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Number 4 • April 2012

## Focus on Nigeria



Federal Ministry  
of Health



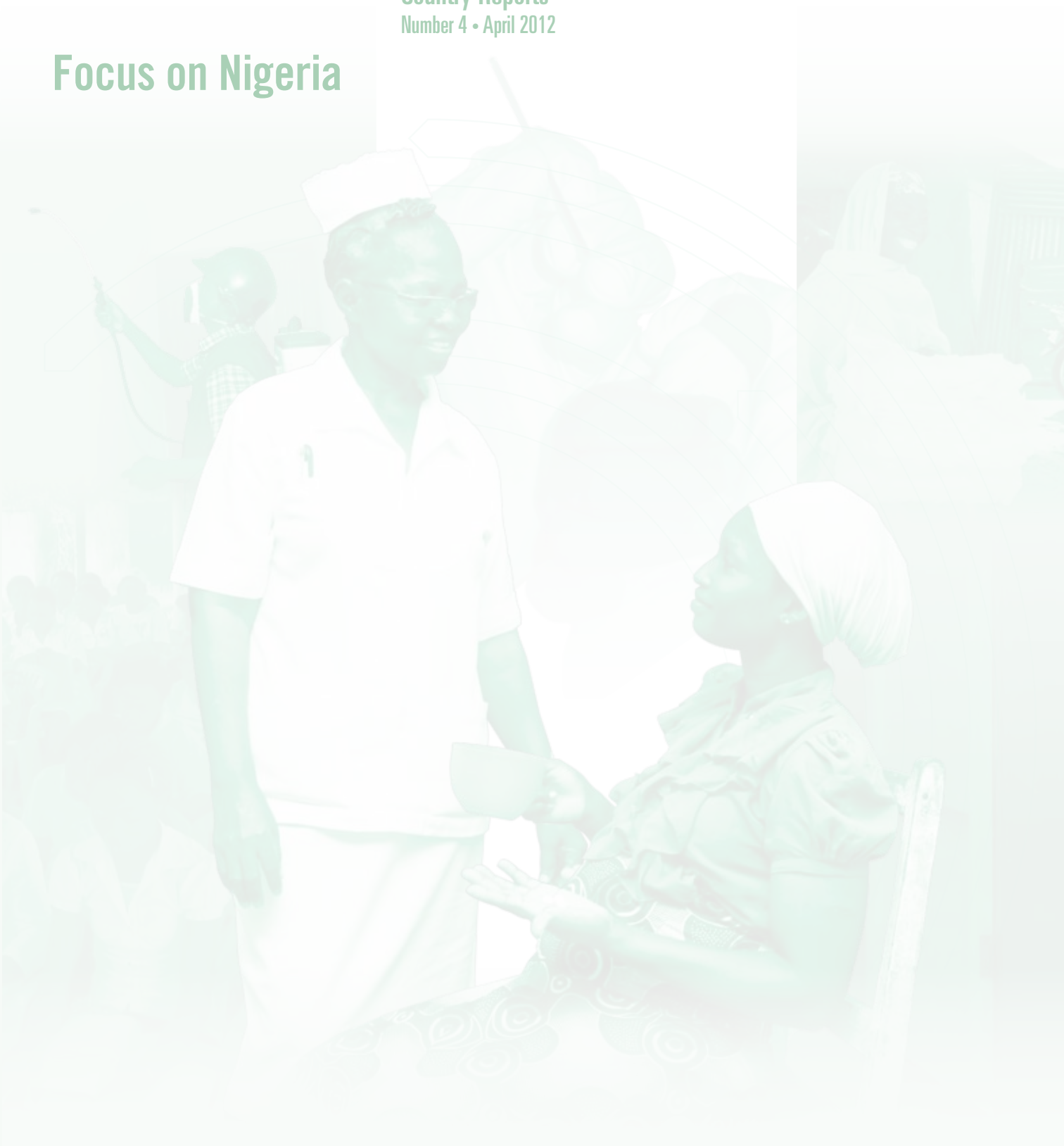
National Malaria  
Control Programme



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# ABBREVIATIONS

ACT	Artemisinin-based combination therapy
ANC	Antenatal care
BCC	Behaviour change communication
CCM	Country Coordinating Mechanism
DFID	Department for International Development (United Kingdom)
DHS	Demographic and Health Survey
FMOH	Federal Ministry of Health
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
HH	Household
IEC	Information, education, and communication
IPTp	Intermittent preventive treatment during pregnancy
IRS	Indoor residual spraying
ITN	Insecticide-treated mosquito net
LF	Lymphatic filariasis
LGA	Local government area
LiST	Lives Saved Tool
LLIN	Long-lasting insecticide-treated net
MDG-F	Millennium Development Goals Achievement Fund
MIS	Malaria Indicator Survey
MOH	Ministry of Health
NIFAA	Nigerian Inter-Faith Action Association
NMCP	National Malaria Control Programme
RBM	Roll Back Malaria
RDT	Rapid diagnostic test
SP	Sulfadoxine-pyrimethamine
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
US-PMI	United States President's Malaria Initiative
WHO	World Health Organization



*Nigeria's National Malaria Control Programme team*

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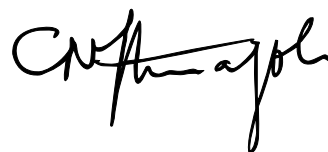
This report marks the first attempt by the programme to chronicle salient achievements in the malaria programme implementation. *Focus on Nigeria* is a record of ten years of hard work and experiences in malaria control in Nigeria, but also a reflection of the public, private and non-profit sectors in the fight against the disease.

We would like to express our gratitude to the team of experts from the RBM Partnership in Nigeria, the Programme Management subcommittee, the Technical Working Group on Malaria, the entire leadership and staff of the National Malaria Control Programme, research groups, professional groups, government departments and the private sector. We appreciate your efforts and hope that, in the spirit of true partnership, we shall together continue to support a scale-up in interventions in order to achieve a malaria-free Nigeria.

This report was co-authored by Eric Mouzin (RBM Partnership Secretariat, Geneva) and the National Malaria Control Programme staff in Abuja, Nigeria. Beatrice Divine (United States President's Malaria Initiative [US-PMI]) edited and proofread the manuscript in English.

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The authors remain responsible for any errors or omissions.



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# FOREWORD

All of Nigeria's population of over 167 million is at risk of malaria caused by *Plasmodium falciparum*, the most lethal of the malaria parasites. While morbidity and mortality due to malaria have been declining over the years, they remain unacceptably high. The disease contributes enormously to both childhood and maternal mortality in Nigeria. It is equally a drain on the economy, costing an estimated 132 billion Nigerian naira (approximately US\$ 835 million) annually for prevention, treatment and loss of income due to inability to work. The malaria burden adversely impacts the physical, mental, and social well-being of all Nigerians.

Malaria control efforts in Nigeria have been ongoing since the colonial days. However, effective coordination began only with the creation of the Division of Malaria and Vector Control in the early 1960s. This evolution culminated in the establishment of a National Malaria Control Committee, which produced a five-year plan (1975–1980) with the key objective to reduce the malaria burden by 25% by 1980.

Commitment to malaria control was further enhanced by the signing of the *Abuja Declaration* on 25 April 2000 during the African Summit on Roll Back Malaria held in Abuja, Nigeria. All 44 Heads of State and Government or their representatives in attendance (this number represented 88% of all malaria-endemic countries in Africa) signed the Declaration which committed these governments to set aside resources towards reducing by half the burden of malaria mortality in Africa by the year 2010.

In the last decade, the Nigeria National Malaria Control Programme (NMCP) has received strong partnership support resulting in massive scale-up of interventions including insecticide-treated mosquito nets (ITNs), rapid diagnostic tests (RDTs), and artemisinin-based combination therapies (ACTs). Between 2007 and 2010, over 50 million ITNs

have been made available to the population and 70 million RDTs have been distributed to health facilities across the country.

Malaria prevalence remains high in Nigeria compared with other African countries that scaled up their malaria control programmes earlier. Data from the 2010 Malaria Indicator Survey (MIS) showed that, using microscopy, 42% of children under the age of five tested positive for malaria. However, recent improvement in intervention coverage will no doubt soon translate into decreases in the malaria burden. In states that received support for their long-lasting insecticide-treated net (LLIN) distribution campaigns, for instance, over 70% of households now own at least one ITN, a good result by the standard of any highly endemic country.

*Focus on Nigeria* is our effort to emphasize Nigeria's achievements of the last few years, as well as some of the challenges in the years to come. This report reflects what can indeed be achieved with effective collaboration, commitment and synergy between the Government of Nigeria and our malaria control partners.

The plan now is to take the National Malaria Control Programme to the next level which is from control to elimination of malaria with increased emphasis on vector control and environmental management. Together, we will be able to consolidate our gains and ultimately achieve better health for all Nigerian citizens.



**Professor C.O. Onyebuchi Chukwu**  
Honourable Minister of Health  
Federal Republic of Nigeria





# EXECUTIVE SUMMARY

## *Progress and impact of malaria control in Nigeria at a glance*

- Over the last few years, Nigeria has built a robust disease control programme capable of delivering interventions to its population, despite logistic challenges presented by the size of the country.
- Good planning and sound partnership coordination have attracted both partners and growing resources. Between 2004 and 2010, nearly US\$ 600 million in external funding was allocated to scale up the country's malaria control programme.
- These funds, as well as growing contributions from the Government of Nigeria, were used to roll out appropriate preventive and curative services:
  - Approximately 50 million ITNs were distributed to households between 2007 and 2010.
  - Indoor residual spraying (IRS) coverage was expanded to protect 560 000 households in 2010.
  - Health personnel, including an expanding number of role model caregivers (community health care providers), have been trained in proper diagnosis and treatment of malaria, using RDTs and ACTs.
- Rolling out these interventions began in earnest in 2007 and 2008, and increased coverage:
  - In 2010, 42% of households in Nigeria owned at least one ITN—a fivefold increase from just two years earlier.
  - In states that received external support for their LLIN distribution campaigns, 70–75% of households own at least one ITN, a coverage rate comparable to other countries in Africa, whose malaria control efforts began earlier.
  - Between 2008 and 2010, 31% of children under five years in rural areas and 36% of pregnant women nationwide (regardless of mosquito net ownership) used an ITN the night before the survey—a six- and ninefold increase, respectively.
- In 2010, 13% of pregnant women received at least two doses of sulfadoxine-pyrimethamine (SP) during antenatal consultations, compared with just 5% in 2008.
- These sharp increases in coverage will likely reduce disease burden and save lives, but since the scale-up is recent, it is still early to detect impact.
  - The prevalence of parasitaemia in children under five is still high: 42% as measured by using microscopy (MIS 2010).
  - According to estimates using the Lives Saved Tool (LiST model), the lives of 166 000 children under five have been saved by malaria control interventions since 2001. Approximately 136 000 (or 82%) of the lives saved occurred in 2009 and 2010 alone.
- Despite initial scepticism about what could realistically be achieved in a country of the geographic size, population, and complexity of Nigeria, these data show that progress can be made and interventions can be delivered when states receive appropriate support.
- Nigeria is now aiming at achieving and sustaining high coverage rates for malaria control interventions in all states nationwide. With continued commitment from states, the federal government, and external partners, the country could set a positive example for Africa and become a leader on the continent in protecting its people from malaria.



## Box 1: The extent of malaria in Nigeria

### Malaria in Nigeria at a glance

- The 167 million inhabitants in Nigeria are all at risk for malaria infection.
- Malaria is endemic and transmission is stable with a seasonal peak from April to October.
- The duration of the transmission season decreases from south to north. It is perennial in most of the south but only lasts three months or less in the border region with Chad.
- In 2008, there were about 100 million suspected cases and 300 000 deaths attributable to malaria among children under the age of five (NMCP data).
- Malaria is estimated as being responsible for about 11% of overall maternal mortality, 25% of infant mortality, and 30% of under-five mortality.

Nigeria is the most populous country in Africa, with a population of approximately 167 million people (government estimates, 2011). It is administratively divided into 6 geopolitical zones, 36 states, and the federal capital territory. There are 774 local government areas (LGAs), each with an average population of 215 000 residents, and 9555 wards.

The entire country is endemic for malaria with moderate-to-high transmission in all states. The only exception is the area south of Jos in Plateau State, where the altitude of settlements lies between 1200 and 1400 metres, which is considered to be at low or very low malaria risk. Taking into account distribution of risk areas as well as population density, an estimated 30% of the population lives in areas of high to very high transmission intensity, 67% lives in an area of moderate transmission and 3% in areas of low to very low transmission. A seasonal pattern of higher transmission is associated with the rains between April and October.

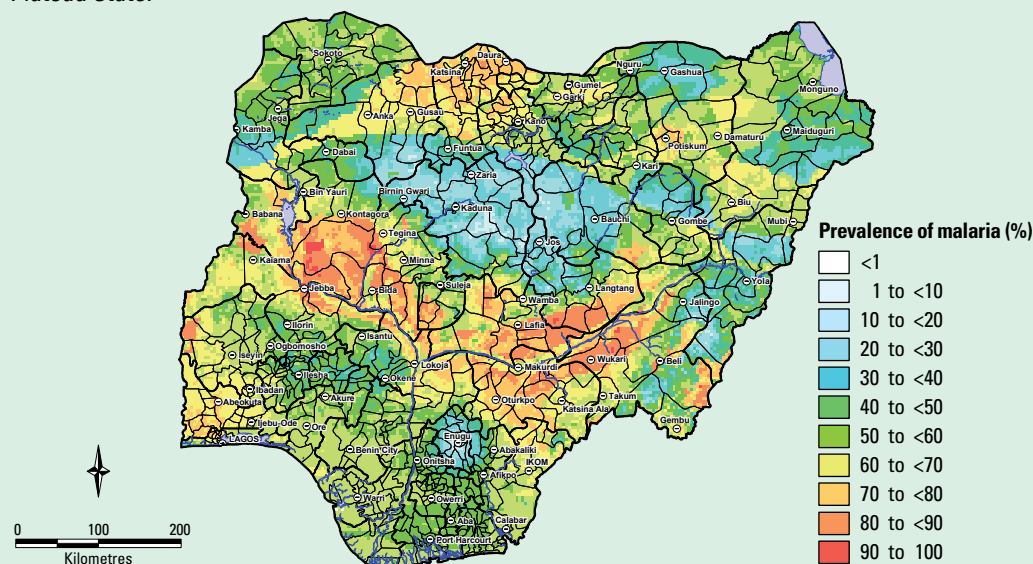
The five ecological strata (from south to north) define vector species dominance and the seasonality and intensity of malaria transmission: mangrove swamps, rain forest, and Guinea-, Sudan-, and Sahel Savannas. Accordingly, the duration of the transmission season decreases from south to north, and from perennial in most of the south to only three months or less in the border region with Chad.

The predominant malaria parasite species is *Plasmodium falciparum*. *P. malariae* and *P. ovale* account for less than 5% of recorded parasitaemia. *Anopheles gambiae* and *Anopheles funestus* are the main mosquito vectors.

**Figure 1**

**Predicted prevalence of parasitaemia in Nigeria, 2002**

*Malaria endemicity is highest near the two river valleys and lowest in mountainous areas of Plateau State.*



Source: MARA/ARMA collaboration ([www.mara.org.za](http://www.mara.org.za)), March 2002.

Malaria places an overwhelming burden on the Nigerian population:

- In 2008, 70 to 110 million cases of malaria (confirmed and unconfirmed) were reported countrywide, with an estimated 300 000 deaths among children under the age of five attributable to the disease (Ministry of Health [MOH], 2009).
- The Mapping Malaria Risk in Africa (MARA) Project models predicted an estimated number of fever and malaria episodes per child per year of 3.5 and 1.5, respectively, for children under the age of five, and 1.5 and 0.5 for those five years and older.
- In 2008, malaria was also considered responsible for 11% of overall maternal

mortality, 25% of infant mortality and 30% of under-five mortality (MOH, 2009).

- Malaria's economic impact is large, with an estimated 132 billion naira (US\$ 835 million) (MOH, 2007) lost annually due to prevention and treatment costs, absenteeism, loss of productivity, and disability.

Nigeria accounts for one quarter of all the malaria cases in Africa; there are more deaths due to malaria in Nigeria than in any other country in Africa. It also has one of the world's highest rates of all-cause mortality for children under five: approximately one in six children die before their fifth birthday.



# THE EARLY YEARS: BIRTH OF THE NATIONAL MALARIA CONTROL PROGRAMME

*From initial pilot projects and operational plans designed and conducted at the central level, Nigeria's National Malaria Control Programme evolved into a decentralized operational structure that relies on a national strategic plan. The attraction of external funding allowed Nigerian authorities to embark on large-scale prevention and control activities.*

Between 1955 and 1968, pre-eradication pilot epidemiological studies were conducted in Kankiya District, under the World Health Organization (WHO) Global Malaria Eradication Programme. Results of the pilot studies were not encouraging, and malaria control—rather than eradication—was recommended for Nigeria. It was also during that time that a Division of Malaria and Vector Control was established within the Medical Department, now named the Federal Ministry of Health.

Further studies were conducted from 1970 to 1975 in Garki District and from 1975 to 1980 in Bendel State (currently Edo and Delta States).

In 1975, the National Malaria Control Committee was established, with membership drawn from the Federal and State Ministries of Health, universities and other relevant sectors. The committee produced a five-year plan of action (1975–1980) with the key objective to reduce the malaria burden by 25% nationwide by 1980. This plan was dormant for years but was re-activated at the start of the RBM initiative in 1998.

In the early 1980s, malaria control became a joint venture between federal, states and local governments, while the committee was expanded to ensure a multi-sectorial approach to malaria control. The objective was to reduce malaria morbidity and mortality by 50% by 1985, mainly through distribution of antimalarial drugs, both as chemoprophylaxis for

vulnerable groups and as treatment of primary school children's fever.

In 1988, a wide health systems reform was conducted and both National Health Policy and the Malaria Control Programme were revised and based on the concept of Primary Health Care.

In 1989, National Guidelines on Malaria Control were prepared by the Federal Ministry of Health (FMOH) for the first time.

In 1992, the Nsukka project investigated the efficacy of permethrin used in ITNs.

In 1996, a National Malaria Control Plan of Action (1996–2001) was written by the Malaria and Vector Control Division of the FMOH.

With the birth of the RBM initiative in 1998, a new approach was brought to malaria control that emphasized evidence-based planning and decision-making, and public and private partnerships. The first strategic plan for rolling back malaria in Nigeria (2001–2005) was released at the end of 2000. It involved a comprehensive needs assessment using adapted RBM tools, situation analyses conducted in four rural communities of six LGAs drawn from the six geopolitical zones of the country, and a tentative programmatic plan and budget.



However, an evaluation carried out in 2005 to assess progress in implementation of that plan found only minimal advances towards its targets. The main challenges to implementation identified during the assessment were limited resources to scale up proven prevention and treatment interventions, non-availability of ACTs and ITNs in most areas of the country, and increased resistance of malaria parasites to the drugs commonly used.

At about the same time, a massive increase in external funding, most notably from the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), the World Bank, and bilateral donors such as the United States and United Kingdom governments, started to turn the situation around dramatically. Today, the third national strategic plan, covering the period 2009–2013, is being implemented with demonstrable results.







# BUILDING A LARGE-SCALE MALARIA PREVENTION AND CONTROL PROGRAMME

*This chapter describes the sequence of events required to set up a malaria control programme: management and planning (an essential step for securing funding), implementation of required interventions, and monitoring and evaluation, including measurement of coverage rates and impact. This last phase leads back to another planning phase using the new data, and restarts the cycle.*

## a. Management and planning

### Nigeria's National Malaria Control Programme (NMCP) at a glance

- The NMCP has full responsibility for coordinating Nigeria's malaria control activities.
- Through its technical working groups, regular planning sessions with partners, and liaison with the Country Coordinating Mechanism (CCM) for the Global Fund, the NMCP ensures good leadership and coordination of the national programme.
- The number of NMCP technical personnel increased from 10 in 2000 to 70 in 2011.
- Prevention and control activities are guided by monitoring and evaluation, as well as by operational research conducted by national institutions and external partners.
- Key strategic priorities are regularly defined and periodically updated.

The NMCP, within the Division of Malaria and Vector Control in the Department of Public Health of the FMOH located in Abuja, assumes responsibility for coordinating Nigeria's malaria control activities.

The NMCP provides technical support to, and coordination of, a wide range of domestic and international partners in the public and private sectors. It comprises six units representing the

programme's core tasks: programme development and administration; integrated vector management; case management and drug policy; procurement and supply management; monitoring and evaluation; and advocacy, communication, and social mobilization.

At national, state, and local government levels, programme management is supported by multiple partners through various mechanisms, including



direct secondment of staff, capacity building, and organizational or technical support.

All partners involved in malaria control form the country RBM Partnership. Coordination of the partnership is ensured through a National Malaria Coordination Committee, which is supported by five technical working groups: integrated vector management, case management, procurement and supply management, monitoring and evaluation, and behaviour change communication (BCC).

In the last ten years, a clear and focused commitment has emerged with well-defined organizational plans. Hence, under consistent leadership from the FMOH and the NMCP, clear and focused policy documents with defined targets and goals (Figure 2.1) were drafted. Today, the programme operates under its third national strategic plan covering the period 2009 to 2013.

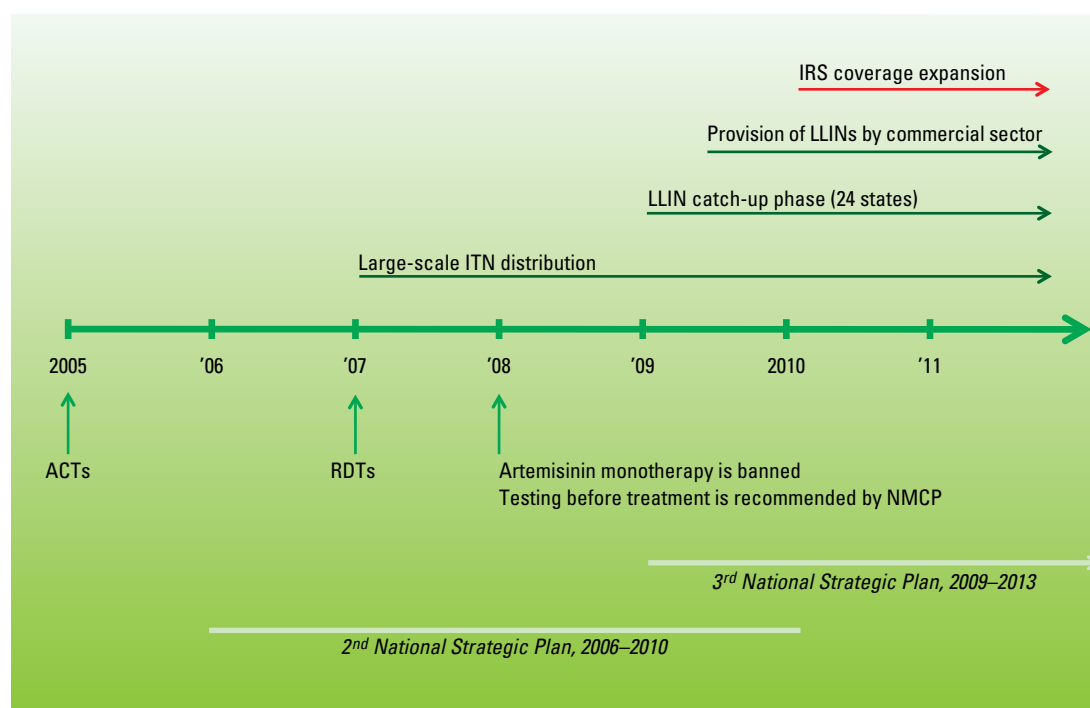
**Figure 2.1**  
Objectives of Nigeria's national strategic plan for malaria control

NATIONAL MALARIA STRATEGIC PLAN 2009–2013	
	Target
ITN coverage	>80% of households (HHs) with an average of 2 ITNs/HH by 2010 and sustain coverage by 2013
IRS coverage	>85% coverage of eligible HHs in target areas by 2013
IPTp coverage	100% of pregnant women attending antenatal care (ANC) receive $\geq 2$ doses of intermittent preventive treatment during pregnancy (IPTp) by 2013
ITN use by pregnant women	>80% of pregnant women sleeping under an ITN by 2010 and sustain coverage by 2013
ITN use by children under 5 years	>80% of children under 5 years sleeping under an ITN by 2010 and sustain coverage by 2013
Case management	>80% of sick persons treated with an effective antimalarial within 24 hours of onset of symptoms by 2013

Source: Nigeria NMCP.

Since 2005, major progress has been achieved by the NMCP as illustrated below:

## Nigeria's malaria control policy and activity milestones 2005–2011



- ACTs were adopted as first-line treatment for malaria in 2005. Between 2008 and 2010, about 8 million doses of ACT have been distributed through public and private channels. (Of note, approximately 100 million fever cases are referred to health care providers each year in Nigeria. Assuming that one in four is due to malaria, 25 million doses of ACT are needed annually if all suspected cases were screened).
- Between 2007 and 2010, over 50 million ITNs have been made available to the population and 70 million RDTs have been distributed to health facilities across the country.
- Routine distribution of LLINs through ANC visits was implemented in states where population-wide distribution campaigns had taken place. About 700 000 LLINs had been distributed in this way as of June 2011.
- Mass distribution of ITNs started in Kano State in May 2009. As of the end of June 2011, 24 states had been covered.
- All monotherapies for the treatment of malaria were banned in 2008 to hinder the development of drug resistance.
- The NMCP revised its treatment and diagnosis policy in 2008, stating that all malaria cases should be confirmed through RDT or microscopy before treatment.

- IRS coverage expanded to protect 560 000 households in 2010. This intervention is further scaled up with the aim to protect 20% of households by 2013.
- Commercial sector partners have been supported to expand their retail sales of LLINs, and approximately 600 000 LLINs were sold between July 2009 and September 2010.
- All malaria commodities are now available free of charge at public facilities and at subsidized prices in private facilities to encourage access.

The NMCP ensures good coordination of the various aspects of the programme through multiple technical working groups which meet several times a year. An annual planning process is conducted with all partners.

Effective liaison is also maintained with the CCM for the Global Fund.

With appropriate planning and management in place, the programme was able to deploy activities and transition to a scale-up phase. After a review of its experiences and achievements, the programme analysed its strengths, weaknesses, opportunities, and threats (SWOT) in order to identify key strategic priorities to guide implementation:

- Prevention is the most feasible way to achieve scaling-up for impact (SUFI) targets and to rapidly reduce the malaria burden.
- Strengthening health systems will help ensure prompt and effective treatment. The focus will shift from prioritizing the most-at-risk groups to universal and equitable access.
- All malaria control interventions will be integrated into the national health system.
- All activities will be implemented in a broad partnership involving all sectors of society.

- Community involvement and empowerment will become a cornerstone of programme implementation.

The NMCP benefits from its partnership with Nigeria's strong academic community. There is a strong history of operational research in malaria, and findings from this research provide vital information to guide continuous adjustments to policies and implementation strategies.

The research agenda is primarily driven by programme needs and derived from regular analyses of the state of implementation of control interventions.

Examples of current operational research areas include:

- factors influencing acceptance and use of ITNs
- treatment-seeking behaviours with respect to fever in general and malaria in particular
- the knowledge, attitudes, and practices of health care providers
- monitoring of the sensitivity of currently used antimalarial drugs
- monitoring of insecticide resistance
- assessment of the environmental impact of vector control interventions
- quality of IRS and ITNs
- impact of BCC interventions, including user satisfaction.

After more funding became available, the NMCP grew from a technical staff of 10 in 2000 to 70 in 2011.



## Box 2: Interview with Chioma Nkasiobi Amajoh, Coordinator, National Malaria Control Programme, Federal Ministry of Health



**If malaria control is to be successful in Africa, it will have to be successful in its two supergiants: the Democratic Republic of the Congo and Nigeria. Some voices in the global community have always expressed strong reservations about whether Nigeria could ever get malaria under control. However, the country seems to have made enormous progress in a very short time. How can you explain this?**

First, we have established a **strong partnership** in Nigeria. It is now robust and quite effective. The NMCP ensures good coordination of all partners' activities and we have good plans and a clear framework for action, planning and programming together. This is probably the most important key to our success.

Secondly, **political leadership**. Nigeria is an active member of the African Leaders Malaria Alliance (ALMA), the Abuja Summit was held here, and some funds freed up by debt alleviation have been channelled to malaria through the Millennium Development Goals office. Conditional

performance-based grants significantly augment malaria control allocations.

Lastly, our ability to attract **external resources**. Our clear commitment to roll back malaria in Nigeria has allowed us to mobilize resources from our external partners, such as the Global Fund, the United States President's Malaria Initiative (US-PMI), the World Bank, and the United Kingdom Department for International Development (DFID). Without important contributions from our partners, we would never be where we are today.

**What challenges have you encountered along the way?**

Nigeria is a huge country, and logistics is probably our biggest challenge. Forecasting, ordering, moving commodities, and avoiding stock-outs represent daily struggles. We are in the process of implementing a logistics management and information system down to the facility level. When rolled out, this system should help improve the situation.



Data management is also an issue. Our health system is able to generate data, but the transmission of those data back and forth to allow quick and appropriate action continues to be a challenge. We are also in negotiation with a firm to develop and implement our district health information system.

We have to rely on our health personnel to deliver our interventions, and total dedication is required from all of them. However, the size of our workforce is much too small. Integration with other relevant programmes is therefore key for staff allocation to malaria control at the state level.

Finally, we have to work tirelessly to secure appropriate financial resources to do our jobs, but access to the resources that are allocated can be very difficult. Meeting prerequisites and satisfying various donors' conditions make the release of funds a lengthy and difficult process which often impairs our effectiveness on the ground and our ability to stick to our work plan. Communities suffer from lack of continuous delivery of interventions.

#### **Can you share your vision about the future of the fight against malaria in Nigeria?**

We are hopeful we will be able to continue and strengthen our action. By improving our information systems, we want to increase our

capacity to plan and deliver our interventions appropriately and in a timely fashion at district and community levels. We are also committed to the goal of reducing malaria-related deaths by 2015.

Through advocacy and documentation of our good results, we will work to maintain the momentum we currently have. We will strengthen our coordination mechanisms to be able to convince our government and external partners of the value of investing in malaria control. States that currently do not have much support need to receive it as soon as possible.

But the battle will be won at the local level. We will strengthen the health system at the peripheral health centre level. We will increase our reach to local communities through community health workers, role model caregivers, patent medicine vendors, and local pharmacists.

#### **What do you see as the immediate next steps in the coming months?**

- We will need to collaborate more effectively with other health programmes.
- We will consolidate our partnership and improve its coordination even further.
- We will lobby our politicians and decision-makers to keep malaria high on the political agenda.
- We will strengthen our health system, focusing on the peripheral level.
- Information systems will be improved to help planning and delivery of interventions.
- We will try to entice stakeholders and the private sector into playing a more active role in malaria control.
- We will focus on action at the community level by attempting to balance equitable distribution of commodities and sustainability for health impact.

## b. Securing appropriate funding

### Outside funding for malaria control in Nigeria at a glance

- Between 2004 and 2010, external partners have committed nearly US\$ 600 million to the malaria prevention and control programme in Nigeria.
- In 2004, external funding totalled US\$ 11 million, compared with US\$ 320 million disbursed in 2009.
- Several major international partners, such as the Global Fund, the World Bank, the United States Agency for International Development (USAID), DFID, WHO, and the United Nations Children's Fund (UNICEF) have been actively involved.

In spite of logistic challenges, the need felt by the global community to tackle malaria in Nigeria—if the battle was to be won in Africa—encouraged partners to increase their investments in the country. Encouraging results from that investment led to even more. The government's own increasing contributions testified to Nigeria's national commitment to malaria prevention and control.

Between 2008 and 2010, US\$ 3.5 million was spent on malaria control out of the Government of Nigeria budget and US\$ 78 million was disbursed through the Debt Relief Millennium Development Goals Achievement Fund (MDG-F).

The World Bank's Nigeria Malaria Booster Project started supporting LLIN distribution campaigns in seven states (Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers) in 2007. Between 2007 and 2010, US\$ 117 million was disbursed by the World Bank to support delivery of interventions in these seven states.

Global Fund grants started being secured at the end of 2004. Between 2004 and 2010, US\$ 304 million was disbursed through Round 2 (US\$ 20 million), Round 4 (US\$ 64 million), and, starting in 2009,

Round 8 (US\$ 220 million). These funds were mostly channelled to support LLIN distribution campaigns in seven other states (Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto).

DFID's contribution, through its Support to National Malaria Programme (SuNMaP), started in 2008 and reached US\$ 18 million for the year 2010. UNICEF has made yearly contributions of several million dollars, with a peak of US\$ 32 million in 2008.

USAID has also actively funded malaria control activities since 2004, with funding of US\$ 26 million in 2010. (This funding is bound to increase markedly with the recent inclusion of Nigeria as one of the 19 countries supported by the US-PMI).

Numerous other partners provided smaller financial contributions towards various aspects of technical assistance, advocacy or service delivery at the local level, including WHO.

The amount of external funding reached a peak of US\$ 325 million in 2009. Still, this represented roughly US\$ 2 per person at risk for malaria when current estimates show that 2 to 2.5 times this amount is needed to tackle the disease. This is a



crucial issue for Nigeria: the large number of people at risk means that a daunting quantity of resources is necessary to control the disease.

Furthermore, the following year (2010), less than US\$ 100 million of external funding was disbursed for malaria control. Ups and downs in funding can make implementation difficult and will need to be evened out over time to achieve consistently functioning malaria control efforts.

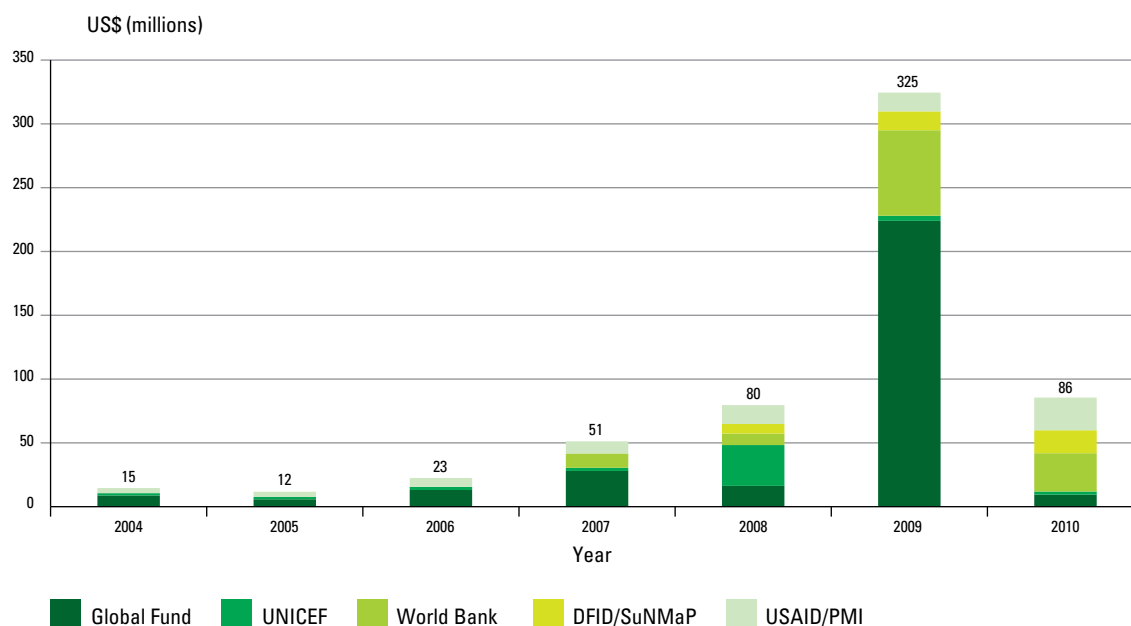
Nigeria has not reached the Abuja target of allocating 15% of its overall country budget to the health sector. However, there has been a modest increasing trend. The health-sector budget grew from 5% of the total national budget in 2004 to 6.5% in 2006. In 2009, 40 billion naira (US\$ 250 million)

out of the national budget was spent on health. The share of the health-sector budget devoted to malaria is difficult to estimate because the budget includes all support for health workers and structures (hospitals, health centres, and laboratories) that provide most of the care. Most (69%) of Nigeria's health budget is still spent on tertiary care (Prof Osotimehin, 2010).

Partners' collaboration is conducted on the basis of the National Malaria Strategic Plan, which is largely funded by malaria partners. The budget for commodities (antimalarials, diagnostics, insecticides, and mosquito nets) is provided entirely by external partners.

**Figure 2.2**  
**External funding for malaria control in Nigeria, 2004–2010**

*Nearly US\$ 600 million of external funds was provided for Nigeria's national malaria control efforts between 2004 and 2010. In 2009, donor disbursements reached a peak of around US\$ 325 million.*



Source: DFID/SuNMaP, Global Fund, Nigeria's NMCP, US-PMI, and the World Bank.



### Box 3: Harmonization and coordination of the RBM Partnership in Nigeria

In 1998, the Roll Back Malaria (RBM) Partnership was launched in Nigeria as a dynamic movement involving all stakeholders affected by, or concerned with, malaria.

While Nigeria was a signatory to the 2000 *Abuja Declaration*, it appeared not to be making sufficient progress toward the 2010 Abuja targets. Given this situation, RBM partners and stakeholders in the country recognized the need to harmonize inputs, priorities, interventions and plans, thus addressing four of the five

*Paris Declaration* commitments and principles: ownership, alignment, harmonization and results.

In November 2008, RBM partners met to plan the implementation of the current National Malaria Strategic Plan, focusing on resources needed for universal coverage and key areas that required harmonized approaches for their implementation. A national coordination framework was approved for implementation at all levels to guide the roll-out of activities.

The NMCP has used this coordination framework as a tool to manage competing donor priorities and funding mechanisms. This has been and continues to be particularly relevant during a period of intense international interest and investment in malaria control.

NMCP's approach to supplement the higher-level planning and coordination efforts has been to promote issue-driven harmonization of partners' efforts, including:

- Using planning processes to align the work of all funding partners towards collective strategic goals and objectives.
- Strengthening coordination to ensure effective and high-quality implementation.
- Leveraging resources to identify potential sources of funding to fill critical health systems' gaps that require interventions beyond the malaria sub-sector.
- Identifying implementation approaches requiring harmonization amongst partners.
- Pilot testing interventions leading to improvements based on lessons learned.
- Documenting the impact of these strategies in various states while putting in place the structures for effective roll-out of activities across the country.

The NMCP's harmonization efforts have led to such key achievements as:

- Endorsement of the NMCP coordination framework by all country partners.
- Mapping of partner activities (areas of intervention per state, commodities).
- Adoption by partners of an LLIN universal campaign model and coordination structure for a unified nationwide roll-out (ongoing).
- Development of annual malaria operational plans at national and state levels that provide a framework for partners to coordinate inputs.
- Strengthening of advocacy, communication, and social mobilization: national strategic framework, joint partners' implementation plan, and toolkit for adaptation of interventions at state level.
- Development and implementation of a national operational research agenda for malaria.
- Development and field testing of monitoring and evaluation tools (routine data collection and surveys).





## c. Delivering interventions

### Intervention delivery at a glance

- Approximately 50 million ITNs were distributed between 2007 and 2010.
- IRS coverage expanded to protect 560 000 households in 2010.
- About 70 million RDTs were distributed between 2008 and 2010 to allow for free diagnosis of suspected malaria cases nationwide.
- Health personnel—including role model caregivers—have been trained in proper diagnosis and treatment of malaria, using RDTs and ACTs.
- Information, education and communication (IEC) and BCC activities have been conducted nationwide using multiple communication channels.

The population of Nigeria has witnessed a major scaling up of prevention and diagnostic services between 2006 and 2010.

### 1. Delivering insecticide-treated mosquito nets to the population

Between 2007 and 2010, the Federal Ministry of Health and partners procured and distributed more than 50 million ITNs (since 2009, all ITNs distributed are LLINs), with the largest distribution occurring in 2009 and 2010 (Figure 2.3). This represented a formidable logistic challenge in a country as large and populated as Nigeria.

Key activities conducted by large-scale state “universal coverage” campaigns included advocacy visits to policy-makers, awareness and sensitization

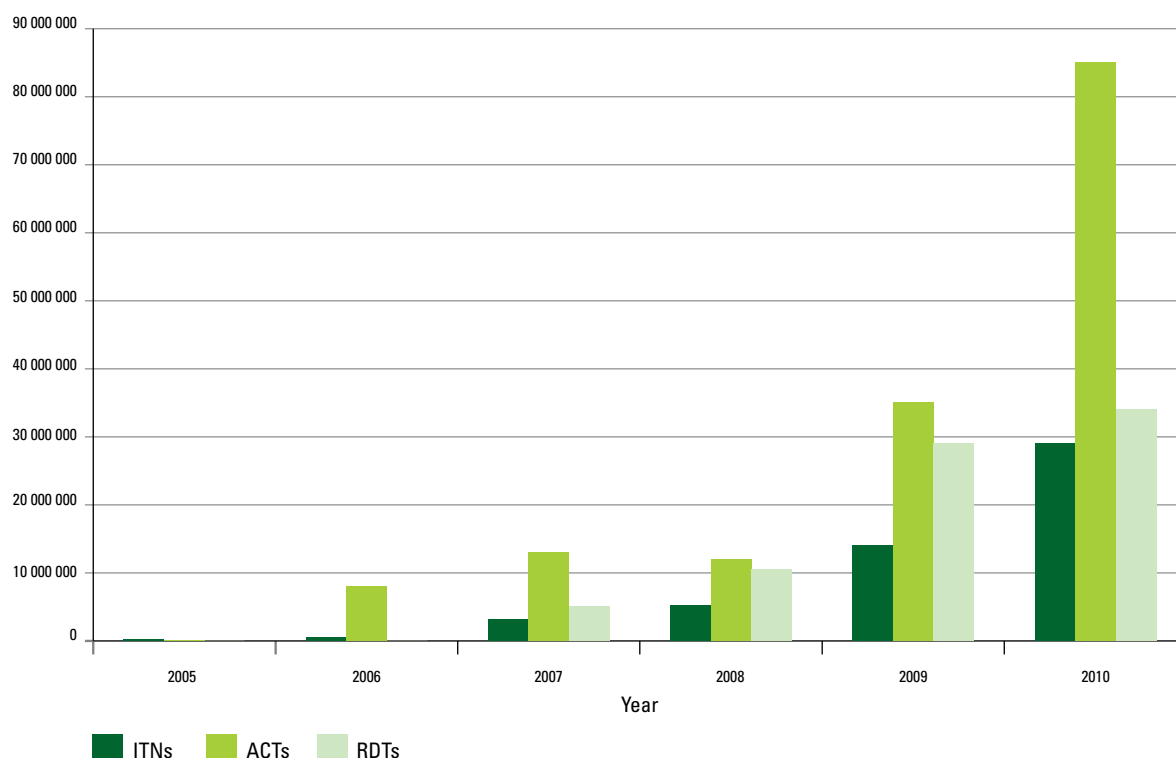
campaigns, and distribution of the LLINs to target beneficiaries. The major objective of the campaigns was to rapidly scale up LLIN coverage by distributing LLINs to every household in Nigeria by the end of 2010. This was described as the “catch-up” phase, aiming to deliver two LLINs per household and to reach at least 80% use.

In 2010 alone, 29 million ITNs were distributed, representing 46% of the December 2010 target (63 million). Efforts have continued in 2011 to reach this target, and rolling mass distribution enabled wide coverage, especially in rural and previously poorly-served areas. Yet, without systems to ensure regular distribution of LLINs, whether through routine channels or “catch-up” campaigns, it will not be possible to achieve and sustain universal coverage with this life-saving intervention.

**Figure 2.3**

**Annual number of ITNs, ACT doses and RDTs distributed, Nigeria, 2005–2010**

*Services were provided following the receipt of external funding. The majority of ITNs were distributed recently, in 2009 and 2010. The goal of 63 million bed nets distributed by the end of 2010 was not met but could be reached at the end of 2011.*



Source: NMCP, 2011.

## 2. Expanding IRS interventions

National IRS activities—including mapping and enumerating IRS target areas, procurement of insecticide and spray equipment, and training of spray teams—expanded to reach approximately 2% of total households in the country at the end of 2010, or 560 000 households. This represented a twofold increase over the 280 000 that had been covered by the end of 2009. The aim is to cover 20% of households by 2013.

Households in LGAs selected for spraying were enumerated and issued IRS cards, which were hung at secure places in the houses. Global positioning

system (GPS) technology was used to enumerate houses and produce maps. The insecticides used for IRS are pyrethroids (alphacypermethrin, lambdacyhalothrin and bifenthrin).

Initially, in each of the seven states supported by the World Bank's Nigeria Malaria Booster Project, one LGA was selected as the initial LGA from which IRS will be expanded to include all other LGAs in the state. In 2011, IRS should be scaled up to cover completely two LGAs in each of the World Bank-supported states. US-PMI and the MDG-F are expected to support additional IRS activities in the coming years.

### 3. Training health workers to implement interventions

training of health workers both at health facility and community levels, and in public and private sectors.

To ensure that all antimalarial commodities procured are well utilized, the NMCP emphasized early on

**Figure 2.4**  
**NMCP-harmonized training blocks for malaria control**

*The currently required training for health workers covers a comprehensive package of skills required for effective delivery of malaria control services and programme management. Since 2008, about 10 million health workers have been trained on the various skills required to deliver malaria control interventions effectively.*

Audience	Health workers (Hospitals)	Health workers (Primary Health Centres)	Community caregivers	Patent medicine vendors	NMCP, State Malaria Control Programme managers and Heads of facilities
Training blocks	Communication skills				
	Case management (adapted to level of service delivery)				<b>Programme Management</b> , incl. Records and Accounts Procurement and Supply Programme Planning General Management Supervision and Training Monitoring and Evaluation
	Prevention in pregnancy				
	Diagnostic testing				
	Prevention				

Source: NMCP, 2011.

### 4. Conducting information, education and communication, and behaviour change communication activities nationwide

The NMCP has developed a communication strategy to guide the implementation of information, education and communication (IEC), and behaviour change communication (BCC) activities. IEC materials are produced and distributed to all states in English and three major Nigerian languages (Ibo, Hausa, and Yoruba). The NMCP also produces a quarterly newsletter disseminated to all stakeholders.

In collaboration with partners, training sessions have been conducted in all states to build capacity at the LGA level. Nigeria has used a variety of

communication channels to reach its citizens. For example, to increase malaria control among citizens using the public transport system in Abuja, jingles have been aired ten times daily on bus TV monitors on major Abuja routes. These jingles have also been aired nationwide on radio and TV.

The national programme has also engaged religious leaders as messengers to deliver malaria messages and materials. Through the Nigerian Inter-Faith Action Association (NIFAA), hundreds of religious leaders of all faiths have been involved in the Malaria Control Programme and social mobilization prior to LLIN distribution. The first NIFAA sensitization meeting was conducted in September 2009 in Kano.

## Box 4: Boosting the retail LLIN market

ITNs have proven to be very effective tools for the prevention of malaria. Hence, the WHO Global Malaria Programme recommended that ITNs be deployed as one of the key malaria control interventions, and the Government of Nigeria and external donors aim to facilitate their adoption and use across the country. Changes in the product, policy, and method of distribution presented the retail ITN market with a number of challenges:

- Technological breakthroughs led to the advent of long-lasting factory-treated nets (LLINs), which soon became recommended over ITNs—the latter needing treatment by their owners.
- NMCP's policy shifted, promoting only LLINs as opposed to a mix of LLINs and ITNs.
- Most importantly, the move towards scaling up for impact (SUFi) led by the NMCP brought about the temporary shrinking of the LLIN private retail market.
- For the local commercial retailer today, reaching more customers with a more expensive product (an LLIN) in resource-limited settings still represents a challenge.

### The “Total Market Approach”

The NMCP and its development partners quickly recognized the need to support the existing commercial infrastructure for LLINs in Nigeria and to help expand the capacity of that sector to meet the ITN replacement demand generated by public-sector campaigns.

A social marketing approach, called the “Total Market Approach”, was used to create profit-driven interest and to jumpstart activities

in the retail market. It was expected that, through an expanded and sustainable distribution network, as well as through support activities (price, procurement and distribution, brand advertisement and promotion, and technical issues) along the chain down to retail, competing brands would be more accessible and affordable to the target population. With competition, the LLINs sold would suit the consumers' preferences best, thereby helping close the gap between ownership and use. LLINs would also be profitable to commercial partners, thereby creating a sustainable retail market.

### Impact of the “Total Market Approach”

After one year of implementation of that approach, the retail market began to re-establish itself. The 2010 Omnibus Survey (carried out on a sample representative of the target population) showed increased LLIN awareness and brand recognition by the consumers, resulting from both commercial and public partners' promotional activities. The survey also showed increased brand recognition and market penetration for all LLIN brands.

As for commercial partners, they seized the opportunity to launch and grow their LLIN brands, as well as to expand their distribution capacity.

From the retail market's perspective, the “Total Market Approach” resulted in:

- Increased availability of LLINs in retail channels: private-sector channels have expanded as people become less dependent on public health channels, beginning to access LLINs from retail outlets in their neighbourhood (Omnibus Survey, 2010).



- Increased affordability: price support combined with logistic support brought the average retail price for LLINs down from 1500 naira (US\$ 9) to 800 naira (US\$ 5).
- Diversification of products: with a greater number of brands (than in the public sector), consumers were able to select from a variety of nets and develop preferences (Household Survey, 2008).
- Greater proximity of commercial partners to their consumers: this proximity allowed for rapid and innovative responses to the customers' needs.

From the commercial partners' perspective, the "Total Market Approach" resulted in:

- New products: one of the surviving Nigerian manufacturers, Rosies Garment Ltd, reported that NMCP-led support allowed the commercialization of Netprotect® LLINs. It is currently imported, but will be manufactured locally when the demand is large enough.
- New entries to the market: Teta Pharmaceuticals Ltd, a Nigerian pharmaceutical company, was able to enter the LLIN market and sell PermaNet® LLINs.
- Sales: between July 2009 and September 2010, about 600 000 LLINs were sold through the retail channels in Lagos, Kano, Anambra, Abia, and Borno States. These sales were boosted by promotional support, which encouraged consumers to make a trial purchase.
- Expansion of distribution capacity: Teta Pharmaceuticals Ltd, for instance, was able to expand its network from Lagos to Anambra and Kano States. More partners were able to distribute their products in rural areas and

through unconventional channels. Direct selling, in-store promotions, and sales through allied product channels such as bedding and agrochemicals were successfully tested.

- Interest by the local private-sector market: C. Zard & Company Limited, a conglomerate of businesses and a representative of BASF-Germany, is conducting a market analysis in preparation for a launch into the retail market. Bayer, the owner of the LifeNet® brand, is working in partnership with Harvestfield Industries Ltd and Sunflag Limited to start up a local manufacturing plant.
- Increase in innovation: for instance, Teta Pharmaceuticals Ltd and Vestergaard-Frandsen responded to the challenges of hanging, aesthetics, and protection outside the bedroom by developing LLIN curtains. The curtains complement bed nets and expand customers' protection from mosquito bites.

Based on these results, the government and its development partners see that the private sector can thrive by selling LLINs. They feel sure that its strength and dynamism will be a crucial component in achieving universal LLIN coverage and in complementing ongoing large-scale public health LLIN campaigns.

## d. Increasing coverage of malaria control interventions

### Intervention coverage at a glance

- In 2010, 42% of households in Nigeria owned at least one ITN—a fivefold increase in just two years (MIS 2010). However, this proportion is still far from the target.
- Coverage rates vary greatly between states. In states receiving external support for their net campaigns, 70–75% of households owned at least one ITN, a coverage rate comparable to African countries that began scaling up malaria prevention and control activities much earlier.
- In 2010, among children under five in rural areas and among pregnant women nationwide, ITN use the night preceding the survey (regardless of ITN ownership) was 31% and 36%, respectively. These figures represent a six- and ninefold increase since 2008, but they are still far from Nigeria's targets.
- The proportion of pregnant women who received at least two doses of sulfadoxine-pyrimethamine during antenatal medical consultations was 13% in 2010, compared with 5% in 2008.
- Among children with fever in the two weeks preceding the survey, 6% received an ACT in 2010, compared with 2% in 2008.
- In 2008, net coverage indicators showed equitable availability across wealth quintiles; however, the wealthiest households still have better access to malaria treatment interventions and preventive therapy during pregnancy.

The success of malaria control efforts between 2003 and 2010 was measured by population-based surveys that monitored intervention coverage rates at household and individual levels. From the initial low coverage levels observed in the 2003 Demographic and Health Survey (DHS), Nigeria expanded its coverage of malaria prevention interventions between 2008 and 2010, as documented in the 2010 MIS.

In 2010, 42% of households owned at least one ITN, while 25% owned more than one. More rural (47%) than urban (36%) households owned at least one net. This represents a fivefold increase in household

availability of ITNs nationally from 2008 to 2010, and a 20-fold increase from 2003 to 2010.

Ownership of at least one mosquito net ranges by geopolitical zone, from 24% in the south-west to 67% in the north-east.

Less than 1% of households received IRS in the past year (MIS 2010).

The picture is markedly different in the 14 states that received support for LLIN campaigns, compared to states that did not. The World Bank's Nigeria Malaria Booster Project supported LLIN campaigns



in seven states (Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano and Rivers) and other partners supported campaigns in seven others (Adamawa, Ekiti, Kaduna, Kebbi, Niger, Ogun, and Sokoto). Overall, households in the 14 states with an LLIN campaign were three times more likely to have at least one ITN than households in states without an LLIN campaign: 72% for the World Bank's Booster Project states and 75% for the seven states with other campaign support, compared to 22% for states without campaign support. Net usage for children under the age of five and pregnant women is also higher in states with support for net campaigns (Figure 2.5).

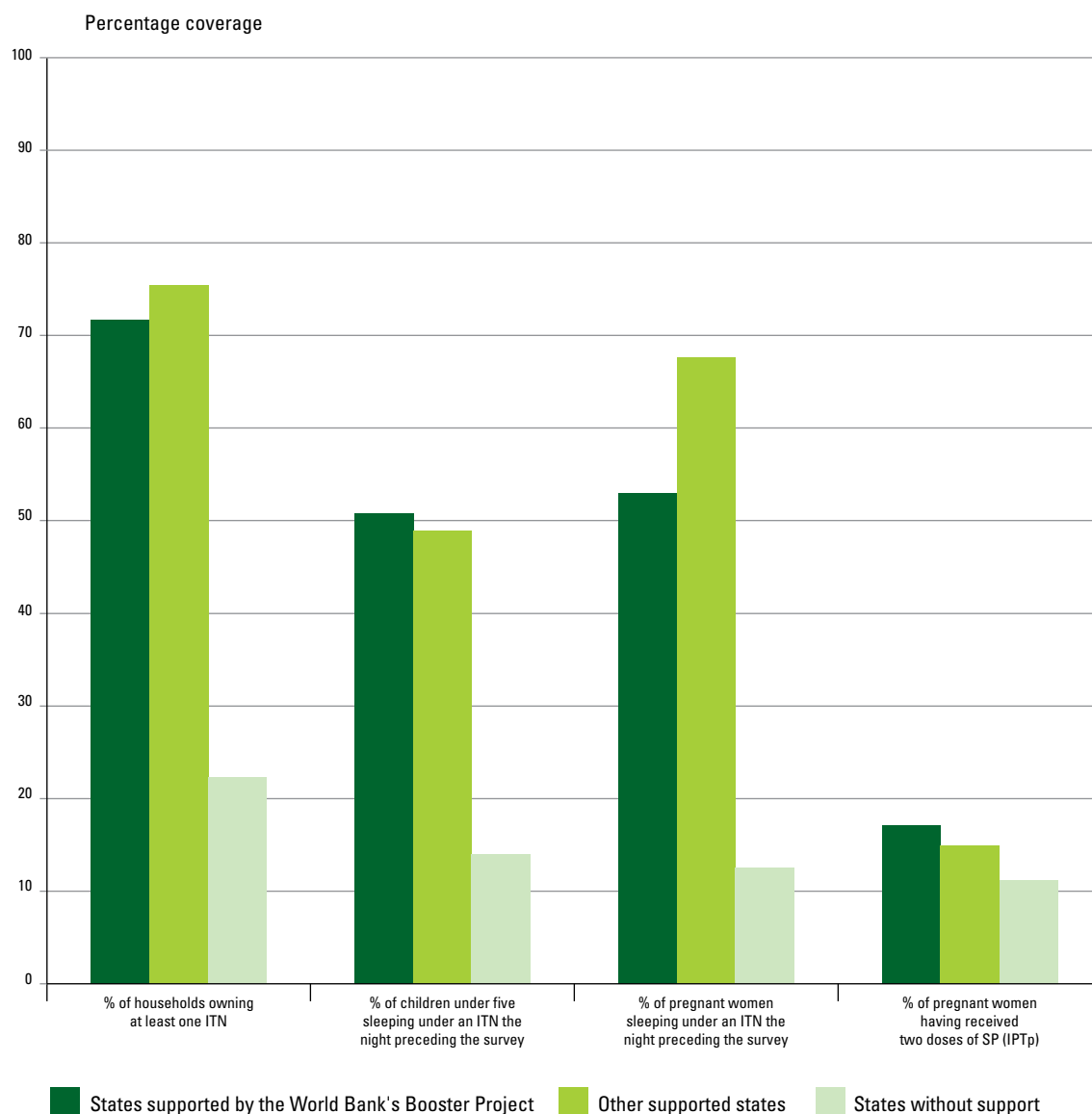
These high coverage rates measured in 14 states show that, with appropriate support, Nigeria can quickly reach a level of scale-up comparable to the countries in Africa with the most advanced malaria control programmes, a remarkable achievement for such a large and populous country.

Apart from net ownership and usage, other malaria indicators such as IPTp or case management do not differ much when comparing states with or without support for net campaigns.

**Figure 2.5**

**Intervention coverage in states with and without support for net campaigns, Nigeria, 2010**

*In states benefiting from support for their LLIN campaigns, net coverage and use was remarkably higher, showing a more than threefold improvement. Coverage rates were similar to those obtained in African countries with the most successful malaria control programmes in Africa. IPTp indicators, on the other hand, did not improve significantly.*



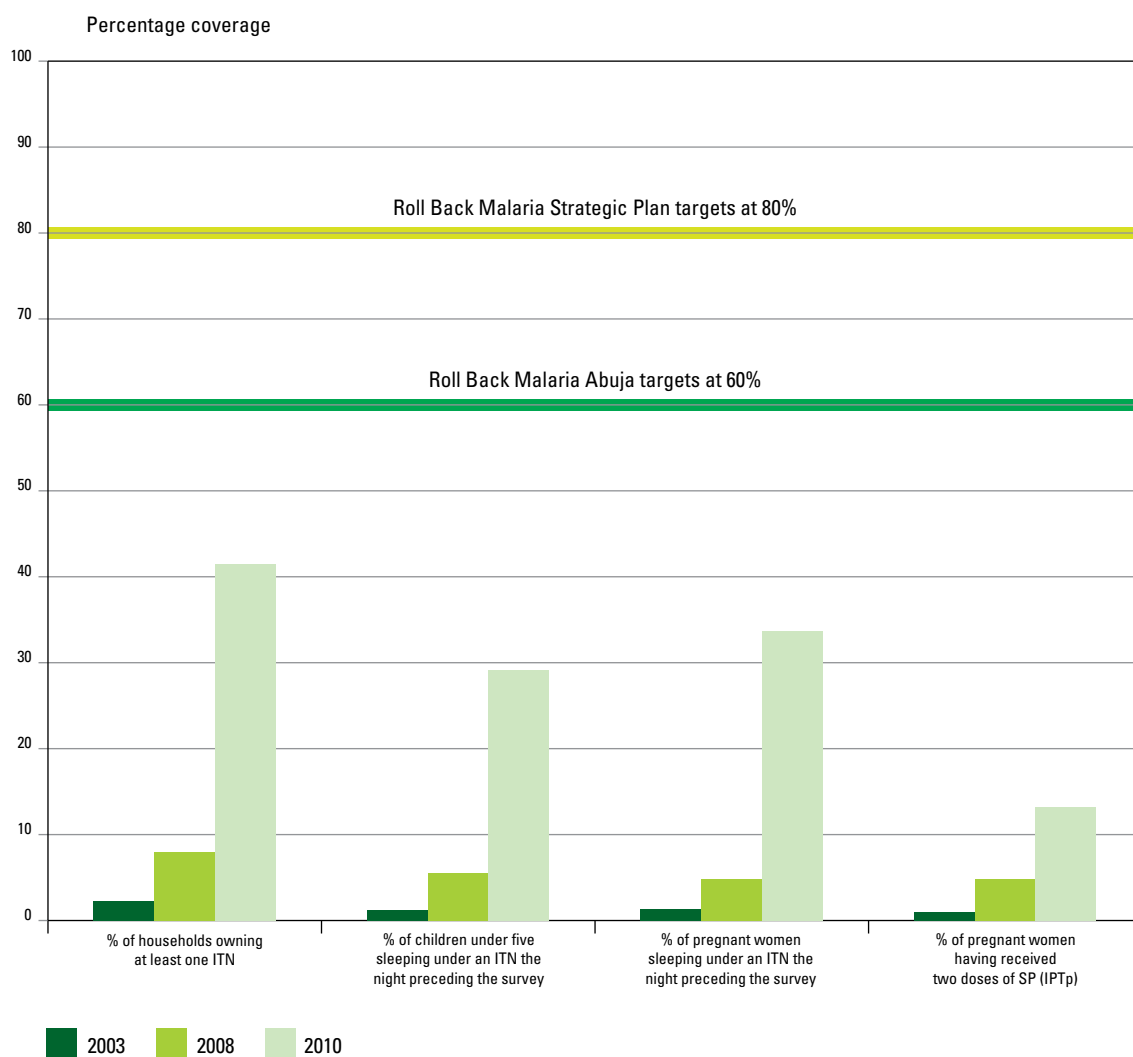
Source: MIS 2010.



**Figure 2.6**

**Progress in intervention coverage, Nigeria, 2003–2010**

*The increase in coverage rates is significant for all interventions. The effect of the scale-up phase on coverage is observed for the first time in 2010.*



Source: NMCP, 2011.

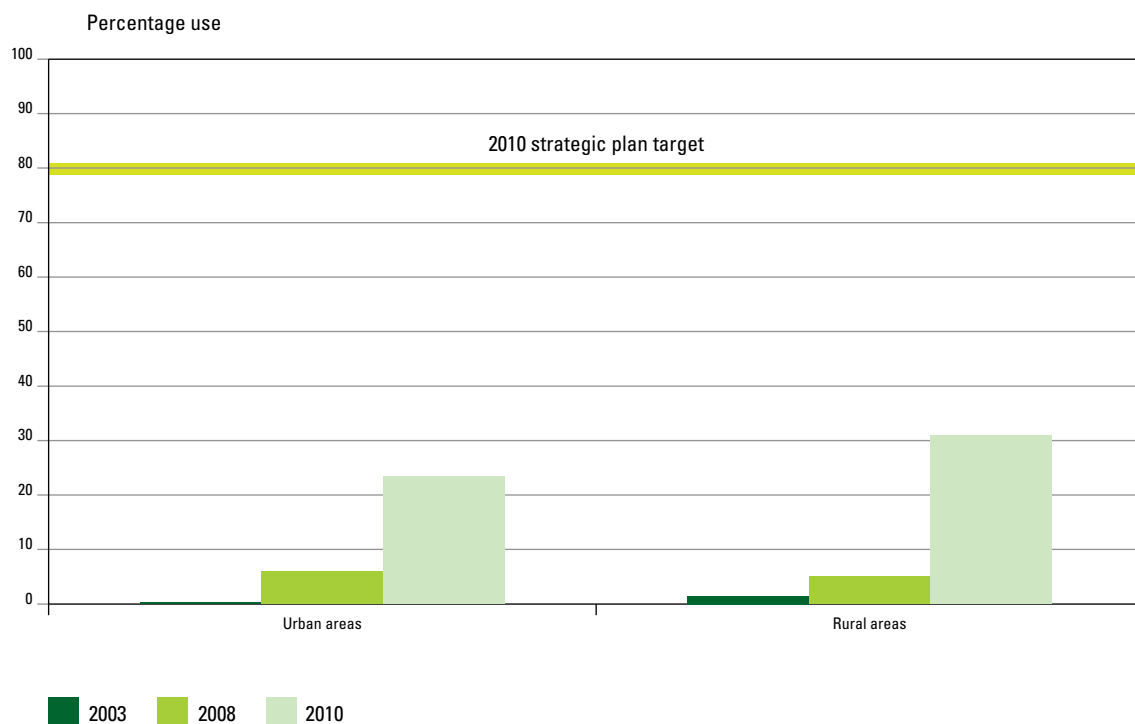
The rate of ITN use among children under five increased from 5% in rural areas (DHS 2008) to 31% (MIS 2010)—a more than sixfold increase in two years (Figure 2.7). This represents impressive recent progress, but much more work needs to be done to reach the target of 80% as set out in the strategic plan.

In households owning a mosquito net, the rate of use the night preceding the survey was even higher (61% in rural areas and 53% in urban areas).

**Figure 2.7**

**ITN use in children under five by urban and rural areas, Nigeria, 2003–2010**

*Between 2008 and 2010, usage rates increased almost fourfold in urban areas and approximately sixfold in rural areas.*



Source: DHS, MIS.

The percentage of pregnant women using an ITN the night preceding the survey increased sevenfold—from 5% in 2008 to 34% in 2010. ITN use (regardless of net ownership) was higher in rural than urban areas (41% vs 17%). Among households owning an ITN, 72% of pregnant women in rural areas and 39% of women in urban areas slept under an ITN the night before the survey.

The proportion of pregnant women who received at least two doses of sulfadoxine-pyrimethamine during antenatal visits rose from 5% in 2008 to 13% in 2010 (from 8% to 18% in urban areas, and from 4% to 12% in rural areas).



According to its current malaria control strategy, Nigeria aimed to treat 80% of patients within 24 hours of onset of symptoms by the end of 2010. Prompt presentation of febrile children to health facilities is essential to meeting this still-elusive target. In 2010, however, among children under five who had fever in the preceding two weeks, only 31% sought treatment from a health facility or provider.

In 2010, 35% of Nigerian children under the age of five were reported to have had a fever in the two weeks preceding the survey. Almost half (49%) of those children were treated with an antimalarial drug (29% with chloroquine and 6% with an ACT). Only about half received those treatments the same or next day after developing fever.

The rates of malaria treatment for febrile children under five years of age increased between the DHS 2003 and the MIS 2010, from 33% to 49%, a 48% increase. Of note, this has not yet been paralleled by wide-scale expansion in the distribution and reported use of malaria diagnostics. It is expected that rates of febrile children treated for malaria should decrease when RDTs become widely available and malaria diagnosis is based on a laboratory test (and is therefore more accurate).

Among children with fever in the two weeks preceding the survey, 6% received an ACT in 2010, compared with 2% in 2008—a threefold increase in two years—suggesting an improvement in using

ACT for first-line malaria therapy. Even though access to ACTs is still low overall in Nigeria (as the scale-up of ACT supplies is still ongoing), the trend is certainly encouraging.

### **Interventions have reached rural and poor populations**

The increased national coverage rates have extended to the poorer, more rural, and more malarious areas in Nigeria. As stated above, the percentage of net ownership in 2010 (national average at 42%) is higher among rural (47%) than urban (36%) households.

Between households in the lowest wealth quintile and those in the highest wealth quintile, there was virtually no difference in the following ITN and IRS indicators: ownership of at least one ITN, use of ITNs among children under the age of five the night preceding the survey, use of ITNs among pregnant women the night preceding the survey, and percentage of households sprayed with IRS in the last 12 months (DHS 2008).

However, households in the higher wealth quintiles had higher rates of coverage with two doses of IPTp, and of prompt and appropriate treatment of fever than those in the lower quintiles (DHS 2008).

## Box 5: Behaviour change communication supporting LLIN distribution campaigns

Increasing ownership of long-lasting insecticide-treated nets (LLINs) is an essential first step towards increasing consistent use of this life-saving technology. However, it is only the first step. Experience in many African countries, including Nigeria, has shown that not all of the nets distributed are consistently used, and net use often falls below national targets, even immediately following mass distribution campaigns. In an effort to close the gap between net ownership and use, the National Malaria Control Programme of Nigeria has recently revised its national strategic plan for advocacy, communication and social mobilization. In addition, it has organized meetings with key stakeholders to develop a coordinated evidence-based approach to addressing additional barriers to net use, now that access to LLINs has been greatly increased as part of the nationwide scale-up for impact (SUI).

The Carter Center is one partner among the many that have been working with the Nigerian Ministries of Health and State programmes to increase net ownership and address barriers

to net use. Since 2004, it has assisted State Ministries of Health with the distribution of approximately 4 million ITNs and LLINs in Ebonyi, Enugu, Imo, Nasarawa, and Plateau States, with routine net distribution, mass distribution campaigns, and small pilot studies. The Carter Center's work is focused on LLIN use as a tool for both controlling malaria and interrupting transmission of lymphatic filariasis (LF) which is also transmitted by *Anopheles* mosquitoes in Nigeria.

The effects of LLINs distributed in 2007 in Ebonyi and Imo States on both malaria and LF transmission were examined in sequential annual surveys. These demonstrated dramatic increases in LLIN ownership and use following distribution in 2007, but by 2009, rates had begun to decline (Figure 2.8). Preliminary data from 2010 (not presented in the following figure) suggest a continued decline in both ownership and use. This seems to highlight the need for better behaviour change communications and continued monitoring of LLIN durability under field conditions.

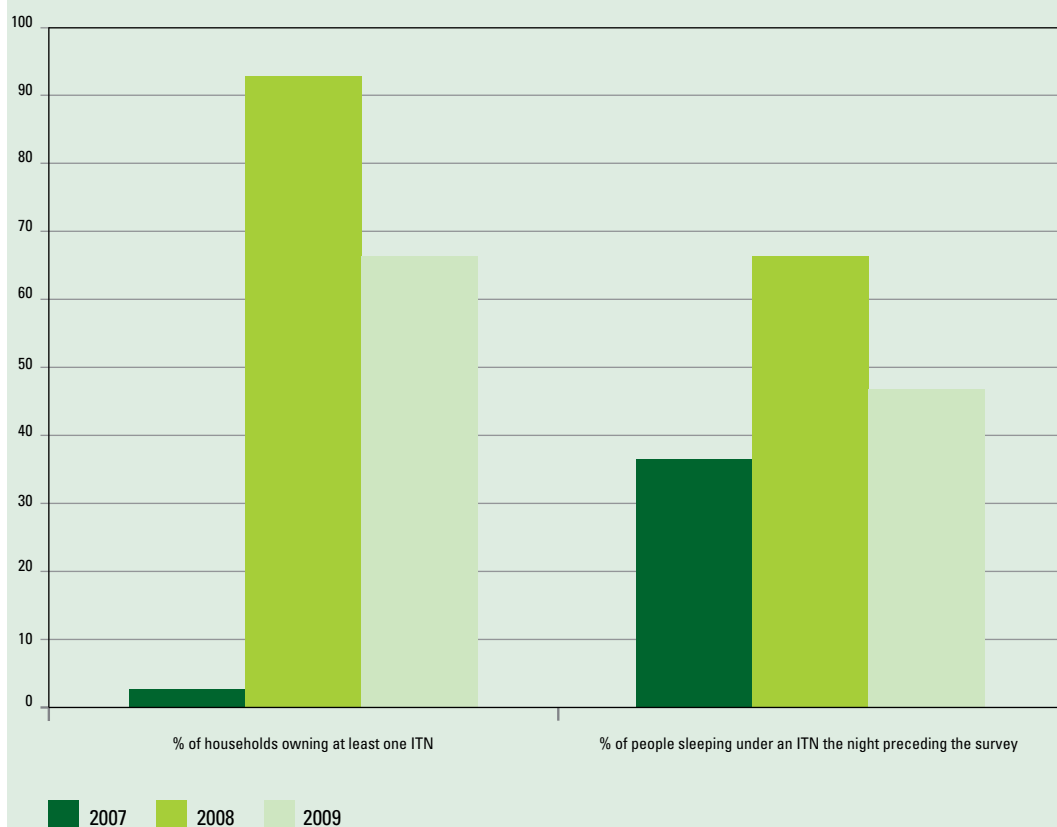




**Figure 2.8**

**Changes in bed net ownership and use from 2007 (before distribution) to 2009 (two years after distribution) in LGAs with “universal coverage” LLIN distribution campaigns in 2007**

*Sequential annual surveys conducted from 2007 through 2009 showed dramatic increases in LLIN ownership and use immediately following distribution in 2007, but by 2009, those rates had begun a decline which continued through 2010.*



To develop more effective, tailored strategies for encouraging sustained LLIN use and appropriate LLIN care, the NMCP collected data on malaria knowledge, attitudes, practices and communication in Ebonyi and Imo States in 2010. Results from 1432 individual interviews in 1373 households showed a number of potentially important determinants of LLIN use. Most respondents knew that malaria is transmitted by mosquitoes (82%), but there coexisted inaccurate beliefs, including the belief that malaria is caused by eating certain foods (64%) and that people are only at risk of getting malaria during the rainy season (66%). Only 54% felt that it was safe to keep LLINs in places where food is stored, which may prevent people from using LLINs over sleeping spaces in close proximity to food storage. Negative stereotypes and rumours associated with bed nets were identified, which may also inhibit LLIN use. Low literacy (48%) and limited comprehension of languages generally used for malaria print, radio, and television communications (English 23%, Pidgin 16%), as well as limited exposure to, and widespread distrust of, many sources of health information, suggest the need for more individualized one-on-one communications in local languages in order to supplement mass media campaigns.

These results informed the development of a social behaviour change intervention, which is now being piloted in six villages by the Ebonyi State Programme, with assistance from The Carter Center. The intervention consists of monthly home visits to all 1284 households in the villages, during which community volunteers

provide tailored messages about malaria and LLINs through a variety of behaviour change methods and interactive strategies. In addition to encouraging behaviour change at the household level, these home visits by community volunteers should prove a valuable source of continuous data monitoring on LLIN ownership, use, care (washing and mending) and condition, which can be used to inform LLIN distribution and replacement activities. The intervention package also includes community events such as LLIN hanging demonstrations, LLIN washing and mending days, drama performances, and construction of portable structures for hanging LLINs over sleeping spaces that do not have walls or other surfaces nearby from which LLINs can be hung. Community leaders have been mobilized to assist with the behaviour change interventions in these villages.

Initial data from home visit registers are promising, showing that in the first month of intervention alone, LLIN ownership increased from 79% to 99%, due to a distribution that took place in response to data collected during initial home visits. The percentage of nets hanging at the appropriate height increased from 57% to 85%, and reported net use increased from 66% to 88%. The effects of the intervention will continue to be monitored using volunteer home visit registers and epidemiological surveys. The Nigerian NMCP, State Ministries of Health and their partners hope to scale up similar behaviour change interventions in additional states in the near future.





## e. Saving lives and measuring impact

### Impact at a glance

- The prevalence of parasitaemia in children under five years of age in Nigeria is high: 42%, as measured by microscopy. Nigeria's scale-up of interventions has been too recent to result in impact.
- Under-five mortality fell by 22% between 2003 and 2008—from 201 deaths per 1000 live births in 2003 to 157 per 1000 live births in 2008. Post-neonatal mortality fell 33%. However, these marked improvements preceded the scale-up of malaria control interventions; these interventions can therefore not be given credit for this mortality reduction. Further decreases in childhood mortality can be expected in the next few years in response to recent malaria control interventions.
- According to the Lives Saved Tool (LiST estimation model), the lives of 166 000 children under five have been saved by malaria control interventions since 2001.

It is still very early to measure impact from malaria control interventions in Nigeria. Although malaria control efforts had been undertaken before 2010, scale-up did not intensify until that year. Thus, the impact of these intensified efforts was not reflected in the 2010 MIS. The MIS data will serve as a reference point to measure the impact of current interventions in the coming years.

Some comparisons with earlier point estimates are important to examine, and the LiST model can provide an estimate of the number of lives saved by scaling up malaria prevention measures.

Malaria prevalence among children under five was measured in the 2010 MIS in two ways. In the field, laboratory scientists used a *Plasmodium falciparum* RDT to diagnose malaria. In addition, they prepared thick blood smears and thin blood films that were transported to Lagos for microscopic examination in the laboratory.

Overall, malaria prevalence is high in Nigeria, compared to African countries whose programmes started scaling up earlier and where impact on anaemia, parasitaemia and child mortality has been

shown. In the 2010 MIS, conducted at the same time as large-scale LLIN campaigns, impact cannot yet be seen. One can only suspect that in the urban and more educated populations, the markedly reduced parasite prevalence can be attributed to the use of malaria prevention and early treatment methods, but also to fewer breeding sites and better housing. As interventions are being scaled up, and as all states achieve coverage rates similar to those benefiting from external support, anaemia and parasitaemia prevalence should decrease markedly as has occurred elsewhere in Africa.

Analysis of blood smears by microscopy showed that 42% of children under five in Nigeria tested positive for malaria. This high prevalence of malaria parasitaemia is consistent with historical data collected in countries at the beginning of their scale-up phase.

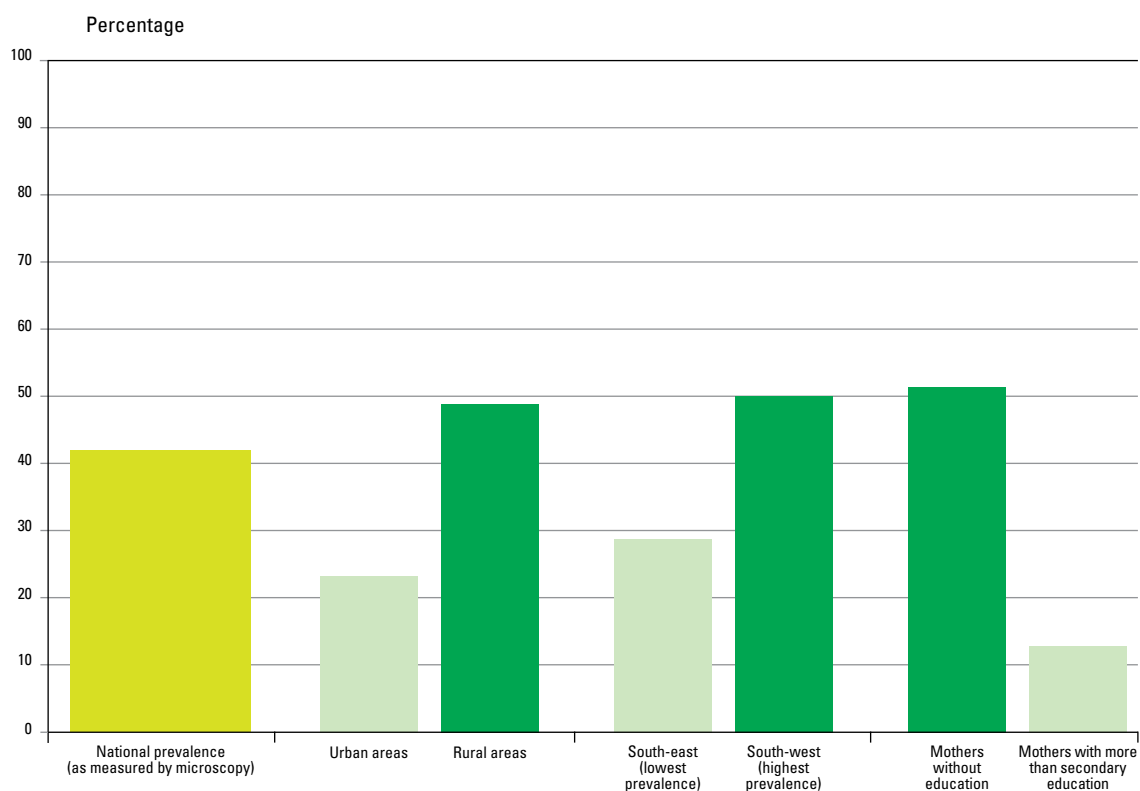
An analysis of MIS data shows that, among children under five years of age, malaria prevalence increases with age, is independent of gender, and decreases with mother's education level. It is higher in rural areas (48%) than in urban areas (23%). Malaria prevalence is highest in the south-west geopolitical zone (50%) and lowest in the south-east (28%).





**Figure 2.9**  
**Malaria parasite prevalence among children under five, Nigeria, 2010**

*Malaria parasitaemia is still high among Nigerian children. Impact of intervention scale-up should be seen in the coming years in response to intensified efforts and more widespread coverage. Higher prevalence is found in rural areas, in the south-west geopolitical zone, and in children whose mothers have a lower education level.*

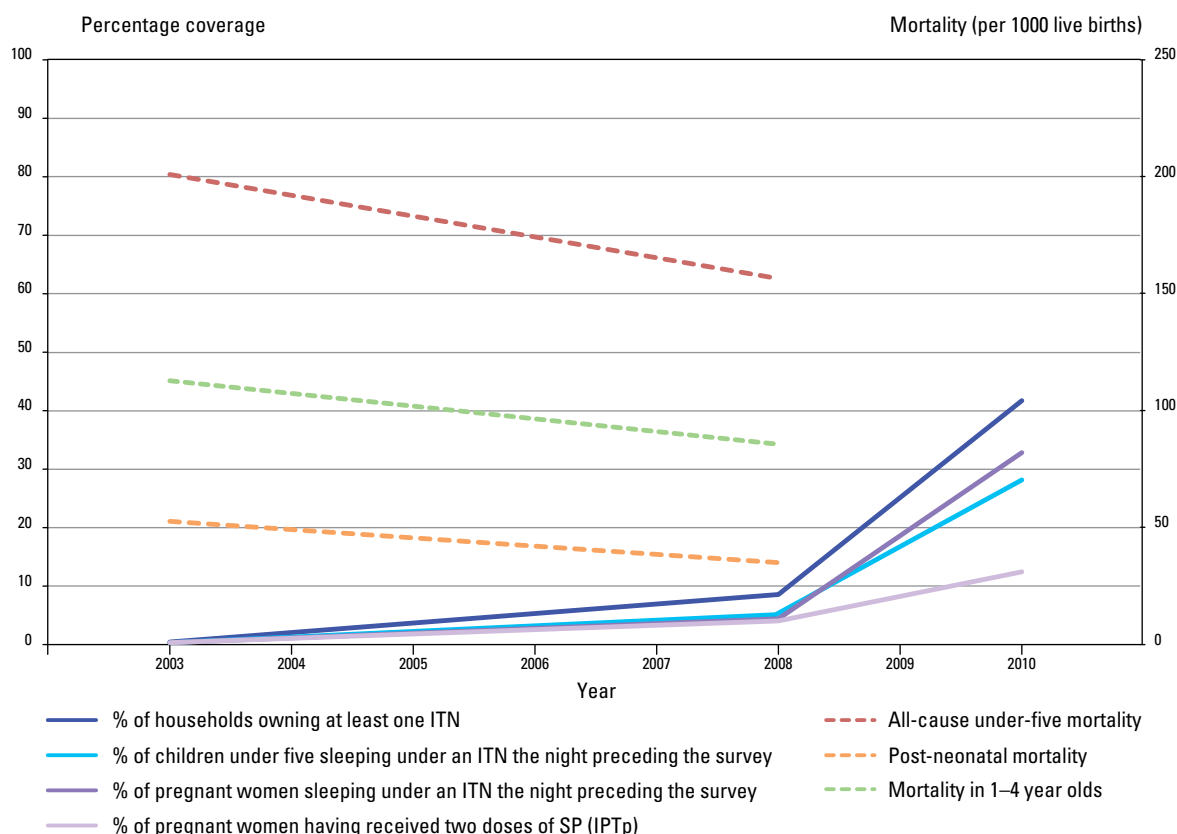


Source: MIS 2010.

**Figure 2.10**

**Malaria control scale-up and all-cause child mortality, Nigeria, 2003–2010**

*The decrease in all-cause child mortality in all age groups precedes the marked scale-up in delivery and use of malaria control interventions. Therefore, malaria control efforts cannot be credited for improvements in child mortality rates at this time. However, the scale-up of interventions should have a significant effect on these rates in the years to come. Mortality data are not available for 2010.*



Source: MIS and DHS.

The marked reduction in all-cause infant and child mortality between 2003 and 2008 (from 201 per 1000 live births to 157) cannot be attributable to improved malaria control since changes were of limited scale during that period. They are likely due to improvements in nutrition, immunization coverage, water and sanitation, as well as education and development.

Given the remarkable increase in coverage rates in 2010, especially in states with support for

large-scale campaigns, one would expect a significant impact on child mortality in the coming years. No mortality data were available in 2010, but if there had been, a decrease in child deaths might not have been seen as it was too early to measure the impact of malaria control interventions.

Considering the role malaria plays in overall child mortality as well as the experiences of neighbouring African countries that reached high coverage levels



and, therefore, decreased the number of child deaths, surveys in the coming years should be able to demonstrate a marked reduction in child deaths in Nigeria.

### **Number of lives saved, as estimated by the LiST model**

The LiST model (Lives Saved Tool) is used to estimate the number of lives saved among children under five according to the estimated efficacy of various malaria prevention interventions.

The LiST model estimates the protective efficacy of vector control at 55% against malaria-specific mortality. The protective efficacy of intermittent preventive treatment during pregnancy has been estimated to be 35% against low birth weight, which then affects child mortality.

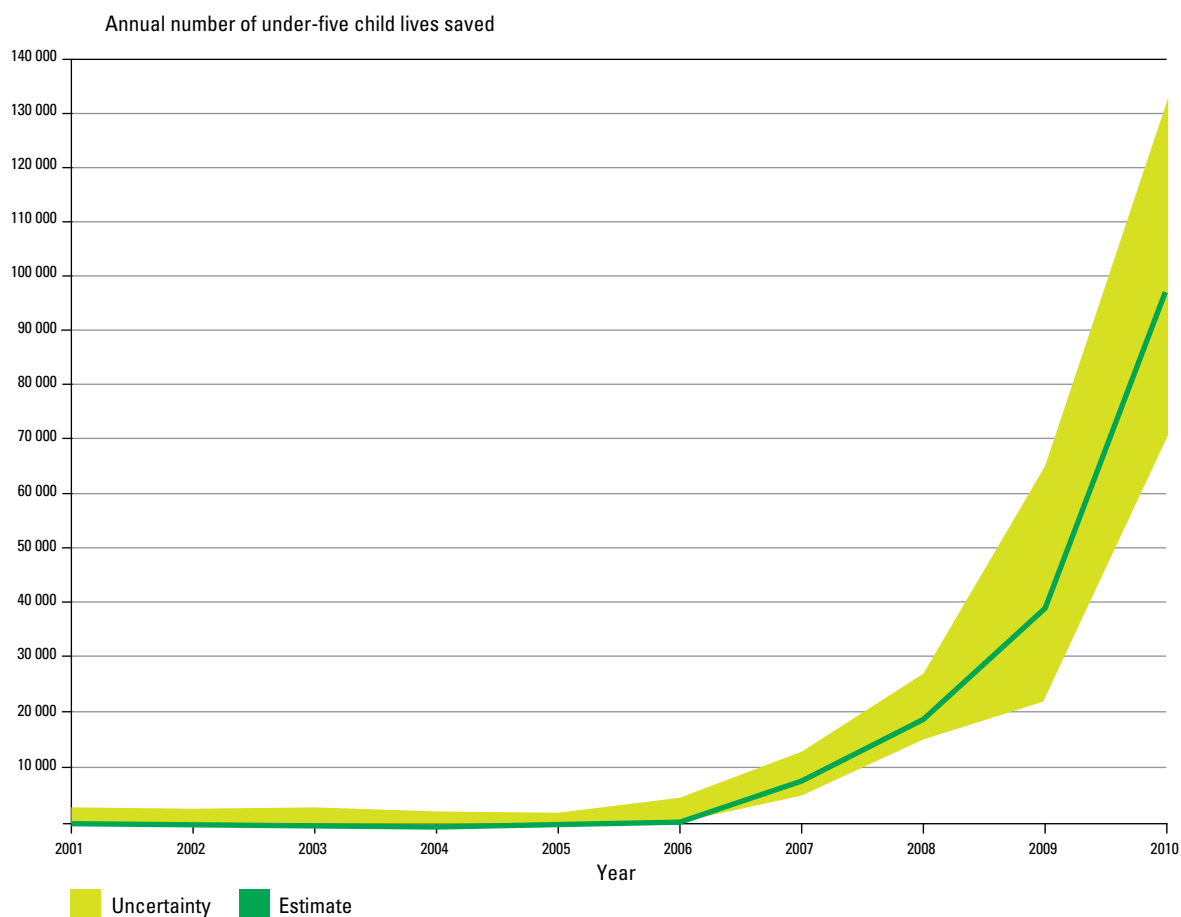
According to this model, approximately 166 000 (range: 121 000–264 000) deaths among children under five were averted in Nigeria between 2001 and 2010, thanks to the scale-up of coverage for vector control measures (defined as a household owning at least one ITN) and intermittent preventive treatment during pregnancy. Vector control accounts for the vast majority of lives saved, preventing 164 000 child deaths (range: 120 000–262 000).

The current LiST model does not account for the lives saved through early diagnosis and effective treatment, or for the indirect effects of malaria on child mortality. It is therefore reasonable to assume that the actual number of lives saved by all malaria control interventions is much higher.

**Figure 2.11**

**Lives of children under five saved by malaria prevention, Nigeria, 2001–2010**

*Among the lives saved, the vast majority has been saved since 2008, when ITN coverage rates began to increase sharply.*



*Source:* Data generated using the LiST model (US-PMI, Tulane University, Johns Hopkins University, and Institute for Health Metrics and Evaluation at the University of Washington), 2012.

It is estimated that the malaria-related mortality rate in children under five for 2010 is 15% lower than it

would have been, had the NMCP not expanded malaria control intervention coverage.

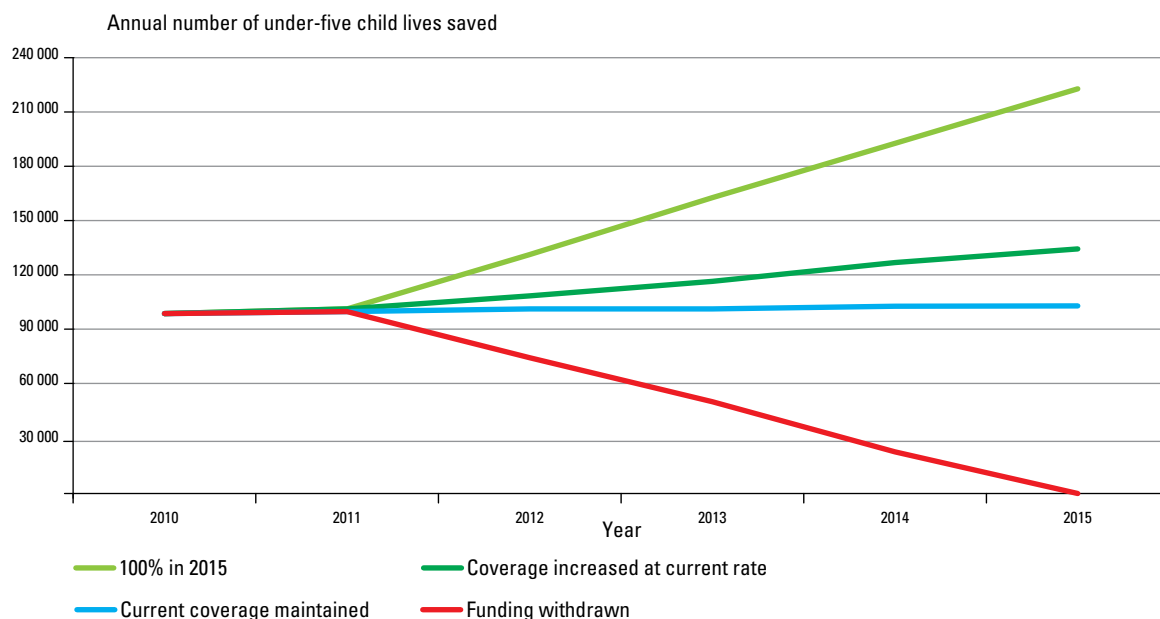


**Figure 2.12**

**Projections of the impact of various NMCP activity scenarios between 2011 and 2015**

Four expansion scenarios were analysed using the LiST model. The first (in light green) achieves 100% coverage (at least one ITN per household) in 2015; the second (in dark green) maintains the annual rate of expansion of ITN coverage; the third (in blue) maintains the current rate of ITN coverage (estimated at 42%); and the fourth (in red) shows reduced coverage if funding were to cease after 2010. The annual number of lives saved for children under five according to each scenario is shown on the graph below.

By increasing the rate of coverage to 100%, the number surpasses—more or less quickly, depending on how fast coverage spreads—200 000 child lives saved per year. When the coverage rate is kept at 42%, the number of lives saved stabilizes at around 100 000 per year. By withdrawing funding, thereby reducing the rate of coverage, the number of lives saved would quickly shrink back to zero within three years.



Source: Data generated using the LiST model (US-PMI, Tulane University, Johns Hopkins University, and Institute for Health Metrics and Evaluation at the University of Washington), 2012.



# LOOKING FORWARD: PROTECTING THE GAINS AND EXPANDING COVERAGE

*The challenges of the coming years will be to build on the current momentum and to mobilize enough human and financial resources to sustain the results and expand coverage.*

## Challenges in the next decade at a glance

- Sustain coverage rates of malaria control interventions in states having received support and made progress to further reduce morbidity and mortality.
- Mobilize human and financial resources to cover areas where coverage remains low.
- Keep malaria control high on the agenda of decision-makers to avoid a resurgence of the disease.

The results presented so far, both in terms of coverage and impact, show that, despite initial scepticism about what could realistically be achieved in a country of the size and population of Nigeria, progress can be made and interventions can be delivered when states receive appropriate support.

When human and financial resources are made available to the population, malaria control works and brings health and economic benefits to the affected communities.

The focus of the next five years is to rapidly scale up interventions nationwide to the level required to bring about major impact: 85% coverage for all interventions.

The long-term vision of the National Malaria Control Programme is a malaria-free Nigeria. At the same time, the country RBM Partnership realizes that

the need now is to keep a strong focus on scaling up interventions. What states receiving support could accomplish is an encouragement to mobilize resources to extend that level of support to all LGAs in the country.

The overall objectives for the coming years are to:

- nationally scale up for impact (SUFI) a package of interventions including appropriate measures to promote behaviour change, as well as prevention and treatment of malaria;
- sustain and consolidate these efforts in the context of a strengthened health system in order to create a basis for the future elimination of malaria in the country.

Efforts in Nigeria over the recent years have focused on scaling up malaria prevention services (ITNs, IPTp and ITNs for pregnant women), while curative services have emphasized provision of improved

diagnostics and quality of care for those attending facilities due to episodes of malaria.

To further reduce malaria-related morbidity and mortality, Nigeria is now moving towards both expanding the level of coverage of its malaria control interventions and sustaining high coverage rates where they have already been achieved. Much work remains to be done to achieve the goals of the 2009–2013 National Strategic Plan.

Key strategies to reach these targets and goals will include:

- Expansion of mass LLIN distribution campaigns to all states.
- Routine LLIN distribution through child welfare and antenatal clinics.
- Progressive expansion of IRS interventions to protect 20% of households by 2013.
- National roll-out of focused antenatal care with IPTp.
- Expansion of rapid diagnostic testing to all public health facilities.
- Capacity building for all health practitioners in public and private sectors on current diagnostic and treatment of malaria with RDTs and ACTs.
- Improvement of the clinical diagnosis of malaria using the Integrated Management of Childhood Illness (IMCI) approach.

- Improvement of home management of malaria through community programmes.
- Extension of IEC and BCC activities.
- Monitoring of drug resistance by strengthening existing sentinel sites.
- Strengthening of routine surveillance for confirmed cases of malaria.

If rolled out swiftly and effectively, malaria control interventions can quickly yield impressive gains and results. But if malaria becomes a less visible public health priority, complacency within the country and among external partners in this malaria control effort could result. Decision-makers could move to support new and different priorities. If complacency or shift in focus leads to undoing current gains against malaria, high malaria morbidity and mortality rates can be expected to return—as has recently been witnessed elsewhere.

The leadership of the National Malaria Control Programme is conscious of this risk and is making every effort to keep advocating for continuous commitment so as to ensure sufficient human and financial resources for malaria prevention and control.









# CONCLUSION

The progress accomplished in Nigeria in the last few years is quite remarkable. Logistic constraints in the most populous African country did not hamper the delivery of interventions to malaria-afflicted communities.

Because of the availability of both external (almost US\$ 600 million between 2004 and 2010) and domestic funding (most notably through the Debt Relief MDG-F), as well as good planning and management, Nigeria's National Malaria Control Programme has been able to deliver malaria control and prevention interventions to urban and rural households.

Between 2008 and 2010, efforts markedly intensified, resulting in the scale up of interventions to both prevent and treat the disease in states that received external support. Rural and poor populations were reached as well or even better than urban and wealthier ones.

In 2010, 42% of households possessed either one or more ITN. In states receiving support, that proportion reached 75%. The impact of these interventions has not been quantified yet, but it will likely be noticeable soon. Thus, in Nigeria like elsewhere, we can expect parasitaemia, anaemia, and child mortality to decrease. The number of children's lives saved by malaria control measures is estimated at around 166 000 over the last ten years, with most of them in the last few years.

Challenges remain of course: states that did not receive enough support need to catch up with those which did; the procurement and supply chain, as well as information systems need to be strengthened; and delivery of interventions must be facilitated and boosted, in particular for diagnosis and treatment.

Even though Nigeria's progress in malaria control has been remarkable, we know the gains are fragile. Other countries have seen that the disease can quickly resurge when the pressure exerted to extinguish it is eased. These experiences highlight the need to maintain sufficient financial and human resources in order to sustain the gains against malaria. Without this commitment, the disease will quickly return.

The next few years should be an important time for Nigeria. The country has shown its capacity to mount campaigns and deliver interventions in a surprisingly short time, when many critics thought it could never be feasible. With continued commitment from states, the federal government, and external partners, a national scale-up of malaria control interventions is now achievable. Nigeria is poised to set a striking example for Africa and to become a leader on the continent in protecting its people from malaria.

# ANNEX

## List of National Malaria Control Programme Partners

A variety of stakeholders joined the NMCP in implementing the activities and achieving the results described in this report. These stakeholders include:

### National Partners

- Association for Reproductive and Family Health (ARFH)
- Association of Civil Society Organizations in Malaria, Immunization and Nutrition (ACOMIN)
- ExxonMobil
- GRID Consulting
- Institute of Human Virology Nigeria (IHVN)
- National Agency for Food and Drug Administration and Control (NAFDAC)
- Nigerian Inter-Faith Action Association (NIFAA)
- Sustainable Healthcare Initiative (SHI)
- Yakubu Gowon Centre for National Unity and International Cooperation (YGC)

### International Partners

- Africare
- Clinton Health Access Initiative (CHAI)
- Family Health International (FHI 360)
- Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM)
- Health Partners International (HPI)
- Institute for Health Metrics and Evaluation (IHME) at the University of Washington
- Japan International Cooperation Agency (JICA)
- Johns Hopkins University
- John Snow, Inc. (JSI)
- Malaria Action Program for States (MAPS)
- Malaria Consortium
- Malaria Transmission Consortium (MTC)
- RTI International
- Society for Family Health (SFH), a programme of Population Services International (PSI)
- Support to National Malaria Programme (SuNMaP), funded by the UK Department for International Development (DFID)
- Tulane University
- United Nations Children's Fund (UNICEF)
- United States Agency for International Development (USAID)
- United States Centers for Disease Control and Prevention (CDC)
- United States President's Malaria Initiative (US-PMI)
- World Bank
- World Health Organization (WHO)
- World Vision International





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