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## **Expanding the Net: how community initiatives and local participation improve the effectiveness of malaria control efforts**

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## **Acronyms and Abbreviations**

<b>ACCM</b>	All-cause Child Mortality
<b>ANC</b>	Antenatal Clinic
<b>BCC</b>	Behavior Change Communication
<b>COMBI</b>	Communication for Behavioral Impact
<b>EPI</b>	Expanded Programme on Immunizations
<b>GMAP</b>	Global Malaria Action Plan
<b>IEC</b>	Information, Education and Communication
<b>IMCI</b>	Integrated Management of Childhood Illnesses
<b>IPTp</b>	Intermittent Preventive Treatment for Pregnant Women
<b>ITN</b>	Insecticide-Treated Nets
<b>IRS</b>	Indoor Residual Spraying
<b>LLIN</b>	Long-lasting Insecticidal Nets
<b>MCP</b>	Malaria Communities Program
<b>MDG</b>	Millennium Development Goals
<b>MoH</b>	Ministry of Health
<b>NGO</b>	Non-governmental Organization
<b>NMCP</b>	National Malaria Control Program
<b>PMI</b>	President's Malaria Initiative
<b>RAPIDS</b>	Reaching HIV and AIDS Affected People with Integrated Development and Support
<b>RBM</b>	The Roll Back Malaria Partnership
<b>SUFI</b>	Scale-up For Impact
<b>UNICEF</b>	United Nations Children's Fund
<b>USAID</b>	United States Agency for International Development
<b>WHO</b>	World Health Organization

## Executive Summary

Malaria is a disease of devastating consequence. Each year, it is responsible for the deaths of nearly 1 million people and an estimated 250 million infections. Eighty-five percent of all those killed by the disease are children. Its deadly and debilitating impact is felt not only at the individual level, but also in lost household income and reduced economic productivity. Malaria is responsible for \$12 billion in direct costs every year in Africa alone and far more in economic costs. The paradox is that malaria interventions are among the most cost-effective and proven effective interventions. Long-lasting insecticidal bed nets, indoor insecticide spraying, prompt treatment with anti-malaria drugs and preventive treatment for pregnant women are all highly effective interventions. The primary challenge to reducing the impact of malaria is that the solutions are often inaccessible to those who need them most.

Over the last decade, malaria has received increased attention at the global level, while national level programs to combat the disease have been newly developed or have been expanded. The international and national level support has resulted in new commitments to combat the disease, galvanized dramatic increases in funding for prevention, treatment and research, led to improved coordination within countries and focused attention on strategic steps needed to combat malaria. Continued support for these efforts is vitally important. Yet, critically missing is attention at the community and household level where the impact of malaria is hardest felt. Despite acknowledgement at international and national levels of the importance of local approaches to defeating malaria, it has not often been followed with action. Enhancing emphasis on the involvement of communities and families offers a more complete approach to reducing the burden of malaria and is a necessary component if the burden of malaria is to be dramatically reduced worldwide.

A survey of malaria studies reveals initiatives that target all at-risk households in a community and promote the participation of community members in anti-malaria activities effectively reduce malaria deaths and infections. Findings reveal local participation increases the sustainability of malaria control efforts, improves the likelihood that marginalized populations will be reached with interventions, enhances proper utilization of the interventions and helps overcome obstacles to access

caused by poor infrastructure. As demonstrated in the findings, approaches focused at the community level also enable better coverage, overcoming challenges imposed through approaches that may target only pregnant women and children under five years. Particularly for interventions such as long-lasting insecticidal nets, where up to 80 percent community coverage has proven to protect an entire community by breaking the transmission cycle – even for those not sleeping under nets – evidence shows reliance on community members and networks enables a high level of coverage and proper utilization.

These findings highlight the importance of ensuring community-wide and household coverage and local participation in efforts to control malaria. In order to promote effective solutions and rectify the insufficient support for these critical levels, World Vision recommends the following actions be taken.

- 1) *All financing partners adopt the policies of the Roll Back Malaria Partnership Global Malaria Action Plan supporting universal access for all populations at risk to locally appropriate anti-malaria interventions.*
- 2) *Multilateral and bilateral funding partners designate a greater portion of resources to enhancing community participation and ownership in malaria control, including the development or facilitation of networks, volunteers and community health workers.*
- 3) *National governments adopt as policy 100 percent community coverage of long-lasting insecticidal nets, where appropriate, to support scaling up for impact.*
- 4) *Funding agencies increase the resources available to non-governmental and civil society organizations that support or foster local participation and strengthen indigenous networks.*

## Introduction

Malaria is one of the world's leading public health challenges and bears its greatest burden on young children. Nearly one million deaths a year are attributed to malaria, 85 percent of which are children under five. Half of the world's population is at risk to the disease.<sup>1</sup> Beyond the profound human costs, malaria also has considerable economic costs. Yet the solutions are not overly complicated. Inexpensive, proven interventions for preventing and treating the disease are well-known: long-lasting insecticidal nets, indoor spraying of insecticides, anti-malarial drugs and preventive medicine for pregnant women. Unfortunately, accessibility and proper utilization of these effective interventions remain a considerable challenge for many individuals. In order to reverse the deadly impact of malaria and deliver the appropriate interventions to all people at risk, focused attention and measurable action must occur at four crucial levels: global, national, community and household.

Acknowledgement of the lethal and debilitating impact of malaria around the world has resulted in considerable progress at both global and national levels. The international community has made measurable commitments to reverse the impact of malaria as documented in the Millennium Development Goals (MDGs), Abuja Declaration by African heads of state and strategies of the Roll Back Malaria Partnership (RBM) and World Health Organization (WHO). These commitments have been supported by increases in global funding for malaria, the formulation of a global malaria strategy and the adoption of more effective policies for combating malaria in some countries, such as the promotion of universal access for locally appropriate interventions. Additionally, national governments have instituted, reinvigorated or rehabilitated National Malaria Control Programs (NMCPs), enhancing country level approaches to prevent and treat malaria and improving coordination among stakeholders. Through the Global Fund to Fight AIDS, Tuberculosis and Malaria, the World Bank and bilateral funding mechanisms, national governments have also received an influx of new funding to support and enhance their own activities. While more is needed globally and nationally by way of additional funding, technical support and research, among others, more effective strategies are being adopted and considerable attention is being directed at these levels.

Still missing, however, is adequate strengthening at the local level through facilitation of community participation and ownership as well as attention to the household, where malaria has its most profound impact. Global and national initiatives are absolutely essential, yet household level decisions and the accessibility and proper use of appropriate interventions in communities will dictate the success of malaria control and elimination efforts. Comprehensive, coordinated approaches that prioritize community-based malaria control initiatives to achieve family and household impact have not been widely adopted, though their importance has been highlighted among international commitments and in well-respected reports. Many of those threatened by malaria remain at risk due to lack of access and proper usage of the most appropriate malaria control interventions, programs that insufficiently promote behavior change or initiatives that target only select groups, leaving others vulnerable. Particularly for program interventions focused on long-lasting insecticidal nets, which are proven to be effective in preventing malaria, policies and practices have not been widely adopted that promote household level changes to ensure availability and proper use of nets for all at risk. In coordination with national malaria control plans and child survival activities, methods must be adopted that prioritize community approaches addressing these weaknesses and strengthen local response to the disease.

If international targets are to be met as identified in the MDGs and commitments by RBM and African heads of state, and if endorsed strategies for protecting all at risk of malaria are to be effectively implemented, more attention and support must be given to local, community-owned responses. A dramatic reduction in the number of malaria deaths and cases can only be reached when mothers, fathers and children are able to fully access and properly utilize proven interventions through a strengthened local community.

## Background

Malaria is a major global health threat causing almost one million deaths and infections in an estimated 250 million people each year. Approximately 85 percent of all deaths are children under five years, ranking it the fourth leading cause of child deaths worldwide. Though 3.3 billion people globally are at risk of contracting

malaria, sub-Saharan Africa bears the greatest mortality burden; approximately 90% of all deaths occur there.<sup>1</sup> In addition to children, pregnant women are also particularly vulnerable to malaria illness. Malaria is estimated to cause 10,000 maternal deaths a year and is associated with anemia in pregnancy, low birth weight babies and infant mortality.<sup>2,3</sup>

Malaria also has great economic costs as well, from its impact on the global economy to the household level. An estimated \$12 billion is lost in direct costs each year in Africa alone as a result of malaria.<sup>4</sup> According to WHO, malaria accounts for as much as 40 percent of public health expenditures in countries with high malaria burdens and up to 50 percent of inpatient hospital admissions.<sup>5</sup> At the household level, malaria can be a significant economic burden, particularly for the poor. While it is difficult to aggregate average household expenditures on malaria due to factors such as differences in income, disease transmission and subsidized health services, studies have shown that the costs associated with a single malaria episode can be catastrophic for a family.<sup>6</sup>

## **Malaria Trends and Focused Attention**

A dramatic reduction in global malaria deaths occurred in the middle of the 20<sup>th</sup> century due in large part to robust national elimination campaigns and WHO's Global Malaria Eradication Programme. Though malaria deaths reached a low of 578,800 in 1970, in large part because of this focused attention and action, morbidity and mortality associated with the disease increased dramatically in the 1980s and 1990s after the program ended in the 1970s. This increase was particularly true for sub-Saharan Africa which saw a tripling of malaria deaths since from 1970 to an estimated 990,000 in 1997.<sup>7</sup>

The resurgence and rising global burden of malaria and large number of child deaths has brought renewed global attention to malaria over the last decade. The establishment of the Roll Back Malaria Partnership in 1998, comprised today of multilateral, bilateral, national, private and non-profit entities, among others, has enabled better support and links between all entities focused on preventing malaria. RBM also developed a strategy for improving malaria control efforts globally and supported the strategic malaria goals of WHO. In

2002, the Global Fund to Fight AIDS, Tuberculosis and Malaria was created as a multilateral funding mechanism to combat the three diseases and has invested millions of dollars in country-led malaria programming. In 2005, the U.S. launched the President's Malaria Initiative (PMI), a \$1.2 billion, five-year program focused on prevention and treatment activities in 15 focus countries. During this time, many malaria-endemic nations reinvigorated or developed National Malaria Control Programs, bringing focused attention and new financial resources to malaria prevention and treatment efforts.

Considerable gaps exist related to funding, the provision of services and research. Yet, the establishment of the organizations, agencies and national programs mentioned above, as well as numerous private, non-profit and civil society initiatives, has contributed to meaningful progress at two of the three critical levels – global and national – needed to control and eliminate malaria. According to Roll Back Malaria, international funding for malaria has increased from \$249 million in 2004 to an estimated \$1.1 billion in 2008 (though this is still well below the estimated international contribution to the global need). This has been particularly beneficial to the procurement of long-lasting insecticidal nets (LLINs). The availability of LLINs has grown dramatically, with global production increasing from 30 million nets in 2004 to 110 million nets in 2008. In 2008 a new global strategy was introduced by the RBM Partnership in the form of the Global Malaria Action Plan (GMAP), which set measurable global targets for reducing malaria mortality and cases and outlines a plan to achieve these goals for all entities working toward defeating malaria.

At a national level, particularly in Africa where the malaria burden is greatest, progress is also being achieved. Countries such as Ethiopia have implemented programs that have reached near universal coverage of insecticide-treated mosquito nets and seen dramatic reductions in malaria deaths and cases: 50 percent and 61 percent, respectively, between 2005 and 2007.<sup>8</sup>

## **Global Malaria Goals**

In addition to the MDG 6 malaria target to have halted by 2015 and begun to reverse the incidence of malaria and other diseases, there are five important goals which the RBM partnership members support and aim to achieve as outlined in the GMAP. They include:

- Achieve and sustain universal coverage with locally appropriate interventions for all populations at risk of malaria until evidence suggests only targeted approaches are necessary;
- Reduce malaria cases from 2000 levels by 50 percent in 2010 and 75 percent in 2015;
- Reduce deaths from 2000 levels by 50 percent in 2010 and near zero deaths in 2015;
- Eliminate malaria in 8 to 10 countries in 2015; and,
- Eradicate malaria in the long-term.

The GMAP identifies three components which must occur in order for these goals to be achieved: control, research and elimination. Supported by research, malaria control is a priority for countries where the disease remains a public health threat and where the burden is greatest. Since a vast majority of malaria endemic countries are not at the elimination stage, two phases are essential to achieving control: scale up for impact (SUF), to ensure universal access of locally appropriate malaria interventions, and sustained control until the malaria burden has been reduced to levels supporting elimination. In order to capitalize on global momentum, ensure immediate protection for vulnerable populations and swiftly transition to sustained control of malaria, RBM promotes a rapid scale-up of malaria interventions that simultaneously supports sustainable solutions.<sup>4</sup> Achieving universal coverage in a short period of time increases the effectiveness of preventive interventions and may help speed the trajectory of a reduction in the number of malaria related deaths and cases.

## **International affirmation of community participation and household approaches**

Though not broadly implemented and prioritized, community participation in malaria prevention and control has been promoted among the goals and objectives espoused in global declarations and documents, including those of RBM, the Global Fund to Fight AIDS, Tuberculosis and Malaria and WHO. Such commitments have yet to yield considerable changes in approach; however, the acknowledgement at an international level – captured below – of community-based and household level initiatives demonstrates their importance.

In 2000, at the African Summit on Roll Back Malaria, heads-of-states and governments made commitments to address the disease through community and household level initiatives in the Abuja Declaration on Roll Back Malaria in Africa. Among the important commitments made by the high-ranking officials at the summit was that ownership and control of RBM actions would be dictated by community participation and that the diagnosis and treatment of malaria would occur as “peripherally far as possible,” including at the household level. It was also pledged that mechanisms would be developed to provide reliable malaria information to decision makers at the household, community, district and national levels. Furthermore, the Abuja Declaration set a goal of securing personal and community-wide protective measures for 60% of people at risk.<sup>9</sup>

Additionally, the Global Malaria Action Plan highlights the importance of community participation and household level changes in numerous parts of its strategy. Community participation and involvement is highlighted as a necessary component in the scaling up for impact stage, particularly for influencing community behavior change and vector control. Three of the four components GMAP indicates are necessary elements to the sustained control stage – strengthened local distribution channels, behavioral change and increased community participation – are absolutely dependent on a local approach that empowers community members.<sup>4</sup>

Though small in scale, the Malaria Communities Program (MCP) supported by the President’s Malaria Initiative also demonstrates the importance of local approaches. Established in 2006, this \$30 million initiative focuses on developing new local or indigenous partners able to target children under five and pregnant mothers. The strategic principles of MCP support linkages and coordination with other groups, integrated approaches that strengthen community capacity, collaboration with host governments and NMCPs and the scale up of proven interventions.<sup>10</sup> While beneficial, the lack of support for complete community coverage of some interventions and limited funding reduce the potential effectiveness of the MCP.

This international and national level support for community participation is vital to achieving success in malaria control efforts and essential to strengthening the local framework to ensure both immediate progress during scaling up for impact and long-term support

during the sustained control phase. Community-based malaria initiatives that promote local participation and household targeted interventions are not only more likely to be sustainable, but the mutual trust and respect between community members increases the likelihood that an intervention will be adopted and the intended behavior change associated with each intervention will occur.

Increased attention and continued support for international funding and adherence to the global malaria strategy, as well as country-level leadership and coordination, are of critical importance. Yet they must be coupled with community-driven, home-based solutions. Greater support for local approaches with strong links to national and international initiatives will be essential to achieving progress and ensuring sustainability at all levels.

## **Obstacles to community and household level malaria prevention and treatment success**

At present, there are great challenges that undermine or hinder achievement of the RBM targets relating to universal access of key interventions for households and communities at risk of malaria and, ultimately, the goals of reducing global morbidity and mortality. Some of the most common obstacles to this community approach are limited resources, insufficient health infrastructure and ineffective policies.

Public health system deficiencies and inadequate Ministry of Health financing are considerable barriers for many living in high-burden malaria endemic countries. The health system weaknesses of many developing countries have been well documented. Lack of trained health care workers and overburdened staff, failing infrastructure and drug stock-outs due to poor supply chain management all limit care for people suffering from malaria. Failure of many African nations to fully finance the health sector at 15 percent of government spending, as promised in the 2003 Maputo Declaration, limits nations from adequately responding to the malaria threat through government services.<sup>4</sup> This is further demonstrated by the extent to which household expenditures on malaria are channeled through the private sector. As an example, a study in Nigeria

showed that 60 percent of malaria treatment expenditures were through private facilities or vendors.<sup>11</sup> Though evident that much greater support is needed for national health system strengthening, both from international and country sources, this should not be prioritized above or come at the expense of strengthening community solutions, which includes utilizing community, civil society, faith-based and household networks. Increasing community participation takes advantage of the components of the “whole health system” and increases the likelihood that behaviors will change at the household level and at risk populations will have access to the needed interventions.

However, evidence suggests that in some countries malaria programs or child survival initiatives with malaria components have in fact been under prioritized. For leading causes of child death like malaria, the Integrated Management of Childhood Illness (IMCI) initiative developed by WHO and the United Nations Children’s Fund (UNICEF), was to help improve child health by supporting the whole health system, from government programs to household case management. The elements of this approach included evidence based interventions, training of health workers, strengthening and improving the health system and strengthening family and household behaviors. However, a multi-country evaluation of IMCI effectiveness revealed that a vast majority of the focus was ultimately on government worker training, lacking support or coordination with family level strengthening. The findings suggested IMCI had not supported engagement of nongovernmental health providers. Furthermore, the study showed that even when government run health facilities were accessible, or the quality of care improved, utilization rates did not necessarily improve due to lack of community promotion and involvement. The exception to this was Bangladesh, where strong delivery mechanisms at the community level had the affect of increasing utilization rates. The authors concluded that to address child morbidity and mortality for diseases such as malaria, there needs to be a move beyond a health facility focus, toward an increase in support for community level case management and development of “bottom up” approaches.<sup>12</sup> Though not evaluating stand-alone malaria initiatives, the findings of this analysis have strong implications for the success of SUFI and the importance of community and household participation.

Distance or other factors limiting access to health facilities is also a real obstacle to many households in

malaria-endemic areas. Particularly for many women in the developing world, distance alone serves an obstacle to malaria prevention and treatment. Antenatal clinics (ANC) and the Expanded Programme on Immunizations (EPI) are key methods by which the governments or Ministries of Health (MoH) distribute critical commodities such as LLINs and medicines for intermittent preventive treatment for pregnant women (IPTp). Most antenatal clinics are housed at health centers that provide life-saving interventions, including for malaria, and should be expanded through health system and community system strengthening. However, the reliance many governments place on ANCs as the sole location for distribution of malaria preventive and treatment interventions can result in limited access for many women. According to the most recent data from District Health Surveys in a selection of highly malaria endemic countries, the percentage of women reporting distance to the nearest health facility as a barrier to health care or major problems accessing health care,<sup>1</sup> respectively, was 38 percent and 66 percent in Mali, 51 percent and 78 percent in Niger, and 60 percent and 79 percent in Malawi.<sup>13, 14</sup> The impact of this barrier on malaria prevention was revealed in one study which showed that of women who had to walk more than an hour to an antenatal clinic where insecticide-treated nets (ITNs) were distributed, only 46 percent reported using ITNs compared to 52 percent utilization among women within less than an hour walk.<sup>15</sup>

Heavy reliance on ANC and EPI distribution channels also serves as a barrier to ensuring universal access to locally appropriate interventions and will not enable the achievement of SUFI and sustained control. While these distribution channels are an important part of an overall “keep-up” strategy and helpful in reaching children under five and pregnant women, a significant percentage of the population is likely to be missed, limiting the proven protective effect of community coverage for interventions such as LLINs.

NMCP and country level policies can also serve as a barrier to access to prevention and treatment measures. Many countries have yet to adopt policies consistent with the GMAP that promote universal coverage of

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<sup>1</sup> Choices included: knowing where to go for treatment, getting permission to go for treatment, getting money for treatment, distance to health facility, having to take transport, not wanting to go alone, concern there may not be a female provider

preventive measures for all people at risk, instead focusing on targeted populations such as children under five and pregnant women. Lack of policies promoting universal coverage is particularly problematic for marginalized groups or impoverished households for whom it may otherwise be impossible to purchase interventions due to lack of availability or high costs. Additionally, few countries allow for community health workers to prescribe or distribute anti-malaria medications – an option which may help overcome the physical challenges of access to ANCs and other government health facilities.

Finally, the lack of access to protective and treatment measures is an obvious obstacle to reducing the malaria burden for many households. An insufficient number of interventions at the country level represents a clear challenge to success nationally. According to RBM, in order to reach universal coverage, there is need of 750 million LLINs (350 million in sub-Saharan Africa), 172 million households reached with IRS, 25 million doses of intermittent presumptive treatment (IPT) of malaria for pregnant women, 1.5 billion diagnostics (rapid diagnostic or microscopy tests) and 247 million anti-malaria drugs (228 million artemisinin combination therapies).<sup>4</sup> Yet even where countries have received financing and procured commodities, there are significant gaps for the key interventions that serve as an obstacle for communities and households. All too often the end point for many of the commodities associated with malaria is the health facility.

In the absence of strong health systems and adequate central funding, community initiatives with strong local participation that are well coordinated with national level efforts can help overcome many of these barriers and improve malaria control when the commodities are already present in country.

## **Evidence of effectiveness of community-participation in malaria control**

Community participation and ownership is an essential component of malaria control, for if programs and initiatives are designed with this in mind, long-term sustainability is more likely. Evidence suggests that several of the most successful malaria control programs resulted from a focus on community-based approaches to malaria prevention and treatment that relied on local

participation and household behavior changes. As resources increase at the international and national level to support scale-up for impact and sustained control, and improved coordination and support occurs at these levels, more focus on sustainable, community-focused solutions is necessary as the following examples highlight. Though each evaluated program was unique and the findings of the studies were on varied continents with differing malaria burdens, all shared a common community focus.

One such study by Barat evaluated the successfulness of four separate programs focused on reducing the burden of malaria in Brazil, Eritrea, India and Vietnam. The malaria program in Brazil targeted high risk areas with indoor residual spraying (IRS), increased rapid case management and improved access to anti-malarial drugs utilizing a decentralized approach that promoted local capacity development and ownership. Within 7 years, the Brazilian program had reduced malaria cases by 60 percent and had averted 2 million cases and 231,000 malaria-associated deaths. In the Eritrean context, a broader project focused on AIDS, tuberculosis and malaria targeted communities with IRS, rapid diagnostic testing, treatment of fevers and insecticide-treated nets through a decentralized approach. Essential to this program was community participation in the distribution of malaria related interventions, supported with technical assistance, intervention procurement and policy guidance by the NMCP. Over the course of 4 years in surveyed communities, ITN utilization increased from 20 percent to 63 percent, the number of malaria cases dropped by 63 percent and the malaria mortality rate was reduced from 13.3 percent to 3.9 percent. The program in India targeted high malaria risk areas with IRS and increased surveillance, diagnostics and ITNs. Though the structures and expertise were in place from a past eradication program, the program greatly benefited from a shift in focus to the community level. An estimated 300,000 community volunteers were trained to assist in case management. Financing was moved to the district level, which proved to stimulate local government, community-based and non-governmental organization (NGO) activities, such as ITN distribution and community awareness activities. Over seven years, malaria cases in program districts had been reduced by 43 percent, contributing to a 38 percent reduction at the national level. At the time of project evaluation, there were 1 million fewer cases of malaria compared to the year of program initiation. Additionally, 3 states saw a decrease in malaria deaths by 65 to 70 percent. Finally,

the Vietnamese program focused on ITNs, IRS and information, education and communication (IEC) campaigns involving all levels of the government and community. The approach in Vietnam relied on the entire health system and incorporated youth leagues, women unions and village heads as distributors of ITNs and retreatment organizers. At the time of evaluation, malaria cases had been reduced to 164,700, only 12 percent of the number nearly a decade prior. The mortality rate had decreased to only 0.6 percent and the country reported an end to malaria outbreaks.<sup>16</sup>

The author found several components to be true of the successful programs. Each country had a context in which political and economic improvements were coupled with national level support for anti-malaria efforts, and malaria was noted to have had the heaviest burden on age groups with income generating potential, motivating attention to the disease. Programs also benefited from a shift in technical approach where more effective interventions were promoted such as ITN distribution. Of the success factors, several were related to community involvement and partnership. All programs had strong partnerships with a lead technical agency (e.g. United States Agency for International Development), yet relied heavily on local level support from NGOs, community organizations and tribal groups. The four programs were also conducted through integrated, decentralized approaches that moved ownership of malaria control activities to the local government. Furthermore, many of the program beneficiaries were among traditionally marginalized populations, such as indigenous groups, where the public health infrastructure was weak. Despite the obstacle of inadequate public health support, the programs were able to scale up coverage of interventions, highlighting the role of non-governmental organizations and local level participation in achieving success.<sup>16</sup>

Findings from a community-based malaria treatment scheme in India provide further evidence that local participation and ownership leads to successful malaria control. An assessment was conducted of a program focused on increasing access to and changing the care-seeking behavior of households in an impoverished, tribal area of the country utilizing local volunteers. Unpaid volunteers were trained by the National Anti-Malaria Program on proper diagnosis of malaria, among others, and served as the distributor of the anti-malarials. Over the course of evaluation, only 10 percent of volunteers needed to be replaced due to poor

performance, despite the fact that an estimated 43 percent had little or no primary education. There were significant differences between control and experimental populations for a number of measurements, including annual fever incidence in high and low endemic settings and annual parasite incidence in low endemic settings. Most notable were the impacts on morbidity and mortality associated with malaria. The average number of sick days among the population in the experimental groups dropped from an average 4.8 days to 1.6 days over the three-year study while the average days of illness remained virtually the same for the control groups. As it relates to mortality, there were 4 deaths and 9 deaths in the experimental and control groups, respectively, the year before implementation of the program. However, during the third year of study there were only 3 deaths in the experimental group compared to 53 in the control population. Though the small number of deaths makes it difficult to analyze the impact, the clear reductions in morbidity and successful provision of appropriate interventions through trained volunteers provide strong evidence that community participatory approaches and development of local networks are viable solutions to malaria treatment where health infrastructure is weak or non-existent.<sup>17</sup>

Another example from a program in Mozambique run by World Relief utilized a “care group” model of volunteers to support IMC, of which malaria interventions are a component. The program relied on a network of 2,300 community health volunteers to provide universal household support, with each volunteer responsible for ten households. Village health networks and other community members also received training on IMCI. Among the findings across a broad range of indicators impacting child survival, the impact on children sleeping under a net the night before and children who had received treatment at a health center within 24 hours was significant. Specifically, 85 percent of children had slept under an ITN the night before during the final year of the study compared to less than one percent at baseline, while 90 percent had been treated for a fever within 24 hours of onset at a health facility, compared to 28 percent at the onset of the program. The authors cited several components that led to program success. First, the program relied on a broad group from the community including volunteer health workers, pastors and village leaders. Second, the volunteer to household ratio was high (only 10 per volunteer), increasing the effectiveness of household interventions. Third, there was limited volunteer attrition due to accountability and personal

attention through the care groups. Finally, the approach increased the number of contacts between the volunteer and the target households, ensuring better compliance and behavior change. In addition to highlighting the feasibility and effectiveness of community participatory approaches for malaria control, the findings also revealed the role NGOs are able to play in strengthening health systems, promoting community ownership and enhancing scale up of best practices.<sup>18</sup>

Additional studies provide evidence of the effectiveness of malaria control plans that rely on community participation and household targeted approaches.<sup>11,19</sup> The interventions range from insecticide-treated material distribution to the provision of IRS or anti-malaria medications. However, of the key interventions, there is considerable evidence to support LLIN distribution and utilization through community participation and household behavior change approaches as a necessary and highly effective solution to malaria control.

## **Community participation and household-targeted approaches to long-lasting insecticidal nets**

Long-lasting insecticidal nets are a priority intervention due to their proven effectiveness preventing malaria and improving child health indicators and pregnancy outcomes.<sup>20,21,22</sup> Two studies in particular demonstrate the fact that LLINs do more than protect against malaria-related morbidity and mortality. According to research, LLINs can reduce malaria-associated deaths by as much as 50 percent and can reduce all cause child mortality (ACCM) by an average of 17 to 20 percent.<sup>23,24,25</sup> This suggests that the protective effect of LLINs has the potential to prevent as many as 1 million child deaths from all causes for children under five years old in sub-Saharan Africa.

Promoting universal access to and usage of LLINs through scaling up for impact is not only a worthy goal to ensure the protection of those at risk of malaria, but it also represents one of the most effective methods for achieving a reduction in malaria morbidity and mortality. A majority of the LLIN initiatives supported by multilateral, bilateral and national entities through country-led campaigns have focused on the targeted provision of nets to those most vulnerable to malaria –

pregnant women and children under five years. Yet evidence suggests that coverage of an entire community results in a protective effect benefiting all at risk, even for highly vulnerable individuals not sleeping under nets. When at least 80 percent of a community utilized ITNs, findings showed households lacking a net were equally protected against malaria associated infections, child mortality and anemia, even at distances up to a mile away.<sup>26,27</sup> One recent study concluded that that when 35 percent to 65 percent of a population uses LLINs, protection for the entire community can be equal to or greater than personal use of a net.<sup>28</sup> The studies by Hawley et al and Killeen et al showed that beyond serving as personal protection, LLINs actually serve a collective barrier of protection beyond the household that leads to the reductions in morbidity and mortality. This method of community coverage is effective because it essentially breaks the cycle of transmission of malaria. A mosquito carrying the malaria parasite may either be killed from exposure to the insecticide before it is able to transmit the parasite to another individual or may be unable to find another human to take a blood meal, as most individuals are protected under a net. With fewer and fewer malaria parasite-carrying mosquitoes present among the population, as well as infected individuals, the risk of malaria decreases.

The findings supporting the effectiveness of long-lasting insecticidal nets as an intervention and benefits provided by community-wide targeting are dependent on achieving high coverage (up to 80 percent) and proper utilization of the nets. Therefore, best-practices and methodologies that facilitate community coverage of LLINs through sustainable, household and community participatory actions should be promoted. While more research of such approaches is needed, particularly comparing delivery methods and measuring malaria protection, intervention efficacy and behavior change, some limited findings suggest such approaches may be highly effective.

One such study occurred in Sudan, where a community-driven IEC campaign based on the Communication for Behavioral Impact (COMBI) strategy was implemented to increase utilization rates of LLINs. Two communities were selected as experimental and control groups which had recently received nets through a national campaign. The IEC campaign and measurements were determined by community members and relied on the use of materials and resources available at the local level. The

findings revealed a significant difference in net utilization and knowledge of malaria cause between experimental and control groups. Among the experimental group 85 percent of households indicated they had prioritized usage of LLINs for children under five years and pregnant women, compared to 78 percent in households of the control group. Although LLIN utilization remained the same across study groups, there were significant differences in utilization. Year round utilization of LLINs changed from a baseline of 2 percent to 43 percent in the experimental group and daily LLIN utilization increased from a baseline of 15 percent to 77 percent compared to no changes for the control group. The study also reported a significant difference in LLIN utilization the night before the survey and a measurable decrease in malaria incidence among the experimental group. Furthermore, among participants in the experimental group, those unable to determine the correct cause of malaria measurably decreased.<sup>29</sup>

Recent data from an unpublished evaluation of an LLIN distribution scheme by World Vision suggests that a household-targeted approach conducted by community volunteers offers an effective method for both the provision and proper utilization of this priority intervention. The organization commissioned a study of its efforts in 2007 to distribute nearly 500,000 LLINs in Zambia through the Reaching HIV and AIDS Affected People with Integrated Development and Support (RAPIDS) program.

The RAPIDS program is a partnership of six non-governmental organizations, led by World Vision, funded and supported by the President's Emergency Plan for AIDS Relief through the U.S. Agency for International Development (USAID) and coordinated with the Government of Zambia to address HIV and AIDS affected households. The RAPIDS model utilizes a field-based approach with the community as the driver of implementation efforts and the household as the primary unit for a broad set of interventions. The RAPIDS program has a network of more than 16,000 local caregivers and has developed and built the capacity of more than 180 community-based organizations. It has served as a model program for malaria prevention and control initiatives that support strategies espoused in the GMAP, as well as demonstrated the effectiveness of integrated programming. RAPIDS has successfully leveraged international, national and local resources, support and coordination to ensure impact at the household level, elements that must be present to ensure

SUFI, sustained control and achievement of RBM morbidity and mortality targets.

Due to its strengths, the RAPIDS model was utilized for the distribution of the LLINs in Zambia to reach the household level through a cascade approach. Nets were initially delivered to central locations from which RAPIDS partners supplied the commodities to the respective districts. Community partners ensured LLINs were distributed through caregivers and youth leaders in their communities. Nets were distributed using two different methods: households and community meetings, involving a central location organized by caregivers. Caregivers received training on hanging, washing and maintenance of the LLINs and were also provided IEC leaflets describing LLIN usage, malaria causes and prevention and treatment recommendations. Through the caregiver networks, approximately 164,000 households were reached with long-lasting insecticidal nets.

The evaluation revealed that of the 559 beneficiaries surveyed, 99 percent had a LLIN and 65 percent had two to three. Seventy-five percent of respondents had slept under a LLIN the night before. Knowledge of malaria prevention, treatments and cause of the disease was high. Approximately 76 percent were aware that malaria was transmitted by a mosquito and were more likely to use an LLIN as a result compared to those without knowledge of the mode of transmission (65 percent). Among the survey respondents, only 3 percent had nets that were unusable at the time of inspection, while 62 percent had nets in perfect condition. Of beneficiaries receiving follow up visits from caregivers, 78 percent were likely to be using a net versus 70 percent who had not received a follow up visit. Analysis also revealed an association between the distribution method and LLIN hang-up. For beneficiaries who had been provided LLINs and IEC at the household, 64 percent had properly hung nets upon inspection compared to 58 percent of beneficiaries which had received LLINs and IEC materials at community meetings. However, there was no difference in LLIN usage the night before between community meeting (76%) and household (74%) methods. These findings suggest that the RAPIDS community-participation method was successful in achieving high utilization rates of LLINs. Further research is needed to determine if the small benefits of household net distribution over the community meeting method is worth the extra effort in terms of financial and human resources.

Though World Vision's study had several weaknesses including a small sample size and lack of district randomization, the findings suggest that distributing LLINs at the community/household level with IEC/BCC and hang-up demonstration through a community led volunteer caregiver approach will likely increase community coverage and proper utilization of nets, ultimately reducing malaria-associated morbidity and mortality.

## Recommendations

As has been demonstrated, there is considerable evidence suggesting community-focused solutions with enhanced participation and ownership are effective and sustainable and should be supported by international and national level efforts as a core component of malaria control.

In order to achieve the RBM targets for reducing malaria deaths and cases by 2015 and bring to scale appropriate interventions through community mechanisms, World Vision recommends the following action be taken.

- 1) *All financing partners adopt the policies of the Roll Back Malaria Partnership Global Malaria Action Plan supporting universal access for all populations at risk to locally appropriate anti-malaria interventions.*
- 2) *Multilateral and bilateral funding partners designate a greater portion of resources to enhancing community participation and ownership in malaria control, including the development or facilitation of networks, volunteers and community health workers.*
- 3) *National governments adopt as policy 100 percent community coverage of long-lasting insecticidal nets, where appropriate, to support scaling up for impact.*
- 4) *Funding agencies increase the resources available to non-governmental and civil society organizations that support or foster local participation and strengthen indigenous networks.*

## Conclusion

Now is a critical moment in the global fight against malaria. With the growth of international support and

renewed attention at the national level to implement malaria control programs, the world is on a positive trajectory to begin reducing the number of cases and deaths associated with the disease. This attention is bolstered by proven effective interventions and the recent development of a global plan of action to control, eliminate and ultimately eradicate malaria. With added focus comes the responsibility of all engaged in the prevention of malaria to ensure actions undertaken today most effectively address immediate concerns while strengthening the viability of long-term success and sustainability. Despite evidence of effectiveness, too little attention is being given to initiatives that focus on community participation and ownership – approaches that help bridge the short-term and long-term objectives. This component is the missing piece that will support and help ensure scaling up for impact, sustained control and progress toward elimination, with the ultimate goal of achieving RBM targets for reducing malaria cases and deaths. Such an approach is vital to scaling up quickly and reaching the most immediate targets of achieving universal coverage of appropriate interventions for all populations at risk by the end of 2010.

Though global and national level commitments have espoused support for community-based approaches to malaria control, insufficient follow through and obstacles to local level access of key interventions have undermined the ability to achieve short-term and long-term success. While efforts are underway to improve support for community system strengthening at the Global Fund, most multilateral and bilateral funding mechanism have not sufficiently prioritized this approach. The objectives of some of these funding agencies do not currently promote universal coverage or require the implementation of interventions to ensure access for all at risk at the local level. Many countries have also failed to adopt policies that promote universal access or support initiatives outside the government health system. Furthermore, obstacles also remain in country, where weak health infrastructure and policies targeting specific population groups in national malaria campaigns limit the ability for many to access interventions at the community level and scale up proven interventions. National level focus on antenatal clinics and expanded immunization programs as the primary local for distribution of LLINs, rapid diagnostic testing or distribution of anti-malarial drugs leaves a significant percentage of the population unreached and fails to capitalize on local networks and community capital that could fill national gaps.

As evidence suggests, strengthening local capacity to conduct malaria control through community approaches is essential, and may in fact be the key, to successfully scaling up and sustaining universal coverage of locally appropriate interventions to prevent and treat malaria. Community participation and ownership have been shown to increase access to population groups previously unserved by the Ministry of Health, improve utilization of critical interventions, decrease the incidence of malaria and associated deaths and alter the behavior of households related to care-seeking, disease awareness and compliance on interventions for malaria.

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<sup>4</sup> Roll Back Malaria, *Global Malaria Action Plan*. 2008.

<http://www.rollbackmalaria.org/gmap/>

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<sup>10</sup> President’s Malaria Initiative. Malaria Communities

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<sup>13</sup> United Nations Department of Economic and Social Affairs, Statistics Division, Millennium Indicators Database.

<http://www.un.org/special-rep/ohrlls/ldc/MDGs/Table-A9.pdf>

<sup>14</sup> MEASURE DHS STATcompiler. Macro International.

<http://www.statcompiler.com/index.cfm>

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<sup>16</sup> Barat, LM. "Four success stories: How malaria burden was successfully reduced in Brazil, Eritrea, India and Vietnam." *American Journal of Tropical Medicine and Hygiene*. 2006. 74(1). pp. 12-6.

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