

A Global Subsidy: Key To Affordable Drugs For Malaria?

A global subsidy could well have joined the “graveyard of good ideas” had it not been for an international environment of openness.

by **Ramanan Laxminarayan and Hellen Gelband**

ABSTRACT: The global fight against malaria has been continually challenged by poor access to affordable, effective medicine. Growing resistance to chloroquine, the traditional treatment, has worsened the situation. Artemisinins, the successor therapy to chloroquine, are at least ten times more costly than the older drug. In developing countries, most malaria medicines are purchased in the private sector, where traditional aid mechanisms do not reach. So a new aid approach was needed. The Affordable Medicines Facility–malaria (AMFm) will efficiently supply publicly subsidized drugs to meet public- and private-sector demand in malaria-endemic countries. If artemisinins are priced more competitively, resistance to them will be delayed. [*Health Affairs* 28, no. 4 (2009): 949–961; 10.1377/hlthaff.28.4.949]

CHLOROQUINE WAS THE ORIGINAL MIRACLE DRUG for malaria—effective for half a century in Africa, safe, and cheap. Despite the spread of chloroquine-resistant malaria parasites (*Plasmodium falciparum*) throughout Southeast Asia beginning in the 1960s, no plans were laid for replacing chloroquine throughout Africa until it was failing in a big way, toward the end of the 1990s. Even though it was clear that no other available and relatively inexpensive drugs would last more than few years before resistance set in, there was no movement to introduce the single best new alternative: the artemisinin compounds. In use in Asia for decades, artemisinin compounds—derived from the plant species *Artemisia annua*—are heirs apparent to chloroquine.

No serious attempt was ever made to try to preserve chloroquine’s effectiveness by promoting combination therapy, now the standard in infectious diseases such as tuberculosis and HIV/AIDS. But with no backup for the artemisinins, malaria thought leaders began laying out a case for delaying their (inevitable) loss to resistance by using them only in combination with another antimalarial.¹ The partner drugs would protect the artemisinin by killing any parasites that, by chance, contained an artemisinin resistance mutation. Partner drugs would also be protected

.....
Ramanan Laxminarayan (ramanan@rff.org) is a senior fellow at Resources for the Future, a policy think tank focusing on environmental, energy, natural resource, and public health issues, in Washington, D.C. Hellen Gelband is a program fellow there.

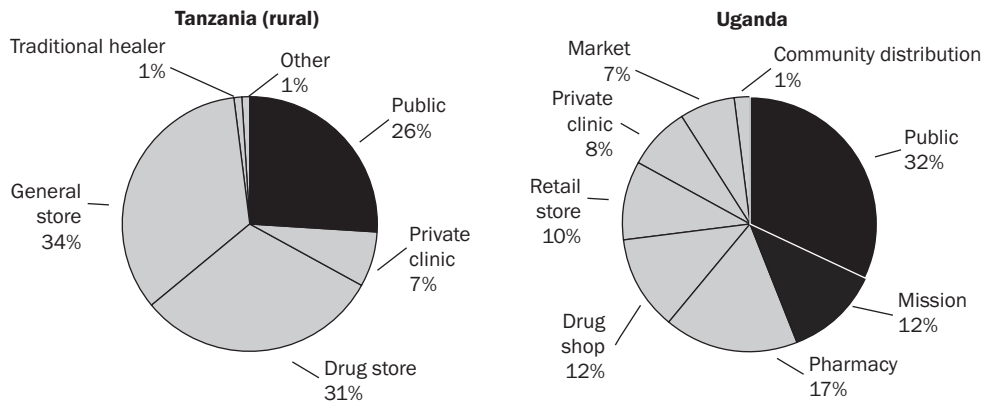
by the artemisinin, although to a lesser extent because artemisinin compounds have a very short half-life: partner drugs would remain in the bloodstream after the artemisinin was long gone. The debate about monotherapy versus combination therapy would last another few years. Artemisinin monotherapy predominated in Southeast Asia, worrying malaria control experts, but even more worrying was its coming introduction in Africa, where the population at risk was an order of magnitude bigger.

The crisis of chloroquine resistance gave way to a new crisis: new, effective drugs for malaria were too expensive for all but the best-off. If most people could get these drugs at public clinics, it would be an easier problem to address, as long as there was adequate funding (from domestic and external sources). Bilateral aid programs of donor countries and global programs—notably, the Global Fund to Fight AIDS, Tuberculosis, and Malaria—are best able to funnel aid through public coffers and certain private-sector organizations, especially secular and faith-based nongovernmental organizations (NGOs) with clinics that serve the public, much as true public-sector facilities do. But these programs were not largely aimed at the for-profit private sector, despite the fact that more than half of the malaria treatments in African countries are purchased in this sector and paid for privately (Exhibit 1).²

In rural villages, most people buy malaria medication at drug stores, at general stores, or from local peddlers for what is a very common, and only occasionally fatal, affliction. No conventional aid mechanism is designed to provide (or subsidize) medications through these channels.

In 2001 the U.S. Agency for International Development (USAID) approached

EXHIBIT 1
Locations Where Patients Access Treatment, In Tanzania (Rural Areas) And Uganda, 2006



SOURCE: Dalberg Global Development Advisors, *Affordable Medicines Facility—Malaria: Technical Design* (Geneva: Roll Back Malaria Partnership, 2006).

the U.S. Institute of Medicine (IOM) to convene a panel to consider whether an immediate switch to artemisinin-based drugs was needed and how, eventually, artemisinins could be made more affordable.

At the same time that the IOM was getting ready to form a committee to address USAID's questions, the discussion about monotherapy versus combination therapy had progressed to consensus in favor of combination therapy. In 2001 the World Health Organization (WHO) issued a recommendation that artemisinins be used only in combination—as artemisinin-combinations therapies (ACTs)—for the treatment of uncomplicated malaria.³

An Early History Of The Global Subsidy

The IOM committee that was formed in 2002 decided that it had to address the question of resistance as well as access to effective antimalarials.⁴ The committee grappled with the challenges of making effective malaria drugs widely accessible to those who need them, and protecting against the emergence of drug-resistant malaria.

■ **Access to antimalarials.** The challenge of access to antimalarials, which are sold mainly as consumer products in small shops and retail outlets, is different from that for drugs treating AIDS or TB. The need for malaria treatment is urgent and unpredictable in the remote African villages where malaria is common. For these populations, although the era of chloroquine effectiveness ended because of drug resistance, chloroquine use has not, because it is still so much cheaper than artemisinins or other drugs.

■ **Protection against drug resistance.** The second challenge was protecting against the emergence of resistance. The WHO had the right guidance—coformulated (that is, both drugs in one pill) ACTs only—but not the right audience, at least in the private sector. The thriving Southeast Asian private-sector market in artemisinin monotherapy prefigured the likely future pattern in Africa. Governments could purchase ACTs and could outlaw monotherapy use officially, but most would be unable to enforce such a ban.⁵

■ **The IOM's global-subsidy proposal.** In its 2004 report on malaria drugs, the IOM committee proposed a global subsidy high in the distribution chain, which would have the effect of making ACTs inexpensive and allowing them to outcompete artemisinin monotherapies on price and other drugs on effectiveness.⁶ The market would again dictate choice; however, the subsidy would ensure that consumers would benefit. If the drugs enter the top of the distribution chain at “chloroquine prices” (and assuming an adequate global supply), they should also come out at “chloroquine prices.” Unsubsidized artemisinin monotherapies would be much more expensive, and other cheap drugs would be less effective. After the IOM report was published, the public debate took off, catalyzed by discussions at a meeting convened by the World Bank in September 2004.⁷

■ **World Bank's analysis.** The idea of a subsidy to pay for a global public good—

“Even a partial subsidy that was able to crowd out artemisinin monotherapies would be preferable to a delay in implementation.”

.....

artemisinin effectiveness—was appealing to the bank’s Health, Nutrition, and Population Department and the leadership of its Human Development Network, who saw an opportunity for the bank to use its convening power and multidisciplinary resources to ensure access to cheap antimalarials. Its selling points were the promise of increased access to life-saving drugs and the delay of large-scale drug resistance. But would a massive release of ACTs into the market itself lead to drug resistance, essentially negating the global public goods argument?

To address this, the World Bank commissioned an analysis of whether vastly expanding the use of ACTs and reducing or forestalling the use of artemisinin monotherapies would delay resistance, or whether it would create greater opportunities for resistant parasites to emerge and spread. The analysis was published as both a World Bank working paper and, later, a paper in the inaugural global health issue of *Health Affairs*.⁸

If it had turned out that greater use of ACTs led to greater opportunities for resistance—even with monotherapy use minimized—that could have been the end. But the model showed that under a range of plausible assumptions, use of ACTs could increase greatly with the subsidy, and the risk of resistance would still be lower than it would be without the subsidy.

The analysis led to three conclusions: (1) The global ACT subsidy would likely extend the therapeutic life of artemisinin drugs because the benefits of crowding out monotherapies outweighed increased resistance that would result from greater ACT use. (2) Even a partial subsidy that was able to crowd out artemisinin monotherapies would be preferable to a delay in implementation. Use of artemisinin monotherapy posed a high risk of resistance emerging, with potentially serious consequences for malaria control. (3) Subsidizing two or more ACTs, compared with subsidizing just one, was likely to be more cost-effective and further delay the time when artemisinin resistance would become an obstacle to malaria control.

The study was featured in more than sixty popular print and electronic outlets around the world, including the BBC and the Voice of America. The science press also covered the idea in *Science* and the *BMJ*.⁹

■ **Prolonged access problems.** While this analysis was in preparation and afterward, the global-subsidy idea moved ahead, but not without continued opposition, this time from outside the World Bank. One argument was that the existing aid mechanisms would, in short order, supply private-sector needs through community health workers and other novel approaches. The slow pace of the process is lamentable, but it has exposed the fallacy of the original argument: four years after the release of the IOM report, access to artemisinins in the African private sector is very

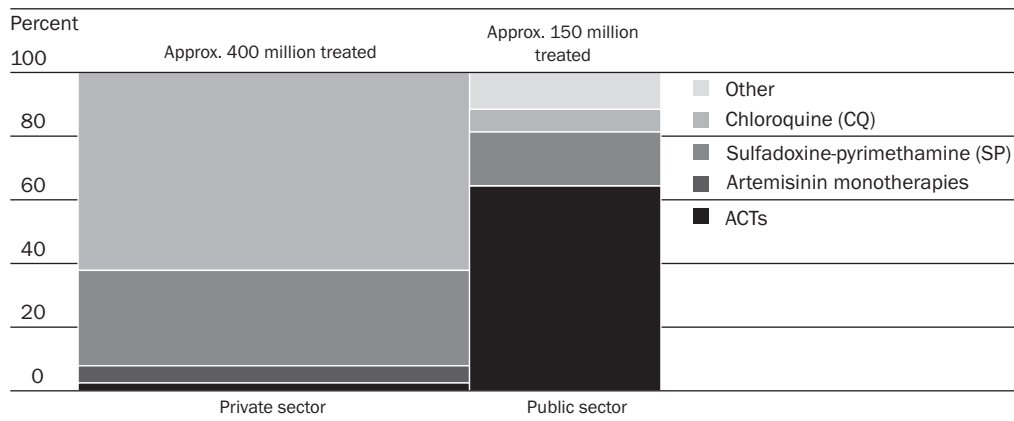
poor (Exhibit 2) and is still inadequate in public-sector facilities, where price could presumably be controlled.

In a 2007 survey in nine rural districts of Uganda, where artemether-lumefantrine (AL, an ACT) has been the official first-line drug for uncomplicated malaria since 2004, antimalarials were for sale in 539 private-sector outlets, but only fifty—less than 10 percent—had any ACTs, and thirty of those outlets were concentrated in two districts.¹⁰ Chloroquine and sulfadoxine-pyrimethamine—both no longer effective in Uganda, but inexpensive—were available everywhere.

From Concept To Plan

All along, it was recognized that the global-subsidy concept had sprung from sound economic roots and is most often associated with the well-respected U.S. economist who chaired the IOM committee, Kenneth Arrow. It also helped that, although the idea was economically sophisticated, noneconomists, including those in malaria research and control, easily understood it. It was consistent with people’s experience of how malaria drugs were acquired in malaria-endemic countries, and understanding how the subsidy would work was intuitive for both academics and practitioners. Opponents and supporters alike were quick to point out that the subsidy would not do everything. Still needed were complementary interventions—in particular, information and education for the various levels of sellers and for patients, and more operational research (for example, on how best to inform people about using ACTs appropriately). Early on, the IOM report emphasized that the things that were not being provided adequately to support the introduction of ACTs in the absence of the subsidy still would be needed, and more urgently, if the subsidy succeeded as anticipated.

EXHIBIT 2
Antimalarial Medications Used In The Public And Private Sectors Worldwide, 2006



SOURCE: Dalberg Global Development Advisors, *Affordable Medicines Facility—Malaria: Technical Design* (Geneva: Roll Back Malaria Partnership, 2006).

NOTES: ACT is artemisinin combination therapy. Approximately 550 million people were treated with antimalarials in 2006.

“Support for the subsidy was linked in many quarters with adequate funding for complementary interventions.”

.....

The IOM committee considered monitoring prices and access integral to the subsidy, and the cost of such monitoring legitimately added to the subsidy cost. The price tag for monitoring was not estimated by the committee but was thought to be relatively small. The committee also held that the complementary interventions, while also necessary, were part and parcel of malaria control more generally. After all, people needed information about malaria treatment, particularly about ACTs, whether or not there was a subsidy. That cost should not become part of the cost of the subsidy. This distinction was moot, however, as it became apparent that support for the subsidy was linked in many quarters with adequate funding for complementary interventions.

■ **RBM Partnership and the global subsidy.** The Roll Back Malaria (RBM) Partnership quickly became interested in the subsidy. RBM, founded in 1999 by the WHO, the United Nations Children’s Fund (UNICEF), the United Nations Development Program (UNDP), and the World Bank, had in April 2000 convened the first-ever summit on malaria in Abuja, Nigeria. There, senior officials from forty-four of the fifty malaria-affected African countries, including nineteen heads of state, committed themselves to halving malaria mortality in Africa by 2010.¹¹ Aggressive expansion of malaria prevention (mainly through insecticide-treated bednets) and prompt treatment would both be needed. The treatment goal was to reach 60 percent of those suffering from malaria with prompt access to affordable and appropriate treatment within twenty-four hours after symptoms appeared.¹² Meeting this target would be impossible without widespread access to ACTs in the public and private sectors alike. A representative of the World Bank chaired RBM’s Finance and Resources Working Group, and it was in this role that the bank advanced the global subsidy as the only extant proposal through which the Abuja target could be met.

■ **Addressing the operational issues.** But skepticism quickly arose about the idea itself and about operational issues. How would such a program actually come into being? In consultation with the RBM secretariat, the World Bank, in its capacity as chair of the RBM Finance and Resources Working Group, had commissioned the analysis referred to earlier.

When this Working Group (now the Resources Working Group) met in late 2005 to discuss the modeling analysis, it concluded that a basis for exploring the subsidy idea further had been established and that it was time to address the operational questions. The next step was to apply to the Bill and Melinda Gates Foundation for a grant to the World Bank on behalf of the RBM partnership, to convert the idea of a malaria subsidy into an operational plan. In late 2006 the Gates Foundation granted \$4 million to operationalize the subsidy and to introduce the concept to a wider group of stakeholders.

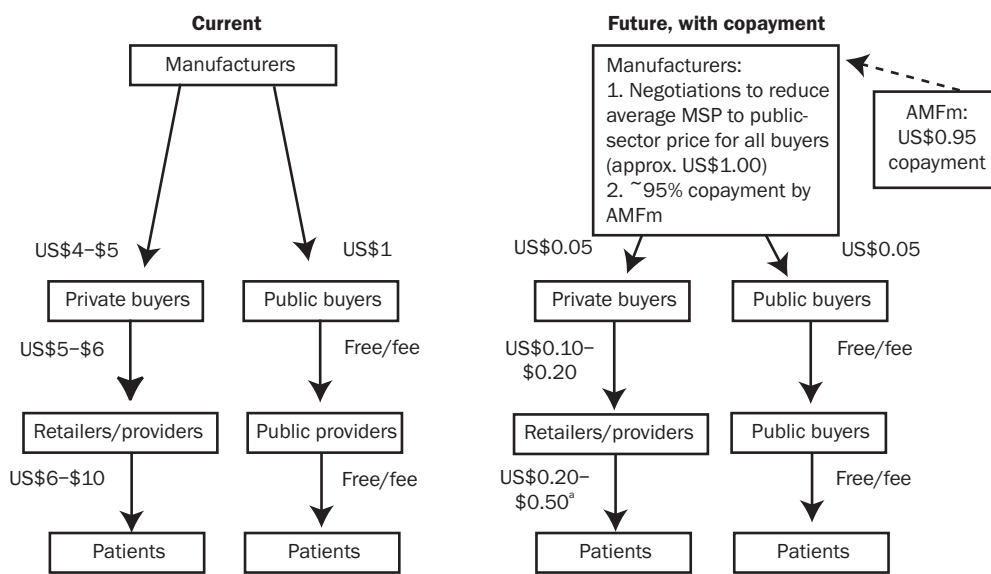
Through competitive bidding, the bank chose Dalberg Global Advisors to conduct this work under the Gates Foundation grant. With promotion by RBM, continued support from others, and the boost from the Gates Foundation grant and Dalberg's work, the idea of a global subsidy took hold.

■ **International responses.** Around the same time in 2005, the modeling work on resistance was presented at a high-level World Bank-hosted meeting in Paris, at which a new urgency in malaria control was also recognized.¹³ The malaria-endemic countries represented at this meeting were enthusiastic about a global subsidy, but proponents of bednet use were concerned that the subsidy could divert resources to treatment. The IOM committee had been careful to insist that resources for the subsidy be incremental to those allocated to other malaria-control activities, but this recommendation could be ignored. There was also enthusiastic support from some donors, most notably the Dutch, who saw the subsidy as complementary to their efforts. Translating this enthusiasm into a real plan was still two years away.

From Plan To Implementation

The initial phase of the bank's engagement involved a balance between technical detail and coalition building. A detailed schema for how the subsidy would work was devised (Exhibit 3). The retail price would be reduced from US\$7–\$8 to US\$0.30–\$0.40 for the consumer buying an ACT at a shop, with wholesaler and

EXHIBIT 3
Projected Effect Of Global Subsidy On Artemisinin Combination Therapy (ACT) Prices



SOURCE: Dalberg Global Development Advisors, *Affordable Medicines Facility—Malaria: Technical Design* (Geneva: Roll Back Malaria Partnership, 2006).

NOTES: MSP is manufacturer sales price. AMFm is Affordable Medicines Facility—malaria.
a For majority of patients.

retailer markups, assuming about a 95 percent subsidy at the “factory gate.”

■ **The politics.** At the same time, the politics demanded attention. Although the British Department for International Development (DfID) and the Dutch government were supportive of the subsidy scheme, institutions such as the WHO and the Global Fund leadership remained opposed.¹⁴ The leaders of the WHO’s Global Malaria Program had developed their expertise in strategies for TB treatment and prevention, which is largely done in the public sector, and were skeptical that a solution that depended on the private sector was feasible. The Global Fund leadership offered technical concerns but may also have been worried that the antimalarial subsidy was in direct competition with the fund’s own malaria financing, which took a more traditional approach. Meanwhile, support was growing among partners who saw synergies with their own plans. For instance, the Medicines for Malaria Venture (MMV) pipeline was populated largely by ACTs and artemisinin-like drugs. MMV recognized that it was unlikely that its drugs would be widely available without a financing mechanism to make them cheaper. The public-sector market alone—perhaps 100 million treatment courses per year—was simply not large enough for more than a couple of antimalarials. And equally, if not more, important, the loss of artemisinin to resistance would jeopardize any future for many MMV drugs.

■ **Concern in Amsterdam and Clinton pilot study.** In January 2007 the Dutch Ministry of External Affairs, which had become an important ally, hosted a forum in Amsterdam on the global subsidy. The World Bank and the broader RBM Partnership brought together about 200 delegates from bilateral agencies, the WHO, NGOs, universities, the original IOM committee, and other interested organizations. For many, the Amsterdam meeting was a first exposure to the idea. Indications that the word “subsidy” was politically unpalatable came through at this meeting and elsewhere, leading to the initiative’s renaming as the Affordable Medicines Facility-malaria, or the AMFm.

Not for the first time, a concern was expressed in Amsterdam that a subsidy at the wholesaler level might not be reflected in retail prices; that is, that the subsidy would be “captured” by intermediaries. In response, the William J. Clinton Foundation stepped in with a pilot study in Tanzania. Within a few months the foundation had organized a baseline survey in three districts: Maswa, Kongwa, and Shinyanga.¹⁵ The Clinton Foundation was new on the malaria scene and was trying to expand its engagement beyond its previous role of negotiating lower drug prices. Although important, this was not as critical as it had been for HIV treatment, where success could be achieved through tiered pricing. Since no wealthy market of importance exists for malaria, tiered pricing was not an option.

The Clinton Foundation pilot was encouraging. In the first postsubsidy survey, ACT prices were as low as (or lower than) expected, and purchases increased steeply. The proportion of customers who bought ACTs increased from less than 1 percent to roughly 44 percent in the two intervention districts in a few months.

And they paid the same average price or less for ACTs as for older drugs.¹⁶ No change was recorded in the control district.

■ **Other concerns.** Some questioned whether the results of the pilot could be extrapolated to other countries.¹⁷ Another concern was that the subsidy would not help the “poorest of the poor”—those who never had financial access even to chloroquine. Indeed, in the Tanzania pilot, the subsidy reached the second and third income quintiles—poor by any definition—but did not have much effect on the lowest quintile, which had always been largely excluded from the market. To some bilateral agencies, this was problematic given their explicit mandate to direct development dollars to reducing poverty. However, supporters of the AMFm argued that public medical facilities—the recipients of most global aid historically—are used more by the better-off than by poorer inhabitants (including the second and third income quintiles). This meant that the AMFm should reach farther down the income ladder than would aid given through the more conventional channels.¹⁸

These concerns notwithstanding, there was now sufficient basis to move the AMFm ahead. In November 2007 the RBM board endorsed the AMFm during its annual meeting in Addis Ababa, Ethiopia.¹⁹ That was a major boost, although not easily achieved.

■ **Searching for a suitable “host.”** At that point, the search for a suitable host for the AMFm began. The original IOM committee had favored housing the subsidy in an existing institution—with the caveat that the financial architecture had to be maintained—instead of setting up a new entity. A number of institutions were willing, including the Global Fund, WHO, UNICEF, and private firms. Eventually, the RBM board settled on the Global Fund to host the AMFm.

■ **Bringing science to bear on lingering issues.** As attention moved from RBM to the Global Fund, support for the AMFm from donors, endemic countries, NGOs, academics, and others broadened, but detractors were still vocal. In early 2008 the U.S. delegation to the Global Fund board again expressed deep concern about the AMFm.²⁰ It questioned the safety of widespread distribution of ACTs, which would increase the exposure of pregnant women; the cost-effectiveness of the AMFm relative to other malaria interventions; and the desirability of ACT use in the private sector without the benefit of definitive diagnosis.

These and other concerns were the focus of a Consultative Forum hosted in Washington, D.C., by Resources for the Future in September 2008.²¹ This was the first wholly technical meeting on the AMFm since the deliberations of the original IOM committee; it engaged the best malaria experts alongside donors and policy-makers. Key conclusions based on the most recent data were the following. (1) The risk of ACTs to pregnant women and their unborn babies was much smaller than the risk of untreated malaria and no greater than the risk posed by other malaria drugs. (2) No evidence supported including diagnostic testing with a subsidy for antimalarials, although all agreed that increasing the use of diagnostic tests was another priority.²² (3) No other practicable mechanisms in place of, or in addition

“Beyond its novelty for financing, the AMFm challenged three orthodoxies of development assistance and medical care.”

.....

to, a global subsidy would be better at reaching the poorest of the poor. Agreement was nearly unanimous that implementation of the AMFm should not be delayed, with continued recognition of the need for careful monitoring and operational research, which had been articulated originally by the IOM committee.

■ **Inauguration of the first phase.** In November 2008 the Global Fund board approved a plan for the fund to host and manage the first phase of the AMFm in eleven countries. In October British Prime Minister Gordon Brown had committed £40 million (about US\$60 million) from DFID to the first phase of the AMFm; since then, the board of UNITAID, an international drug purchase facility, has approved \$130 million for the AMFm. The AMFm will process its first orders for ACTs in 2009.

Escaping The ‘Graveyard Of Good Ideas’

■ **Challenges met.** Although a rational response to the challenges of malaria treatment in countries with poor health systems, the AMFm was never a sure thing. The idea seemed all but dead at times, only to be revived and carried ahead with renewed enthusiasm. Beyond its novelty as a financing mechanism, the AMFm challenged three orthodoxies of development assistance and medical care.

The first orthodoxy was that aid should be between two countries or between a multilateral institution and a single country. Historical precedents—both political (Cold War) and administrative (easier to keep track of money given to a single country than to a group of countries)—favored this form of assistance.

The second was that development assistance was best provided to national governments—because intervening in local markets was bound to fail. Even when development agencies had engaged with the private sector, it had usually been in the context of social marketing for distribution of bednets or condoms. These programs, typically run by NGOs based in developed countries, recognized that people had to be reached through mechanisms other than the public health system. However, most created an extramarket system to deliver commodities instead of relying on existing markets.

The third orthodoxy challenged was that of drugs prescribed by physicians, available through pharmacies only. To work through the private sector, ACTs would have to be sold over the counter (OTC)—officially. The “medical model” still holds strong sway: a definitive diagnosis (by a physician or surrogate), a prescription, and a drug purchase at an approved drug facility. In most of rural Africa, none of these requirements is feasible, at least in the short-to-medium term. In fact, an official OTC system may give officialdom more rather than less control over the situation. By recognizing that perfect systems would not be built in time

“The story of AMFm so far is of a novel, experimental idea getting a chance to prove itself.”

.....
 to save malaria patients or artemisinins, the AMFm carved out an alternative path for effective drugs to get to patients in the meantime.

■ **Time well spent.** Although to many, the four years that it took for the AMFm to move from IOM committee recommendation to operation was much too long, the time was not idle or wasted. It was necessary for the dialogue within and between institutions to form a coalition in support of the subsidy. Each institution arrived at its acceptance of the AMFm at its own pace and in line with its own principles. For the World Bank, it was important that the proposal be scientifically and economically valid and feasible and that it not cause more harm than good. For UNICEF, the AMFm could help achieve Millennium Development Goal of reducing under-five mortality. For the Global Fund, the recognition that the AMFm was complementary rather than adversarial to its business model came with a change in leadership.

■ **Environment of openness.** The development of the AMFm occurred at a unique time in the history of malaria and international development assistance for health. Since 2003 an unprecedented willingness to change paradigms, develop institutions and arrangements, and allocate funding for malaria has occurred. Besides the remarkable increase in funding for malaria control from the Global Fund, the World Bank Malaria Booster Program, and the U.S. President’s Malaria Initiative, a financier entered the global health world in the form of UNITAID.²³ And, thanks to a major revitalization, the RBM Partnership could lead on malaria control.

The AMFm could well have joined the “graveyard of good ideas” but for an environment of openness and a small set of individuals at the World Bank, the Gates Foundation, DFID, the Global Fund, and the Dutch government who were willing to push for the program even at the risk of criticism from within and outside. The AMFm was also helped by the willingness of the World Bank and the RBM Partnership to broaden the dialogue to partners not traditionally included. Global consensus is more important than ever before, and projects face the high bar of not just having overall benefits exceed costs, but of benefits that must exceed perceived costs for all players involved. The idea, which originated in a committee chaired by a reputed economist, was strengthened by support from subsequent analysis, scientific meetings, and a pilot experiment. Certainly there might have been faster pathways to setting up the AMFm, but it is difficult to predict what would have happened with those alternatives.

Will It Work?

The final chapter in the AMFm’s story cannot yet be written. The story so far is of a novel, experimental idea getting a chance to prove itself. A lot depends on the implementation of the plan at the Global Fund through “phase 1,” which includes

nearly half of the world's population at risk of malaria, and then to global scale. Collusion by a few wholesalers and pharmaceutical manufacturers could undermine the AMFm; monitoring to uncover and prevent this will help keep it on track, but threats from all around must be monitored and problems remedied.

Given the large number of malaria interventions under way around the world, it may be difficult to determine the effect of the AMFm on malaria prevalence or drug resistance. But if it is able to keep ACT retail prices low and displace artemisinin and other monotherapies in target countries, it will have achieved its purpose.

Other measures of whether the AMFm is working will include crowding out ineffective treatments and substandard or counterfeit products. The AMFm should draw more antimalarial manufacturers into producing WHO-prequalified, high-quality drugs. This, too, is measurable.

Finally, the AMFm was conceived as a means to work around poor health systems, not to replace them. The most lasting indicator of success is that with stronger public health systems, the success of malaria elimination, and lower-cost ACTs through technological innovation, the need for the AMFm will disappear.

.....
The authors were supported by Resources for the Future (RFF). The RFF Consultative Forum on AMFm, held in September 2008, was supported by the Bill and Melinda Gates Foundation. The views expressed in this paper are those of the authors and do not necessarily reflect the views of RFF or the Gates Foundation.

NOTES

1. N. White et al., "Averting a Malaria Disaster," *Lancet* 353, no. 9168 (1999): 1965–1967.
2. Dalberg Global Development Advisors, *Affordable Medicines Facility–Malaria: Technical Design* (Geneva: Roll Back Malaria Partnership, 2006). This was difficult to document at the time, although it was something widely held to be true. Subsequent data collection, some in relation to the global subsidy itself, has confirmed that this is, in fact, the case.
3. World Health Organization, *Antimalarial Drug Combination Therapy: Report of a Technical Consultation* (Geneva: WHO, 2001).
4. IOM committees often take the prerogative to shape the questions presented to them so that they address the specific questions asked, but also cover related policy-relevant questions.
5. J. Bohannon, "Arata Kochi Profile: Fighting Words from WHO's New Malaria Chief," *Science* 311, no. 5761 (2006): 599.
6. K.J. Arrow, C.B. Panosian, and H. Gelband, *Saving Lives, Buying Time: Economics of Malaria Drugs in an Age of Resistance* (Washington: National Academies Press, 2004).
7. Olusoji Adeyi, World Bank, personal communication to Ramanan Laxminarayan, 2004.
8. R. Laxminarayan, M. Over, and D.L. Smith, *Will a Global Subsidy of New Antimalarials Delay the Emergence of Resistance and Save Lives?* (Washington: World Bank, 2005); and R. Laxminarayan, M. Over, and D.L. Smith, "Will a Global Subsidy of New Antimalarials Delay the Emergence of Resistance and Save Lives?" *Health Affairs* 25, no. 2 (2006): 325–336.
9. M. Enserink, "Combating Malaria: Malaria Treatment: Act Two," *Science* 318, no. 5850 (2007): 560–563; and J. Tanne, "News Roundup: Subsidies for Malaria Treatment Could Save 25,000 Lives a Month," *BMJ* 332, no. 7541 (2006): 569.
10. Medicines for Malaria Venture, *Understanding the Antimalarials Market: Uganda 2007—An Overview of the Supply Side* (Geneva: MMV, 2008); and WHO, *World Malaria Report 2008* (Geneva: WHO, 2008).
11. RBM Partnership, *The African Summit on Roll Back Malaria, Summary Report*, 2000, <http://rbm.who.int/docs/>

- abuja_sumrep.htm (accessed 22 April 2009).
12. Abuja Declaration and the Plan of Action, "The African Summit on Roll Back Malaria," 25 April 2000, http://www.rollbackmalaria.org/docs/abuja_declaration_final.htm (accessed 16 April 2009).
 13. ReliefWeb, "Malaria Fight in Africa Needs Better Donor Coordination and More Financial Help, Says World Bank Chief," Press Release (Washington: World Bank, September 2005); and World Bank, *Rolling Back Malaria: The Global Strategy and Booster Program* (Washington: World Bank, 2005).
 14. A. Jack, "Malaria Drug for the Poor 'a Bad Idea,'" *Financial Times*, 2 April 2007; and "Money v Mosquito," *Economist* 385, no. 8553 (2007): 90.
 15. U. Samarasekera, "Drug Subsidy Could Help Tanzania Tackle Malaria," *Lancet* 371, no. 9622 (2008): 1403–1406.
 16. William J. Clinton Foundation, *Tanzania Pilot ACT Subsidy: Report on Findings* (New York: Clinton Foundation, 2008).
 17. M. Enserink, "Global Health: Malaria Drugs, the Coca-Cola Way," *Science* 322, no. 5905 (2008): 1174.
 18. F. Castro-Leal et al., "Public Social Spending in Africa: Do the Poor Benefit?" *World Bank Research Observer* 14, no. 1 (1999): 49–72; and World Bank, *Making Services Work for Poor People*, World Development Report (Washington: World Bank, 2003).
 19. See Roll Back Malaria, "Summary of Twelfth RBM Partnership Meeting: Decision Points and Next Steps," <http://www.rollbackmalaria.org/partnership/board/meetings/docs/12pbmDecisions.pdf> (accessed 16 April 2009).
 20. W. Steiger, in memo to PSC colleagues (March 2008).
 21. B.R. Bloom, H. Gelband, and R. Laxminarayan, "Consultative Forum on AMFm—The Affordable Medicines Facility—Malaria" (Washington: Resources for the Future, 2008).
 22. C. Whitty et al., *Opportunities and Threats in Targeting Antimalarials for AMFm: The Role of Diagnostics* (Washington: RFF, 2008).
 23. In 2006 France, Brazil, Chile, Norway, and the United Kingdom decided to create an international drug purchase facility called UNITAID through a tax on air travel in some countries. The revenue generated from the tax is a truly additional, new source of funds for global public health.