SHOULD BEDNETS BE SOLD, OR GIVEN FREE?

THE ROLE OF THE PRIVATE SECTOR IN MALARIA CONTROL

BY URS HEIERLI AND CHRISTIAN LENGELER

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This young woman runs a bednet distribution shop in Dodoma, Tanzania. She is holding a voucher that can be used by a pregnant woman for redemption with any participating net retailer.

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ACRONYMS, ABBREVIATIONS AND GLOSSARY

ANC	**ANTE-NATAL CLINIC**
A TO Z	**A MANUFACTURER OF BEDNETS AND LLINS IN ARUSHA, TANZANIA**
BCC	**BEHAVIOUR CHANGE COMMUNICATION CAMPAIGN**
DFID	**DEPARTMENT FOR INTERNATIONAL DEVELOPMENT**
DHMT	**DISTRICT HEALTH MANAGEMENT TEAM**
DMO	**DISTRICT MEDICAL OFFICER**
EV	**EQUITY VOUCHER FOR THE TOP-UP AMOUNT TO BE PAID IN CASH**
IEC	**INFORMATION EDUCATION AND COMMUNICATION**
MCH	**MOTHER AND CHILD HEALTH (CLINICS)**
ITN	**INSECTICIDE-TREATED NETS**
IV	**INFANT VOUCHER (FOR CHILDREN UNDER FIVE IN TANZANIA)**
LLIN	**LONG-LASTING INSECTICIDE-TREATED NETS, ALSO KNOWN AS LONG-LASTING IMPREGNATED NETS**
'MALARIA HAI	**KUBALIKI SWAHILI' FOR 'MALARIA IS UNACCEPTABLE'**
MEDA	**MENNONITE ECONOMIC DEVELOPMENT ASSOCIATES**
MOHSW	**MINISTRY OF HEALTH AND SOCIAL WELFARE**
NMCP	**NATIONAL MALARIA CONTROL PROGRAMME**
PMI	**PRESIDENT'S MALARIA INITIATIVE (USA)**
PSI	**POPULATION SERVICES INTERNATIONAL**
RCH	**REPRODUCTIVE AND CHILD HEALTH (CLINIC)**
RNE	**ROYAL NETHERLANDS EMBASSY**
ROE	**RATE OF EXCHANGE. (ROES ARE INDICATIVE AND, UNLESS STATED OTHERWISE, AT THE PREVAILING RATE AT PRESS TIME)**
SSA	**SUB-SAHARAN AFRICA**
SDC	**SWISS AGENCY FOR DEVELOPMENT AND COOPERATION**
STI	**SWISS TROPICAL INSTITUTE, BASEL**
TEHIP	**TANZANIA ESSENTIAL HEALTH INTERVENTION PROGRAMME**
TDR	**SPECIAL PROGRAMME FOR RESEARCH AND TRAINING PROGRAMME IN TROPICAL DISEASES BY UNICEF·UNDP·WORLD BANK·WHO**
TZS	**TANZANIAN SHILLING (ROE USED IN THIS PUBLICATION: TZS 1,000 = US$ 0.80)**
USAID	**UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT**
WTP	**WILLINGNESS TO PAY**
ZUIA MBU	**SWAHILI FOR 'PREVENT MOSQUITOES'**

EXECUTIVE SUMMARY: SHOULD MOSQUITO NETS BE SOLD, OR GIVEN FREE?

The burden of malaria is one that weighs heavily on Africa's development: it is responsible for a high child mortality – 25% of all child deaths in sub-Saharan Africa – and it has also a strongly negative impact on economic growth. A study by Jeffrey Sachs revealed: "Malaria and poverty are intimately connected. Controlling for factors such as tropical location, colonial history, and geographical isolation, countries with intensive malaria had income levels in 1995 of only 33% that of countries without malaria, whether or not the countries were in Africa."[1]

MALARIA AND INSECTICIDE-TREATED (BED) NETS (ITNS)

After some setbacks in the 1980s and 1990s (reduction of DDT use, resistances against common anti-malaria drugs), there is again progress in the fight against malaria. There are significantly more funds available to combat malaria, new drugs are becoming available and the discovery of insecticide-treated bednets (ITNs) has led to renewed malaria prevention. Several large-scale studies have documented the beneficial impact of ITNs on malaria disease and on child-mortality[2].

ITNs have a smart double-impact: a) they protect those sleeping under the net from mosquito bites – **Anopheles** mosquitoes bite at night only – and thus reduce the under-five mortality by about 20%; b) they kill the mosquitoes which touch the netting and thus reduce their number drastically. This second effect has also a strong community impact, as those people not sleeping under a net are benefiting as well. Overall, more than half a million deaths could be avoided every year if most children in sub-Saharan Africa could be protected.

FROM STUDIES TO IMPLEMENTATION: DISSEMINATION CHALLENGES

With numerous studies showing such positive results, how could a successful dissemination strategy be implemented? Is it simply a matter of distributing free bednets to everybody in the same manner as for example vaccines are given out for free in clinics? Should dissemination focus on the most vulnerable groups (namely children under five years) or target the whole population? Is there a need for a more holistic programme including community health and awareness creation? These were some questions raised by research teams and early implementers. These questions also pointed out the importance of distinguishing between efficacy and effectiveness of a public health intervention: while scientific studies had shown the efficacy of ITNs under very controlled conditions, there was uncertainty that the same interventions would also be effective under real-life delivery conditions.[2]

In searching for an effective dissemination strategy three issues had to be addressed:

1. Intervention technology:[3] Even though a bednet is something simple that every village tailor can make, many technical issues are associated with netting durability and the insecticide treatment. There is also an issue with mosquito nets in houses in which a normal net cannot be hung (for example because the space is insufficient). Conventional insecticide needs to be renewed every 6–12 months. Experience in many settings showed that many people did not bother to perform these re-treatments. ITNs require the combination of two totally different products, a bednet and an insecticide. One is produced in a textile mill and the other one by a chemical industry. At the outset, programmes attempted to bundle nets with an insecticide sachet, such as in Tanzania. Fortunately, the development of long-lasting insecticidal nets (LLINs) has largely solved this issue and there are currently six excellent products on the market.

2. Implementation models:[4] Early experiences showed a broad variety of implementation approaches that worked and others that did not. Sometimes there was a potential demand but no supply; sometimes people wanted nets but could not afford them at market prices, and in a third case people wanted to buy nets but local dealers would not stock them because the margins were not attractive or for other reasons. In China and Vietnam, dissemination was organised as a public health strategy: the private households had to buy the net and the malaria control programme would give them the insecticide for free. Another approach was to target the most vulnerable groups (pregnant mothers and their newborns) through a public health system delivery (free in Eritrea, highly subsidised in Kenya and Malawi). In recent years many countries have also had free distribution of nets linked to measles or polio vaccination campaigns. Tanzania chose a combination of several elements based on an approach involving largely the

private sector. This was based on the conviction that "one size does not fit all" and that people would need different types of nets, and the only way to deliver this choice of products was by setting-up a supply chain that would reach even remote villages. Further, there was a realisation that the public health system was not strong enough to deliver ITNs consistently over the next decades.

3. Promotion:[5] Sleeping under a bednet implies behavioural changes and this always takes time. Social marketing was thus felt to be required to spread the right messages and to ensure the right use of the nets. One of the key messages of a social marketing campaign of Population Services International (PSI) was: "Malaria Haikubaliki – Malaria is not acceptable". People perceived malaria as something so common that they had into way to deal with it. This attitude needs to be changed before meaningful progress can be made.

THE TANZANIAN NATIONAL NET PROGRAMME (NATNETS)

Approximately 100,000 deaths are attributed to malaria yearly in Tanzania – about 80,000 of these deaths are among children under-five. The total Tanzanian population at risk from malaria amounts to nearly 35 million. Young children and pregnant women bear by far the highest risk of dying from malaria. It is estimated that 4% of this risk population, 1.4 million, are pregnant women and that there are approximately 6.4 million under-five children in Tanzania.

NATNETS is a large integrated programme with currently four main components:

1. A **national coordination unit** (ITN cell) within the National Malaria Control Programme, supported by the Swiss Agency for Development and Cooperation (SDC) and implemented by the Swiss Tropical Institute (STI).

2. The Tanzania National Voucher Scheme (TNVS) aiming to provide every pregnant woman and every infant coming for measles vaccination with a voucher worth, in Tanzanian Shillings[6], TZS 3,250 (US$ 2.85) that can be redeemed against a bundled polyester net at a shop of a participating retailers. The women pay a top-up contribution which in 2005 averaged around TZS 1,000 (US$ 0.80). By 2007, the top-up had risen in line with petro-chemical prices to about TZS 1,600 (US$ 1.40). The idea of giving women a voucher rather than a highly subsidised net is two-fold: (1) that it leaves the trouble of ITN distribution entirely to the commercial sector, and (2) that it stimulates strongly the development of the commercial net sector, which can then also cater for non-target groups and provide a sustainable distribution mechanism. Support comes from the Global Fund to fight AIDS, TB and Malaria (GFATM) and the US President's Malaria Initiative (PMI). Most TNVS activities are sub-contracted to implementing partners such as Mennonite Economic Development Assistance (MEDA) for the logistics of the vouchers.

3. The free-of-charge provision of insecticide treatment kits for bundling with all polyester nets manufactured and sold in Tanzania, the marketing of subsidised, stand-alone re-treatment kits and the facilitation of LLIN technology transfer to the Tanzanian net manufacturers. These activities are financed currently by the PMI and the Royal Netherlands Embassy (RNE).

4. Demand creation and Behaviour Change Communication. Two complementary programmes have now replaced the successful SMARTNETS social marketing programme (2002–2007). The COMMIT programme supported by the PMI and implemented by a consortium led by the Johns Hopkins Bloomberg School of Public Health Center for Communication Programs, and the GFATM-supported Behaviour Change Communication programme implemented by Population Services International (PSI).

In 2008, two additional components will be added to NATNETS:

5. Catch-up: Since coverage of risk groups increased too slowly under the voucher scheme, NATNETS will conduct a mass 'catch-up' distribution campaign to provide free LLINs to all 7.2 million children under five years of age. This will be co-funded by the GFATM, the World Bank and the PMI.

6. Re-treatment: At the same time as the 'catch-up' campaign, a National Net Re-treatment Campaign will be carried out to re-treat approximately 6.5 million polyester nets with support from the World Bank.

In the first four components, impressive results had been achieved: four manufacturers in Tanzania launched large bednet production programmes, some of them becoming significant exporters. Over 6,400 retail outlets are now selling almost three million bednets per annum (compared with 1.1 million in 2001). Some 13.1 million bednets and 12.5 million re-treatments have been delivered from 2002 to 2007. Some 2.96 million nets were sold or distributed in 2007 alone, at prices ranging from TZS 2,000 (US$ 1.60) to TZS 8,000 (US$ 6.50) depending on type, size and material. Importantly, a true culture of bednet use has been introduced into the country, putting future programmes on a strong basis.

STUMBLING BLOCKS TO DISSEMINATION

Affordability is clearly the most important hurdle for the dissemination of ITNs, especially in rural areas (where the coverage is less than that of urban areas). The number of children below the age of one sleeping under any net has increased from 31% to 55% (from 2005 to 2007) and the same figure for treated nets are 12% to 34%. Even with the voucher subsidy, the top-up price of one dollar seems to be a hurdle for many poor women. "Lack of money" is a reason for not redeeming about 15% of the vouchers (another 15% are not redeemed for other reasons, including that the woman / mother owns already enough nets).

Another big issue are the re-treatment kits. Conventional insecticides lasted only for some six months and are now being replaced by longer-lasting ones lasting over 12 months. But even with improved timing, re-treating existing nets is a problem, with only 20% of nets getting a repeated insecticide treatment. There is now agreement on the need to switch over to **long-lasting insecticide-treated (impregnated) nets** (LLIN) with a pre-treatment lasting for the entire lifespan of the net of three to four years. However, this switch is technically a big jump for manufacturers and requires the industry to convert from traditional textile industries to a high-tech production. Understandably, the manufacturers are reluctant, due to high investment costs and the small margins they make on a net; some manufacturers claim that their margins are only around TZS 100 per net (US$ 0.09). This may be an understatement but it is a fact that the market is very competitive.

Currently, the best LLINs are polyethylene nets with insecticide dissolved into the plastic (Olyset™ nets). Unfortunately these nets are much more expensive than conventional nets (roughly US$ 6 versus US$ 3 ex-factory) and because of the extreme price elasticity there is currently no market for such a product. On the other hand, LLINs are cheaper per 'treated net year' of protection because their higher cost is largely compensated by their much longer use life.

BALANCING CATCH-UP AND KEEP-UP

Over the years, a consensus has been built up in Tanzania that ITN dissemination strategies based on a subsidised commercial sector approach are the right answer to the current malaria challenge. It is an ongoing debate, in which another viewpoint, proclaimed by Jeffrey Sachs, calls the delay in the delivery of bednets "one of the shocking crimes of our time"[7]. He advocates dropping the present NATNETS strategy and calls the social marketing approach a total failure. Already well before these strong words, however, the stakeholders in Tanzania had agreed to a mass free distribution of LLINs; indeed, this decision had been the basis for the Round 7 proposal to the GFATM. The discussion is now proceeding on the importance of achieving rapidly universal coverage of the population as a whole.

There is, at present, at least some level of consensus among malaria specialists that an approach is needed which combines both a catch-up and a keep-up strategy for ITNs[8]. Basically, more than one approach is required and the value of complementary distribution mechanisms has been very well shown in Kenya, Tanzania and Malawi.[9]

1. 'Catch-up' strategies: There is a need to increase coverage fast and this may only be possible through free, or highly, subsidised mass distributions. Public distributions linked to measles vaccination campaigns have made a big impact in, for example, Niger, Sierra Leone and Togo (where a 1- or 2-week campaign achieved 50% to 60% coverage in children under five years). Recently a very large distribution campaign spread over three years has been initiated in Ethiopia.

2. 'Keep-up' strategies: Massive free net distributions are time-bound and hence a sustainable and continuous system is also required to reach newly-pregnant women and newly-born children. Further, there is a need to continue getting messages out to the population to ensure further behaviour change. Keep-up strategies can involve clinic distribution of ITNs (such as in Kenya or Malawi) or a voucher scheme (as in Tanzania).

In the case of Tanzania, reconciling campaigns with a continuous commercial sector distribution is challenging as the private sector can obviously not compete with free nets. The voucher system in Tanzania, while a more complex system initially, does allow reconciling the two strategies. The TNVS is likely to survive the mass free distribution of LLINs to children, since there will still be a large part of the population requiring nets. However, it is unlikely that the voucher scheme will survive a universal mass distribution. In the latter case, a new form of 'keep-up' mechanism would need to be implemented.

HOW THE PUBLIC AND THE PRIVATE SECTOR CAN COOPERATE BEST

The story of insecticide-treated nets in Tanzania is a major success story, but there are still many challenges left. A basic problem is that long-lasting nets cost from US$ 5

to US$ 6 to produce and US$ 2 to US$ 3 to distribute, including management and promotion costs. Those who need the nets most (the most vulnerable and poorest groups) cannot afford to pay even one dollar for a net. Paradoxically, this is so despite the fact that many poor families pay a much higher cost to treat malaria episodes or in lost productive time. Malaria is truly a disease that increases poverty and hampers development.

ITNs are a good answer to this problem, and spreading them is a public health task and an investment into development, the basis for economic growth and prosperity. The development of the ITN programmes has already reduced the burden of malaria considerably, although it is too early to see an effect on economic development.

Any meaningful ITN distribution strategy requires a smart way of using subsidies. Subsidies can either compete with the goal of sustainability or go along with it, as with vouchers. Smart subsidies are needed to make the bednets affordable to poor vulnerable groups for a long time. Another form of subsidy is justified temporarily if they can prime the market. For example, if all pregnant women get one voucher for a bednet, they may buy another net once it is worn out.

The ITN programme in Tanzania is an outstanding example of a public-private partnership (PPP). Given careful planning, it is possible to have commercial sector delivery alongside limited free distribution campaigns. The fact that substantial subsidies for such programmes have been made available has led the private sector to make huge investments in producing conventional and long-lasting nets. In Tanzania, this has created a new and thriving export industry. In 2007, all Tanzanian companies had an estimated total production of at least 20 million pieces, most of it being exported. No figures are yet available in terms of turnover and tax revenues but this industry has generated at least 3,000 new jobs.

What is needed now is a rational and constructive debate between the advocates of free distribution and those of other approaches, with the aim of building a multi-channel programme with maximum reach and sustainability. Repeated experience in sustainable development has taught us that putting all one's eggs in the same basket is not the best strategy. In the case of ITNs, it is clear that a diversity of strategies is best for reducing the enormous human and economic burden imposed by malaria.

INTRODUCTION: GIVING BEDNETS FOR FREE, OR BUILDING UP A SUPPLY CHAIN

1

This publication aims at contributing to the debate about the best way of scaling-up the use of insecticide-treated bednets (ITNs). Over the past few years, that debate has raged over whether ITNs should be given free of charge and distributed via public health channels, or sold via a private supply chain with targeted subsidies. Consensus has firmed up that the best way forward is a combination of distribution strategies, yet many issues still arise as to how best to do this.

The main emphasis of this publication is to show how the supply chain in Tanzania works and how carefully it has been constructed. In this sense, it takes a clear stance in favour of the commercial distribution chain, but it is also acknowledges the need for a catch-up strategy to attain a high coverage as quickly as possible. A one-off catch-up campaign will not be adequate, because of new pregnancies and births. It is therefore crucial to take the keep-up needs into consideration and ensure a regular supply of ITNs, any day in the year, anywhere they are needed in a context of generalised poverty.

1.1. FAST TRACK OR SUSTAINABILITY: BALANCING CATCH-UP AND KEEP-UP NEEDS

ITNs have proven to be very effective for the prevention of malaria and especially in reducing child mortality. "The regular use of insecticide-treated nets (ITNs) is currently one of the two primary prevention tools against malaria in highly endemic areas of sub-Saharan Africa, along with indoor residual (house) spraying. ITNs reduce child mortality by nearly a fifth and the number of clinical episodes by one half, with no evidence of mortality delay effects"[10]. The widespread dissemination of ITNs is thus highly desirable, especially in sub-Saharan Africa (SSA). "Protection with a fully effective ITN of all children in SSA would allow preventing – 500,000 child deaths each year, a major reduction in sufferings and economic losses, and a crucial contribution toward the achievement of the Millennium Development Goals".[11] The big question is, of course, how to achieve this in a sustainable way?

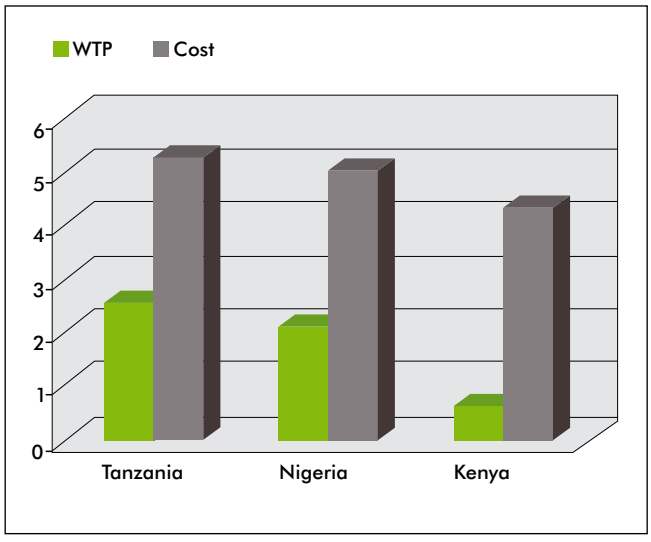
On the one side are those who advocate for a fast track saying that ITNs should be distributed in large numbers, free of charge, as a public health activity, for example by linking the bednet distribution to vaccine campaigns – a 'catch-up' strategy.

On the other side are the more cautious voices saying that ITNs should be made available to everybody through setting up a sustainable distribution mechanism, for example through a private sector supply chain (a 'keep-up' strategy). As nets are needed all the time – and not just during a vaccine campaign – it is of crucial importance that there are mechanisms to make them available in every remote village at any time of the year. This task, admittedly a tedious one, of setting up a supply chain and requires time and investment. One of the key issues is that there is indeed a problem of affordability.

1.2. SOLVING THE AFFORDABILITY CHALLENGE: WHAT ARE PEOPLE WILLING TO PAY?

Today, ITNs are widely available in a number of African countries where they are sold through the commercial sector at approximately US$ 4 to US$ 5, which is less than what people paid for untreated nets in 2000. For many poor women, however, this price is far too high and some 15% of women in Tanzania who received a voucher for a net were unable even to afford the top-up price of about US$ 0.80.

Several studies on willingness to pay (WTP)[12] have indicated that most people in Africa are willing to pay between one and two dollars per net, but very rarely the real cost of US$ 4 to US$ 8. Less than 5% of respondents in a survey in Nigeria would have been willing to pay US$ 4 for a net.[13] In Ethiopia, almost half of the people



The gap between Willingness-to-pay (WTP) and actual cost of insecticide-treated nets (ITNs)

asked mentioned an amount of US$ 1.20 and only 14% would have been willing to pay US$ 5.50 for a net[14]. The following graph shows this gap between WTP and real cost of nets[15].

A similar study in Mali[16] revealed, however, that the mean price paid by ITN customers was CFA 3,500 (US$ 6.34) and the somehow shocking fact that poorer households were paying more for a net than better-off households (up to US$ 8.15). Some 86% of respondents who had no net mentioned its high cost as the reason for not owning it.

One question has remained totally unanswered: why is the willingness to pay so low for ITNs if they are so effective. Very often, malaria is not only a life-threatening but also a costly disease: "There was an average of one attack per household during the month prior to the survey and the average **monthly** expenditure to treat an episode of malaria was more than 250 Naira (US$ 2.30).[17] In addition, malaria attacks often and keeps children from going to school, and mothers from work and earning an income. Poverty is certainly one answer, but one key issue is that ITNs are not as high on the priority list as they should be. Many households spend much more on acquiring a radio, a motorbike, a bicycle, and probably many – especially men – spend similar or higher amounts for luxury consumption items such as beer. This issue should once be studied more carefully through the eyes of a professional marketing specialist in order to determine what could be done to influence the priority setting of poor families and to put malaria prevention higher on their agenda. In the related field of sanitation, such priority shifts have been successfully introduced by using social pressure and the prestige motive to increase latrine usage (positive incentive) and to ban open defecation (negative incentive) in the total sanitation strategy applied in Bangladesh and elsewhere[18].

In any case, there is a broad consensus that mosquito nets should be subsidised, at least for the poor and vulnerable groups, pregnant women and children under five. How these subsidies can be applied most effectively will be discussed further in this publication.

1.3. HOW EFFECTIVE ARE INSECTICIDE-TREATED NETS?

"The regular use of insecticide-treated nets (ITNs) is currently one of the two primary prevention tools against malaria in highly endemic areas of sub-Saharan Africa, along with indoor residual (house) spraying. ITNs reduce child mortality by nearly a fifth and the number of clinical episodes by one half, with no evidence of mortality delay effects"[19].

The health impact of ITNs has been proven under clinical conditions but also under programme conditions, meaning that ITNs are not only effective under specifically controlled research conditions but also in the African reality[20]. Based on these robust findings, the Roll Back Malaria Partnership (RBM) recommended the large-scale use of ITNs as one of the main malaria control tools with a special focus on the groups at highest risk: small children and pregnant women. "Since then, the major issue for the international health community has been the national scaling-up in all endemic areas, with the aim to protect the estimated 100 million children and pregnant women living in endemic areas in sub-Saharan Africa (SSA). Protection with a fully effective ITN of all children in SSA would allow preventing some 500,000 child deaths each year, a major reduction in suffering and economic losses, and a crucial contribution toward the achievement of the millennium development goals."[21]

1.4. UPSCALING ITNS: AMAZING PROGRESS

The actual progress made in upscaling ITN is truly amazing: UNICEF alone has increased its procurement and distribution of ITNs from zero in the year 2000 to 25 million in 2006. The global production of mosquito nets has more than doubled in only two years: from 30 million to 63 million per annum[22]. And despite these efforts, there is still a huge gap to cover.

The Abuja Declaration on Roll Back Malaria by African Heads of State made a commitment to ensure that some 60% of pregnant women and children would have access to an ITN by 2005 and the target of the Roll Back Malaria Partnership for 2010 is even set higher, at 80%. WHO now recommends a near full coverage of the entire population by 2010. Unfortunately, so far not a single African country has achieved either of these goals, as the graph on the following page shows[23].

1.5. SHARON STONE'S WELL-INTENDED FLOP: HOW GOOD SUGGESTIONS CAN DO HARM

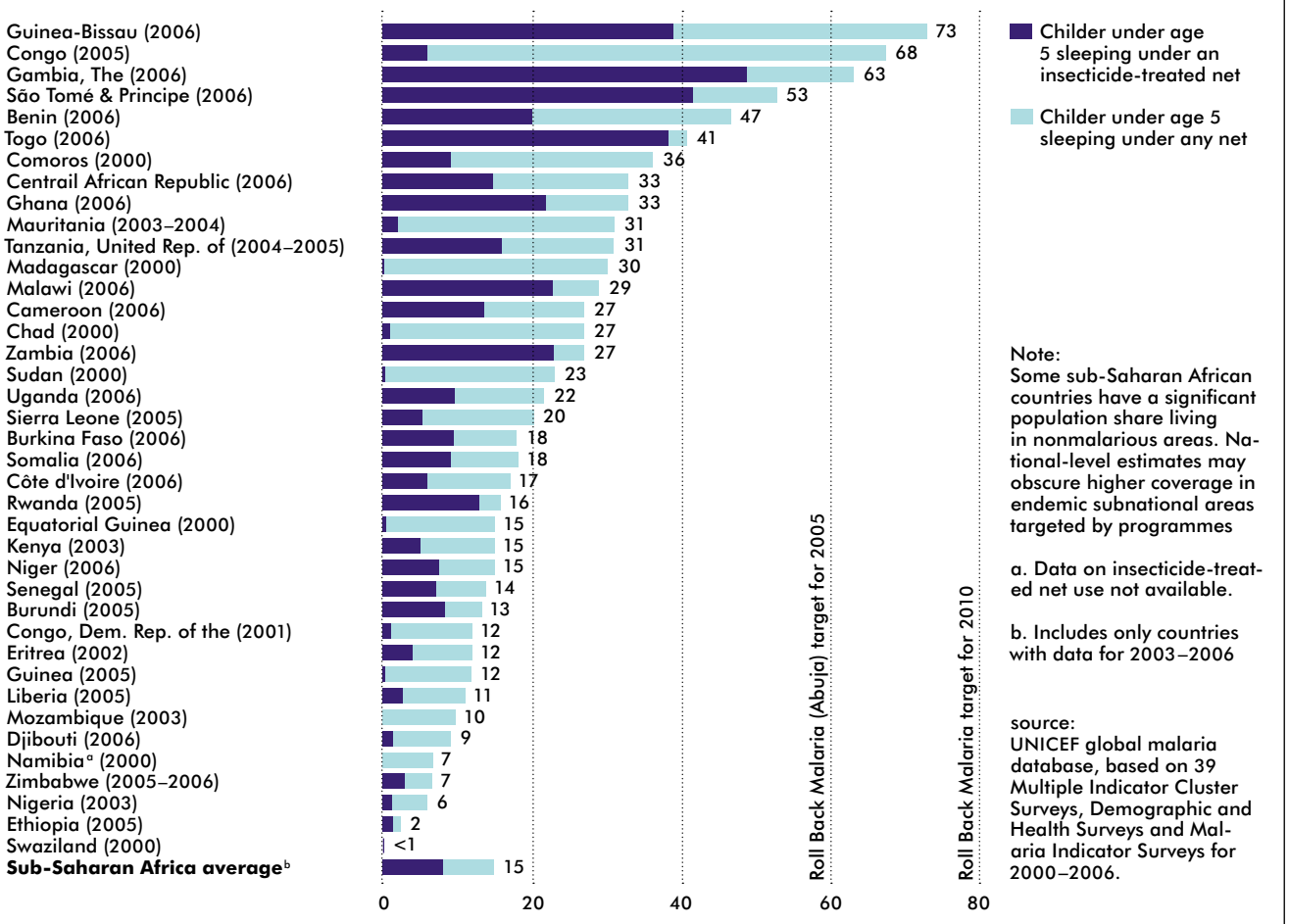
When Sharon Stone, an actress, attended the World Economic Forum (WEF) in January 2005, she was moved to hear that 150,000 children were dying of malaria every month because they lacked protective nets. She stood up and took the microphone and told Tanzanian President Benjamin Mkapa, who was on the panel: «I'd like

to offer you 10,000 dollars to buy some bednets today,» and to the audience in the conference room she said: «Just stand up. Just stand up. People are dying in his country today, and that is not okay with me.»[24]

Her spontaneous action surprised not only the WEF organisers but also the press. Instantly, the news travelled around the world that she had raised one million dollars for bednets in five minutes. Not quite. While many participants in the conference room made spontaneous pledges, barely a few finally kept their promises and only US$ 140,000 was raised[25]. Unfortunately, Tanzania had already been told that one million dollars would be available and it had planned a free distribution campaign accordingly. In the end, it was UNICEF funds which made up the missing US$ 860,000, in effect heavily subsidising Stone's publicity stunt.

In the end, the well-intended action caused also quite some upheaval and fears in Tanzania that free bednets would threaten the fragile emerging supply chains that were just building up. There was an immediate strong

reaction from the local manufacturers of bednets: they were angry that they had invested not only in bednet production but also in a distribution network and now these free nets were flooding the market and undermining the private sector. If people were to get to know that they could get a net free, they would obviously stop buying them.



Percentage of children under age 5 sleeping under any type of net and insecticide-treated nets, sub-Saharan Africa, 2000–2006

However, there was also much to learn from this experience: it was decided to use the free bednets in only two areas, Lindi and Mtwara. As the free nets were targeted at vulnerable groups only, the programme learnt that free distribution is compatible with a private supply chain approach, provided the free distribution remains targeted (see below, Chapter 4.2).

1.6. THE SACHS CONTROVERSY: FREE NETS FOR ALL – NOW!

Jeffrey Sachs, who has homed in on malarial control as a key focus for African development, is a man with a noble mission, and a deal of impatience. He would like to increase coverage much faster and describes the social marketing approach in Tanzania in strong words, as a failure: "Tragically, funds mobilised for malaria prevention and control are not used for saving lives, but are instead diverted to try to create new markets for bednets that do not exist. This approach has compromised the effectiveness of malaria control efforts. We strongly suggest that malaria-endemic countries and donor agencies should abandon the idea of social marketing, especially in rural areas greatly affected by malaria, and also in urban areas with malaria transmission. They should also commit to a policy that regards anti-malarial commodities – such as drugs, diagnostic methods, and insecticides – as public goods to be available free of charge for mass distribution to affected communities. Comprehensive malaria control in Africa is achievable by 2010, at the minimal cost of US$ 3 billion per year if sound principles of public health and economics are observed."[26]

1.6.1. TARGETING TO VULNERABLE GROUPS OR NETS FOR ALL?

When he talks of coverage, Sachs does not take the targeted coverage rates of the Abuja Declaration as a yardstick, namely 60% of the most vulnerable population, pregnant women and children under five. His yardstick is coverage of sleeping places and, renouncing the targeted approach, and advocates for free distribution to all. Sachs justifies this policy change with the argument, amongst others, that ITNs not only protect those who sleep under a net, but that they also have a community effect and can thus "extend the protection beyond that for the individuals under the nets. By greatly reducing malaria transmission, LLINs decrease the risk of others in the community coming into contact with an infected mosquito. Every LLIN user thereby contributes not only to his or her safety, but also to the safety of others – the mass effect. The effect is analogous to herd immunity from vaccines. To have maximum effect within communities, LLIN coverage should be as high as possible, with a target of complete coverage."[27]

While this argument is correct epidemiologically – protecting the whole population is indeed more effective than protecting only a high-risk group, the latter is simply a much more efficient approach – and hence one that is more likely to be sustainable in the future. If the long-term funding required for total free protection of the population was made available at global level, then there would be a great consensus around this – as there is, for example, with childhood vaccines. Unfortunately, the history of development is rich with repeated situations in which external support has faltered over time. And there is certainly consensus around the fact that massive external support is required to sustain universal ITN coverage through free LLIN distributions.

In any case, it is a clear priority and a highly ethical issue to target pregnant women and children at all cost, since the risk for them is highest.

1.6.2. ARE ALL PEOPLE TOO POOR TO BUY?

As long as limited funds are available, it does make sense to use them for subsidising those who cannot afford and those most at risk. While it is now clear that the free market is not able, on its own to increase net coverage to acceptable standards, it is wrong to say that "there is no market". Two million nets purchased at full price by Tanzanians every year mean an investment of US$ 8 million. The danger is that willing buyers will immediately stop doing so if there is an announcement that they can also get it free.

On the other hand, it is also certain that the free market cannot solve the problem: experience in many different countries show that only around 20% of the population is willing and able to pay for the nets. This coverage is by far not high enough, neither for protecting vulnerable groups nor for achieving the 'mass effect' mentioned earlier. Subsidies are thus needed, unquestionably, and the issue that remains unresolved is whether to opt for free public distribution or working with the private sector.

1.6.3. PUBLIC FREE DISTRIBUTION – THROUGH HEALTH SYSTEMS OR VACCINATION CAMPAIGNS

Basically, there are two models of free distribution of nets: a) in the form of full integration into the public health system, as in Eritrea, or b) linked to vaccine campaigns.

In smaller countries, in particular, the integration of ITN distribution into the regular health systems can bring good results, provided that their capacities are not diverted from other urgent tasks and that the health system is functioning well as a whole.

Linking free mass distribution to vaccine campaigns can be a suitable instrument to target free ITNs and achieve a rapid catch-up effect. There are striking similarities between vaccine campaigns and ITN distribution programmes that make this option attractive: "Both target well people and not sick patients. Both can be delivered in campaigns, and in the case of the oral polio vaccine, with minimal trained community workers. Both interventions target the same priority population – children younger than five years of age."[28]

If public free distribution systems can be hooked up to existing services, this seems to be a suitable solution, especially if it is accompanied by the relevant awareness creation. Social marketing interventions that spread the right messages and are able to influence and change the attitudes are crucial to also achieve that the nets are properly used.

Free distribution as part of the health system can cater to both catch-up and keep-up needs if sufficient funds are available. Once a certain level of coverage is attained, it is also possible to charge a user-contribution if funding levels are decreasing.

However, the distribution of nets during vaccination campaigns must, by definition, be free of charge, otherwise it would give mothers the false impression that they may have to pay for the vaccines and this could prevent them from getting their children vaccinated. Linking free distribution to vaccine campaigns will mainly solve the catch-up needs to increase the coverage in one go, from a low level to a higher level. They cannot cover the keep-up needs for those babies born after the days of the vaccine campaign. If proper awareness creation comes along with the delivery, it can also ensure the right use of the nets.

1.6.4. LOGISTICS, AND INVOLVING THE PRIVATE SECTOR IN "HEAVY LIFTING JOBS"

What logistics are needed for distributing one million nets? The man on the photo below is taking 500 bednets from wholesaler to retailer in Dar es Salaam. To distribute one million nets would take 2,000 pushcarts and carriers, and a lot of footwork.

That may seem a reasonable amount of work, but if the nets need to be distributed to remote rural areas in a

large country, the logistics of net distribution – described by one supplier as "a lot of heavy lifting" – should not be underestimated. This is an important argument for involving the private sector and for establishing a private supply chain, where wholesalers and retailers stock and sell the nets. The key role of the private sector is thus to deal with the 'heavy lifting'. It would be the private sector that would pack, unpack, stock, store and lift the nets and keep watch to make sure that they are not stolen, nor damaged by rats.
In Tanzania, the average margin of all links in the commercial supply chain amounts to around TZS 1,000, or roughly US$ 0.80 for distributing a net from the factory gate to the final customer. The supply chain is relatively short and involves wholesalers, distributors and retailers. This is hence a very efficient system. Nevertheless the President of Tanzania has now issued a decree that the retailer margins should be capped at TZS 500 (or US$ 0.40). How this can be implemented remains unclear at this point.

1.7. NEEDED, BADLY: A DELIVERY SYSTEM THAT WORKS

One of the key persons criticising the conventional public distribution approaches is William Easterly[29]. He gives especially short shrift to the approach of top-down planning rather than building the development programmes up from the bottom. Attacking the conventional system of aid distribution as scandalously inefficient and ineffective, he speaks of two tragedies:
1. The first tragedy: he deplores the fact that those malaria medicines that could save the lives of half of the malaria victims cost only 12 cents per dose and yet do not reach the children who most need them. The same is the case with mosquito nets.
2. The second tragedy: is that the 12-cent medicines still do not reach the children indeed despite the fact that the West has spent 2.3 trillion dollars on aid in the past 50 year.

There is, he contends, clearly something seriously wrong with the delivery system. He contrasts this with the situation where: "In a single day, July 16, 2005, the American and British economies delivered nine million copies of the sixth volume of the Harry Potter children's book series to eager fans. (…) It is heartbreaking that global society has evolved a highly efficient way to get entertainment to rich adults and children, while it can't get 12-cent medicines to dying poor children."[30]

Now, many people in the development community will be outraged, protesting: "This is not the same story; one cannot compare the wants of the middle-classes with the needs of those vulnerable children". Right, but is there really nothing to be learned from this example?

There is agreement that ITNs – and especially long-lasting nets – should be widely distributed and that the coverage rates for the vulnerable groups and for the rest of the population should increase as quickly as possible. However, there is no silver bullet answer to the best way of doing it. Sachs' criticism that the process is too slow and that much more should be done much faster is valid: however, impatience can also backfire.

Easterly does not have a miracle solution, either, but he criticises those whom he calls the "planners", those who have a plan to solve all problems at once. He says it would be better to support what works than promise big plans, and this would require "searchers" rather than 'planners'. He then mentions the case of Population Services International (PSI): "PSI stumbled across a way to get insecticide-treated nets to the poor in Malawi, with initial funding and logistical support from aid agencies. PSI sells the bednets for fifty cents to mothers through ante-natal clinics in the countryside, which means it gets the nets to those who both value them and need them. The nurse who distributes the nets gets nine cents per net to keep for herself, so the nets are always in stock."[31]

Having bednets in stock, wherever and whenever they are needed, does not cost much, but somebody must be motivated to do it. Nine cents incentive can help a lot to boost this motivation. Motivation is the most precious asset in making a delivery system work.

The NATNETS story told in the next chapter is an excellent example of a 'searcher approach', to use Easterly's terminology. It tells the history of a long project and programme where dedicated researchers and practitioners have left almost no stone unturned to find out what strategies do work. Careful trials of methods, not only in terms of sound medical research but also in terms of social marketing, have been implemented to prepare the ground for a scaling-up process.

THE NATNETS STORY IN TANZANIA – CREATING A DELIVERY SYSTEM THAT WORKS

2

NATNETS is a concerted national programme for the distribution of ITNs at a national scale. With its name derived from the programme title 'Tanzanian **National Insecticide-Treated Nets**', it arose from several predecessor programmes such as KINET, which was a large-scale social marketing programme of ITNs in two rural districts operated by the Swiss Tropical Institute from 1996 to 2000, and SMITN, a national-scale social marketing programme pioneered by PSI – both are described below.

The following pages look back over the path taken by the many 'searchers' involved in finding suitable approaches and strategies to make widespread upscaling become a reality in present and future activities.

2.1. HOW IT ALL BEGAN: FROM RESEARCH TO IMPLEMENTATION

The effects of ITNs have been studied since back in the 1980s in The Gambia, Guinea Bissau, Kenya, Sierra Leone and Tanzania. Many studies showed reductions in malaria morbidity by up to 55%. The dramatic results of these first trials prompted the UNICEF/UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases (TDR) to collaborate with many agencies and to launch four large-scale trials. The aim was to measure the impact of ITNs on overall child mortality in various areas of Africa where malaria is endemic.

The studies proved the efficacy of ITNs, with generally very high percentage decreases of both mortality and morbidity. However, efficacy under controlled conditions as these would not automatically mean that the same programmes would be effective under large-scale implementation and real-life conditions[32]. Would the nets really be re-treated, would people use them properly and would a sufficiently high coverage be attained? These questions were still open after the first set of studies.

Working under real-life conditions also means getting communities involved, influencing behaviours and addressing a myriad of small but pertinent technical issues. Even something as simple as a treated mosquito net can become a complex matter if it has to be applied on a large scale by many people who are often not highly educated and a lot of them extremely poor.

What were such technical issues?

1. Entomological impact: would mosquitoes immediately die, or would they be diverted and bite other people instead? Would they change their biting cycle and if they could not get blood in the night, would they attack in the day? Would they become resistant to pyrethroids?
2. Shape, size of nets or curtains: would people prefer conical or rectangular nets? Is cotton, polyester, or nylon more suitable? Are the sleeping habits and the type of housing suitable for nets or would curtains serve the same purpose?
3. Insecticide: what is the right type of insecticide that is both effective and harmless to children? How does the insecticide behave in the long run, how should one apply it, will it disappear when washed?

How ITNs work

The idea behind the insecticide-treated bed net is both simple and incredibly effective: catch the enemy when and where she attacks. Female Anopheles mosquitoes are the only transmitters of the malaria parasites. Since these mosquitoes need to feed by sucking human (or animal) blood, a simple way to get rid of them is to prevent them from doing so – by using a bednet that is protecting sleeping individuals.

If a net is treated with insecticide and the mosquitoes touch it, they will die. And even if the net has some holes, they may touch the insecticide before they have found the hole. The insecticides used on

netting (pyrethroids) are excito-repellent: their effects on insect behaviour include inhibition of feeding, and driving insects from their hiding places. The presence of a pyrethroid on a net greatly reduces a mosquito's ability to feed through the fabric or penetrate through small gaps. An ITN with large holes protects as well as an intact untreated bed net, reducing biting by up to 95%.

Personal protection against mosquitoes is an individual gain and is all that can be expected when an ITN is used in isolation. If many ITNs are in use in the same locality, many mosquitoes are killed and this is beneficial for the whole community. This kind of 'mass effect' does not always occur, but when it does, it benefits everyone in the village.

All these questions were answered satisfactorily over the course of several scientific meetings and conferences. In 1994, an important conference was held in Dar es Salaam, bringing together researchers conducting various types of ITN trials as well as donor agencies. The purpose was to define a research and implementation agenda for bringing ITNs as a solution to the people. But how? It was one thing to do health studies and technical research, but a totally different cup of tea to spread this know-how, and, of course, the nets to large numbers of people. One short 15-minute presentation was made at the conference, by a person from PSI about social marketing, with two clear messages:

1. Just as with disseminating condoms, a sustainable distribution system needs first to create awareness and a market; and

2. Giving away nets for free might well have been an easy enough temptation if the numbers and time were limited, but it was not for something that was so urgently needed by the entire population.

2.2. THE CHALLENGE IN BEING SUCCESSFUL: HOW TO DISSEMINATE

Where, the ultimate question was, would the nets come from that the country needed? There was only one textile manufacturer, mainly of t-shirts, in Arusha, Sunflag Pvt. Ltd. who also manufactured some mosquito nets. These nets were not linked to any programme of malaria prevention but there was already a small niche market for nets, mainly consisting of people who protected themselves against any mosquitoes, especially the ones that make disturbing noises but are, in fact, harmless. In one sample of households in Dar es Salaam, for example, 62% owned at least one net, 48% claimed to have heard of soaking nets in insecticide, but only 5% had an ITN.

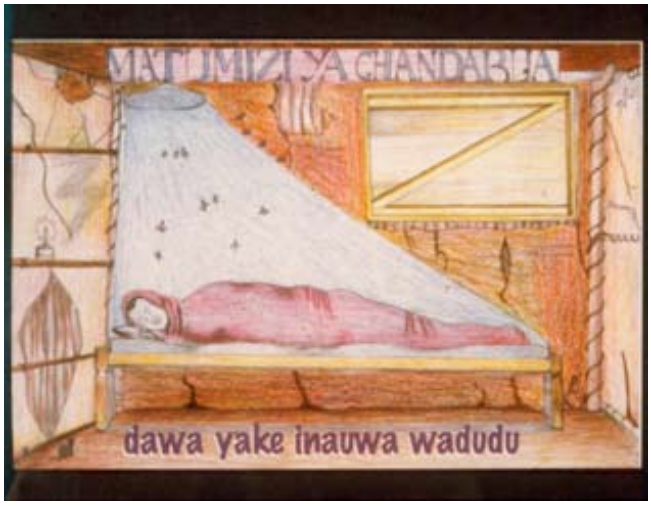
The question of whether the bednets should be disseminated by free public distribution campaigns or by the private sector was not an either/or issue in the early days of dissemination. Since public funds were very scarce in those days, it would have been an unrealistic luxury to even think of large-scale public free distribution. On the other hand, it was also evident that the free market would not be able to solve the problem: there was neither enough demand – mainly in rural areas – nor purchasing power to acquire bednets and even less for the treatment and re-treatment of nets with insecticides.

The core group behind the dissemination strategy of bednets to combat malaria opted therefore for a

Distributing "Zuja Mbu" (Kishuali for 'prevent mosquitoes') in the early days of supply chain development.

KINET was also closely linked to research about malaria and produced solid evidence that insecticide treated mosquito nets work.

The first street posters to promote the bed nets



Early drawings to demonstrate the effect of bed nets as part of the promotion campaign

public-private strategy where the public or NGO sector would place the emphasis on creating awareness and thus demand for ITNs and the private sector would develop a supply chain to make the bednets available.

2.3. KINET: AN ITN PILOT PROJECT, 1996 TO 2000

KINET (Kilombero Net Project) was a social marketing programme of ITNs in two rural districts in Southern Tanzania. It was funded by the Swiss Agency for Development and Co-operation (SDC) and implemented by the Swiss Tropical Institute between July 1996 and June 2000.

Initially, formative and market research were conducted in order to understand the perception, knowledge, attitudes and practices of the local population with respect to malaria, main causes of child death, and the products to be socially marketed. The name 'Zuia Mbu" (Swahili for 'prevent mosquitoes") was identified as a suitable brand for treated mosquito nets and insecticide, in 1996.

What is social marketing?

Social marketing is an implementation model that has proved successful for interventions such as oral rehydration salts (ORS) and condoms. It is the application of commercial marketing principles and experiences to a product or service which has a social benefit. The main motivation is health (or social) improvement rather than financial gain. Social marketing seeks to combine business competence with the credibility and resources of the public sector (Andreasen, 1996).

A pragmatic mix of public and private channels was chosen for distributing the nets and insecticide. Shop owners, village leaders, health workers and young people were trained as agents. Institutions in both districts such as hospitals, development agencies and major employers were also involved in distribution. The social marketing area expanded over two years to reach all 112 villages in both districts with a total target population of 460,000.

A comprehensive campaign of information, education and communication was developed and implemented. Much of it was carried out by local health and community development personnel. Discount vouchers were available through mother-and-child (MCH) clinics for pregnant women and those with young children. These vouchers could be used as subsidies for a treated net (approximately 17% discount). The KINET vouchers were the model for the later TNVS.

Many tests were necessary, for example to test whether bed nets are dangerous when catching fire.

Introducing a bed net requires a behaviour change and it is important to know the sleeping habits of families and especially of children.

2.3.1. KINET: THE 4 PS OF MARKETING

From the outset, KINET applied a social marketing approach based on professional marketing techniques and applying the 4 Ps, Product, Price, Place and Promotion.[33]

The four principal features of the social marketing programme were:

1. Product: This comprised nets and insecticide together. Social marketing often works with a branded product that can be marketed and advertised professionally. Many recent condom programmes operate the same way all over the world. Community preference studies revealed that rectangular, dark green, high-quality polyester nets were the most popular. Regarding the insecticide, a decision was made to use individual net treatment doses and not larger units such as one-litre bottles. The sachets were packaged with a pair of disposable gloves and instructions, and sealed in a plastic bag.

2. Price: Village sensitisation meetings, feedback and experience from previous net projects suggested that local people would be willing to pay a near cost-recovery price for nets, but rather less than the cost-recovery price for the insecticide. Consumer prices were set at US$ 5 for a net and US$ 0.45 for an insecticide kit.

3. Place – the distribution system: Retail agents in each village, and wholesalers in every division, helped to ensure that people had easy access to Zuia Mbu products. Treated net retailers were selected jointly by the project staff and community leaders. All retailers participated in a one-day training seminar on malaria and its control, how to treat nets, and sales record keeping. Over a period of three years, the distribution network was progressively expanded to cover the total population of 460,000 spread over 30,000 km^2, two thirds the area of Switzerland, or one-fifth that of Bangladesh or Nepal.

5. Promotion: Community perceptions of severe childhood diseases were determined by two baseline studies, revealing that malaria was widely seen as a major health problem but not really recognised as a major

child killer. A high proportion of interviewed individuals (76%) named mosquito bites as the source of the mild form of malaria. However, no respondent linked the severe forms of the disease to mosquito bites. Other causes such as bad spirits, a type of moth or contaminated blood were mentioned. This differentiation had consequences for the type of preventive measures that were considered. Some 46% of the interviewees reported using a mosquito net for protection against the mild form of disease, but this was never mentioned for the severe form. Protective magical charms were thought to be effective protective measures for them. As a result of this formative research, a range of promotional materials was developed in collaboration with the district health management team (DHMT) focusing on (1) the link between malaria, mosquitoes and severe disease, (2) behaviour change, and (3) increasing the demand for treated nets and net treatment.

2.3.2. THE KEY ACHIEVEMENTS OF KINET

A total of 65,000 nets and 25,000 treatments were sold by the project between May 1997 and June 2000. The cost of this approach was estimated at CHF 10 (US$ 6.25)[34] per net distributed, and CHF 820 (US$ 514) per death averted. By mid-2000, over 50% of infants in the 25 villages covered were using a treated net. Most importantly, the coverage rate continued to climb after the end of the project; by 2003, over 80% of the total population were using a net (treated or not).

The regular use of ITNs was associated with a 27% reduction in child mortality, the first time such a spectacular result had been shown under programme conditions in sub-Saharan Africa. More than 200 child deaths were averted by the project over its lifespan.

The KINET programme was the pilot project for trying out a good many things – in the sense of Easterly's 'searcher' approach – and it provided much of the practical experience required to design a national scaling-up programme in 2000. Much of the distribution experience was useful in this, along with the experience generated by the SMITN programme (below). KINET also contributed the voucher scheme and hence an effective way of delivering targeted strategies to high-risk groups while strengthening the commercial distribution sector.

2.3.3. ANOTHER PIONEERING PROJECT: SMITN

In 1998, PSI started its own social marketing programme of ITNs, under the name of SMITN (Social Marketing of Insecticide-Treated Nets), which expanded to national level in 2000. The increased competition, along with the removal of taxes and tariffs on nets and netting material, brought prices down. Before social marketing, large family nets had been selling for the equivalent of about US$ 10. After SMITN, the same net was sold for US$ 4, with single nets retailing for as low as US$ 2.

2.4. SMARTNETS – A TANZANIAN PUBLIC-PRIVATE PARTNERSHIP 2002 TO 2007

The successor to SMITN was SMARTNETS, implementing a public-private partnership for ITNs between the Ministry of Health, PSI/Tanzania, the four Tanzanian net manufacturers, insecticide suppliers, distributors,

Public awareness campaigns in villages are an important tool to inform people about malaria and suitable ways to protect themselves.

Slowly a supply chain was evolving in the villages and first tests were made with a voucher to subsidise the cost for pregnant women.

wholesalers, retailers, NGOs, research organisations, advertising and promotion companies and the principal donors, DFID and the Royal Netherlands Embassy (RNE).

Each of these players had a specific role to play, either in policy, hardware delivery or in spreading the right messages The SMARTNETS programme ran from 2002 to 2007 and was fundamentally different from SMITN in that the social marketing undertaking no longer had its own brand and distribution system, but was entirely dedicated to supporting the existing commercial system.

These were the key components of SMARTNETS:
Setting up a nationwide supply chain: Before the project intervention, nets were only sold in the major cities and a key intervention was to establish in cooperation with the private sector a nationwide distribution system. Another important step was the bundling decision, an agreement with all net manufacturers that a sachet of insecticide would be included in every bednet sold. PSI provided the insecticide with the brand name 'Ngao' ('shield' in Swahili) to the manufacturers free of charge.

Promotion on public buses for the "Zuja Mbu" bednets

Social mobilisation and rural awareness creation: The intervention focused on rural areas using rural road shows, video van presentations and local theatre groups, billboards and other promotion means. In addition, much emphasis was laid on supporting mobile dealers in shifting markets with promotion materials such as megaphones, t-shirts, caps and information leaflets.
Behaviour change: An important element of SMARTNETS was to continue the national Behaviour Change Communication (BCC) campaign with the aim of supporting ITN implementation and fighting widespread fatalism regarding malaria.

SMARTNETS was also active in dealing with more general issues such as lobbying in government, and tax and tariff issues, until the establishment of the ITN cell in the NATNETS programme

2.5. TODAY: THE NATNETS PROGRAMME FROM 2007 ONWARDS

The main aim of NATNETS is the scaling up of ITNs in Tanzania. It has currently four main components:

1. A national coordination unit (ITN cell) within the National Malaria Control Programme, supported by the Swiss Agency for Development and Cooperation (SDC) and implemented by the Swiss Tropical Institute (STI).

2. The Tanzania National Voucher Scheme (TNVS) aiming to provide every pregnant woman and every infant coming for measles vaccination with a voucher worth TZS 3,250 (US$ 2.60) that can be redeemed against a bundled polyester net at participating retailers. Women have to pay a top-up contribution – in 2005, it averaged around TZS 1,000 (approximately US$ 0.80). By 2007, the top-up had risen, in line with petro-chemical prices, to about TZS 1,600. The dual idea of giving women a voucher rather than a highly subsidised net is (1) that it leaves the trouble of ITN distribution entirely to the commercial sector, and (2) that it strongly stimulates the development of the commercial net sector, which can then also cater for non-target groups and provide a sustainable distribution mechanism. Support comes from the Global Fund to fight AIDS, TB and Malaria (GFATM) and the US President's Malaria Initiative (PMI). Most TNVS activities are sub-contracted to implementing partners such as Mennonite Economic Development Assistance (MEDA) for the logistics of the vouchers.

3. The free-of-charge provision of insecticide treatment kits for bundling a sachet with each polyester

net manufactured and sold in Tanzania. This, and the marketing of subsidised, stand-alone re-treatment kits and the facilitation of LLIN technology transfer to the Tanzanian net manufacturers, are key elements and are currently financed by the PMI and the RNE.

4. Demand creation and Behaviour Change Communication. Two complementary programmes have now replaced the successful SMARTNETS social marketing programme (2002–2007). The COMMIT programme is supported by the PMI and implemented by a consortium led by the Johns Hopkins Bloomberg School of Public Health Center for Communication Programs, and the GFATM-supported Behaviour Change Communication programme, implemented by PSI.

In 2008, two more components will be added to NATNETS:

5. Catch-up: Since coverage of risk groups grew too slowly under the voucher scheme, NATNETS will conduct a mass 'catch-up' distribution campaign to provide free Long-Lasting Insecticidal Nets (LLINs) to all 7.2 million children under five years of age. This will be co-funded by the GFATM, the World Bank and the PMI.

6. Re-treatment: At the same time as the 'catch-up' campaign, a National Net Re-treatment Campaign will be carried out to re-treat approximately 6.5 million polyester nets, with support from the World Bank.

Promotion – and information – in all villages was necessary as no-one made a link between malaria and mosquito bites.

THE PRIVATE SECTOR INVOLVEMENT IN TANZANIA

3

Involving the private sector to perform the "heavy lifting jobs" was a key pillar of the dissemination strategy. This chapter describes the role of the private sector more in detail.

3.1. THE TEXTILE INDUSTRY IN TANZANIA AND SECOND-HAND CLOTHES

During the 1980s, the textile sector in Tanzania was struggling with tough competition from other countries (such as China) and also from European second-hand clothes that were flooding the markets. It is estimated that second-hand clothes worth more than US$ 1 billion are traded every year, mainly to Africa.

For example in Switzerland, TEXAID, a subsidiary of Swiss charity agencies founded in 1997, collects over 40,000 tons of used textiles per year and ships most of them to Africa, with apparent distorting effects on the local market. It is nonetheless doubtful if, even without such shipments, the African textile industry would have been able to remain competitive with the Asian textile industry. Studies were undertaken to determine whether these second-hand clothes were an unhelpful competition to the African textile industry; they arrived at the conclusion that this trade was not entirely to blame for the demise of this industry. The African textile industry was in shambles for many other reasons, and would not have been able to survive and compete with Chinese low-cost textiles, especially in West Africa. On the other hand, second-hand clothes are highly beneficial for poor consumers and the handling of second-hand clothes creates some 24,000 jobs in trading, distribu-ting, repairing, restyling and washing clothes in Senegal alone.[35]

3.1.1. AWAKENING: BEDNETS REVIVE A DEAD INDUSTRY

In Tanzania, this international competition from Asia and second-hand clothes also hit the clothing industry hard. One of its members, Textile Manufacturers of Tanzania Limited (TMTL), had closed down production in the 1980s and their machines were getting rusty (see photo).

At the end of the 1990s, the owners recognised mosquito nets as a new market opportunity and re-started production of netting on a small scale. Some of the machines used to weave textiles could also be used to make mosquito netting. All that was required was to set up a stitching workshop and a new distribution network. Currently, TMTL produces around 1 million nets per year.

An even more dramatic story is that of A to Z, a company based in Arusha, which started mosquito net manufacturing from scratch in 1997 and has become a leading global manufacturer. A recent joint venture with Sumitomo Corp has given A to Z access to LLIN technology and has become an industrial success story.

Today, there are four major manufacturers of bednets operating in Tanzania, a business that is traditionally in the hands of Asian entrepreneurs. That number may, of course, change as they depend on positive, or downward, trends in the national, and, in particular, international markets. In 2005, they produced and sold some 2.7 million nets per year. With a surge in exports in the last few years, the entire bednet industry in Tanzania now (2008) produces over 10 million nets per year.

Sales of second hand clothes have distroyed the textile industry in Tanzania and the knitting machines were rusting.

Bednets have led to a revival of the textile industry in Tanzania. The TMTL factory in Dar es Salaam is now back in operation, producing nets.

Making bednets is labour-intensive, with several steps of weaving, sewing and finishing before the nets are ready. Pictures from the Sunflag factory in Arusha.

A to Z textile mills in Arusha was a latecomer in bednet manufacture, but is now the largest manufacturer in Tanzania with over 60% of market share.

With a contribution by the Acumen Fund, A to Z started producing Olyset LLINs under licence from Sumitomo Chemicals from Japan.

The opening of the new Olyset factory in 2008 was celebrated as a milestone in the fight against malaria.

These are the four manufacturers:

1. Sunflag (Tanzania) Ltd.: This large textile mill belongs to an India-based steel conglomerate, the Sunflag Iron and Steel Company Ltd. The company was founded in Arusha in 1967 and employs over 3,500 people. Manufacturing a whole range of textiles products, mainly for export, Sunflag has always produced bednets and were the first manufacturer to switch to polyester nets in the mid-1990s. It produces around 750,000 nets per year with a market share of 26% in 2007.[36]

2. MOTEX Ltd.: This company in Moshi was established in 1980, but soon shut down all its operations, when the entire Tanzanian textile industry turned unprofitable. It started again in the 1990s as a sub-contractor of knit fabrics for A to Z of Arusha, until the latter set up its own fabric knitting facilities. It is estimated that MOTEX produces some 135,00 nets per year, with a market share of scarcely 5%.

3. A To Z Ltd.: is now the largest bednet manufacturer in Tanzania with a production of over 1.5 million nets per year and a share of 63% in the Tanzania market in 2007. In 2003, A to Z was chosen by UNICEF/WHO and the Acumen Fund as the first manufacturer of LLINs, long-lasting insecticide-treated nets in Africa.

4. Textile Manufacturers of Tanzania Ltd (TMTL): is another former textile manufacturer that re-converted to mosquito netting. TMTL is the only factory based in Dar es Salaam.

3.1.2. THE INSECTICIDE MANUFACTURERS

The Ngao brand insecticide treatment kit is sold at a highly subsidised price by PSI, either in a sachet bundled along with the net, or as a home-based re-treatment kit through various distribution channels. The chemical is manufactured by transnational companies such as Bayer, BASF or Syngenta. Recently, PSI replaced the conventional Ngao with the longer-lasting KO-Tab 1-2-3 produced by Bayer, a product that includes a binder. All insecticides used in Tanzania have been officially approved by the WHO insecticide testing scheme (WHOPES). One disadvantage of the new product is that it costs about four times the conventional insecticide treatment (US$ 1.60 versus US$ 0.44).

3.1.3. THE PRODUCTION OF LLINS IN AFRICA: OLYSET

Manufacturing long-lasting nets is technologically not straightforward and it is a big step from conventional textile to high-tech textile production. Basically, a long-lasting insecticidal net can be manufactured in two ways. Either one uses a binder to make it harder for the insecticide to be washed off the netting, or as in the case of Olyset, the insecticide is dissolved into the polyethylene granules. The latter technology was developed by Sumitomo chemicals in Japan and made available to Africa with minimal support by the Acumen Fund of the Rockefeller Foundation. The fund is a New York-based non-profit organisation that invests philanthropic resources in innovative social entrepreneurs and enterprises with a primary goal of social change. After visiting a number of bednet manufacturers in Africa, Acumen chose A to Z Textile Mills Limited in Arusha, Tanzania, as being the most promising candidate company for the early transfer of the new technology. The fund then provided a loan to A to Z Textile Mills to purchase the required machinery for the manufacture of insecticidal nets.

The machinery and specialised chemicals came from Japan's Sumitomo Chemical Company, which invented the process. Sumitomo streamlined the production process to make bednets more affordable, and transferred its 'Olyset' technology on a non-exclusive basis to A to Z Textiles. In addition, Sumitomo agreed to train African technicians and establish quality control procedures for LLINs manufactured in Africa. The company has already expressed its willingness to transfer the Olyset technology to more African bednet producers. ExxonMobil, another partner in the venture, will supply the resin for the manufacture of long-lasting nets.

At present, there are also other technologies available, one is developed by Syngenta and traded under the brand name 'IconLife'. Permanet by the Vestergaard and Frandsen company is not on the market in Tanzania but elsewhere in Africa it sold to the tune of 60 million bednets per year, mostly due to public procurement during vaccination campaigns. Permanet is manufactured in Vietnam.

3.2. SETTING UP A NATIONWIDE DISTRIBUTION NETWORK

Whether the bednets are manufactured within the country or imported, the task of setting up a nationwide distribution network that reaches out to rural areas is a difficult one. Initially, the manufacturers in Arusha and Dar es Salaam established a network of retailers in the major towns. Thanks to SMARTNETS and the incentive provided by the TNVS, the retailing sector was also strongly developed in rural areas.

Today, the distribution network covers all districts where malaria is endemic in Tanzania and had over 6,500

Modern workplaces have been created in the new A to Z factory for Olyset LLINs

retailers in December 2007. The table below shows the historical development of the distribution network.

3.2.1. WHOLESALERS

Wholesalers have an important role to play and there are 260 wholesalers and sub-wholesalers participating in the TNVS programme. First, they are involved in the bulk trade and get their mosquito nets from Arusha, Moshi or Dar es Salaam. Depending on sales, they may order a full truck, half a truck or a small truck. Each order requires a substantial investment. One truck, or 40-feet container, can load 200 bales of 125 nets each (25,000 nets) and is thus worth almost US$ 100,000. From their place of storage, the nets need to be distributed to sub-wholesalers and finally to dealers. For this, the wholesaler needs a well-woven distribution system, involving small trucks or pushcarts. Finally, he has to collect the money – or as we will see – the vouchers from the sub-wholesalers and dealers.

One large wholesaler like Kenthouse (see next page) may sell some 50,000 nets per year and have six to eight sub-wholesalers catering to the retailers. The margins of a wholesaler are around TZS 200 to TZS 250 per net (US$ 0.22); for the sub-wholesaler, they are around TZS 300 to TZS 400 (US$ 0.24 to US$ 0.32). As most dealers only take 10 to 25 nets on stock, a wholesaler operation needs to supply some 1,000 dealers to be viable and have a sufficiently fast turnover of his stock.

All wholesalers have expressed their satisfaction with the net business and have confirmed that sales have gone up considerably in the last years. Mr. Anwer G. Karim of Kenthouse said: "We know that PSI and MEDA will not be here forever to create the market for ITNs, but we are confident that, once they pull out, malaria bednets will be known in Tanzania and that the sales will continue."

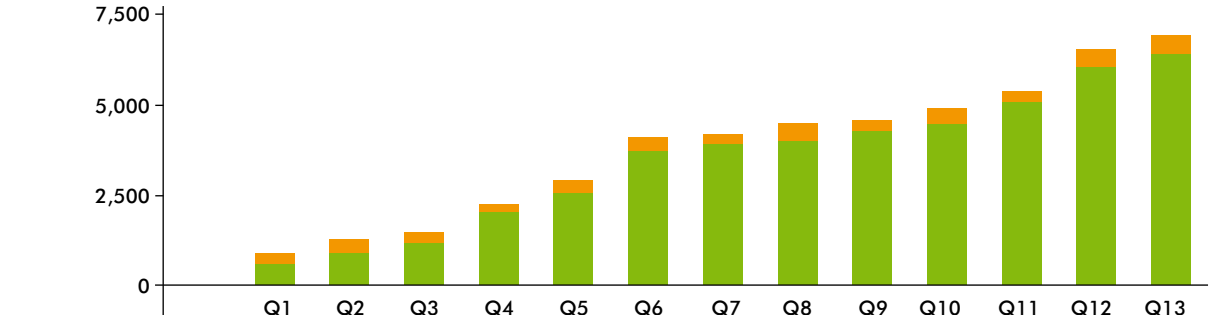
3.2.2. DEALERS

Over 6,500 retailers have enrolled in the net distribution programme in Tanzania. While it was very easy to find dealers in the main cities, it was much harder to make the selling of ITNs attractive in rural areas.

There is now a broad array of retailers in place; most of them also sell other products. For example, pharmacies are good places to sell mosquito nets and insecticide re-treatment kits. Pharmacies are a natural place for pregnant women to go to redeem their vouchers. Hardware shops and general stores are other distribution channels but the most important strategy to reach out to rural areas is through mobile dealers. These traders buy a stock of nets from the sub-wholesalers and do business every day at another shifting market in one area. They usually travel by bus, carrying between 10 and 30 nets with them.

Shifting markets are a good place to sell nets because many farmers come there to sell their products. They thus often have cash in hand when they attend these markets. There is not, apparently, always a direct link between the cash income of a family and the purchase of ITNs. Two women told us that they could only buy the nets because they have their own small trading business on the side from which they can earn some cash; the husband would not allow them to purchase a net with money from the sale of agricultural products.

The impact of the SMARTNETS efforts is significant: the number of sales posts has increased both in major trading centres and in poor rural areas since 2005: "In non-



	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13
wholesalers	33	63	73	119	134	174	192	206	206	226	230	241	260
retailers	701	1,022	1,300	2,091	2,618	3,773	3,909	4,058	4,280	4,517	5,023	6,037	6,509

Number of retailers and wholesalers

The logistics challenge: One single net is not cumbersome, but storing and shipping large numbers of nets becomes a bulky affair. With one bale containing between 100 and 150 nets, handling three million nets means sending around 25,000 bales to every corner of Tanzania.

The Karim brothers (left, Anwer G. Karim) of Kenthouse Ltd. in Dar es Salaam have been wholesalers in textiles for over 30 years. Their main products are bedsheets, t-shirts, school uniforms and now insecticide-treated bednets, in a major way.
Mr. Farhad Ladakh (right) is a textile wholesaler and sells bedsheets, t-shirts and similar products. He also distributes large numbers of bednets through their traditional and newly created distribution network.

Retailers in Dar es Salaam: in the busy market near the bus stands, almost all shop-owners sell ITNs. Many small shop-owners were mobile dealers (itinerant street traders) until that activity was banned and they had to use a fixed shop in a market.

major trading centres the proportion of wards with at least one outlet stocking a net kit almost doubled from 35% to 65% in 2007, and in major trading centres the proportion increased from 79% to 91%."[37]

The growth of the consumer market for nets underscores the impact of both the distribution network which has been set up and the behaviour change communication. Rather than cannibalising commercial sales, ITN voucher sales have actually grown the market, with commercial sales growing at the same rate as voucher redemptions and selling at the same volume as vouchers.

3.3. PROMOTION: DELIVERING SOFTWARE ALONG WITH THE BEDNETS

To have set up a functioning and highly decentralised supply chain is a tremendous achievement, which would not have been possible without an outstanding promotion effort by Population Services International (PSI). The basic concept of their social marketing projects is two-fold:

1. Achieving a behaviour change objective: this means creating awareness about the benefits of insecticide-treated bednets and net re-treatment. Some aspects of the communication campaigns are presented below in more detail.

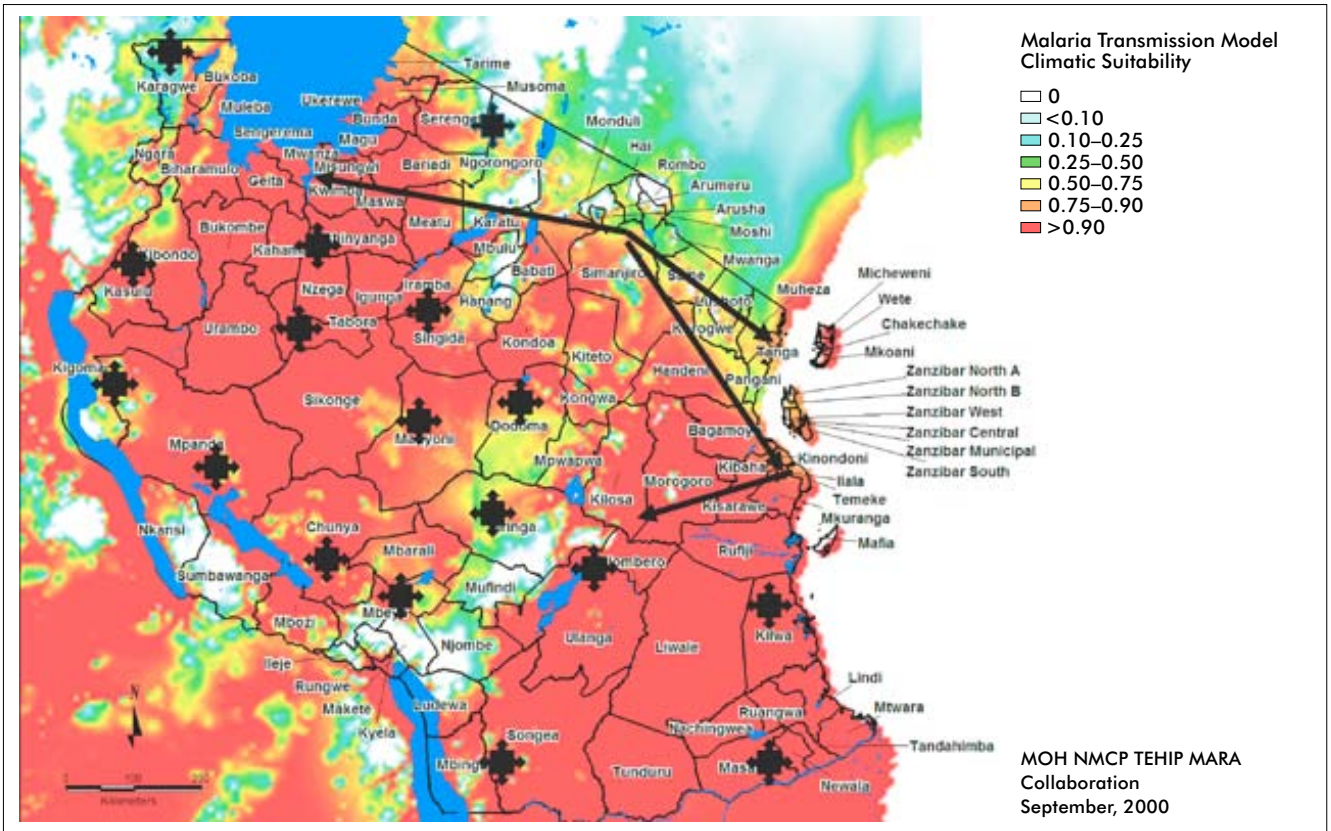
2. Creating a market for ITNs: while making ITNs popular and using a well-defined marketing strategy, sales of nets are expected to increase, thus making it more attractive for the private sector to participate. This is called the 'crowding-in' effect.

Different strategies have been pursued to achieve the two objectives.

3.3.1. BEHAVIOUR CHANGE: "MALARIA HAIKUBALIKI"

It is very common that a frequent disease is seen as being 'part of life', against which nothing can be done. For this reason, the key message of a recent PSI campaign has been "Malaria Haikubaliki" – 'malaria is unacceptable'. This alerts the population to there being solutions to this deadly disease, with a simple answer on offer, if bednets are properly used.

Alongside this message, it is also important to give the right information on malaria, on the effect of mosquito



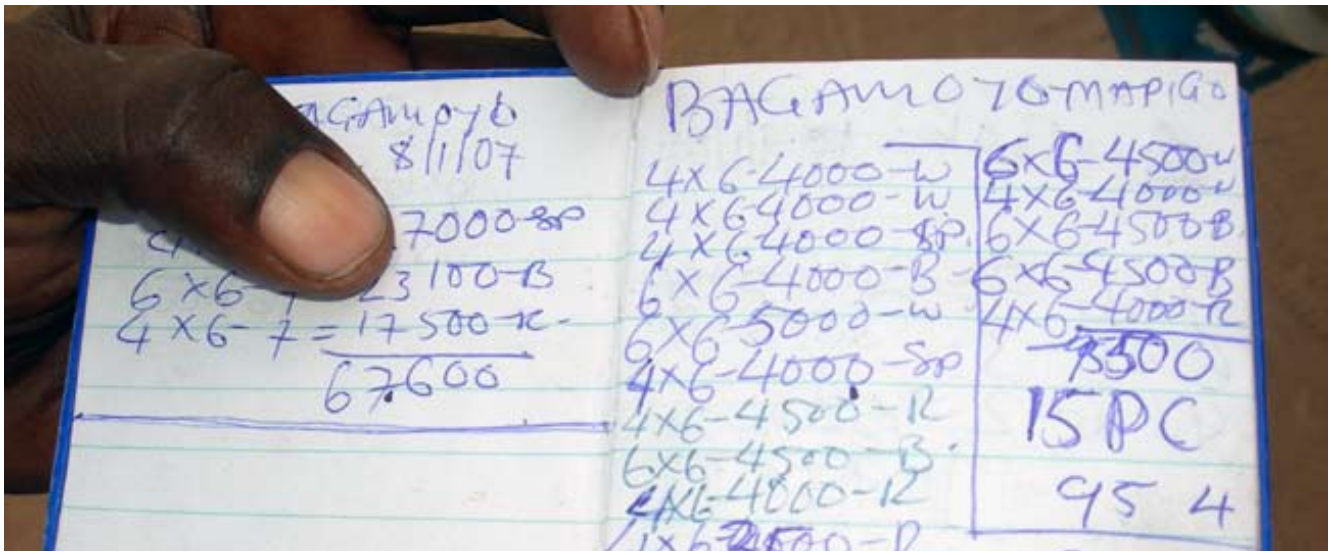
This map shows the areas at risk from malaria and the corresponding distribution networks. The black dots show major wholesale operations. Before the different project interventions had created a national distribution network, bednets were only available in major cities.

The Tumbi pharmacy in Kibaha is located next to a hospital; many pregnant women come to buy their nets with the vouchers they get from the ante-natal clinic. Ngao brand insecticide re-treatment kits are sold in a small pharmacy and beauty shop, but they do not sell very well.

This woman has just bought her second net, paying in cash. She had a voucher to get her first net but now it is worn out. She had a severe malaria case herself, and her child a mild malaria case; now she wants to protect her and her child. Her small business, fortunately, is doing pretty well, so she could save up the cash. Her husband would not have allowed her to buy the net with 'his' money. The woman on the right has a similar story, buying her second net to replace the old one that has got holes.

PSI has helped many mobile dealers to set up their business. Some attend very large shifting markets, others only a small corner 'shop'. Although it is hard work running from one market to another, their smile seems to say "business is good".

Mr. Joseph Williams is a mobile dealer, travelling every day to a different shifting market by bus. He has some 30 nets in stock, but sells up 25 on a good market day. He makes about TZS 500 gross profit on a net and can thus earn, net, up to TZS 6,000 (US$ 4.80) on a good day. PSI has given him a megaphone to increase his sales – he is also local co-ordinator for PSI.
He needs a working capital of some TZS 100,000 (US$ 80) for always having a decent stock of 30 nets for one day. He could, in any case, not transport many more in the bus. He also keeps very detailed records of all sales, including the sizes of nets sold.



nets and on how to use them properly. Many people do not know that the mosquitoes which make the most disturbing noise are not the ones that transmit malaria. The culprit, the *Anopheles* mosquito, preferably bites late at night and inside houses.

PSI has prepared creative briefs for several campaigns with posters, radio and TV but also with mobile video vans. One such brief for spreading the message that insecticide treatment is effective is shown in the text box below.:

These campaign messages are complemented by widespread social mobilisation efforts with mobile video vans showing such films as 'Malaria Haikubaliki'.

3.3.2. CREATING A MARKET FOR NETS IN RURAL AREAS

PSI has also done a lot of additional marketing to improve the availability of nets in rural areas. Posters, demonstrations, support to dealers with information materials, songs, music, megaphones and many other supporting tools have been used.

Each retailer has undergone a short training course, with these retailers always present when PSI undertakes its awareness campaigns. They thus benefit directly from the demand created through these awareness campaigns. Special emphasis has been put on making bednets available at shifting markets and a great deal of promotion was done to support retailers at such places.

3.4. MAKING ITNS AFFORDABLE: THE TANZANIA NATIONAL VOUCHER SCHEME (TNVS)

The single most important stumbling block for large-scale dissemination of ITNs is affordability. Evaluations have consistently shown that many people would like to have a bednet but they cannot afford it, at least not immediately. To make bednets affordable thus requires subsidies, targeted or not. Smart ways of targeting are important as earlier evaluations of KINET have shown that subsidies can easily be misused.

At the same time, it is crucial to distribute the subsidies in such a way that they can stimulate the private sector to make bednets available anywhere, and at any time. The Tanzanian National Voucher Scheme is a unique system which aims to target vulnerable people, to prime the market and to create demand for bednets in the most remote rural areas. Nowhere has a similar voucher scheme been made operational on such a large, national scale.

3.4.1. HOW THE VOUCHER SCHEME WORKS

Launched in 2004, the Tanzania National Voucher Scheme (TNVS) is based on the work piloted by the KINET project, using a unique and innovative public-private partnership approach to reduce the impact of malaria amongst pregnant women and children under five. The Mennonite Economic Development Association (MEDA), a reputable non-governmental organisation, is the logistics contractor for the TNVS and handles over one million vouchers per year. This is quite a challenging job,

Behaviour Change Objectives	Communication Objective
To create a strong belief among parents of under five year children that NGAO is really effective against malaria transmitting mosquitoes. That NGAO supercharges nets to repel and kills malaria mosquitoes.	**To create awareness to the target group that:** **1.** NGAO has been proven to be 100% effective with malaria mosquitoes **2.** Not all mosquitoes are malaria mosquitoes **3.** Nuisance mosquitoes are less susceptible to insecticide-treated nets **4.** For NGAO to be effective proper treatment procedures have to be followed (correct amount of water, dry and clean net, etc) **5.** One bottle of soda full of water for a small net and two bottles of soda full of water for a big net are the only amounts of water required to treat nets for effective protection

A road show run by PSI goes from village to village, presenting the film Malaria Haikubaliki and other promotion materials

Sometimes massive promotions are made in connection with vaccine and other health campaigns. The logo of Malaria Haikubaliki is omnipresent on the streets as well, even on the covers of spare tyres.

as vouchers are distributed through some 4500 antenatal clinics and redeemed by over 6,000 retailers, 80% of them in rural areas, and 120 wholesalers. The figure below shows how the vouchers are distributed to the target group.

One of the key issues in the design of the voucher scheme was to ensure security and to avoid fraud. The vouchers are printed in South Africa by a specialised printing house and carry security features similar to bank notes. Each voucher has a number and bar code and can be traced. So far, no fraudulent vouchers have been discovered.

The figure on page 38 also shows how the vouchers are redeemed. After the woman has received the voucher, she can get a net from a retailer against the voucher. One voucher has a value of TZS 3,250 (US$ 2.60) and pays a large share of the net. The dealer usually asks for a top-up of some TZS 1,000 (US$ 0.80) or more if she wants to have a better or larger net. The retailer can redeem the voucher with the wholesaler against more nets, but not cash, in order to prevent fraud. The wholesaler collect the vouchers and redeems them either against cash from MEDA, or against new nets with the manufacturers. Cash is thus only moving directly from MEDA to the manufacturers and selected wholesalers – this reduces the risks of losses and fraud considerably.

Such a system is not cheap, since MEDA needs to set up a nationwide logistics system. For this purpose, MEDA has a staff of 54 people (33 are administrators, accountants, regional, middle and senior managers, and 21 are drivers). The division of roles between MEDA and the private sector is worthy of note, with MEDA handling subsidies for bednets and only moving the vouchers around, and all so-called "heavy lifting" jobs, the physical shipment of nets, being undertaken by the private sector.

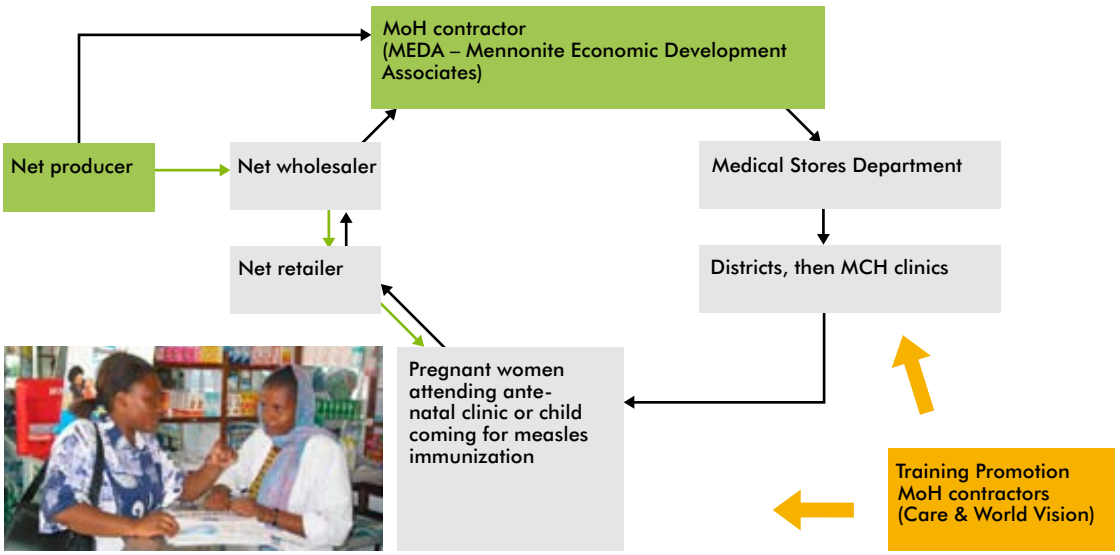
The impact of the TNVS is impressive: since its inception in 2004, it has distributed over three million vouchers and has thus directly served millions of pregnant women and children. The health impact is visible, with a substantial reduction in child mortality seen since 2004. Another major impact of the TNVS system is to have served as a priming agent for the market: thanks to the vouchers, sales of nets have increased dramatically, not only in sales against vouchers but also direct cash sales. For every bednet sold against a voucher, about two nets have been sold for cash.

In targeting pregnant mother and children with subsidised nets, it has reached its primary objective of reaching the most vulnerable groups. At the same time, ITNs have become very popular and this has stimulated a

Malaria Day 2004: a group of nurses and doctors draws the attention of the public to bednets.

Roadside billboards are used to spread the message about the Ngao-brand insecticide. PSI always uses branding in product promotion.

The promotion is not for one specific brand of nets but is both generic and multi-brand: all nets are promoted simultaneously but with the same corporate identity for the main message: ITNs are effective against malaria



Tanzania National Voucher Scheme (TNVS)

market for the private sector. In remote rural areas in particular, it would not have been feasible for private retailers to start a trade in bednets had there been no voucher scheme.

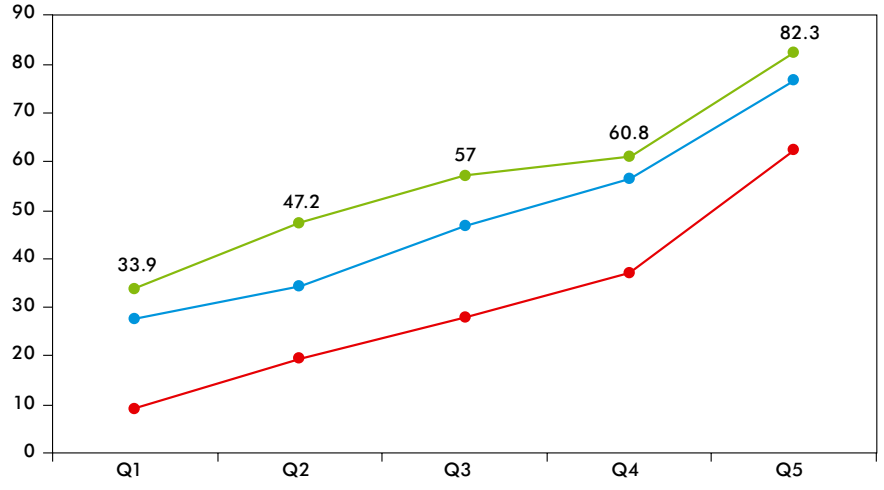
3.4.2. HOW TO REACH THE VULNERABLE GROUPS: CHILDREN UNDER FIVE?

One, critical, shortfall of the TNVS that its coverage rate (in June 2007: 47% for any nets and 32% for treated nets) has been well below the expected 60% for treated nets. This is, in part, due to the fact that the TNVS only targeted pregnant women and newly born children. Since polyester nets only last for two to three years of intense field use, the replacement rate for older children has not been adequate.

As a partial solution, the programme has introduced an Infant Voucher (IV) targeted at children attending measles vaccination when they are around one year old. As a result, an increase is expected in the number of children receiving measles vaccinations, with more parents or caregivers bringing in their children for their vaccination promptly at nine months.[38]

3.4.3. BEDNETS AND EQUITY: HOW TO REACH THE POOR?

The well-organised monitoring system of NATNETS has consistently shown a trend of stagnating uptake among the poorest groups. Some 15% of vouchers are never redeemed, in about half the cases because of "lack of money". It seems that a sizeable group of poor people



Net use (any net) of children under one year of age, by socio-economic strata (Q1= lowest quintile, or poorest group) and by year

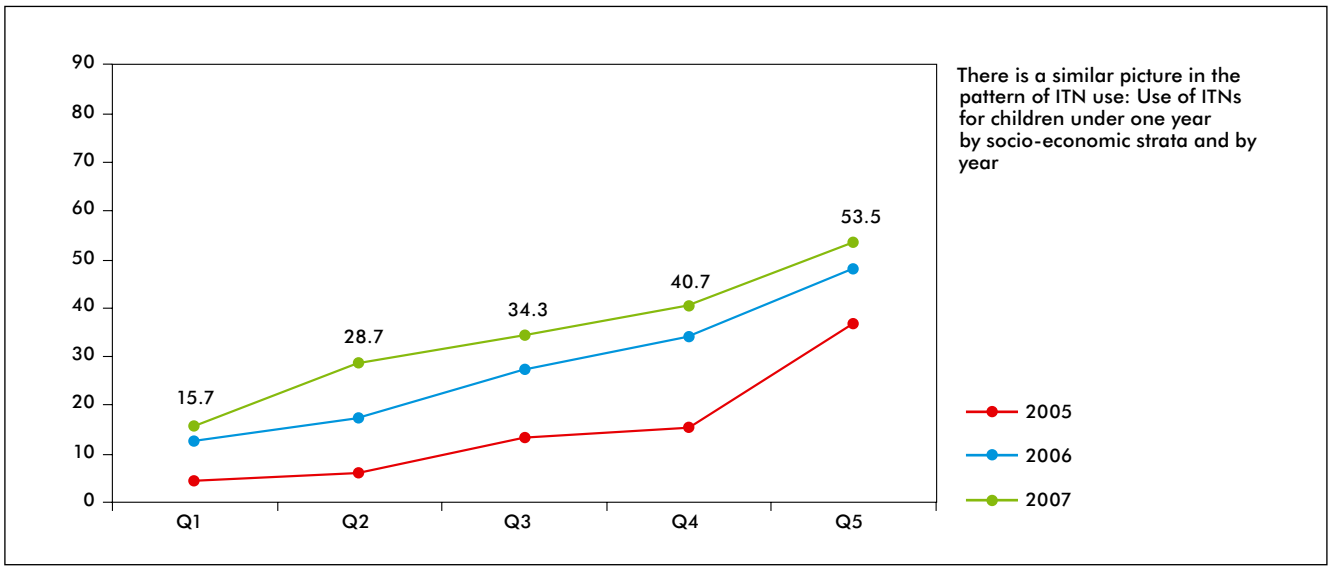
Mr L. N. Shah, a textile and bednet wholesaler in Dar Es Salaam, is handling a set of payment vouchers which have been presented by end-users and retailers, and will now be submitted for reimbursement.

This booth – in a former container – is located in Dodoma, next to the office of the District Medical Officer (DMO). Dealers can redeem their vouchers here against new nets.

simply do not have the money to pay the top-up fee of about US$ 0.80. The graphs below show how the lower socio-economic groups have a much lower coverage with ITNs, and they remain unprotected. This is especially disturbing as the negative impact of malaria in these groups is very high.

To address this constraint, the TNVS has attempted the introduction of an equity voucher that would take care of the top-up fee for the poorest. Unfortunately, the implementation proved to be impossible.

The voucher carries some key safety features of bar codes, unique numbers and watermarks, similar to bank notes and bank cheques.



There is a similar picture in the pattern of ITN use: Use of ITNs for children under one year by socio-economic strata and by year

TAKING STOCK IN TANZANIA: IS THE GLASS HALF FULL OR EMPTY?

4

The discovery and dissemination of ITNs in Tanzania is one of the success stories of development co-operation. About 10 years ago, net use was below 10%, with no treated nets in use except in a few small project areas. Awareness of both malaria and the benefits of ITNs was very limited, and even the priority given by the Government to malaria control in general was low. There was, essentially, a belief shared at all levels that malaria is such a big problem that nothing could be done.

4.1. THE ACHIEVEMENTS SO FAR

In the last decade, ITNs have become a common household item, with household ownership of any net at over 80%. They are well accepted by the population, and they are available virtually everywhere at over 6,500 retailers. The national ITN production is over 15 million pieces, and a new and thriving industry has been created. The use of nets is an accepted and encouraged behaviour and the distribution structures are well in place. Malaria control has now a high visibility within the *Ministry of Health and Social Welfare (MoHSW)*, in line with its prime importance as a source of disease and death. Finally, NATNETS is a strong and well-coordinated programme, with substantial and secured funding for the years to come.

Clearly, the glass is half full and not half empty.

4.2. CATCHING UP, WHILE HAVING A GOOD KEEP-UP SYSTEM

There are, however, some daunting challenges ahead.

First of all, there is a need to accelerate coverage among the high-risk groups, much more rapidly and equitably. Following a very comprehensive strategy discussion among ITN stakeholders in 2007, it was decided to implement a mass campaign of free LLINs to all children under the age of five years in 2008 (7.2 million LLINs). This campaign will be supported by the GFATM (58%), the World Bank (37%) and the PMI (5%). At the same time, there will be a mass re-treatment of all existing polyester nets with a long-lasting insecticide, in fact converting many untreated nets to be LLINs for the rest of their life-span.

Various upgrades of the TNVS are also planned, including raising the value of the voucher so that it covers a LLIN, and to reduce the top-up amount paid by pregnant women and mothers to only TZS 500 (US$ 0.40).

As a result of these measures, coverage of children should exceed 80% by the end of 2008.

A serious challenge in this catch-up campaign will be to leave the current supply chain intact. Fortunately, the experience with free net distribution in Lindi and Mtwara in 2005 (the infamous 'Sharon Stone nets') indicates that both the commercial sector for nets and the voucher scheme are likely to survive the mass distribution, if given only to children. If free nets are targeted at vulnerable groups only, there may still be sufficient demand – or perhaps the free distribution may even act as a primer – to allow for private purchases.

4.3. REMAINING CHALLENGES

Other challenges still remaining in striving to serve the entire population and especially the vulnerable groups in Tanzania – and even more so, if we talk about all of Africa and other malaria regions. One such challenge has to do with the technology improvements, the other with the universal reach out issue.

4.3.1. ESTABLISHING THE LONG-LASTING INSECTICIDE TECHNOLOGY

There is a clear consensus, at both global and national level, that long-lasting insecticidal nets (LLINs), while initially more expensive (US$ 5 to US$ 6 versus US$ 2 to US$ 4) offer a much easier operational prospect and a lower cost per year of effective malaria protection. In the introduction of LLINs, there are both technological and programmatic issues to consider.

Good technological solutions exist nowadays, with no less than five products currently on the market that fit the LLIN criteria of WHO. One of these technologies has already been introduced on the Tanzanian market by A to Z (Olyset nets). The other manufacturers are also considering their options and TMTL has now a commercial agreement with the company making IconLife nets (Syngenta). The process of technology transfer is being promoted currently and supported by PSI and the PMI.

More challenging is the introduction of LLINs through the commercial market, because their higher prices

make them relatively unattractive to consumers. Higher (up-front) investment costs represent a high hurdle for poor people. This is the case with any product and poor people typically buy in small portions as per their daily urgent needs. Whether or not it is cheaper in the long run is an irrelevant consideration for somebody who does not know how she can serve an evening meal to the family. Bednets therefore have a high price elasticity and an increase of two dollars on the price of a net is a very strong deterrent to purchasing that product.

Currently there are plans to upgrade the value of vouchers for pregnant women and infant, so that they cover the higher cost of a LLIN. There would also be the possibility to subsidise the product directly at factory level but that route has not yet been explored.

4.3.2. UNIVERSAL DISTRIBUTION OF LLINS

Another, much-debated option is the massive free LLIN distribution to the entire population. This strategy is now recommended by WHO in order to move from the control of disease and death in high-risk groups to a true vector control operation. This is then seen as a first step towards a massively-reduced malaria transmission in high transmission areas such as in Tanzania. However, this approach is obviously very costly and funds still need be raised.

Discussions about universal free distribution are now made possible by the much changed international funding situation. Ten years ago, there was virtually no funding for malaria control and solutions had to be found which offered a good prospect for sustainability beyond donor involvement. This was the basis for the emphasis on ITN commercial distribution in Tanzania, with the later addition of the TNVS. In 2008, malaria control funding is available on a massive scale, in particular through the GFATM and there is a real prospect for a high and predictable funding level for ITN programmes.

However, such a massive free distribution (around 12 million LLINs – in addition to the 7.2 million LLINs distributed in 2008) very probably means the end of the commercial distribution system. With two LLINs per household on average, the remaining market for nets for the coming years would be very small. As a result, the TNVS would probably also cease to be functional and a new keep-up system catering for the newly pregnant women and the newly born children will have to be found.

It is also debatable whether such massive investments in malaria control are justified if other diseases such as diarrhoea or malnutrition do not get the same attention or are perhaps even further neglected if massive funds are channelled to combating only one disease.

CONCLUSIONS: WHAT IS THE RIGHT DELIVERY SYSTEM?

5

That the malaria bednets programme in Tanzania is a success story can be in little doubt. The fact that ITNs have such a massive impact on malaria, and on child mortality especially, points to the need to disseminate and make them available to the most vulnerable groups as quickly as possible.

Reaching those vulnerable groups who need the ITNs most – children under five – is a real challenge, especially in view of the poverty dimension: affordability is the key barrier to fast dissemination from the demand side. To provide access to the entire population and especially to these vulnerable groups, whenever and wherever ITNs are needed – even in the remotest areas – is a costly affair and calls for very refined logistics.

It was a very daunting and equally courageous attempt to involve the private sector in the dissemination of bednets through a network of manufacturers, wholesalers and retailers. Setting up a voucher system to subsidise the nets for the targeted people – pregnant mothers and children under five – was a smart way to stimulate the creation of a market rather than distorting it and discouraging the private sector from participating. Whether a retailer, wholesaler or manufacturer is willing to sell bednets depends only on the question if it is profitable or not.

Through the demand from private clients (repeat purchases) and from voucher users, it suddenly became interesting and profitable for small retailers to stock nets and even to attend rural markets and chase customers. Having set up a decentralised and country-wide retailer network is a very precious asset, especially in order to ensure that the keep-up demand can be satisfied: every day, new women get pregnant and children are born and new nets are needed then, not only during the days of vaccination campaigns.

In this sense, the involvement of the private sector in the "heavy-lifting jobs" has been very rewarding. The private sector thus played a major positive role in achieving public health goals in a sustainable way. This was obviously only possible in combination with social marketing efforts to create the awareness among the population and the voucher scheme to overcome the affordability issue.

However, this approach has also its limitations:

1. Catch-up needs and speed of dissemination: the market-driven dissemination cannot catch-up and reach vulnerable groups quickly enough. Many mothers are too poor to even pay the difference between the topping up amount (between 80 cents and one dollar), the difference between the voucher value and the bednet price. This is not because they are not interested, but they have so many other urgent needs and priorities that they cannot invest in an ITN. Whereas the system has worked quite well for pregnant women and new-born children, it is not likely to work fast enough to provide bednets to all children under five and additional catch-up programmes (free distribution during vaccination campaigns) may be needed.

2. Long-lasting nets and up-front investment: while LLINs are cheaper in the long run – and certainly more effective – the additional up-front cost (at least US$ 2 more) is a severe obstacle for the poor and may need considerably higher subsidies. If LLINs cost US$ 5 to US$ 6 and the top-up price that poor people can afford is less than a dollar, then it becomes difficult to argue against giving the whole net for free, if more than 80% has to be subsidised anyhow.

3. Targeting or universal distribution: if bednets are to be given free to the entire population, the private sector distribution will be more and more marginalised – few customers will be willing to buy a bednet if they know that they can get it free. While the universal distribution of bednets may be justified in order to eradicate malaria and its burden on poor economies, there is also a cost to such a massive course of action. Universal distribution can only be envisaged if very substantial external funding is available and can be assured for several years to come. Such universal distribution programmes will most likely spell the end of a private sector supply chain.

The experience in Tanzania has clearly shown that a combined strategy of public funding and an involvement of the private sector is an effective way to achieve public health objectives such as reducing child mortality due to malaria. Even the free distribution of bednets does not threaten a private supply chain, as long as that free distribution is targeted at vulnerable groups only – this was, was it not, the major lesson from the saga of the Sharon Stone initiative.

The approach of Tanzania's bednet programmes may now be threatened by its own success: insecticide-treated bednets are so effective and visually such a simple method that everybody should get them immediately – for public health reasons, not because of individual

priorities. Even if all people threatened by malaria – and especially the vulnerable groups – should be protected as quickly as possible, they do not have the money to buy them. Their consumer priorities are totally fixed by other, much more urgent and immediate needs such as buying kerosene to have some light tonight or some oil or charcoal to cook the evening meal.

Clearly. a massive universal distribution may overstretch the purchasing power of the population and the capacities of a private sector delivery network in underdeveloped markets of such poor countries as Tanzania. This is the difference with disseminating 9 million copies of the Harry Potter book to the children of the middle classes in rich countries in one single day.

Does this mean that Easterly is wrong with his scepticism of purely public supply channels? He might be wrong in this very specific case. There is a strong political will at national and international level to go for universal free distribution of LLINs and the available global funding seems assured for the coming few years. While delivering and especially maintaining full net coverage is a Herculean task, the current conditions are now such that this is an equally daunting task than setting up NATNETS in 2000, when nothing existed. Further, the search for pragmatic solutions based on multiple approaches that has characterized the Tanzanian programme so far could again lead to a working solution.

In this sense Easterly was right… The pragmatic searchers will carry the day in the end.

ENDNOTES

1 J. L. Gallup and J. Sachs: *The Economic Burden of Malaria*. American Journal of Tropical Medicine and Hygiene, Vol 64, 1 Suppl, 85–96

2 C. Lengeler, J. Cattani, D. de Savigny: *Net Gain – a New Method for Preventing Malaria Deaths*, IDRC / WHO, Ottawa and Geneva 1996, page 10ff.

3 Op.cit, page 17ff.

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POVERTY ALLEVIATION AS A BUSINESS – THE MARKET CREATION APPROACH TO DEVELOPMENT

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SHOULD BEDNETS BE SOLD, OR GIVEN FREE – HOW THE PRIVATE SECTOR CAN CONTRIBUTE TO MALARIA CONTROL

Over the years, a consensus has been built up in Tanzania that ITN dissemination strategies based on a subsidised commercial sector approach are the right answer to the current malaria challenge. It is an ongoing debate, in which another viewpoint, proclaimed by Jeffrey Sachs, calls the delay in the delivery of bednets "one of the shocking crimes of our time".

There is, at present, at least some level of consensus among malaria specialists that an approach is needed which combines both a catch-up and a keep-up strategy for ITNs. Basically, more than one approach is required and the value of complementary distribution mechanisms has been very well shown in Kenya, Tanzania and Malawi.

1. 'Catch-up' strategies: There is a need to increase coverage fast and this may only be possible through free, or highly, subsidised mass distributions. Public distributions linked to measles vaccination campaigns have made a big impact in, for example, Niger, Sierra Leone and Togo (where a 1- or 2-week campaign achieved 50% to 60% coverage in children under five years). Recently a very large distribution campaign spread over three years has been initiated in Ethiopia.

2. 'Keep-up' strategies: Massive free net distributions are time-bound and hence a sustainable and continuous system is also required to reach newly-pregnant women and newly-born children. Further, there is a need to continue getting messages out to the population to ensure further behaviour change. Keep-up strategies can involve clinic distribution of ITNs (such as in Kenya or Malawi) or a voucher scheme (as in Tanzania).

This publication tells the fascinating story of bednets dissemination in Tanzania from the early beginnings to the present.