



*Global Health  
Teaching Case  
From the Harvard  
School of Public  
Health*

**Translating an Idea into a Policy:  
“Saving Lives and Buying Time” for Antimalarial Medicines**

**PART A**

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## Introduction

Global public health leaders had cause for worry at the dawn of the 21<sup>st</sup> century. Old treatments against malaria were increasingly ineffective. A new malaria medicine—artemisinin-based combination treatment, or ACT—was highly effective, but two big problems remained. First, ACTs were too expensive for people who needed the medicine in malaria-endemic countries. Second, there was a high probability that the malaria parasite would quickly develop resistance to artemisinin. Public health leaders knew that these two problems needed to be addressed.

In July 2004, the Institute of Medicine (IOM) Committee on the Economics of Antimalarial Drugs published a report called *Saving Lives, Buying Time: Economics of Malaria Drugs in an Age of Resistance*. The IOM Committee—chaired by Kenneth Arrow, a Nobel Laureate in economics—recommended the creation of a global-level subsidy for ACTs as the most economically and scientifically sound solution to the twin problems of poor access and the risk of early onset of drug resistance. The report recommended the establishment of a global fund that would purchase ACTs from manufacturers at the price of one dollar per dose and resell it at one-tenth of that price. Both the public and private sectors of all malaria-endemic countries could purchase the subsidized ACTs. The proposed global subsidy would solve the two critical problems at the same time: it would promote widespread access to effective antimalarials (to “save lives”) and would delay the emergence of resistance to artemisinin (to “buy time”).

USAID, which commissioned the work of the committee, accepted the recommendation but took no steps to take the idea forward. The global subsidy idea needed a policy champion, an individual or organization that could take the research idea and translate it into global policy. Otherwise, it would remain an untested proposal for improving global health. How could the report’s innovative idea be translated into policy and action?

## The Problem: Malaria and its Treatment

Malaria is a parasitic infection spread from person to person by the bite of the female *Anopheles* mosquito. Every year, malaria parasites infect approximately 250 million people, over half of whom children.<sup>1</sup> Over half of the world’s population currently lives in malaria-endemic countries, many of which are classified as “less developed” and already face considerable human and economic development challenges.<sup>2</sup> There are four types of human malaria; *Plasmodium falciparum* is the most deadly and is also the type most common to sub-Saharan Africa. Morbidity from *P. falciparum* has widespread consequences for both the health systems and economies of developing countries. In the early 1950s, chloroquine was introduced as the primary first-line drug for malaria. Affordable and available, it continues to be a widely used treatment in many malaria-endemic countries. But *P. falciparum* resistance to chloroquine is now so extensive that chloroquine is no longer considered an effective treatment for this type of malaria.<sup>3</sup> In response to widespread resistance to chloroquine, many countries in the 1980s and 1990s began to substitute sulphadoxine-pyrimethamine (SP) as a cost-effective alternative. SP, like chloroquine, is affordable, available, and commonly prescribed throughout both the

public and private sectors in Africa. But SP resistance has been increasing and the World Health Organization (WHO) now only recommends the drug for intermittent preventive treatment in pregnant women.<sup>4</sup>

Presently, the only treatment for which *P. falciparum* malaria has not developed significant resistance is artemisinin, a drug derived from the Chinese plant *Artemisia annua*. In order to preserve artemisinin's effectiveness and extend the life of other, less effective antimalarials, WHO recommends that artemisinin derivatives be used in combination with another partner drug (such as lumefantrine, amodiaquine, SP, or mefloquine).<sup>5</sup> These combination antimalarials are known as artemisinin combination therapies, or ACTs. In early 2009, WHO listed ten companies that make artemisinin-based antimalarials that the agency says are acceptable, in principle, for procurement by UN agencies. These companies include both western manufacturers such as Sanofi Aventis and Novartis, as well as a number of Indian generic producers.<sup>6</sup> There are about a dozen other manufacturers of ACTs, including local manufacturers in Kenya, Cameroon, Ghana, and Uganda.<sup>7</sup>

In April 2002, WHO endorsed the adoption of ACTs as a first-line treatment for uncomplicated *P. falciparum* malaria in countries with significant resistance to chloroquine. To further encourage the transition to ACTs, the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) in 2004 began reprogramming all approved grants to procure ACTs in areas where there is demonstrable resistance.<sup>8</sup> But two key barriers to widespread ACT access are affordability and availability. A single dose of ACT can cost up to twenty times more than a dose of chloroquine or SP, due to the high cost of producing the combination therapy.<sup>9</sup> Until August 2007, Coartem® (manufactured by Novartis) was the only WHO-prequalified fixed-dose combination on the market.<sup>10</sup> Prequalification meant that Coartem® was the primary drug of choice for public-sector procurement and for use in clinical trials. The production process of ACT is complex and involves the long growing cycle of *Artemisia*, the artemisinin extraction process, and the difficulties of combining artemisinin with a partner drug. This coupled with high demand for Coartem® by international and public sector procurement agencies, led to increasing Coartem® shortages once the reprogramming of GFATM grants got underway.

There are also concerns about emerging resistance to artemisinin. Artemisinin monotherapy (AMT) circulates on the market in many countries, threatening the lifespan of artemisinin. Counterfeit ACTs (drugs that contain fake artemisinin derivatives) and substandard ACTs (drugs of poor quality) also available and increase the probability of parasite mutation and resistance. A recent report confirms cases of ACT resistance in Cambodia.<sup>11</sup> In May 2007, the World Health Assembly passed a resolution requiring member states to withdraw oral AMT from the public and private sectors, to promote the use of quality ACTs, and to take measures to prevent counterfeits from being produced and distributed. Some countries continue to allow AMT to be marketed and as of August 2007, 67 companies continued to produce and market AMT.<sup>12</sup> There is an increasing sense of urgency among members of the global health community to find innovative

solutions to high ACT prices and supply-side uncertainty, and to delay resistance to artemisinin.

### **Designing a Solution: The Institute of Medicine Committee on the Economics of Antimalarial Drugs**

In 2001, the United States Agency for International Development (USAID) asked the Institute of Medicine (IOM) in Washington, D.C. to convene a panel to assess the economics of antimalarial drugs. The committee's task would be to "recommend steps that could be taken to maximize the influence of both new and established antimalarial drugs while postponing the development of drug resistance."<sup>13</sup> USAID was interested in two key areas: 1) ensuring that new and existing antimalarial drugs were affordable to the people who needed them, and 2) ensuring that antimalarial drugs were produced, packaged, and delivered in ways that encouraged adherence to prescribed regimens.<sup>14</sup> USAID wanted to know how to extend the life of SP as an effective antimalarial drug and how to make artemisinins more affordable. IOM wanted to focus on the broader question of how to make antimalarial drugs more affordable.<sup>15</sup> After a year of discussions between the two groups, it was decided that the Committee would focus its attention on the affordability of antimalarial drugs. During the period of discussion between USAID and the IOM, WHO had made a recommendation that artemisinins should be used in combination with other antimalarials to protect the compound from drug resistance.<sup>16</sup>

In 2002, the IOM's Board on Global Health convened a committee—the IOM Committee on the Economics of Antimalarial Drugs—to examine the questions posed by USAID. The chair of the Board on Global Health was Dean Jamison, Professor of Public Health and Education at the University of California in Los Angeles. He asked his former PhD advisor, Kenneth Arrow of Stanford University, a Nobel Laureate in economics and a founding member of the IOM, to be chair of the Committee. As Arrow states, "They convinced me quite quickly to be Chair. I like challenges and had done nothing in this area of malaria and global health, so I thought this would be an interesting challenge."<sup>17</sup> Jamison also asked Hellen Gelband and Claire Panosian to staff the Committee; they were responsible for project management and writing the report. Jamison, Arrow, and their colleagues then assembled the members of the Committee, seeking a balance between economists and public health experts with malaria expertise.

The Committee held a series of meetings in Europe and the United States, invited experts to present their work, and commissioned studies. While USAID provided initial funding for the Committee's proceedings, the Bill & Melinda Gates Foundation (BMFG) later became a co-sponsor. The idea for a global subsidy for antimalarial drugs, accessible by the public and private sectors, emerged early in Committee proceedings. Jamison, for one, had been considering the idea since his work at the World Bank, where he learned the challenges of addressing procurement problems at the country level.<sup>18</sup> Likewise, in his research and discussions on malaria before the Committee was even constituted, Arrow learned that the private sector plays a key role in the distribution and delivery of antimalarials, particularly in Africa.<sup>19</sup> He knew that these distribution and delivery issues would be central to the Committee's discussions.

After weighing the advantages and disadvantages of both targeted and broad subsidies, as well as subsidies administered at country and global levels, the Committee concluded a broad subsidy at the global level for ACTs would be more efficient and equitable than targeted subsidies or subsidies at the national or end-user levels.<sup>20</sup> It recommended the establishment of a global fund that would purchase ACTs from manufacturers at a dollar price per dose and resell it at one-tenth of that price. The subsidized ACTs would be accessible by both the public and private sectors of all malaria-endemic countries. The subsidy would at the same time enable widespread access to effective antimalarials (to “save lives”) and delay the emergence of resistance to artemisinin for as long as possible (to “buy time”). The Committee argued that a global subsidy allowed ACTs to flow to both the public and private sectors, and also freed up countries to pursue malaria policies most appropriate to their circumstances without having to divert funds better used for other interventions toward ACT purchase. The Committee also believed that a global subsidy would give the international community leverage to force artemisinin manufacturers to stop monotherapy production. The Committee spent time assessing a number of different alternatives before recommending the global subsidy as a solution to the challenges of making ACTs more affordable and staving off resistance to artemisinin compounds for as long as possible.<sup>21</sup>

The Committee presented its recommendations in a report called *Saving Lives, Buying Time: Economics of Malaria Drugs in an Age of Resistance*, released in July 2004. Prior to the release of the report, Arrow presented the Committee’s findings to USAID staff members by phone. USAID accepted the recommendation but took no steps to take the idea forward. The GFATM, which had recently been established in 2002, did not respond favorably to the report’s recommendations. Richard Feachem, the Executive Director of the GFATM, wrote a letter to Arrow stating that the global subsidy was not necessary because it already existed in the form of the GFATM. He argued that the private sector could apply for subsidized ACTs from the GFATM (with a 100% subsidy) through the national-level country coordinating mechanism.<sup>22</sup> Feachem may have also been concerned that a new global subsidy entity could potentially take resources from the GFATM.<sup>23</sup> With this kind of opposition, it was clear that the global subsidy idea needed a sponsor to propel it forward.

In mid-2004, Olusoji Adeyi, Coordinator of Public Health Programs in the World Bank’s Human Development Network, received a prepublication version of *Saving Lives, Buying Time*. He was leaving for vacation so he put the report in his bag and forgot about it. Later, sitting on the beach in North Carolina, he removed the report and read it. To Adeyi, the idea of a global ACT subsidy seemed “an incredibly bright and simple idea.”<sup>24</sup> He believed that the global subsidy recommendation was groundbreaking, addressing in a single stroke the questions of access to treatment, drug resistance, and public-private channels for treatment. Adeyi stated, “I wanted to get back to the office right away to start working on the recommendation.”<sup>25</sup> The challenge was how to translate the IOM report’s core ideas into global policy. Adeyi knew that this would require technical work to design an architecture and operational plan, including an institutional home for the proposed global subsidy. Where could the proposed subsidy be located, and who would

take ownership for it? The plan would also require political strategies to build a coalition of supporting donors, implementers, and other stakeholders.

### **Gaining Adoption for the Idea within the World Bank**

At the time of the IOM report's release, Adeyi was serving as chair of the Roll Back Malaria Partnership's Working Group on Finance & Resources (RBM FRWG). In its role as chair, the World Bank convened a FRWG meeting in its Washington, D.C. offices in September 2004. The primary topic of the meeting was the *Saving Lives, Buying Time* report.<sup>26</sup> In the meeting, it became clear that there was opposition to the idea, even within the World Bank's Development Economics Research Group (DEC). One concern raised by participants was whether the subsidy, by encouraging greater use of ACTs, would lead to increased resistance of the only effective antimalarial currently on the market.<sup>27</sup> To defuse the opposition, Adeyi sought a small grant from the RBM Secretariat to further analyze the global subsidy idea. Instead of participating in the study team, Adeyi recused himself from the analysis and invited Mead Over to participate. Over was a senior economist at the World Bank and one of the meeting participants that expressed apprehension about increased resistance. The two other members of the study team were Ramanan Laxminarayan, a member of the IOM Committee and Fellow at Resources for the Future in Washington, D.C., and David Smith, a staff scientist at the Fogarty International Center, National Institutes of Health. The study's specific objective was to explore the effects of a global subsidy on both ACT demand and potential drug resistance.

The researchers modeled a number of different scenarios, including no subsidy, partial subsidy, full subsidy, and a two-year delayed subsidy. They concluded that any promptly implemented subsidy of ACTs—whether full or partial—would have a significant effect on the number of deaths averted. A two-year delay in implementing the subsidy, however, would lead to increased use of both cheaper artemisinin monotherapy and partner drug monotherapy and greatly amplify the risk of widespread artemisinin resistance. The authors recommended that a global ACT subsidy be introduced immediately on all eligible drug combinations in order to delay resistance and “buy time” for further research and development of new antimalarial drugs. The study report was published in July 2005 as a DEC Research Working Paper (and later in *Health Affairs* in February 2006).<sup>28</sup>

The study findings had a profound effect at the World Bank. On July 28, 2005, the former Chief Economist and Senior Vice-President of DEC, Francois Bourguignon, and the former Senior Vice-President for Human Development, Jean-Louis Sarbib, wrote to Kenneth Arrow. They noted that the IOM's recommendations on a global subsidy had clear merit and indicated a willingness to explore its feasibility. The study also reinforced the sense of urgency among Adeyi, IOM Committee members, and other advocates for moving forward rapidly on the global ACT subsidy.

## Securing Resources for Development of an Operational Plan

In September 2005, the World Bank held a donors' conference in Paris. The meeting centered around the World Bank's new Booster Program for Malaria Control in Africa and discussion of its framework for action in the Africa region.<sup>29</sup> This effort represented the Bank's renewed attention to malaria control and Adeyi had played a key role in its design. One session at the meeting was devoted to *Saving Lives, Buying Time*. This session proved to be an important opportunity to educate senior staff from donor agencies about the global ACT subsidy idea. The main opposition that arose in the forum was from supporters of insecticide-treated bednet programs who were concerned that the subsidy might shift money away from efforts to scale-up bednets.<sup>30</sup>

Also at this Paris meeting, RBM asked the World Bank, in its role as chair of the FRWG, to develop a detailed proposal on behalf of RBM for the design and operation of a global ACT subsidy. Adeyi welcomed this request as he felt RBM could bring institutional legitimacy to the global ACT subsidy idea, provide a forum within which the operational plan could be developed, and lead to widespread ownership of the global subsidy.<sup>31</sup> RBM itself was not at that time in a position to move the work forward. It was about to embark on the Change Initiative, facilitated by Boston Consulting Group, which was a comprehensive redesign of RBM to improve effectiveness. Adeyi agreed to develop the proposal but needed to find funding for the work. Daniel Kress and Girindre Beeharry of the Bill & Melinda Gates Foundation (BMGF)—both members of the RBM FRWG—said they would consider a proposal, and asked that it include architecture (what does the organizational structure look like), analytics (what are additional questions that need to be examined), and advocacy (what are the strategies for advocating for this).<sup>32</sup> Beeharry, who was the point person within BMGF on the Medicines for Malaria Venture (MMV) drug portfolio, was interested in how to get prices of new antimalarials down so they could compete with SP in the private market and achieve health impact.<sup>33</sup> Given this focus on affordability and the private antimalarial drug market, his interest in the global ACT subsidy was growing. On behalf of RBM, Adeyi and his World Bank team, in consultation with Ramanan Laxminarayan from Resources for the Future and Hellen Gelband from IOM, submitted a Letter of Interest to BMGF in early 2006 and then submitted the proposal for the project on *Defining the Architecture and Management of a Global Subsidy for Antimalarial Drugs* in May 2006. After a period of review and revision, the grant for \$4,085,789 was approved in August 2006 for a 22-month period (and was subsequently extended to March 2009).

Following approval of the grant, the World Bank initiated a procurement process for consultants who would conduct many of the grant activities. Dalberg Global Development Advisors, a consulting firm that specializes in international development and globalization, won the contract. Some members of the RBM community were unhappy with the selection of Dalberg, and wondered why they had been chosen. The firm had only recently been established (in 2001) and did not have a long track record in the field of global health. And unlike some of the other consulting firms bidding for the project, they did not have previous experience working on malaria. But for these very

same reasons, Dalberg had a lot to prove to the global health community, and they began the work in December 2006 with enthusiasm.

By the end of 2006, a small group of policy champions had started to form around the global subsidy idea including Adeyi, Beeharry, Ramanan Laxminarayan from Resources for the Future, and Hellen Gelband from the IOM. This core group believed that the World Bank could act as policy sponsor of the global ACT subsidy, but that they also needed a political sponsor. In the summer of 2006, the group went out to lunch with Rob de Vos, the Dutch government's Deputy Director General of Foreign Affairs, to discuss the subsidy idea. At that time, the Dutch Foreign Affairs staff had been internally discussing subsidized procurement because of global discussions around advanced market purchases (AMCs) and the International Finance Facility for Immunization (IFFIm).<sup>34</sup> The Dutch government had also been a member of the RBM Partnership Board and de Vos, who had suffered from malaria, had a personal interest in the subsidy idea.<sup>35</sup> Given these factors, the Dutch government agreed to host a RBM FRWG meeting in Amsterdam (with the World Bank team and Dalberg carrying out the logistics) that would bring together the RBM Partnership community and begin to drive the idea of the global subsidy forward.

### **Challenges in Translating a Research Report into an Operational Plan**

In January 18-19, 2007, the RBM FRWG held the two-day Expert Workshop and Consultative Forum on a High-Level Buyer Subsidy for Artemisinin-Based Combination Therapies in Amsterdam. The meeting was attended by representatives of the IOM Committee (including Kenneth Arrow), World Bank, the U.S. President's Malaria Initiative (PMI), UNITAID, WHO, GFATM, UNICEF, MMV, Drugs for Neglected Diseases initiative (DNDi), BMGF, malaria-endemic and donor countries, NGOs, and the private sector.<sup>36</sup>

Participants in the Amsterdam meeting included two broad groups of people. One group consisted of the core group of policy champions, many of whom had been developing the subsidy idea since 2004 when *Saving Lives, Buying Time* was released. Many of these advocates had been working hard, often without support and on their own time, to get internal adoption for the global subsidy from their organizations. They were ready to move forward and urgently. They were excited about the subsidy idea, and convinced that it was the right way forward given the research that Arrow and the IOM Committee had put into it. Their strategy was to provide a forum on key issues related to the global subsidy, but not to debate the "yes" or "no" of moving forward.

The other group represented the meeting participants who did not know much about the global subsidy and came to Amsterdam to learn more about it. A number of these people were very attracted, in principle, to the subsidy idea but were cautious about fully endorsing it without further debate. Others had read *Saving Lives, Buying Time* and were opposed to its recommendation to work through private sector distribution channels. One concern that participants raised was whether the global subsidy was essentially a subsidy to pharmaceutical companies, providing manufacturers a disincentive for lowering ACT

prices. Others voiced concerns about whether it was feasible or correct to provide the subsidy to private sector buyers (a group of people felt the private sector was not needed to solve the problem). Yet other participants, many of whom supported the subsidy idea, felt that additional interventions were needed to make the subsidy idea work in the field. These interventions included pharmacovigilance, social marketing, and monitoring and evaluation. Some of these participants discounted the global subsidy idea because no operational research had been done on the idea, and they were not convinced that it would work in practice. A final category of concerns was from participants who questioned whether a global subsidy initiative was the best or most efficient way to spend scarce resources (time and money) at a time when other malaria control efforts were being scaled-up to meet the goal agreed in the Abuja Declaration of 2000 to halve malaria mortality in Africa by 2010.

Many of the participants who raised questions at the meeting felt that their views were not welcomed or heard at the forum. The advocates of the global subsidy, on the other hand, were frustrated with what they viewed as ideological responses to a new idea that required new thinking. Both groups described the meeting as “heated.”<sup>37</sup> On the meeting’s second day, the Deputy Director General of the Dutch Ministry of Foreign Affairs, Rob de Vos, worked hard to find some consensus. De Vos, in the words of one participant, was a “skilled diplomat, a negotiator.”<sup>38</sup> Many participants reported that the actions of de Vos salvaged the meeting in the end. As one person said, “He created a slight change in the group from ‘no’ to ‘yes’ and this was a critical moment for moving forward.”<sup>39</sup>

One result of the Amsterdam meeting was the creation of an RBM task force, called the Global ACT Subsidy Task Force, to steer the work forward. The RBM Executive Committee approved the creation of this task force in February 2007. The Task Force’s role was to build consensus within the RBM Partnership on key factors related to the global ACT subsidy and present these to RBM Board members later in the year. Specific areas of work included making recommendations on a series of technical issues, reaching out to stakeholders to create awareness and build support for the subsidy project, reaching out to donors to mobilize funding, and raising awareness among malaria-endemic countries.<sup>40</sup> The United Republic of Tanzania (Minister of Health David Mwakuyusa) and the Netherlands (Harry van Schooten of the Dutch Ministry of Foreign Affairs) were chosen as co-chairs of the Task Force. Other members included the core group of advocates for the global ACT subsidy along with a number of RBM partners. Task Force membership was open to all RBM partners. The RBM Executive Director, Awa Coll-Seck, and the RBM Secretariat facilitated and supported this group. The World Bank, through its subcontract to Dalberg, took on the role of Secretariat for the Task Force.

The conflict experienced at the Amsterdam meeting was a difficult beginning to the global ACT subsidy’s journey from research report to operational plan. In the view of some participants, the meeting served to cement key groups’ opposition to the global ACT subsidy, including the U.S. President’s Malaria Initiative (PMI). Some of these opposing groups never changed their views on the subsidy and continued to oppose it.<sup>41</sup> Yet it provided a forum for groups to express their views. It also demonstrated to the

policy champions and Dalberg that the technical and political challenges involved in moving forward with the global ACT subsidy were more complex than they originally thought.

There continued to be vocal opponents to the global subsidy idea. Richard Feachem, director of the GFATM, argued that even with the subsidy, ACT prices would still be unaffordable for many poor people. People may start a course of treatment but then stop because they could not afford the rest of the treatment, and this would lead to drug resistance. He also stated that the global subsidy would undermine pharmaceutical innovation on antimalarial drugs and distract ongoing work toward malaria targets. Finally, he argued that the subsidy's policy champions had created a picture of consensus for the global subsidy, when in fact serious criticisms had not been addressed.

In the United States, PMI also continued to raise concerns about the global subsidy. As Bernard Nahlen, deputy coordinator of PMI later stated to the National Journal Magazine, "The U.S. Government has been consistent from day one on this, which is, there needs to be some evidence for this. You have to go to a few countries and try this out and see if it's going to work. Nobody has all the answers to this. To propose one particular model to solve all these problems, I think, is going far out on a very thin limb."<sup>42</sup>

Some representatives of northern NGOs also continued to oppose the global subsidy. They opposed the idea of working through private sector distribution and delivery channels.

### **Designing Strategies for Addressing Opposition**

Given this opposition to the global subsidy idea, Adeyi and others in the core group realized that more of their attention needed to be on educating and engaging stakeholders about the IOM report's core idea. In particular, they began to think about specific strategies that would address skepticism and opposition from some key members of the global malaria community. After the decision from Roll Back Malaria to create a task force in February 2007, the core group knew that these strategies for stakeholders would have to be designed and implemented in tandem with the technical work to develop an architecture and operational plan for the global subsidy program.

### Case Study Questions:

1. What were the main barriers to ACT access in poor countries?
2. What was the IOM Committee's recommendation in *Saving Lives, Buying Time* and how does it propose to address these access barriers?
3. Conduct a stakeholder analysis to assess the feasibility of the IOM's recommendation.
  - First, identify the groups in the global health community that are stakeholders in the global ACT subsidy and assess their views of the subsidy.
  - Second, develop specific strategies that the core group of policy champions could use to engage opponents of the global ACT subsidy idea and improve the feasibility of the proposal.

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## Notes

<sup>1</sup> World Health Organization, *World Malaria Report 2008* (Geneva: WHO, 2008), 10.

<sup>2</sup> World Health Organization, *World Malaria Report 2008*, 31.

<sup>3</sup> Nicholas White, "Antimalarial drug resistance," *The Journal of Clinical Investigation* 13 (2004): 1084.

<sup>4</sup> White; World Health Organization, *World Malaria Report 2008*.

<sup>5</sup> World Health Organization, *World Malaria Report 2008*, 25.

<sup>6</sup> WHO, *Antimalarial Medicines Procured by WHO*,

<http://www.who.int/malaria/pages/performance/antimalarialmedicines.html> (retrieved March 26, 2009).

<sup>7</sup> Artepal, *Inventory of ACT Producers*,

[http://www.artepal.org/index.php?option=com\\_content&task=blogcategory&id=39&Itemid=100](http://www.artepal.org/index.php?option=com_content&task=blogcategory&id=39&Itemid=100) (retrieved March 26, 2009).

<sup>8</sup> Rima Shretta, Catherine Adegoke, and Peter Segbor. *Global Fund Grants for Malaria: Lessons Learned in the Implementation of ACT Policies in Nigeria* (Geneva: Roll Back Malaria Partnership, 2007), 1.

<sup>9</sup> Kenneth Arrow, Claire Panosian, and Hellen Gelband, eds. *Saving Lives, Buying Time: Economics of Malaria Drugs in an Age of Resistance*, (Washington, D.C.: National Academies Press, 2004).

<sup>10</sup> A number of new drugs have been prequalified since, including an artesunate + amodiaquine combination from Guilin, China (August 2007), artesunate + amodiaquine combination from Ipca India (April 2008), artesunate + amodiaquine combination from Sanofi-Aventis (October 2008), and an artesunate + amodiaquine combination from Cipla India (November 2008).

<sup>11</sup> William Rogers, Rithy Sem, Thong Tero, Pharath Chim, Pheakra Lim, Sinuon Muth, Dong Socheat, Frédéric Arieu, and Chansuda Wongsrichanalai, "Failure of artesunate-mefloquine combination therapy for uncomplicated Plasmodium falciparum malaria in southern Cambodia," *Malaria Journal* 8 (2009).

<sup>12</sup> World Health Organization, *Informal Consultation with Manufacturers of Artemisinin-Based Pharmaceutical Products in Use for the Treatment of Malaria* (Geneva: WHO) August 24, 2007: iii.

<sup>13</sup> Arrow, Panosian, and Gelband.

<sup>14</sup> Arrow, Panosian, and Gelband.

<sup>15</sup> Interview #27 by author (Laura J. Frost).

<sup>16</sup> World Health Organization, *Antimalarial Drug Combination Therapy: Report of Technical consultation* (Geneva: World Health Organization, 2001).

<sup>17</sup> Interview with Professor Kenneth Arrow on February 25, 2009 by author (Laura J. Frost).

<sup>18</sup> Interview #15 by author (Laura J. Frost).

<sup>19</sup> Interview #17 by author (Laura J. Frost).

<sup>20</sup> Arrow, Panosian, and Gelband, 95.

<sup>21</sup> The IOM Committee examined other interventions, such as insecticide-treated bednets (ITNs) and indoor residual spraying (IRS). It endorsed the idea, suggested by the RBM Partnership in 2003, of a Malaria Medicines and Supply Service (MMSS) as a means of expanding access to other forms of malaria control, in addition to drugs. However, the Committee still believed a global subsidy was necessary to engage the private sector and force monotherapies from the market. The RBM Secretariat began implementing the MMSS in 2005. Kenneth Arrow, Claire Panosian, and Hellen Gelband.

<sup>22</sup> Interview #22 by author (Laura J. Frost).

<sup>23</sup> Interview #32 by author (Laura J. Frost).

<sup>24</sup> Interview with Olusoji Adeyi, February 4, 2009, by author (Laura J. Frost).

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- <sup>25</sup> Interview with Olusoji Adeyi, February 4, 2009, by author (Laura J. Frost).
- <sup>26</sup> The session is available online at <http://info.worldbank.org/etools/docs/voddocs/632/1289/lo.htm>.
- <sup>27</sup> Ramanan Laxminarayan, Mead Over, and David L. Smith, "Will a global subsidy of new antimalarials delay the emergence of resistance and save lives?" *Health Affairs* 25 (2006): 325-336.
- <sup>28</sup> Laxminarayan, Over, and Smith, "Will a global subsidy of new antimalarials delay the emergence of resistance and save lives?" 2006.
- <sup>29</sup> World Bank, "Framework for Action: Booster Program for Malaria Control in Africa, Scaling up for Impact" (Working Paper, Donors' Conference, Paris) September 8-9, 2005. [http://siteresources.worldbank.org/INTAFRBOOPRO/Resources/framework\\_for\\_action.pdf](http://siteresources.worldbank.org/INTAFRBOOPRO/Resources/framework_for_action.pdf) (retrieved March 25, 2009).
- <sup>30</sup> Interview #33 by author (Laura J. Frost).
- <sup>31</sup> Interview #1 by author (Laura J. Frost).
- <sup>32</sup> Interview #11 by author (Laura J. Frost).
- <sup>33</sup> Interview #11 by author (Laura J. Frost).
- <sup>34</sup> Interview #16 by author (Laura J. Frost).
- <sup>35</sup> Interview #16 by author (Laura J. Frost).
- <sup>36</sup> RBM, "Global subsidy for ACTs agreed in Amsterdam," RBM E-update, (January 2007), <http://www.rollbackmalaria.org/eupdate/rbmEupdate2007-02-06.htm>, (Retrieved March 23, 2009).
- <sup>37</sup> Interviews #4, 7, and 22 by author (Laura J. Frost).
- <sup>38</sup> Interview #16 by author (Laura J. Frost).
- <sup>39</sup> Interview #16 by author (Laura J. Frost).
- <sup>40</sup> The World Bank, *Terms of Reference for a Consulting Project*.
- <sup>41</sup> This view has not been validated by staff of the U.S. President's Malaria Initiative, who declined to be interviewed for this study.
- <sup>42</sup> Jonathan Rauch, "Can Markets Cure Malaria?" *National Journal Magazine*. October 11, 2008. <http://www.nationaljournal.com> (retrieved April 6, 2009).