Background Paper
Financing of Artemisinin-Based Combination Antimalarial Drug Treatment

September 2003

Prepared by:

Yann Derriennic, MBA
Abt Associates Inc.

Beaura Mensah, MPH
University Research Co., LLC

In collaboration with:
Development Associates, Inc. Emory University Rollins School of Public Health Philoxenia International Travel, Inc. Program for Appropriate Training in Health SAG Corporation Social Sectors Development Strategies, Inc. Training Resource Group Tulane University School of Public Health and Tropical Medicine University Research Co., LLC.

Funded by:
U.S. Agency for International Development

Order No. TE 023
Mission

Partners for Health Reformplus is USAID’s flagship project for health policy and health system strengthening in developing and transitional countries. The five-year project (2000-2005) builds on the predecessor Partnerships for Health Reform Project, continuing PHR’s focus on health policy, financing, and organization, with new emphasis on community participation, infectious disease surveillance, and information systems that support the management and delivery of appropriate health services. PHRplus will focus on the following results:

- Implementation of appropriate health system reform.
- Generation of new financing for health care, as well as more effective use of existing funds.
- Design and implementation of health information systems for disease surveillance.
- Delivery of quality services by health workers.
- Availability and appropriate use of health commodities.

September 2003

Recommended Citation


For additional copies of this report, contact the PHRplus Resource Center at PHR-InfoCenter@abtassoc.com or visit our website at www.PHRplus.org.

Contract/Project No.: HRN-C-00-00-00019-00

Submitted to: Karen Cavanaugh, CTO
Policy and Sector Reform Division
Office of Health and Nutrition
Center for Population, Health and Nutrition
Bureau for Global Programs, Field Support and Research
United States Agency for International Development

The opinions stated in this document are solely those of the authors and do not necessarily reflect the views of USAID.
This paper was prepared for an Expert Consultation on the Procurement and Financing of Antimalarial Treatments to be held September 2003 in Washington DC. The paper looks at the financing issues raised by changing of first line drug treatment for uncomplicated malaria to artemisinin-based combination therapies (ACTs). These treatments are significantly more expensive than current first line drugs such as chloroquine and sulfadoxine pyrimethamine. Following a background section on health sector reform and financing, the paper outlines a framework for estimating the impact of ACT on people’s ability to pay at the country level. This is followed by a model that presents a range of estimates of the overall financing impact at the level of sub-Saharan Africa, and for Ghana and Zambia as well. Finally, an approach to financing of ACT at the country level is outlined. This includes a financing situation analysis, applying the framework, and a sustainability plan.
# Table of Contents

Acronyms .......................................................................................................................... ix

Acknowledgments ............................................................................................................... xi

Executive Summary ............................................................................................................. xiii

1. Introduction .................................................................................................................. 1

2. Background .................................................................................................................. 3
   2.1 Current Status of Health Systems .............................................................................. 3
   2.2 The Role of the State and the Private Sector .............................................................. 3
   2.3 The Role of Nongovernmental Organizations ............................................................ 4
   2.4 Decentralization ........................................................................................................ 4
   2.5 Cost Recovery Schemes – User Fees and the Bamako Initiative ................................. 4
   2.6 Private, Social, and Community Health Insurance Schemes ..................................... 5
   2.7 New Support Mechanisms – SWAps, Global Fund, and HIPC II ............................... 6
   2.8 Targeting .................................................................................................................. 7
   2.9 The Nature of Antimalarial Treatment ...................................................................... 8

3. Conceptual Framework .................................................................................................. 11

   4.1 Results: Sub-Saharan Africa ...................................................................................... 18
   4.2 Results: Country Examples ...................................................................................... 21
      4.2.1 Zambia ................................................................................................................ 21
      4.2.2 Ghana .................................................................................................................. 23

   5.1 Drug Financing Analysis ......................................................................................... 26
   5.2 Impact Analysis ....................................................................................................... 27
   5.3 Targeting and Pricing ............................................................................................ 27
      5.3.1 Targeting for ACTs ............................................................................................ 28
      5.3.2 Support or Subsidies .......................................................................................... 28
   5.4 Sources of Financing .............................................................................................. 29
   5.5 Sustainability Plan ................................................................................................... 31
   5.6 Implementation Plan ............................................................................................... 31

Annex A. Model Tables ....................................................................................................... 37

Annex B. Bibliography ....................................................................................................... 39
List of Tables

Table 1. Estimated Annual Malaria Incidence ................................................................. 15
Table 2. ACT Price/Evolution Scenarios – Adult Treatment (International Prices in US $)........ 17
Table 3. ACT Adoption Uptake ......................................................................................... 18
Table 4. SSA Yearly Incremental Cost of ACT US $ Million............................................... 20
Table 5. Zambia, Impact of Incremental Cost of ACT, Year 1 ............................................ 22
Table 6. Zambia, Impact of Incremental Cost of ACT, Year 3 ............................................ 22
Table 7. Incremental per Capital Cost of ACT: Ghana (Low Incidence Medium Price Scenario) 24
Table 8. Targeting and Subsidies ..................................................................................... 33
Table 9. Source of Financing for ACT .............................................................................. 35
Table A-1. Annual Incremental Cost of ACT: Zambia (in US $ Million) .............................. 37
Table A-2. Annual Incremental Cost of ACT: Ghana (in US $ Million) .............................. 37

List of Figures

Figure 1. Malaria Treatment Seeking Behavior, Pre- and Post-Introduction of ACTs............. 14
Figure 2. Price Evolution of ACTs .................................................................................... 17
Figure 3. Yearly SSA Incremental Costs of ACT – 400 Million Episodes ............................ 19
Figure 4. Yearly Zambia Incremental Costs of ACT, 24 Million Episodes .......................... 21
Figure 5. Yearly Incremental Costs of ACT Low Incidence: Ghana (17.3 Million Episodes) .... 23
Acronyms

ACT Artemisinin-based Combination Therapy
AQ+ASU Amodiaquine + Artesunate
ART-LUM Arthemeter-Lumefantrine
CBHF Community-based Health Financing
CQ Chloroquine
GAVI Global Alliance for Vaccines and Immunization
HIPC Heavily Indebted Poor Countries Initiative
IPT Intermittent Preventive Treatment
MHO Mutual Health Organization
NGO Nongovernmental Organization
ORS Oral Rehydration Solution
RBM Roll Back Malaria
SP Sulfadoxine-Pyrimetamine
SP+ASU Sulfadoxine-Pyrimetamine + Artesunate
SSA Sub-Saharan Africa
SWAp Sector-wide Approach
WHO World Health Organization
Acknowledgments

The authors would like to thank Marty Makinen, Nancy Pielemeier, Lynne Miller Franco, and Chris Tetteh for their thorough critiques and feedback on an earlier draft of this paper. Thank you also to Steve Hodgins, John Chimumbwa, Ed Elmendorf, James Banda, Alan Shapiro, Rima Shretta, Grace Adeya, Charlotte Muheki, Natasha Hsi, and Bob Snow for the valuable contributions to the information and insights of this paper.
There is growing resistance to chloroquine (CQ) and sulfadoxine-pyrimethamine (SP) and it is only a matter of time before malaria endemic countries have to switch to a new, more effective first line drug. Following WHO guidelines, the new drug will most likely be an artemisinin-based combination drug and will be, in the short term, 10 times the current costs – $1.30 adult dose versus $0.9 to $0.12 for CQ and SP. This has raised concerns among affected countries and various partners in the Roll Back Malaria (RBM) Partnership about how countries and persons with malaria will be able to bear the incremental costs of treatment.

To address these concerns, the RBM Partnership and the Institute of Medicine Committee on the Economics of Antimalarial Drugs have agreed to hold a meeting on the financing of antimalarial treatment. The meeting will be held at the World Bank in mid-September 2003.

This paper was commissioned to frame the financing issues to be considered in the introduction of the new, more expensive antimalaria drugs. It focuses on sub-Saharan Africa, which has 90% of malaria morbidity, the greatest burden of malaria worldwide. The paper provides financing options at the country level, presents major trends in health systems reform and health financing in sub-Saharan Africa (SSA), and discusses the potential impact this initiative could have on these systems and new developments. It also illustrates the impact of introducing the new drug treatment using a conceptual model and presents a range of estimates of financing needs at the “global” SSA level as well as for the individual countries of Zambia and Ghana.

The impact of the introduction of a more expensive treatment will be determined by numerous factors that are country-specific, such as per capita income and distribution, public sector financing (cost sharing/cost recovery/cash and carry), public sector facility coverage, formal private sector development (private and nonprofit facilities), importance of the informal sector, and effectiveness of drug registration and import controls.

There are no ideal financing solutions and each country will have to develop the approach appropriate in its own context. However, evidence shows that there is often a danger of over-reliance on external funding for country programs.

The importance of addressing the financing issues as part of a larger effort should also be stressed, and other aspects of the introduction of new antimalarial drugs such as regulation and registration, packaging, taxes, efforts to improve compliance, and change in the treatment protocol should be included in the implementation process.

Because factors determining the financing options will vary greatly across countries, the paper recommends that each country follow the steps below in its own context:
▲ Conduct primary operations research covering public and private sector utilization and willingness and ability to pay.

▲ Assess the current antimalarial financing situation – who pays what, where, when – and perform an impact analysis – who is at risk, how many, where?

▲ Lay out the targeting and pricing (subsidies) options.

▲ Identify financing options and draft a sustainability plan (to show how the financing and the subsidies evolve over time).

▲ Draft an implementation plan.
1. Introduction

This paper was prepared to inform an Expert Consultation on the Procurement and Financing of Antimalarial Drug Treatment to be held in Washington D.C. in September 2003.

The goal of the meeting is: “to assist the RBM [Roll Back Malaria] Partnership to target its support and resources most effectively to optimize affordability of highly effective antimalarial treatment to persons in malaria-affected countries.”

The objectives of the meeting are:

- To assess various models at global and country levels for reducing the cost to purchasers of highly effective antimalarial drug therapies in both the public and private sectors.
- To develop recommendations to the RBM Board on preferred mechanisms for reducing the cost of malaria treatment at the global level.
- To provide guidance to countries on financing and procurement options at the country level to reduce the cost of malaria treatment for consumers in both the public and private sectors.

Responding to the expressed needs of meeting, the paper aims to answer the following questions:

- What will be the impact on clients’ willingness and ability to pay, at the country level, of introducing higher priced artemisinin-based combination therapy (ACT)?
- What is the range of financing needs for ACTs?
- What approach should countries consider when thinking about the financing impact of the introduction of ACTs?


Section 2, Background, provides health system and financing information as it relates to antimalarial drugs. The goal is not to be exhaustive but to highlight major trends in health system reforms and health financing. The section endeavors to inform the reader about the complexity of introducing ACTs, both at the global and national levels.

Section 3, the Conceptual Framework, illustrates that the impact of the introduction of a more expensive treatment is determined by numerous factors that are country specific: per capita income and distribution, public sector financing (cost sharing/cost recovery), public sector facility coverage,
formal private sector development (private and nonprofit facilities), the role of the informal sector, the effectiveness of drug registration and import controls, among others.

Section 4, Estimates of Global ACT Financing Needs, develops a model that estimates a range of ACT financing needs at the “global” (sub-Saharan Africa) level. Major determinants are the number of malaria episodes, the number of episodes treated with modern drugs, the evolution of the prices of ACTs, and speed of ACT uptake or utilization. The results are a range of incremental costs for ACT drugs. These costs are calculated using likely ACT international price scenarios and do not include all other costs associated with the change in a widely used drug such as sensitization, development of material, training of providers, public information campaign. To illustrate the country level impact, the model is applied to two countries: Zambia and Ghana.

Section 5, Country Level Financing Approach, lays out steps at the country level to respond to the financing impact of the introduction of ACTs. The steps include a drug financing analysis, an impact analysis (using the conceptual framework), targeting and pricing decisions, the identification of sources of financing (i.e. who will pay), a sustainability plan, and finally, an implementation plan. The section stresses that this approach and the resulting financing and sustainability plans should be part of a larger country level effort that considers other aspects of the introduction of ACT, such as regulation and registration, packaging, taxes, efforts to improve compliance, and changes in the treatment protocol. Financing is only a small part of the challenges posed by the introduction of high priced but more effective antimalarial drug treatments.
2. Background

This section provides health system and financing information as it relates to antimalarial drugs. The section attempts to inform the reader to consider the complexity of introducing ACTs in the context of health system reforms and financing in sub-Saharan Africa (SSA).

2.1 Current Status of Health Systems

The diversity of health care systems in Africa makes generalization difficult; however, by and large, they are considered to be weak. Reforms implemented to strengthen these systems in recent years have focused on “ways of improving the sustainability, equity, and effectiveness of health care services” (Leighton 1995). The main reform strategies undertaken and/or endorsed by governments have been decentralization, the institution of cost recovery schemes (e.g., user fees, the Bamako Initiative), the establishment of private and social insurance, the emergence of community-based insurance schemes, and the changing of the roles of the state and that of the private sector in health service provision. New trends in donor support such as sector-wide approaches (SWAps), the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) and the Heavily Indebted Poor Countries Initiative (HIPC II) will also be discussed briefly in this paper for their potential impact on the introduction of new antimalarial drugs in SSA countries.

2.2 The Role of the State and the Private Sector

Traditionally, African governments have tried to be the primary provider of free, universal health care for basic services (Leighton 1995). While this was only hypothetical in some cases, because many countries could not afford to truly provide free care for all, the commitment was strong enough that states with socialist ideologies (e.g., Guinea) often suppressed the growth of the private sector. Most countries have since “recognize[d] the limitations in their governments’ ability to raise general [sufficient] tax revenue, as well as the unlikelihood of continued and substantial amounts of external donor assistance for health care” (Leighton 1995) and have gone from being the exclusive provider of services to acknowledging the role of the private sector and sometimes encouraging a more mixed system of health care provision.

The private sector, now the majority provider of health care services in many developing countries, can be described as covering “a very broad spectrum from professionally certified specialists to drug peddlers and traditional providers of health-related services” (Standing and Bloom 2002). A variety of reasons including limited access to formal health delivery facilities, especially in rural areas, inability to pay for those services even when they are available, poor quality of services (especially frequent stock-outs of drugs and unsatisfactory provider-client relations), lack of health-related knowledge and cultural beliefs have led to greater use of the informal private health sector (i.e., unlicensed practitioners and drug sellers) in SSA. Introducing new, more expensive antimalarials in this context is potentially problematic as inappropriate treatment (partial doses, substandard and
counterfeit drugs) can be bought in the informal market by those unable to afford drugs in the formal health delivery system. (Many countries lack the capacity and resources to regulate and supervise private providers, especially those working in unorganized/informal markets (Standing and Bloom 2002). Haak (2002) cites numerous studies in SSA showing inappropriate antimalarial drug use resulting from services provided outside the formal health delivery system. Since resistance to current antimalarials can be attributed in part to this irrational drug use, granting full or partial subsidies through the formal private sector may be one way to slow resistance to ACTs.

### 2.3 The Role of Nongovernmental Organizations

Nongovernmental organizations (NGOs) (i.e., the nonprofit private sector including faith-based organizations) in many countries provide extensive care in rural areas not reached by other providers. They generally charge at least a nominal fee for their services to recover partial costs and often have some outside support as well. NGOs are widely perceived to offer quality care and are often chosen over lower-priced services considered to be of lesser quality.

As a key provider of health care to poor populations, NGOs will be affected by the price increase in the introduction of ACTs more than the commercial private sector because they do not recover their costs fully through user fees. Nonprofit providers will have difficulty passing the cost increase of ACTs to their clients and may need additional government support or subsidies. This will be easier to implement in countries where the government already contracts with NGOs to provide health services. Subsidies to NGOs could also take the form of block grants (common in East Africa), per capita contracts (frequently used in Central America), and fee-for-service reimbursement plans.

### 2.4 Decentralization

Decentralization is often defined as a strategy involving the transfer of some degree of authority, responsibility, and resources from a central body to lower levels (e.g., district or subdistrict offices) that is pursued for political, administrative, and/or financial reasons (Brinkerhoff and Leighton 2002; Bossert and Beauvais 2000; World Health Organization [WHO] 1998). Its main advantage is that it allows local health systems to make decisions, plan programs, and allocate resources based on their own epidemiological situation rather than on national interests and priorities, which may be inappropriate in the local context. Because decentralized systems are not homogeneous, the impact of the introduction of ACTs will depend on the model(s) adopted in each country. However, the problems most likely to affect implementation of the initiative are unmatched priorities between the center and the periphery, insufficient resources at the local level, and unclear lines of authority and decision making.

### 2.5 Cost Recovery Schemes – User Fees and the Bamako Initiative

Faced with budget constraints and a growing demand for health care services, many countries introduced cost recovery schemes as a means of improving the financial sustainability of government health systems. However, the extent to which revenue from these initiatives contribute to public sector funding for health care is a subject of much debate and may depend largely on the average household income within a country and the level of utilization of the public health care system (Leighton 1995; Bennett and Gilson 2001).
User fees, the primary means of cost recovery for health care in many parts of the developing world, are as controversial as they are widespread, especially with regard to their impact on the poor. Supporters of the strategy argue that revenue from user fees can increase accessibility of health services for the poor and improve the quality of care by assuring at minimum access to drugs, while critics counter that fees represent such an insignificant portion of total revenue in low-income countries that they could not make a significant impact on the health system and can act as a barrier to utilization (Bennett and Gilson 2001, Bitran and Giedion 2002).

The Bamako Initiative is a model of user fees designed primarily to generate revenue for local health systems through community-based activities (Beattie A. et al. 1996). Hence, it can contribute to decentralization goals, giving communities authority to spend fee revenues based on local needs. However, a major drawback of this is that poor communities unable to raise sufficient resources may not be cushioned by national funds, which are pooled from wealthy as well as poor communities. This weakness may be highlighted with the introduction of ACTs since Bamako schemes may not have the resources necessary to absorb the costs of the new drugs. Many may need access to subsidized ACTs or additional government subsidies.

### 2.6 Private, Social, and Community Health Insurance Schemes

Formal private health insurance in SSA is a financing mechanism for health care that is not yet well developed. Currently it covers only a small segment of the population, the few well-off private sector employees able to afford the relatively high premiums required for membership (Bennett and Gilson 2001).

Social health insurance is an arrangement, usually employer-based, through which health services are paid for by mandatory contributions to a fund (Bennett and Gilson 2001). This form of insurance is not commonly found in SSA because conditions there (especially the small size of the formal private sector) generally do not favor introducing it effectively (Department for International Development 2002).

Community health insurance is also a mechanism by which health care is financed through payments to a fund. Unlike social health insurance, however, it is not necessarily linked to employment status nor is it mandatory and so covers people working outside the formal sector (Bennett and Gilson 2001). In SSA, community health insurance schemes have been primarily in the form of mutual health organizations (MHOs) in West and Central Africa and community-based health financing schemes (CBHFs) in East and Southern Africa. Defined as “voluntary, nonprofit health insurance scheme[s] for the informal sector, formed on the basis of an ethic of mutual aid and the collective pooling of health risks, in which members participate in [their] management and functioning,” (Atim 1998) these schemes’ capacity to mobilize resources is currently limited. However, findings from case studies of MHOs in several countries suggest that their potential to generate revenue is great, with improved design and management. (Atim et al. 1998).

The introduction of higher-priced drugs could strain these already fragile systems. Given that malaria is endemic in most of the areas covered by MHOs/CBHFs, they may have difficulty absorbing the costs of ACTs and may need some outside support, probably in the form of subsidies. Alternatively, MHOs could be used as a means to provide subsidized ACTs through government
contracting. It must be noted that many CBHFs do not cover outpatient services and they would have to change their benefits package to play a part in the subsidization of ACTs.

2.7 New Support Mechanisms – SWAps, Global Fund, and HIPC II

A sector-wide approach (SWAp) is often defined as a mechanism through which “all significant funding for the sector supports a single sector policy and expenditure programme, under government leadership, adopting common approaches across the sector, and progressing towards relying on government procedures to disburse and account for all funds” (Foster et al. 2000). SWAps reflect a shift in donor funding from traditional stand-alone project aid to a more pooled funding approach. Ideally, fully developed SWAps can provide adequate and timely resources, because they assemble funds from all donors and lenders and disburse them through existing channels, reducing administrative costs and time. Currently there are no examples of SWAps sufficiently evolved to be assessed for their true impact although experience from several countries suggests that this approach has the potential to make an important contribution to health sector funding (Levine et al. 2002; Foster et al. 2000). From the point of view of ACT procurement, the embracing of SWAps by donors means that some donors (notably the Swedish International Development Cooperation Agency) that traditionally bought drugs and drug kits for government systems now tend to put the equivalent funds into the common basket.

An initiative set up to provide rapid debt relief for countries characterized as Heavily Indebted Poor Countries, HIPC II allows governments to use debt relief proceeds to target poverty reduction. Because the funds are already in country and need only to be redirected, HIPC resources may be more reliable than other sources of external funding. As of April

**GAVI and Financial Sustainability – Lessons for ACT Financing Mechanisms**

Can the financing needs of ACTs be modeled after the Global Alliance for Vaccines and Immunization (GAVI)? GAVI was established in 1999 to raise immunization coverage in the poorest countries of the world. In drawing lessons from GAVI, it is important to note several important distinctions between it and the needs of ACT financing:

**GAVI:**
- Time-bound intervention
- Narrowly targeted (to children under the age of five)
- Recognized as a public good and provided free of charge
- Population and demand are well known
- Narrow range of vaccines from which to choose

**ACT:**
- Indefinite intervention: recurring and open ended (for now)
- Broad target population: ACTs needed by everyone, although there are higher-risk groups (children under five and pregnant women)
- Usually paid for out-of-pocket and most often procured through the private sector
- Estimates of demand uncertain (fever is often reported as malaria)
- Multiple combinations likely

A study by Brugha et al. (2002) of four African countries where GAVI vaccines were introduced finds that “there was little or no evidence…that efforts were being made to mobilize alternative sources of support and to plan for sustainable financing if GAVI support stopped after 5 years.” Recognizing this problem, GAVI now requires countries to present sustainability plans.

Keeping these differences in mind, what financing lessons can be learned from GAVI? Sustainability plans must be developed sooner (as part of program design) rather than later. External support is likely to be needed for most countries until the price of ACTs drops close to that of current anti-malarial drugs.
2. Background

2003, HIPC had provided debt relief to 34 countries, at an estimated total of US$ 39.2 billion\(^1\) in 2002 net present value terms (International Development Agency/International Monetary Fund 2003). While the level of support varies by country, HIPC funds go far enough into the future (e.g., in Senegal they go as far as 2017) that they could be considered a medium- to long-term financing solution for the health sector as a whole. However, an external evaluation of the RBM Partnership reveals that these large amounts of resources are “typically not being used for malaria control” so advocacy with governments will be required to ensure that enough money is put aside to help meet the likely access gap that will come about from the introduction of new, more expensive drugs.

The Global Fund to Fight AIDS, Tuberculosis and Malaria is a public-private partnership founded to mobilize resources for the three priority diseases. According to the Fund’s May 2003 progress report, following the review of two proposal rounds, it has approved a total of $1.5 billion over two years to 150 programs in 92 countries. Unfortunately, the Fund is currently struggling to secure enough funds to meet its commitments for the third round of grants (Aidspan 2003) so it appears unlikely that it will be a long-term source of funding. However, if the Fund remains solvent and complements, rather than replaces other funding sources, it could contribute significantly to meeting the funding gap for ACTs in SSA.

2.8 Targeting

This section is drawn largely from *The Current State of Knowledge about Targeting Health Programs to Reach the Poor* by Davidson R. Gwatkin (2000). Targeting can be described in two ways: direct and indirect. Direct targeting is also called “individual” and involves some form of means testing. Indirect has also been called “broad,” “characteristic,” or “indicator” targeting. An example of direct or individual targeting is a poverty exemption (indigent – unable to pay) while indirect targeting could be geographical or age based (the north, under five, school children).

Targeting accuracy is measured in two ways: the number of people in the program who are the target (usually the poor) and the proportion of the target group that is covered by the program. A program with many non-poor in it will have “leakage” or “type I error,” sometimes called “inclusion” error. The absence of the target population in the program is called “undercoverage” or “type II,” “exclusion” error (Willis 1993).

Of the general effectiveness of targeting methods Gwatkin writes “while none achieved perfection, the more carefully targeted programs were much more successful in reaching the poor than the less carefully targeted ones.” Broad or indirect targeting is often justified on administrative simplicity (and thus costs) bases. It is much easier to determine if one is under five, or a student, or living in an area, or pregnant, than to determine if one cannot afford to pay for a service. Another advantage of broad targeting, with some leakage, is that the inclusion of the non-poor could help in the program’s sustainability and political acceptability (Gelbach and Pritchett, 1997).

Unfortunately, successful individual (poverty) targeting programs in health care (mostly on exemptions and/or waiver to user fees) in Africa are rare or non-existent (Tien and Chee 2002, Bitran and Giedion 2002). The better-known successful direct targeting program is in Thailand where more

\(^1\) All amounts are given in U.S. dollars.
than 65 percent of Thailand’s poor are covered in its “Low Income Support Program” with an inclusion error of 20 percent (Gwatkin 2003).

Fortunately, research has shown what improves the chance of success of individual targeting programs. The first is formal eligibility criteria, especially when explicit, clear, and verifiable. The second is independent eligibility verification. It is rare that a program succeeds when the provider also determines eligibility. When someone else does the assessment of eligibility, the chance of success increases (Gwatkin 2000). In addition, if the exemption or waiver will result in a loss of income (cost sharing, cost recovery system) to the provider making the eligibility determination, a reliable funding mechanism must be in place to replace or compensate the lost revenues – or else the provider will tend to deny the benefit and undercoverage will grow.

One aspect of targeting that should be kept in mind is that no method is exclusive and the best results can sometimes be reached with multiple targeting. For example, for intermittent preventive treatment during pregnancy (IPT), geographical and group targeting could be combined in selecting a poor district and pregnant women attending antenatal clinics.

### 2.9 The Nature of Antimalarial Treatment

There is growing resistance to chloroquine (CQ) and sulfadoxine-pyrimethamine (SP) and it is only a matter of time before countries have to switch to a new, more effective first line drug. Following WHO guidelines, the new drug will likely be a combination drug based on artemisinin and will be, in the short term, 10 times the current costs – $1.30 adult dose versus $.9 to $.12 for CQ and SP.

Antimalarial drugs are known and found worldwide, and used (or misused) by many people. Malaria is most often self-treated (~75 percent) (Breman 2001) and costs are usually out of pocket (>70 percent) (Kelley et al. 2001). The scale of the disease and the prevalence of private sector provision for treatment make it different from other public health programs. Although it is well known that young children are most at risk (WHO and UNICEF 2003), malaria strikes anyone at any age, and anytime of the year in endemic areas.

Other health interventions have better defined target groups or depend on public sector provision: immunization targets children under five years of age in most countries and is overwhelmingly delivered by the public sector. Oral rehydration solution (ORS) programs mostly target children and solution packets are distributed through both the public and private sector. ORS promotion programs have used social marketing to inform the public and create demand. Family planning targets adults of reproductive age. The promotion of family planning and insecticide-treated nets uses social marketing as well as traditional information, education, and communication. Due to the long history of antimalarial treatment, social marketing to create demand for drugs is not needed, as it is for products related to family planning and insecticide-treated nets. Moreover, malaria strikes the rural areas more often than urban ones (Kelley et al. 2001), and social marketing, which relies on commercial distribution channels to distribute commodities, is less effective in rural areas where these channels are less developed.
Thus the challenge of switching antimalarial drug treatments, and ensuring access and affordability, is that they are widely used by a large part of the population, and that the drugs are procured with out-of-pocket funds from private sources.
3. Conceptual Framework

This section lays out a framework to illustrate that the impact of the introduction of a more expensive treatment will be determined by numerous factors that are country-specific, such as per capita income and distribution, public sector financing (cost sharing/cost recovery/cash and carry), public sector facility coverage, formal private sector development (private and nonprofit facilities), importance of the informal sector, and effectiveness of drug registration and import controls. While these factors will vary greatly across countries, what is known is that the more precise the data, the more accurate the analysis, the more appropriate and effective the response will be to the introduction of ACTs. Getting precise and relevant data is not a simple order given the paucity of malaria (especially private sector, and health seeking behavior) data available. It is possible that some primary operations research covering public-private sector utilization and willingness and ability to pay will be needed, although in most countries there are some data that can be used. This approach will not resolve all the issues but if used it will shed some light on the outcomes of ACTs and assist the government in crafting the most cost-effective response.

The example below assumes that some individuals will be able to meet the increase in cost, some will be able to meet part of the costs, and some will not be able to meet any of the costs. Those who can afford partial treatment are likely to get substandard treatment or continue to use ineffective drugs.

The example illustrates possible outcomes of the introduction of ACTs as first line drugs at market (unsubsidized) prices. While not taken from a particular country, all assumptions used in the example are well within the range of possibilities.

Assumptions:

- Fevers will be perceived as malaria in most cases and treated as such; most malaria cases will be determined symptomatically and laboratory confirmation will be rare.
- There is some use of traditional medicine – herbs and traditional healers instead of or in addition to modern medicine.
- A significant percentage of individuals with fever will do nothing – likely to be adults in endemic areas.
- Public sector care is not free. There is a fee either for consultation or for drugs.
- Partial treatment regimens can be purchased and those who do not have enough money for a full treatment will do so. Individuals receiving partial dose treatment are considered not to have had access to effective treatment.
- Once ACTs are introduced, individuals who purchase other antimalarial treatments (CQ and SP) are considered not to have had access to effective treatment.
As described in Section 2.2, the private sector is now a majority provider of health care in many developing countries. The private sector is defined here as:

- Private for-profit and nonprofit practitioners (doctors, nurses, etc)
- Pharmacies/chemists
- Licensed chemical sellers – formally trained and licensed drug sellers
- Unlicensed drug sellers

Figure 1 (see end of section) shows the impact of the introduction of a more expensive antimalarial drug. The ratios and/or decisions are only for illustrative purposes and will differ from country to country; in fact, they will differ within country between geographical areas, socioeconomic groups, etc.

Before the introduction of new antimalarial drugs, 20 out of 100 individuals suffering from a fever choose to do nothing – no assumption is made on why they choose to do so. Inability to pay (for consultations and/or drugs) and perceived poor quality of care (especially frequent stockouts) in the public health delivery system are cited as reasons for choosing not to seek care in public health care facilities (Haak 2002), but treatment uptake can be low even when treatment is free and easily available (Von Seidlein et al. 2002). When considering whether or not to use the private sector, cost is a determinant at the high and low levels of income. At the higher end, patients are willing to pay for quality or convenience. Patients with less means often chose to purchase drugs directly from unlicensed sellers, bypassing the consultation fees, as a cost containing strategy. (Unfortunately they often receive partial doses and/or drugs of poor quality.) Knowledge of the disease and effective treatments (malaria is common and many know how to treat), proximity to treatment, and related costs (transport and opportunity) are also factors that figure into the choice to seek or not seek treatment (Kelley et al. 2001).

Of the 80 individuals who seek treatment, 90 percent (72 individuals) seek modern medical care (again, consultations and/or drug treatments) and 10 percent (8 individuals) seek relief through traditional medicine (self-treatment with herbs or consultations with traditional healers). Thus the effective demand for modern antimalarial is 72 treatments. Like the choice or whether or not to seek care, the choice of modern or traditional medicine is driven by factors such as knowledge of the disease, level and ease of payment (often in-kind), and proximity to treatment, as well as cultural beliefs and level of education.

The framework then considers two scenarios: the first is the current situation (treatment with CQ or SP); the second is the expected outcome once ACTs are introduced.

**Current Scenario:**

In the current scenario, 25 percent of the population (18 individuals) will seek treatment, either consultation and drugs or drugs alone, from the public sector, and 75 percent (54 individuals) from the private sector. The reasons for their choices vary, but it is known that malaria is most often self-treated, and convenience and costs play a large part in choosing whether or not to purchase drugs from licensed or informal sellers. For individuals seeking treatment from the public sector, 75 percent
(13) will be able to afford effective treatment and 25 percent (five) will not – they will either get partial treatment or will purchase drugs of poor quality. Of those seeking care in the private sector, 75 percent (40) will get a complete treatment; 25 percent (14) will not. In summary, in the current scenario, 53 of 100 fevers are treated with effective antimalarials; 19 individuals who seek modern treatment are not able to afford it.

**Higher Cost Scenario:**

When ACTs are introduced at a market price much higher than that of the current treatment, what is the expected impact? Of those who formerly sought treatment in the private sector, only 50 percent (27) will now be able to afford the treatment, with the remaining 27 unable to afford the new treatment – some will get partial doses, some will use the old, less effective, treatments. For the individuals who formerly sought treatment in the public sector, the expected impact is greater: only 25 percent (five) will be able to afford the new drugs; 75 percent (13) will not be able to afford them. In other words, of the 72 individuals who would seek modern treatment for malaria, only 32 will receive it when full-cost ACTs are introduced; 40 will not be able to afford ACTs and, therefore, will not be considered effectively treated. Thus, in this example, the impact of the introduction of more expensive antimalarial is an additional 21 cases not treated appropriately.

As mentioned above, this illustration is simplified to show the complexity of measuring the impact of an increase in the cost of antimalarials. Using the example, while the introduction of more expensive drug treatment results in the exclusion of an additional 21 individuals, the current situation, where only 53 out of the original 100 fevers were treated adequately, is no cause for rejoicing. It should be stressed that price is only one of the factors influencing treatment choices, and that often other factors have more influence. When considering expenditures to mitigate the impact of ACTs other interventions such as education, sensitization, training of personnel, improvement of drug supplies, which address these other factors may have more impact on health status than a drug price subsidy.

This is only one example. When using this approach it is necessary to consider a range of prices and their impact. A contingent valuation study can be undertaken. For example, if using household interviews or surveys to gauge the willingness and ability to pay for ACTs, questions such as “Would you be willing to pay $ .75, .50 or .25 for the drugs? Could you afford to pay this amount? What would you do if you could not?” would be used to measure consumers’ price sensitivity.

The section has explored a framework and example that illustrates that, although the price of antimalarials is important, it is not the only factor that influences the choice of various treatment options. It also highlights the importance of looking at all factors when estimating the impact of the introduction of ACT.
Figure 1. Malaria Treatment Seeking Behavior, Pre- and Post-Introduction of ACTs

<table>
<thead>
<tr>
<th>Number of individuals with fever</th>
<th>Level of education</th>
<th>Sex of patient</th>
<th>Number of individuals with fever</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>80% seek treatment</td>
<td>Modern treatment - 90%</td>
<td>72 Public sector - 25%</td>
</tr>
<tr>
<td>20% do nothing</td>
<td>20% seek treatment</td>
<td>Traditional - 10%</td>
<td>Private sector - 75%</td>
</tr>
<tr>
<td>80</td>
<td>80% seek treatment</td>
<td>Modern treatment - 90%</td>
<td>72 Public sector - 25%</td>
</tr>
<tr>
<td>20% do nothing</td>
<td>20% seek treatment</td>
<td>Traditional - 10%</td>
<td>Private sector - 75%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level of education</th>
<th>Sex of patient</th>
<th>Prior satisfaction with treatment</th>
<th>Level of education</th>
<th>Lack of knowledge of available treatment</th>
<th>Affordability of treatment options</th>
<th>Availability of treatment</th>
<th>Proximity to health facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>80% seek treatment</td>
<td>Modern treatment - 90%</td>
<td>72 Public sector - 25%</td>
<td>72 Private sector - 75%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20% do nothing</td>
<td>20% seek treatment</td>
<td>Traditional - 10%</td>
<td>Public sector - 25%</td>
<td>Private sector - 75%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of individuals with fever</th>
<th>Level of education</th>
<th>Sex of patient</th>
<th>Prior satisfaction with treatment</th>
<th>Level of education</th>
<th>Lack of knowledge of available treatment</th>
<th>Affordability of treatment options</th>
<th>Availability of treatment</th>
<th>Proximity to health facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>80% seek treatment</td>
<td>Modern treatment - 90%</td>
<td>72 Public sector - 25%</td>
<td>72 Private sector - 75%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20% do nothing</td>
<td>20% seek treatment</td>
<td>Traditional - 10%</td>
<td>Public sector - 25%</td>
<td>Private sector - 75%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current scenario</th>
<th>Higher cost scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 Can afford</td>
<td>18 Can afford</td>
</tr>
<tr>
<td>13 Cannot afford</td>
<td>5 Cannot afford</td>
</tr>
<tr>
<td>5 Cannot afford</td>
<td>13 Cannot afford</td>
</tr>
<tr>
<td>40 Cannot afford</td>
<td>27 Cannot afford</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Can afford treatment</th>
<th>Cannot afford/ did not receive treatment</th>
<th>Can afford treatment</th>
<th>Cannot afford/ did not receive treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>53</td>
<td>19</td>
<td>32</td>
<td>40</td>
</tr>
</tbody>
</table>
This section develops a model that estimates a range of ACT financing needs at the sub-Saharan Africa level. Major determinants are number of malaria episodes, number of episodes treated with modern drugs, evolution of the prices of ACTs, and speed of ACT uptake or utilization. The results are a range of incremental costs for ACT drugs, i.e., the model looks at only the costs of the drugs and compares the financing needed to pay for ACTs to the costs of current first line malaria treatments. The costs are calculated using likely ACT international prices scenarios and do not include all other costs associated with the change in a widely used drug program such as sensitization, development of material, training of providers, or public information campaign. To illustrate the country level financing impact of the introduction of ACTs, the model is applied to two countries: Zambia and Ghana.

The first variable of the model is the number of malaria episodes. Estimates of annual malaria incidence vary greatly: from 200 million episodes (Snow et al. 1999) to 300-500 million episodes are most often quoted for Africa alone (Kindermans 2002, Africa Malaria Report 2003). A mid-range figure of 400 million (average of 300-500 million) has been used in this model to estimate the financing impact of introducing ACT throughout SSA, where 90 percent of all malaria deaths occur (WHO and UNICEF 2003).

Table 1. Estimated Annual Malaria Incidence

<table>
<thead>
<tr>
<th>Sub-Saharan Africa</th>
<th>Zambia</th>
<th>Ghana</th>
</tr>
</thead>
<tbody>
<tr>
<td>400 million (average range 300-500 million*)</td>
<td>High 24 million**</td>
<td>65.3 million†</td>
</tr>
<tr>
<td></td>
<td>Low 3 million††</td>
<td>17.3 million**</td>
</tr>
</tbody>
</table>

* WHO and UNICEF (2003), **Derriennic (2003), † Snow et al. (2003), †† author consultation with National Malaria Control Centre, Ministry of Health, Zambia, 2003

The model does not make any assumptions about a reduction in incidence due to the introduction of a more effective first line drug, nor does it try to measure the impact on severe malaria. For this reason, the number of malaria episodes assumed by the model remains constant over the 10-year period.

In addition to the number of malaria episodes, important determinants of the cost impact of ACT treatments are the number of cases treated with modern drugs, the cost of the drugs and the speed at which ACTs are introduced and used in country.

The second variable is the number of cases treated by antimalarial drugs. Estimates of the number of episodes treated with modern drugs vary. The Africa Malaria Report (WHO and UNICEF 2003) puts the figure of 42 percent of children under five. The number of cases treated with modern
drugs range from 76 percent in Ghana (Ministry of Health/RBM/WHO 2001) to 27 percent in Gambia (Von Seidlein 2002). Conservatively, a higher (costlier) figure of 60 percent is used here.

The third variable is the cost of ACT drug treatment. Three drug cost scenarios were used for three artemisinin-based treatments: amodiaquine + artesunate (AQ+ASU), sulfadoxine-pyrimethamine + (SP+ASU), and artemether-lumefantrine (ART-LUM) under patent as Coartem®. For all scenarios, Coartem® prices remain the same until the patent expires in eight years; thereafter, generic ART-LUM prices drop quickly but not as much as the other combinations.

The average cost of treatment is calculated using a breakdown of episodes by age group multiplied by the cost of treatment for that age/weight (Snow et al. 2003). From the resulting average cost the current cost of chloroquine and sulfadoxine-pyrimethamine treatment is subtracted to calculate the ACT price differential. Since there is little international price difference between CQ and SP, one price is used for both. No assumptions are made about prescription practices or compliance.

ACT Drug Price Evolution Scenarios:

Low price scenario: Under the low price scenario, the costs of AQ+ASU and SP+ASU drop quickly as demand increases, the price ‘floor’ of plant-based production (~ $.55 to .70) is broken through and the prices of ACTs come closer to current costs of SP ($.35 to .40).

Medium price scenario: Under the medium price scenario, prices drop rather quickly, in three years, as suggested by MSF (Kindermans 2002), but do not break through the “floor” and stabilize around $ .55 to .60.

High price scenario: The high price scenario has prices declining slowly, reaching $.55 to .60 in eight years and then stabilizing.

All scenarios use current international prices as a base. It should be noted that the in-county (landed, cleared) prices would be higher, in some cases significantly higher due to transport, handling, duties, and other costs.

Table 2 shows ACT drug price evolution under low, medium, and high price scenarios. Figure 2 graphically depicts the same evolution.
Table 2. ACT Price/Evolution Scenarios – Adult Treatment (International Prices in US $)

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 6</th>
<th>Year 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Price</td>
<td>AQ+ASU</td>
<td>1.30</td>
<td>1.25</td>
<td>1.15</td>
<td>1.00</td>
<td>0.85</td>
</tr>
<tr>
<td></td>
<td>SP+ASU</td>
<td>1.20</td>
<td>1.15</td>
<td>1.10</td>
<td>0.95</td>
<td>0.80</td>
</tr>
<tr>
<td></td>
<td>Coartem®</td>
<td>2.40</td>
<td>2.40</td>
<td>2.40</td>
<td>2.40</td>
<td>2.40</td>
</tr>
<tr>
<td>Medium Price</td>
<td>AQ+ASU</td>
<td>1.30</td>
<td>1.30</td>
<td>1.3</td>
<td>0.60</td>
<td>0.60</td>
</tr>
<tr>
<td></td>
<td>SP+ASU</td>
<td>1.20</td>
<td>1.20</td>
<td>1.20</td>
<td>0.55</td>
<td>0.55</td>
</tr>
<tr>
<td></td>
<td>Coartem®</td>
<td>2.40</td>
<td>2.40</td>
<td>2.40</td>
<td>2.40</td>
<td>2.40</td>
</tr>
<tr>
<td>Low Price</td>
<td>AQ+ASU</td>
<td>1.30</td>
<td>1.10</td>
<td>0.65</td>
<td>0.65</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>SP+ASU</td>
<td>1.20</td>
<td>1.00</td>
<td>0.60</td>
<td>0.55</td>
<td>0.35</td>
</tr>
<tr>
<td></td>
<td>Coartem®/ART-LUM</td>
<td>2.40</td>
<td>2.40</td>
<td>2.40</td>
<td>2.40</td>
<td>2.40</td>
</tr>
</tbody>
</table>

The fourth element to the costing is the speed of the adoption of ACTs. The major determinant of this factor will be the price of the drugs. The choice of combination therapy for antimalarial treatment is based on the desire to forestall the growth of drug resistance. In countries where SP resistance is low, such as Ghana, RBM has recommended reserving SP for IPT in pregnancy. The use of artemisinin mono-therapy is growing as its effectiveness becomes known. Thus, in order to promote ACT, the price of the ACT cannot be significantly higher than these effective mono-therapies (ASU and SP). The fact that both of two of the ACTs in consideration are in co-packaging, and are less convenient to the user, would argue for pricing them below mono-therapies. For this
model, it is assumed that the prices of the ATC (excluding Coartem®) are competitive with artemisinin mono-therapy and that acceptance is rapid.

The global SSA model assumes quick acceptance of ACTs as the first line drug of choice. Twenty-five percent of episodes treated with antimalarial drugs are using ACTs by the end of the third year (Table 3). This is the equivalent of Kenya, Tanzania, Uganda, Malawi, Zambia, Burundi, Sudan, and Mozambique using ACTs exclusively for malaria treatments (Snow et al. 2003). Fifty percent usage is reached after six years and 85 percent at the end of 10 years. For Zambia and Ghana, the adoption of ACTs is even quicker: 30 percent at the end of the first year, 60 percent at the end of the second, and 90 percent at the end of the third year.

<table>
<thead>
<tr>
<th>Table 3. ACT Adoption Uptake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of utilization of ACTs as antimalarials</td>
</tr>
<tr>
<td>Global scenario</td>
</tr>
<tr>
<td>Ghana/Zambia</td>
</tr>
</tbody>
</table>

Model Formula:

\[
?_t \cdot E_i \times MM \times P \times U_t = IC
\]

Where:

\(E_i\) = Yearly Episodes in country i

\(MM\) = Use of Modern Medicine as % of malaria episodes

\(U_t\) = Utilization of ACTs in year t

\(P = P_{act} - P_{CQ or SP}\) Incremental Price of ACT: Price of ATC minus Price of CQ or SP

\(IC\) = Incremental Cost of ACT antimalarial – yearly

4.1 Results: Sub-Saharan Africa

The aim of this section is to provide a range of estimates of the incremental costs resulting from the introduction of ACTs. As stated previously, these amounts are based on international prices for the drugs and country level costs will be higher due to transport, handling, and tax expenses. Likewise, the figures do not include the program expenses of introducing a new drug – calculated, for the first year, as $800,000 for Tanzania (Abdulla et al. 2000) and $905,000 for Ghana (Derriennic 2003).
As the estimated number of episodes of malaria per year varies greatly, the costing results do as well. The model uses current prices as a starting point for the three prices/costs scenarios. The first year has the least variation (Figure 3 and Table 4). For the AQ+ASU combination, the lowest incremental cost estimate is $21.7 million and the highest is $156.7 million. The SP+ASU combination tracks the AQ+ASU combination, as the only difference between the two is the cost difference between SP and AQ. For SP+ASU, the low incremental cost estimate is $19.7 million and the high is $147.9 million. Coartem® is the most expensive option: the lower estimate of episodes of illness yields an incremental cost estimate of $44.5 million; the high episode estimate yields a cost increment of $321.6 million.

By year three, with 25 percent coverage or uptake – 25 percent of all malaria drug treatments are using ACTs – there is more variation between scenarios. The low price lower incidence scenario yields an incremental cost of $25 million for AQ+ASU and $111.4 million for Coartem®. The high cost high incidence scenario results in $343 million for AQ+ASU and $804 million for Coartem®.

Fifty percent use of ACTs is reached in year 6. In that year the medium price low incidence scenario gives incremental cost estimates of $45 million for AQ+ASU and $223 million Coartem®. The medium price high incidence scenario results in $326 million and $1.6 billion respectively. The medium price cost scenario is the scenario that assumes that the artesunate “floor” price is not broken through.

Finally in the tenth year, for the AQ+ASU combination, the incremental cost associated with the low price low incidence scenario is $45 million while the cost of the high price high cost scenario is $775 million. arthemeter-lumefantrine (Coartem® being off patent) costs are $165 million and $1.8 billion for the low price low incidence and high price high incidence scenarios respectively.

**Figure 3. Yearly SSA Incremental Costs of ACT – 400 Million Episodes**
### Table 4. SSA Yearly Incremental Cost of ACT US $ Million

<table>
<thead>
<tr>
<th>ACT Uptake</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Year 6</th>
<th>Year 7</th>
<th>Year 8</th>
<th>Year 9</th>
<th>Year 10</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10%</td>
<td>20%</td>
<td>25%</td>
<td>30%</td>
<td>40%</td>
<td>50%</td>
<td>60%</td>
<td>70%</td>
<td>80%</td>
<td>85%</td>
<td></td>
</tr>
<tr>
<td>AQ+ASU</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>22</td>
<td>36</td>
<td>25</td>
<td>30</td>
<td>25</td>
<td>27</td>
<td>33</td>
<td>38</td>
<td>43</td>
<td>45</td>
<td>324</td>
</tr>
<tr>
<td>Medium</td>
<td>22</td>
<td>43</td>
<td>46</td>
<td>27</td>
<td>36</td>
<td>45</td>
<td>54</td>
<td>63</td>
<td>72</td>
<td>76</td>
<td>486</td>
</tr>
<tr>
<td>High</td>
<td>22</td>
<td>42</td>
<td>47</td>
<td>49</td>
<td>58</td>
<td>68</td>
<td>81</td>
<td>89</td>
<td>101</td>
<td>107</td>
<td>664</td>
</tr>
<tr>
<td>AP+ASU</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>20</td>
<td>34</td>
<td>23</td>
<td>28</td>
<td>26</td>
<td>23</td>
<td>28</td>
<td>33</td>
<td>38</td>
<td>40</td>
<td>292</td>
</tr>
<tr>
<td>Medium</td>
<td>20</td>
<td>41</td>
<td>44</td>
<td>25</td>
<td>34</td>
<td>42</td>
<td>50</td>
<td>59</td>
<td>67</td>
<td>71</td>
<td>454</td>
</tr>
<tr>
<td>High</td>
<td>20</td>
<td>41</td>
<td>47</td>
<td>44</td>
<td>57</td>
<td>65</td>
<td>78</td>
<td>85</td>
<td>97</td>
<td>103</td>
<td>638</td>
</tr>
<tr>
<td>Coartem®</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>45</td>
<td>89</td>
<td>111</td>
<td>134</td>
<td>178</td>
<td>223</td>
<td>267</td>
<td>312</td>
<td>155</td>
<td>165</td>
<td>1,679</td>
</tr>
<tr>
<td>Medium</td>
<td>45</td>
<td>89</td>
<td>111</td>
<td>134</td>
<td>178</td>
<td>223</td>
<td>267</td>
<td>312</td>
<td>186</td>
<td>198</td>
<td>1,743</td>
</tr>
<tr>
<td>High</td>
<td>45</td>
<td>89</td>
<td>111</td>
<td>134</td>
<td>178</td>
<td>223</td>
<td>267</td>
<td>312</td>
<td>233</td>
<td>247</td>
<td>1,838</td>
</tr>
</tbody>
</table>
4.2 Results: Country Examples

The country scenarios differ from the SSA scenario in the uptake speed of ACTs. It is assumed that if ACTs are priced competitively, they will quickly displace current treatments. At the end of the first year, in both Ghana and Zambia, ACTs should account for 30 percent of modern malaria treatments. By the end of the second year, this has risen to 60 percent, and 90 percent coverage is attained by the end of the third year.

4.2.1 Zambia

The malaria incidence used for the Zambia model is 24 million episodes. This is calculated using 2001 public sector data that shows 6 million child doses and 18 million adult doses of chloroquine (Dr. S. Hodgins, personal communication, July 2003). Snow et al. (2003) calculate 23.469 million episodes. (See Annex A for detailed table.)

For AQ+ASU in the first year, incremental costs are $5.08 million for the all scenarios (Figure 4). For Coartem®, the incremental cost is $10.42 million.

For AQ+ASU, by the third year, low, medium, and high price scenarios yield $6.98, 12.88, and 13.33 million respectively. Coartem® cost is $31.26 million.

By year 6, AQ+ASU costs $3.81, $6.35, and $9.52 for the low, medium, and high scenarios. Coartem® costs are $31.26 million. By the end of the tenth year, the low price scenario yields $3.74 million for AQ+ASU and $13.64 million for artemether-lumefantrine. The medium price scenario
results in $6.30 million and $16.35 million for AQ+ASU and artemether-lumefantrine. The high price scenario gives $8.86 million and $20.42 million for artemether-lumefantrine.

Table 5 shows the financial impact of year 1 ACT use in terms of public sector health expenditures for 2002, the actual 2002 public sector drug procurements, and the “need-based” drug procurement. The need-based procurement amount is the estimate of the total public sector drug need, which has been estimated at about $18 million per year. It is clear that switching to ACTs will have a significant impact on public health expenditures: using AQ+ASU would have increased public drug expenditures by 45 percent while Coartem® would have almost doubled it. In terms of the need-based drug estimates, AQ+ASU would have required an additional 28 percent while Coartem® would have needed 58 percent. Finally in term of overall public sector expenditures, this would have resulted in an additional funding of 6 percent for AQ+ASU and 12 percent for Coartem®.

Table 5. Zambia, Impact of Incremental Cost of ACT, Year 1

<table>
<thead>
<tr>
<th></th>
<th>AQ+ASU</th>
<th>Coartem®</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incremental cost year 1 (million)</td>
<td>$5.08</td>
<td>$10.42</td>
</tr>
<tr>
<td>In % of public sector drug expenditures (actual 2002)* ($11.2 million)</td>
<td>45%</td>
<td>93%</td>
</tr>
<tr>
<td>In % of public sector drug expenditures – need-based** ($18 million)</td>
<td>28%</td>
<td>58%</td>
</tr>
<tr>
<td>In % of total public health sector expenditures:* ($87.8 million)</td>
<td>5.78%</td>
<td>12%</td>
</tr>
</tbody>
</table>

* Ministry of Health, Zambia 2003  
** Ministry of Health, Zambia 2000

As Table 6 shows, the impact of the ACTs on expenditures increases as their use increases. By the end of the third year with ACT use in 90 percent of modern drug treatments, AQ+ASU would more than double drug expenditures, increasing the needs-based expenditures by 71 percent and public sector spending by 15 percent. The impact of Coartem® is even more dramatic: Coartem® alone would take almost triple the actual drug expenditures, almost double the need-based estimates, and increase public sector expenditures by 35 percent.

Table 6. Zambia, Impact of Incremental Cost of ACT, Year 3

<table>
<thead>
<tr>
<th></th>
<th>AQ+ASU</th>
<th>Coartem®</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incremental cost year 3 (million)</td>
<td>$12.86</td>
<td>$31.26</td>
</tr>
<tr>
<td>In % of public sector drug expenditures (actual 2002)* ($11.2 million)</td>
<td>115%</td>
<td>279%</td>
</tr>
<tr>
<td>In % of public sector drug expenditures – need-based** ($18 million)</td>
<td>71%</td>
<td>174%</td>
</tr>
<tr>
<td>In % of total public health sector expenditures:* ($87.8 million)</td>
<td>14.6%</td>
<td>35%</td>
</tr>
</tbody>
</table>

* Ministry of Health, Zambia 2003  
** Ministry of Health, Zambia 2000

4.2.2 Ghana

The Ghana model uses 17.3 million annual malaria episodes (Derriennic 2003) for the low incidence and 65.3 million episodes (Snow et al. 2003) for high. (See Annex A for detailed tables.)

For the first year, the incremental costs for AQ+ASU range from $2.8 million in the low price low incidence scenario to $10.63 million for the high price high incidence scenario (Figure 5). For Coartem®, the low price low incidence scenario costs $5.8 million while the high price high incidence scenario costs $21.8 million.

**Figure 5. Yearly Incremental Costs of ACT Low Incidence: Ghana (17.3 Million Episodes)**

By the third year, the low price low incidence scenario costs $3.88 million and $17.38 million, the high price high incidence scenario $27.9 and $65.5 million for AQ+ASU and Coartem® respectively. By the end of the tenth year, the low price low incidence scenario yields an incremental cost of only $2.1 million for AQ+ASU and $7.68.4 million for artether-lumefantrine. The high price high incidence scenario calls for $18.6.6 million for AQ+ASU and $42.8 million for ART-LUM.

To put these estimates in context, the World Bank estimated that in 2000, per capita total expenditure for health was approximately US $20 – of which $14 were private expenditures, $6.4 were public expenditures ($4.2 government and $2.2 external funding) (World Bank 2002).

As Table 7 shows, using the medium price low incidence scenario, the per capita impact of the incremental cost of ACT is relatively small – at least for the AQ+ASU combination. It ranges from
2.2 percent of public sector expenditures in year 1 to 2.8 percent in year 6. Coartem® cost increases range from 4.5 percent of public health expenditures in year 1 to 13.6 percent in years 3 and 6.

Table 7. Incremental per Capital Cost of ACT: Ghana (Low Incidence Medium Price Scenario)

<table>
<thead>
<tr>
<th>Per Capita</th>
<th>Year 1</th>
<th>Year 3</th>
<th>Year 6</th>
<th>Year 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>AQ+ASU</td>
<td>0.14</td>
<td>0.36</td>
<td>0.18</td>
<td>0.18</td>
</tr>
<tr>
<td>Coartem®</td>
<td>0.29</td>
<td>0.87</td>
<td>0.87</td>
<td>0.45</td>
</tr>
<tr>
<td>In $</td>
<td>0.7%</td>
<td>1.8%</td>
<td>0.9%</td>
<td>0.9%</td>
</tr>
<tr>
<td>In % of Total</td>
<td>2.2%</td>
<td>4.3%</td>
<td>13.6%</td>
<td>7.1%</td>
</tr>
</tbody>
</table>

This section has outlined a range of estimates of the differential impact of the introduction of ACTs. It did not aim to provide ‘hard’ numbers, but to define a ‘ballpark’ impact. Again, the bases for these differential costs are international drug prices; in-country prices will be higher as they will include transport, handling, and other costs. Moreover, these are only the cost of drugs themselves; all other expenses associated with a drug treatment changeover have not been included. All these factors will increase the cost of switching to ACTs; however, the model is built conservatively – it tends towards options that increase the cost – 60 percent use of modern antimalarials and a quick uptake of ACT. In many instances, the uptake of ACTs as first line drug will take more than three years and in some case use of modern drugs for fever is lower than 60 percent.

For all scenarios it is clear that the number of episodes of malaria is the most significant variable influencing the range of results. The lower episode scenario, the mid point between the 300 to 500 million episodes a year often quoted, yields a range of $24 to 47 million for AQ+ASU in year 3 and $45 to 107 million in year 10. Coartem® being under patent, is more costly – yearly incremental cost peaks in year six at $223 million. Much work is ongoing in calculating better estimates of the number of episodes; it is hoped that in the near future the ranges will be narrower. As for the future price of ACTs, recent development could indicate that prices may break through the ‘floor’ of US $.55 to .60.
This section lays out steps at the country level to respond to the financing impact of the introduction of ACTs. The steps include a drug financing analysis, an impact analysis (using the framework in Section 2), targeting and pricing decisions, the identification of source of financing (who will pay?), the sustainability plan, and, finally, the implementation plan.

The section stresses that this approach and the resulting financing and sustainability plans should be part of a larger country level effort that considers other aspects of the introduction of ACT such as regulation and registration, packaging, taxes, efforts to improve compliance, changes in the treatment protocol, etc. Financing is only a small part of the challenges posed by the introduction of higher price but more effective antimalarial drug treatments.

Based on field information and following WHO guidelines on when to switch (WHO 2001), national authorities following recommendations from the national malarial programs have decided to change the drug for first line treatment of uncomplicated malarial to an ACT. The objective of the government’s actions is to make ACT available to the most at-risk population, and greatest number, at the lowest cost, for both the government and the consumers, as possible.

Considering the price of ACTs, what should the government do, what actions can it take to reach its goal? This section focuses on the financial, targeting, and subsidies concerns raised by the introduction of ACT as a first line drug. It outlines an approach or a series of steps to consider when addressing these issues.

The steps are as follows: First, the current antimalarial financing situation must be assessed – who pays what, where, when – and an impact analysis should be done – who is at risk, how many, where? Second, the targeting and pricing (subsidies) options should be calculated and laid out. Third, financing options should be identified and fourth, a sustainability plan drafted (to show how the financing and the subsidies evolve over time). Finally the implementation plan is drafted. The process is dynamic, especially between the targeting/subsidies and financing options, and political as well as technical imperatives will greatly influence the choices taken.

In the process of making the decision to switch to ACT, country decision makers will have to gather data on resistance level and treatment failures of current drug treatments. The more data available and the more spatially specific they are, the more informed policymakers will be in planning effective interventions. The geographical data will have to be analyzed to determine if the geographical targeting is possible or desirable.
5.1 Drug Financing Analysis

In order to assess the impact of the introduction of ACTs, in-depth knowledge of the current financing of pharmaceutical, and, more specifically, antimalarial drug sector is needed.

What are the government’s drug financing policies and practices? Are there separate malaria financing policies and practices? Are drugs free in government facilities? Is the price of drugs bundled with the consultation fee? Is the cost of drugs cost shared with the patients? Is the system using drug cost recovery i.e. only the cost of the drug is paid for but no other costs? Is it full cost recovery (drugs, handling, etc.)? Finally are drugs (and specifically antimalarial drugs) used to subsidize other drugs or services? In some cases, antimalarials are sold at more than cost and the profits are used to subsidize more expensive drugs – such as those for sexually transmitted infections, or the profits are used to cover running costs of the health facility, as is the case in some Bamako Initiative facilities.

Answers to these basic financing questions will define the financing strategies. For example, in Zambia drugs at government facilities are free – or their costs are bundled within the user fees. Thus a priori, and unless the government’s policy is changed, the financing burden of ACT falls squarely on the government (at least for the public sector). Furthermore, the rural health centers use a drug kit system. An external partner procures these kits; thus the change of first line drug impacts directly external partners. In many West African countries, malaria drugs are sold through community pharmacies at cost recovery plus a margin, and the funds generated are used to provide other services. Policymakers must decide how to best protect these pharmacies – and for how long. Will they need assistance absorbing the shock?; is it a one-time or recurring help?

Are there different policies at different levels? How decentralized is the procurement and pricing of pharmaceuticals for the public sector? Do different levels of government or different government units (local, district) have responsibility for either drug procurement or drug financing? Will there be a need to consult extensively on the fiscal impact of introducing ACTs? Can the central government set retail prices in the public sector, private sector? If yes, how is it done?

What is the government policy for the public sector procurement? Who procures, how? Will the introduction of ACTs call for any changes? Who is paying for the antimalarials? What are the costs and sale prices of antimalarials in the public sector?

For example, the government may have a policy to only partially subsidize drugs in the private sector and until now, due to their relative low prices, antimalarial drugs have been sold at a margin to cross-subsidize more expensive medicines. The introduction of ACT means that the government pricing policy would have to be examined. With this situation, it is likely that ACTs could not be sold at a profit, and the government would have to increase subsidies to replace lost revenue on antimalarials.

As the private sector is the most common source of antimalarials, it is critical that the government take the private sector into consideration when introducing ACTs. What is the current state of the private sector, its relative size, composition (is there any manufacturing or packaging done in country), wholesalers, state of competition, and size of private nonprofits in the sector? What is the government’s policy towards the private sector: Are there partnerships, collaboration, continuing education efforts, examples of concrete collaboration and partnerships? What is present on the
market? What antimalarials are authorized or being used in the country, what doses and packaging? What are the distribution channels (public, private, nonprofit) formal – informal? Who is using what? And at what costs (unit cost)?

In many countries, government knowledge and cooperation with the private sector is poor. The introduction of ACTs may provide incentive for renewed efforts to learn more about the private sector and to strengthen cooperation. As mentioned previously, most antimalarial drugs are procured through the private sector; therefore policymakers cannot afford to ignore the role of the private sector in the introduction of ACTs.

5.2 Impact Analysis

What is the likely impact on people’s ability to pay for antimalarials of introducing higher costs ACTs? The framework in Section 3 answers this question. No country will have all the information needed but the better the situation analysis and data on patients’ willingness and ability to pay, the more effective will the intervention be. Using the best available data, the impact analysis should estimate the number of individuals or households that will not be able to afford ACTs if they were made available without government support. If possible, several target groups and price ranges should be explored through a contingent valuation survey. How many households could afford ACT at $ .75, .50, or .25 for an adult dose?

As mentioned in Section 3, data are likely to be difficult to find to inform the impact analysis. However poor or approximate, the analysis should be attempted and the results used to inform targeting and pricing decisions. Government and partners should be encouraged to fund operations research to gather better data on malaria. Their appreciation of the importance of this type of research will be influenced by the urgency of the need to switch to a new first line drug. For example, although CQ resistance is up in Ghana and the government has decided to switch to ACT, the government and its partners may be willing to fund operations research on willingness and ability to pay to inform pricing. In eastern Africa, the failure rates of SP have led to the conclusion that switching to ACT is urgent (Kindermans 2002).

5.3 Targeting and Pricing

The impact analysis will have estimated the likely number of households that will not be able to afford the newly introduced ACTs. This section looks at what can be done to improve affordability and how to go about doing it.

Overall goal: Get the most effective drug treatment to the most people at the lowest possible cost.
5.3.1 Targeting for ACTs

Although malaria strikes everyone, data has shown that ill health in poor populations is concentrated in the young. “Poor infants, children and youth suffer a significantly higher proportion of total ill health experienced by a poor population” (Gwatkin 2000). The impact of malaria is highest in children under five years old (WHO and UNICEF 2003). Thus one key target group is poor children under five. While this is a key target group for support, it does not mean that it should be the only population or group benefiting from assistance (it may not be politically feasible do so), but that if resources are limited, it should be the primary beneficiary of intervention.

5.3.2 Support or Subsidies

Once it has been determined that some intervention is needed to improve financial access of poor individuals/households to ACTs, the intervention mechanism has to be selected. The aim is to reduce (or make free) the cost of ACTs to the consumer.

Characteristics of malaria treatment: What characteristics of antimalarial treatment have to be taken into account when designing an intervention? Malaria is often self-treated in young children; 44 percent are treated at home and an additional 10 percent are treated at home and at a health facility (WHO and UNICEF). In Ghana, up to 64 percent of patients self-medicate (Ministry of Health/RBM/WHO 2001). The source of drug treatments is often the private sector formal and informal retailers (Kelley et al. 2001).

The choice of intervention to use and the costs of this intervention will depend on the target population and local conditions. (See Table 8 at the end of this section for a simplified matrix of possible interventions.) One of several trade-offs that have to be taken into account at the country level is the precision of the subsidy versus the cost of administrating that subsidy. It will be easier for countries that already have a functioning and effective exemption system for the public health facilities to incorporate antimalarial treatment. A country with no public health care exemption or waiver system and weak administrative capacity may choose a broader, less targeted, subsidy (such as subsidizing all ACTs in the public system) as a feasible solution – although this option will be more expensive and have more inclusion errors (non-target population benefit).

Making the best of current systems: One aspect of targeting that should be reinforced is that even in programs that are considered successful there are considerable inclusion errors: One of the programs often cited as successful and presented as a “best practice” example, the Low Income Support Program in Thailand, has an inclusion error of 20 percent because one beneficiary in five actually did not qualify for it (Gwatkin 2000). Thus, in designing a subsidy system, one should remember not to “make the perfect the enemy of the good” and work on the best possible targeting outcome within the current system.

Few sub-Saharan African health care systems provide free drugs (Uganda has eliminated all public-sector user charges and Ghana has promised to do so). One important aspect of the governments’ intervention is the target price of the ACTs to the consumer. One element to consider when developing a target sale or cost price for ACTs is the alternatives available. In most cases, ACTs will be introduced to replace (displace) either chloroquine or sulfadoxine-pyrimethamine. In
many countries artesunate mono-therapy has been introduced in the private sector. Should the ACTs’ target (subsidized) price be equal to the cost of CQ and SP, or should it be subsidized to undercut the price of artesunate? Will policy call for a quick withdrawal of CQ and SP from the market, or will SP still be used for IPT? If subsidized ACTs are only available in the public sector, will there be action to limit the use of SP or artesunate in the private sector? How will this be done – by banning imports, withdrawal of registration? How expensive or effective is this likely to be?

For example, Ghana, which has a cash and carry (cost recovery) system for drugs, has decided to consider ACT as a first line drug and to reserve SP for IPT. Currently SP in Ghana sells for ~ $0.59 (mostly Fansidar®) and artesunate for $1.85 (Derriennic 2003). If the government wants to promote the use of ACT, it should target the price below that of Fansidar®. However, in order to promote SP for IPT, the government might want to import generic SP. To “preserve” SP for IPT, it could package SP differently and have a public information campaign centered on SP for pregnancy.

The answers to the questions above are complex and will have impact on the cost of any ACT subsidy. In addition to the cost of the ACT themselves, the calculation of the cost of the program should also include the expenses of strengthening or setting up all the systems that will ensure the success of the subsidy program; designing of the identification and allocation system (if using individual targeting), training of providers, supervision, inventory control, regulation, monitoring, etc.

To these costs directly associated with the government’s intervention to ensure access to ACTs should be added all other costs associated to the introduction of a new drug: registration and licensing, professional education, public sensitization campaigns, development of protocols and training materials, training of providers (public and private), training of drug sellers (formal and informal), monitoring, and finally operations research to monitor the use and effectiveness of the new treatment (Derriennic 2003).

### 5.4 Sources of Financing

This subsection is adapted from *Immunization Financing Options: A Resource for Policymakers* by the GAVI Financing Task Force (Levine et al. 2001).

Financing and the ACT program objective (targets and level of subsidy) are dynamically linked. The less resources available, the smaller the numbers of beneficiaries and smaller the subsidies; conversely, the more resources available, the greater the number of beneficiaries and the greater the subsidy.

Possible sources of financing for ACT support can be listed as follows:

- Domestic public finance: General revenues – central, subnational, earmarked taxes
- External public finance: Project grants (bilateral aid), debt relief proceeds (HPIC), SWAp, budget support
- Mixed external public and private finance: Global Fund
- Mixed external and domestic public: Development loans
Mixed domestic public and private: Social insurance

Domestic private: User fees/households, community health insurance, private health insurance

Each source can be measured by its ability to promote equity, achieve efficiency, provide adequate, timely, and reliable resources, engender accountability and encourage self-sufficiency.

Promote equity: The financing arrangement ensures that, across society, the poor are not disproportionately burdened with the responsibility for financing of health services.

Achieve efficiency: Financing arrangements minimize the costs of obtaining and accounting for funds.

Provide resources in an adequate, timely, and reliable manner: The financing arrangement ensures that resources are available in the volume and at the time and place where they are needed.

Engender accountability: The financing arrangement is compatible with procedures and documentation that allow for transparency in the allocation and the use of funds.

Encourage self sufficiency: Financing arrangements materially advance movement toward as high a level as possible of financial, technical, and logistical self-reliance.

Table 9 captures some of the attributes of financing options; to these should be added accessibility and timeliness. No additional funding comes without effort, but some sources require more than others. Is there a need to prepare advocacy briefs, sensitize decision makers, present your case to parliament, or does the source call for an application, plans, and financial analysis? What is the in-country capacity to meet these requirements, how quickly can they be acquired? For timeliness, how long will it be between request and disbursement? Will the resources be available in six months, a year, two years?

For all sources of funding, but especially for external resources, a risk assessment must be made: How reliable is this source over time? Can it be counted on? Are partners’ contributions dependent on yearly commitments?

There are no ideal solutions, and each country will have to develop the appropriate approach for its own context. However, it is important to note that there is danger of over-reliance on external funding for country programs.
5.5 Sustainability Plan

Sustainability is “the ability of a country to mobilize and efficiently use domestic and supplementary external resources on a reliable bases to achieve current and future targets” (GAVI 2003).

The GAVI experience would suggest that some countries had not focused on the financial implication of their immunization choices until they were required to submit sustainability plans that outlined funding beyond the program (personal communication, Natasha Hsi, Partners for Health Reformplus).

Thus drafting a sustainability plan for ACT subsidies would require decision makers to consider the impact of their decision over time.

Table 9 shows the advantages and disadvantages of funding sources (table derived from GAVI 2001). The assembling of the financing for ACTs cannot be divorced from the development of a sustainability plan. In general domestic resources are preferable to external resources and ideally over time the price of ACTs will decline to the point where they will be affordable to most consumers. Thus the sustainability plan should outline the mix of financing over time, declining in terms of total costs, and with an increased reliance on domestic sources. Due to the uncertainty of ACT prices, speed of utilization, and demand (number of episodes, ability to pay), it is suggested that a five-year, detailed sustainability plan be drawn up, and a less detailed strategic plan be drafted for the following five years.

The sustainability plan should be updated at regular intervals to reflect increased knowledge and changes in conditions. For example, the price of ACT may go down faster than expected leading to savings, while the estimates of the population unable to pay for it may have been low and demand for subsidies higher than expected. This could call for a shift of resources from procurement to targeted subsidies. To facilitate the routine updating of these plans, it is important that countries develop the capacity to do so.

5.6 Implementation Plan

Finally the financing portion of a more general ACT implementation plan should be drafted. While the overall implementation plan will include all of the activities that are needed to introduce ACT, such as registration, training of providers, and informational campaigns, the financing implementation plan will focus on the actions needed to secure and disburse the funds needed for ACT program. For example, if the financing plans calls for an increase in the ministry of health budget, does this require a specific line item? When in the budgetary cycle is the request introduced, and who introduces it? The country may have chosen to modify its request to the Global Fund – reallocating funds for malaria from program support to procurement of ACTs. How is this done, who will write the request?
As in all plans, the critical elements are what needs to be done by whom and when, and how does one measure progress – process indicators and overall program indicators (in this case funding from a given source).

In summary, this section has laid out an approach to the financing dimensions of switching to ACTs at the country level. It emphasized the importance of estimating the impact of ACT on ability to pay, designing a subsidy that targets the most affected while taking account of the local conditions, and a sustainability plan that takes into account the probable financing sources. The section stressed that addressing the financing issues should be part of a larger effort that includes the other aspects of the introduction of ACT such as regulation and registration, packaging, taxes, efforts to improve compliance, and change in the treatment protocol. Finally, while considering investing resources to mitigate the impact of ACTs, government and their partners should look at subsidies in light of their cost effectiveness versus other interventions addressing antimalarial drug treatment – ensuring drug supply, increasing compliance and so on.
### Table 8. Targeting and Subsidies

<table>
<thead>
<tr>
<th>Targeting</th>
<th>Channel</th>
<th>Method</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Risks</th>
<th>Response to risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad/all</td>
<td>Public only</td>
<td>National level subsidy on ACT through state procurement and provision at reduced or no charge</td>
<td>Supports current system Simple</td>
<td>Undercoverage (limited public sector facilities)</td>
<td>ACTs may be diverted to private sector</td>
<td>Public sector packaging Better inventory control Extend to nonprofit private sector</td>
</tr>
<tr>
<td>Broad/under five</td>
<td>Public only</td>
<td>National level subsidy on ACT + instructions/guidance to public facilities</td>
<td>Focuses on at risk group Support on current system</td>
<td>Undercoverage (over fives who cannot afford to pay)</td>
<td>ACTs may be diverted to private sector Greater under-coverage if facilities lose net revenue when granting exemptions</td>
<td>Public sector and children packaging Improve inventory control Compensate facilities for exemptions granted</td>
</tr>
<tr>
<td>Unable to pay</td>
<td>Public only</td>
<td>National level subsidy on ACT + instructions/guidance</td>
<td>Focuses on poor – increase access</td>
<td>Administrative burden: Need to have/develop clear criteria and must have/develop independent verification mechanism Undercoverage May disrupt current drug financing mechanisms (cost recovery/sharing)</td>
<td>ACTs may be diverted to private sector Criteria may not be followed Unpopular with the ‘non poor’</td>
<td>Invest in system design, training, and continued supervision Improve inventory control Training and supervision of staff and who decides Community-based identification and allocation system</td>
</tr>
<tr>
<td>Unable to pay/under five</td>
<td>Public only</td>
<td>National level and exemptions mechanism and guidance</td>
<td>Focuses on the most at risk Least expensive subsidy</td>
<td>Administrative burden: Need to have/develop clear criteria and must have/develop independent verification mechanism</td>
<td>Misuse (adult treatment) ACTs may be diverted to private sector Unpopular with the ‘non poor’</td>
<td>Improve inventory control Training and supervision of staff and who decides</td>
</tr>
<tr>
<td>Broad/all</td>
<td>Public and private</td>
<td>National level subsidy on ACT. Distribution through public and private wholesalers. Use of Community-based Health Financing</td>
<td>Supports current systems Simple</td>
<td>Leakage to able to pay Most expensive subsidy option</td>
<td>ACTs may be diverted to other countries Opportunity for favoritism Private sector excessive margins Poor prescription practices Not all communities have CBHF</td>
<td>Regional approaches Packaging Enforcement Set and publicize national prices Promote competition Packaging, training, and supervision of private sector Appropriately priced product available in public facilities</td>
</tr>
</tbody>
</table>
Table 8. Targeting and Subsidies

<table>
<thead>
<tr>
<th>Targeting</th>
<th>Channel</th>
<th>Method</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Risks</th>
<th>Response to risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad/under five</td>
<td>Public and private</td>
<td>National level subsidy on ACT + instructions</td>
<td>Focuses on at risk group</td>
<td>Undercoverage (adults unable to pay)</td>
<td>Misuse (adult treatment)</td>
<td>Children dose packaging</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use of community-based health financing</td>
<td>Support on current system</td>
<td>Leakage to able to pay</td>
<td>Not all communities have CBHF</td>
<td>Public information campaign</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Private would use a voucher system</td>
<td></td>
<td>Cost of processing bills or claims from private providers</td>
<td>Over billing by private providers</td>
<td>Improve supervision</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use of community-based health financing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unable to pay</td>
<td>Public and private</td>
<td>National level subsidy on ACT + set up a voucher system for private sector</td>
<td>Focuses on poor</td>
<td>Administrative burden: Need to have or develop clear criteria and must have or develop independent verification mechanism</td>
<td>Administrative burden is so high that the system is badly implemented leading to undercoverage and leakage</td>
<td>Invest in system design, training, and continued supervision</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use of community-based health financing</td>
<td></td>
<td>May disrupt current drug financing mechanisms (cost recovery/sharing)</td>
<td>Unpopular with the ‘non-poor’</td>
<td>Improve inventory control</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Voucher system prone to abuse (trading/selling)</td>
<td>Payment of vouchers may be slow, private sector may drop out</td>
<td>Training and supervision of staff and who decides</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Community-based identification, allocation and supervision of Private sector</td>
</tr>
<tr>
<td>Unable to pay/under five</td>
<td>Public and private</td>
<td>National level and exemptions. Voucher system for private sector.</td>
<td>Focuses on the most at risk</td>
<td>Administrative burden: Need to have or develop clear criteria and must have or develop independent verification mechanism</td>
<td>Misuse (adult treatment)</td>
<td>Improve inventory control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Private would use a voucher system</td>
<td></td>
<td>Where would the vouchers be handed out – who would hand them out?</td>
<td>ACTs may be diverted to adults and able to pay</td>
<td>Training and supervision of staff and who decides</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unpopular with the ‘non-poor’</td>
<td>Use NGOs and other groups to hand out vouchers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Undercoverage due to the difficulty of distributing the vouchers</td>
<td>Decentralize payment of vouchers to lowest level possible.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cannot hand out the voucher before an episode and thus may have high transaction costs</td>
<td>Community-based identification, allocation and supervision of private sector</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Slow payment of vouchers</td>
<td></td>
</tr>
</tbody>
</table>
### Table 9: Source of Financing for ACT

<table>
<thead>
<tr>
<th>Source of Financing</th>
<th>Equity</th>
<th>Efficiency</th>
<th>Adequate, timely, and reliable resources</th>
<th>Engender accountability</th>
<th>Encourage self-sufficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic public finance: general revenues (central)</td>
<td>+/- Depends on tax structure</td>
<td>+ No additional resources required</td>
<td>+/- Varied</td>
<td>+/- Depends on quality of administration</td>
<td>+</td>
</tr>
<tr>
<td>Domestic public finance: general revenues (subnational)</td>
<td>+/- Depends on tax structure</td>
<td>+ No additional resources required</td>
<td>- Subnational units often have difficulties raising adequate funds/reliability of central allocations to sub-national levels often weak</td>
<td>+/- Depends on quality of administration but closer to users than central</td>
<td>+</td>
</tr>
<tr>
<td>Domestic public finance: Earmarked taxes</td>
<td>- Targets consumption items</td>
<td>- Requires some additional resources to manage</td>
<td>+/- Varied, depends on changes in sales of the consumption item taxed</td>
<td>+/- Depends on quality of administration</td>
<td>+</td>
</tr>
<tr>
<td>External public finance: Project grants (bilateral aid)</td>
<td>+</td>
<td>- Requires additional resource to manage</td>
<td>+/- Relative short term, varies greatly, aid can be tied; can also be unreliable if donor priorities change or political issues intervene</td>
<td></td>
<td></td>
</tr>
<tr>
<td>External public finance: Debt relief proceeds (HPIC)</td>
<td>+</td>
<td>+ Requires little additional resources (reporting requirements)</td>
<td>+/- Same as domestic public finance</td>
<td>+/- Depends on tracking procedures and quality of administration</td>
<td>+</td>
</tr>
<tr>
<td>External public finance: SWAp</td>
<td>+</td>
<td>+</td>
<td>+/- Depends on competing priorities defined by government and partners</td>
<td></td>
<td>+/– Can contribute to better sectoral planning but largely reliant on external funds</td>
</tr>
<tr>
<td>External public finance: Budget support</td>
<td>+/-</td>
<td>+ Requires few additional resources</td>
<td>+/- Depends on competing for priority</td>
<td></td>
<td>+/- Can contribute to better sectoral planning but largely reliant on external funds</td>
</tr>
<tr>
<td>Mixed external public private finance: Global Fund</td>
<td>+/- On a global scale</td>
<td>+/- Requires additional resources for proposals and tracking</td>
<td>Uncertain reliability for the medium to long term</td>
<td>+/- Depends on tracking procedures</td>
<td>+/- Can contribute to better sectoral planning but largely reliant on external funds</td>
</tr>
<tr>
<td>Mixed external and domestic public: Development loans</td>
<td>+/- Depends on future tax structure</td>
<td>- Requires additional resources</td>
<td></td>
<td>+ Over the long term, if debt is repaid</td>
<td></td>
</tr>
<tr>
<td>Mixed domestic public and private: Social insurance</td>
<td>- Equity among those covered but the covered are the better off</td>
<td>- Has high administrative costs</td>
<td>+ Positive</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 9: Source of Financing for ACT

<table>
<thead>
<tr>
<th></th>
<th>Equity</th>
<th>Efficiency</th>
<th>Adequate, timely, and reliable resources</th>
<th>Engender accountability</th>
<th>Encourage self-sufficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic private: User fees/ households</td>
<td>- Effective exemptions for the poor can mitigate inequity</td>
<td>+/- If existing user fee program, no significant extra cost; if a stand-alone, then additional costs of set up and administration</td>
<td>+ Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domestic private: Community health insurance</td>
<td>- Financial risks are shared among members but the poorest may not be members</td>
<td>+/- May have difficulty absorbing additional costs—fragile</td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Domestic private: Health insurance</td>
<td>- Financial risks are shared among members but members are likely to be among the highest income</td>
<td>+/- Positive</td>
<td></td>
<td></td>
<td>+</td>
</tr>
</tbody>
</table>
Annex A. Model Tables

Table A-1. Annual Incremental Cost of ACT: Zambia (in US $ Million)

<table>
<thead>
<tr>
<th></th>
<th>Year 1 – 30% Utilization</th>
<th>Year 3 – 90% Utilization</th>
<th>Year 6 – 90% Utilization</th>
<th>Year 10 – 90% Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price Scenarios*</td>
<td>AQ+ASU</td>
<td>Coartem®</td>
<td>AQ+ASU</td>
<td>Coartem®</td>
</tr>
<tr>
<td>Low Price</td>
<td>5.08</td>
<td>10.42</td>
<td>6.98</td>
<td>31.26</td>
</tr>
<tr>
<td>Medium Price</td>
<td>5.08</td>
<td>10.42</td>
<td>12.86</td>
<td>31.26</td>
</tr>
<tr>
<td>High Price</td>
<td>5.08</td>
<td>10.42</td>
<td>13.33</td>
<td>31.26</td>
</tr>
</tbody>
</table>

*Landed Prices: 1.30% of International Prices

Table A-2. Annual Incremental Cost of ACT: Ghana (in US $ Million)

<table>
<thead>
<tr>
<th>Scenarios: Price and Incidence</th>
<th>Year 1 – 30% Utilization</th>
<th>Year 3 – 90% Utilization</th>
<th>Year 6 – 90% Utilization</th>
<th>Year 10 – 90% Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>AQ+ASU</td>
<td>Coartem®</td>
<td>AQ+ASU</td>
<td>Coartem®</td>
<td>AQ+ASU</td>
</tr>
<tr>
<td>Low Price- Low Incidence</td>
<td>2.82</td>
<td>5.79</td>
<td>3.88</td>
<td>17.38</td>
</tr>
<tr>
<td>Medium Price- Low Incidence</td>
<td>2.82</td>
<td>5.79</td>
<td>7.15</td>
<td>17.38</td>
</tr>
<tr>
<td>High Price- High Incidence</td>
<td>10.63</td>
<td>21.83</td>
<td>27.91</td>
<td>65.48</td>
</tr>
</tbody>
</table>
Annex B. Bibliography


Brugha, Ruairi, Mary Starling, and Gill Walt. 2002. GAVI, the First Steps: Lessons for the Global Fund.


