# Review of the evidence on access to malaria treatment among the poor

## in the context of the proposed Affordable Medicines Facility for malaria (AMFm)

## Paper prepared for the RBM AMFm Task Force

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## *Summary*

The purpose of this paper is to summarise the evidence and issues around how the poor and the poorest groups in malaria endemic countries access malaria treatment, in order to consider how far the AMFm can be expected to reach the poor and ways to enhance its impact on the poor and the poorest groups. The poor are defined here to include the lower 60% of the population in terms of socio-economic status (SES), and the poorest as the worst off, within the lowest 20%.

Key findings from the literature on who has access to treatment include the following:

- Malaria cases and mortality from malaria are concentrated in poor countries, hence tackling malaria is a priority for the poor;

- Among poor countries, access to treatment is very variable; the better performers achieve around 60% access to anti-malarials for children under 5 with fever (in 2005 or 2006); other countries have lower levels of treatment (although the case for treatment of all fevers with anti-malarials depends on the pattern of malaria in the country).

- In terms of equity in access, all SES quintiles have some access to treatment, but the proportion from poorer groups getting treatment tends to be lower than the better off. District level studies indicate that the differential is very variable, and sometimes there is little difference across the lower 4 quintiles.

- There is limited data on treatment quality by SES group, but what there is suggests the better off get better quality care (more effective anti-malarials, full course etc).

- All SES quintiles use the private sector for malaria treatment e.g. 75% of treatment is from the private sector in Nigeria, with no difference among SES groups.

- The better off tend to make more use of public sector hospital care than the poor.

- Home based fever management with community health worker distribution of ACTs is being rolled out in various countries. There is little data on how well it reaches the poor. One study in Uganda that looked at whether it reaches the poor found that it was twice as successful in reaching the least poor SES quintile (50% reached) compared to the lower quintiles (20-25% reached). Further work is needed to identify how to ensure such efforts are reaching the poorer groups and how to scale up and sustain such programmes.

- There was success in adding malaria treatment and other interventions alongside distribution of ivermectin in areas where the community already manages onchocerciasis control. However, sustaining the supplies of anti-malarials in the community was a problem.

- The pilot scheme to provide subsidised ACTs through small drug shops in 2 districts in Tanzania has produced early results. Within five months, almost half of the consumers purchasing anti-malarials bought ACTs in the districts where low price ACTs were available (compared to 1% before the pilot started, and 0.1% in the control district). There were more purchases by least

poor than from the poorest customers but in one district the proportion from poorer groups had increased substantially over time. The monitoring also showed that the low price was passed on to customers, and there was no evidence of 'price gouging'. Prices in remote rural shops were no higher than in trading centres with more competition; this is encouraging as the poor customers were more likely to use these remote shops. However the remote shops were less likely to have ACTs in stock.

- In Senegal low cost ACTs were made available to public and private sectors with a recommended price level by age band; the findings were that the recommended price level was respected in all sectors.

- In Kenya, artemether-lumefantrine (AL), an ACT, was distributed free of charge to RDT positive patients in a pilot study involving 9 community shops that operated using a franchising model (CFW shops). The preliminary results of the evaluation survey indicate that 9% of those getting AL obtained the drug through CFW shops. This data should be considered in the context of the scale up of free distribution of AL in government health facilities in the same period, with 86% of those getting AL from government facilities. Overall, access to AL rose from 15% to 41% of those buying an antimalarial.

- A review of whether interventions to improve quality in the private for profit sector were benefitting the poor found there is very little evidence on this – it is simply not studied in many evaluations. The review concluded that "many interventions have worked successfully in poor communities and positive equity impacts can be inferred from interventions that work with types of providers predominantly used by poor people."

- Training of private providers has been shown to improve quality. Following training of drug retailers in rural Kenya, the proportion of those buying anti-malarials who bought an adequate dose increased from 8% to 33%.

A number of conclusions and implications for AMFm follow from these findings, including:

There is substantial use of anti-malarials across the SES groups, although use by the poor tends to be lower than by the better off. If ACTs can be made available at a comparable price or for free, with education about the benefits, then it is likely that uptake of ACTs will increase and replace ineffective anti-malarials. This will benefit people from all SES groups, although a smaller proportion of the poorest. This is consistent with experience in other areas of health.

Many anti-malarials are purchased from private sector sources including private clinics and retailers, as well as from public sector providers. This is true for the poor as well as the better off, and reflects the reality that there are more access points for drugs in the private sector than public health facilities, in most countries and many settings. Hence by making drugs available through public, private and NGO channels, the AMFm should reach at least some of the poor.

Many countries want to scale up access to ACTs and tackle the relatively lower use of effective anti-malarials among the lower SES groups and for children. However, reaching groups who do not currently have access is hard and there is not clear evidence on how best to do so. Further work is needed to test and refine approaches, with research to see who among the population benefits, and how best to reach the poor and vulnerable.

The AMFm needs to be implemented in ways and alongside other interventions that will make it more likely to reach the poor and the poorest. These need to be designed at country level. For example:

- ACTs need to be made accessible through the types of outlets and services the poor use, in private and public sectors
- This will require training for the providers used by the poor, and in poor areas, as well as other measures to assure quality services, such as ensuring drug supplies; deployment of trained staff to poor areas; and supervision
- Messages and media for the IEC efforts need to be targeted to poor audiences
- Ensuring services that are already targeting the poor and vulnerable groups, such as NGO services for vulnerable groups, include ACTs for malaria treatment
- Using interventions to encourage prices to be set at levels that are affordable to the majority of the population
- Expanding free or low cost distribution arrangements targeted to reach those with least access to medicines.

The AMFm and efforts to reach the poor and poorest need to complemented by effective operational research and evaluation at country level. Countries can apply to the Global Fund (and others) for funding for operational research. It will require country level efforts to design appropriate research and monitoring, as well as central coordination to maximise learning from the findings.

## *1. Introduction*

The purpose of this note is to summarise the evidence and issues around how the poor and the poorest groups in malaria endemic countries access malaria treatment, in order to consider how far the AMFm can be expected to reach the poor and ways to enhance its impact on the poor and the poorest groups. The note is intended as part of the briefing for AMFm and for discussion with interested partners. It was developed by members of the AMFm Task Force in February 2008 and updated in July 2008.

Defining the poor, the poorest and most vulnerable: for the purpose of this analysis, the poor are considered in absolute terms, as those living on less than $2 PPP per day (World Bank definition), which includes the majority of the population in most countries in Sub Saharan Africa. In relative poverty terms, the poor are defined in this paper as the lower three socio-economic status (SES) quintiles while the poorest are within the lowest SES quintile. Children under 5 and pregnant women are particularly vulnerable to malaria and there are potentially also specific vulnerable population groups at country level, based on conditions where they live, ethnicity etc.

## *2. What do we know about reaching the poor and vulnerable with malaria treatment?*

### Do the poor suffer from malaria?

The impact of malaria is concentrated in low income countries, to a greater extent than other diseases of public health importance. Gwatkin estimated that 58% of malaria deaths occur in the poorest 20% of the world's population[1]. Hence tackling malaria is a priority for the poor in absolute terms.

It is unclear whether the poorer groups within countries experience more malaria, while it is known that they face worse consequences in terms of mortality and severe illness[2].

### What proportion of people have access to malaria treatment in poor countries?

Coverage with modern treatment is very variable across countries. For example, surveys suggest that 58% of children under 5 with fever receive antimalarials in Cameroon (2006), Zambia (2006) and Tanzania (2004/5), compared to 24% in Malawi (2006) and 34% in Nigeria (2003)[3]. The Malaria in Children report gives an overall estimate that some 34% of children with fever in Sub-Saharan Africa receive treatment with antimalarials. 23% of the children receive prompt treatment within 24 hours[4].

### How unequal is access to anti-malarials?

As with other health interventions, the higher SES groups tend to have better access to treatment for malaria. Lack of access among the poorest appears greater in West

[1] Gwatkin DR & Guillot M, 2000. *The Burden of Disease among the Global Poor: Current Situation, Future Trends and Implications for Strategy*. Global Forum for Health Research, Geneva.
[2] Barat et al, 2004. *Do Malaria Control Interventions reach the poor? A view through the equity lens*, Am. J. Trop. Med. Hyg, 71 (2s), pp174-178.
[3] Data from DHS, MIS and MICS compiled at http://www.childinfo.org/areas/malaria/maldata.php?cat=1&subcat=1
[4] UNICEF & RBM, 2007, Malaria & Children: progress in intervention coverage, UNICEF

& Central Africa (WCA) – analysis of DHS studies found that over 70% of lowest 2 quintiles lack access to treatment in WCA, versus around 45% in S&E Africa[5].

However, a study in Southern Tanzania suggests that within districts there is quite limited variation in uptake of treatment across SES groups[6], particularly across the lower two thirds of the population (whom we have defined as the relative poor).

Table 1 – Fever treatment in three rural districts in Tanzania (all age groups, 2001 survey)

| | Poorest third | Middle third | Better off third | *Ratio T1:T3* |
|---|---|---|---|---|
| Any treatment | 83% | 80% | 91% | *91%* |
| Any anti-malarial | 31% | 34% | 46% | *67%* |
| Effective anti-malarial | 11% | 12% | 24% | *46%* |
| Adequate dose of effective anti-malarial | 8% | 6% | 19% | *42%* |

Source: Njau, 2006.

Table 1 above also shows differences in treatment quality, with the better off more likely to receive effective drugs and adequate doses, reflecting higher spending and greater use of NGO services. This is confirmed in other studies in Tanzania e.g. Schellenberg et al found the highest SES quintile are twice as likely to receive appropriate treatment compared to the least well off quintile[7].

Data from a recent study in Uganda found some districts show much more disparity in access than others – see table 2 below. This relates to treatment with anti-malarials of children under 5, so the rates found cannot be compared directly to the Tanzania figures above. It is not clear why there is this difference – why for example there is less than 6% difference in uptake between first and fourth quintiles in 4 districts but over 20% difference in Kamwenge.

Table 2 – Use of anti-malarials among children by socio economic status (SES), in selected districts in Uganda (% of children under 5 who received any anti-malarial within 48 hours of onset of fever)

| District | SES quintiles within the district | | | | |
|---|---|---|---|---|---|
| | Lowest (%) | Second (%) | Middle (%) | Fourth (%) | Highest (%) |
| Kamuli (n=275) | 17.0 | 23.9 | 27.2 | 22.7 | - |
| Pallisa (n=248) | 24.3 | - | 26.7 | 29.4 | - |
| Soroti (n=191) | 23.7 | - | 23.2 | 23.4 | - |
| Kamwenge (n=218) | 32.8 | - | 31.5 | 54.4 | 55.6 |
| Kabarole (n=161) | 24.6 | 29.3 | 34.3 | 27.1 | 42.1 |
| Mubende (n=158) | - | 34.8 | - | 37.0 | 43.2 |

Source: MMV, MOH Uganda and PSI, Nov 2007. *Understanding malaria health seeking behaviour in selected districts in Uganda – Draft report*

As Pearson noted, there can often be greater inequality in preventive than treatment interventions[8]. For example, Table 3 shows figures for Zambia, indicating more equitable access to treatment than to insecticide treated nets or indoor residual spraying. Clearly the challenges are different in ensuring access to such different types of commodity/ services.

[5] Barat, 2004 Figure 2 presents analysis of DHS data by Filmer, 2002, World Bank.
[6] Njau, JD et al, 2006. *Fever Treatment and household wealth: the challenge posed for rolling out combination therapy for malaria*. Tropical Medicine and International health, 11, 3, pp 299-313.
[7] Schellenberg JA et al, 2003. *Inequities among the very poor: Health care for children in rural southern Tanzania*. Lancet 361: 561-566.
[8] Pearson M et al, 2008. *AMFm – Economic Appraisal and Access by the Poor*, DFID Health Resource Centre, London

Table 3 – Use of anti-malarials for children, insecticide treated nets (ITN) and indoor spraying in Zambia by socio economic status (SES)

| | SES index | | | | |
|---|---|---|---|---|---|
| | Lowest | Second | Middle | Fourth | Highest |
| % of children under 5 with fever who took anti-malarial drugs | 52.6 | 52.9 | 68.3 | 68.9 | * |
| % of children under 5 with fever who took anti-malarial drugs same day or next day | 32.3 | 32.2 | 48.3 | 44.4 | * |
| % of children under 5 who slept under an ITN the night before the survey | 18.8 | 18.5 | 21.1 | 28.9 | 29.9 |
| % of households sprayed in the previous 12 months | 8.6 | 10.0 | 32.5 | 27.0 | 30.2 |

Source: Zambia National Malaria Indicator Survey 2006, Zambia Ministry of Health
* - small numbers so no data shown.

**How well do public, private and NGO providers reach the poor?**

These studies also show where people from each SES group get treatment from, including public providers and different kinds of private sector sources. Table 3 and 4 give some results from Tanzania and Uganda studies to illustrate this. The Tanzania data suggest that there is relatively little difference among SES groups in the use of public providers, drug shops and general shops; the biggest difference is in the use of NGO providers which is more common among the highest SES group.

Table 3 – Fever treatment by source by SES, 3 districts in rural Tanzania
% taking up treatment (not just anti-malarials) for all age groups, 2001 data

| Source of treatment | Poorest third % | Middle third % | Better off third % | Total % | No. |
|---|---|---|---|---|---|
| Any treatment | 83 | 80 | 91 | 85 | *509* |
| Visited Government facility | 24 | 21 | 23 | 23% | *136* |
| Visited NGO facility | 3 | 3 | 13 | 7% | *39* |
| Visited drug store | 28 | 24 | 27 | 27% | *159* |
| Visited general shop | 30 | 34 | 26 | 30% | *179* |

Source: Njau 2006

Table 4: Source of antimalarials by SES among all children treated for fever in Kamuli District, Uganda

| Source of antimalarials | Lowest (n=22) % | Second (n=59) % | Middle (n=44) % | Fourth (n=86) % |
|---|---|---|---|---|
| Government provider / facility | 40.9 | 39.0 | 22.7 | 38.4 |
| Private health facility /worker | 31.8 | 28.8 | 15.9 | 22.1 |
| Pharmacy | 9.1 | 6.8 | 15.9 | 15.1 |
| Drug shop | 18.2 | 25.4 | 43.2 | 20.9 |
| Shop | 0.0 | 0.0 | 2.3 | 1.2 |
| Community Medicine Distributor | 0.0 | 0.0 | 0.0 | 2.3 |

Source: MMV et al, Nov 2007

Data for one district is shown here in Table 4 for reasons of space. The report covers 4 districts and finds variation in the pattern of use across districts, with a clear picture that the majority of treatment for children is sourced from the private sector in all 4 districts analysed, and in most SES groups. For adults, the data is not available by SES, but shows that the majority of anti-malarials are sourced from private sector providers, with 8 – 40% using drug shops and pharmacies across six districts, versus 24-39% using a Government health facility or worker as their source of anti-malarials. There is strong data from 2 states in Nigeria showing that for both children and adults, about 75% of fever treatment takes place in the private sector. There is little difference across SES groups, though there is some evidence that private sector use is higher in the better off quintile. Within the private sector, about 40% of treatment

seeking is from patent medicine dealers, but these are a more important source of care for the poorest, compared with private hospitals and pharmacies which are used more by the better off. Within the public sector, the poorest make better use of primary care facilities, while public hospital benefits are disproportionately captured by the better off[9].

Data from a study in South east Nigeria compared treatment patterns between rural and urban mothers for their children in cases of fever and confirms this picture[10]. While the study did not look at socio-economic status, the urban mothers were generally better educated and more were employed; hence may on average have had higher incomes. It showed that 80% of both groups initially either gave treatment at home using drugs bought from patent medicine dealers or left over drugs, or took the child to a patent medicine dealer. Village health workers had a minor role in rural areas (with 8% of first contacts). Where there was subsequent treatment sought, the source was a private clinic (49.8% of urban, 42.4% or rural mothers), health centre (7.3% urban vs 38.0% rural) or hospital (42.9% urban vs 19.6% rural). This initial use of patent medicine dealers highlights the importance of enabling them to have effective medicines.

These studies indicate that all the SES groups make significant use of drug shops and private practitioners. Hence enabling distribution through the private sector will reach at least some of the poor and even some of the poorest. Njau's article on Tanzania comments: "… one might have expected the poorer households to be less likely to use drug stores, but this study found use relatively constant across SES groups, indicating that distribution through these outlets would not reach the better off alone. ….. Based on the current use patterns, delivery through government facilities will reach only a quarter of care seekers."

This partly reflects the numbers of outlets available – Tanzania has more than twice as many private health providers, drug shops and pharmacies as public sector health facilities. This is not just an East African issue - Senegal has around 1000 drug stores and 650 pharmacies, alongside some 930 public sector health facilities. Overall there are estimated to be at least 75,000 private sector access points, compared to over 45,000 public sector in sub-Saharan Africa[11].

Studies show variation in sources of medicines between and within countries, e.g. drug shops, stores, public and private providers. This presumably depends on the interplay of factors including regulations, financing policies, extent of dual practice by health workers, numbers of facilities as well as local factors such as trust in local providers, distribution of facilities, seasonal incomes etc. It demonstrates the importance of making ACTs accessible and affordable through diverse channels within a country in order to improve uptake.

**Is there evidence on the impact of making ACTs available through the public sector health facilities?**

Countries have been making a major effort to increase the availability of ACTs through the public sector. This scaling up of ACT use is however very recent and there is not data readily available on how far this is reaching the poor. A recent WHO

[9] Obinna Onwujekwe, 2008, unpublished data.
[10] Uzochukwu, B et al, 2008. *Rural Urban differences in maternal responses to childhood fever in South East Nigeria*. PLoS One 3(3): e1788
[11] Estimates of outlet numbers for selected countries by Dalberg consultants, based on fieldwork in 2007 and IOM reports.

report[12] shows substantial reductions in severe inpatient cases and deaths from malaria in four countries that have received funding for nationwide distribution of LLINs and provision of ACTs. The countries that showed greatest impact (over 50% decline in severe cases and deaths in a sample of facilities), Ethiopia and Rwanda, achieved mass distribution of LLINs, while less impact was shown in Ghana and Zambia where net supplies were inadequate or mass distribution came later. However, the report available at present does not show how far ACTs were available in practice, so it is not possible to assess how far the impact can be attributed to nets versus ACTs; this may come out from later analysis. It did not look at impact on the poor or poorest.

A study in one district in Zanzibar showed introduction of free ACTs in public facilities, with no stockouts, was followed by substantial reduction in malaria prevalence and admissions[13]. Subsequently LLINs were provided through mass distribution to cover 90% of children, and malaria prevalence fell further (10 fold reduction). During this period, child mortality declined by 52%, and much of this impressive decline is attributed to the uptake of ACTs. Use of the public sector increased as the medicines were known to be available and effective. The study did not look at how much the poor and poorest benefited.

In a survey done in Kenya, use of artemether-lumefantrine (AL) to treat uncomplicated malaria rose from 15% to 41% of those getting treatment for suspected malaria. The majority of this was delivered by the public sector which rose from 64% of AL provided in 2006 to 86% in 2008. This increase in AL use accompanied the scaling up of free distribution of AL in government health facilities.

The Uganda survey in 6 districts looked at uptake of ACTs which were in principle available for free from public providers at the time of the survey. Despite this, it found that use of ACTs was very low in all districts - about 10% of children received ACTs within 48 hours in the three Western districts, less than 4% in the three Eastern districts surveyed. Furthermore, many of these ACTs were sourced from the private sector. Thus free distribution of ACTs by the public sector is not sufficient to ensure uptake.

A reason for low uptake may be limited availability in practice, given the problems of stock outs that are especially common in rural areas. In the Tanzania pilot survey for example, 34% of the facilities in one district reported a stock out in the last three months. A survey in Zambia found that Coartem was unavailable in 42% of rural health units, 30% of urban health clinics and 25% of hospitals, while average stock out times for Coartem were 9.5 weeks for rural units, 6 weeks for clinics and 8 weeks for hospitals[14]. A study in Kenya showed there were various reasons why health workers were not prescribing ACTs although they were available in their facility. Concerns about future stock outs were a factor, alongside other issues[15].

[12] WHO, 31 Jan 2008, *Impact of LLINs and ACTs measured using surveillance data in 4 African countries*. Prelim report.
[13] Bhatterai et al, Nov 2007, *Impact of ACT and ITN on Malaria Burden in Zanzibar*. PLOS, 11, e309
[14] MOH, Zambia 2007,
[15] Wasunna b et al, 2008. *Why Don't Health Workers prescribe ACTs? A qualitative study of factors affecting the prescription of AL*, Malaria Journal, 7:29. http://www.malariajournal.com/content/7/1/29

**What about providing ACTs via community health workers as a way to reach the poor and the poorest?**

There is increasing interest in providing home based care with access to ACTs through community health workers (CHWs) or other community based distributors – all are considered as CHWs in the discussion below.

There is a systematic review of the evidence on the impact of home based management of malaria, where treatment is provided by community members with training but no formal health qualification (i.e. CHWs)[16]. Only six studies provided credible evidence on health impact and the findings were mixed. Of the four that looked at the impact on mortality, one (in rural Ethiopia) showed a substantial reduction in child mortality, but the other three found no impact on mortality. One study showed a reduction in malaria incidence but not in mortality. Two studies looked at impact on transition to severe malaria and showed benefits. The studies were conducted in the 1980s and 1990s using CQ rather than ACTs.

There is early evidence of the acceptability of ACTs distributed by CHWs reported in a recent multi-centre study that covered four study sites[17]. Coverage of malaria episodes through CHW distribution ranged from 57% to 75%. However the study did not look at whether the poorest groups benefited.
There is little evidence on whether such mechanisms are effective in reaching the poor and the poorest. The only study found that assesses whether the poor were reached by this approach was an evaluation of the Home Based Management of Fever initiative[18] in Uganda. It indicated limited effectiveness – overall a 10% improvement in community effectiveness of malaria treatment[19]. It had most success in reaching the better off quintile (50% use), with levels of coverage across the poor – the lower four quintiles around 20-25%. “HOMAPAK use among the most poor was less than one half that in the least poor quintile (23% vs 50%)”.

Hence further work is needed to learn from community based distribution approaches including how to expand and sustain a system on a large scale, how to make it cost effective and how to ensure it reaches the poorer households.

**Is it essential to have free distribution of ACTs by CHWs?**

In the four country study mentioned above, prices of ACTs varied by study site, ranging from free (Uganda) to 0.30 US$ (children aged 36-59 months in Nigeria). The coverage level achieved was not associated with the price of ACTs.

In Ghana, the policy of "treatment first, payment later" was adopted. Mothers accessed ACTs from CHWs at prices of 10 US cents and 20 US cents depending on the age of the child. They described the prices as cheap and affordable, and even those who could not pay on demand were optimistic that they could still treat their children and pay later. The provision of regular and readily available affordable pre-packs in the communities was convenient, saved time and increased productivity[20].

[16] Hopkins et al, 2007. *Impact of Home-based Management of Malaria on health outcomes in Africa: a systematic review of the evidence.* Malaria Journal, 6:134

[17] Ajayi et al, Jan 2008, *Feasibility and acceptability of artemisinin-based combination therapy for the home management of malaria in four African sites*. Malaria Journal **7**:6

[18] Nsungwa-Sabiti J et al, 2007. *Home-based management of fever and malaria treatment practices in Uganda*. Trans Royal Soc Trop Med & Hyg, 101, 1199-1207. The Home based management of fever initiative provided pre-packaged 3 day course of SP antimalarials called HOMAPAK (not ACTs), free of charge, for treatment of under 5 fevers.

[19] Effectiveness defined as treated within 24 hours of onset, with recommended anti-malarials in the right dosage.

[20] Browne et al, June 2007, Final report to TDR, study A41067

One mother commented "*It has reduced health care spending. When our children get fever we rush them to the CHW to be treated. The price is good that is why parents are buying. The price is such that every parent can buy."*[21]

In a study in Nigeria reasons for not seeking AL from CHWs were investigated. Among 284 caregivers not having sought treatment from CHWs, only 3 mentioned lack of affordability as the main cause.

This evidence suggests that free distribution is not essential especially if there is flexibility on timing of payment. But further work is needed to see whether the poorest are able to access treatment in these settings.

**What about adding malaria treatment to existing services targeted to poor communities?**

A recent study published by TDR reports on a three country trial to add several health interventions, including home based management of malaria, in communities that already have community directed ivermectin distribution for onchocerciasis control[22]. The community directed intervention (CDI) approach embodies the philosophy of primary health care in that communities are encouraged to take responsibility for organizing their own distribution of the drug ivermectin, The community took decisions on which additional interventions to adopt, how, when and where to manage them, and selected volunteers to implement the activities. Local health facilities were responsible for providing supplies and supervision. The study found that twice as many children with fever received appropriate anti-malarial treatment compared to control districts. However they found problems with sustaining drug supplies at community level – the health facilities were unable to maintain supplies consistently. The opportunity costs for volunteers increased sharply in several cases due to greater time commitments. As with many studies, there was no assessment of how successful the approach was at reaching poorer groups within the district.

**Which ways of working with the private sector have been shown to benefit the poor?**

A systematic literature review looked at this question in 2007[23]. Whilst there were almost 2,500 references identified, for only 5 interventions were there impact evaluations that looked at the distribution of benefits across SES groups; and in only 5 cases was there data to assess whether the intervention was in a poor community. The studies with data on distribution of benefits covered bed nets and franchising of health services; the findings were mixed, for example in urban Pakistan it was the better off who used franchised services, while in Bihar, India, there was no significant association between use of services and income, although clients with no education were more likely to use services than those with education. Some interventions were shown to be effective at improving quality (e.g. training non-pharmacy retailers in Kenya and Nigeria), but did not assess who was using the services.

The conclusion was “Few studies provided evidence on the impact of private sector interventions on quality and/or utilization of care by the poor. It was, however, evident that many interventions have worked successfully in poor communities and positive

[21] Garshong, August 2008, Final report to TDR, study A41075

[22] TDR, 2008. Community Directed Interventions for major health problems in Africa: a multi-country study - Final Report. WHO

[23] Patouillard, E et al, 2007. Can working with the private-for-profit sector improve utilization of quality health services by the poor? A systematic review of the literature. Int J Equity Health 2007, 6.17 http://www.equityhealthj.com/content/pdf/1475-9276-6-17.pdf

equity impacts can be inferred from interventions that work with types of providers predominantly used by poor people. Better evidence of the equity impact of interventions working with the private sector is needed for more robust conclusions to be drawn."

There is also a useful summary of approaches to working with the private sector in malaria control published by TDR[24].

**What are the findings from the pilots to make ACTs available at low prices through private drug shops?**

The Clinton Foundation is working with Government of Tanzania to pilot provision of subsidised ACTs in two districts. The subsidised drugs are made available through one private wholesaler to small, registered drug shops. The pilot was set up in October 2007 and there have been two monitoring surveys, one month and five months later, in these two districts and one control district; the results are still preliminary[25]. The surveys collect data from facility users and the shops themselves – these are not household surveys that look at who uses which services, but rather exit surveys which allow monitoring of who is buying which anti-malarials from the drug shops, and what the shops and public health facilities have in stock.

The findings of the review after five months included

- There was rapid uptake of ACTs: within one month 30% of consumers who purchased anti-malarials in the two intervention districts bought ACTs. After five months, this had increased to 44% of purchases. This compares to 1% of consumers buying ACTs before the pilot and 0.1% purchasing ACTs in the control district. Purchases intended for children were higher – 62% of the anti-malarials bought for children under 5 were subsidised ACTs.

- Uptake of ACTs also increased in the public sector in the two districts, so the availability of subsidised ACTs in shops does not seem to be displacing use of the public sector for malaria treatment (although this question cannot be answered definitively).

- Prices for ACTs were competitive with other anti-malarials. Where there was a suggested retail price (SRP), this resulted in lower prices for child doses and higher for adult doses than for the competing products (SP and Amodiaquine). ACT prices averaged $0.39 for infants in the district without an SRP and $0.25 with the SRP; for adults the prices were $0.50 without and $1.00 with the SRP. The SRP was closely followed, resulting in little price variation in that district while there was more price variation without the SRP.

- Prices in remote drug stores were not higher than in more densely populated areas, where there is more competition. This is encouraging for access by the poor, as the data showed that the shoppers in remote stores were more likely to be poor.

- Overall 60% of the drug stores held stocks of the ACTs when surveyed, (compared to 69% holding stocks of SP). However fewer of the drug shops in remote areas had subsidised ACTs in stock than those shops in busier areas with more competitors (38% vs 80%). This suggests further efforts may be needed to identify how to encourage distribution through such outlets in order to reach the poor living nearby.

[24] TDR, 2006. *Partnerships for malaria control: Engaging the formal and informal private sectors*, WHO.
[25] Clinton Foundation, April 26 2008, *Tanzania Pilot ACT subsidy: Report on findings*.

- In one of the intervention districts there was substantial use by people from the lowest two quintiles (33% of customers surveyed, up from 18% found in the first survey). In the other two districts the poorest quintiles made up a smaller share of the customers (8%, 19%). Reasons for this are not clear, nor whether the poorer households are buying anti-malarials elsewhere, such as general stores. That would require further study using a household survey approach.

- There was no statistically significant correlation between socio-economic group and the choice of ACTs or the price paid. Thus poor customers were as likely to buy ACTs as the better off.

Further monitoring will be carried out with another report due in December 2008.

In Senegal there are similar findings of low prices being passed on where subsidised ACTs are being made available through public and private sectors[26]. A recommended price level was set and independent pricing studies showed that in public, faith based and private sectors, urban and rural areas, adherence was high to the recommended prices. There was however limited availability of the subsidised drugs in private pharmacies due to supply problems.

In Kenya, artemether-lumefantrine (AL) was distributed free of charge to RDT positive patients in a pilot study involving 9 community shops that operated using a franchising model (CFW shops). The preliminary results of the evaluation survey indicate that the contribution of CHW shops to overall access to AL was of 9%. However, these findings must be interpreted in the context of a massive scale up effort of AL availability in Government Health facilities (GHF) that coincided with the study. The overall proportion of patients treated with AL in the study area increased during the study period from 15% to 41%, and 86% of patients reported obtaining AL from GHF (up from 64% at baseline).

Other findings indicate a trend towards increased use of CFW shops by older children and adults than children under 5 years of age (10% vs 6% of all patients taking AL). Furthermore, treatment at CFW shops was more frequently based on weight (rather than on age) than at GHF, and the first dose was more frequently observed at CFW shops than at GHF. The study did not analyse access to CFW shops by SES quintile.

**What are determinants of uptake of malaria treatment including ACTs?**

On the **supply** side, the anti-malarials need to be available in local sources of treatment as well as affordable. Availability varies by country. In Tanzania for example, a study in four districts[27] showed a large number of general stores (675) stocked some drugs such as painkillers, with one third of these stores stocking antimalarials, usually Chloroquine. There were a smaller number of drug shops in these districts (43) virtually all of which stocked a range of anti-malarials, with diverse brands and active ingredients. The study concludes that "this active and highly accessible retail market provides opportunities for improving the coverage of effective

[26] Kone KG et al, Oct 2007. *Subsidized ACTs available for sale in private drug stores: experience in Senegal*, IRD, in Background paper 7 Summary of Field Research, AMFm Technical Proposal (or see Fig 16, AMFm Technical Design)
[27] C Goodman et al, 2004, *Retail supply of malaria related drugs in Tanzania*, Trop Med Int Health, Jun, 9 (6) 655-63.

anti-malarial treatment". On the other hand there are the problems of confusion over different brands, sale of ineffective products and monotherapies that bring risks of resistance. A different study demonstrated that drug stores that are not meant to stock prescription-only drugs are in practice doing so[28].

There is scope for competitive markets for ACTs to develop in the private sector. Estimates of the supply chain in Uganda suggest that there are some 15 private sector importers, with about 50 private wholesalers. These operate alongside the centralised public medical stores and a joint procurement and wholesale agency for the NGO sector. Some 2,500 pharmacies and 8,000 general retailers sell drugs nationwide, for a population of some 25 million. Zambia has about 50 private wholesalers, and 40 retail pharmacies, as well as private clinics and drug stores mainly in urban areas. These wholesale markets are much larger than countries in West Africa such as Burkina Faso (with 5 wholesalers, for some 13 million population) and Cameroon (with 10 wholesalers for some 16 million population).[29]
On the demand side, the choice of treatment will only partly be based on the affordability of treatment from different sources. Non-price barriers such as distance may impede access to malaria treatment. For example, a recent trial in Ghana randomly allocated households to an intervention in which their National Health Insurance premium was paid for them[30]. Health service utilization was monitored for the next six months. Generally, utilization decreased with increasing distance from a health facility. Although households in the insured group living within 5 km of a health facility utilized primary care services more than the control households in the same vicinity, this was of borderline statistical significance. In contrast, households in the intervention group used non-formal source of care much less than control households. At distances 5 to 10 km away from the nearest health facility, the intervention households utilized primary care services significantly more than the control and although they tended to use non formal sources of care less, the difference between groups was not statistically significant. However, among those households living more than 10km away from a health facility there was no significant difference in the use of primary care services and non-formal sources of care between the intervention and control households.

Other factors will influence uptake of treatment from different types of providers. These include access to cash when it is needed; knowledge about and attitudes to different products; confidence in treatment and in advice from providers; willingness to change; and motivation. Changing the price of ACTs will only affect one of the factors in demand – the affordability – which can be expected to impact on uptake, but the demand will be affected by other factors too. Effective information, education and communication to the public and providers should help address the knowledge and attitude barriers. However the relative importance of different factors and how to alter these factors is not well understood.

**What are the lessons from other efforts to target subsidies to the poor?**

Looking at experience with cash and food subsidies intended to benefit the poor, the broad picture is that while most efforts to target support do favour the poor to some extent, some do not in practice. A major review by Coady, Grosh and Hoddinott[31]

[28] C Goodman, 2007, *Drug shop regulation and malaria treatment in Tanzania – why do shops break the rules, and does it matter?*, Health Policy and Planning, 22, 393-403.
[29] Estimates of wholesaler and retailer numbers by Dalberg consultants based on fieldwork in 2007 and IOM reports.
[30] Ansah E, 2006. *The effect of reducing the direct cost of care on health service utilization and health outcomes in Ghana: A randomized controlled trial*. PhD Thesis, University of London.
[31] Coady, D et al. *Targeting of Transfers in Developing Countries: Review of Lessons and Experience*, World Bank

looked at 122 interventions intended to reduce poverty in 48 countries. They found that the median programme provided about 25% more resources to the poor than if there had been random allocations. However, the targeting does not always work – 25% of the interventions did not benefit the poor, and this applied across various approaches to targeting the poor.

A key message from the review is that it is the detailed design and implementation practice that makes a huge difference to the impact in terms of benefiting the poor. The same message comes from the major World Bank review on Reaching the Poor[32].

A similar picture comes from a review by Coady[33] that notes, for example, while targeted food ration systems in general had limited success in targeting (median 37% of benefit to the lower 30% of the population), in one state in India 49% of the benefits reached the poor. Targeted food subsidies were shown to be more successfully at targeting and more efficient than universal food subsidies. How the benefit is offered makes a difference. For example, if the benefit is intended to get milk to poor children, then offering a portion of milk daily in slum areas will be better targeted to the poor than offering a week's supply of dried milk from a central point (as the better off will send a servant to collect the weekly supply).

The analysis of targeting identifies the importance of looking not only at how well targeted the programmes are (whether there is 'leakage' to the non-poor), but also at exclusion or under-coverage – how many of the poor are not reached. A review of social funds notes "Many programs start on a small pilot scale with the intention of scaling up. This leaves most villages and households without access to benefits."[34]

There are different methods of targeting such as geographic targeting to poor regions, targeting by age group, assessing households by means testing or by the community, and self selection. Many interventions use a combination of geographic and other measures. The value of geographic targeting to specific regions or districts will depend on how far poverty is spatially concentrated, which varies by country. The reviews note the trade offs to be addressed – between political support for the programme and the narrowness of its coverage; between poverty reduction objectives and other objectives it may have; and at a practical level between the cost and complexity of targeting methods and the costs and efficiency of the programme.

How relevant is this for AMFm? The objectives of the AMFm are to improve uptake of ACTs across population groups in order to achieve the public health benefits, including to avoid emergence of resistance. Because the well off already have better access to ACTs, in practice the AMFm is seeking to ensure wider access for the poorer majority (the 60 – 80% who cannot currently afford ACTs) and the poorest. While there will be leakage to the better off quintile, this can in part be justified by the externality of averting resistance; and the amount of leakage can be limited if the well off can still buy branded premium products in pharmacies at higher prices.

In addition some of the drawbacks of universal food subsidies, such as their influence on local food markets, as well as the ease of diversion and waste with food, are much less relevant to ACTs.

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[32] World Bank, 2005, *Reaching the Poor* reports.
[33] Coady,D, 2004. Designing *and Evaluating Social Safety Nets: Theory, Evidence and Policy Conclusion*s. International Food Policy Research Institute, Washington
[34] Van Domelen, J, 2007. *Reaching the Poor and Vulnerable: targeting Strategies for Social funds and other Community Driven Programs*. World Bank Social protection Discussion Paper 711.

The greater concern is how to avoid under-coverage. The lessons from the literature suggest the importance of careful design and implementation of roll out interventions in order to succeed in reaching the poor; and continuing monitoring and evaluation of impact to refine and improve performance. The case for geographic targeting of efforts to reach groups who lack access will depend on country context; but experience suggests this can be useful especially if combined with other targeting measures.

Scale is also critical to reach the poor – interventions need to be able to scaled up and sustained. The temptation is to start programmes in better off or more accessible areas where interventions are easier to manage and monitor; but on equity grounds it may be preferable to start in the worst off areas, especially if there is a risk that full scale up will not be achieved.

## *3. Conclusions*

Many countries have substantial use of anti-malarials across the SES groups, and although the use by the poor (defined as the poorer 60% of the population) tends to be lower than by the better off 40%, there is substantial use among the poor and the poorest through existing channels. If ACTs can be made available at a comparable price (or for free), with education of users and providers about their benefits, then it seems very likely that uptake of ACTs will increase and replace ineffective antimalarials. This will benefit people across the SES groups, although a smaller proportion of the poorest.

It is widely recognised that many anti-malarials are purchased from private sector sources including private clinics and retailers, as well as from public sector providers. The mix of sources varies between countries and within countries, but all show a 'mixed economy' for malaria drugs in a way that is not the case for TB or AIDS treatment. The limited data available on the sources of treatment by SES indicates that this 'mixed economy' is true for the poor as well as the better off, and even for the poorest.

Hence by making drugs available through public, private and NGO channels at comparable prices to existing medicines, the AMFm should reach the poor, as they already use these channels. To be sure of reaching the poor, it will be critically important for ACT roll out plans to be designed at country level to ensure drugs will be distributed through sources of treatment used by the poor and poorest groups, usually including drug retailers and private providers as well as public providers and registered pharmacies.

Many countries want to tackle relatively low use of anti-malarials among the lower SES groups and for children. Reaching the groups who do not currently have access is hard and there is not clear evidence on how best to do so, especially at large scale. Further work is needed to test and refine approaches.

There still remain the problems with the quality of treatment – appropriate doses, duration and timeliness. These issues will require major efforts to complement increased availability of ACTs – particularly IEC and packaging. These are already being introduced in countries as part of ACT roll out, whether via the public sector, home based or private sectors. Positive results have also been shown from

shopkeeper training (although not at large scale)[35]. Hence these are emphasised as essential supporting interventions alongside AMFm.

The AMFm needs to be implemented in ways and alongside other interventions that will make it more likely to reach the poor and the poorest. These need to be planned and developed at country level to ensure that the messages are relevant to the poor and vulnerable groups in the country. This should include[36]:

- IEC / behaviour change to promote the advantages of ACTs, their availability at low prices, correct ACT use and prompt treatment of children
- Messages and media for the IEC efforts need to be targeted to poor audiences
- ACTs should be accessible through different channels including public and private, and make sure this includes the types of outlets and services the poor use
- Strengthening the quality of services in poor areas and those used by the poor, including provider training to cover the providers the poor use; assuring drug supplies; enhancing supervision[37]
- Building malaria treatment for the poor and vulnerable groups into services targeting those groups, such as service contracts with private or NGO providers; home based care; community based care
- Use interventions that encourage prices that are affordable to the majority of the population
- Expanding free or low cost distribution arrangements targeted to reach those least able to pay, with least access to medicines and most vulnerable to malaria.

The impact and cost effectiveness of these interventions are not proven and need to be demonstrated and improved at country level. Hence the AMFm must be complemented by effective operational research, monitoring and evaluation at country level, structured in ways that will enable an assessment of how well interventions are reaching the poor, the poorest and the most vulnerable groups. Operations research is planned as part of the AMFm, and counties can already apply to the Global Fund (and others) for funding for operational research. It will require substantial country level efforts to design appropriate research and monitoring, as well as central coordination to maximise learning from the findings.

[35] Marsh VM et al 2004. *Improving malaria home treatment by training drug retailers in rural Kenya*. Trop Med Int Health 4 pp 451-460. Following training of drug retailers in rural Kenya, there was an increase in the proportion of those buying anti-malarials who bought an adequate dose from 8% to 33%.

[36] See also Pearson et al, 2008, op cit.

[37] Given the findings from various studies that facilities serving the poor are less likely to be well stocked with drugs and to be properly staffed. See references in Wagstaff et al, 2004, *Child health: Reaching the Poor*. AJPH May 2004, 94, 5

**Schematic of AMFm impact**