



INNOVATIONS IN PRIVATELY DELIVERED MALARIA HEALTHCARE: EXPLORING THE EVIDENCE BEHIND EMERGING PRACTICES

» The Center for Health Market Innovations (CHMI) (healthmarketinnovations.org) profiles more than 70 malaria control programs that engage the private sector in low- and middle-income countries (LMICs).ⁱ CHMI documents programs that use innovative delivery and financing approaches to improve access, quality, or affordability of healthcare for the poor for malaria and many other health areas. This brief draws on data from the CHMI programs database and external evidence to provide an overview of market-based interventions for improving malaria healthcare, highlight promising approaches, and identify opportunities for future research.

Key Takeaways

- More than 50% of the malaria control innovations in the CHMI database are concentrated in East and West Africa and 40% are programs run by not-for-profits.ⁱⁱ
- Many of the innovations focus on increasing coverage of key malaria interventions, particularly high quality antimalarials (artemisinin-based combination therapies or ACTs), bednets, and rapid diagnostic tests (RDTs) through private sector channels. Social marketing, vouchers, and subsidization of products are the most commonly applied types of approaches, and there is some evidence that they have increased utilization among consumers and improved pro-poor targeting. More research is needed on the effects of these interventions on the quality of the products and health outcomes.
- Innovative use of technology is also common among CHMI programs. Often programs incorporate technology to improve quality and access at lower costs and change patients' health behaviors. However, evidence on the impact and effectiveness of these interventions on malaria outcomes is limited.

The private sector has a particularly important role to play in ensuring the supply and efficient distribution of drugs, diagnostics, LLIN's and other interventions against malaria.

– Roll Back Malaria

Photo Above: The private sector plays a large role in the supply and distribution of commodities supporting the prevention and diagnosis of malaria, including insecticide-treated nets. Here, a woman watches her baby sleep under a mosquito net in Jakarta, Indonesia. Photo by Oscar Siagian for CHMI

ⁱ These are programs or policies – implemented by a wide variety of public and private actors – that have the potential to improve LMIC health systems where private providers tend to predominate and household out-of-pocket spending is a major source of health financing.

ⁱⁱ These figures represent captured data on the CHMI database and may not be representative of the entire malaria program landscape.

Overview of Market-Based Interventions in Malaria

The private retail sector plays an important role in malaria control. Households in many countries rely on retail outlets and other private providers to access malaria drugs in part due to persistent stock-outs in the public sector.^{1,2} For example, in Cambodia, patients first sought care from private providers in 90% of fever cases,³ whereas in Laos, initial treatment was sought in the private sector in 63% of fever cases.⁴ In particular, private retail outlets, such as drug shops and kiosks, play an important role in the provision of malaria medicines. Worldwide, as much as 50% of anti-malarial medications are distributed by the informal retail sector.^{5,6} In rural Tanzania, the private sector supplied 58% of antimalarial drugs, mostly through the retail sector, which provided 39% of all antimalarial drugs;⁷ in the malaria-endemic district of Sre Ambel in Cambodia, 22% of residents sought treatment for malaria from private practitioners and 63% sought treatment from private drug vendors.⁸ The private sector has also played a large role in the supply and distribution of commodities supporting the prevention and diagnosis of malaria, including insecticides, insecticide-treated nets (ITNs), medicines, and diagnostic tests.

Given the important role of the retail sector, it is not surprising that innovators in many countries have sought to leverage the sector to improve access to key commodities and improve the quality of malaria services offered. Health worker shortages, medicine stock-outs, and lack of quality diagnostic equipment often hinder the ability of public providers to implement effective case management strategies. While a long term strategy may be to improve public health facilities, many innovators are filling the gap by training and equipping alternative front-line service providers—including drug shop attendants, community health workers (CHWs) and Village Health Teams—to sell health commodities and drugs, improving the availability and quality of care.⁹ One particular focus of quality improvement efforts has been expanding access to diagnosis. Diagnosing malaria properly and providing appropriate case management reduces unnecessary resource allocations for expensive drugs, which is important as global funding for malaria control levels off.¹⁰ Moreover, appropriate diagnosis also ensures that those with other febrile illnesses are treated properly.

Information and education efforts targeting consumers have complemented these efforts. These campaigns often seek to increase demand for the prevention, diagnosis, and treatment services and products that drug shops and CHWs typically supply.

Highlights From an Overview of CHMI-Profiled Malaria Programs Include:

- The private sector plays a large role in the supply and distribution of commodities used to prevent and diagnose malaria, and as much as 50% of anti-malarial medications are distributed by the private retail sector.
- Health worker shortages, medicine stock-outs, and a lack of diagnostic equipment often hinder public providers from implementing effective case management strategies.
- Many programs are training CHWs, drug shop attendants, and Village Health Teams to sell drugs and commodities to fill distribution gaps.

Market-Based Activities of Malaria Programs

The CHMI database currently captures comparable data on more than 1,200 programs in over 100 countries, including 70 malaria control programs. CHMI documents programs that use innovative delivery and financing mechanisms to improve access to high quality, affordable healthcare for low income and vulnerable communities.ⁱⁱⁱ Programs are categorized by the approach they take to improve healthcare: *Organizing Delivery, Financing Care, Regulating Performance, Changing Behaviors, and Enhancing Processes*. The graph on page 3 outlines the number of CHMI-profiled malaria programs that use innovative delivery, regulatory, and financing approaches within these categories. Approaches profiled in this brief were selected through a review of the approach of CHMI-profiled programs and discussion in the gray literature.

The private sector plays an active role in the provision of malaria prevention, diagnosis, and treatment services. In turn, many innovators across social enterprise, nonprofits, corporations, and government have experimented with new approaches aimed at improving availability, access, and affordability of care in the private sector. The following sections examine commonly used and established market-based approaches in addition to new and emerging approaches, and present the available supporting evidence—or lack thereof—about their effectiveness in improving the quality, affordability, and accessibility of malaria services. However, an outstanding question remains as to whether these approaches have resulted in improved health outcomes for target populations in LMICs.

See Page 3 for Innovative Malaria Program Activities Graph »

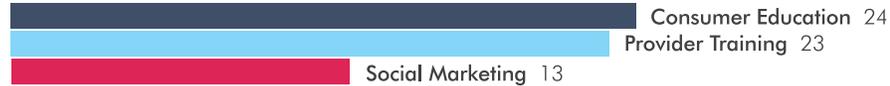
ⁱⁱⁱ In-country partners in more than 20 countries and global analytic partners obtain CHMI data through systematic searches for innovative health programs in a broader set of countries. Direct searches are supplemented by literature reviews and self-reported information from programs. As a result, the data is limited to the information captured by contributions to the CHMI database, and does not capture the full universe of relevant programs.

Innovative Malaria Program Activities^{iv, v}


ENHANCING
PROCESSES




CHANGING
BEHAVIORS




REGULATING
PERFORMANCE




FINANCING
CARE




ORGANIZING
DELIVERY



Reported Results: Tracking Program Performance

While some programs have performance results that have been externally verified, other programs are too small-scale or resource-limited to carry out full evaluations. In order to capture the universe of performance results, CHMI launched the Reported Results initiative to capture “what’s working,” or achieving the kind of health and financial protection results that are important to national and global health policymakers, donors, investors, and other program implementers. Reported Results are clear and quantifiable self-reported statements of program performance related to health access, operations/delivery, and health status. For more information please visit: Bit.ly/CHMIReportedResults.

This report captures both externally verified studies (under “The Evidence”), and self-reported performance results to CHMI (under “Reporting Results”.)

^{iv} This data is drawn from the CHMI database, downloaded on January 21, 2013 from <http://healthmarketinnovations.org/>

^v Programs may be tagged as having more than one approach.

What We Know About Better-Studied Market-Based Models

ITNs, effective antimalarials, and RDTs are important commodities that are at the core of global malaria control and elimination campaigns. Alongside efforts to improve the public sector delivery of these interventions, a number of organizations have focused on using the strong procurement and distribution networks of the private sector. In doing so, they had to tackle a number of problems: chiefly, how to ensure that the cost of these commodities is not a barrier to access, especially for the poorest; and how to ensure rational and appropriate use of ACTs so that resources are not wasted and drug resistance does not emerge quickly.

Organizations are identifying a range of approaches to tackle these challenges. Some are using vouchers to address equity and cost, while others are using social marketing to promote the sale of ACTs, RDTs, and long-lasting insecticide-treated nets through trained community health workers and healthcare providers. Some organizations are also exploring ways to subsidize ACTs in the private sector to support rapid scale up. Programs utilizing these approaches are well studied and have a solid base of evidence indicating their effectiveness, including evidence demonstrating that they improve access to priority interventions and the quality of care.

› Social Marketing and Vouchers: A Targeted Approach to Expanding Access

Thirteen CHMI-analyzed malaria programs use social marketing or commercial marketing techniques to encourage the uptake of health products. Social marketing typically involves selling a branded and subsidized health product, and using the marketing mix—price, product, place, and promotion—to ensure the product or training corresponds to consumer values.⁶ Setting the optimal price for a product is a particular challenge for social marketing programs since the optimal price from a public health perspective (usually a price low enough to encourage uptake and not exclude the poor) is often not the optimal price from a commercial perspective (a price high enough to earn a profit). This is particularly salient for preventative products, like ITNs, where anything other than free distribution has been shown to exclude the poor.^{6,7,8}

Some CHMI-profiled programs, including the **Tanzania National Voucher Scheme**,⁹ address this issue by coupling social marketing with vouchers. Vouchers are distributed to a targeted group and can be presented at participating retailers to obtain ITNs for free or at a significantly subsidized price. Retailers are then reimbursed by the government or another copayer.¹⁵ This combination has the potential benefit of combining an efficient distribution network with a payment

mechanism ensuring that retailers receive a reasonable profit and that cost is not a barrier to access. Other programs, such as the **Kilombero and Ulanga Insecticide Treated Net Project** in Tanzania, are experimenting with vouchers to introduce new products to a target population, with the expectation that once they have experience using the products, they will value them more and be willing to pay for them in the future.¹⁶ Five malaria programs profiled by CHMI provide vouchers for malaria commodities, including medicines and bednets, or for services such as diagnostic testing.

The Evidence: There is evidence that voucher-subsidized, socially marketed ITNs sold through commercial retailers can help achieve rapid and sustainable ITN coverage.^{17, 18, 19, 20} Studies have shown that this combined approach can successfully target vulnerable populations with long term (three years per net), low-cost solutions through the distribution of ITNs.^{18, 21, 22, 23, 24} However, some studies have noted that very poor households report relatively low awareness and uptake of voucher schemes.²³ The combination of vouchers and social marketing of ITNs has most notably occurred in Tanzania and Ghana, with Tanzania expanding this approach nationally.²⁵

› Reporting Results:

- **Living Goods:** Living Goods is a network of franchised community health providers who provide health education and sell health products at affordable prices in Uganda and Kenya. Community health agents are trained to provide basic health counseling on the causes of malaria, while encouraging clients to call an agent at the first sign of symptoms. The program also piloted voucher programs to jumpstart client demand for priority interventions like mosquito nets. The program reports that its prices are 10-30% below market as a result of its buying power prior to voucher use, resulting in more affordable products to target populations.²⁶ Living Goods is also currently undergoing a randomized control trial (RCT) to measure the impact of its program on under-5 child mortality and morbidity.

› Subsidizing the Private Sector Supply of Acts: Going for Scale

Four CHMI programs distribute subsidized ACTs. Malaria programs have pursued efforts to subsidize ACTs and distribute them at a lower cost to low-income patients in an effort to make recommended treatment more accessible, channeling government funds through public and private sector supply chain networks. This can range from country-level initiatives, like the Nigeria Malaria Booster Program that provides targeted subsidies for quality antimalarials through Patent Medicine Vendors (PMVs),²⁷ to multinational initiatives, like the Global Fund's **Affordable Medicines Facility – Malaria (AMFm)**.²⁸ The AMFm is a financing program launched in 2009 to expand access to affordable ACTs

through price negotiation with ACT manufacturers and subsidies in public and private distribution channels.^{2,3} The Global Fund piloted this program in eight countries; however, its Board decided in 2012 to discontinue independent funding to the AMFm. Countries can still request funding to subsidize ACTs for distribution in the private sector; however, it remains to be seen whether countries will choose to prioritize this over other malaria control funding needs. Other organizations, including Population Services International (PSI), continue to subsidize ACTs in the marketplace.

The Evidence: Evidence indicates that subsidized ACTs can result in reduced prices for consumers from about US\$6-10 per treatment to about US\$0.20-0.50.^{28, 29, 30, 31, 32} However, in many participating countries prices charged by retailers remained higher than the country-specific suggested retail prices.³ Other studies have examined the effect of the AMFm on access to quality-approved antimalarials for low-income and rural populations, finding that while market penetration was high in both rural and urban areas in the pilot countries,^{30, 29} stock-outs of both AMFm and non-AMFm products remained an issue, particularly in rural areas.³ Further research is needed to assess the impact of private sector subsidies on ACT use among high priority populations, particularly children and the rural poor; limited access to ACTs among these populations has been cited as a primary barrier to greater investment in subsidization.³² Additionally, there is a need for evidence on appropriate treatment, as patients are often treated presumptively; as a result, the extent of over-treatment of patients presenting with fever is not well known.³³

Can Private Medical Vendors Effectively Distribute Subsidized Treatment?

- **Nigerian Private Medicine Vendors (PMV):** According to CHMI-commissioned research on PMV malaria management practices in Nigeria, led by the University of Ibadan, providing PMVs with government-subsidized ACTs at a reduced cost was an effective intervention. Participating PMVs were more likely to stock appropriate ACTs, had improved prescribing practices, and adhered better to regulations.³⁴

gap in availability and use of diagnostic testing.^{37, 38} In response, social franchise programs like **MicroClinic International** in Ghana and Uganda and **AMUA** in Kenya are operating CHW-owned franchises to increase access to diagnostic testing, especially in more remote locations.^{36, 39, 10, 40, 41} The goal is to provide an effective alternative for malaria diagnosis in areas where providers lack access to facilities with functional microscopy. There are five CHMI-profiled programs equipping CHWs or other front-line service providers in a franchise model with RDTs for malaria diagnostics.

The Evidence: Evidence indicates that CHWs can accurately use RDTs, dispense ACTs, and counsel patients, increasing the coverage of treatment to areas that need it the most. CHWs studied were also able to maintain the supply chain, guarantee that drugs prescribed had not expired,⁴² and make effective diagnosis and referral of diseases other than malaria, such as child pneumonia.⁴³ Studies have indicated that well-designed training and follow-up support are two critical factors for improving the prescription and use of RDTs by CHWs and other providers.⁴⁴ Such training can enhance the effectiveness of CHWs in diagnosing and counseling patients taking ACTs.¹⁰

Reporting Results:

- **ChildCount+:** ChildCount+ is a mobile health platform that uses SMS to facilitate and coordinate the activities of CHWs across ten sub-Saharan African countries and to register patients and their health status on a central web-based dashboard. Data collected through the network of CHWs provides a real-time view of the health of a community, providing insights into areas of health such as malaria or malnutrition that require greater attention. CHWs can also use ChildCount+ to coordinate the delivery of commodities such as home-based RDT testing and ACTs to communities with shortages. This program is currently undergoing a third party evaluation.⁴⁵ Three of the four sites report a high level of improved efficiencies and an improved ability to set care priorities.⁴⁵

What We Know About Emerging Market-Based Models

There are a number of emerging areas of innovation and experimentation around malaria that are generating significant excitement within the global health community; however, there is less evidence to support the effectiveness and impact of these particular models. In particular, the private sector is implementing innovative technologies, using diagnostic tools, mobile phones, and data collection systems to improve malaria prevention, diagnosis, and treatment. Although the evidence for these methods is limited, many approaches are promising.

Increasing Access to Diagnostic Services Through CHW-Owned Franchises: Bringing Point-of-Care RDTs to the Patient

The development of RDTs, which quickly test for the presence of malaria parasites through a one-time-use device, has been a major technological advancement and has contributed to the scale up of malaria diagnosis in both the public and private sectors. Ministries of Health drive much of the large-scale procurement of RDTs and primarily target the public health sector.^{35, 36} However, due to scarcity of accessible public health facilities and personnel in many countries, there is still a major

› Mobile Data Collection: Tracking Malaria Surveillance Data with Mobile Technologies

The WHO points to malaria surveillance systems as a high priority and major gap in current malaria control approaches, with existing systems detecting only around 10% of the estimated global number of cases.¹ On average, national malaria surveillance systems only collect data from about 20-25% of private health care facilities, which is particularly problematic in countries where half of patients or more seek care in the private sector.¹ Mobile technologies, such as mobile phones and PDAs, are tools that can be used to inexpensively and effectively collect data on malaria incidence, and this can often be extended to track intervention effectiveness. The All-Party Parliamentary Group on Malaria and Neglected Tropical Diseases suggests scaling up mobile phone reporting systems as one of its key recommended actions to improve malaria surveillance systems in Zanzibar, which has eliminated malaria three times in its history, only to see it resurge when control efforts abate and cases are imported from mainland Tanzania.⁷ Data collection with mobile phones can help privately operated programs track this information and contribute to the national malaria surveillance system. There are nine programs using mobile phones to track malaria data in the CHMI database.

The Evidence: Some evidence suggests that mobile phone data collection systems require minimal setup and ongoing costs, increase reporting timeliness,⁴⁶ and improve malaria surveillance and epidemic detection.⁴⁷ Additional research could determine not just whether these programs work, but how they work, and their key factors for success. There are no mobile phone data collection models reporting results to CHMI.

› Mobile Phones: Tracking the Supply Chain and Distribution of Malaria Health Products

Mobile phones are increasingly being used to track inventory levels and, in turn, decrease the likelihood of stock-outs, which leave health workers without the tools to diagnose malaria and patients without immediate access to treatment.⁴⁸ Four malaria programs profiled by CHMI use mobile phones to track supply chain inventory levels, typically via SMS. Health workers periodically SMS stock details to those responsible for managing their supply, allowing for replenishment of depleted items before a stock-out.⁴⁹ Mobile technology can also be used to track bed net distribution efforts, allowing health workers to electronically record the status and location of bed nets during surveys following their distribution.

The Evidence: Some program-specific data suggest that mobile phones used to track inventory levels can reduce stock-out rates for malaria medications and RDTs.⁴⁶ **SMS for Life** provides an example of efficient and accurate stock management through mobile technologies.⁴⁷ Few mobile phone supply chain models

report results to CHMI. More research could determine the affordability of implementing this model and the feasibility of scaling up this activity in resource-constrained settings. Further research could also assess whether mobile inventory tracking can improve access to bed nets, RDTs, and ACTs in different contexts, and what the impact is on health outcomes.

Evidence Gaps and Research Opportunities in Malaria

Over the past 10 years, progress has been made in the financing and implementation of malaria control programs. However, progress began to level off in 2010 in parallel to diminishing funding levels,¹ pointing to the need for innovative and cost-effective approaches to ensure universal coverage of malaria interventions. It is clear that the private sector will play an important role in the implementation of new and innovative practices, ranging from the use of private supply chain networks to distribute essential commodities, to the development and adoption of technological innovations.

A number of well-established approaches used by malaria programs, such as social marketing, are effective when used in family planning and other priority health programs. In the context of malaria, a unique feature is that these approaches are being used effectively in combination, with social marketing and vouchers for ITNs, and targeted government subsidies for malaria drugs flowing through private supply chains. While early evidence suggests that the use of mutually reinforcing strategies can successfully target vulnerable populations, and increase adherence to quality care protocols, more research could determine how to effectively combine approaches to make the biggest impact. A number of gaps remain: evidence about impact on population-level health outcomes is insufficient; and there is little available evidence on the cost-effectiveness of interventions involving the private sector.

Other technology-centric developments have also started to emerge, such as point-of-care RDTs, mobile data collection, and mobile supply chain tracking tools. While each of these products seems to hold great promise, there is limited or no evidence available currently about their impact on malaria outcomes. Early evidence from a few programs suggests that the models that rely on existing technology infrastructure, such as mobile phone platforms used for data collection and inventory monitoring, can result in cost savings and increased efficiencies. However, little evidence indicates the actual impact of these programs on malaria control, and the key factors for success. More research could help the community to understand whether the expected benefits can be actualized on a large scale, and to determine whether these products contribute to improved health outcomes. **PAGE 7 »**

Finally, what emerges is that there continues to be limited evidence on the scale of the private sector's contribution to malaria control, and how it interacts with public sector contributions. In particular, the cost-effectiveness of interventions delivered by the private sector is under-researched, and the malaria treatment practices of informal providers are not fully understood. The private sector could also do more to identify sustainable financing solutions for malaria interventions. Some programs are tapping into a range of non-state funding sources, but they are not always designed for long-term implementation. Going forward, CHMI will continue working with its partner organizations on the ground to identify more innovative health programs, and with research institutions to showcase the evidence around such models. In doing so, CHMI aspires to identify which health programs have the greatest potential to harness innovation to control malaria.

The brief was prepared by Onil Bhattacharya, Kathryn Mossman, and the T-HOPE team⁶ at the University of Toronto, in collaboration with the Results for Development Institute.

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