REPORT

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Pre-read

2nd Board Session: RBM Committees' Report

Executive Committee

AMFm Landscape Report

For Information

The Affordable Medicines Facility – malaria (AMFm) is a new initiative currently being piloted in Africa. Its main objective is to increase access to Quality Assured Artemisinin-containing Combination Treatments (QAACTs) through a co-payment mechanism. The co-payment is intended to reduce the end-user price of QAACTS to the same level as chloroquine or sulphadoxine-pyrimethamine. The pilot programmes will come to an end in December 2012 and the Global Fund has asked RBM to take leadership in planning for the transition in 2013 to the next phase of this initiative (as yet to be decided).

In response to this request from the Global Fund, it has been proposed that the RBM Board should discuss at its May 2012 meeting the following questions:-

1. What are the best ways to ensure that low cost and high quality diagnostic testing and treatment is available to all patients accessing treatment through the private sector?
2. Are subsidies for drugs and diagnostics a practical way to achieve the goal in (1)? If so, should they be actively promoted by RBM?
3. Is the AMFm model, as currently established, a viable and sustainable way to deliver drug subsidies? If not, can it be modified to make it viable and sustainable or is a completely different design needed?
4. If subsidies for diagnostics are a practical way to achieve the goal in (1) and RBM should promote them, then should this follow an AMFm model or another model?

5. Should RBM be involved in the planning for the transition from Phase 1 of AMFm? If so, what is RBM's role, and how should it proceed, given that the planning needs to start before the Fund's Independent Evaluation will be completed at the end of 2012?

To inform these discussions, the RBM Executive Committee (EC) has commissioned this facts-based situational analysis of:

- the role of the private sector in delivering high quality diagnosis and treatment;
- the global experience of social marketing programmes and subsidies in increasing access to health related commodities, especially those related to malaria;
- the current situation of AMFm and what will be known about it at the end of the Phase I pilots.

A second paper has also been commissioned to set out possible processes for RBM to gather more information and to make recommendations for strategies to improve access to high quality diagnosis and treatment with particular reference to the potential role of the private sector.

Requested Board Action

- The Board is requested to use the information in the attached report to inform its discussions on the future role of the retail private sector in increasing access to high quality antimalarial diagnosis and treatment, the role of social marketing and subsidies in improving access, and the status and future plans for the Affordable Medicines Facility – malaria (AMFm).

Contacts for clarification of this document or discussion of these issues or proposals

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VI. Annexes

Landscape Paper: "Malaria – Delivering High Quality Diagnosis and Treatment, the Role of the Private Sector and of Subsidies, the Status of AMFm"

TropMed Pharma
Consulting

MALARIA

DELIVERING HIGH QUALITY DIAGNOSIS AND TREATMENT

THE ROLE OF THE PRIVATE SECTOR AND OF SUBSIDIES

THE STATUS OF AMFm

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Executive Summary

Background

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Role of the Private Retail Sector

The role of the private retail sector in delivering healthcare, especially in low and middle income countries, has become an increasing focus in the last 20 years. However the sector covers a broad range of outlets with widely differing facilities and staff skills. In the context of this paper, the sector consists of pharmacies, drug outlets (licensed and unlicensed), informal outlets, and others selling medicines. It does not include private clinics and hospitals.

Delivering Antimalarial Treatment

The latest World Malaria Report shows globally ≈25% febrile children seek treatment from the public sector and ≈45% from non-public sources (with ≈30% not seeking any treatment). A widely quoted study estimates the reliance of care-seekers on private retail outlets at 60-80%. However other studies give a wide range of estimates, and they vary significantly between countries and are very context-specific. For example, in Zambia <20% of antimalarials are sourced from the private retail sector compared to >80% in Cambodia. The paper outlines in more detail the evidence on the importance of this sector, the variation in findings between studies and countries, and the likely need for a variety of approaches depending on the country context.

The reasons given that the private retail sector is usually favoured by patients and care-givers are that it is more responsive to patients' needs, and offers prompt access to treatment, better opening hours, less risk of stock-outs, and more considerate staff than the public health sector.

There have been concerns about the widespread availability of QAACTs in the private sector being a driver of resistance. However this was not a widely held view and most people interviewed felt that getting quality products as widely accessible as possible was a better protection against resistance as they would crowd out ineffective and sub-standard drugs.

Delivering Malaria Diagnosis

In recent years, the success in reducing malaria incidence and transmission though measures such as universal access to LLINs, prompt access to effective treatment, etc., means that the risk in malaria endemic countries of a fever being due to something other than malaria has significantly increased. This makes wider access to accurate diagnosis more urgent (as recommended by the latest WHO Treatment Guidelines). In one study in Kenya only 24% of patients buying antimalarials in drug shops were parasitaemic, and for over-fives this fell to 18%.

The development of RDTs in the last 10 years has opened up the possibility of making diagnosis more widely available, reducing wastage of expensive antimalarials in treating non-malarial fevers, and reducing child mortality by ensuring correct treatment. RDTs are now of a standard that they may be able to replace conventional microscopic diagnosis in most situations.

The private retail sector is very important for delivering treatment and so it is argued that it also ought to have a major role in delivering diagnosis. Diagnostics are not however widely available in this sector – statistics vary but one study in 6 countries of facilities used mostly by poorer patients showed only 11% stocked RDTs. Another study in six African countries showed that only between 2 and 16% patients received a blood test in a private sector outlet.

Usually sellers simply provide the drugs asked for by the care-seekers and do not offer any form of diagnosis or treatment advice. Even when diagnosis is possible (through the use of RDTs) then the seller is unclear on how to handle a negative test result. There are many perverse incentives for the private sector not to offer diagnosis but to simply offer an antimalarial for any form of fever. In addition, there is an absence of clear algorithms that the private sector staff can use to decide on what treatment to offer in the case of a negative test result. Care-seekers often have well-established patterns of behaviour when a case of fever occurs, and there is a significant need for behavioural change to take place before diagnosis (especially RDTs) will be more widely used in the private sector. However this is not easy to achieve. Cambodia has been socially marketing both ACTs and RDTs at subsidised prices for more than 5 years, associated with large-scale behavioural change campaigns. Despite this, only 49% private providers stock RDTs and only 21% of patients are tested for malaria.

One concern expressed about expanding the availability of diagnostics to the private retail sector is whether the staff would be able to correctly administer and interpret the tests. Several studies have now shown that village health workers can be quickly and easily trained to effectively diagnose malaria. These people are of similar backgrounds and educational attainments to drug store owners and staff, and so one may extrapolate that drug store staff could just as easily be trained. A study in the Brazilian Amazon showed that bar staff could also be trained to administer RDTs to their customers complaining of fever, with a saving of 77% in malaria-related diagnosis and treatment costs.

A major challenge that needs to be overcome in expanding the use of RDTs into the private retail sector is the safe handling of the sharps and the contaminated waste from the RDTs. One suggested method to overcome this problem is to restrict availability of RDTs to only a certain type of private outlet (e.g. Tanzanian ADDOs, or Kenyan Community & Wellness Shops).

While most people interviewed for this paper supported the increased access to diagnosis, the high level of BCC support, on-going training, and the development of appropriate treatment algorithms that can be followed by drug shop staff means that this needs to be developed carefully. There is unlikely to be a "one size fits all" approach. As one interviewee put it "we probably have one shot at getting this right".

Role of Social Marketing & Subsidies

Role of Subsidies in Social Marketing Programmes

Social Marketing Programmes (SMPs) are a response to a simultaneous failure of both the market and of government/public sector provisions. They aim to (a) increase demand through promotion of desired behaviours and the use of particular products, and (b) increase access through a combination of reduction of prices to affordable levels, increasing distribution reach, and better matching of product to patients' needs. The situations in which an SMP is undertaken can vary considerably, but it has been shown that it is important to their success that the demand for the product in question has to be created first before any initiatives to increase access and supply can have any effect.

Global Experience of SMPs

The only example of a global SMP identified for this paper was the WHO Control of Diarrhoeal Diseases in children special programme. This has been in place since the 1980s. Learnings from this that relate to this paper are:-

1. It is crucial to maintain marketing beyond the initial phase.
2. Subsidising the costs of a new commodity alone is unlikely to be enough for it to gain market share.
3. It should not be expected that rapid and sustained uptake of the commodity can be obtained and a plateau may be achieved that is difficult to rise above.

Subsidies in Delivering Antimalarial Treatment

During the design of AMFm, four pilot projects were carried out to test the AMFm subsidy model for delivering ACT treatment. These were all small sub-national projects. In addition, there were six national level programmes delivering subsidised ACTs that also give insights into the role and success of subsidising ACTs. None of the studies looked at delivery of diagnosis.

Sub-National Pilots

The four studies were in Uganda, Tanzania, Angola, and Kenya. All four studies showed significant increases in availability and market share of ACTs, and drops in prices to end-users. The Kenyan study is the only one to-date to look at impact on treatment patterns. Here again there were significant improvements in the use of ACTs in treating febrile children, although not reaching WHO targets.

Care is needed to be taken in extrapolating from these sub-national pilots to a national level programme (like AMFm):-

1. The pilot projects are small scale and AMFm is national.
2. The pilot projects in three countries (Angola, Uganda, and Kenya) added a new distribution route for the subsidised ACTs, whereas AMFm only uses existing distribution channels.
3. In the Angola pilot, the price was closely monitored at shop level and action was taken against shops making large mark-ups. This close monitoring is unlikely to be replicated in a national programme.
4. All pilot projects were associated with intensive health education campaigns and training for drug sellers. It is not clear if the same level of intense marketing campaigns will be possible on a national level and sustained for many years.

National Programmes

The six national programmes confirmed the concerns about the falling off of the results of a subsidised ACT programme when delivered at a national level. All six studies have methodological issues which mean that the changes from baseline were not readily available and different parameters were collected in different countries. However the results showed that end-user prices of ACTs could fall significantly, but usage data (where available) was not encouraging. This may be due in large part to the scale of any associated communications packages.

Cambodia has had a social marketing campaign for ACT and RDT usage that has been running for 10 years. The evidence is that despite this time period and an effective communications campaign to raise awareness of the subsidised brand of ACT, availability of ACTs took years to pick up and was particularly low in rural areas. This may be due to poor reliability of supply or lack of demand. Uptake by consumers was also low compared to other antimalarials (≈ 40%). This may be due to the challenge of long-standing brand loyalty to other antimalarials.

Subsidies in Delivering Malaria Diagnosis

The Cambodian national programme is the only case study attempting to promote diagnosis in the private sector, supported by a comprehensive BCC programme. Key lessons have been:-

- despite high brand awareness for ACTs, there was much lower brand awareness for RDTs;
- availability of RDTs also took years to pick up and was particularly low in rural areas;
- uptake of RDTs was much lower than ACTs.

A key challenge for increasing the use of RDTs, especially in the private sector was identified as the complexity of the BCC messages needed. It is not a simple “buy this product” but involves multiple steps many of which fly in the face of care-seekers’ prior experience or education. The lack of a robust treatment algorithm to be used by private retail sector staff explaining what to do with negative test results and integrating this with the treatment of other major febrile childhood diseases (pneumonia, meningitis, etc.) added to the challenge.

There has been a study that looked at the price elasticity of combining treatment with ACTs and diagnosis with RDTs. It has shown that if ACTs are heavily subsidised then a reduction from 90% to 80% subsidy to fund a subsidy of the RDTs did not reduce ACT usage and increased demand for RDTs.

Other Health-related SMP Experience

Most health related SMPs on a national level with associated subsidies of commodities have been associated with sexual or reproductive health. Measurement of success has usually been restricted to availability and/or market share. Again most of the experience has been that, despite effective SMP communication programmes, uptake levels have never reached near to the levels seen in the ACT subsidy sub-national pilots (with a few exceptions associated with promoting condom and contraceptive usage).

The conclusion from all the reports of the SMP programmes included in this paper was that subsidy programmes alone will not deliver adequate results. There needs to be a strong focus on the associated SMP communications and training campaigns to ensure positive trends, especially where there is a major behavioural change desired.

Affordable Medicines Facility – malaria (AMFm)

Background

The AMFm has been developed from the concept of a high level global ACT subsidy proposed by an Institute of Medicine (IoM) Committee in 2004. The concept was to reduce the ex-manufacturer price of ACTs to a level that will allow the First Line Buyers (FLBs) – the first stage of the ACT distribution chain in a country – to be able to sell QAACTs at a price at least as low as chloroquine. It is achieved by making a co-payment from a central fund to manufacturers equal to the difference between the factory gate price and the affordable price they sell to the FLBs. This will then allow end-users to buy effective treatment at a price close to non-effective older drugs, and drive sub-standard and ineffective drugs as well as artemisinin monotherapies from the market.

AMFm was designed initially by a Task Force under the auspices of RBM. In 2008 the Global Fund took over management of the initiative as a separate business line within the Fund. The Fund Board agreed to a set of 9 Phase I programmes in 8 countries (Cambodia, Ghana, Kenya, Madagascar, Niger, Nigeria, Tanzania [mainland]), Tanzania [Zanzibar], Uganda). Cambodia has been unable to start their pilot due problems of accessing appropriate quality ACTs.

The Board approved a two year period for Phase I so that it could make a decision to "expand, accelerate, terminate or suspend the AMFm business line" in the second half of 2010, but delays in the launch of AMFm (till June 2010) has meant that this has now been delayed till November 2012. Funding for the co-payments initially has come from grants from UNITAID, DFID, and the Gates Foundation.

Objectives

The objectives of the AMFm programme are:

1. To increase the availability of quality assured ACTs in public and private outlets.
2. Reduce the price of quality assured ACTs in comparison to other commonly used antimalarials.
3. Increase the market share of quality assured ACTs among antimalarials.
4. Increase the use of quality assured ACTs in malaria sufferers, including among vulnerable groups such as the poor, rural communities, and children.

Concerns

Before AMFm was launched, several groups expressed concerns about the concept of a global subsidy and of the hosting of it by the Global Fund. These included:-

- Commodity pricing is only one barrier to access and availability. A broader approach to removing all the barriers (including policy, health worker training, behavioural change, regulatory issues, supply chain management, and diagnostics) should be addressed preferably as an aligned package.
- The funding gap for all aspects of a comprehensive approach to malaria control and elimination means that the opportunity cost of allocating a significant sum to a single top-down intervention may be too high.
- ACTs are being made available to national governments free through donor-funded programmes. However the application by endemic country governments of user fees means that factory gate prices are not the only barrier to accessing treatment by the poor and AMFm does not address this issue.
- The market share levels that have been projected for AMFm will not reach a level to properly crowd out artemisinin monotherapies – a key objective of AMFm.
- The market share levels also do not give confidence that the availability of ACTs will reach to the poorest or the more remote communities.
- AMFm does not address the need to diagnose malaria and so drug may be wasted on treating non-malarial fevers.
- How to ensure that ACTs are safely dispensed to care-seekers.
- How AMFm might stabilise the artemisinin market.

- Over-enthusiasm based on the 4 sub-national pilots studies referenced above given the reservations on scalability already noted.

During the Phase I pilots, these concerns have continued to be expressed, along with increasing concerns about the impact of a lack of diagnosis on the use of ACTs and its impact on drug supply. Specific questions have been raised about the amount of ACTs supplied to Zanzibar, a country already discussing malaria elimination.

Phase I Pilots

AMFm was formally launched in June 2010. Co-paid ACTs started to arrive in countries from August 2010. The resources for the supporting interventions (communications programmes and other SMP related activities) were found by reprogramming existing Global Fund grants and were subject to Fund Technical Review Panel review. Funds for these did not start to be disbursed until 2011 and countries had delays of six months to one year between drug availability and the launch of local awareness campaigns.

The co-payment fund was originally set up with US$ 216 million but this had to be replenished in early 2012 with an additional US$ 120 million. The budget for supporting interventions was US$ 127 million.

Experience to-date

- Due to the mix of dosage forms of co-paid ACTs being ordered by FLBs, the co-payment fund was depleted faster than expected, resulting in the need for the US$ 100 million replenishment. Much more adult strength dosage forms have been ordered compared to paediatric for a disease where the major burden is in under-fives.
- The Fund's AMFm Unit has had to institute a series of demand levers to ration co-payments and orders by FLBs to manage the "burn rate" of the co-payment fund and the supply of co-paid ACTs from manufacturers.
- AMFm is a financing mechanism that can be used by both the public and private sector. Demand from the private sector has been significant and this has run the risk of crowding out the public sector. However there have also been examples in Ghana and Niger of the public sector overcoming problems of lack of supply through the public sector by buying co-paid ACTs from private sector outlets.
- Pricing surveys undertaken during the Pilots show that prices of co-paid ACTs have fallen significantly and paediatric doses are available at 1x – 2x generic SP. Adult doses range between 1x – 4x generic SP. However there is evidence that the mark-up on paediatric forms is higher than for adult forms. The reasons for this are currently unclear.
- Availability surveys show that co-paid ACTs have become widely available but this is mainly due to demand for the adult strength of artemether/lumefantrine. Other dosage forms, especially paediatric ones, have only reached about 30% of stores surveyed.

By-and-large, countries involved in the pilot programmes are very happy with the results, commenting on the rapid increase in availability and the reduction in prices. They also comment on the positive experience of bringing the public and private sectors together in planning and executing the pilots. Most feel that the pilot programmes are too short and are concerned about what will happen after Phase I ends in December 2012.

Independent Evaluation

An Independent Evaluation (IE) of the AMFm has been commissioned, to report for the November 2012 Global Fund Board. The IE will measure AMFm's success in achieving its objectives. Principal measures of success have been defined as:-

Availability:	20 percentage point increase in availability from baseline (All QAACTs)
Price:	Co-paid QAACT price < 300% of price of dominant non-QAACT
Price:	Co-paid QAACT price < price of artemisinin monotherapy
Market share:	10-15 percentage point increase in market share from baseline (All QAACTS)
Market share:	Decrease in market share of artemisinin monotherapy

The Global Fund Board had originally asked that the IE show that AMFm was cost-effective relative to other similar financing initiatives and that a comparator country where AMFm was not operating was included. However, based on input from the Fund TERG and external consultants, it was subsequently decided that neither of these would be possible and they were dropped. The results of the IE will be presented as a set of country case studies that will attempt to put the findings into local context.

In addition, the AMFm Unit has commissioned studies to look for the future at (a) ACT & API market dynamics, (b) governance, and (c) financial sustainability.

CHAI is undertaking a series of operational research studies to look at a variety of other aspects of drug and RDT subsidy interventions, impact of packaging on adherence, and how far co-paid ACTs are reaching remote locations.

All these studies will feed into the overall evaluation of AMFm.

The IE will distinguish two parts of AMFm: (i) the upstream part, with emphasis on the business model of the AMFm as a financing platform; and (ii) the downstream part, with emphasis on service delivery to increase access to and use of ACTs, including by poorer and more remote people. However the data on the upstream part is likely to be much more robust than the downstream part. The IE will not give information on:-

- effective targeting of ACT usage to vulnerable populations;
- adherence to drug regimens;
- the global supply situation and how AMFm has affected this;
- diversion of QAACTs from public to private sectors as a result of AMFm (potentially leading to supply problems in the public sector);
- diversion of AMFm co-paid ACTs from AMF to non-AMFM countries.

A major concern about the IE is the very short period of Phase I and whether this is long enough to get meaningful results. Including the time that supporting interventions have been in place, the IE will only be examining 3-8 months of full implementation. Most health-related commodity SMPs have waited until they are considered mature (3-6 years post-launch) before attempting to measure impact. Major financing initiatives (e.g. GAVI, PEPFAR, Global Fund) have waited for at least 5 years before evaluating their performance.

Post-Phase I Scenarios

Three "operational" scenarios for the post- Phase I period have been identified:-

- *Continue:* AMFm continues beyond Phase 1, but does not expand into additional countries and does not include modifications such as malaria RDTs.
- *Modify:* AMFm continues beyond Phase 1 and expands into additional countries and/ or includes modifications (*e.g.* addition of malaria RDTs).
- *Terminate:* AMFm is suspended or terminated leading to a winding down period to prevent interruption of services in AMFm countries. Possible alternatives could be national-level subsidies or a new global-level subsidy with a different model to AMFm or another organisation taking over from the Global Fund.

Work has been started by the AMFm Unit on developing contingency plans for each of these scenarios, but this has been interrupted by the changes in governance mechanism at the Global Fund and the request by the Fund for RBM to take on leadership of this.

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Abbreviations

ACT	Artemisinin-containing Combination Treatments
ADDO	Accredited Drug Dispensing Outlets
AMFm	Affordable Medicines Facility – malaria
AOA	Angolan Kwanza
API	Active Pharmaceutical Ingredient
BCC	Behavioural Change Communication
BMGF	Bill & Melinda Gates Foundation
CDD	Control of Diarrhoeal Disease
CHAI	Clinton Health Access Initiative
CHW	Community Health Worker
DFID	Department for International Development
DHS	Demographic and Health Survey
DRC	Democratic Republic of Congo
FDC	Fixed Dose Combination
FLB	First Line Buyer
HAI	Health Action International
HIV	Human Immune-deficiency Virus
IE	Independent Evaluation
IoM	Institute of Medicine
ITN	Insecticide Treated Nets
KAP	Knowledge, Attitude, Practice
LIC	Low Income Countries
LPG	Lowest Price Generic
LSHTM	London School of Hygiene & Tropical Medicine
MDAG	Market Dynamics Advisory Group
MICS	Multiple Indicator Cluster Surveys
MIS	Malaria Indicator Survey
MSF	Medicins sans Frontières
NGO	Non-Governmental Organisation
NMCP	National Malaria Control Programme
OB	Original Brand
ORT	Oral Rehydration Therapy
OTC	Over The Counter
POM	Prescription Only Medicines
PQR	Price & Quality Reporting
PSP	Private Sector Provider
QAACT	Quality Assured ACTs
RBM	Roll Back Malaria
RBM EC	Roll Back Malaria Executive Committee
RDT	Rapid Diagnostic Tests
RRP	Recommended Retail Price
SMP	Social Marketing Programme
SP	Sulphadoxine-pyrimethamine
TDR	Special Programme for Research & Training in Tropical Diseases
TERG	Technical Evaluation Review Group
TFDA	Tanzanian Food & Drug Authority
TMPC	TropMed Pharma Consulting
TRP	Technical Review Panel
TZS	Tanzanian Shilling
UGX	Ugandan Shilling
USG	US Government
WHO	World Health Organisation
WPRO	Western Pacific Regional Office
WTP	Willingness To Pay

Introduction & Background

It has generally been assumed that a high proportion of people affected by malaria access treatment, at least initially, through the private retail sector. Therefore it has been argued by some that, in order for high quality diagnosis and treatment to be accessible by all people affected by malaria, the private retail sector needs to be engaged in some way. However the introduction of the artemisinin-containing combination treatments (ACTs) in the early 2000s and their recommendation by the World Health Organisation (WHO) as the first-line treatment of choice posed problems. Their high cost (compared to existing but by then ineffective drugs like chloroquine and sulphadoxine/pyrimethamine [SP]) made them unaffordable to patients accessing treatment through this sector. Against this background, it was proposed that there should be a global subsidy to reduce the price-to-patient down to the level of chloroquine. This idea was developed into a new initiative - the Affordable Medicines Facility-malaria (AMFm) – which was finally launched as a two year pilot in 2009 (Phase 1). Phase 1 was funded by UNITAID, the Bill and Melinda Gates Foundation (BMGF), and the UK Department for International Development (DFID).

In October 2011, during the Gates Malaria Forum in Seattle, the Roll Back Malaria Partnership (RBM), and the Global Fund to fight AIDS, TB, & Malaria (Global Fund) convened the AMFm Founder's Forum. Its purpose was to:-

(a) to review progress and key challenges of AMFm Phase 1;
(b) to learn from country officials about their experiences, priorities and expectations;
(c) to anticipate and share perspectives on potential scenarios that may emerge when AMFm Phase 1 ends in December 2012, and how to prepare for those scenarios.

Subsequently the Executive Director of the Global Fund (Prof Michel Kazatchkine) wrote to the Executive Director of RBM (Prof Awa Coll-Seck) to follow up on the conclusions of this meeting [1]. He requested that RBM should take a leadership role in determining the future of AMFm and the transition that would be needed in 2013, without prejudice to any decision of the Global Fund Board at the end of 2012 on the Fund's future role in managing AMFm. His letter envisioned three functions to be led by RBM:-

(a) its convening function as a global framework that includes all principal stakeholders.
(b) the development of a suite of conceptual and analytical work to be performed by experts in domains that are central to the purpose, design, execution and updating of the AMFm concept in preparation for the transition.
(c) country-level technical support for country-specific scenario planning.

The RBM Executive Committee (RBM EC) discussed this letter and concluded that, before the RBM Board could decide on a plan of action for 2013 as a year of transition for AMFm, certain preparatory work was needed. It was also agreed that the Board needed to have one-or-more options for a process to meet the requests made in Prof Kazatchkine's letter [1]. The recommendations to be considered by the Board at its May 2012 meeting should balance the short-term urgent needs to address the specific issues concerning the transition of AMFm from its Phase 1 pilot and the broader longer term issues of access to high quality diagnosis and treatment [2].

A small *ad hoc* Steering Group of the RBM EC [1] was set up. It commissioned TropMed Pharma Consulting Ltd (TMPC) to work on the preparations for the May 2012 Board Meeting discussion on this subject. TMPC's credentials to work on the project are set out in Appendix 1. Discussions of the *ad hoc* Steering Group with TMPC[2] developed the following questions that the RBM Board might discuss:-

[1] Chaired by Dr M Lynch, and consisting of Drs D Brandling-Bennett, R Newman, B Nahlen, and A C Santelli.
[2] At the ASTMH Annual Meeting on 05 December 2011

1. What are the best ways to ensure that low cost and high quality diagnostic testing and treatment is available to all patients accessing treatment through the private sector?
2. Are subsidies for drugs and diagnostics a practical way to achieve the goal in (1)? If so, should they be actively promoted by RBM?
3. Is the AMFm model, as currently established, a viable and sustainable way to deliver drug subsidies? If not, can it be modified to make it viable and sustainable or is a completely different design needed?
4. If subsidies for diagnostics are a practical way to achieve the goal in (1) and RBM should promote them, then should this follow an AMFm model or another model?
5. Should RBM be involved in the planning for the transition from Phase 1 of AMFm? If so, what is RBM's role, and how should it proceed, given that the planning needs to start before the Fund's Independent Evaluation will be completed at the end of 2012?

Before the Board would be able to come to an objective and reasoned decision on these questions, it was agreed that a facts-based situational analysis needed to be conducted. This should attempt to gather in one document all the available evidence relating to the questions above, what evidence would be available at the end of the AMFm Independent Evaluation and the views of as wide a range of members of the malaria community as possible. In addition, a logical process should be designed to ensure that the Board could have the best possible advice and guidance when answering the 5 questions above. This would be required in time for the May 2012 RBM Board Meeting. At that time, the Board could endorse the process and this would then proceed in time to deliver recommendations to the Board in time for its November 2012 meeting, when the Board would take a definitive position on the way forward. This would ensure that the Board was able to make an objective decision based as far as possible on all the available evidence.

This paper contains the situational analysis mentioned above. A separate paper will outline the recommended options for the process to be carried out in the second half of 2012.

This is paper is in three sections, covering the role of the private retail sector in delivering diagnosis and treatment for malaria, the experience of social marketing programmes and subsidies in improving access for health-related commodities, and background on AMFm. Each section is a summary of the evidence based on published information, studies, and opinions. At the end of each section is a summary of the comments made on the topic during the interviews conducted as part of the information-gathering exercise. The latter may be considered to be rather more subjective than the published opinions.

The Role of the Private Retail Sector

The last 20 years has seen a growing attention to the importance of the private health sector in delivering healthcare, especially in low and middle income countries [3].

Private sector facilities can be classified as either 'formal' or 'informal' and demonstrate a wide range of products and services as well as skills and quality of care provided. The private sector is particularly important for the poor. Poorer patients get sick and go without care more frequently, and spend proportionately more of their incomes on private healthcare than the wealthy. What this means for public health, and for the health of the poor in particular, depends upon the quality of care and the affordability of care provided – two topics which have been the subject of many studies, often with conflicting results [4]. Those facilities generally considered to be part of the 'formal' private sector include licensed pharmacies, small private clinics, private healthcare practitioners, and private hospitals that typically cater to a wealthier clientele. In some countries, the formal private sector may also include licensed drug outlets, such as *duka la dawa baridi* in Tanzania [5] . The 'informal' private sector often consists of small outlets, manned by personnel with little to no formal healthcare training [6,7]. There is also a further distinction – between private clinics (where doctors and nurses deliver diagnosis and treatment in return for fees and/or income from prescribing and dispensing medicines) and the private retail sector that include pharmacies, drug outlets (licensed and unlicensed), informal outlets, and others selling medicines.

The role of the private sector in ensuring access to antimalarial commodities has been well recognised in the literature and in statements of global health policy. The WHO has supported the importance of working with the private sector to improve access [8], while recognising that serious problems exist for this sector of healthcare delivery access [9]:-

- inefficiency;
- profit motivation of private sector providers (PSPs);
- low quality of commodities often found in PSP outlets;
- counterfeit commodities.

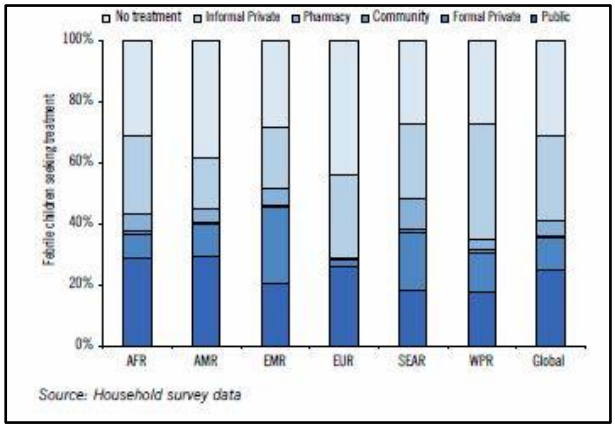
The Special Programme for Research & Training in Tropical Diseases (TDR) Report referenced here identified the need to develop key strategic options to engage the private sector in order to scale up malaria prevention and treatment. While the focus was on the delivery of insecticide treated nets (ITNs), it recognised the need to include treatment, but did not address the need for diagnosis to be part of the strategy.

Delivering Treatment

The role of shops and drugstores in enabling access to antimalarial treatment has been increasingly studied in the last 20 years, mostly in Africa [10,11]. However these studies have usually been in restricted geographical areas. It is only recently that wider surveys have started to be undertaken to properly establish the scale of the use of the private sector by patients and care-givers to access antimalarial drug treatment.

Treatment-seeking behaviour can differ significantly between various countries and between different socio-economic groups. This is important in designing programmes to ensure universal access to high quality treatment for any disease, including malaria. A widely quoted study estimates the reliance of care-seekers on private retail outlets at 60-80% [11,12], but it disguises wide variations in percentages. It also disguises the lack of consistent data on the exact importance of the private sector specifically for malaria treatment.

The latest World Malaria Report (2011) [13] shows data on the treatment-seeking behaviour of febrile children by WHO Regions:-



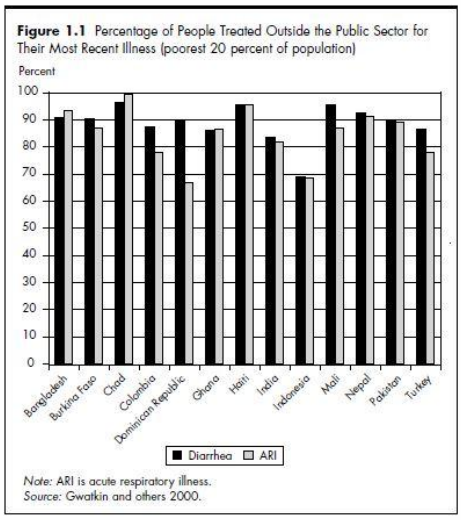
This illustrates the variations between Regions, (which is further illustrated by the data from individual countries). On a global basis, approximately 25% children are seeking treatment in public sector facilities, 30% do not seek any treatment, and 45% are seeking treatment from a range of non-public sector providers.

The Private Healthcare in Developing Countries database [14] contains information on the source of healthcare for children under-five (one of the major target groups for prompt and appropriate treatment of malaria):-

Source of Healthcare by Income Level (%)

	Poorest Quintile			Richest Quintile		
	Pharmacies	Shops	Traditional Healers	Pharmacies	Shops	Traditional Healers
Sub-Saharan Africa	21.2	20.1	11.5	27.1	5.4	2.7
South Asia	14.4	2.4	4.7	8.9	-	1.9
SE Asia	14.6	24.7	-	16.4	4.6	-
Latin America	22.6	3.1	7.4	11.4	-	-

While this data refers to all healthcare-seeking, it may serve as a surrogate for malaria treatment seeking. This again shows the wide variations both between different parts of the world and between the behaviours of the poorest and richest quintiles of the population.



Gwatkin *et al.* have also published data that show the reliance of the poorest quintile on the private sector to deliver healthcare [15]. Here they have shown data on treatment for diarrhoea and acute respiratory infections, but it is not unreasonable to extrapolate the reliance on the private sector to other common diseases (including malaria). While there are differences between countries, in all cases shown the percentage exceeds 60% for the poorest quintile.

The ACTwatch surveys cover seven countries, six in Africa, and look specifically at antimalarial drug delivery. These surveys also show wide variations in where patients access treatment and obtain antimalarial drugs. Again only considering only the data for children under-five [16-22]:-

Source of Antimalarial Drugs (%)

	Public Health Facility	Private Clinic	Pharmacy or Drugstore	Grocery	Community or Village Health Worker	Home	Other[3]
Benin	39.6	9.9	3.7	-	-	30.2	16.7
Cambodia	21.9	7.7	33.5	2.7	5.3	3.4	21.2
DRC	27.2	15.1	50.6	-	-	5.6	2.2
Madagascar	24.5	11.9	33.2	16.8	2.2	11.8	1.5
Nigeria	24.2	9.9	39.1	0.4	1.2	27.1	1.7
Uganda	23.8	42.4	9.4	1.0	2.6	20.8	-
Zambia	85.5	1.9	2.5	1.9	1.3	5.7	1.2

[3] Others includes: mobile providers (Cambodia), kiosk vendors, hawkers, traditional healers.

Primary Treatment Seeking Source (%)

	Public Health Facility	Private Clinic	Pharmacy or Drugstore	Grocery	Community or Village Health Worker	Home	Other[2]	Did Not Seek Treatment
Benin	13.4	3.5	2.8	-	-	44.2	18.8	17.4
Cambodia	5.8	2.4	19.9	8.4	1.0	45.5	13.2	3.9
DRC	16.0	10.1	36.5	-	-	23.2	4.5	9.4
Madagascar	20.1	7.1	27.1	16.9	1.2	15.8	2.3	9.5
Nigeria	16.3	5.1	36.6	0.8	0.8	31.3	2.7	6.4
Uganda	14.9	28.6	10.4	2.0	1.5	37.4	0.7	4.5
Zambia	48.6	1.9	5.3	6.5	1.2	24.5	4.0	8.0

Even within Africa, in this data the importance of the private retail sector varies significantly (*e.g.* comparing Zambia and DRC).

McCombie's review of the literature on antimalarial-treatment seeking behaviour from 1996 also shows a high proportion of patients accessing treatment through the private retail sector [23]. Despite the limitations of the studies reviewed, the proportion of people self-treating or buying drugs was high. Most people initially self-treated cases of suspected malaria. Self-treatment rates vary from <1% to 94% in the studies reviewed (but with 44% of the rates >50%). Rates for buying drugs in the retail sector varied from 4% to 87% (but with 36% of the rates >50%)[4].

The reasons given that the private retail sector is usually favoured by care-seekers are that it is more responsive to patients' needs, and offers prompt access to treatment, better opening hours, and more considerate staff than the public health sector [24,25]. A Mentor study in Angola [26] found that, of the individuals who favoured the private sector, 68% did so because of drug stock-outs in the public sector, 12% because of better customer service, 12% due to better accessibility, and 8% because of shorter waiting times.

A systematic review of the quality of public and private ambulatory health care in low and middle income countries found that "many services, irrespective of whether public or private, scored low on infrastructure, clinical competence, and practice. Overall, the private sector performed better in relation to drug supply, responsiveness, and effort. No difference between provider groups was detected for patient satisfaction or competence. Synthesis of qualitative components indicates the private sector is more client-centred" [27]. Recent research by Das in India suggest that, while the quality of care is uniformly very low across all sectors, even untrained private providers often perform better than providers in the public sector because their lower levels of knowledge are compensated by higher levels of effort [28].

There is a paucity of information on the supply and demand for antimalarials in the private sector which has inhibited the development of effective and evidence-based interventions in this sector. Few efforts have been made to study how to increase effective treatment access through this channel [29].

Delivering Diagnosis

Until recently, malaria diagnosis was restricted to the use of microscopy. This requires both proper facilities and equipment, and well trained staff to ensure accurate identification of cases. Given the need to treat malaria rapidly, especially in the young and in pregnant women, treatment was therefore recommended to be presumptive [30]. However this led inevitably to treatment of non-malaria febrile

[4] Where the nature of self-treatment was identified, the majority of self-treatment involved buying drugs.

episodes with antimalarials, wasting valuable resources on incorrect treatment, increasing the risk of drug resistance developing, and delaying giving patients the correct treatment for their fevers [31]. Also, if patients take ACTs when they don't have malaria, then it stops them learning about the effectiveness of ACTs over other antimalarials and undermines the strategy of crowding out ineffective drugs [32].

The development of reliable and affordable rapid diagnostic tests in the last 10 years has made it possible to envisage that all cases of malaria would be properly diagnosed before treatment is initiated [33,34]. The most recent edition of the WHO Malaria Treatment Guidelines [35] now recommends that "In all settings, clinical suspicion of malaria should be confirmed with a parasitological diagnosis." (p9). The gold standard for diagnosis is microscopy, but outside the formal health sector this is usually not practical. Rapid diagnostic tests (RDTs) "make it possible to expand the use of confirmatory diagnosis." (p11). With the high levels of self-treatment and access to antimalarials through the private retail sector identified in the previous section, any significant impact on case management will need RDTs to be deployed across both the public and private sectors [36]. A recent Cochrane Review concluded that RDTs were now of a standard that would allow them to replace (or at least augment) conventional microscopy in diagnosing *P falciparum* malaria [37].

The success of the complete range of interventions recommended to combat malaria (bednets, insecticide residual spraying, prompt drug treatment, intermittent presumptive treatment in pregnancy, *etc.*) mean that the incidence of malaria has dropped significantly in many endemic countries [38]. This in turn has a beneficial impact on malaria transmission rates. However it increases the need to use diagnosis before initiating antimalarial treatment, especially with expensive drugs like ACTs. Cohen *et al.* has shown that only 56% of patients buying ACTs in rural Kenyan drug shops actually tested positive for malaria [39]. Kachur *et al.* found that only 24% of clients in drug shops with fever were parasitaemic [40]. Presumptive treatment of febrile patients for malaria is fine in areas of high transmission (where there is a >90% risk that the fever is due to malaria), but in areas of lower transmission (<90% risk of the fever being due to malaria) then prior diagnosis becomes more-and-more important [41]. There is still debate about whether it may be premature to move to completely stop the use of presumptive therapy, especially in a high transmission setting [42,43].

The importance of the private retail sector in enabling patients to access treatment has been already mentioned in this document. However the study by Kachur *et al.* in Tanzania [40] showed that symptomatic diagnosis in drug stores (without the help of RDTs) could be misleading, especially as most sales of antimalarials were made at best on reported symptoms by care-givers with no physical examination of the patient. For patients over the age of five buying antimalarials, only 18% were parasitaemic. In fact "sellers simply provided whatever preparation their customers requested and were seldom asked for advice concerning what treatments might be appropriate. It is also not surprising, then, that we failed to find any association between symptoms, clinical findings, or clinical diagnoses and purchasing an antimalarial product." This was in contrast to the fairly passive response of patients and care-seekers in a public clinic setting [44], where the problem was the clinicians' reactions to diagnostic test results.

Given the risk to patients, especially the under-fives, from a misdiagnosis, the problems of developing and applying clinical algorithms to cases of fever have been identified [45]. This study confirmed earlier work and suggests that their use leads to drug wastage in areas of low endemicity and increased failures to treat in areas of high endemicity. The evidence supports the need for the use of diagnostics to properly direct treatment, wherever it is obtained.

These conclusions have also been confirmed by the baseline study in Uganda on the feasibility of introducing RDTs through the private retail sector [46]. This study showed that 59% of visits to obtain treatment for malaria did not result in a confirmatory test, and where tests were carried out, 90% were by microscopy. Children under-five were slightly more likely to receive a diagnostic test before drugs were sold than for older children and adults.

A recent study by Albertini *et al.* [47] has shown how little is known about the availability and use of diagnostics in the private sector. The data this study collected shows the very limited use of diagnosis where the majority of poorer patients seek treatment:-

Country	Private Facilities Visited	Private Facilities stocking RDTs
Central African Republic	25	9
Nigeria	120	4
Senegal	70	2
Tanzania	2	2
Philippines	83	18
Peru	24	0
TOTAL	324	35

Littrell *et al.* have also shown that malaria blood testing is significantly higher among cases treated in the public sector than in the private sector across all six African countries studied [48], even though overall testing levels were low:-

Country	% receiving blood test (public sector)	% receiving blood test (private sector)
Benin	9.8	2.4
Democratic Republic of Congo	27.8	16.0
Madagascar	21.0	1.8
Nigeria	14.1	4.9
Uganda	21.3	11.3
Zambia	48.8	7.3

Yeung *et al.* have reviewed ten years of experience of socially marketed RDTs and ACTs in Cambodia [49]. This paper will be considered in more detail in the next section on subsidies. However, despite 5 years of an intensive programme of information and behavioural change communications, only 49% of private providers stocked RDTs and only 21% patients were tested for malaria (61% with RDTs).

Mbonye *et al.* examined the attitude to accessing diagnosis with RDTs at Ugandan drug shops [50]. They found that while having RDTs available in drug shops was attractive to most interviewees, there was concern about:-

- over-pricing of RDTs;
- poor adherence to the test result;
- re-use of RDTs leading to infection;
- use of RDTs to secretly test for HIV.

Also drug shops had no medical records and referral rates to health facilities were poor. However the authors concluded that "that introducing rapid diagnostic tests for malaria into drug shops is feasible. … However, we identify a number of challenges that will need to be addressed if RDTs are to be used effectively …These challenges cannot be underestimated given the important but neglected position of drug shops in the public health system in countries such as Uganda." Chandler and colleagues also found that the concept of RDTs and their use in drug shops in Uganda was attractive in theory. However the challenge would be to change the entrenched behaviours of care-seekers and patients to use treatment with antimalarials as the diagnostic tool and the reluctance of drug shop staff not to accede to customers' demands. Cost was also seen as a barrier and RDTs would need to be subsidised to break

through that barrier to use. Similarly there would need to be some form of incentive for the shopkeepers to offer, administer, and to take appropriate action based on the test results [51].

Doubts have been expressed about the ability of staff working in private retail outlets to learn how to use RDTs properly and to interpret the results. However various interviewees for this paper said that the problem is no worse than for community health workers (CHWs), who often have no better education attainment. Concerns about blood-borne diseases and CHW competence have made many African health systems reluctant to promote RDT use by CHWs [52]. However, the Tigray Project in Ethiopia has shown that, with adequate training, CHWs could administer and interpret RDTs for malaria just as effectively as the staff of peripheral health clinics [53]. In this study, CHWs were all farmers with a primary school education. The report concluded that "using simple rapid diagnostic tests at community level for a widely dispersed, poor, primarily rural, hard-to-reach population is feasible if the health workers are appropriately trained, equipped with simple tests, and supported by frequent supervision."

Counihan *et al.* have shown that Zambian CHWs demonstrated consistently high performance over a 12 month period after receiving half-a-day's training and a field-tested job aid [52]. This study also showed a strong compliance with the results in the dispensing of ACTs in an area of low-medium malaria prevalence. Harvey *et al.* have also shown that, in Zambia, well-designed instructions plus training can ensure high performance by CHWs [54]. In this study, 93% of CHWs who received training and the job aid could deliver RDT-based diagnosis correctly. Similar results have been obtained in Uganda [55], with performance and action taken being satisfactory in >90% cases across a range of measures. Rennie *et al.* have also shown in Philippines and Laos how good instructions (job aids) and relatively short training for CHWs can significantly improve error rates [56].

In the Brazilian Amazon, bar workers have been trained to administer dipstick tests for malaria to people presenting in the bar with malaria-like febrile symptoms [57]. The study took place in a mining village over a 12 month period. Bar workers received a 2-day training course at the start of the study. Of interest was that it took only 2 hours to train the bar workers how to use the dipsticks and interpret the results. The study showed a significant reduction in the number of visits to health care facilities for malaria. This approach delivered a 77% savings in malaria-related diagnosis and treatment costs with a benefit cost ratio of 9:1 [58]

Concerns & Restrictions

Countries differ quite significantly in the approach they take to approving different types of private sector retail outlets to sell different types of medicines, including antimalarials. The principal reason for limiting the private outlets that can supply certain antimalarials, especially the newer ones (like ACTs), is concern about quality of care provided and overtreatment. In Kenya, the Community and Family Wellness shops are approved to sell ACTs. They are reported as almost always dispensing the correct dose and following treatment guidelines (such as weighing children and observing the first dose) more frequently than in public facilities in the same area. Although similar metrics have not been captured in Tanzania, it is reasonable to assume that few shops engaged in these practices because they were not trained as comprehensively and the relevant equipment (*e.g.* scales) was typically not available. Shops in Tanzania did, however, dispense the correct ACT dose (according to age) almost as frequently as those in Kenya and there was little evidence of packages being split or opened. Nevertheless, it appears that the approved shops in Kenya consistently provide better care than the more informal shops in Tanzania. Less information was available on the appropriateness of ACT prescriptions and the role of diagnostics, including the impact of RDT use in Cambodia and Kenya. This is a critical topic for further research, particularly if ACT subsidies are to be introduced in areas with low or moderate malaria transmission [29].

There is a fundamental tension between access and quality in private sector ACT distribution that policymakers must grapple with as large-scale interventions are increasingly rolled out [59]. Many Sub-Saharan countries take an approach similar to Kenya's, allowing ACTs to be distributed only through a limited number of outlets (*e.g.* pharmacies). At the same time, most other antimalarials are available

over-the-counter from a wide range of outlets, including general stores. It is doubtful that introducing new antimalarials (including ACTs) into a narrower private sector will have a dramatic impact on access or the use of monotherapies. Regulatory action to make the availability of monotherapies illegal is necessary. Although some subsidized ACTs will undoubtedly be distributed illegally to other outlets, regulatory authorities will likely apply greater scrutiny to publicly financed subsidy interventions, dissuading wholesalers from distributing to smaller, unapproved outlets. This experience suggests that prescription-only ACTs and associated restrictions on outlets must be at the centre of discussions on the best way to apply subsidies or to introduce new antimalarial products, both within countries and across the global community [29].

A key problem with the delivery of diagnosis through any part of a healthcare system in malaria endemic countries, including the private sector, is the proper and safe handling of the test kits and the disposal of waste. This is also reflected in the attitude of many care seekers to the use of RDTs in the private retail sector [50]. Looking at the WHO-WPRO guidelines and considering the nature of many private retail facilities in endemic countries illustrates the concerns [60].

Comments from Interviews

There was general recognition among people interviewed that the private retail sector would remain an important channel where care-seekers would access treatment for the foreseeable future. This would vary widely between countries, but overall would remain significant. Bringing it fully into efforts to roll back malaria would need a strategic approach. The Treatment 2.0 type approach for HIV was suggested as a model to be considered by the malaria community [61].

Delivering Diagnosis:

Delivering diagnosis safely and effectively through the private retail sector was challenging, and probably could not be achieved by somehow ensuring access through all the same outlets as drugs. Getting the communications right on this was crucial and, as “we probably have only one shot at getting this right”, it would be better to have a well-planned series of pilots to see what works and what doesn’t. There is unlikely to be a single approach that will work in all countries, and context-specific programmes will need to be developed. There were considerable risks of simply making RDTs widely available in the private sector without getting the incentives to retailer and patient right, as well as the treatment algorithms and the overall behavioural change communications properly designed and tested. However there is still little clarity on the best way to achieve this and much more research is needed (but quickly!).

A consistent concern was how to handle patients who tested negative for malaria. A challenge would be to integrate malaria control approaches with the broader childhood illness management programmes in-country. The best approach will vary among countries depend on the background disease endemicity.

Given the problems of quality control for RDTs, especially in the challenging climatic conditions of many malaria endemic countries, improvements in quality control and regulation of outlets offering diagnosis should be looked into.

A common comment was that the best approach of increasing access to diagnosis in the private sector might be to focus on certain types of outlets where there was a greater variety of drugs, staff were better qualified and could be easier to train, and where the problems of safety (sharps & contaminated waste) would be easier to overcome. The better level of service from these outlets might be an incentive for care-seekers to prefer them over other types of outlets where only drugs were available. This approach could be piloted along in different country contexts. However it might disadvantage more remote communities. The increased use of CHWs to deliver diagnosis was also suggested, with the care-seekers then being directed to the most appropriate outlet to obtain treatment (including PSPs for antimalarial drugs). However one well-placed interviewee noted that the public sector was struggling to deliver high quality diagnosis and so effective assistance from the private sector might be at least an intermediate answer to improving access overall.

Resistance Development:

There have been concerns expressed about extending the scope of Quality Assured ACTs (QAACTs) into the private sector on the grounds that widespread private sector use will result in poor adherence and widespread use in non-malaria fevers. This will in turn lead to increased drug pressure and an increase in the development of resistance. At the present time, especially with the appearance of resistance to artemisinins seen in Cambodia [62], some people are concerned about any initiatives that might threaten ACTs as the mainstay of malaria control.

However interviewees did not see AMFm as a disproportionate driver of drug resistance. It would be better to flood the public and private market with QAACTs at prices that most people could afford in order to stop them using either ineffective alternatives (chloroquine, SP) or sub-standard ACTs (which would be more likely to drive resistance). Poor drug quality has been highlighted in the recent QAMSA study [63]. This found that in Nigeria a patient had a 60% chance of getting a substandard antimalarial, and in Ghana and Cameroon this was about 40%. The main problem with ACTs was low active ingredient content – a potential key driver of resistance development.

Interviewees felt that more emphasis needed to be placed on banning artemisinin monotherapies (and enforcing the ban) and ensuring QAACTs are more widely available in all sectors if drug resistance was to be tackled.

The Role of Social Marketing and Subsidies

Given that donor-funded subsidies for ACTs are costly, it is essential that the programmes are going to have their desired impact. This section outlines the evidence base from previous private sector ACT and other commodity subsidy schemes have achieved their objectives or not. It draws heavily on the research carried out by Schäferhoff and Yamey in their briefing document for the AMFm *ad hoc* Committee of the Global Fund [64].

In the health field, subsidy programmes of health-related commodities are almost never implemented in isolation. They are usually part of a programme with an extensive health education component that encourages the users of the commodity in question to adopt behaviours that promote better health, of which taking an appropriate drug is part but not the entire story. These heath education programmes are usually referred to as Social Marketing Programmes (SMPs). They use private sector techniques, incentives, and organisations to achieve efficiency in communicating key messages to the target audience and to achieve sales of certain products so as to achieve a defined aim. In many developing countries, SMPs are used to increase the availability, affordability, market share, and use of health commodities through private retail and other distribution channels. Such programmes have encompassed the sales of oral contraceptives, condoms, and bednets as well as promoting behaviours that improve healthy living, *e.g.* safer sexual practices.

Where commodities are being sold through a SMP, then there are two basic models of how the commodity is distributed [65]:-

- The NGO Model: here the commodity is heavily subsidised and usually distributed through a new supply chain established by the NGO running the programme. This model aims to have the largest possible health impact among the target population. Because the level of subsidy has to be high to make the commodity affordable, it is usually impossible for the manufacturer to continue to supply the product if the subsidy is withdrawn, and so this model is a long-term commitment by the SMP's funders [66]. This is the model usually adopted in low income countries (LICs). It often involves an "own-brand" version of the commodity being promoted [67].
- The Manufacturer's Model: this model was primarily developed in response to the need to improve reproductive health and to do so in an economically sustainable way. The commodity is sold by the manufacturer or local supplier through existing distribution channels where there is a well-established supply chain. Through negotiation, the price of the commodity is reduced by the supplier to an affordable level that can compete with other products or brands. Technical assistance is given to the supplier to get the programme established and then this is withdrawn and the SMP is left to be self-sufficient. It is seen as a temporary intervention with a realistic exit strategy by the programme funders. This is most frequently seen in middle income countries (MICs).

Commodity-related SMPs are usually defined by their management and financial structures, and often can differ quite widely in terms of their use of branding, pricing, distribution, *etc.*. Their design is usually context-specific and may be hybrids of the two models described above [68]. In recent years, USAID and DFID have been developing one such hybrid model – "Total Market Approach" [67]. This takes a pragmatic view of the possibilities of growing a market for an intervention across all segments (private, social marketing organisations, NGOs, and the public sector). This approach develops a range of options and the possible contributions of different players and stakeholders. Importantly it has an explicit exit strategy. However there has been no comprehensive empirical assessment of the best model for a particular social or economic set of circumstances. Usually (despite over 30 years of experience with such programmes) there has been little analysis of impact beyond looking at aggregate sales data [69].

Three types of management structure have been used for SMPs [65]:-

1. management by an affiliate of a global NGO;
2. management by locally based organisations;
3. partnerships with commercial organisations.

No 1 is the most commonly used model in health-related SMPs. However, as concluded by Meekers *et al.* [65], "it is crucial that social marketing programmes are designed using the model or approach that is most suitable for the local context."

Experience of SMPs has made it clear that it is important to ensure that there is national government ownership of the programme, local involvement in the planning of its implementation, and ensuring that there is also local involvement in the monitoring and evaluation of the programme. Successful SMPs have built local support and ensured that they are properly integrated and work to reinforce local policies and strategies [67].

The Role of Subsidies within Social Marketing Programmes

SMPs involving commodities are a response to simultaneous market failure and government/public sector failure. They aim to:-

- Increase demand: through the promotion of particular behaviours and the use of particular products.
- Increase supply: through reduction of price to consumers, increase distribution reach, increase number of points-of-sale, and matching product to patient need.

Usually SMP products are aimed at a midway point between the normal commercially available products – expensive but perceived as high quality and only affordable to the top percentiles in the community – and a free product distributed *via* the public sector – often perceived as of poor quality because it is free [67]. This has led to criticisms that they are unlikely to be "pro-poor" especially in their early stages. This may improve as they mature and inequalities are reduced. They are characterised as being targeted at the "upper lower income" and " lower middle income" groups in the target communities [69].

Subsidies can be structured in many ways [70]. One major division is between "broad" and "targeted" subsidies:-

> Broad Subsidies: apply equally to all members of society. In principle these can reach into the private sector, although they are often only made available through the public sector, and this deters many people from taking advantage of them.
> Targeted Subsidies: designed to benefit particular groups within society. Targeting is often chosen to address issues of equity, efficiency, sustainability, and/or meeting community needs [71].

The pros-and-cons of these two types of subsidies have been reviewed [72].

The placement of the subsidy in the supply chain is important as it can affect how widely it can be distributed between countries. A high-level or "supranational" subsidy is more likely to ensure that the largest number of countries benefit than one that is delivered on a country-by-country basis. Examples of supranational subsidies are to be found in the smallpox and polio eradication programmes.

Experience of Global Social Marketing Programmes

There is no experience of a global subsidy programme on which to draw. All subsidy and social marketing programmes identified have been country or regional specific.

The nearest example to a global SMP scaled up over a number of years is the WHO's special programme for the Control of Diarrhoeal Diseases (CDD) in children. This was launched in 1980 and over 100 national programmes were in place by 1988. The programme took the form of the active promotion of oral rehydration therapy (ORT) to the public, the training of health workers, and the improvements in medical curricula. Despite this global programme, a survey of 40 low- and middle-income countries showed that the use of ORT had only increased from 23% in 1986 to just over 39% in 2003, peaking at 55% in 1999 [73]. The authors comment that "It is well known that coverage of public-health messages or activities often reaches a steady-state level after which it is difficult to increase coverage without specifically targeted activities or a significant increase in resources." Schäferhoff and Yamey [64] conclude in their review of this programme that [5]:-

1. **It is crucial to maintain marketing beyond the initial phase.** If ORT marketing efforts tail off, vendors often end up selling alternative products for diarrhoea (*e.g.* anti-diarrhoeals, antibiotics).
2. For any new commodity introduced to the market, it is important to understand the competing products and customers' preferences for, and loyalty to, these products (this is true for both ORT and ACT). **Subsidizing the costs of the new commodity alone is unlikely to be enough for it to gain market share.**
3. Evidence of the benefit of ORT was often not enough to persuade health providers to recommend ORT for diarrhoea treatment. (As one key informant said, "We need to pay more attention to the community through which we work, *i.e.* the providers—with ORT, they were harder to influence than we thought.")
4. Unlike ACT, in general there have not been major financial constraints preventing ORT use. Yet even without financial barriers, coverage only reached 41% by 2003 (from 35% in 1986). Key informants suggested that **the experience with ORT should caution us not to expect rapid, sustained ACT uptake in the AMFm Phase 1**.

Experience in Delivering Antimalarial Treatment

The need to find a mechanism to reduce the price of ACTs to a level where patients and carers are willing to pay has been investigated by Saulo *et al.* in Tanzania [74]. They found that 92% of mothers and household heads were willing to pay TZS 500 (US$ 0.46) for a child's treatment of an ACT, but this fell to 55% when the price was increased above this level. Socio-economic status did not seem to affect this "Willingness to Pay" (WTP) level. The WTP price is below the current cost of manufacture of ACTs and so indicated a subsidy is necessary to overcome this barrier to access, at least in Tanzania.[6]

[5] Author's (ICB) emphasis.

[6] This study found that the median annual non-subsidized ACT cost for clinical malaria episodes in an average household was calculated as US$ 6.0, which would represent 0.9% of the average total consumption expenditures as estimated from official data in 2001. The cost of non-subsidized ACT represented 7.0% of reported total annual expenditure on food and 33.0% of total annual expenditure on health care.

Evidence on delivering subsidised ACTs is currently available from four sub-national studies (Table 1) and six national programmes (Table 2):-

Table 1: Sub-national pilots of subsidised ACTs:

	Lead Organisation	Timeframe	Design	Scale	Age Group	Outlets
Kenya	Government, PSI, LSHTM, KEMRI	1 year (ended May 2010)	Cluster RCT	3 districts (all in 1 province); 9 clusters (3/district), 9 controls (3/district)	Children <5 yr.	Retail outlets
Tanzania	Government, CHAI	1 year (ended Nov 2008)	Quasi-randomized trial	2 intervention districts, 1 control district	All age groups	Drug shops
Uganda	Government, MMV	20 months (ended May 2010)	Non-randomized, controlled	4 intervention districts, 1 control district	All age groups	Drug shops, clinics
Angola	Government, Mentor Initiative		Uncontrolled	2 municipalities (95 pharmacies)	Children <5 yr.	Pharmacies

Table 2: National ACT Subsidy Programmes:

	Lead Organisation	Launch Year	Age Group	Outlets	Coverage
Cameroon	Government	2007	All age groups	Public & private health facilities	Countrywide
Senegal	Government	2006	All age groups	Pharmacies	Countrywide
Cambodia	PSI	2002	All age groups	Pharmacies, drug shops	17/20 malaria endemic provinces
Democratic Republic of Congo (DRC)	PSI	2006	Children <5 yr.	Pharmacies	Limited to some districts
Madagascar	PSI	2003	Children <5 yr.	Pharmacies, private providers, community agents	Countrywide
Rwanda	PSI	2007	Children <5 yr.	Pharmacies	Countrywide

However much of this data is weak as the studies suffer from significant design flaws, and so the conclusions that can be drawn from them are limited:-

- The Ugandan study is non-randomised and a new intervention was added in the control area midway through the study.
- The Tanzanian study is only quasi-randomised.
- The Angola study is non-controlled.
- None of the national programmes have control districts allowing for comparisons, and only Rwanda has baseline data.

Results from Sub-national Pilots:

Tanzania:

The study was a quasi-randomised three-armed controlled study, with two intervention districts and one control [75]. It focused exclusively on one type of private retail outlet – the *duka la dawa baridi* – and did not look at a wider range of private retail outlets (like pharmacies). In one district, the intervention was a 90% subsidy of the ACT (artemether-lumefantrine): in the other the intervention was the same subsidy plus a recommended retail price printed on the packaging. In both intervention districts, the subsidy was accompanied by a communications package and other supporting interventions. Prior to the initiation of the subsidy, the Tanzania Food and Drug Authority (TFDA) conducted a one-day training of *duka* staff, focusing on malaria symptoms and ACT dispensing and dosing. A range of health education activities, including local radio advertisements, wall paintings, and themed cultural shows, were also carried out throughout the project. The activities emphasized the importance of using ACTs and their availability in private shops, as well as basic messages on the dangers of malaria and the importance of prompt treatment-seeking.

The results of the study were:-

- Availability: shops stocking ACTs increased from 0% to 72% over the 12 months of the study. In the control district, the percentage stocking changed from 1% to 0%. However there was a substantial difference in availability between urban and rural areas.
- Pricing: consumers interviewed paid a mean price of US$0.58 during the study period (RRP = US$0.50). This was comparable with the prices being paid for SP, but was higher than for amodiaquine when the adult dose was being purchased.
- Market Share: based on exit interviews, the percentage of consumers who bought ACTs increased from 1% at baseline to 44% at the end of the study. Purchases of SP fell from 58% to 36%, and of amodiaquine from 37% to 17%. However this trend seemed to have stabilised after 9 months and there was no further increase in market share seen in the last three months of the study.

The study report concludes that “Caution should be used in directly applying these findings to other settings. Socioeconomic factors, malaria treatment-seeking behaviour, and the structure of private supply chains all vary widely between and within countries [23]. This study operated through only one wholesaler and one type of retail outlet, while national scale subsidies will employ multiple of both. And although concerted measures were put in place to limit the Hawthorne Effect, it is possible that businesses and consumers were influenced by the presence of the study team.”

Uganda:

This study [76] was a non-randomised controlled study of four intervention districts and one control. It was designed to test the feasibility of providing affordable treatment through the private retail sector.

The study had the following specific targets:-

- ensure availability of the subsidised ACT in 70% of licensed pharmacies and drug shops.
- increase by 50% the number of children <5 yr. who receive effective treatment within 24 hours of the onset of fever.
- ensure that 85% of people purchasing the ACT comply with the recommended treatment schedules.
- achieve a 40% market share of the private retail sector antimalarial market in the intervention districts.

In the intervention districts a subsidised brand of artemether-lumefantrine (carrying the "green leaf" logo now being used to identify AMFm co-paid ACTs) was supplied to the drug shops. The packaging of the ACT was designed not only to identify it as a high quality medicine but also to have illustrated patient instructions on correct dosing to maximise adherence. The price of the ACT was subsidised by 95% and recommended retail prices were printed on each pack. In addition, comprehensive communications campaigns were carried out (including community mobilisation, community events, broadcast media, print media, point-of-sales promotion, songs, and community events). Finally comprehensive training programmes were carried out with the staff of licensed outlets in the intervention districts.

At the end of the study period, the results were:-

- Availability: the percentage of retail outlets stocking the ACT increased in the intervention districts from 1% to 77%. In the control district it increased from 13% to 32%.
- Market Share: the purchase of the ACT increased in the intervention districts from zero at the outset to 69% at the end of the study. In the control district, it remained low (5%). However the trend over the study period was adversely affected by stock-outs in the outlets.
- Usage: there was a fivefold increase in ACT usage within one year of the study. The proportion of children receiving ACTs within 24 and 48 hours of the onset of fever increased from 3% and 4% respectively to 15% and 20%. However better results were seen in the control district (after one year the equivalent percentages rose from 1% & 2% to 17% and 23%). This has been associated with a new public sector intervention in the control district (see below).
- Pricing: the price charged by the outlets to care-givers was comparable to chloroquine in the intervention districts. The mean price of the adult pack was UGX850.6 (US$0.37) at the end of the study period. Based on exit interviews, 95% of purchases of the ACT were made at the recommended retail price.
- Adherence: the adherence to the correct dosing regimen (based on interviews) was measured on a composite indicator as 71% in the intervention districts.

In the report referenced, the study has been considered to have achieved its objectives. However the report does identify certain remaining challenges:-

- The absence of unlicensed drug shops in parts of the study districts meant that the ACT (which can legally only be sold in a licensed outlet) did not get the widest geographical distribution.
- There was not an uninterrupted supply of ACTs in the Ugandan health system throughout the study and this caused stock outs at various stages and at various levels in the distribution chain. Smaller outlets tended to experience stock-outs more frequently than larger ones.
- Prices in more remote areas were higher than those in urban or suburban centres.

The interpretation of the results of this study on usage are complicated as new public sector interventions were launched in the control district after this study was initiated. The interventions in the control district targeted ACT distribution through the public sector and community health workers (*i.e.* not through private outlets). The study's interventions were solely focused on private drug shops [64].

Kenya:

This study is the only study that has looked at the impact of a retail sector subsidy on the delivery of prompt and appropriate treatment for children under five years of age [77]. The study was a cluster-randomised controlled design with nine control and nine intervention locations in Western Kenya. Interventions consisted of the supply of subsidised ACTs to retail outlets in the intervention locations, training of retail staff, and local health education programmes. The study's prime outcome was the proportion of children under 5 years reporting fever in the previous 14 days who started treatment with an ACT (artemether-lumefantrine) within 24 hours of the onset of fever. The study design was selected to as closely reflect a real-life situation as possible, but there still remained implementation practices that would be unrealistic in day-to-day programme implementation. The design also did not isolate the relative influences of the three types of intervention (subsidy, training, health education).

Although the coverage of children receiving an ACT fell well short of the RBM 80% target [78], it was still more than double in the intervention arm compared to the control arm (54% *vs.* 27%). This represented an increase of almost sevenfold from the baseline figure (8% to 54%), compared to less than a threefold increase in the control arm (10% to 27%).

In the intervention arm, 95% of caregivers reported paying the recommended price of US$0.25 for the ACT.

This study concluded that a suite of ACT subsidy, retailer training, and community awareness activities can result in substantial improvement in the prompt and effective treatment of children with fever in a rural environment.

Angola:

In Angola, it is estimated that 40-60% of febrile cases are treated in the private sector. This pilot in two municipalities, subsidised paediatric ACTs (Coartem® - artemether-lumefantrine) were distributed through 95 licensed private sector outlets in two municipalities (approximately 60% of the total in this area) over a 12 month period [79]. It built on earlier work carried out in the same area so that distribution of ACTs had been promoted for a total of three years. The study had no control group. There was no subsidy for adult formulations of ACTs. The suggested paediatric retail price for Coartem was AOA75 (≈US$0.80). This was a price comparable to the main competitors – chloroquine and amodiaquine – and the pharmacies were generally found to be selling at this price during the duration of the study. Prices were monitored and pharmacies selling at above the RRP were told that such behaviour was not acceptable. The subsidised ACTs were combined with training for relevant staff at the approved private sector outlets in the study and communication campaigns activities directed at the inhabitants of these municipalities.

At the start of the study ACTs were largely unavailable in the private sector in Angola. After 12 months, 69% of pharmacies in the project stocked the subsidised ACT, chloroquine availability had fallen from 52% to 35%, and amodiaquine from 72% to 47%. Although there is no baseline data on market share, by the end of the study ACT share was 38% compared to 47% for monotherapies [64].

A Knowledge/Attitude/Practice (KAP) study among the participants showed that over the course of the study, the awareness of Coartem had increased from 43 to 87%. Usage of Coartem increased from 60 to 66% [26].

Results from National Programmes:

ACT Availability:

Quantitative data is only available from three national programmes. Only Rwanda was able to report changes from a baseline and showed availability of paediatric dose forms of ACTs increased from 10% at baseline to 80-90% at 18 months. In Cambodia, after 12 months, only 22% of private drug stores stocked adult forms and 6% paediatric. In Senegal after 12 months only 11% private outlets stocked adult forms of ACTs, 43% paediatric, and 29% infant.

Rwanda's impressive success on this parameter has been argued to be exceptional due to [64]:-

- Small size of the country.
- Highly engaged and committed government.
- Strong drug distribution systems.
- A national ban (enforced) on artemisinin monotherapies.

Because of these factors, it may be difficult to replicate the results in much larger countries with weaker systems and regulatory control over drug availability.

ACT Pricing:

Data is only available from two national programmes. In Cambodia, where chloroquine cost US$0.20, subsidised ACTs were sold to outlets at US$0.42 and the mean price charged to consumers was US$1.07 after 4 years of the programme (a mark-up of 150%). In Senegal, subsidised ACTs were sold to outlets at US$0.99 and the mean price paid by consumers after 12 months was US$1.34 (a mark-up of 34%). This was lower than SP, which cost US$2.00.

ACT Market Share:

Data is only available from one national programme. In Cambodia ACT market share was only 28% in private outlets after 6 years of the programme. Monotherapies still accounted for 50% of all antimalarial sales.

ACT Usage:

Data on country usage is available for three countries. In DRC, ACT usage was 1% after 12 months of the subsidy. In Senegal it was 4% after 2-3 years. In Madagascar, it was 2.4% after 5 years. Baseline data is not available, but might be reasonably assumed to be close to zero.

ACT Usage in Remote Communities:

The national programmes have no data on the impact of subsidies across geographies or socioeconomic groups.

Cambodian National Programme:

This programme is worth commenting in more depth since it has been the subject of a detailed report in the recent literature [49]. Cambodia has more than ten years of experience of implementing a subsidised ACT programme as part of a national SMP. It is also unique in having included the social marketing of rapid diagnostic tests (RDTs) alongside ACTs.

The Cambodian programme includes the distribution of a subsidised ACT (artesunate + mefloquine), behavioural change communication programmes for the general population, and training for staff of retail outlets. The ACT was co-blistered into age-specific packs. The subsidised prices of the ACT are US$0.29/child dose, US$0.41/adolescent dose, and US$0.61/adult dose.

Behavioural Change Communication (BCC) programmes have been a key component of the social marketing programme. The range of media includes mass media advertisements through television and radio spots, community educational activities through mobile video units, distribution of point-of-sale

materials such as posters and job aids, training of providers, and a "medical detailing" programme. Private providers are trained on malaria diagnosis and treatment during one-day group sessions. Treatment providers are also visited by medically or pharmacy trained "detailers" who provide additional advice and support. It should be emphasised that these BCC programmes have been delivered over a 10 year period to achieve the results reported.

The report notes that the lack of standardisation in the surveys and data collection limits the assessment of the impact of the campaign. ACT uptake, appropriateness of ACT treatment, quality of products used, and how the products are used cannot be assessed from the information available. However there is enough confidence for several important lessons to be drawn:-

- a high degree of brand awareness was achieved through an effective BCC programme around the ACT.
- availability of ACTs took years to pick up and was particularly low in rural areas. This may be due in part to supply bottlenecks.
- actual uptake of ACTs remained low compared to other antimalarials (at around 40%). This may be due to challenges of brand loyalty.

Further research is needed to clarify the extent to which low stocking levels are attributable to difficulties obtaining supplies versus a lack of consumer demand. The observed trend that providers consistently sell both ACTs and RDTs above their recommended retail price (RRP) likely reduces the equity of access and may be driven by a number of factors. First, because the products were available for several years at substantially higher prices before the pricing was re-evaluated, providers and consumers may still associate the products with these price levels and charge or pay accordingly. Second, the irregular supply may have enabled providers to charge more when products are available assuming adequate demand. Last, consumers' price elasticity for the products may be higher than estimated or the providers' margin from the RRP is limited, enabling them to generate greater revenue by selling fewer products at higher prices [29].

Experience in Delivering Malaria Diagnosis

The only documented large-scale study of the use of subsidies to promote the use of diagnosis in the private sector has been the Cambodian one [49]. In this 10 year programme, diagnosis was promoted through the availability of RDTs in a social marketing programme. For diagnosis, an RDT was branded to relate it to the programme. A comprehensive health education and BCC programme was implemented, including a nationwide advertising campaign, and training of private providers (described above). The BCC programme has been undertaken over a 10 year period. The emphasis on appropriate diagnosis in the BCC programme has increased over the years. A RRP has been established but, unlike for the ACT in the programme, this is not printed on the packaging of the test. The price has been reduced over the course of the campaign in response to the findings of a WTP study. It is now available at US$0.24/test.

Key lessons identified by Yeung *et al.* are:-

- despite a high degree of brand awareness being achieved through an effective BCC programme for ACTs, this was much lower for the RDT.
- availability of RDTs took years to pick up and was particularly low in rural areas. This may be due in part to supply bottlenecks.
- uptake of RDTs was also much lower than for ACTs.

A key challenge for increasing the usage of RDTs especially in the private sector was identified as being the complexity of the message. Usually in SMP campaigns, the message is a simple “buy this product” or “behave this way” that the target audience can easily understand and relate to. While this is also true for purchasing an antimalarial to treat visible symptoms, it is much more complex to get across the message about the need to also include diagnosis. There are effectively three messages to be got across:-

1. “if you are going to buy an anti-malarial, only buy the recommended ACT";
2. “before you buy an anti-malarial, get tested first";
3. “if you test negative, don’t take an anti-malarial”.

In addition, there are a number of other important messages, including for example the importance of adherence to the recommended course and appropriate referral to the public health facilities. Where non-falciparum malaria is common, as in Cambodia, the message gets even more complicated. The lack of clarity about what to do if the RDT is negative is a major barrier to the effective use of diagnosis in the private retail sector. For a successful adoption of RDTs and their proper use in the private retail sector, a clear and simple diagnosis and treatment algorithm needs to be developed and communicated. The strongest determinant of a patient with fever using a diagnostic test for malaria was being offered a test by the provider [29].

There will be a need, as the issue of treatment algorithms in the private sector is addressed, to combine the approach being taken for malaria with those being taken for the other major childhood diseases – diarrhoea, meningitis, and pneumonia. A recent Gates Foundation/CHAI/UNICEF Expert Consultation has looked at this and has made recommendations on how to address this challenge [80]. Scaling up of communications activities aligned across all these diseases and greater leverage of existing child health platforms were among them.

The cost of RDTs is seen as a barrier to access for high quality diagnosis almost as bad as the cost of ACTs is to access to effective treatment. Cohen *et al.* [39] have modelled the impact of reducing the ACT subsidy in the private retail sector from 92% to 80% and using the money saved to subsidise the RDTs. This would reduce the cost of treatment of a malaria patient by 5% and reduce the amount of mistreatment by 58%. Demand for RDTs was found to be extremely high when they are readily affordable and available. Cohen & Dickens [81] have shown through modelling that subsidising the cost of RDTs will significantly raise provision of RDTs in drug shops as the owners will have an incentive to offer diagnosis. They are now testing this in Uganda where initial results have shown that reducing the cost of RDTs from US$ 1.20 to US$ 0.40 (67% reduction) makes diagnosis affordable for patients, profitable to shop keepers, and has significantly increased the use of diagnosis.

Drug Resistance

One of the key objectives of the global subsidy proposed by Arrow *et al.* was to reduce the risk of the development of drug resistance especially to artemisinins through crowding out the use of monotherapies [82]. Laxminarayan *et al.* [83] have modelled the use of different types of subsidies and conclude that even a partial subsidy could delay the emergence of resistance and that a delay in implementing a subsidy for ACTs could facilitate the emergence of resistance and lower the economic value of ACTs.

Experience with Other Health-related SMP Subsidy Programmes

In this section, discussion is restricted only to SMPs where the programme involves promoting the sales of a health-related commodity within the programme.

Of note to the discussion of the evaluation of AMFm in the next section, most of the reports of the outcomes of commodity-related SMPs & subsidies have been made once the programme is considered to be “mature” (usually 3 – 6 years from launch) [64].

Yamey and colleagues have identified five programmes using the NGO model to promote health-related commodity access. These programmes are:-

NGO Model
• Condoms • Oral contraceptives • Vitamin A • Water purification • Zinc

These studies are reported using the parameters which have been assigned as measures of success for AMFm (availability, price, market share, and use).

Studies on Availability (NGO Model)

Socially Marketed Condoms:

Piot and colleagues have noted that "Little documentation exists on the measurement of condom availability and its trends over time." [84]. However a few small studies have reported on such trends:-

- Tanzania: after four years' of a SMP for condoms, 25% outlets were selling the SM brand. This increased to 32% at five years, and stabilised at 32% by six years. The study did also find an increase in availability across outlets that were more likely to be accessed by the poor.
- Zambia: after six years, 39% of outlets were stocking the SM condom, compared to only 2% for the commercial brand and 3% for a government distributed, donor-funded brand. Again poorer men were better able to access the SM product.
- India: four years after a programme targeted at sex workers, coverage had reached 79% in the hot spots defined by the researchers.

Socially Marketed Water Purification:

- Tanzania: four years after the launch of this programme, only 6% outlets stocked the programme's brand of water purification tablets.
- Benin: after one year, national coverage was only 7.5% but this had increased to 36% after two years.
- Uganda: after about four years, 20% outlets stocked the purifier powder, 25-27% stocked the solution, and 26 – 33% stocked the tablets.

Studies on Market Share (NGO Model)

Socially Marketed Contraceptives:

- Indonesia: 3 years after the launch of a condom programme, the SM brand had reached 10% market share.
- Honduras: 3 years after the launch of an oral contraceptive programme, the SM brand had reached 15% share.

Studies on Use (NGO Model)

Socially Marketed Condoms

This summary is drawn from a DFID review of the studies published on usage data in low-income settings and quoted by Schäferhoff and Yamey [64].

- Cameroon: "Ever use" of condoms increased significantly. In another study, women reported use of condoms increased from 57 to 76% after 2 years.
- Botswana: use of contraception increased
- Guinea: condom use at last sexual encounter increased.

- Zambia: Women reported an increase in condom use from 17% in 1996 to 21% in 1999 but this was not statistically significant. Men reported use increasing from 24% to 28%, but again this was not statistically significant.
- Zimbabwe: after 3 years, use of the SM brand of condom was 35%, with 5% sexual encounter protected by commercial brands, and 10% by free condoms.
- South Africa: men reported after one year "ever use" of condoms increased from 57% to 73%, and "at last sex" from 38% to 54%.
- Uganda: after 18 months, increases in "ever use" of a condom in a casual sexual encounter increased from 23% to 46%.

Socially Marketed Zinc:

- Bangladesh: in an environment where over 90% parents sought help for their child's diarrhoea from the private sector, after 2 years a national SMP (SUZY) reported that the proportion of children receiving the subsidised SM brand of zinc was 19% in urban slums, 29% urban non-slums, 17% in municipal areas, and 12% in rural areas [85].

Socially Marketed Vitamin A:

- Burkina Faso: after 12 months, 33% respondents in a survey reported use of vitamin A supplements in the previous week [86].

Studies on Manufacturer's Model

There is a near absence of studies to show the impact of projects using the manufacturer's model [87].

Need for Suites of Interventions

There is a general agreement that subsidy programmes alone will not deliver adequate results. Intensive suites of interventions with strong health education and retailer training are necessary to ensure positive trends [88,89].

Comments from Interviews

Social Marketing & Subsidies:

Many interviewees recognised that the key to success of any social marketing programme (including a programme involving the subsidy of a key health commodity) was the behavioural change communications (BCC) within the SMP. The subsidy component was usually secondary as it would not have an effect until people's behaviour had been changed and demand for the relevant commodity had been created. Only then would the subsidy come into effect. This would be particularly true for diagnosis. It would be a mistake to assume subsidies alone could increase access if the demand had not been created through BCC and provider training. Testing various models of improving access, especially to subsidised diagnostics, would somehow have to measure separately the impact and relative importance of BCC and the subsidy.

At least one interviewee recommended that any consideration of the role of the private sector and subsidies should start by taking a step back and start from the question "Exactly what are we trying to achieve". Once clarity on this had been achieved, then possible solutions can be considered. There is a concern that the community rushes too quickly "into the weeds" of a particular model (*e.g.* AMFm) without getting the final objective clear first.

It was suggested in one interview if one way to increase access to diagnosis could be through using various health insurance schemes (public & private sector) that do exist in many malaria endemic countries. These often include subsidised drugs in the scheme and it might be possible to add subsidised diagnosis to these management algorithms.

Affordable Medicines Facility – malaria (AMFm)

Background & Purpose

The origins of the Affordable Medicines Facility – malaria (AMFm) lie in the report of the Committee on the Economics of Antimalarial Drugs [82]. The committee was established by the Institute of Medicine under the chairmanship of Prof Kenneth Arrow[7]. The report, entitled "Saving Lives, Buying Time" and published in 2004, made a central recommendation ("a sustained global subsidy of artemisinins co-formulated with other antimalarial drugs" – p.2) in response to the crisis that had been identified in the control of malaria with the emergence of resistance to affordable and accessible drugs, notably chloroquine and sulphadoxine-pyrimethamine (SP) [90]. The purpose of the subsidy was to make ACTs affordable and accessible to all malaria patients worldwide – to reduce the price of these life-saving drugs across all sectors (public, private, NGO).

In detail the recommendations were:-

At the Global level:

1. Commit new funds of US$300-500 million per year to subsidise co-formulated ACTs for the entire global market to achieve end-user prices of US$0.10 – 0.30, equivalent to those of chloroquine.
2. Stimulate production of artemisinin through a short-term funding of US$ 10-30 million per year to assure and stabilise demand.
3. Establish a centralised process for ACT procurement.
4. Discourage the use of antimalarial monotherapies (especially of artemisinins) through governmental and procurement actions.

At the Country Level:

5. Facilitate access to ACTs especially among the poorest in society and improve their effective use.
6. Carry out intensive integrated control programmes in low-transmission areas where malaria could be dramatically reduced or eliminated in a few years.

Monitoring, Evaluation, and Research:

7. Monitor public & private drug distribution to assure that ACTs reach the intended targets at least as well as chloroquine does.
8. Establish two types of monitoring and evaluation programmes at country level:
    a. effectiveness of drug regimens, treatment failures, and resistance;
    b. surveillance for drug-related adverse events.
9. Increase global investment in antimalarials drug R&D to US$ 60-80 million per year to ensure the on-going development of new antimalarials.

The case for a subsidy rested under four headings:-

1. Humanitarian: it would save lives through increasing access to effective drug treatment.
2. Economic: it would establish a "public good" through buying time against the development of drug resistance.
3. Investment: the subsidy would provide the impetus for pharmaceutical manufacturers to invest in the production of ACTs at the volumes needed to meet the global demand.
4. Research: it would give confidence to drug developers to invest in the discovery and development of new antimalarials to replace the current ones as their effectiveness declined and to meet the new needs that would be identified as malaria was brought under greater control.

[7] Emeritus Professor of Economics, Stanford University: Nobel Prize – Economics (1972)

The report argued that a supranational subsidy for ACTs and other antimalarials would avoid undermining the existing local drug distribution systems that are important in many malaria-endemic countries. They claim that "it is difficult to imagine how to subsidise at local level and maintain the reach of the private distribution system" (p.92). The benefits of such a subsidy near the top of the distribution chain would be that:-

- it would allow ACTs to flow through the existing public and private sector distribution chains that already exist even in remote locations.
- it would allow countries to adopt malaria treatment policies (including the use of ACTs) without concern about the sustainability of country-level funding to ensure the ACTs remained affordable and accessible to those in need.
- it would not force countries to choose between effective antimalarials and other antimalarial measures.
- it would provide equitable access to all malaria sufferers in endemic countries.
- it would give the global community leverage with the artemisinin manufacturers to stop them from supplying artemisinin monotherapies.
- it would minimise the administrative costs of delivering the subsidy.
- it would reduce the incentives to counterfeit ACTs.
- it would minimise the incentives to divert or smuggle ACTs.

The report looked at the various operating scenarios for organising procurement of ACTs (and other commodities):-

- Informed Buying: sharing of information on pricing and suppliers between individual procurers (*e.g.* the Global Fund's PQR system).
- Co-ordinated Informed Buying: purchasers conduct joint market research, share supplier information, and monitor prices, but still purchase individually.
- Group Contracting: purchasers jointly select suppliers and negotiate prices. Purchases can be either jointly or individually.
- Central Contracting and Purchasing: purchasers jointly tender and purchase through a global procurement agent.
- Pooled Procurement: a central organisation negotiates and purchases from suppliers and then distributes to the next level in the distribution chain.

An informal consultation held as part of the work of the IoM Committee agreed that efficient procurement of ACTs would require an operation towards the bottom of the list above [91].

The IoM report was initially taken up by the World Bank who championed the adoption of its recommendations through the convening and co-ordinating mechanisms of RBM. An RBM Global ACT Subsidy Task Force was established in 2007 to steer the design and implementation process of the global subsidy. The history of the progress of the idea from the IoM report to the setting up of the Task Force has been documented [92].

In November 2008 and at the request of the Board of the RBM Partnership, the Board of the Global Fund approved the setting up of the AMFm as a self-contained business line within the Fund [93]. This followed a year of examination of the proposals by the Fund in parallel with the work of the RBM Task Force. Resources for the initiative came from UNITAID[8], DFID, and the Gates Foundation. In this decision, the Board approved a two year period for Phase I so that it could make a decision to "expand,

[8] The UNITAID Board Resolution (Resolution No. 1, 9th Board Meeting – 29 January 2009) committing US$ 130 million over 2 years to AMFm included requests to the Global Fund to:-

a) increase the use of diagnostics in country action plans,
b) increase use of fixed dose combination ACTs,
c) undertake AMFm activities to ensure long-term sustainability in ACT price reductions and quality standards.

accelerate, terminate or suspend the AMFm business line" in the second half of 2010. This timeline was extended to the 2012 mid-year Board Meeting in November 2009 [94] and again to 2012 year-end Board Meeting in December 2010 [95]. These delays were to take into account the various delays in the setting up of the pilots and to allow for a proper period for the assessment of the pilots. Phase I started operations in June 2010.

Objectives:

The objectives of the AMFm global subsidy programme are [96]:

1. To increase the availability of quality assured ACTs in public and private outlets.
2. Reduce the price of quality assured ACTs in comparison to other commonly used antimalarials.
3. Increase the market share of quality assured ACTs among antimalarials.
4. Increase the use of quality assured ACTs in malaria sufferers, including among vulnerable groups such as the poor, rural communities, and children.

Lessons from Earlier Subsidy Pilots

Care needs to be taken in extrapolating from the pilot ACT subsidy programmes described in the previous section. These include [97]:-

1. The pilot projects are small scale and AMFm is national.
2. The pilot projects in three countries (Angola, Uganda, and Kenya) have added a new distribution route for the subsidised ACTs, whereas AMFm only uses existing distribution channels.
3. In the Angola pilot, the price is closely monitored at shop level and action is taken against shops making large mark-ups. This close monitoring is unlikely to be possible in a national programme.
4. All pilot projects have been associated with intensive health education campaigns and training for drug sellers. It is not clear if the same level of intense marketing campaigns will be possible on a national level.

The small-scale pilot projects have shown some success in demonstrating proof-of-principle that a private sector subsidy can reduce prices, increase availability, and increase market share. But they run the risk of suffering from the "Hawthorne Effect" of showing the behavioural results desired simply due to the existence of the study and the intensity of attention the community involved is receiving [98].

From the national subsidy programmes described in the previous section, there is little evidence that a subsidy can have a rapid effect on ACT price, market share, and availability. This echoes the evidence outlined in the previous section on experience with subsidy and SM programmes for other diseases. In particular, the timescale for the evaluation of the intervention and the level of the associated health education programmes must be carefully considered when assessing the success or failure of an AMFm pilot.

Concerns about AMFm before Phase 1 Implementation

During the planning and discussions that took place before the Global Fund Board approved the AMFm Phase 1 Pilot, several groups raised specific concerns about the concept and the opportunity costs of this novel initiative.

The US Government (USG) had concerns about the AMFm in its original form. In a 2007 position paper for the RBM Board, the USG outlined these concerns [99]. It supports the objectives of increasing affordability of ACTs, increasing their availability, and of crowding out artemisinin monotherapies. However:-

- it was unclear if AMFm will have a substantial impact on affordability in either the private or public sectors;

- commodity pricing is only one barrier to access and availability. A broader approach to removing all the barriers (including policy, health worker training, behavioural change, regulatory issues, supply chain management, and diagnostics) should be addressed preferably as an aligned package;
- the funding gap for all aspects of a comprehensive approach to malaria control and elimination means that the opportunity cost of allocating a significant sum to a single top-down intervention is too high;
- ACTs are being made available to national governments free through donor-funded programmes. However the application by endemic country governments of user fees means that factory gate prices are not the barrier to accessing treatment by the poor and AMFm does not address this issue;
- the market share levels that have been projected for AMFm will not reach a level to properly crowd out artemisinin monotherapies – a key objective of AMFm;
- the market share levels also do not give confidence that the availability of ACTs will reach to the poorest.

The USG also has concerns about the hosting of the AMFm by the Global Fund [100]:-

- is AMFm consistent with the role of the Global fund as a funding, not an implementing entity;
- the number of staff needed to manage AMFm, especially if it is scaled up in a Phase 2.

Oxfam expressed concerns about AMFm [101]:-

- how to ensure that private providers will safely dispense the medicines;
- the risk that a subsidy will actually encourage more over- and under-prescribing (running the risk of promoting resistance development);
- even the subsidised drugs will be too expensive to be accessible for the poorest, especially children;
- it will distract from rapid scaling–up and strengthening of free public sector provision.

They concluded “The malaria subsidy if applied only through the private sector risks setting a damaging precedent of further diverting international donor attention away from addressing the problems of the public sector. As a result failure of public provision becomes a self-fulfilling prophecy.”

Medicins sans Frontières’ (MSF) concerns about the AMFm model [102] were driven by the over-arching concern that improving patient care should be central to any new strategy for increasing access. Specifically:-

- AMFm should only support the use of fixed dose combinations (FDCs);
- it should promote the greater use of diagnosis and RDTs. Better diagnosis would increase the reputation of ACTs with patients and so increase their usage relative to other ineffective antimalarials;
- avoid the use of ACTs where the non-artemisinin component had already shown significant resistance – primarily targeted at the use of sulphadoxine/pyrimethamine-based ACTs;
- supporting interventions should focus on how to improve access for the poorest;
- as one of the rationales for supporting private sector distribution was to improve access in remote geographical areas, then evidence that AMFm achieves this needs to be gathered;
- evaluation of AMFm must focus on improvement in health outcomes and not just on its impact on the price of ACTs;
- AMFm did not seem to have a mechanism built into the plans to stabilise the artemisinin market;
- AMFm should be consciously complementary to efforts to strengthen the public sector provision of effective diagnosis and treatment. The public sector has advantages over the private sector in making it easier to deliver diagnosis, train healthcare workers, ensure access for the poorest and most vulnerable, and reduce the amount of over-prescribing.

In 2009 Bate & Hess [103] also raised concerns about:-

- opportunity cost to the Global Fund of AMFm compared to core grant funding;
- increasing the availability of ACTs over-the-counter in the absence of proper diagnosis;
- over-enthusiasm based on the four pilot studies described above, which don't show conclusive evidence that it will deliver its goals [29].

They conclude with the comment "As the Global Fund delays new funding rounds and cuts back on its core functions, it risks wasting public funds pursuing a scheme that might have been appropriate 4 years ago [2005], but which could undermine malaria control and treatment programmes and impose considerable opportunity costs today."

A particular concern in the design of AMFm and one that has been raised by several groups with concerns about the entire concept (see below) is that, even at the end-user prices applying under AMFm, they will still be too high for the poorest of the poor to access quality ACTs [104]. One Demographic and Health Survey (DHS) survey has shown that the poorest may find spending as little as US$0.05 on antimalarial treatment beyond their means. Prices would have to be reduced further through additional or alternative mechanisms for the price to be affordable to these people. Such mechanisms would be context specific and so would probably have to be designed to take each country's situation into account. Bitran and Martorell have reviewed the options to take the price down further through a possible second subsidy targeted at the poorest of the poor [104], but have concluded that this may not be practical or cost-effective.

Phase I Pilot Projects

In 2009 the Global Fund Board [94] approved a set of pilot programmes (Phase 1) to test how well the AMFm model to achieve its objectives of:-

1. Increasing the availability of quality assured ACTs in public and private outlets.
2. Reducing the price of quality assured ACTs in comparison to other commonly used antimalarials.
3. Increasing the market share of quality assured ACTs among antimalarials.
4. Increasing the use of quality assured ACTs in malaria sufferers, including among vulnerable groups such as the poor, rural communities, and children.

After the two-year Phase I programme, the level of success of these pilots in meeting the objectives would be assessed by an Independent Evaluation (IE) carried out by an independent group of consultants.

This Board decision also asked that evidence be produced that AMFm was more cost-effective than other equivalent interventions. However, the Independent Evaluation Inception Report advised that this would not be possible in practice [96], and a separate feasibility study carried out by evaplan Consultants concluded that such a study was not feasible because:-

- the relevant data was unavailable;
- it was not possible it identify appropriate comparative financing models;
- it is difficult to directly attribute effects to AMFm;
- the difficulty of estimating costs and disentangling impacts of one financing model from another.

Therefore it was agreed by the Global Fund AMFm *ad hoc* Committee not to proceed with a full study of cost-effectiveness [105]. The Independent Evaluation may attempt to estimate additional impact and benefits in the some of the country case studies.

Originally it was proposed to set up pilots in 12 countries - Benin, Cambodia, Ghana, Kenya, Madagascar, Niger, Nigeria, Rwanda, Senegal, Tanzania (mainland), Tanzania (Zanzibar), Uganda. These would be funded from two sources – the cost of the co-payments to the ACT manufacturers would be paid from the AMFm account at the Global Fund; the costs of the supporting interventions[9] would be paid for by reprogramming existing Global Fund grants after the applications had been through the usual Fund processes for re-programming (including Technical Review Panel [TRP] reviews) and funds dispersed through the usual Global Fund channels. Benin and Senegal failed to get TRP recommendations for funding and Rwanda withdrew during the clarifications phase of the TRP review. Cambodia has not been able to launch its programme due to issues with QAACT supply[10].

The total amount of money in the Co-payment Fund at the outset of AMFm Phase 1 was US$ 216 million.

For supporting interventions, the total budget was US$ 127 million (indicative and not definitive – an upper ceiling);

- it was estimated that US$ 98 million would be provided through savings gained in the budgets of the Phase I countries' existing Global Fund malaria grants (cost savings from buying QAACTs at AMFm prices);
- a further US$ 11 million would be provided from other sources;
- incremental new funding was US$ 18 million.

Countries were not required to make any changes to laws and regulations in order to participate in Phase I of AMFm. However one of the criteria for participation was "preparedness for rapid scale-up of ACT distribution" and one measure of this was "approved over-the-counter (OTC) status for ACTs". Ghana and Nigeria had reclassified ACTs as OTC medicines in 2006 (well before AMFm was launched). In other Phase I countries, they remain prescription only (POM). Other changes that have been made:-

> *Niger:* legalisation of public sector health facilities buying drugs from the private retail sector.
> *Tanzania:* unlicensed drug shops (DLDBs) are now allowed to sell ACTs provided they have received some training, but which have not yet been accredited as ADDOs.
> *Uganda:* plans to classify all ACTs as OTC (currently only Coartem®[11]).
> *Zanzibar:* ACTs reclassified as OTC, but this is being reconsidered as part of the pre-elimination phase malaria strategy.

Phase I Experience

This section is not intended to pre-empt the findings of the Independent Evaluation which is described in the next section. Instead it summarises the findings from various surveys that have been published during the Phase I period and may give some early indication of how AMFm is progressing. It also outlines some challenges that have been met in the running of Phase I up to the time of writing (March 2012).

Financing Requirements:

The AMFm started operations in June 2010 with a co-payment fund of US$ 216 million. However, the average co-payment *per* treatment has turned out to be higher than estimated in 2008, and this resulted in the depletion of the co-payment fund faster than expected. This is thought to be due to the mix of ACT dosage strengths being ordered by First Line Buyers (FLB)[12] being much more concentrated

[9] "Supporting Interventions" is the term used in this context to describe the proposed SMP to support the introduction of AMFm at country level.
[10] Cambodia would use dihydroartemisinin/piperaquine as its first-line ACT but is unable to source product that meets the Global Fund Quality Assurance Policy standards
[11] Coartem® = artemether/lumefantrine manufactured by Novartis Pharma AG.
[12] A First-Line Buyer is a company in a malaria endemic country that buys QAACTs from the manufacturer at the co-paid price. These are the first step in the in-country supply chain. They sign agreements with the AMFm Unit of the Fund to (i) abide by the goals and objectives of AMFm, (ii)

on adult strengths than paediatrics, and this is also thought to be having an adverse effect on drug supply (though this is disputed by some) [106]. In the middle of 2011, the AMFm Unit instituted a series of demand management levers to address both the challenges of drug supply and to conserve financial resources. These levers were to give preference for co-payment requests based on prioritising:-

- better performing manufacturers in meeting planned delivery dates;
- allowing deliveries to catch up to orders;
- paediatric formulations over adult formulations;
- fixed dose formulations;
- cheaper modes of transport (sea *vs.* air freight);
- public over private sector.

At their October 2011 meeting, the AMFm *ad hoc* Committee was briefed that, even with the application of these demand management levers, the current "burn rate" would see the co-payment fund fully depleted by January 2012. A request was made to UNITAID, CIDA, and DFID to refinance the fund with US$ 124 million to see AMFm able to continue until the end of 2012. As of the end of April 2012, UNITAID, CIDA, & DFID have agreed to commit an additional US$ 120 million to AMFm.

ACT Demand:

In 2008, the forecast needs for ACTs to meet AMFm demand was 290 million treatment courses [107]. As of the end of September 2011 (15 months since the formal launch in June 2010), co-payments for 168 million treatments had been approved (58%). However the initial uptake had been slow and then had started to accelerate in 2nd quarter of 2011 [108]. In August 2011 cumulative planned deliveries were 134 million but only 92 million were actually supplied (68%).

Global demand for ACTs increased in 2011 with the demand from the private sector being the major component. This gave cause for concern about the ability of the overall ACT supply chain to meet the demand. Given the timing of this and the availability of AMFm co-paid ACTs, the additional demand due to AMFm was thought to be a major contributing factor to the "tight" supply situation. However a RBM-WHO Round Table on ACT Supply held in September 2011 concluded that the situation was much more complex than this – and this is explained in full in the meeting report [106]. However it is clear that, given the number of "moving parts" in the ACT supply chain, there is a clear need to ensure that all stakeholders are properly talking to one another and so an Inter-Agency ACT Supply Taskforce (under the auspices of WHO GMP) was set up to monitor the situation, identify any problems, and facilitate communications to ensure better planning [109]. The application of the demand levers has, to some extent, reduced the pressure on drug supply.

In October 2011, it was noted that 35% of all co-payments were for sales to the public sector, and that in some countries public sector facilities were purchasing their requirements from the local private sector. This helps with stock-outs and "suggests that the private sector is a faster channel [of distribution] for assuring the availability of ACTs" [105].

ACT Pricing and Availability:

Health Action International (HAI) have been surveying prices (and, to a degree, availability) of ACTs in AMFm pilot countries. These use a method co-developed by WHO and HAI. Sixty private sector outlets are surveyed *per* country (50:50 formal[13] and informal[14]). The HAI methodology is mainly to assess prices and "availability results are useful but should be interpreted with some caution..."[110].

In the January report [111], it was found that a high percentage of outlets surveyed stocked at least one formulation of AMFm co-paid ACTs:-

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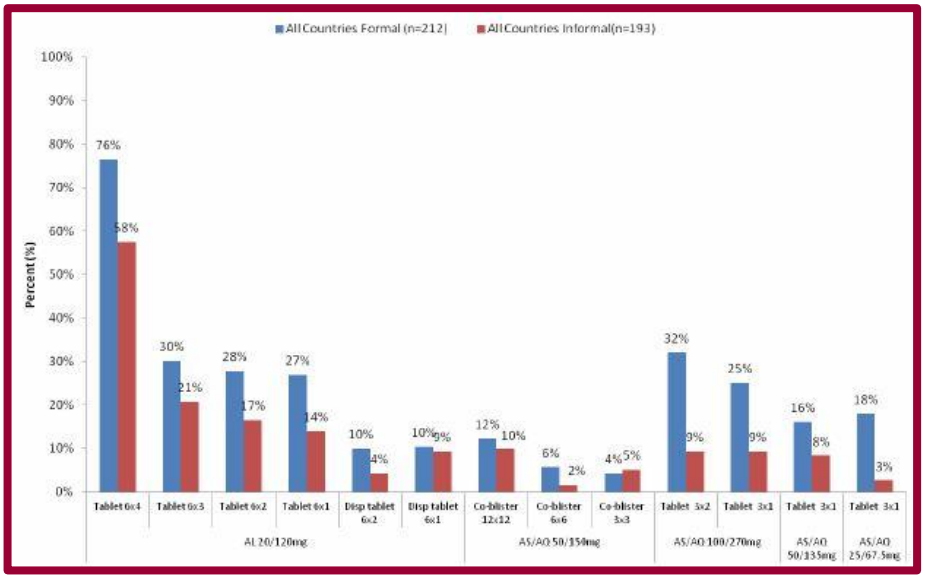
maintain high standards in distribution, (iii) only sell AMFm co-paid drugs in participating countries, and (iv) to pass on the savings from buying at the co-paid price (among other undertakings).

[13] Registered retail pharmacies.

[14] Unregulated, unlicensed outlets.

Country	Type	% Stocking AMFm ACTs
Ghana	Formal	97
	Informal	59
Kenya	Formal	81
	Informal	48
Madagascar	Formal	100
	Informal	40
Nigeria	Formal	100
	Informal	100
Tanzania	Formal	97
	Informal	100
Uganda	Formal	82
	Informal	66

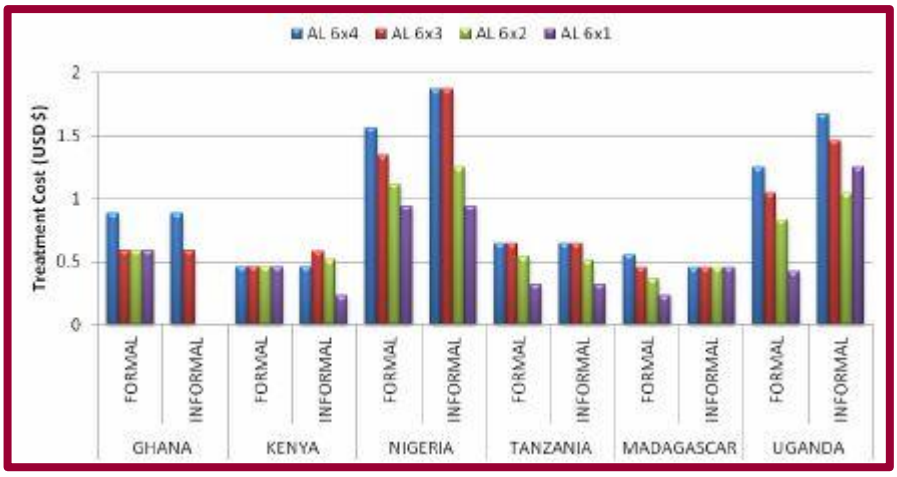
However the distribution of specific dosage forms and different types of ACTs varies considerably. Across all six countries, the most widely available dosage forms are the adult ones (*e.g.* artemether/lumefantrine 20/120mg tablets 6x4). This is in environments where the major disease burden is in children. Paediatric dosage forms have been found in <30% outlets. This position has not changed over the last 4 reports:-



Some concern has been expressed as to whether these survey samples include too many urban outlets and so do not accurately measure the impact of AMFm on availability in remote or rural areas. Remoteness has been seen as a barrier to access for AMFm ACTs. This is being looked at in a study by Yadav and colleagues in Tanzania [112]. This study is on-going but the preliminary conclusions are that:-

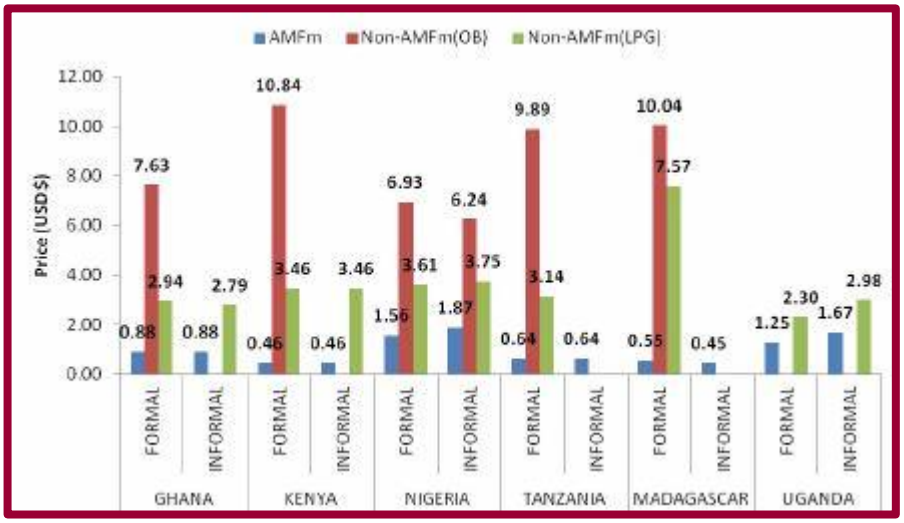
- there is no significant difference in availability of AMFm ACTs between remote and urban drug outlets;
- initial differences disappear quickly as overall availability increases.

HAI surveys report prices to be relatively stable over time (surveys in June, August, September, November 2011, and January 2012). The January data for artemether/lumefantrine median treatment costs is shown in this graph:-



The flattening of the price differences between adult and paediatric packs at outlet level shows that there is a higher mark-up for the children packs, as compared to the adults, losing the age-specific price differentials which are offered to FLBs when placing orders to AMFm. This may be a reflection of the demand for the different dosage forms in the shops and the profit-maximising motives of the outlet owners.

Median price data shows that the AMFm products are priced below both the non-AMFm original brand (OB) and the lowest priced generics (LPG). This is illustrated in the chart below for artemether lumefantrine 20/120 6x4 packs (adult dosage):-



The HAI reports analyse their findings in more detail than is possible in this paper. However the high level conclusion from this data is that AMFm ACTs have become available in a high percentage of retail outlets in all countries (especially those where the AMFm supporting interventions have been in place for the longest period). Median prices for AMFm ACTs are well below non-AMFm products. For adults, the median prices of AMFm ACTs vary between countries in the range of 1x – 4x generic SP, and for children between 1x – 2x[15]. However outlets seem to be stocking adult dosage strengths rather than paediatric ones and the mark-up on paediatric strengths is higher than for adult ones.

[15] Chloroquine data is only available for a few countries.

Country Consultations:

The Fund Secretariat has undertaken (leading up to the October 2011 meeting of the *ad hoc* Committee) consultations with the countries implementing AMFm in Phase I [108]. The feedback from this was:-

Ghana: AMFm is well received and is considered as successful in raising awareness and access to affordable QAACTs nationwide – including the poor and vulnerable. A strong public-private partnership has been built, including increasing the role of the private sector in supplying ACTs to the public sector. Challenges include issues with the reliability of ACT supply, ensuring adherence to the suggested retail prices, and ensuring proper rational use.
Kenya: AMFm is perceived as having had a beneficial effect on QAACT availability, access, and affordability with a positive impact on the malaria burden. The private sector has been rapidly mobilised and the public-private partnership that has developed is effective. Challenges include over-coming the initial stigma of the low price being equated with low quality, lengthy procurement processes, negative impact on local pharmaceutical manufacturers (with local political implications), and an inadequate timeframe for implementation.
Madagascar: AMFm aligns with the national health and control policies and is now fully incorporated into the malaria control efforts. It has local political support. It is perceived as having increased awareness, availability, and affordability of QAACTs. It has also afforded the opportunity for collaboration between the public and private sectors, and with global partners. Challenges include long lead times for delivery of ACTs, lack of diagnosis and RDTs as part of the programme, inadequate access to rural areas, and issues over advertising ACTs to the general public.
Niger: AMFm is considered to be a "fantastic" initiative meeting "the real needs of Nigeriens". Since the start of AMFm in Niger, there had been no stock-outs in the public sector as public sector facilities had been able to access drug through the private sector to overcome any challenges in the public sector procurement or distribution systems. Challenges include ensuring adherence to recommended retail prices, information flows about decisions on co-payments, and impact on local manufacturers. Extension to diagnosis and RDTs should be considered.
Nigeria: AMFm is perceived as increasing awareness, availability, and affordability of QAACTs. The current business model is a good strategy ("Public and private sectors working hand in hand will ensure better reach"). Challenges include bottlenecks in the supply chain, long lead-times for deliveries, manufacturers being perceived as not being able to meet demand, limited involvement of stakeholders at sub-national levels. Extension to subsidising RDTs was recommended.
Tanzania: the existence in Tanzania of an infrastructure including Accredited Drug Dispensing Outlets (ADDOs) enabled a successful launch of AMFm. Affordable QAACTs are now widely available, including rural areas. Stock-outs and drug shortages have been reduced due to this wider accessibility. Challenges include the lengthy disbursement process for co-payments, slowing imports of drugs, the lack of involvement of local manufacturers, inadequate competition between manufacturers and first-line buyers (FLBs).
Uganda: the experience of hosting the pilot CAPPS study (see above) [76] enabled a quick set-up of the Phase I project and rapid importation and distribution of drugs. Re-classifying ACTs from prescription-only to OTC status enabled wide distribution. Challenges included the long delays in the disbursement of the funds for the supporting interventions by the Fund which has limited public awareness and so uptake of the affordable drugs. Local manufacturers' lack of involvement is also seen as a problem. Expansion to diagnosis and the treatment of severe malaria should be considered.
Zanzibar: malaria is now well controlled on the island. AMFm should be extended to cover diagnostics in this situation and its continuation will be a significant part of achieving the elimination goal.

The AMFm Unit reported that, in all these country consultations, strong views were expressed by the country-level stakeholders that AMFm (or a similar subsidy scheme) should be continued to ensure

progress was not lost [108]. There were significant concerns that the level of political will and capital that had been invested in the launch of AMFm would be lost if it was prematurely terminated with no alternative and this might lead to a strong backlash at governmental level against the Global Fund in particular and global aid initiatives in general. There were also general concerns that the length of the evaluation period for Phase I was too short – one country consultation concluded that a 5 year period should be used to properly evaluate the success or failure of this initiative.

At the recent Global Fund Partners' Forum, the São Paulo Parliamentary Declaration on Access to Medicines and Other Pharmaceutical Products has called upon the Global Fund to "Work towards the progressive extension of the Affordable Medicines Facility – Malaria to all countries in which the Global Fund is supporting programs to fight malaria." [109]

Global Fund Phase I Evaluation

The Independent Evaluation was set up to assess how well the model has achieved its objectives [96]. It is being carried out by a consortium led by ICF Macro and the London School of Hygiene and Tropical Medicine (LSHTM)[16]. The IE is based on a non-experimental design with a pre-test and post-test intervention assessment in which each participating country is treated independently as a case study. In addition to measuring the changes in key indicators pre- and post-intervention, the evaluation includes an assessment of the implementation process and a comprehensive documentation of the context both to inform assessments about causality and to aid in generalising to other contexts. It was originally intended to include a comparator country where AMFm was not being implemented but this was rejected for several reasons:

(i) it would be difficult to identify an appropriate comparator;
(ii) comparing the intervention countries with a comparator would require data pooling among implementer countries which would be misleading due to differences at baseline and differences in the speed of implementation;
(iii) few potential comparator countries would have data on changes over time in key AMFm indicators over the relevant timeframe.

The case study approach, looking at intra-country differences (rather than inter-country ones) was deemed to be the most useful.

The analysis will be undertaken on a country-by-country basis, making use of the qualitative and quantitative approaches described above, to document and describe how the AMFm has evolved in each country. The evaluation will distinguish two parts: (i) the upstream part, with emphasis on the business model of the AMFm as a financing platform; and (ii) the downstream part, with emphasis on service delivery to increase access to and use of QAACTs, including by poor people. In the case studies, findings from nationally representative outlet surveys will be compared before and after the introduction of AMFm, taking into account relevant contextual information and results from operational research that become available to help learn how and why the new model unfolds in a variety of contexts while drawing lessons that can help future operations. Case studies will include a comparison of country progress for each of the main outcomes against the "benchmarks for success" (see below).

The evaluation is based on primary data collected from outlet surveys conducted at baseline and endline (for questions related to availability, affordability and market share of QAACTs); secondary data

[16] Three other institutions (Population Services International [PSI], Drugs for Neglected Diseases initiative [DNDi] and Centre de Recherché pour le Développement Humain [CRDH]) have been sub-contracted to serve as data collection agencies within the countries. PSI is responsible for data collection in Kenya, Madagascar, Nigeria, Uganda, Tanzania mainland (which was in turn further sub-contracted to the Ifakara Health Institute) and Zanzibar. DNDi further sub-contracted the Department of Child Health of the Komfo Anoke Teaching Hospital, Kumasi, to undertake this work in Ghana. CRDH further subcontracted the Centre International d'Études et de Recherches sur les Populations Africaines (CIERPA) to conduct the survey in Niger.

from national household surveys (for question related to use of QAACTs), such as Demographic and Health Surveys (DHS), Malaria Indicators Surveys (MIS), Multiple Indicator Cluster Surveys (MICS), and ACTwatch household surveys; in-depth interviews with key stakeholders involved in the drug supply chain in the country; and review of documents such as reports from AMFm operations research, malaria treatment guidelines, pharmacy regulations, country-level reports from Ministries of Health and donor partners (including national malaria control strategy documents), and results from national surveys and any other documents relevant to the context data described above.

For each country, relevant indicators will be computed for the baseline and endline from the outlet surveys. For secondary data from existing national household surveys, appropriate indicators will be extracted from existing reports. To assess change, the IE will calculate the percentage point change or the per cent change (whichever is relevant for each indicator) between the baseline and the endline. Contextual information will then be processed to help in the interpretation of these results.

The IE plan has been reviewed by the Fund's Technical Evaluation Reference Group (TERG) and their findings have influenced the design of the evaluation. Some key relevant recommendations were:-

1. Due to the short time for implementation of Phase I, the IE should focus on the impact of AMFm on price, availability, and market share of QAACTs.
2. Due to the short implementation period, conclusions regarding the success of AMFm will depend more on how quickly the parameters of price, availability, and market share are changing, and so benchmarks should be pre-determined at the start of the evaluation.
3. Evaluating changes in usage of QAACTs in remote locations will only be possible in a subset of countries, most usefully the fast moving ones. However these may not be representative of all pilot countries.

Principal measures of success defined in response to recommendation (2) are:-

Availability:	20 percentage point increase in availability from baseline (All QAACTs)
Price:	Co-paid QAACT price < 300% of price of dominant non-QAACT
Price:	Co-paid QAACT price < price of artemisinin monotherapy
Market share:	10-15 percentage point increase in market share from baseline (All QAACTS)
Market share:	Decrease in market share of artemisinin monotherapy

In addition to the four evaluation questions, the AMFm Unit of the Global Fund has commissioned three studies to look at:-

a) ACT and Active Pharmaceutical Ingredient (API) market dynamics;
b) institutional analysis;
c) financial sustainability.

The study on the market dynamics for ACTs and related APIs has been published by the William Davidson Institute [113]. This gives forecasts of demand for 2012 – 2014 under four scenarios:-

- continuation of the AMFm in the eight pilot countries;
- an expanded AMFm Phase 2 to include twelve additional countries (total = 20);
- expanded AMFm in a total of 20 countries (including the eight pilot countries) along with faster scale-up of rapid diagnostic testing (RDT) in the private sector in all 20 countries;
- discontinuation of AMFm after the 2012 Global Fund decision-making process is complete.

In addition to the studies listed above, CHAI are also undertaking a set of operational research projects (OR) looking at other related aspects of increasing access to diagnosis and treatment through the private retail sector, usually with subsidised RDTs and ACTs. These can further inform the overall evaluation of AMFm in late 2012, as well as extending the scope to include the use of RDTs. These are outlined in Table 3.

Table 3: CHAI Portfolio of Operational Research Studies Related to Improving Access to Diagnosis and Treatment in the Private Retail Sector

	RDT/ACT Demand Study	Packaging/RDT Study	Private Sector RDT Study	Remote Incentive Study	GUARD (Good Use of ACTs and RDTs)	Village Malaria Worker Study	PACT (Preserve ACTs)	Medical Rep Study	Private Sector Role in Case Management
Objective	Access: Targeting	Appropriate Use	Targeting	Access: Equity	Targeting	Access: Equity	Appropriate Use	Access	Targeting
Location	Kenya	Uganda	Uganda	Tanzania	Cambodia	Cambodia	Ghana	Madagascar	Zanzibar
Research Questions	(1) How does demand and uptake for RDTs vary with price (even highly subsidized prices)? (2) How does demand and uptake of ACTs vary with price? Can RDT prices be bundled in such a way with ACTs that there is an incentive to be diagnosed? (3) What are current rates of overtreatment for malaria in the private sector and will consumers use RDTs to reduce that?	(1) What effect do different types of packaging have on adherence rates to ACTs? (2) What are the most cost-effective packaging approaches to improve adherence to ACTs? (3) What is the impact of confirmed diagnosis (by RDT) on adherence to ACTs?	(1) Can subsidized RDTs be successfully introduced, distributed, and sustained in the private sector? (2) How do shop owners price RDTs? What is the mark up and end user price of subsidized RDTs in drug shops? Are they affordable? (3) Do customers adhere to RDT test results? Does this impact health outcomes? (4) Can additional training for drug shops and impact pricing, uptake or adherence to RDT results? (5) Can information campaigns or free distribution	(1) [originally] Can a top-of-the-chain incentive increase the availability and price of ACTs in remote areas? (2) How does availability of subsidized ACTs influence usage over time?	(1) What is the quality of RDTs at private providers and how can a quality control system be designed? (2) How are fevers managed at private providers in terms of use of RDTs, artemisinin based drugs and drug cocktails?	(1) Is Cambodia's national Village Malaria Worker (VMW) program an effective means for improving access to free diagnosis and treatment to the most poor and vulnerable populations, therefore optimizing equity? (2) Is the VMW program an effective means for targeting of ACTs through the use of combination RDTs and treatment of "RDT negatives"?	(1) What are the most effective and scalable delivery systems for text message reminders? (2) Can text message reminders increase adherence to ACT regimens?	(1) Is the use of Medical Representatives (MRs) workforce an effective strategy for increasing availability of ACTs in the private sector in remote areas?	1. Will the introduction of the trial policy shift treatment seeking toward facilities where diagnosis is available? 2. Will the introduction of the trial policy increase the proportion of patients seeking treatment for fever illness that receive a confirmed diagnosis (by RDT or microscopy)? 3. Will anti-malarials remain available at OTC shops after implementation of the trial policy change?

	RDT/ACT Demand Study	Packaging/RDT Study	Private Sector RDT Study	Remote Incentive Study	GUARD (Good Use of ACTs and RDTs)	Village Malaria Worker Study	PACT (Preserve ACTs)	Medical Rep Study	Private Sector Role in Case Management
			of RDTs stimulate consumer demand, uptake, and adherence to RDT results?						
Results Available	Published	May 2012	April 2012	April 2012	Available	April 2012	April 2012	May 2012	November 2012

What the IE will tell us:

The IE should give robust information on the impact of AMFm on price, availability, and market share of QAACTs in the pilot countries, and how this varies with the strength of implementation of the programme. In particular, it will give information on the quantity of co-paid ACTs that are provided and the implementation of the SMPs.

The various other operational research projects undertaken by CHAI and others will go some way to answer questions about how to incorporate RDTs into treatment delivery strategies, the impact of packaging on adherence to treatment, and if the AMFm model can address the challenge of availability in remote areas.

What the IE will not tell us:

There is concern that the duration of Phase I is too short to get meaningful and clear answers to the questions posed [114]. Including the customer awareness (social marketing) programmes and other supporting interventions, the IE will only examine 3-8 months of full implementation of AMFm (see Chart 1). Comparative timelines for other major global health & development initiatives have been much longer:-

	Period of Implementation before Evaluation	Amount Invested (US$ millions)
GAVI Phase 1	2000-2005 (5yr)	711
GAVI Phase 2	2006-2010 (4yr)	2,096
PEPFAR	2003-2012 (10yr)	>20,000
WB Education for All Fast Track Initiative	2002-2012 (8yr)	1,400
UNITAID Paediatric HIV/AIDS Procurement	2006-2012 (6yr)	317
UNITAID Second Line HIV/AIDS	2007-2011 (3yr)	306
Global Fund Five-Year Evaluation	2002-2007 (5yr)	4,400
AMFm	2010-2011 (<1yr)	353

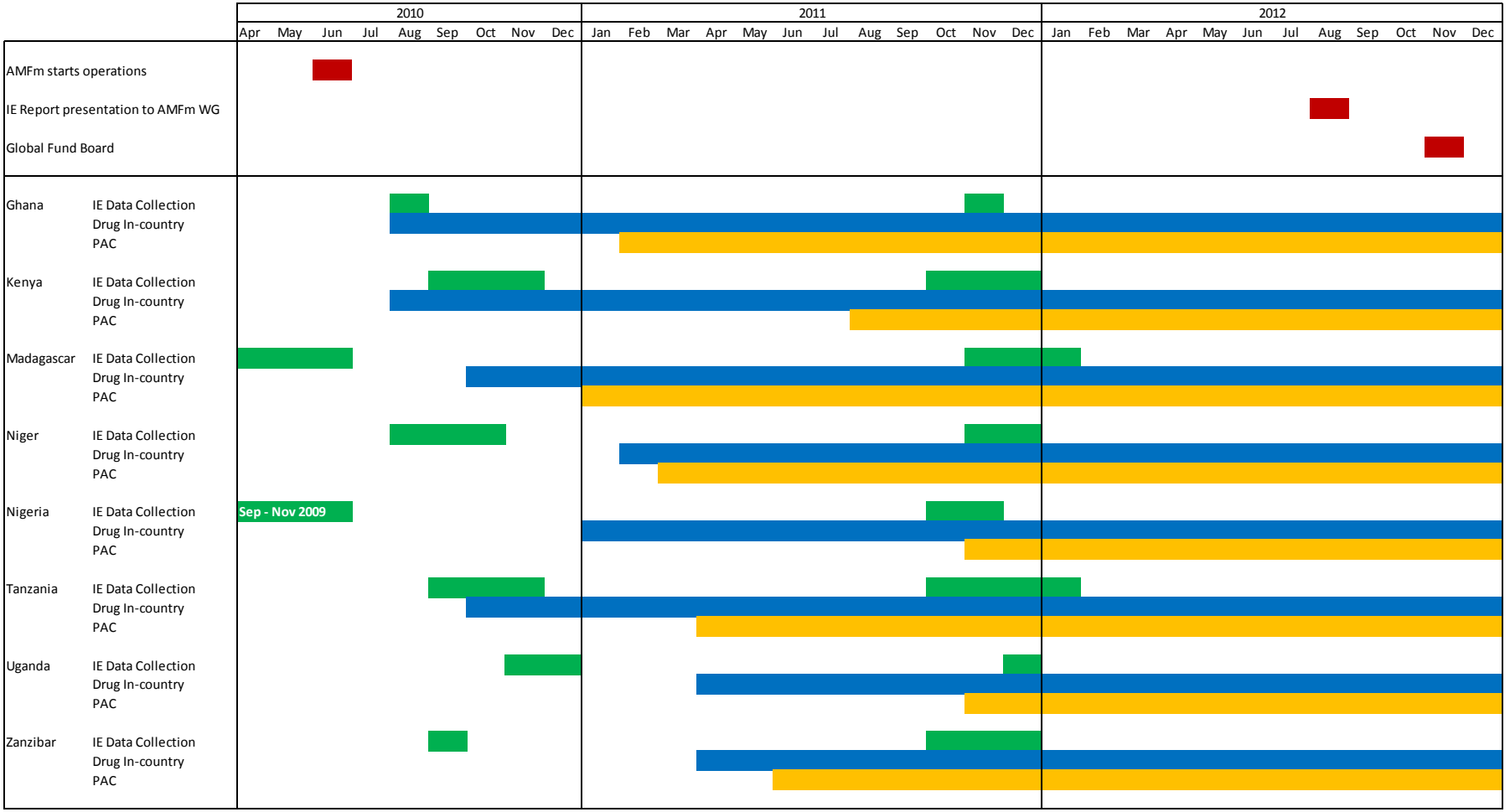
Pharmaceutical companies and MIT-Zaragoza would expect the speed of uptake of a new product into emerging markets and developing countries to be measured in years. Into countries like the AMFm Phase I ones, they believe that uptake by Year 2 in rural areas would struggle to reach 20%, although higher market shares might be achieved in highly urbanised situations. They stress that “high levels of availability and market share in the AMFm would only be possible within 2 years in small countries with effective government regulations and good distribution systems, such as Rwanda” [64].

Information on the use of ACTs from household surveys that were not conducted as part of the Independent Evaluation will be included in the IE report, but the timing of these surveys is not ideal and country coverage is incomplete. Also this data only measures fever and not malaria. While this may show information on changes in which antimalarial care-seekers are buying, it will not show clearly if there is any impact on changes in usage specifically to treat malaria.

The IE will not give information on:-

- effective targeting of ACT usage to vulnerable populations;
- adherence to drug regimens;
- the global supply situation and how AMFm has affected this;
- diversion of QAACTs from public to private sectors as a result of AMFm (potentially leading to supply problems in the public sector);
- diversion of AMFm co-paid ACTs from AMF to non-AMFM countries.

Chart 1: Timings of AMFm and Independent Evaluation activities.



NB: PAC (Public Awareness Campaigns) deemed to start from date of launch event in-country, except Uganda where launch event on 29-04-11 but first disbursement of GF grant not till November 2011.

The short timeframe for a proper evaluation of a new financing mechanism is also reflected in the comments of the Global Fund TERG about the Global Fund's 5-year Evaluation: "Most importantly, five years is an extraordinarily limited amount of time over which to measure global level outcomes and impact, especially in a new program with a new model. Investments of both new resources and new approaches require time to take root and bear fruit." [115]

The IE's information on actual usage by patients will not be as robust as the other success parameters and information will not be available for all pilot countries.

The differences between countries in the availability of co-paid ACTs and the roll-out of the SMPs promoting AMFm may make understanding the impact of AMFm difficult to measure.

The use of demand management levers by the AMFm Unit in the second half of 2011 occurred after the start of the IE period, but the IE Team consider that these are part of the normal workings of an intervention like AMFm. Therefore they do not consider the results to be distorted by the levers.

It is generally agreed that the importance of the private retail sector varies between malaria endemic countries. The private sector supply chain also can differ significantly along with the regulatory and enforcement systems. All the Phase I countries are in Africa, and so it may be difficult to translate the findings of the IE to endemic country situations in Asia and Latin America.

Concerns Expressed During Phase I

In July 2011 Africa Fighting Malaria (AFM) undertook a survey of the price and availability of co-paid ACTs in West Africa (Accra – Ghana, Lagos – Nigeria, & Lome – Togo) [116] [17]. The authors admit that this was a "limited" survey. They found that prices had dropped and that "there are some positive results from AMFm". However they were concerned about some of their other findings:-

- though malaria in Africa is a disease of children, 70% of AMFm treatments were for the adult dosage forms;
- three ACT manufacturers were also acting as FLBs (Ipca, Guilin, Quality Chemicals) with potential conflicts of interest;
- Zanzibar, with virtually no malaria transmission, had ordered 240,000 AMFm treatments;
- oral artemisinin monotherapies were still available and often at prices below co-paid ACTs;
- no diagnosis was offered to the survey administrators.
- AMFm co-paid ACTs were found to be available in non-AMFm countries.

AFM was also concerned about how 80% of total global ACT production (as of August 2011) was being taken up by 4 AMFm pilot countries (Ghana, Kenya, Nigeria, and Tanzania), which "threatens the availability of ACTs in all other malarial countries". [18] AFM would like to see more emphasis on access to and use of diagnostics, as well as a greater sharing of financial risk with the FLBs. They concluded that "Evidence to date suggests that the AMFm was pushed forward too far, too fast, and with too much money".

Sabot *et al.* are concerned at the restricted timeline for the Independent Evaluation and that the nature of the AMFm will mean that "the results will undoubtedly present a mixed and nuanced picture that will require careful interpretation" [114]. They would prefer to see the discussion move away from "if" AMFm should continue and towards "how, when, and where" it should be used. They make a plea that the discussion should not become polarised and rancorous, but focus on the best models that meet the needs of local malaria epidemiology and other contextual factors.

[17] This survey was carried out 12 months after the global launch of AMFm (June 2010). In Ghana AMFm co-paid drugs were first delivered in August 2010 and in Nigeria in January 2011. Launch of the public awareness programmes in the two countries was in February 2011 and November 2011 respectively.
[18] These concerns were addressed during the September 2011 ACT Supply Chain Roundtable.

Oxfam also have continued to express concerns about the lack of evidence that AMFm will improve access to the poorest and the most vulnerable. Misdiagnosis and the use of antimalarials in children with pneumonia can increase childhood deaths [117].

Global Fund – Possible *Post*-Phase I Scenarios

The AMFm Unit at the Global Fund (with the approval of the Global Fund AMFm *ad hoc* Committee) has identified three "operational" scenarios for the *post*- Phase I period:-

- *Continue:* AMFm continues beyond Phase 1, but does not expand into additional countries and does not include modifications such as malaria RDTs;
- *Modify:* AMFm continues beyond Phase 1 and expands into additional countries and/ or includes modifications (*e.g*. addition of malaria RDTs). There may be several possible variations of this scenario as described in the William Davidson Institute study [113];
- *Terminate:* AMFm is suspended or terminated leading to a winding down period to prevent interruption of services in AMFm countries. Possible alternatives could be national-level subsidies or a new global-level subsidy with a different model to AMFm or another organisation taking over from the Global Fund.

As mentioned above (under Phase I Evaluation), the AMFm Unit of the Fund has initiated work on these scenarios, but it is unclear at the time of writing what is the status of contingency planning for each scenario [108].

Comments from Interviews

Current Impressions:

This is a summary of the impressions that interviewees have formed about the successes and challenges of AMFm to-date. These are obviously subjective and formed without the benefit of the IE results.

Successes

- QAACTs are reaching countries and patients.
- Prices to end-users have fallen compared to pre-AMFm levels. This appears to have happened even without any mechanism to monitor and enforce prices.
- Compared to the speed of disbursement of conventional Global Fund and other development funder grants, AMFm has shown that it can act very quickly and results can be seen in a short timeframe.
- Supply of ACTs and artemisinin derivatives has substantially increased.
- Change in attitude by FLBs from high price/low volume model for QAACTs to low price/high volume (as predicted by the IoM Report [70]).
- Implementation of AMFm has broken down barriers at country level between public & private sectors, and this bodes well for collaboration on malaria and other diseases in the future. The cross-sectorial country teams are a good platform to further develop this. One interviewee commented on how the "public sector's eyes had been opened" to what they could learn from the private sector.
- Use of AMFm by the public sector (especially in Ghana and Niger) to get around temporary problems in public sector distribution is generally seen as a good thing and fully in line with AMFm's objectives. This was not replacing the normal supply chain.
- The feasibility of running a global subsidy seems to have been shown, but there are many learnings from this for the future to improve on the design and the management.

Challenges/Learnings

- AMFm is incorrectly seen as a stand-alone solution to the challenge of improving access to QAACTs in the private retail sector. It should be seen only as a financing mechanism to overcome one barrier (price) to the widespread adoption of QAACTs, but that other levers

need to be employed as part of a comprehensive local disease control strategy to ensure success.

- AMFm has interrupted the debate on how best to improve access to effective case management, seen holistically (*i.e.* including diagnosis and treatment of non-malarial fevers).
- AMFm took too long to set up and launch.
- Initial simple idea has been weighed down by additional requirements and components. Some measures of success are unrealistic in the timeframe of the evaluation. Future models should go back to the core principles.
- Distribution of different products and pack sizes is not uniform across all outlets and this could lead to incorrect dosing (cutting up packs, *etc.*).
- The time needed to reprogramme standard Global Fund grants to pay for supporting interventions meant that co-paid ACT availability and SMP communications have not been properly synchronised.
- More country-level involvement is needed in planning in future. The current AMFm initiative is seen as being too top-down and planning not inclusive enough. Some interviewees thought that over-fixating on a one-size-fits-all model globally may be counter-productive.
- Communications between the various stakeholders in AMFm, especially the AMFm Unit, National Malaria Control Programmes (NMCPs), FLBs, and manufacturers need to be improved in the future. Several interviewees felt that the introduction of the demand management levers could have been more transparent and better communicated.

Interviewees said that when people looked at the results of the IE and other related studies to evaluate AMFm, they must do so against a counter-factual hypothesis. It would be invalid to make conclusions about the success or failure of AMFm in the absence of consideration of what results one-or-more alternatives would have produced.

Scope of Subsidy:

Several interviewees commented on the amount of AMFm co-payments that were going to adult dosage forms and on the higher mark-ups apparently being charged by retailers for paediatric dosage forms (HAI data). There were several suggestions about restricting the subsidies only to those dosage forms where the greatest need for accessible drugs was. In Africa this would be children, but might be more adult populations in other parts of the world. There was some interest in looking at whether better targeting could be achieved through only focusing on certain distribution channels.

There was some concern about how the subsidy was reaching not only the poor but also the better-off. There was an issue of equity here that needed to be examined. There was also concern about public sector purchases through AMFm using country funding when Global Fund grants supply free ACTs. However other interviewees saw this as a benefit to circumvent challenges in Fund disbursement and public sector supply chains.

It was noted by one interviewee that thinking about the AMFm model (and subsidies in general) should not be restricted to ACTs, as in future access to other types of antimalarials (especially for treating vivax malaria) would need to be considered.

Sustainability:

The original idea for AMFm had been as a short-term solution to the high costs of ACTs that would only be needed until new antimalarials which were affordable could be developed. However it was noted that in reality newer antimalarials will continue to be expensive for the foreseeable future and drug subsidies of one-form-or-another would probably be a long-term commitment. Donors would remain concerned about sustainability.

Sudden and poorly planned termination of AMFm with no alternative mechanism in place will risk discrediting the entire global health and aid system (among pilot countries at least). The AMFm Unit's report to the last *ad hoc* Committee also quoted a range of opinions on this by pilot countries [108]. However several interviewees were worried that, with only 9 months to go before the end of Phase I,

there was no clear idea of where funding would come from for the 2013 transition and any future scenarios.

Independent Evaluation:

Several interviewees agreed with the published authors referenced above that the IE would not give clear answers as to whether AMFm was meeting its objectives. Several asked if the evidence would be sufficient to really justify termination of the initiative. The lack of clear answers as to AMFm's usefulness would complicate internal discussions about future support.

The performance of FLBs needs to be better studied and interviewees were not clear on how well the IE would handle this. Also there was a lack of understanding of how well the IE would be able to measure the impact of the supporting interventions and the value for money of US$ 127 million allocated for this. Some interviewees thought that the length of time that the supportive interventions had been in place was so short that they probably had not had any meaningful effect during the period of the IE data collection.

Also there was interest in seeing how well the IE would be able to measure or comment on the delivery of the supporting interventions, and relate that to the performance of AMFm in a particular country.

There are no major Francophone countries among the pilot countries. It was suggested that these countries have better developed and regulated integrated distribution systems. Extrapolating from a predominantly Anglophone group of countries across all of Africa could be misleading.

Transition Planning:

A lot of interviewees were concerned over a perceived lack of planning for the 2013 transition, especially around the mobilisation of resources for each of the contingency planning scenarios and ensuring adequate drug supplies. This was complicated by the need for the Fund to cancel Round 11 and worries about equity between sufferers of malaria and the other diseases (HIV & TB).

One-or-two interviewees expressed concerns at simply throwing money at the problem to buy time, but wanted to see a proper evaluation of the learnings from Phase I to properly inform any decisions on future co-payment systems and/or redesign of AMF.

Diagnosis:

The issue of how to bring diagnosis and the expanded use of RDTs in any future phase of AMFm was frequently commented upon (one interviewee called it "the elephant in the room"). Without diagnosis, as malaria incidence falls, funding for ACTs is actually going more-and-more to treat febrile children without malaria. The problem is that the working assumption of care-seekers for febrile children in Africa is that the fever is malaria: elsewhere (*e.g.* Brazil) the working assumption is that it is something else (like pneumonia). This is where BCC is crucial to build in diagnosis to care-seekers behaviour.

However there was also concern expressed about how best to do this, especially in the private retail sector – as has already been mentioned earlier in this paper. It had taken a long time between the original idea of AMFm in 2004 and the launch in 2010. The environment had changed, especially with regard to diagnosis. Modifications to the design for the future would need to take this into account. Interviewees noted that any impact AMFm might have on malaria incidence and transmission rates could not be measured in the absence of good diagnosis. One interviewee noted that widespread availability of highly subsidised QAACTs was actually a disincentive to increase diagnosis in the private sector.

Country Context:

Interviewees recognised that what works in each country is extremely context-specific. Communications have to be tailored to the local situation as well as aligning with the national malaria control strategies. AMFm-related patient awareness communication programmes would need to integrated with wider

health information messages and so there was a case for these to be funded out of total programme funding and not a stand-alone resourcing stream.

Pharmacovigilance;

At least one interviewee expressed concerns about the difficulty of obtaining good pharmacovigilance information in an environment where access to ACTs in the private sector was not associated with an ability to obtain adverse event reports. This would be an increasing problem as new ACTs are launched with pharmacovigilance requirements from the drug regulators and concerns about new adverse events.

Drug Diversion:

The diversion of co-paid ACTs from participating countries to non-participating countries had been a concern from the design phase of AMFm, and the IoM Report had recommended going straight to a global programme to avoid this [70]. The AFM paper had seen diversion into Togo [116]. However most interviewees who commented on this finding felt that it was not significant and some leakage would be acceptable. They did not feel at present that this was a major problem resulting in drug shortages inside Phase I countries.

Governance:

Some people interviewed expressed concerns about the standard of governance and supervision of the AMFm from the Global Fund mechanisms. This would need to be addressed in any future AMFm-like programme. Some people expressed the hope that the new AMFm Working Group (approved by the Global Fund Board in November 2011) would improve matters.

Hosting of AMFm by the Global Fund had been sensible in 2007-08, but in any evaluation other hosting models should be considered. Interviewees were divided on whether it was better to retain a global mechanism to administer the co-payments from a centrally held pot of money or to devolve this to regional or national programmes. The global model was recognised to have benefits of administrative efficiency and cost, but might not be able to adapt easily to local country programme needs. This would need to be examined when modifying the design of any follow-on to AMFm Phase I.

Manufacture & Supply Chain:

The QAACT manufacturers commented on the success in increasing capacity to meet the large increase in demand for drugs. They also noted the major reductions in *ex*-manufacturer prices that had been achieved. Other interviewees also said that this should be recognised. However the instability in the artemisinin market and the adverse impact on cost-of-manufacture needed to be better recognised and planned for. Better long-term planning and forecasting is needed because of the 14-24 month lead-time on drug supply and the high level of risk that manufacturers have to take on when buying raw materials ahead of firm orders. Also the risk of increases in food prices in 2013 [118] may encourage farmers to move away from growing artemisinin and driving prices up further. This in turn will need to be reflected in the co-payment prices agreed with the QAACT manufacturers.

AMFm was seen as a good way to maintain a range of manufacturers in the QAACT market. Tender business with the public sector is an all-or-nothing process and can drive smaller companies out, leading eventually to market dominance by two-or-three manufacturers. AMFm allows smaller companies to continue to supply products even when they are not able to win tenders and so stay in the market – with the benefits to competition.

There were some fears that the existence of a subsidy mechanism like AMFm would reduce the incentives for manufacturers and the R&D community to find ways to drive down costs to a level affordable to care-seekers. However the nature of the *A annua* plant and its cultivation made it difficult to see how this could be achieved in the short-term.

Given the low financial risk to FLBs of buying large volumes of QAACTs, several people worried about what was happening to this in the supply chain. They felt that there should be more risk-sharing with

FLBs and/or monitoring of their performance. However others felt that this was a temporary phenomenon and would work itself out over time. The problem was that the length of the evaluation period was not long enough for the market to stabilise and these anomalies to work themselves out.

Drug Resistance:

One concern about the development of resistance to ACTs is that in Africa 80% of ACTs being used are artemether/lumefantrine dosage forms [119]. This not only puts pressure on the artemisinin component but also on the partner drug (lumefantrine). AMFm, by potentially increasing the availability of other QAACT combinations, can (in the private sector at least) increase the chance of drug rotation as a strategy to reduce drug pressure and resistance development. It has even been proposed that the public and private sectors should use different ACTs, but this was not generally thought to be practical.

One interviewee found it amazing that AMFm could not get off the ground in Cambodia – the epicentre of artemisinin resistance. If any country deserved to have access to co-paid ACTs to drive out monotherapies and sub-standard drugs, then it was Cambodia. Yet here there was a major problem with drug supply and private sector stock-outs.

Appendices

Appendix 1:

TropMed Pharma Consulting Ltd.

TropMed Pharma Consulting (TMPC) was set up in 2008 and specialises in advising companies, academic institutions, non-governmental organisations (NGOs), and governmental and intergovernmental organisations working on malaria and neglected tropical diseases to help them be more successful. It aims to deliver on this mission principally in four areas:-

1. Strategic Planning
2. Late Stage Development & Deployment Planning
3. Building Partnerships
4. Good Management Practice

Ian Boulton, Managing Director, brings more than 30 years' experience in the pharmaceutical industry and nearly 10 years working in the field of malaria, TB, and neglected tropical diseases. Further details of the work, capabilities, and approach of TMPC and Ian Boulton can be found on the company's website (www.tropmedpharma.com). Here recommendations from current and former clients and colleagues can also be seen. Ian is the consultant working with the *ad* hoc Steering Group on this project. He has previously been an RBM Board Member, and was part of the RBM Global ACT Subsidy Task Force. He has also been a member of the Global Fund Technical Advisory Group on AMFm pricing and represented the Private Sector on the Fund's *ad hoc* AMFm Committee in 2010 (during the maternity leave of the usual representative). He has also been the Private Sector member of the Fund's *ad hoc* Market Dynamics Committee (2008 – 2011), and has recently been appointed to the new Fund Market Dynamics Advisory Group (MDAG).

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