered. The risk of emergence of resistance to current medications and insecticides means that there is a need for a pipeline of new products. Thus, advances in research could lead to new and more effective approaches to malaria prevention, diagnosis, and treatment.

For example, in the past decade, groups of researchers have fully sequenced the genomes of three organisms that allow the transmission of malaria: the parasite *Plasmodium falciparum*, the mosquito vector *Anopheles gambiae*, and, of course, *Homo sapiens*. With this information, researchers will be able to identify the genes and pathways that the disease uses to better understand the complex host-parasite, host-vector, and vector-parasite interactions. This could lead to the development of more effective medications and vaccines, and better ways to disrupt malaria transmission.[84]

The three types of research that need investment are: (1) development of new and improved tools; (2) policy research; and (3) research on operations and implementation.

Most experts agree that in high transmission areas, **elimination of malaria is not possible unless we develop new tools.**[83]

STRATEGY 11 Support innovation for new tools

Philanthropists can help transform the landscape of malaria control by funding the research and development of new drugs, vaccine strategies, insecticides, and mosquito control. With tools that are easier to use and implement, we can increase their appropriate utilization and delay the emergence of resistance, while lowering costs.

The high priority areas for investment are:

1. ***Vaccine*** - No effective vaccine is currently available for clinical practice. The development of a vaccine – especially one that is effective in young children and blocks transmission – would provide a critical advantage in malaria prevention. It would sharply reduce long term prevention and treatment costs, and make the long-term eradication of the disease a serious possibility.

2. ***Mosquito control*** - There is a need for new mosquito control strategies using insecticides, civil engineering (e.g., filling in breeding areas), or innovative vector genetic approaches (e.g., breeding mosquitoes that interfere with the life cycle of the malaria parasite). Ideally, new mosquito control methods would combine antimalarial properties with nuisance abatement, as many people would be motivated to use the tools if they stopped the biting and buzzing of the insects. (Current abatement methods involve coils or sprays, neither of which is effective against malaria.) While IRS and bednets target mosquitoes that bite indoors and at night, there is currently no effective tool for mosquitoes that bite outdoors.[85]

3. ***Diagnostic tests*** - We need rapid, reliable, easy-to-use diagnostic tests that can differentiate the number and species of malarial parasite(s) without requiring that the user have medical expertise.

4. ***Antimalarial drugs*** - Resistance to current drugs continues to emerge and spread. Two trends are particularly alarming: the increasing resistance to SP (the primary drug for IPT prevention during pregnancy), and the newly identified decreased sensitivity to ACTs in South Asia. A new pipeline of safe and effective antimalarial medications is essential.

On the next page is a list of organizations focusing on these high-priority R&D targets. This is not an exhaustive list, but a selection of primarily public-domain consortia that create effective public-private partnerships to speed up innovation.

Funding opportunities in innovative research

FOCUS	ORGANIZATION	CURRENT PROJECTS
Vaccines	**Malaria Vaccine Initiative** (**www.malariavaccine.org**) A global program working to accelerate the development of safe, effective, and affordable malaria vaccines	The Malaria Vaccine Initiative's portfolio includes three vaccine candidates currently in clinical development. Worldwide, there are currently over 20 vaccine candidates in different stages of bench or clinical testing.
Diagnostics	**The Foundation for Innovative New Diagnostics** (**www.finddiagnostics.org**) A partnership between academic, public, and private entities that is dedicated to the development of rapid, accurate, and affordable diagnostic tests	The Foundation for Innovative New Diagnostics currently researches and improves available diagnostic tests to ensure their accuracy in the field.
New Medications	**Medicines for Malaria Venture** (**www.mmv.org**) A nonprofit organization that was created to discover, develop, and deliver effective and affordable antimalarials through public-private partnerships	The organization's portfolio contains over 30 projects, and has the largest and most diverse portfolio of antimalarial drug projects in history.
	Institute for OneWorld Health (**www.oneworldhealth.org/**) The first nonprofit pharmaceutical company in the U.S., OneWorld Health is dedicated to developing affordable medications for neglected diseases	The supply of natural ACT is limited, as it comes from the wormwood plant, which requires time to grow and harvest. OneWorld Health's Artemisinin Project is working to produce a semi-synthetic ACT so that a constant and affordable source of ACT will be available to communities who need it most.
Mosquito Control	**Innovative Vector Control Consortium** (**www.ivcc.com**) A major research consortium that is developing new and better ways to control the transmission of insect-borne disease; five leading research institutions are members of the partnership.	IVCC works to develop improved insecticides. It is also creating information systems to track resistance and vector sites, allowing malaria control groups to make better decisions about the best times to re-treat homes/bednets with insecticides.

Progress toward the ultimate tool in malaria prevention – an effective vaccine

Development of a vaccine that prevents severe malaria in young children is a research priority in global health today. If such a vaccine were available and accessible in poor countries, it would drastically reduce the burden of the disease in much of the developing world. There are currently about 40 *P. falciparum* candidate vaccines or components in the pipeline, but no commercially available products as of yet.[86]

Candidate vaccines have targeted different stages of the malarial life cycle. One vaccine candidate (RTS,S), which targets the pre-erythrocytic (pre-red blood cell) stage, was found in field trials in the developing world to decrease clinical episodes of malaria by 26% and severe malaria by 58% for up to 18 months in young children.[87] While not particularly effective in decreasing infection, this vaccine has been shown to decrease rates of severe malaria in children.

Researchers are pursuing several innovative new models. For example, in seeking to develop a product that could prevent infection, **Sanaria** is pursuing a vaccine strategy where malaria parasites are weakened through a process of irradiation. If successful, a vaccine that prevents infection could make the long-term goal of malaria eradication possible.

Other areas of research needed to support malaria control[88]

Philanthropists can support NGOs or academic university partnerships to examine key unanswered issues (SEE TABLE BELOW) in delivering malaria control. For example, **MSF/Doctors without Borders** has partnered with the field research group **Epicentre** to find ways to overcome barriers to rapid testing in rural settings using community health workers (SEE P. 31).

AREA/OBJECTIVE	NEEDS/FOCUS
Research To Improve Policy Gather evidence to inform and shape policy to improve how interventions and programs are targeted to different regional, country, and local settings	*Key unanswered questions:* ■ When does it make sense to use rapid diagnostic tests (RDTs) for children less than 5 years in high transmission areas? When should community health workers use RDTs? ■ In what settings is it most appropriate to use indoor residual spraying? Is there a synergistic benefit to using IRS and bednets together? What are the long-term costs and benefits of using IPT for infants and young children, considering its effects on protective immunity?
Implementation Research Improve program performance and develop practical solutions to common critical problems in implementation of interventions	The current real world effectiveness of many tools is much lower than their potential and varies significantly based on setting. Obstacles include challenging drug regimens and difficulty sustaining behavior change (e.g., improper use of bednets and washing of walls after IRS). *Key unanswered questions and research areas:* ■ Bednets: Where should we use mass campaigns and routine distribution? Commercial sector or free distribution? ■ Health system research: How can we implement effective multi-disease integrated programs? How can we improve delivery strategies (e.g., mobile clinics) to reach rural populations? ■ Behavior change research: What practices would increase uptake, usage, and compliance with tools? ■ New monitoring and surveillance techniques: How can we increase the frequency and quality of data collected (e.g., mobile phones, SMS, PDA technologies)?

STRATEGY 12

Innovate by harnessing the potential of the private sector or applying new technology

In some countries, most people get their malaria medications from commercial sector drug sellers and pharmacy shops. Although the commerical sector can provide an excellent distribution network for malaria interventions in places where the public sector cannot, poor oversight of quality creates new problems.

For example, if a mother in Liberia believes her child has malaria, she may go to a 'store,' if she is lucky enough to have one nearby, and ask the shopkeeper for medicine. The shopkeeper, after asking how much money she has, might give her a couple of red pills, or a handful of green pills, along with some encouraging words. The pills are potentially malicious – they could be tainted, or an insufficient dosage that not only leaves a child dying, but may also contribute to the problem of increasing drug resistance. Such a scenario undermines a community's trust in healthcare providers and in the interventions themselves, making mothers less likely to seek care from legitimate sources.

Examples of ways a philanthropist can support the private sector in malaria control

- **Use the reach and assets of the business sector to strengthen malaria control**
  The Corporate Alliance on Malaria in Africa (CAMA) is a new initiative through the Global Business Coalition on HIV/AIDS, Tuberculosis, and Malaria. CAMA's major goal is to advance business' fight against malaria through a common platform of private sector cooperation in host-countries, sharing of information and best practices, and serving as a leading private sector advocacy organization. It is also a way for philanthropists to offer their in-kind business skills to the effort. **www.gbcimpact.org/cama**

- **Invest in local companies producing malaria control commodities**
  Acumen Fund: A nonprofit global venture fund that supports local entrepreneurial approaches to delivering critical services through loans or equity. Malaria investments in their health portfolio include local manufacturers of bednets and ACTs. **www.acumenfund.org**

- **Support franchise medicine shops**
  Child and Family Wellness (CFW) Shops. In Kenya and now Rwanda, the HealthStore Foundation runs a micro-enterprise-franchise business model called CFWshops. Shop owners are required to follow drug regulations and standards to maintain accreditation. They are also entrepreneurs who are able to generate an income as well as serve their community by increasing access to essential medications and prevention services. The model deserves an external evaluation to document its impact and examine its potential applicability to other settings. **www.cfwshops.org**

Because quality assurance systems are inadequate or nonexistent for costly items such as ACTs and rapid diagnostic tests, the private sector is rife with counterfeit and substandard drugs. For example, in the Mekong region of Southeast Asia, as much as 30% of ACT is fake.[89]

Philanthropists can address this problem in a variety of ways. For example, they can:

- Support initiatives to increase the quality of the private sector through training and oversight programs
- Reduce the impact of counterfeit drugs through branding/franchise models and drug quality assurance systems (e.g., **CFW Shops** in Kenya)
- Create referral networks to link drug sellers to appropriate medical services
- Encourage efforts by regional networks to train and supervise private drug sellers and pharmacies in diagnosis and treatment of uncomplicated malaria, and referral to appropriate health centers for severe cases

Another option is to support local private-sector companies (e.g., bednet or ACT manufacturers) that contribute to solutions, or give to intermediaries that serve this role (e.g., **Acumen Fund**).

New technology also holds potential to transform malaria control programs, particularly in the area of information services. For example, **Phones for Health** is an initiative that links the private mobile phone sector with health information systems to aid the prevention and treatment of infectious diseases in Africa.

While telephone and Internet lines remain a rarity on much of the continent, 60% of the African population now lives in areas that have access to cell phone coverage. Through the Phones for Health pilot, community health workers have the ability to send health information about HIV/AIDS through cell phones, thus ensuring that program coordinators and managers receive timely updates about the course of the disease, drug shortages, and other important information. Phones for Health plans to expand this approach to address other health concerns such as malaria, tuberculosis, and other infectious diseases. Phones for Health is a partnership between the GSM Association Fund, Motorola, MTN, Accenture, Voxiva, and PEPFAR.

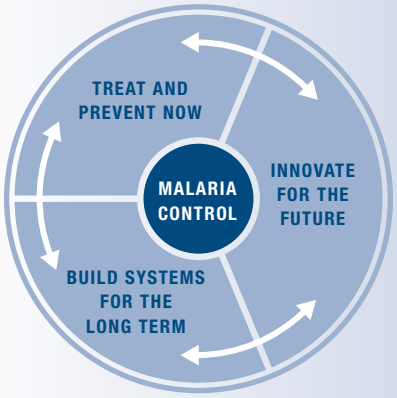
V: TRANSLATING GOOD INTENTIONS INTO HIGH IMPACT PHILANTHROPY

In the preceding sections, we identified ways in which you can help lift the burden of malaria. We described promising practices, highlighted organizations that are implementing those practices, and in the case of direct service programs, estimated what it costs to produce change. All of the organizations we highlighted have been able to save lives and make a positive impact in some of the poorest and most remote populations in the world. We also discussed opportunities for capacity building and innovation where philanthropic investments are sorely needed.

In this section, we discuss how you, as a philanthropist, can set an effective strategy for giving, no matter what population or region you target.

1. Select your entry point supporting the global malaria strategy

The first step is to select an entry point from one of these three options: treat and prevent now, build systems for the long term, or innovate for the future. All three are critical to the overall global strategy's long-term success, and are interdependent. In fact, some of the most effective program models are those that use all three approaches at once (FOR EXAMPLE, SEE MACEPA ON PAGE 35). However, because the entry points differ in important ways, we have divided them in this report to help with your decision making.



All three approaches are interdependent

There are tradeoffs to consider in your decision. In our research (See ***"I'm Not Rockefeller": 33 High Net Worth Philanthropists Discuss Their Approach to Giving***) and in numerous conversations we have had with both philanthropists and nonprofits, we found that philanthropists often differ with regard to their comfort with risk, patience for results, desire to touch and feel projects, and their need to attribute measurable results directly to their donation. The chart on the following page summarizes the different options, taking these factors into account.

SELECTING AN ENTRY POINT – KEY CONSIDERATIONS

ENTRY POINT	GIVING PROFILE		
	TIMEFRAME	RISK/REWARD	ABILITY TO SEE RESULTS
Treat and Prevent Now ▪ Fund tools ▪ Fund delivery models	3-5 years	Lower investment risk/ saves lives now, but may not address underlying capacity issues	Impact directly attributable to donor's investment; results observable in specific communities
Build Systems for the Long Term ▪ Build capacity ▪ Strengthen health systems	5+ years	Higher investment risk depending on the country/ potential for broader and more sustainable impact	More difficult to measure impact directly; harder to attribute impact to individual investors
Innovate for the Future ▪ Fund new tools (e.g., vaccine development) ▪ Support research into new delivery models	5 -10+ years	High investment risk/ breakthrough could lead to widespread impact (e.g., elimination of the disease); could save the most lives over the long term	Donor must be comfortable with the possibility that the end result may only improve knowledge of what does not work

Next identify a strategy within your selected area of focus.

If the **Treat and prevent now** entry point appeals to you most, then consider the following options.

These strategies provide immediate access to key interventions to high-risk populations in areas without health infrastructure (e.g., refugee situations, remote villages):

- Rapidly increase access to bednets through vaccine campaigns (p. 24)
- Assist the most vulnerable in areas of conflict or natural disaster (p. 31)
- Harness the potential of the private sector to deliver medications (p. 48)

The following strategies improve and extend services to neglected communities in areas with some health infrastructure in place. These work best when they are linked to a larger health system for training, supervision, drug supply, and referral of sick patients:

- Community case management (p. 17)
- Train community volunteers to provide health information (p. 20)
- Build training networks to incorporate malaria prevention in prenatal care (p. 30)
- Scale-up new ACTs at the community and household level (p. 27)

Building health system capacity is a **critical unmet need** and a **key opportunity** for philanthropists.

If your giving profile instead fits with **Build systems for the long term**, then consider options that support the four building blocks of any national healthcare system: leadership, health workforce, financing, and health information. Programs using these models will have an impact on not only malaria control, but also a broad range of health issues. They reach larger populations, and address many of the system issues that would allow for the long-term continuation of results.

- Increase management capacity of national malaria control programs (P. 34)
- Train the next generation of leaders, researchers, and care providers (P. 40)
- Help poor countries tap into international financing mechanisms (P. 36)
- Build health information systems that improve critical decision making (P. 38)

Finally, if you identify most with the **Innovate for the future** profile, then you can support research to close critical gaps in tools or delivery models. Malaria parasites and mosquitoes will continue to evolve and find ways to overcome current medications and insecticides. Building a pipeline of new medications and mosquito-control strategies could help ensure that the investments made today are not lost, but continue to have an impact for generations. Investments in vaccine development could lead to a tool that not only may drastically cut costs and increase health impacts, but also could make global eradication of malaria a real possibility. Another option is to innovate in delivery to overcome infrastructure and health system constraints. Telecommunications, bioinformatics, and franchise models can provide ways to bring down barriers and reach those currently left without services.

- Support innovation for medications, mosquito control, and a vaccine (P. 44)
- Innovate in delivery through the private sector or new technology (P. 48)

Efficiency and Equity

You may have noted that we did not present efficiency (getting the most impact given the resources) and equity (ensuring fair distribution of benefits) as key considerations in selecting an entry point. In fact, these were the first two criteria that we used to screen the models for this report. In other words, all of the opportunities we profile increase access for underserved communities using the most cost-effective bundle of tools.

Cost effectiveness was a major consideration in the selection of the global consensus tool set for malaria. However, the most cost-effective strategy to deliver these tools to any one community depends largely on local conditions in that community such as existing infrastructure and health workforce. A large body of research and field experience indicates that in the long run the most effective programs are those that respect and empower local decision making, which is in turn shaped by local circumstances and culture.[90]

Many philanthropists are drawn to global health because they want to address the horrible inequity in access to services and health outcomes. We also know that many of the worst off live the farthest from existing services and are likely to be the most expensive to reach. On the surface, it may seem that there is a trade-off between equity (serving the worst off) and efficiency (getting the best bang for buck). However, we have found that efficiency can be considered at many different points along a philanthropist's decision making process. If the primary goal is to serve the neediest community regardless of the additional incremental cost to reach them, then there are ways to ensure the most impact for this community with the dollars you have available. No matter where you choose to act, your investment can go further by using local human resources in the form of community health workers, partnering with other efforts for increased scale and cost-sharing, and bundling essential services.

2. Consider what region you want to target

The political stability of the region you choose to support presents potential trade-offs for your philanthropic gift. Politically stable countries such as Malawi and Ghana typically carry less risk and can be easier places to implement strategies given there are partners who can share information and costs.

However, many of the countries with the greatest burden of malaria deaths are politically fragile states. Five countries in Africa account for 50% of all global deaths from malaria: Nigeria, the Democratic Republic of Congo, Uganda, Ethiopia, and Tanzania.[91] Supporting malaria control in a fragile state such as the Democratic Republic of Congo may carry more risk, but may also reach some of the most neglected communities, where the potential for impact is highest.

In either case, there are several issues to keep in mind when giving internationally.

Giving to U.S.-based organizations

In this report, we assume that you are a U.S.-based philanthropist who prefers to work with U.S.-based NGOs. U.S.-based NGOs have training and experience in developing countries and can help you navigate the following issues:

- *Communication*

  Communication issues include language and dialect barriers,[93] technological barriers (e.g., unreliable or inaccessible telecommunications networks), and distance-related problems.[94] Communication problems can increase costs (e.g., for translation services) or make it difficult to monitor progress. Quarterly progress reports, e-mail updates, video conferencing, and physical visits are all ways in which philanthropists can stay in touch with what is happening on the ground.

- *Culture*

  Cultural concerns include customs, religious beliefs, and attitudes (e.g., about gender roles) that can affect the implementation of a delivery program. For example, the underutilization of bednets in one region was due to the fact that they were white and resembled what the local community used as death shrouds. The history of the beneficiary country is also important; countries with a history of colonization or foreign interference may be less inclined to welcome foreign aid.

> It is one thing to distribute bednets. It is another to have people understand that a white bednet in some areas is the color of the shroud of the body of a dead person. And if you are putting people under a white net, you might not be doing something good for them, in their own view.
>
> *– Roger Glass, Director of Fogarty International Center*[92]

- *Political environment*

  The political environment brings its own set of concerns. Political instability and corruption can interfere with the progress of a philanthropic project. At the same time, countries struggling with political violence, civil strife, and economic crises are often the ones suffering the most from malaria.

Hot spots outside Africa

In this report, we focus on sub-Saharan Africa, where most cases and deaths occur. However, there are numerous *hot spots* outside of Africa where conditions (i.e., parasite type, mosquito species, geography, climate, socioeconomic factors, and underfunding) combine to make the disease especially dangerous. Some examples are Papua New Guinea, Myanmar, and Haiti.

Last, it is important to be aware of concurrent aid efforts in the region. International donors should abide by the Paris Declaration on Aid Effectiveness, which seeks to harmonize international aid so that there are no redundant systems in place that overtax recipient countries and communities.[95]

Giving to organizations outside the U.S.

Philanthropists may also choose to give to an organization based in a developing country. These small-scale, local organizations are well positioned to address the language and cultural barriers noted above. By supporting these organizations, philanthropists are also building the ability of local communities to play an active role in their own health systems.

However, giving to such organizations involves additional legal and financial considerations, which makes giving more complex, but not impossible.

- Philanthropists who give to organizations outside the U.S. may not receive the same tax benefits that they would by giving to U.S.-based organizations.
- International giving is subject to a number of laws put into place after September 2001. Primary among these are the Patriot Act, Executive Order 13224, and the Treasury Department Voluntary Guidelines, which serve to monitor and safeguard against terrorists obtaining funding through charitable channels.
- In addition to U.S. laws regulating international grants, there are also local laws of which the philanthropist must be aware. The philanthropist will also need guidance on how to transfer money overseas, which banks to use, and the reliability of these global bank networks.

Philanthropists that choose to give to local non-U.S. based groups often elect to work with an intermediary organization to assist them in navigating through these issues. For a list of intermediary organizations, refer to the **Global Philanthropy Forum Index on Intermediaries**.

3. Evaluate potential investments

Before writing a check to a nonprofit organization, consider the organization's capacity to accept and use your gift. There are a number of resources available to guide you through the due diligence process. At minimum, you should try to learn, prior to investment, how your gift will be used, what kind of impact the organization expects your investment to make, and how the organization will determine the investment's actual results. In addition, do not underestimate the importance of the quality of implementation. In particular, pay close attention to the people who will be executing the program and the faithfulness of their efforts to the program model. Impact depends on smart execution of a program's critical components.

There are two criteria that we do not recommend using: overhead ratios and percentage of funding going to program. These are both common measures that people use to choose between programs. However, we do not think these are meaningful ways to measure effectiveness. A better method is to look at outcomes. For example, instead of looking for NGOs that state that "100% of funds go directly to program," look for well-functioning NGOs that invest in good processes, leadership, and assessment. Then judge these NGOs based on the results they achieve with the money they spend.

Here, as an example, is how we performed the due diligence for the programs that we chose to include in this report.

We first identified unmet needs to achieve global targets in malaria. We then assessed which tools and delivery models have evidence for impact. From there, we selected an exemplar organization that is implementing the evidence-based model. For each agent, we looked to see whether each had the management and technical expertise to succeed; whether it could clearly articulate how it would use donated capital to target a meaningful impact; and if its strategy was consistent with the evidence base that exists for malaria control. We reviewed available external

evaluations to understand the nonprofit's track record in the field and to affirm the nonprofit's responses. In addition, we examined the nonprofit's commitment to monitoring and assessing its progress, improving its practices, and sharing this information.

In our assessments of service delivery programs, we also considered what it cost each nonprofit to produce results.

Overall, we found that few organizations currently link their outcomes to the costs of the required inputs. More often, the organizations instead use a cost-per-beneficiary figure, which links inputs (e.g., the number of bednets procured) to outputs (number of children sleeping under a bednet), but not to health impacts (lives saved or malaria cases averted). For this reason, we calculated back of the envelope *cost-per-impact* ratios for the promising models that directly provided services to communities using a special child "Lives Saved" calculator.[96] These calculations allowed us to provide philanthropists with rough estimates of what change costs and offer a benchmark to use in comparisons with future implementations. At the same time, these calculations helped us develop insight into how the intervention and the implementing nonprofit work in

Some questions to ask a nonprofit

How will your organization make a difference in malaria or public health in general?

- *Information the answer should provide:* Identification of the leading indicators (i.e., what is likely to change first such as care-seeking behavior) and lagging indicators (i.e., the impact ultimately desired, such as decreasing death from malaria), and how these are measured
- *Follow-up questions to consider:* How do you distinguish yourself from similar organizations?

How will you know your organization is making that difference in the short term and over the long term?

- *Information the answer should provide:* Explanation of how the nonprofit assesses its effectiveness
- *Follow-up questions to consider:* What measures do you use? What types of data do you collect (e.g., mother's knowledge, proper use of medications)? How do you use the information to improve your program?

How would my contribution help your organization?

- *Information the answer should provide:* Indications that the nonprofit has thought about how to use donor dollars effectively
- *Follow-up questions to consider:* How do you use other contributions and is there a way my philanthropic dollars are different from other funds you receive?

How will your organization report and/or track progress for donors?

- *Information the answer should provide:* Outline of data that a nonprofit can currently make available for a donor regarding the extent to which targets are being met and when information will be available
- *Follow-up questions to consider:* What resources would you need to better link dollars to impact?

specific local contexts. (See p. 70 for the three steps we used to assess cost and impact.)

In most cases, nonprofits will not have a cost-per-impact figure readily available; you will need to work with them to understand what drives the cost of implementation and how much financing they realistically need to make the difference that they seek.

As you get started, other considerations will arise. Some will be specific to your own giving strategy, such as how you think about equity and efficiency issues, your appetite for risk, your patience for results, your willingness and ability to partner with others, and your existing relationships.

There is also the business of philanthropy, which includes the legal, tax, and financial considerations that go into giving. Wealth-management advisors, donor advised funds, community foundations, family offices, and estate and tax lawyers can all serve as sources of information and guidance on these issues. Finally, as our review was not exhaustive, you may find these web resources helpful in identifying other organizations working in malaria (see box below).

How to find additional malaria organizations

- **Roll Back Malaria:** Their website lists the organizations that are involved with this global partnership (**www.rollbackmalaria.org/constituencies.html**)
- **Core Group:** A partnership consisting of 48 U.S.-based international organizations focusing on maternal & child health (**www.coregroup.org/members/contact_info.cfm**)
- **President's Malaria Initiative:** This website links to a list of several organizations that are engaged in the worldwide malaria arena (**www.fightingmalaria.gov/about/donors.html**)
- **Global Business Coalition for HIV, Tuberculosis, and Malaria:** Lists opportunities for businesses and private sector to contribute to the global strategy (**www.gbcimpact.org**)
- **Global Giving:** This website allows you to search by interest and quickly gain a small snapshot of the work that several selected organizations are doing. Its easy interface allows you to donate on-line if an organization seems interesting. In addition, each organization states their funding goal, shows how much funding the project has received to date, and provides email updates of progress (**www.globalgiving.com**)

4. Measure what matters after you have written the check

Your involvement with the nonprofit should not end once you have signed the check. By continuing to engage with the organization, you will not only add an element of accountability, but you can grow from the experience, become a savvier investor, and subsequently improve practices across the field by sharing both your successes and disappointments.

Continuous improvement – and maximizing the amount of good produced for the dollars invested – requires ensuring that nonprofits measure what matters and use this information to improve malaria control. Thus, a critical post-allocation task includes the tracking and assessment of a project's progress once it is underway. It is important that philanthropists provide financial support for these critical processes and that metrics are actually useful to the nonprofit to improve performance in real-time.

Tracking performance and measuring impact

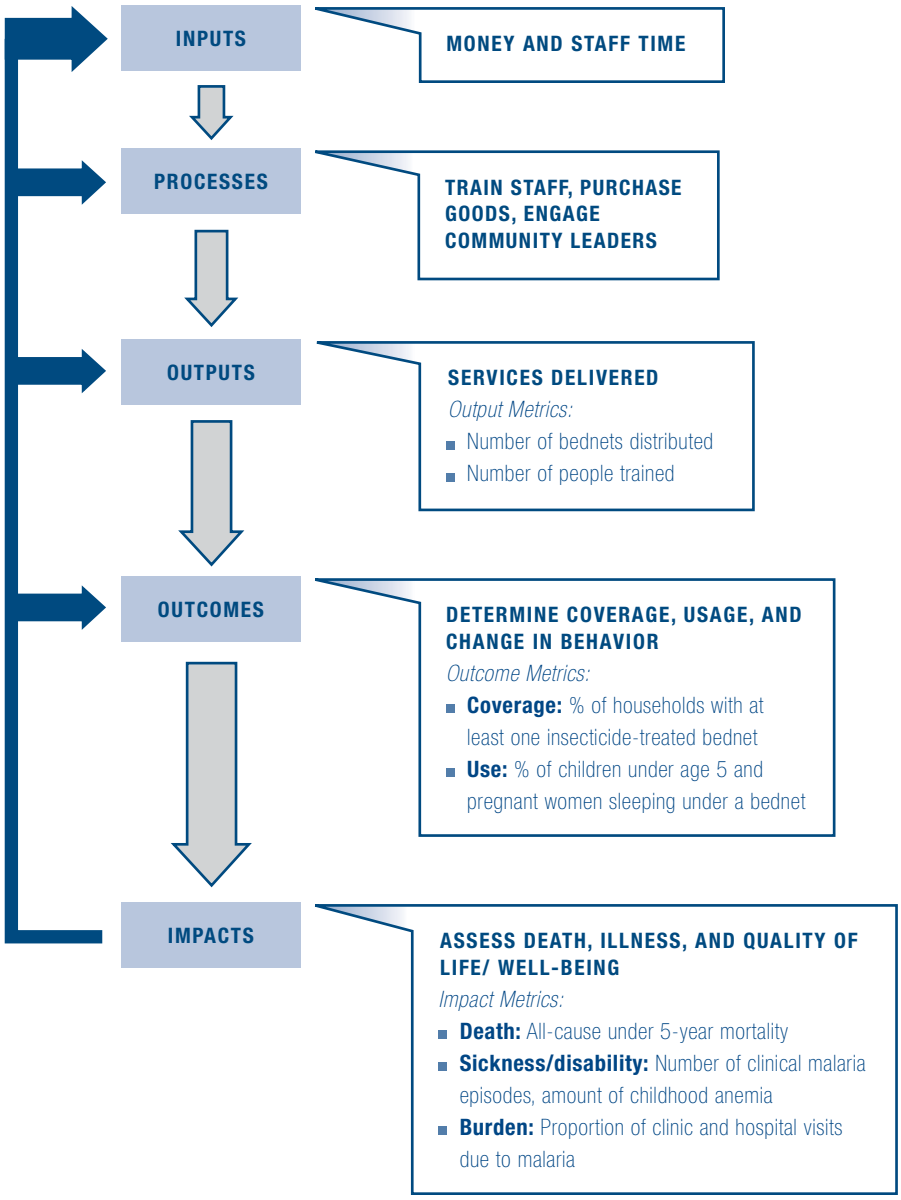
Achieving measurable impact requires thoughtful attention from the outset. Like any investment, an investment in malaria control begins with clearly defined project goals, a strategic plan to achieve the goals, and reasonable targets, including opportunities for mid-stream course correction, where needed. As each local setting has different implementation challenges, your gift can be viewed as an opportunity to learn and add to the evidence base of what works. For this reason, it is important to use part of your donation on assessment. Implementation research on what works is critically needed to design and modify delivery strategies, both for your own project, as well as others.

As a philanthropist, you need not do all of this on your own. Instead, identify an NGO partner which knows how to monitor regular performance, or team up with a university or other evaluation partner for more in-depth impact assessments, if desired. Most important is finding NGO partners committed to a similar programmatic approach in terms of goals, impact, and evaluation.

What to measure

For malaria control programs, the international health community has designed a common set of agreed-upon core outcome and impact metrics so that performance can be assessed in comparison to other locations and interventions with the same goals. In essence, the metrics allow us to see whether the interventions are on track to achieve their intended impacts. Competent NGOs will know these metrics. On the next page is an illustrative example of a results chain from a bednet distribution program.[97]

Results Chain: bednet distribution program



An ideal scenario would allow you to measure along the entire results chain to the impacts of a project (in this case, prevention of death and sickness from malaria). In practice, however, it is usually very difficult to track the final impacts for every project. Doing so can require large investments in both money and staff because of the absence of good diagnostics and data collection systems in the developing world. At minimum, every project should have a measurement plan and monitoring system that can assess if it is reaching the milestones along the results chain.

Given these realities, it is not reasonable to expect that all projects will measure to ultimate health impacts. Measuring up to final impacts is much more important for new, untested programs, and less important when simply replicating previously studied interventions. For example, an innovative home-based diagnosis and treatment program using community health workers and new artemisinin medications should have a more rigorous evaluation plan than a previously evaluated bednet distribution program that is being replicated in neighboring villages.[98]

What is reasonable is for most NGOs to measure intervention coverage (or, even better, utilization) and compare it to a baseline. If you wish to estimate the health impact from this change in coverage, there are "Lives Saved" calculators that can perform a rough estimate.[99]

What level of evaluation is needed?

Overall, projects need benchmarks to know if they are on track. This does not necessarily need to be a formal impact evaluation. Options range from simple "before" and "after" surveys to comprehensive evaluations that have random assignment and control groups. On the next page is a table that describes three levels of evaluations: the most rigorous, the middle range, and the minimum.

Several considerations make the use of rigorous evaluation very challenging, including financial costs and the time horizon necessary to observe longer-term health effects. Additional constraints that make such assessments particularly difficult in developing countries include a lack of health information systems and routine diagnostic testing. Moreover, most NGOs will not have the technical capacity or financial resources to engage in the most rigorous type of evaluation work. At minimum, look for partner organizations that demonstrate a willingness to engage in evaluation work, a commitment to learning from past experience, and a desire to build accountability into their operations.

One way you can expand the impact of your philanthropic activities is to invest in rigorous impact assessments for new innovative programs so that your efforts generate evidence that the global community can use and share. Prior to getting the project underway, you may want to reach out to evaluation experts for help in developing a feasible and sufficiently rigorous evaluation design that will meet your requirements for precision, timeliness, and cost. You can consider funding an NGO to partner with a research university to perform impact assessments for innovative projects. For example, Pfizer's philanthropic arm partnered with the London School of Hygiene and Tropical Medicine to coordinate the monitoring and evaluation of its malaria programs in Ghana, Senegal, and Kenya.[100]

What to look for in evaluations

EVALUATION CHARACTERISTICS	MOST RIGOROUS...	...LESS RIGOROUS BUT STILL INFORMATIVE	...AT MINIMUM SHOULD INCLUDE
Is Objective	Completed by neutral third party	Data collected by external group but analyzed in-house	In-house data monitoring and analysis
Measures a Baseline	Assesses participants and control/comparison group along critical metrics (e.g., prevalence of malaria and anemia) before beginning interventions	May use rapid assessment techniques in a small subset area to get a general sense of the current malaria burden	Considers available regional data that can be used as a benchmark
Provides a Comparison or Control Group	Randomly assigns a portion of eligible children or communities to a control group or randomly staggers introduction of a new model or tool; Ensures the difference between the groups is not larger than what chance would create	Carefully matches communities with comparable ones on key characteristics or uses statistical techniques to control for differences at project's start	Considers externally calculated national, district and/or other comparable measures
Includes a Sufficient Number of Individuals or Communities	Sample size depends on the size of effect anticipated from the program; the larger the effect size, the fewer communities are required for it to be found statistically significant. Even a small pilot of a dozen communities might be sufficient to inform practitioners on how to improve practice and whether the program is worth scaling up.		
Uses Objective and Meaningful Measures	Measures actual health impacts (e.g., child mortality) Uses both quantitative and qualitative methods Employs surveys and indicators that have been externally assessed for their ability to measure the intended factor consistently across the population of interest	Measures change in coverage or use of key health interventions (e.g., bednet use) during project cycle using standardized household surveys Presents reports from multiple stakeholders (e.g., health staff, beneficiary communities) and identifies likely biases	Monitors project outputs (e.g., medications distributed) and quality of services Considers reports from one party and identifies likely biases
Considers Program's Replicability	Evaluates multiple implementations in a diversity of sites	Evaluates multiple implementations in similar settings	Evaluates a single implementation

5. Incorporate proven strategies for successful public health efforts

We have provided examples in the case studies of what is reasonable to expect for the price tag in malaria control at this time in several different country contexts. Here is a summary of our key recommendations for an effective philanthropic strategy that maximizes efficiency:

- **Local tailoring:** What works in one place may not work in another. Any effective strategy should be tailored to the local situation, including consideration of malaria disease patterns (epidemiology), vector (mosquito) ecology, drug resistance patterns, health system capacity, and cultural norms and resources. For example, in rural Mali, the most effective way to increase malaria medication access may require engaging with traditional healers, whereas in Kenya, private sector drug vendors may be the more effective delivery channel.[101]
- **Synergistic packages:** While specific interventions may work individually, the most effective strategies will use a combination of tools synergistically to address the many root causes of the malaria problem in a particular area. For example, bundling prevention tools such as bednets, household insecticide spraying, and intermittent preventive treatment for pregnant women (IPT) with treatment tools such as artemisinin-based combination therapy (ACT) can be far more effective in controlling malaria than simply funding the use of one tool.
- **System integration and capacity building:** While many people are helped by disease-specific programs, one can also waste time and resources by not integrating efforts on the regional and village level into community health programs that are responsive to local needs. Smart strategies not only address malaria, but also increase the capacity of the delivery system to address health problems in general. For example, programs that train and equip the local health work force in Community Case Management can address a diverse array of issues such as diarrhea and childhood pneumonia with relatively low marginal cost.
- **Community engagement:** Even with accessible medications and health services, programs are not likely to be successful or sustainable if the target community does not trust the delivery team or understand how the interventions work. For example, if villagers believe malaria is caused by over-ripe mangoes or witchcraft, they are unlikely to sleep under a bednet or value access to timely ACTs at the clinic. Thus, an informed and mobilized community is necessary to help control the spread of malaria. An engaged community will support the fight against this disease by seeking timely medical attention and treatment, cooperating in the use of preventive measures, and monitoring and coordinating these efforts in partnership with the government and the nonprofit sector.

A FINAL THOUGHT

Ray Chambers – businessman, philanthropist, and U.N. Special Envoy for Malaria – once reflected that the millions of children dying from malaria might be considered a sort of "genocide of apathy."[102] As recent developments have shown, it does not need to be that way. For example, Rwanda and Zanzibar have succeeded in sharply reducing death and sickness from the disease. This amazing progress, combined with a renewed global commitment to malaria control, provides much encouragement to those affected by malaria and to those who wish to help.

With an arsenal of cost-effective tools, political will, and global partners from all sectors, we now have an opening to make a sustained impact that can save millions of lives and help raise some of the world's neediest communities out of poverty.

Image by Bonnie Gillespie, VOICES for a Malaria-Free Future

Resources and References

Also visit the Center for High Impact Philanthropy's website (www.impact.upenn.edu) to check for updates and additional information on malaria.

GLOSSARY OF ACRONYMS AND TERMS

ACT – Artemisinin-based combination therapy

Bednet – See LLITN

BRAC – Bangladesh Rural Advancement Committee

CCM – Community Case Management

CDC – U.S. Centers for Disease Control and Prevention

CEA – Cost-effectiveness analysis

CER – Cost-effectiveness ratio

CHERG - Child Health Epidemiology Reference Group

DALY – Disability-adjusted life year

DDT – Dichloro-Diphenyl-Trichloroethane (insecticide)

DHS – Demographic and health surveys

EMR – Electronic mosquito repellents

EPI – Expanded Program on Immunizations

GAIN – Global Alliance for Improved Nutrition

GDP – Gross domestic product

GFATM – Global Fund to Fight AIDS, Tuberculosis, and Malaria

GMAP – Global Malaria Action Plan (produced by the Roll Back Malaria Partnership)

GSM – Global system for mobile communications

HIS – Health information system

ICER – Incremental cost-effectiveness ratios

IMCI – Integrated management of childhood illness

IPT - Intermittent preventive therapy

IRS –Indoor residual spraying

ITN – Insecticide-treated net

IVC - Innovative Vector Control Consortium

LLITN – Long-lasting insecticide-treated net (bednet)

MACEPA – Malaria Control and Evaluation Partnership in Africa

MoH – Ministry of Health

MPH – Masters in Public Health

MRTC – Malaria Research and Training Center

MTN – GSM (see left column) network operating in Africa

NGO – Non-governmental organization

NMCP – National Malaria Control Programs

NPO – Nonprofit organization

PCR – Polymerase chain reaction

PDA – Personal digital assistant

PEPFAR – President's Emergency Plan for AIDS Relief

PMI – President's Malaria Initiative

PSI – Population Services International

RBM – Roll Back Malaria Partnership

R&D – Research and development

RDT – Rapid diagnostic test

SMS – Short messaging system

SP - Sulfadoxine-pyrimethamine

U5 – Under five years old

UNICEF – United Nations Children's Fund

USAID – United States Agency for International Development

WWARN – WorldWide Antimalarial Resistance Network

WHO – World Health Organization

WHO CHOICE – World Health Organization Choosing Interventions that are Cost Effective

SUMMARY OF PHILANTHROPIC OPPORTUNITIES

ENTRY POINT	STRATEGY	EXAMPLE MODEL AND AGENT
Treat and Prevent Now	▪ Extend the existing health system capacity through community health workers	Community case management of childhood illness; *Save the Children*
	▪ Enlist family members to educate communities	Care Groups: education and behavior change through volunteer networks; *World Relief*
	▪ Piggyback on existing systems for delivery of bednets	Integrate bednet distribution with vaccine campaigns; *Measles Malaria Initiative/ Alliance for Malaria Prevention*
	▪ Scale-up community and household access to new ACTs (Artemisinin Combination Therapy)	Overcome ACT delivery bottlenecks with malaria control associates; *Population Services International (PSI)*
	▪ Build training networks to prevent malaria in pregnancy	Train the trainer networks in Africa; *JHPIEGO*
	▪ Assist the most vulnerable in areas of conflict or natural disaster	Emergency medical care and technical assistance; *Médecins Sans Frontières (MSF); Mentor Initiative*
Build Systems for the Long Term	▪ Strengthen health system capacity through effective partnerships	Strengthen national leadership and management capacity; *MACEPA/ PATH*
	▪ Leverage existing financing resources for system-wide change	Tap into the Global Fund platform of financing; *Global Fund & Global Business Coalition on HIV/ AIDS, Tuberculosis, and Malaria*
	▪ Create information networks to track outcomes, monitor resistance, and predict epidemics	Expand a global drug resistance network; *WorldWide Antimalarial Resistance Network (WWARN)*
	▪ Prepare future health leaders from malaria-affected countries	Training programs in Africa; *Malaria Research and Training Center (MRTC), University of Bamako, Mali*
Innovate for the Future	▪ Support innovation for new tools such as vaccines, diagnostics, and medications	Public-private partnerships; *Malaria Vaccine Initiative, Medicines for Malaria Venture, Institute for OneWorld Health*
	▪ Harness the potential of the private sector or apply new technology	Franchise private-sector drug vendors; *Child and Family Wellness Shops* Invest in local companies; *Acumen Fund*

EXEMPLARY MODELS AND EXAMPLE AGENTS MENTIONED IN THIS REPORT

ORGANIZATION	WHERE THEY WORK	WEBSITE
Direct Service/Community-Based Organizations		
JHPIEGO	Asia, Africa, Central/South America	http://www.jhpiego.org
Measles Initiative and the Alliance for Malaria Prevention	Africa, Asia, Americas	http://www.measlesinitiative.org
Médecins Sans Frontières/ Doctors without Borders (and Epicentre)	Worldwide	http://www.msf.org http://www.epicentre.msf.org
MACEPA (a program at PATH)	Zambia, Ethiopia, Malawi, Mozambique, Tanzania	http://www.path.org/projects/malaria_control_parnership.php
Population Services International (PSI)	32 countries worldwide	http://www.psimalaria.org
Save the Children	Worldwide	http://www.savethechildren.org
World Relief	Southeast Asia, Africa, Americas	http://www.worldrelief.org
Innovation		
Acumen Fund	—	http://www.acumenfund.org
Child and Family Wellness Shops	—	http://www.cfwshops.org
Corporate Alliance on Malaria in Africa	—	http://www.gbcimpact.org/cama
Foundation for Innovative New Diagnostics	—	http://www.finddiagnostics.org
Innovative Vector Control Consortium	—	http://www.ivcc.com
Institute for OneWorld Health	—	http://www.oneworldhealth.org
Malaria Vaccine Initiative	—	http://www.malariavaccine.org

EXEMPLARY MODELS AND EXAMPLE AGENTS MENTIONED IN THIS REPORT *(cont'd)*

ORGANIZATION	WHERE THEY WORK	WEBSITE
Innovation (cont'd)		
Medicines for Malaria Venture	—	http://www.mmv.org
Phones for Health	—	http://www.pepfar.gov/press/80384.htm
Sanaria	—	http://www.sanaria.com/
Training		
Fogarty International Center: Global Infectious Disease Training Program	Africa, Asia, Latin America	http://www.fic.nih.gov/programs/training_grants/gid.htm
Infectious Disease Institute (IDI)	Uganda	http://www.accordiafoundation.org/programs/training-programs/index.html
John P. Grant School of Public Health at BRAC University	Bangladesh	http://www.bracuniversity.ac.bd/I&S/sph/index.htm
Malaria Research and Training Center (MRTC)	Mali, trains students from outside Mali as well	http://obtoure.africa-web.org/
Mentor Initiative	Africa, Southeast Asia	http://www.thementorinitiative.org
Information/Coordination/Financing		
ACTMalaria Network	Asia	http://actmalaria.net/
Global Fund to Fight AIDS, Tuberculosis, and Malaria	Worldwide	http://www.theglobalfund.org/EN/
Roll Back Malaria	Worldwide	http://www.rbm.who.int/
WorldWide Antimalarial Resistance Network	Worldwide	http://www.wwarn.org/home

HOW WE CALCULATED COST PER IMPACT IN MALARIA

What change is reasonable to expect, and at what cost? To shed light on these important questions, we provided cost-impact profiles for several of the exemplar program models in this report. We based each estimate on an implementation in a local international country context. These figures provide philanthropists with ballpark estimates of how much change costs. As local conditions are often the most important determinants of both cost and impact in international settings, we also highlighted critical local factors to consider. We encourage philanthropists to discuss these factors with a potential NGO partner so that the expectations of both regarding results will be in line with the reality in the field. Here are the steps we took to calculate the rough cost per impact:

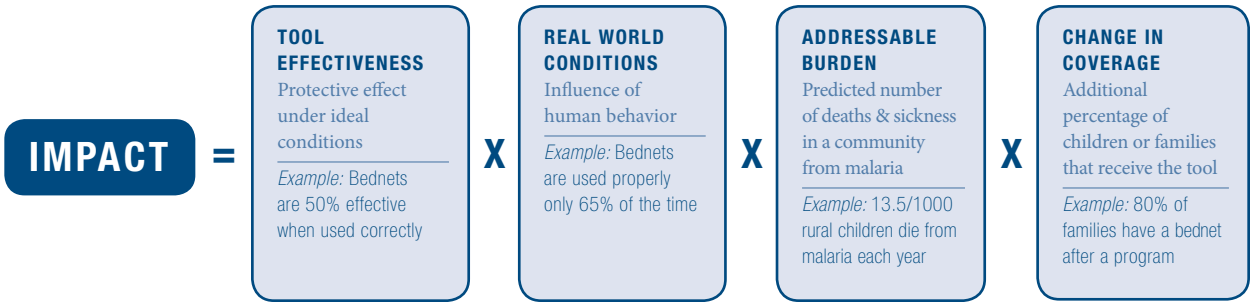
1. *Costs:* We obtained cost information from the nonprofit organization's own cost estimates for an actual implementation of the model at a scale relevant to them (e.g., rollout of a malaria program in one district). We included all direct costs incurred by the NGO for the project. To better reflect the actual costs for philanthropists, we did not include costs typically covered by other partners, such as medications or staff provided by the local Ministry of Health, but did note when these were assumed.

2. *Results* (or *Impacts*)*:* We obtained empirical results of past implementations of the model (or for new projects, projected results) from the organizations and/or from third party evaluations of their programs. For the sake of simplicity, we used the primary impact that the program produces (e.g., child lives saved). Successful programs often have multiple, additional benefits that are more difficult to quantify or compare, such as cases of malaria prevented, DALYs averted, or quality of life improved.

   As most nonprofit organizations measure program results at an earlier step in the impact chain (i.e., change in intervention coverage), we used an Impact Calculator to estimate the number of child lives saved (SEE OPTIONS FOR DETERMINING IMPACT P. 71). This method not only considers the change that the malaria program produced in affecting important health behaviors or in reaching target communities with interventions, but also incorporates the local malaria disease context.

3. *Ratio:* Using the above costs and results, we calculated cost-impact ratios to link the approximate cost to the identified impact. Although not captured in this ratio, we also identified other important benefits that the model achieves but that are not included in the primary impact (and are more difficult to measure). In doing so, we provided a broader view of the change produced by the program for the given price tag (e.g., impacts on decreasing sickness and disability).

How we think about health impact



OPTIONS FOR DETERMINING IMPACT

OPTIONS	EXAMPLE	RELEVANT/FEASIBLE IF	NOTES
A. Most certain – measure directly: *Measure actual health impact in the program*	Measure lives saved (i.e., change in child mortality attributable to malaria) or malaria disease averted due to program	Need: Census, health information system, diagnostics in place. Relevant in more middle-income countries (e.g., Brazil) or in settings of clinical trials and impact evaluations Strengths: Can measure many different impacts such as death, sickness averted, and quality of life changed Limitations: Expensive, may not be feasible without partners, expertise, etc.	
B. Model estimation: *Measure change in effective coverage of key interventions or behavior change. Then use a model to estimate the health impact you care about*	Measure change in effective coverage (e.g., percentage of children sleeping under a bednet the previous night). Use a model to estimate the number of lives that this change might save, given the local malaria conditions	Need: (1) Estimate of baseline annual deaths from malaria in target area that could potentially be addressed by intervention (2) Estimate of intervention effectiveness in real world setting (the more locally customized the estimate, the better) (3) Change in intervention coverage in target population (baseline to end of project) Limitations: Without a control group or area, attribution confidence decreases. Calculator outputs are only as good as estimates available for baseline addressable deaths and tool effectiveness. Most calculators currently only measure impact on deaths averted (i.e., they do not measure sickness or disability averted) Examples of impact calculators[103]: Child Survival Lives Saved calculator (CHERG/USAID); PSI DALY calculator; Global Fund and GAIN both have calculators as well	Even better: Use a control group or setting to estimate the percentage of the impact that can be attributed to the project (i.e., subtract the change in coverage that might have happened without the project)

WHERE TO LEARN MORE

Global strategy

- Global Malaria Action Plan 2008: (**http://www.rbm.who.int/gmap/index.html**) Provides the global strategy for controlling malaria and provides region-specific strategies for moving towards sustained control and eradication.

Malaria epidemiology and burden

- World Malaria Report 2008: (**http://www.who.int/malaria/wmr2008/malaria2008.pdf**) Tracks the progress made from 2000 to 2006-07 and provides current epidemiological information for the disease.
- World Malaria Report 2005: (**http://www.rbm.who.int/wmr2005/**) Tracks the progress made globally from 2000-2005 in malaria control and discusses current epidemiology.

Evidence summaries by interventions

- Reducing Malaria's Burden – Evidence of Effectiveness for Decision Makers: (**http://www.globalhealth.org/assets/publications/malaria.pdf**) Document prepared by the Global Health Council; summarizes effective interventions for malaria control and treatment.

Malaria and children

- Progress in Intervention Coverage UNICEF 2007: (**http://www.unicef.org/health/files/MalariaOct6forweb_final.pdf**) Document outlines progress made in preventing malaria in children globally and discusses future interventions targeting this vulnerable population.

Global malaria resource needs and funding strategy

- Bulletin of the World Health Organization August 2007: (**http://www.who.int/bulletin/volumes/85/8/06-039529.pdf**) Journal article that summarizes current funding gap in the fight against malaria and the financial commitment necessary to scale-up and achieve success.
- We Can't Afford To Wait: Business Case for Rapid Scale-up of Malaria Control in Africa: Prepared by Malaria No More and McKinsey & Company on behalf of Roll Back Malaria: (**http://www.malarianomore.org/businesscase/012508-business_case.pdf**) Provides economic evidence on the cost efficiency of scaling up quickly, rather than maintaining current funding levels.

Cost-effectiveness analysis

- Conquering Malaria. Disease Control Priorities Project: (**http://www.dcp2.org/pubs/DCP/21/FullText**) Chapter from DCPP's Disease Control Priorities in Developing Countries that discusses the biological aspects of malaria, disease burden, control strategies, and cost-effectiveness analyses.
- Using Cost-Effectiveness Analysis for Setting Health Priorities. Disease Control Priorities Project: (**http://www.dcp2.org/file/150/DCPP-CostEffectiveness.pdf**) Short 4-page introduction to cost-effectiveness analysis and its use in global health; provides overview of the commonly used DALY as a health metrics unit.
- World Health Organization CHOICE project for malaria: (**http://www.who.int/choice/publications/p_2005_MDG_series_Malaria.pdf**) Cost-effectiveness analysis of current malaria control strategies as they relate to achieving the Millennium Development Goals set by the United Nations. Website gives analysis based on geographic region and considers packages of interventions at different coverage levels. Also provides a costing toolkit.

Cost estimation for malaria control programs

- Methodology for estimating the costs of global malaria control (2006-2015). (**http://www.who.int/malaria/docs/costing/Costing_MethodologyWP.pdf**) Kiszewski et al. Global Malaria Programme WHO 2007: Outlines the costing and assumptions behind WHO's Global Malaria Programme.

Monitoring and evaluation

- Global Fund to fight HIV, TB, and Malaria Toolkit: (**http://www.theglobalfund.org/documents/me/M_E_Toolkit.pdf**) This in-depth document outlines outcome indicators suitable for evaluating and monitoring malaria programs based on location and epidemiology of the disease.

Recent research findings

- Defining and defeating the intolerable burden of Malaria III. American Journal of Tropical Medicine and Hygiene: (**http://www.ajtmh.org/content/vol77/6_Suppl/**) This peer-reviewed academic journal is the leader on current scientific matters related to tropical diseases. The December 2007 supplement is dedicated to malaria.

Informative Websites

- Centers for Disease Control and Prevention (CDC): (**http://www.cdc.gov/malaria/**) Provides background information on malaria and its diagnosis and treatment. Information about endemic areas and travel to those areas is also included.
- Kaiser Family Foundation: Global Data on HIV/AIDS, TB, Malaria, & more: (**http://www.globalhealthfacts.org/**) Provides up-to-date information by country on people affected by malaria.
- Malaria Journal: (**http://www.malariajournal.com/**) Online academic journal that is open access; reports on scientific research, progress, case studies and more.
- Malaria No More: (**http://www.malarianomore.org/**) Advocacy organization that works to raise awareness about malaria globally.
- Roll Back Malaria: (**http://www.rbm.who.int/**) This partnership coordinates global approaches to end malaria and was launched by the WHO, UNICEF, UNDP, and World Bank in 1998. Information about global advocacy efforts, World Malaria Day, and the newly-developed Global Business Case for Malaria can be found on their website.
- World Health Organization: Malaria: (**http://www.who.int/topics/malaria/en/index.html**) Provides background information on malaria, vector control, and medical care for those infected.
- World Health Organization: Global Malaria Programme: (**http://malaria.who.int/**). Provides information on the WHO's coordinated response to malaria globally.

Malaria Maps

- Malaria Atlas Project: (**http://www.map.ox.ac.uk/index.htm**)

Email List-Servs

- Kaiser Family Foundation Weekly TB/Malaria Report: (**http://www.kff.org/profile/subscriptions.cfm**) Sign up to receive a weekly email on global stories about malaria.

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Note: The analysis compared current trajectory vs. rapid scale-up in the next 5 years for 30 high transmission African countries accounting for >90% of the global malaria burden. Reason for the added impact of rapid scale up is the achievement of community health effects which occur when villages reach > 60-80% coverage with effective malaria interventions.

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[7] Ellis Amy and Susan Walters. *Mother's Action Changes Son's Fate*. Voices for A Malaria Free Future website. http://www.malariafreefuture.org/news/success/mali_mothersaction.php. Accessed November 6, 2008.

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[13] Roll Back Malaria (RBM) Partnership was launched by the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), the United Nations Development Programme (UNDP), and the World Bank in 1998 in order to coordinate global efforts in fighting malaria. RBM is designed to facilitate effective global and national partnerships in projects such as scaling-up malaria control efforts at country level, avoiding duplication and fragmentation in research and effort, and optimizing resource use. Currently, the partnership includes approximately 85 organizations (NGOs, private sector organizations, researchers and academia, donor countries, etc.) in addition to 53 malaria endemic nations.

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[15] Senior staff UN Foundation and International Red Cross, May and October 2008.

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[18] Goodman CA, Coleman PG, Mills AJ. Cost-effectiveness of malaria control in sub-Saharan Africa. *Lancet* 1999; 354(9176): 378-85.

[19] For donors who wish to address the availability of tools, consider donations to international mechanisms such as The Global Fund to fight AIDS, Tuberculosis and Malaria (www.theglobalfund.org) and the Measles Malaria Partnership (www.measlesinitiative.org). Groups such as Malaria No More and Nothing But Nets also raise funds for this partnership which delivers bednets. Such international financing mechanisms take advantage of large economies of scale and coordinate provision of tools through national malaria control strategies.

[20] Roll Back Malaria Partnership. *Global Malaria Action Plan.* September 2008.

[21] Roll Back Malaria Partnership. *Global Malaria Action Plan.* September 2008.

[22] Malaria No More and McKinsey & Company. *We Can't Afford To Wait: The Business Case for Rapid Scale-up of Malaria Control in Africa.* January 2008.

[23] Roll Back Malaria Partnership. *Global Malaria Action Plan.* September 2008.

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Note: Some experts consider interventions/packages with cost-effectiveness ratios (CERs) under $150/DALY to be cost-effective in very low-income countries. A different threshold used by the World Health Organization is to define the threshold relative to the local GDP per capita with < GDP per capita considered very cost-effective, 1-3 x GDP per capita as cost-effective, and > 3 x GDP per capita as not cost-effective. For countries in WHO Africa D region, the threshold for very cost-effective would be less than $1,381/DALY averted and not cost-effective as greater than $4,143/DALY averted. All of the assessed malaria interventions are well below this GDP threshold and are considered highly cost-effective uses of resources.

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Note: This is because IRS cannot be targeted to only high-risk age groups where health benefits can be maximized unlike bednets. However, cost per person-year protection by IRS was similar to bednets if the whole population was considered. There is little data on how to model the benefit of IRS to adults.

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[46] Save the Children staff. September 2008.

[47] Cost per child in target area was calculated by dividing the total project cost by number of children in the target area and dividing by number of project years.

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POTENTIAL IMPACT AND BALLPARK COST/IMPACT IN TWO DIFFERENT AFRICAN SETTINGS, ASSUMING SIMILAR COSTS TO DELIVER 100,000 BEDNETS:[62]

ESTIMATES	MALAWI (HIGH BASELINE DEATHS)	GHANA (MODERATE BASELINE DEATHS)
Child lives saved (for a 3-year project)	1,160-1,730	430-640
Cost per child's life saved	$580-$870	$1,560-$2,350
Inputs:		
■ Addressable number of malaria deaths of children age five or under (each year) in hypothetical population[62]	1,375	508
■ Under-five mortality rate (per 1000 live births)	170	110
■ Percentage of mortality attributable to malaria	31%	26%
■ Annual birthrate (per 1000 population)	43	29

[63] Cost estimates from personal communication with UN Foundation staff. May 2008.

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[65] Roll Back Malaria Partnership. *Global Malaria Action Plan.* September 2008.

[66] Figures from PSI staff. July 2008.

[67] PSI staff June/July 2008.

[68] Additional assumptions and estimations: (Data provided by PSI staff). July 2008.
- Number of fevers: 8/child/year (from Nigeria DHS survey 2003)
- % of fevers treated: 40% in year 1 increasing to 60% with effective promotion in year 2
- Forty percent of treated fevers are treated by a health worker in year 1 rising to 50% in year 2; the remainder being treated in the public and private sectors
- Forty percent of treated fevers are malaria (giving average incidence of 1.3 episodes per child per year - very conservative in endemic sub-Saharan Africa)
- Ninety percent compliance with treatment; Ninety-five percent efficacy with ACT
- Two and a half percent (2.5%) case fatality rate for malaria

PSI estimates were checked and a range was created using the Lives Saved Calculator of CHERG/CSTS+. This assumed change in ACT coverage of 45% for children under 5, addressable malaria deaths of 24,000 per year in each pilot area, and effectiveness of ACTs ~ 34 -67% (range considering presumptive therapy and real-world use).

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[93] Language and dialect barriers exist not only between countries, but in many cases within a region; these barriers can result in additional costs for translators and associated costs and logistics.

[94] Given the technological limitations, distance poses another considerable challenge of which the philanthropist must be mindful. Consider the ways in which you can get input on the progress of the program since the physical distance limits the number of personal visits and opportunities for direct observation.

[95] **Paris Declaration on Aid Effectiveness: A Summary Code for Philanthropists**

- Be aware of the country's priorities and plans for the future. Be sure that your aid aligns with a stated and recognized need and that you are not duplicating efforts currently in motion.
- Be clear and consistent in your expectations for reporting policies and that your requirements are in line with best practices and similar to other donor requirements to ensure that staff time is spent on projects, not reporting. Any changes to these policies should have justification and should remain streamlined and aimed at achieving stated outcomes.
- Multi-year commitment of aid can ensure that project staff spends more time on the project, and less time on scrambling for future funds.
- Recognize that what works in one country may not be suitable to another. Epidemiology, culture, current infrastructure and many other factors may determine what is applicable in a country. Listen to in-country project staff; they are the experts.
- Respect ownership of the project – the partner country should take the lead. This applies to development, implementation, and monitoring & surveillance. It is imperative that the project country leads so as to have experts in charge who can also attain skills that will be helpful in the future success of this project and others, while building in-country leadership as well.
- Work with the partner country using agreed upon frameworks that work with the project and strengthen in-country systems. Use already existing infrastructure if able.

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[98] In the case of a pilot program, philanthropists might consider funding a research university to partner with the service delivery NGO to perform an in-depth evaluation that can be shared for all to learn. In the scenario of scaling-up a known effective model, change in intervention coverage from project baseline to end should be adequate in most cases. Change in intervention coverage and use (e.g. prompt access to treatment) can be relatively easily obtained through household surveys. Malaria Indicator Surveys have been developed by the Roll Back Malaria partnership (http://www.rollbackmalaria.org/merg.html) for use by NGOs for this purpose. Even if measurement stops at change in coverage, final health impacts (lives saved or under 5 mortality) can be estimated by modeling techniques. The known effectiveness of the tool (e.g. bednets) and the amount of malaria in that setting are used to give a ballpark health impact. (See the "Lives Saved Calculator" as an example of such a modeling tool http://www.childsurvival.com/tools/mon_eval.cfm.)

[99] Lives Saved Calculator developed by the Child Health Epidemiology Reference Group (CHERG) and adapted by USAID Child Survival and Health Grants Program (CSTS+) can be accessed at http://www.childsurvival.com/tools/mon_eval.cfm. An updated on-line version called the Lives Saved Tool (LiST) has recently been released.

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About the Center for High Impact Philanthropy

The Center for High Impact Philanthropy is a resource center established to support philanthropists and their advisors as they decide where to allocate their philanthropic dollars. Its goal is to provide information and tools to help philanthropists determine where their gifts would have the greatest potential to improve the lives of others.

Our staff gathers information from multiple sources and thinks systematically about what it suggests, how it fits together, and how best to use it. Staff members then translate their findings into clear and practical decision making tools.

The Center identifies promising programs to support using a multi-perspective, evidence-based approach that synthesizes three types of information: field experience (e.g., practitioner's insights and performance assessments), research (e.g., randomized controlled trials and quasi-experimental studies), and informed opinion (e.g., expert analysis and stakeholder input).

We also identify practical ways to think through philanthropic decisions, measure social impact, and create new models for achieving impact. Our objective is to address not only the information gap in the world of philanthropy, but also the continuing uncertainty about the best ways to measure and compare effectiveness, and the lack of analytic and decision frameworks to support philanthropists focused on achieving high social impact.

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