Roll Back Malaria






Working Group for Scaling-up Insecticide-treated Netting

Scaling up Insecticide-treated Netting Programmes in Africa

A Strategic Framework for Coordinated National Action

CONTENTS

Illustrations

Working Group for Scaling-up Insecticide-treated Netting (WIN)

Purpose Statement

To provide the RBM partnership with strategic advice on best practices for scalable malaria vector control interventions in pursuit of the RBM Global Strategic Plan and Millennium Development Goals.

In most settings in highly-endemic malarious countries, the most applicable cost-effective malaria preventive intervention for national-scale implementation is insecticide-treated nets (ITNs) which are therefore the primary focus of the WIN. The only other cost-effective vector control method for large-scale application is indoor residual spraying (IRS). The WIN therefore also provides strategic advice for choices involving IRS. However other vector control interventions intended for more focal application including larval control and environmental management are not considered for national-scale strategies and are not addressed by this RBM Scaling-up Working Group.

Roll Back Malaria is a global partnership founded by the governments of malaria-afflicted countries, the World Health Organization, the UN Development Programme, the UN Children's Fund and the World Bank. Its objective is to halve the burden of malaria for the world's people by the year 2010 by saving lives, reducing poverty, boosting school attendance and making life better for millions of people living in poor countries, especially in Africa.

If you are interested in becoming part of the Roll Back Malaria movement and becoming part of the global success story in reducing malaria, please write to:

Roll Back Malaria
World Health Organization
20, avenue Appia
CH-1211 Geneva 27
Switzerland
e-mail: rbm@who.int or fax +41 22 791 4824
Website: www.rbm.who.int/partnership

Acknowledgements

We thank the many country programmes and individuals who provided feedback and suggestions for this second edition of the Strategic Framework for Coordinated National Action.

Preface

Prevention of malaria is a cornerstone of the RBM strategic plan, with increased coverage of ITNs in African communities a key element of the prevention effort. In many cases, promoting ITNs involves not only the public sector, but also the commercial sector, non-governmental organizations (NGOs), development agencies and communities. Since there is considerable variation within and between African countries in the capacity of public sector delivery systems and in the current state of commercial sector markets in ITN commodities, national ITN implementation strategies must be adapted to local conditions.

The first edition of the RBM Framework for Scaling-up ITNs in 2002 was useful and widely used to support scaling-up access to ITNs. Potential for rapid action have improved dramatically since then. The current edition seeks to respond to the opportunities created by the Global Fund to Fight AIDS, Tuberculosis and Malaria, the World Bank's Malaria Booster Programme for Rolling Back Malaria, the US Presidential Malaria Initiative and several other new sources. It further recognizes the rapidly growing capacity of the African public and private sectors. This revision also seeks balance and, we hope, synergy in responding to the dual needs of the rapid scale-up through public sector initiatives and the eventual evolution to a more sustainable approach to ITN distribution. The revision emphasizes that the priority of programmes should be rapid achievement of high coverage of populations at risk of malaria, without attempting to be prescriptive regarding the path taken to achieve this goal. It also recognizes the possibility—and probable necessity—of combining different approaches to ITN distribution to ensure sustained high coverage into the future.

This revision of the Strategic Framework for Scaling-up Insecticide-treated Net Coverage in Africa is consistent with RBM's Global Strategic Plan 2005-2015, which calls for rapid and sustainable scale-up of malaria control measures in Africa. It also reflects substantial feedback from national programmes and other RBM partners. The WHO Regional Office for Africa systematically solicited feedback from national programmes; the results of this process are incorporated here. In addition, the composition of the RBM working group on ITNs was substantially expanded thereby enabling a greater range of field experience to shape the content of this document. This revised consensus document is therefore the result of the efforts of the RBM partnership, as represented by the Working Group on Insecticide Treated Nets (WIN) whose membership includes national malaria control programmes, multilateral and bilateral organizations, research institutions, NGOs and the commercial sector.

The Strategic Framework outlined in this document is not intended to replace or supersede existing national strategies, but rather to help in their implementation and further development. It reviews some of the generic issues frequently encountered in sub-Saharan Africa during the integration of public and commercial sector activities. This framework offers suggestions and guidance as to how the various partners can better understand their different roles in the overall process, how they can help and avoid hindering the efforts of other partners, and how they can work together in a constructive and complementary fashion. Finally, it highlights the complexity of the strategic issues involved and that careful thought must be given to the design of sustainable national programmes.

Executive Summary

The African Summit on Roll Back Malaria (Abuja, Nigeria, April 2000) resolved ***"to initiate appropriate and sustainable action to strengthen health systems to ensure that by the year 2005, at least 60% of those at risk of malaria particularly pregnant women and children under five years of age, benefit from the most suitable combination of personal and community protective measures such as insecticide-treated mosquito nets and other interventions which are accessible and affordable to prevent infection and suffering"***. Since the first edition of this document in 2002, substantial resources have been raised through public: private partnerships for malaria interventions including ITNs through new funding mechanisms such as the Global Fund to Fight AIDS, Tuberculosis, Malaria, the World Bank's Booster Programme, the US Presidential Malaria Initiative, and other new sources. Many of these investments are making it easier for countries to procure the necessary commodities for their malaria interventions. But relatively little investment has so far been made in the necessary health systems by which these goods can be effectively delivered to those in need. Hence effective coverage with ITNs remains low in many countries and meeting the Abuja and Millennium Development Goal (MDG) targets continues to be a formidable challenge for Africa where public health delivery systems are weakest.

Strengthening health systems is not something that can be done quickly. Although increased funding for health system strengthening is now on the horizon for Africa, it is increasingly recognized that we cannot wait while the necessary sustainable systems are built. A two-pronged approach is needed to quickly reach high coverage, and then sustain high coverage.

The first priority is to accelerate achieving and exceeding the RBM and MDG targets using substantial public subsidies to guarantee access to ITNs for the most vulnerable. The parallel second priority is to be able to move seamlessly over time to a means of sustaining high coverage, even if large-scale subsidies are no longer available. In other words, a strategy to "catch-up" coverage must be linked to a strategy to "keep-up" coverage. We must avoid the trap where a singular focus on "quick wins" results in greater inequities later. Equally we must maximize the opportunity for these new investments to strengthen sustainable health systems that will serve effectively long into the future. For example, countries could link the subsidized delivery of free ITNs or high-value ITN vouchers to a national immunization campaign to rapidly achieve high coverage of infants and under-fives, and then continue with a system of subsidized delivery of ITNs or vouchers via a continuous targeting of pregnant women at ante-natal care clinics to maintain coverage. Moving to vouchers will pull commercial supply out to remote rural areas. Over the long term as malaria is controlled and household economies improve, the scale of subsidized delivery could gradually be reduced or focused and a culture of household transactions with an easily accessible local commercial source of ITNs will be in place for the majority of the population.

No country has yet done both catch-up and keep-up strategies at national scale. There is no text book on how this should be done. The goal is rapid, sustained, equitable, and effective coverage of the most vulnerable population. Planning a system that can achieve this raises important issues concerning subsidies, sustainability and the interaction between public and private sectors. These strategic issues are the focus of this document which examines the lessons learnt from current ITN programmes and reviews the broad options for maximizing the health impact of publicly-funded subsidies. Since the key to success in achieving rapid and sustained high coverage is complementarity between public and private sectors it also considers the best way to encourage the growth of a vigorous, competitive private sector. Some of the public sector actions required to bring this about are essentially temporary while others must be sustained over time. A national ITN partners task force or similar coordinating mechanism engaging a variety of public, private and NGO partners can help government to facilitate negotiation, coordination and complementarity in this scaling-up process.

Much of this document deals with the first priority of public subsidies for achieving rapid ITN scale-up. Subsidies must be targeted to achieve the maximum possible health impact, yet not burn bridges to eventual sustainability. There is an urgent need to identify effective mechanisms and clearly define target groups. Targeting pregnant women through antenatal clinics is an attractive option, since protection benefits will extend to the young child while it sleeps with its mother. Targeting young children through Maternal and Child Health (MCH) and Expanded Programme on Immunization (EPI) programmes is another attractive option. Advantages and disadvantages of the most common approaches to high subsidy ITNs are discussed in

this document: Distribution mechanisms have included selling ITNs at token prices via routine public sector health services; free distribution of ITN vouchers via routine public sector health services for free or highly subsidized redemption on the commercial market; free distribution of ITNs via routine public sector health services; and free distribution of ITNs via periodic public sector campaigns.

The second priority of long-term sustainability requires commercial market growth of the kind already seen in the United Republic of Tanzania. Such growth requires public sector stewardship, firstly through the provision of an "enabling environment" (including the removal of taxes and tariffs and streamlined regulation of insecticide products), and secondly through a vigorous campaign of public and privately funded demand creation and behaviour change using a variety of communication approaches and media. Care is needed to encourage competitiveness, and to avoid retarding the growth of local commercial access to ITNs.

Where the commercial market is not yet well developed, some form of "market-priming" may be needed. This is a temporary, transitional intervention involving the procurement and distribution of ITN goods, and aimed at strengthening unsubsidized distribution channels. Market priming must be time-limited, in order to avoid displacing independent commercial activity and creating a system dependent on an "all or nothing" subsidy. It must be evaluated in terms of its impact on sustaining high coverage in the long term.

There remain important questions: for example, how to target subsidies effectively, and when to transition from market priming? Each country and health system is unique. The balance between public and private sector activities will vary between countries, according to local conditions, health system capacity and rural penetration of commercial distribution chains. There is no one solution, and in some settings, a mix of strategies over time and place will make sense. This document is not intended to provide technical advice or to be prescriptive with regard to strategies. It is intended to share ideas and provoke strategic thinking with a view that ITN subsidies can work to strengthen both the health system and commercial distribution synergistically without excluding access of the most vulnerable. Its central vision is to reduce the intolerable burden of malaria morbidity and mortality in Africa through effective strategies to rapidly achieve and sustain high coverage with ITNs.

The Framework

1. Introduction

This RBM strategic framework for rapid national scale-up for ITNs coverage is fully integrated in and consistent with the RBM Global Strategic Plan 2005-2015[1].

1.1. Goal of the strategic framework

To provide a strategic framework for rapidly scaling-up and sustaining use of ITNs to national scale coverage in support of relevant RBM and MDG targets, prioritizing those who bear the brunt of the malaria burden, namely pregnant women, children under five years of age and people living with HIV/AIDS.

1.2. Objectives of the strategic framework

- To draw on lessons learnt from the implementation of large-scale ITN programmes in several countries, primarily in sub-Saharan Africa;
- To assist those responsible for the implementation of national-scale ITN programmes to design effective strategies for going to scale and maintaining high coverage;
- To outline roles and responsibilities of various partners involved in ITN programming, including the public and commercial sectors, NGOs and other agencies and institutions.

1.3. ITNs work but coverage is key

Regular use of ITNs in Africa reduces child mortality by 20%[2], and has a substantial impact on malaria morbidity in children and pregnant women[3,4]. When community coverage is high, ITNs not only protect those who sleep under them, but also those in the same dwelling (the home effect) and those living nearby (the community effect)[5,6]. Promoting rapid and sustained scale-up in the use of ITNs is therefore a key approach by the RBM partnership to the reduction of malaria morbidity and mortality.

In order to achieve maximum public health impact, ITN coverage needs to be maximized amongst those population groups that are most vulnerable to malaria infection and its consequences, primarily pregnant women and children under five years of age [7]. Other individuals and groups are also at increased risk from malaria, including the rural poor, orphans, child-headed households, people living with HIV/AIDS, and people living in refugee camps or in chronic emergency circumstances.

It is recognized that neither the public nor the private sectors are capable, with existing resources, of achieving the stated goal alone.

The cost-effectiveness of ITNs is similar to most childhood vaccines. In Africa, ITNs and IRS are both very effective for malaria vector control. There is mixed evidence concerning the relative cost-effectiveness of these two interventions: in some cases IRS appears to have been more cost-effective than ITNs, while in other cases the reverse was found. It is not possible to make any generalized assertion, for the region as a whole, that either of these interventions will be more cost-effective than the other. Hence, choosing between IRS and ITNs is largely a matter of operational feasibility, availability of local resources and prospects for sustained coverage. This document focuses exclusively on the ITN option.

As more financial resources are coming available, the potential for progress has never been higher. About half of the African countries have waived taxes and tariffs on nets, netting materials and insecticides. Since 2002, several countries started scaling-up free of charge or highly subsidized provision of ITNs for children under five years of age and pregnant women. As a result, there has been a substantial increase in ITN coverage in several of these countries and some have already achieved the RBM 2005 target. Although a number of countries are accelerating coverage and closing in on RBM targets, for many, figures still fall far short of the RBM target for ITNs of at least 60% coverage of high-risk groups by the year 2005.

1.4. The two-pronged approach

In recognition of this, the RBM partnership advocates a two-pronged approach to achieving national-scale ITN coverage.

- The first step incorporates short-term strategies, assisted by significant public subsidy to increase ITN coverage rapidly among those most vulnerable to malaria;
- The second step requires the longer-term design and implementation of sustainable strategies and systems that maintain high coverage of ITNs, and ensure that nets are adequately treated with insecticide and used regularly by those most vulnerable to malaria.

This is analogous to food crisis and food aid: starving communities need food first, but they also need to build systems that will provide sustainable access to food in the long-term future.

Integration of delivery systems into existing public sector programmes, including free distribution of ITNs or high value ITN vouchers to vulnerable groups through ANC and EPI services, can achieve rapid scale-up to high coverage[1]. For long-term sustainability, subsidized programmes should be complemented by support to growth of the commercial sector for production and distribution of ITNs. Design and coordination of these different approaches requires careful planning. Integrated approaches are not only more cost-effective than stand-alone programmes, but offer the opportunity for synergy, as ITN distribution may spur people towards increased utilization of prevention services unrelated to malaria, and spur private sector investment in commercial distribution systems.

Subsidies for at-risk groups are a mechanism to achieve maximum public health impact. Subsidies must be carefully targeted to ensure that limited resources are used in the most cost-effective manner. A variety of targeting and delivery mechanisms have been used including:

- ITNs distributed free during specific, time-limited campaigns by the health system such as measles and polio immunization campaigns;
- ITNs sold at a subsidized price to qualifying beneficiaries at government health clinics as part of regular service delivery;
- ITNs provided at a subsidized price or free of charge through community-based groups; and
- ITN vouchers delivered through the health system to qualifying beneficiaries, providing a substantial discount on commercially available ITNs.

Targeting pregnant women through antenatal clinics is an attractive option since targeting is simple and protection benefits will extend to the young child while it sleeps with its mother. It may also result in a complementary increase in the use of ANC services. Targeted subsidies delivered in conjunction with routine EPI activities; enhanced routine EPI, for example child health days/weeks; and immunization campaigns such as done for measles and polio can provide high volume increases in targeted communities.

Vouchers that are redeemable at a commercial retailer or other outlet (e.g. NGO, community group) and entitle the recipient to the full value of, or a substantial discount on the purchase price of an ITN, have certain advantages. Vouchers can be handled more easily by the public sector than bulky ITNs and can be distributed through a variety of mechanisms, including routine health services. Vouchers redeemable through commercial outlets securely shift the “heavy lifting” of ITNs to the private sector while also stimulating rural penetration, growth and development of the commercial sector, yet still targeting vulnerable groups.

Prior to 2001, the bulk of ITNs used in Africa were provided through unsubsidized commercial markets[8] and there is evidence that these markets can grow rapidly when stimulated by public sector actions such as demand creation initiatives and the removal of tax and tariff barriers[9,10]. Trends in Africa following reduction or removal of taxes include:

1) Commercial importation of ITNs greatly increased in Uganda;

[1] Targeted subsidies can include full subsidy resulting the equivalent of a free ITN service (e.g. full value vouchers).

2) Due to competition in the market place and promotion, prices decreased in the United Republic of Tanzania;
3) Consumers responded to the availability/accessibility and lower prices by purchasing more in Zambia and United Republic of Tanzania;
4) In Uganda, the removal of taxes and tariffs increased sales of ITNs almost four-fold.

There are considerable potential benefits from the creation of a vigorous and competitive market, including substantially reduced prices, improved product quality, enhanced marketing and educational efforts, increased penetration into rural areas, wider choice for consumers, and making possible voucher approaches that build synergies between the public and private sectors.

High levels of commercial activity and market growth, already seen in Benin, Gambia, Mali, Nigeria, Senegal and the United Republic of Tanzania, are also highly desirable for sustainable provision of ITNs. Commercial sector growth may be enabled by public sector actions such as removal of taxes and tariffs, streamlined regulatory approval of insecticides, market priming, generic demand creation activities and voucher schemes. While initial rates of coverage were inadequate, there has been substantial commercial market growth in ITN distribution over the past four years. This has raised ITN coverage, including in the countries where a culture of net use is new. Such trends are encouraging and highlight the progress that is being made in the development of sustainable private sector involvement in ITN distribution

Important operational questions remain to be answered in each of these areas of activity: for example, how to combine rapid scale-up initiatives with longer term sustainable coverage maintenance? how to target subsidies effectively, and when to withdraw market priming/market evolution? The balance between public and commercial sector activities will vary within and between countries, according to local contexts, and is also likely to change as the commercial markets develop and economic growth occurs. The public/private balance may be different for nets and for insecticide. The introduction of nets pre-treated with long-lasting insecticide treatment is also likely to create new opportunities and challenges.

The strategy suggested here recognizes that most populations affected by malaria live in rural subsistence economies, and have limited ability to pay for malaria prevention tools out of household budgets. While growth of the private and commercial sectors involved in ITN production, distribution, and marketing is necessary and desirable, use of public funds will be needed for some time to come to ensure appropriate levels of ITN coverage in most rural African communities. For country managers, the question is not so much "which strategy?" as "which mix of strategies?" The goal is to combine immediate impact with sustainability.

Health infrastructures in Africa are weak, inadequately funded, and face a daunting array of public health problems. The Global Fund to Fight AIDS, Tuberculosis and Malaria will, however, contribute several hundred million dollars during the next few years and this funding will be supplemented by other donor contributions such as the World Bank's Booster Programme. It is therefore important to focus part of this short-term finance for ITNs on building a system that allows recurrent public expenditure to be focused on the groups most vulnerable to malaria.

The revised framework outlined here represents the consensus of the Roll Back Malaria Partnership Working Group for scaling-up ITNs (WIN) which includes representatives of national malaria control programmes, multilateral and bilateral organizations, research institutions, NGOs and the commercial sector.. It concerns broad strategies rather than detailed tactics, reviews the strategic options and makes recommendations based on experience to date. It is intended for use by country-level RBM partnerships to develop and implement national strategies and programmes and as a framework for coordinating the activities of different agencies and sectors. Its approach is pragmatic and its goal is to ensure that public health expenditure on ITNs has the maximum possible public health impact, especially among those most vulnerable to malaria.

A SHARED VISION FOR THE FUTURE

All people exposed to malaria in Africa will own and use mosquito nets, either as long-lasting insecticidal nets or regularly re-treated.

Those most vulnerable to malaria will not be excluded from owning an ITN due to cost. Through public sector subsidies, vulnerable groups will be able to obtain ITNs at little or no cost to them through public channels (e.g. EPI or ANC), sometimes in the form of a voucher, and sometimes in the form of the ITN itself.

Within the commercial market, prices will be kept as low as possible by economies of scale and competition at all levels. Governments will help by providing an "enabling environment" which has two elements:

- *a favourable fiscal and regulatory environment, e.g. through removal of tax and tariff barriers; and*
- *a continuous promotional environment where informed demand is high, e.g. by using mass media as well as IEC and health education channels to encourage people to obtain and use nets and insecticide.*

1.5. Lessons learnt from experience

This revised framework is based on some important lessons drawn from ITN projects and programmes in several countries:

- The public sector can be an effective mechanism for rapidly increasing ITN coverage of vulnerable groups for public health benefit (e.g. Eritrea, Malawi, Togo, United Republic of Tanzania, Viet Nam and Zambia).
- The private commercial sector working with the public sector can be an efficient channel for distributing and marketing ITNs and targeting subsidies. There is evidence that commercial ITN markets are flexible and can expand rapidly in response to increased demand (e.g. Mali, Nigeria, United Republic of Tanzania, and Zambia).
- Equity tends to increase as coverage increases[11].
- Commercial retail prices (and even subsidized prices) may often be too high for some sectors of the population, including vulnerable groups at most risk from malaria.
- Economies of scale are significantly reducing the costs of distributing ITNs through public sector channels in some countries (e.g. Malawi).
- Demand for nets already exists wherever there is significant nuisance biting by mosquitoes and can readily be stimulated by demand-creation activities.
- The largest and longest sustained ITN programme in the world is in China where users purchase their own nets from the unsubsidized commercial market, and the government provides insecticide at no-cost through a regular net-treatment service.

1.6. Challenges

- A balance must be found between sustainability and equity.
- Ensuring an adequate supply of high-quality ITNs, especially in remote rural areas.
- The development of sustainable mechanisms for supporting community-managed ITN programmes, particularly in rural areas that are not adequately served by the commercial sector or the public sector.
- In most ITN projects where insecticide has been sold, even at very low prices, re-treatment rates have been disappointingly low (usually 20% or less) as the perceived value of the insecticide to end-users is lower than its cost.

- Until LLINs become widely available there is the challenge of how to maximize re-treatment levels for existing conventional nets.
- With LLIN technologies becoming more widely available, the challenges arise for how to make them affordable and how to manage the changeover from conventional nets to LLINs without creating confusion.
- Standardized quality assurance and control procedures will need to be developed to ensure institutional buyers and individual consumers that they are receiving a product that is effective.

1.7. Creating a Partnership – the Role of a National ITN Coordination Mechanism

An essential first step in scaling-up use of ITNs at country level is to create a national mechanism, such as a national RBM partnership task force, with representation from all partners including relevant government departments and agencies, multilateral and bilateral donor agencies, national and international non-governmental and civil society organizations, the commercial sector and research organizations. Such bodies, where given prominence under the MOH, can play a critical role in assisting the coordinating, planning and implementation of all stakeholder activities to maximize coverage, sustainability and cost-effectiveness.

The function of such a national ITN coordinating mechanism would be to catalyse the scaling-up of ITN coverage at national level. This is likely to include:

- Creating strong political support for RBM in general and ITNs in particular, especially within national and local government structures, but also among all stakeholders.
- Overall co-ordination of the national ITN scaling-up strategy
- Advocacy and mobilizing human and financial resources.
- Lobbying for the removal of taxes and tariffs on nets, insecticides and the raw materials used to make them.
- Facilitating negotiations between suppliers and national regulatory bodies.
- Negotiating, planning and setting up mechanisms to target and deliver subsidies for vulnerable groups.
- Continuous evaluation and monitoring of the implementation process, particularly the identification and removal of factors hindering commercial sector development.
- Setting an agenda for national and international research into specific operational issues.
- Providing consumer information.
- Articulating and promoting the national strategy at national and international levels.

2. Elements of the Framework

2.1. Strategic partnerships at national level

The national framework for implementation will involve a variety of activities, some of which are essentially temporary; while others must be sustained indefinitely. Some can only be carried out by the public sector or the commercial sector, while others are naturally part of the role of NGOs. Many activities, however, can be jointly done by more than one sector. The relationships between these domains of activity and sectors are illustrated in the figure below.

It is important to recognize that this generic framework needs to be adapted to local country contexts in order to maximize the health impact of both public and commercial sector activities. It is recognized that for most countries in Africa, public sector engagement through intensive publicly funded subsidies will be necessary to accelerate the pace at which national-scale effective coverage can be achieved.

2.2. Strategies for subsidized delivery

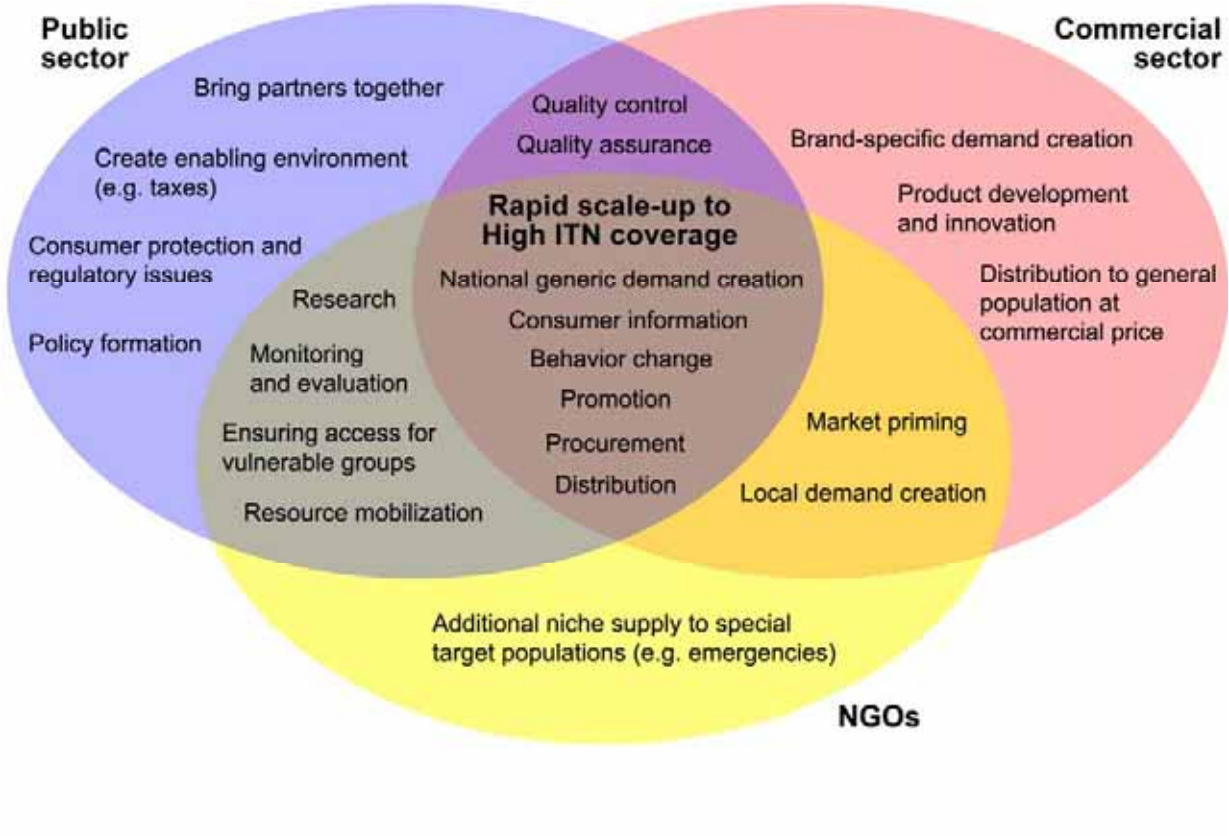

Figure 1. Rapid National Scale-up for ITNs: a strategic framework for partners

Providing subsidized ITNs. What are the possibilities? To date there has been experience with six public sector subsidized distribution strategies:

- Providing ITNs at non-commercial prices intended to achieve cost-recovery and to support a revolving fund (many NGO projects);
- Providing ITNs at token prices via routine public sector health services (e.g. Malawi, Kenya);
- Distribution of ITN vouchers via routine public sector health services for free or highly subsidized redemption on the commercial market (e.g. Ghana, United Republic of Tanzania, Zambia);
- Distribution of free ITNs via routine public sector health services (e.g. Angola, Benin, Eritrea);

- Distribution of free ITNs via routine public sector health services (e.g. Angola, Benin, Eritrea);
- Distribution of free ITNs via enhanced public sector outreach services (e.g. enhanced outreach in Ethiopia; child health days in Zimbabwe);
- Distribution of free ITNs via periodic public sector campaigns (e.g. measles and/or polio immunization catch-up campaigns in Ghana, Niger, Togo, Zambia)[12].

Obviously these alternatives are not equivalent: the eventual aim of a revolving fund is some kind of independent sustainability, whereas the others are aimed mainly at rapid increases in coverage, and explicitly depend on continued donor and/or government input.

At national scale, free distribution campaigns have recently been shown to achieve rapid increase in coverage in the short-term. There is as yet little experience of how such campaigns marshal support for more sustainable long-term delivery systems. Without such support the population needs to wait for the next campaign and both inequities and low coverage can quickly reappear for new pregnancies and for children born between campaigns. There is also little experience in post-campaign periods regarding sustained effectiveness of coverage (i.e. sustained ownership and use after campaigns).

The appropriate balance between subsidized approaches and sustainable market development will vary from country to country, depending on the state of local markets, and is expected to evolve over time, as in the figure below.

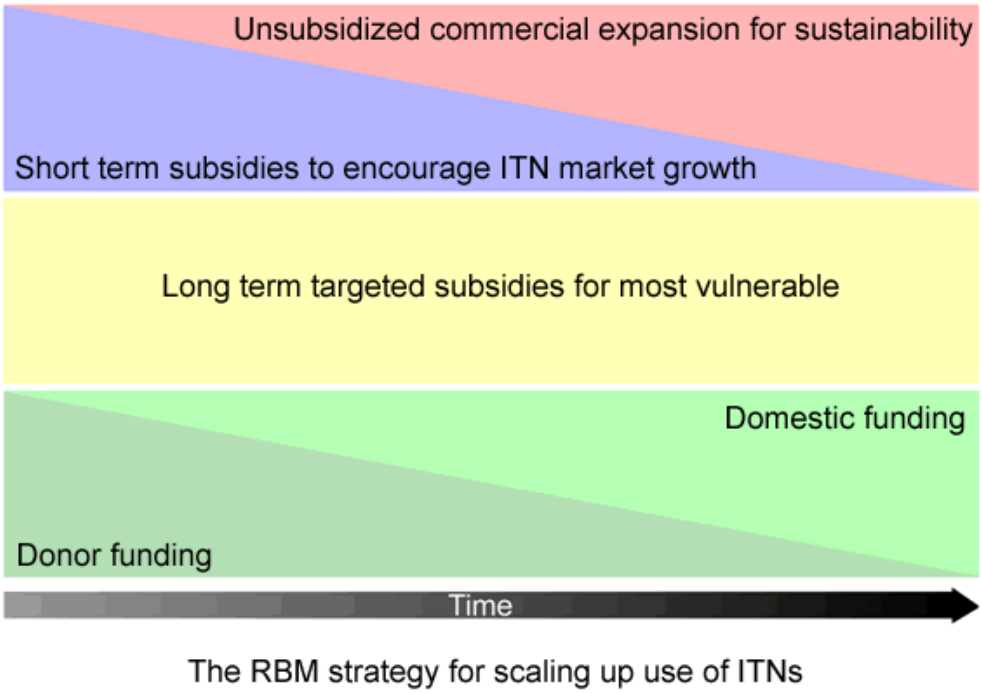

Figure 2. The RBM strategy for scaling-up use of ITNs

The above figure sketches the dynamic balance between time-limited highly subsidized interventions, including market priming, and the eventual development of an unsubsidized market for ITNs. Provision of an enabling environment, demand creation and behaviour change and the sustained equitable provision of ITNs to vulnerable groups are all expected to be long-term processes. Initially, such subsidies will be primarily from donors, but over time—possibly several generations—the need for donor funds will diminish as economic development proceeds and the domestic tax base solidifies. Further, the need for social marketing and other market priming activities should decrease as the commercial sector develops over time and consumer incomes increase.

2.2.1. ITN subsidies

Public provision of targeted subsidies to maximize public health benefits

Heavily subsidized or free access to ITNs cannot be provided to everyone at risk of malaria given current resource constraints. There are also limitations to what the commercial sector alone can achieve. Even the most vigorous ITN markets, with low prices and good penetration into rural areas, will not provide universal and fully equitable access to ITNs. There is a clear need for sustained, full or partially subsidized provision of ITNs and/or insecticide for the most vulnerable groups[13-15]

Who should benefit?

The primary aim of targeting is to ensure that subsidies have the maximum possible public health impact. Target groups can, in principle, be identified according to characteristics that are biological (e.g. pregnant women and children under five, people living with HIV/AIDS) or socioeconomic (e.g. the very poor, orphans, female-, child-headed households, etc.) or geographical (e.g. populations affected by chronic emergency; those living in environments where malaria transmission is most intense). Geographical and biological targeting is useful and efficient. In many countries, most young children and pregnant women living in rural areas are both exceptionally vulnerable to malaria and unable to pay for ITNs. Unless programmes can find efficient mechanisms to identify the most socio-economically vulnerable individuals, programmes may need to identify biological groups and/or geographic regions for targeting.

Providing subsidized ITNs to pregnant women has real advantages: eligibility to receive a net is clear and can be maintained over time; an ITN provided to a pregnant woman reaches two vulnerable groups at the same time since new-born infants usually sleep with their mothers for several months or more. An ITN given to a pregnant woman is expected to last until her child is about three years old, protecting the child through the most vulnerable period of its life. When a woman receives a further ITN during a subsequent pregnancy or alongside childhood vaccination, the original ITN, if it is still in good condition, can continue to be used by the child who originally slept under it.

The type of subsidy

Targeted subsidies can be delivered by providing the goods themselves directly to the target group for free or at subsidized prices (i.e. a 'direct subsidy'). Alternatively the subsidy can be delivered separately from the physical goods through provision of vouchers (i.e. an 'indirect subsidy') that allow the recipient to access an ITN from commercial retailers at a discount, yet not have a distorted perception of the value of the purchase, nor be restricted in choice of brand, colour, size or shape.

2.2.2. Direct subsidies: provision of subsidized goods

To date, the most common way of delivering subsidies has been to supply ITNs either free[16] or at discounted prices[17] (see Box: Malawi's National ITN Programme). There is also a strong rationale for delivering insecticides in this way due to the almost non-existent market for insecticides (see 2.2.5).

Advantages of distributing subsidized goods through the public sector

- By directly distributing subsidized goods to the intended recipient, one can be reasonably certain that the subsidy does in fact reach the specified target groups;
- Existence of a functioning commercial market is not required;
- Potential exists to increase rural penetration and reach the 'hard to reach' as a result of increased affordability;
- Enables rapid scaling-up of ITNs if necessary resources are available;
- Makes use of credible and professional health workers for message dissemination directly linked to the provision of the product;
- When token prices are charged for heavily subsidized products, beneficiaries become more active investors in their families' health rather than passive recipients;

- Subsidized product delivery can lead to rapid increases in coverage and therefore experience of using the product and this in turn creates future demand and increased willingness to pay, prerequisites for market development.

Disadvantages of delivering subsidized goods through the public sector

- Requires substantial local level administrative and logistic systems for handling, transporting and storing bulky goods and managing inventory;
- Goods may be sold or given to non-target populations;
- Requires a system for handling and accounting for cash received if partially subsidized;
- If targeting is not well-defined, the growth of the commercial market is likely to be hindered, when free or subsidized ITNs are obtained by people who would otherwise have bought commercial ITNs with cash or a voucher. The degree to which this is a problem in practice urgently needs further research;
- The recipient has no choice in the type or characteristics of the ITN;
- Can mislead the public on the true cost of the commodity, leading to a perception of diminished value or mistrust of commercial pricing structures.

MALAWI'S NATIONAL ITN PROGRAMME

In Malawi, 90% of pregnant women attend ANC at least once during pregnancy. 80% of the population lives in rural areas. Until recently, a 35 % tariff on textile imports discouraged growth of a commercial market for nets.

Building on a 1998 district pilot, PSI and the Malawi government launched its facility-based ITN programme in 2000 with nationwide roll-out completed in 2002. The programme has trained 280 district staff and 1,832 nurses.

Rectangular nets are sold to pregnant women and mothers of children under five through clinics at a heavily subsidized price (US$0.40). The programme recoups a portion of its running costs through the sale of a branded, conical net (attractive to wealthy customers) in urban outlets. Insecticide re-treatment kits are sold at both types of outlet. Estimated annual sales are 100,000 per year for the ITNs sold through commercial outlets and 1 to 1.5 million for the ITNs through clinics. About 40% of revenues have come from the commercially sold blue net. Nationwide household net coverage increased from 13% to 60% between 2000 and 2004.

2.2.3. Indirect subsidies: vouchers and similar systems

An ITN voucher entitles the recipient to the full value or a substantial discount on the purchase price of an ITN (either a net bundled with an insecticide or a LLIN) and is redeemable at a commercial retailer or other outlet (e.g. NGO, community group)(See Box: United Republic of Tanzania's National ITN Programme). Vouchers can be delivered more easily than actual ITNs through a variety of mechanisms, including routine health services (ANC and EPI), enhanced routine outreach services, measles or other immunization campaigns, NGO development programmes, employer schemes, schools and nutrition programmes. If a full value voucher is delivered, this equates to a free ITN. To date most experience has been gained from voucher distribution through static health facilities, usually in conjunction with ANC or EPI services. Mozambique has delivered vouchers with a measles campaign in two provinces. The comparative costs of voucher schemes and direct distributions are currently under investigation

Advantages of voucher schemes:

- Public sector voucher distributors can operate the system without the cost and inconvenience of having to securely transport and store bulky ITNs;
- Voucher recipients can choose which specific brand, size, colour or type of ITN to purchase and when and where to obtain it;

- Vouchers can stimulate growth and development of the commercial sector. Local retailers can be reasonably assured that demand for ITNs will increase as a result of voucher distributions and this will stimulate them to stock ITNs and compete for business, and could lead to increased rural penetration over time, allowing all segments of the population to have access to an ITN;
- Subsidized product delivery can lead to rapid increases in coverage and therefore experience of using the product and this in turn creates future demand and increased willingness to pay, prerequisites for market development;
- Voucher systems have greater potential for sustainability after subsidies end since the required distribution systems will be in place;
- Vouchers do not confuse the pricing structure and perceived value of the commodity.

Disadvantages of voucher schemes:

- Requires substantial national level logistic system for managing voucher redemption;
- Requires ITNs and insecticide to be consistently available in local shops. The required degree of development of the commercial sector to ensure that a voucher scheme is viable has not yet been determined. It is not yet clear whether local traders will always be able to respond quickly to the introduction of voucher systems;
- Vouchers could potentially be exchanged for goods other than ITNs or insecticides. More experience is needed with vouchers to determine how best to ensure they are used for their intended purpose by the intended population.

2.2.4. Integrating ITN subsidies (direct and indirect) with EPI and other programmes

ITN distribution via national campaign days, such as National Immunization Days (NIDs) or Supplementary Immunization Activities (SIA) offers opportunities to rapidly increase coverage of ITNs in targeted communities. These distributions are most effective when implemented complementary to continuous ITN distributions via routine ANC or EPI services as well as enhanced routine outreach to maintain coverage. Campaigns in remote areas or areas with little access to routine health services need to plan for ensuring access to ITNs for these areas during periods between campaigns.

Advantages of delivering ITNs alongside routine EPI

- The target group for both interventions is young children, especially infants; ITN (and/or insecticide kit) distribution can be integrated with the logistic arrangements of currently existing EPI services. In some African countries, coverage of the target group for EPI is high and the addition of an extra service to EPI could potentially increase demand for EPI services even further.
- ITN distribution assists in increasing EPI coverage.

Disadvantages of delivering ITNs alongside routine EPI

- Increased burden on public sector distribution channels for a bulky product, if ITNs are delivered rather than vouchers;
- Increased burden on EPI staff;
- If ITNs rather than vouchers are delivered, this does not stimulate sustainable commercial sector distribution.

Advantages of delivering ITNs alongside immunization campaigns

- The target group for both interventions is young children, especially infants; ITN (and/or insecticide kit) distribution can piggy-back onto the logistic arrangements of currently existing EPI services. In some African countries, coverage of the target group for EPI is high and the addition of an extra service to EPI could potentially increase demand for EPI services even further;
- Does not require commercial sector or fixed health facility to be in place;

- Potential exists to increase rural penetration and reach the 'hard to reach';
- A campaign setting with extra resources may be able to rapidly and more effectively increase ITN coverage in remote communities compared with other models
    - Increased exposure to ITNs in a community as a result of campaign style distributions may create demand among segments of the population not reached by the intervention, and increased demand may ultimately lead to commercial sector entry into the market;
    - ITN distribution may assist in increasing EPI coverage, especially among the hardest to reach.

TANZANIA'S NATIONAL ITN PROGRAMME

During the 1980s mosquito net use in Tanzania was rare and prices were high where nets were available. Prior to 1994 the Tanzanian Government imposed a 100% tax on ready made nets, but no tax on netting materials. In 1994, the sales tax on ready-made nets was removed and commercial manufacture and sales of nets began with the launch of the "Mmbu" net by the Tanzanian textile company Sunflag. Mmbu nets were sold at a retail price of US$7.00. Sales were approximately 250,000 per year in the first year and reached 450,000 in 1997. At the end of 1997, a second Tanzanian textile manufacturer, A to Z, entered the market, and quickly gained a large market share. In 1998, the social marketing agency PSI began to promote ITNs under an independent brand name. Early in 1998 a third local manufacturer, TMTL, joined the ITN market followed by a fourth, MOTEX in 2004. Evidence from factory sale figures and national coverage surveys both suggest that the market has been growing rapidly and steadily since 1994 at an average growth rate of 20% per year.

Since 2002 the PSI programme has been expanded nationally under the name SMARTNET, moving away from supplying and distributing an independent brand of ITNs to strategically supporting the existing brands on the market. Support is given in a number of ways: generic and multi-brand advertisement on behalf of the manufacturers, identification of new retailers and wholesalers, subsidy on transport cost to remote areas, financial guarantee for first consignment to new agents, and general lobbying and regulatory support. As of 2002, the Government of Tanzania requires all locally-produced nets in the country to be bundled with insecticide treatment kits and SMARTNET has provided such kits free of charge to all manufacturers.

In 1999, rebates on VAT on raw materials used specifically for ITN production were introduced, in order to further stimulate local manufacture of ITNs. Current annual production of ITNs by Tanzanian companies is estimated at over 5 million and Tanzania is a major exporter of ITNs to other countries in the region. More than 2 million ITNs are now sold annually to the 7 million households in the domestic market. Current ex-factory prices of Tanzanian nets average about US$ 2.00 – US$ 2.50 and retail prices range from US$ 3.00 – US$ 4.00. Commercial competition between factories has greatly reduced prices.

In 2004, A to Z textiles began manufacturing the Olyset™ long-lasting insecticidal net (LLIN) through a technology transfer agreement with the Japanese company Sumitomo. Overall, mosquito net coverage in Tanzania, including both treated and un-treated nets is approaching 40%, although coverage is generally higher in urban compared with rural areas. Research has shown that 90% of bundled nets are treated with the insecticide kit within six months of purchase.

After a pilot study at district level in Tanzania (KINET Project) a national voucher scheme (TNVS) supported by the Global Fund to Fight AIDS, Tuberculosis and Malaria has been introduced in Tanzania in October 2004 to protect pregnant women and their infants. Pregnant women are receiving a voucher through ANC services (approximately 90% of Tanzanian women attend ANC at least twice), entitling them to a two-thirds discount on the price of an ITN. Vouchers are exchanged for several brands of ITNs in retail shops. In addition, insecticide re-treatment kits are being distributed during EPI visits. With help of both SMARTNET (supply and promotion) and TNVS (demand generation) it is hoped that Tanzania can increase coverage to the Abuja Summit target of 60% by 2005. This integrated national ITN strategy is coordinated by an ITN cell within the National Malaria Control Programme and is expected to further stimulate growth of the commercial sector, resulting in a sustainable provision of ITNs in the near future.

Disadvantages of delivering ITNs alongside EPI campaigns

- Increased burden on public sector distribution channels for a bulky product, if ITNs are delivered rather than vouchers, however the increased burden may be of short duration if delivery is through campaigns;
- If ITNs rather than vouchers are delivered, this does not stimulate sustainable commercial sector distribution;
- Timing of ITN bulk supply, logistics and storage at campaign distribution points is critical;
- There can be difficulties in determining eligibility of children if age cut-offs are used in campaigns;
- A potential disadvantage of associating ITN distributions with measles campaigns is that children in the youngest age groups are not covered by measles immunization and will therefore be missed unless campaign structures are flexible enough to target different interventions at different age groups;
- Experience with immunization suggests that campaigns are not a substitute for primary level routine services, but are useful as a means of reaching those who have not been covered by routine services. The same applies to ITNs.

RAPID SCALE-UP OF ITN COVERAGE IN ZAMBIA

In June, 2003, a consortium of partners, including the WHO EPI programme, UNICEF, the Zambian National Malaria Control Programme, NetMark, and the Red Cross Societies of Zambia, the U.S., and Canada teamed up to pilot distribution of free ITNs in four remote rural districts, and vouchers in a fifth district, in Zambia in conjunction with a measles 'catch-up' campaign aimed at children 6 months to 15 years of age. Vitamin A and mebendazole were also distributed. In addition, a full-value voucher scheme was implemented for ITNs in one urban district in cooperation with NetMark and local merchants. During the one week campaign, Abuja targets for households and children were all met in the targeted communities, even though the target group for the ITN programme was children aged six months to five years, as children under 6 months were not eligible for measles vaccination. Before the campaign, marked differences in ITN ownership were observed among economic quintiles. After the campaign, these differences disappeared. Measles coverage was not harmed by the ITN distribution. IFRC report that children who received an ITN were 16% more likely to receive a measles vaccination. Six months after the campaign, 97% of ITNs distributed remained in the households that received them, and 70% of children under five years had used an ITN the previous night. Success of the effort hinged upon exemplary cooperation among Zambian and international public sector agencies and NGOs.

2.2.5. Other subsidized distribution systems

Three other distribution systems are worthy of mention.

Emergencies

Complex emergencies and natural disasters are distinct situations in which the distribution of ITNs at no-cost to the end user is imperative in malarious areas. Such distribution is essentially a temporary intervention, and its purpose is to provide immediate relief. The intervention is targeted geographically, but not usually to particular social sub-groups. The opportunities provided by the temporary logistic platform of emergency relief operations taking place in malarious areas such as World Food Programme (WFP) famine relief and UNHCR operations should be utilized to gain rapid scale-up of free ITN coverage.

Revolving funds

While community-based approaches do not lend themselves to scaling-up of ITNs to a national scale, the diversity of settings in rural Africa suggests that there may be a need for community level approaches supported by local NGOs, particularly in remote or politically unstable parts of Africa. Experience with community revolving funds, credit schemes and employer-based schemes, as alternative financing mechanisms for community-based distribution of ITNs has been mixed, and in

many cases inefficient. Some promising collaborative projects involving micro-credit schemes and women's groups are currently underway in Senegal.

Insecticide for net treatment

Insecticide for net treatment is still an unfamiliar commodity in Africa. Nets are well-known and tangible household utilities, recognized even in places where net ownership is rare and nets are available through commercial channels in most large African towns. Insecticide, by contrast, is invisible in use, intangible and unfamiliar: its commercial availability remains relatively limited compared with nets. Although treating a net approximately doubles its effectiveness in public health terms, this additional benefit of the insecticide is not as easily perceived by users as the benefits of the net itself. To date, every ITN project has found that it is easier to stimulate demand for nets than demand for insecticide.

The prospects for the commercial market are thus much clearer for nets than for insecticide. It is therefore appropriate to plan a different balance between the public and commercial sectors for insecticide distribution with a stronger role for subsidy through publicly-funded channels. This is the system used in the largest and longest-sustained ITN programmes in the world, for instance in China and Viet Nam, where governments provide insecticide re-treatment at no cost to the user, but ITN users buy their own nets from the commercial market. This system has several advantages. First, it recognizes that a treated net not only protects the user, but also gives partial and indirect protection to others sleeping nearby, and that market forces alone can therefore not be expected to achieve adequate levels of coverage. Second, provision of no-cost net treatment provides a strong additional incentive for buying a net. In Asia, these re-treatment services are mostly built on the same systems that previously organized and carried out residual house spraying, and the same system may work in some parts of Africa. Distribution of simple net treatment kits, with well-designed and clear instructions, via antenatal visits as outlined above should also work well, as might distribution of re-treatment kits via the EPI system. The United Republic of Tanzania is distributing free kits via EPI clinics alongside a national voucher scheme for ITNs, which is currently being implemented using support from the Global Fund to Fight AIDS, Tuberculosis and Malaria.

A solution to the need for regular re-treatment is the development of long lasting insecticidal nets (LLINs) which are treated at factory level and maintain protective efficacy for the entire average use life of the ITN (2 to 5 years and potentially longer depending on netting material). There are currently two LLIN products that have been recommended by WHO[18,19] and a number of alternatives that are under development. WHO is stimulating these developments with special interest on two technologies: 1) a long lasting dipping that can be used in the field to transform any new or used net into a LLIN; and 2) a yarn with insecticide incorporated that can be mass produced and used by any local net manufacturers with the existing machinery to produce nets. It is likely that new mechanisms of subsidizing insecticide will become possible, for example by subsidizing the insecticide component of LLINs or by supporting the transfer of the technology to African manufacturers. These manufacturers currently sell millions of untreated nets into local African commercial markets, and the possibility that their products could be easily and cheaply transformed into long-lasting ITNs appears to be an attractive opportunity for highly cost-effective intervention.

Meanwhile, efforts should focus on giving free insecticide for treatment of the millions of nets already owned by African communities through all available delivery mechanisms[20]. Several countries including Eritrea, Malawi, and Uganda operate annual net retreatment campaigns before malaria season, free of charge to the end user.

2.3. Strategic approaches to public: private partnerships for sustaining national-scale coverage

2.3.1. The enabling environment

Creating an enabling environment is largely the responsibility of the national ITN coordinating mechanism. It involves creating the conditions for maximizing access to quality ITN products at the lowest possible prices through a competitive but favourable business environment that leads to lower prices and more effective distribution networks. It may also include stimulation and protection of local production and/or trade. The national ITN coordinating mechanism can play a key role in identifying and advocating for the removal of barriers to ITN market growth. These efforts may include reduction or preferably removal of taxes and tariffs on nets, netting materials and streamlining insecticide registration. Taxes and tariffs removal has been very effective in stimulating commercial growth and competition in countries such as the United Republic of Tanzania[10] and Uganda.

RBM partners can play a key role in working with the private sector to improve the quality and capacity of ITN production around the world to meet the growing demand by consumers, NGOs, government agencies and donors. For example, in Nigeria, the DFID-funded Futures Group and the USAID-funded NetMark have brokered deals between local net manufacturers and insecticide distributors for bundling treatment kits with nets. Similar arrangements for 100% bundling of nets and insecticide on the local market have been brokered by DFID and PSI among all domestic ITN manufacturers in the United Republic of Tanzania. Further, NetMark, with support from USAID and the Regional Economic Development Services Office for Eastern and Southern Africa is providing technical assistance to six African companies interested in improving capacity or quality of production, or in developing production capacity for nets and long-lasting insecticidal nets. Either international and local companies already active in or considering entering the ITN market should be able to obtain advice on business issues such as finance (commercial credit or donor) and access to market research.

2.3.2. Demand creation

Intense and sustained ITN promotion is urgently needed at both national and local levels. Demand creation is vital for achieving effective coverage with appropriate utilization, as increased demand leads directly to increased supply, whereas increased supply does not necessarily lead to increased demand. Wherever people are exposed to mosquito bites, the potential for increasing demand is great. Demand creation should be undertaken by all partners—the commercial sector, the public sector, community groups and NGOs. Those with social marketing expertise can play a role in designing appropriate campaigns. Many African towns have potential suppliers, and at least some commercial activity in nets or ITNs, so public investment in demand creation may well be cost-effective. In order to realize this potential, it will be necessary to exploit not only conventional IEC and health education channels, but also mass media and advertising. The choice of media and messages should be based on formative research into local perceptions of mosquitoes, malaria, nets and ITNs. The cultural factors that determine ITN purchase, ownership and use must be taken into consideration to ensure that demand creation activities are appropriate and effective. The added value of participatory approaches to communication for social and behaviour change, particularly at community and household level, have been demonstrated in several countries in the region and should form a component of malaria prevention and control communication activities.

Informed experience, based on use of a specific product, in this case ITNs, is at least as important in creating demand as other traditional demand creation activities such as advertising. Subsidized product delivery leads to rapid increases in coverage and therefore experience of using the product and this in turn creates future demand and increased willingness to pay, prerequisites for market development.

In general, publicly funded promotion of ITNs should not favour any one supplier (or group of suppliers) over another, in order to encourage competition and avoid monopoly.

2.3.3. Market priming

Market-priming (also known as "pump-priming") represents public sector intervention on the supply side and aims to stimulate growth in the subsidized and eventually unsubsidized commercial market, through:

a) demonstrating the commercial viability of trading in ITNs and/or insecticide to potential traders;
b) establishing and strengthening the infrastructures and trading networks needed for vigorous and competitive commerce;
c) initiating a culture of ITN acquisition and appropriate use.

Market-priming activities can range from a simple and direct supply-side subsidy—such as paying suppliers a premium for every ITN distributed and sold—to creating a complete subsidized distribution system for local retail outlets. The contribution made by market-priming will be most valuable where there is currently no commercial activity e.g. in rural areas or countries with no nascent ITN/insecticide markets. It is less appropriate in urban areas where commercial trade already exists.

Market-priming is a temporary, transitional intervention. Its aim is to build demand and strengthen distribution channels, whether subsidized or not. Traders will not enter a new market until they are confident of sales, and this may be less likely to happen unless subsidized supplies are restricted to particular target groups.

The use of market priming must be time-limited and criteria must be defined for initiating the transition process. Without a time limit, market priming can create a subsidy-dependent delivery system, and either prevent growth or displace existing independent commercial activity. Similarly, the volume of goods procured and sold through subsidized market-priming activities should be limited according to previously agreed criteria. Most importantly, the success of market priming should be measured, not on the basis of its own sales, but primarily in terms of impact on unsubsidized commercial sales, and its contribution to overall commercial market growth. This means monitoring markets, and appropriate methods and indicators for this purpose are now being developed. Unfortunately, the criteria that should be used to guide the withdrawal of market-priming supplies are not yet well understood, and more experience is urgently needed.

MALI AND COMMERCIAL MARKET SUPPLY

Mali is a good example of a country where a culture of use of nets has existed for some time; as a result more than 70% of households have at least one net. In Mali, even poor rural populations buy nets from the private market. A recent study by NetMark found a very equitable net coverage obtained through commercial channels. Compared with other interventions, the commercial channel distribution of nets has resulted in more equitable coverage than interventions such as immunization services that are provided for free to all. The Mali example highlights the need to distinguish between nets which many people already have, and re-treatments, (which we know most people will not buy) and the need to look more seriously at free/highly subsidized treatment in such settings. Treatments cost much less than nets. Where budgets are limited, subsidized treatment could reach many more people and result in rapid public health impact in places that already have fairly high net coverage. Specific solutions for those not covered are still required.

2.3.4. Managing the transition from market priming

The multi-pronged strategic framework summarized in the figure in Section 2.2, shows the need to balance and adjust the components over time in order to achieve sustainable and large-scale public health impact. The design of interventions and the relative investments in each component will vary and change over time as markets are nurtured and gradually mature from highly subsidized malaria interventions to markets that cater for all segments of the population in a sustained manner. Considering this framework and the way it adjusts over time to meet the evolving needs of the market,

one recognizes that some countries are ready for programmes with some level of commercial involvement, while other countries may need to initially focus more on highly subsidized sales or free distribution of ITNs. Whichever combination of activities and investments is implemented within a national strategy, it must consider how the situation will evolve over time, ultimately leading to commercially viable markets serving as much of a given population as possible, thereby decreasing the burden on the public sector and allowing them to focus on the neediest.

Key transition issues

Historically the development of transition strategies has not been given enough attention. It was, to a large extent, taken for granted that the private sector would be able or willing to take over a market, once the market priming programme ended. However, considering key issues such as, affordability, availability, demand creation and appropriate use (in the commercial market known as price, place, promotion and product); it becomes evident that there are major difficulties along the timeline, when transitioning from a largely subsidized market to a sustainable commercial market. Some of the key issues and implications that need to be considered are presented in the table below.

Private sector issues in the transition from market priming

Transitioning		Key transition issue
from time-limited subsidized interventions	**towards a sustainable commercial market**	
Subsidized price	Sustainable and demand / market driven price	**Price:** The price gap between subsidized goods and non-subsidized goods is the most vivid challenge in the transition process. Reduction in public sector subsidy, when done, must be phased gradually to avoid rapid increase cost and risk of reducing coverage and health benefits.
Standard public sector products	Consumer driven products	**Product:** Product design, as determined by consumer demands / panels, rather than institutions, reducing the perception of an ITN as a health tool while increasing its perception as a consumer product
Public health outlets (ANC clinics)	Commercial outlets (kiosks, open markets, etc)	**Place/Distribution:** Moving from public sector distribution through health facilities, etc to purely commercial outlets requires that channel management and distribution infrastructures be built afresh. This calls for substantial commercial sector investments.
Public brands	Commercial brands	**Branding:** Although this is a more intangible issue, it is one of the more crucial challenges to overcome, as consumer trust in any product is often based on the brand, and this trust has to be built
Market priming and behaviour change	Brand specific demand creation and positioning	**Promotion/Communication:** The shift from market priming and behaviour change communication to brand specific demand creation and positioning has to be effectively co-ordinated for a successful transition.
Global standards	National regulations	**Quality Assurance:** Transitioning from an institutionally driven market to a “free” commercial market greatly reduces the level of product knowledge of the decision-maker and offers ITNs to end-users without physical evidence of quality.

Without overcoming these key transition issues, particularly on pricing and branding (which is the cornerstone of promotion, positioning and trust building), programmes run the risk of collapsing the ITN market when the subsidized intervention eventually comes to an end. Creating an enabling environment for the transition is not only a governmental task of supporting the free trade of ITNs by reducing taxes and tariffs on ITNs; it also establishes a forum where the public and private sectors can negotiate a transition that includes both business and public health strategies.

To maximize the impact of short and long term public and commercial resources invested in a programme/market, it is essential for the publicly-funded/subsidized programmes to involve the private sector from the beginning. It is important for subsidized interventions to consider mutually beneficial elements that will lead to sustainable public health impact, while effectively engaging the investment of the private sector to ensure their long-term investment and commitment to the market. This would create more active and committed involvement from the commercial sector, creating the foundation for a mutually beneficial joint strategic investment. The subsidized intervention should focus on coverage, market priming and behaviour change, while the private sector should focus on brand-specific demand creation and positioning.

QUALITY CONTROL

Since manufactured LLINs are pre-treated at the factory, and are intended to protect users for the entire life-span of the net, it is essential to ensure that their insecticidal properties and wash resistance comply with relevant specifications. This is important because of the likely appearance of fake LLINs. It applies both to LLINs that are procured for distribution by agencies, and to branded LLINs sold in retail markets

At the international level, the WHOPES evaluation process provides an authoritative guarantee of the efficacy and safety of defined insecticide formulations and manufactured LLIN products. It does not take account of the packaging and labeling of the product, which is a matter for national regulatory authorities. The fact that the evaluation process must be repeated by at least one regulatory authority in each country prior to national approval for use in that country represents a major barrier to the introduction of new LLIN products, and these authorities should be strongly encouraged to consider how national regulatory processes can be streamlined, preferably by eliminating the need for duplication of WHOPES testing.

Institutional buyers, national programmes and NGOs should be encouraged to adopt regular QC procedures as part of their routine procurement process.

When a WHOPES-recommended product has been registered at national level, there remains a need for quality control, and this must commence at factory level. Manufacturers of LLINs should develop their testing capacity and should be actively encouraged to adopt an open-door policy to random QC testing both during production and at the post-production stage. Inspections should be carried out at least twice per year by independent external agents and should include an assessment of the manufacturer's own internal QC systems. In addition, national regulatory authorities may carry out shelf-checks to test the quality of samples of products available from retail outlets.

Available QC testing facilities in Africa are at present underutilized.

Quality control / Quality assurance

The government plays a key technical role in monitoring insecticide resistance and safety and quality control of locally-manufactured and imported LLINs. It is important that all insecticide products, especially those sold for use at home should be properly registered according to national laws. Unfortunately, the required registration process often acts as a barrier to market entry, partly because insecticides for net treatment may be unfamiliar to national regulators. Risk assessment guidelines have been prepared by the WHO Pesticide Evaluation Scheme (WHOPES) in order to help streamline the registration process.

3. Conclusions and Next Steps

The public sector activities outlined in this framework will require substantial domestic and international investment. **Long-term support will certainly be needed for sustained provision of targeted subsidies to vulnerable groups**, and to ensure that ITNs remain appropriately treated with insecticide. Long-term support may also be needed for demand creation. Shorter-term support is needed for market priming and other supply-side development activities, and for facilitating the development, testing and dissemination of long-lasting net treatments.

The strategic framework and options suggested here are not intended to be a rigid prescription for a national programme or plan of action. Rather, they are intended to guide the further development of national ITN strategies, and to assist the process of ensuring coordination and complementarity, which are necessary to maximize the health impact of both public resources and commercial activities.

It is important to acknowledge that there remain important gaps in planning guidance. These include:

- how sustained subsidies should best be targeted and delivered, including voucher systems?
- how to manage integration of ITNs or ITN vouchers into routine health service delivery points?
- how to plan for the transition from market-priming?
- development of methods and indicators for monitoring markets.

It is therefore anticipated that the framework presented in this document will continue to evolve, not only as a result of the advent of new technologies (e.g. long-lasting insecticide treatments), but also as more experience and a better understanding is gained of the process of scaling up. In the meantime, it is hoped that the suggestions offered here will help to stimulate and accelerate this process and stand as a global reference document.

2nd Edition. Revision 23 August 31, 2005

Visit http://www.rollbackmalaria.org and http://www.who.int/malaria or http://www.who.int/malaria/insecticidetreatedmaterials.html for access to a wealth of technical information and latest news on malaria and malaria prevention with ITNs.

4. References

1. Roll Back Malaria Partnership. Global Strategic Plan: Roll Back Malaria 2005-2015. 2005.

2. Lengeler C. Insecticide-treated bednets and curtains for preventing malaria (Cochrane Review). The Cochrane Library Update Software [Issue 2], CD000363. 2004. Oxford.

3. Phillips-Howard PA, Nahlen BL, Wannemuehler KA, Kolczak MS, ter Kuile FO, Gimnig JE *et al.*: **Impact of permethrin-treated bed nets on the incidence of sick child visits to peripheral health facilities.** *Am J Trop Med Hyg* 2003, **68:** 38-43.

4. Garner P, Gulmezoglu AM. Prevention versus treatment for malaria in pregnant women (Cochrane Review). The Cochrane Library Update Software [Issue 2]. 2000. Oxford.

5. Binka F, Indome F, Smith T: **Impact of spatial distribution of permethrin-impregnated bed nets on child mortality in rural northern Ghana.** *Am J Trop Med Hyg* 1998, **59:** 80-85.

6. Hawley WA, Phillips-Howard PA, ter Kuile FO, Terlouw DJ, Vulule JM, Ombok M *et al.*: **Community-wide effects of permethrin-treated bed nets on child mortality and malaria morbidity in western Kenya.** *Am J Trop Med Hyg* 2003, **68:** 121-127.

7. WHO, UNICEF. Protecting vulnerable groups in malaria-endemic areas of Africa through accelerated deployment of insecticide-treated nets. http://www.who.int/malaria/rbm/Attachment/20050318/RBM-UNICEF-english3.pdf, 1-2. 2005. WHO and UNICEF.

8. Webster J, Lines J, Bruce J, Hanson K. How equitable is mosquito net and insecticide treated net coverage across socio-economic groups compared with that of childhood immunization? American Journal of Tropical Medicine and Hygiene 71[4], 59. 2004.

9. Lines J, Addington W: **Insecticide-treated nets in Tanzania.** *Lancet* 2001, **358:** 671.

10. Magesa SM, Lengeler C, deSavigny D, Miller JE, Njau RJ, Kramer K *et al.*: **Creating an "Enabling Environment" for taking insecticide-treated nets to national scale: the Tanzanian experience.** *Malar J* 2005, **4:** 34.

11. Nathan R, Masanja H, Mshinda H, Schellenberg JA, de Savigny D, Lengeler C *et al.*: **Mosquito nets and the poor: can social marketing redress inequities in access?** *Trop Med Int Health* 2004, **9:** 1121-1126.

12. Grabowsky M, Nobiya T, Ahun M, Donna R, Lengor M, Zimmerman D *et al.*: **Distributing insecticide-treated bednets during measles vaccination: a low-cost means of achieving high and equitable coverage.** *Bull World Health Organ* 2005, **83:** 195-201.

13. Worrall E, Hill J, Webster J, Mortimer J: **Experience of targeting subsidies on insecticide-treated nets: what do we know and what are the knowledge gaps?** *Trop Med Int Health* 2005, **10:** 19-31.

14. WHO, RBM. Targeted subsidy strategies for national scaling up of insecticide-treated netting programmes: Principles and approaches. 1-72. 2005. WHO, Geneva.

15. Roll Back Malaria. Targeted Insecticide Treated Nets Subsidies: A Framework for Programme Managers in Africa. 2005.

16. Guyatt H, Ochola S: **Use of bednets given free to pregnant women in Kenya.** *Lancet* 2003, **362:** 1549-1550.

17. Stevens W, Wiseman V, Ortiz J, Chavasse D: **The costs and effects of a nationwide insecticide-treated net programme: the case of Malawi.** *Malaria Journal* 2005, **4:** 22.

18. World Health Organization. Report of the Fifth WHOPES Working Group Meeting. WHO/CDS/WHOPES/2001.4. 30-10-2001. Geneva. 30-10-2001.

19. World Health Organization. Report of the Seventh WHOPES Working Group Meeting. WHO/CDS/WHOPES/2004.8. 2-12-2003. Geneva. 2-12-2003.

20. Manga L, Bagayoko M, Ameneshewa B, Faye O, Lyimo EO, Govere J *et al*.: **Mass mosquito net impregnation campaigns: an effective way to increase net re-impregnation rates.** *Communicable Disease Bulletin for the African Region* 2004, **2:** 1-3.