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Enquiries | Roll Back Malaria Partnership Secretariat | Hosted by the World Health Organization | Avenue Appia 20 | 1211 Geneva 27 | Switzerland | Phone: +41 22 791 5869 | Fax: +41 22 791 1587 | E-mail: inform@who.int

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ABBREVIATIONS

ABCD	<i>Atteindre les Bénéficiaires Communautaires à travers les Districts (Reaching community beneficiaries through the health districts)</i>
ACT	<i>Artemisinin-based combination therapy</i>
CCM	<i>Country Coordinating Mechanism (for Global Fund grants)</i>
DHS	<i>Demographic and Health Survey</i>
DSDOM	<i>Dispensateur de soins à domicile (home-based care provider)</i>
GMP	<i>Global Malaria Programme</i>
IPT	<i>Intermittent preventive treatment</i>
IPTp	<i>Intermittent preventive treatment for pregnant women</i>
IRS	<i>Indoor residual spraying</i>
ITN	<i>Insecticide-treated mosquito net</i>
LiST	<i>Lives Saved Tool, a model used to estimate impact based on rates of coverage of the various interventions</i>
LLIN	<i>Long-lasting insecticide-treated net</i>
MDG	<i>Millennium Development Goals</i>
MIS	<i>Malaria Indicator Survey</i>
NMCP	<i>National Malaria Control Programme</i>
PECADOM	<i>Prise en charge à domicile (home-based care)</i>
RBM	<i>Roll Back Malaria</i>
RDT	<i>Rapid diagnostic test</i>
SP	<i>Sulfadoxine-pyrimethamine</i>
UNICEF	<i>United Nations Children's Fund</i>
USAID	<i>United States Agency for International Development</i>
US-PMI	<i>United States President's Malaria Initiative</i>
WHO	<i>World Health Organization</i>



Senegal's National Malaria Control Programme team

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FOREWORD

Senegal's high-level commitment to the Roll Back Malaria Partnership has been translated into action by the scaling up of proven malaria-control interventions, thanks to support from technical and financial partners. Intensified community-based malaria-control interventions, large-scale distribution of insecticide-treated mosquito nets, and the implementation of rapid diagnostic tests and artemisinin-based combination therapies have resulted in considerably lower rates of malaria-related morbidity and mortality. These new malaria-control tools could not have been introduced without major advocacy efforts and health systems strengthening at every level, including the community level.

The implementation of community networks run by health workers has given rise to synergistic action by the various stakeholders in the fight against malaria. As a result, the population has become aware of the dangers of malaria, has taken appropriate preventive measures to fight the disease, and has made use of health structures in the event of fever.

The improved quality of diagnosis—attributable to the introduction of rapid diagnostic tests, provided free of charge to patients—can be considered a decisive turning point in the fight against malaria in Senegal. It has allowed us to target our resources more accurately in the fight against malaria while garnering buy-in from service providers and communities.

On the treatment side, free artemisinin-based combination therapies and the implementation

of home-based care have made malaria-control services more accessible for all Senegalese people, especially those living in isolated rural areas. This policy reflects the priority given to equity, which is of course a constant concern for the country's health authorities.

The remarkable results achieved by the above activities—especially among vulnerable groups—confirm that malaria control will contribute significantly to the achievement of the Millennium Development Goals, particularly those related to maternal and childhood health (goals 4 and 5).

Today, Senegal has the honour and privilege of sharing these results with all Roll Back Malaria partners. We hope to raise awareness even further among donor countries and agencies of the necessity and the importance of allocating increased resources to countries affected by malaria.

In this time of rapidly evolving technology and programme design, the sharing of information and experiences is not only desirable, but also essential. We therefore hope that this report will be a welcome contribution to this information exchange.

Together, using these lessons learned, we can beat malaria in Africa.

*His Excellency Mr Modou Diagne Fada
Minister of Health and Prevention
of the Republic of Senegal*



EXECUTIVE SUMMARY

Progress and impact of malaria control in Senegal at a glance

- Since 2005, Senegal has built an effective malaria control programme based on strong management and well-defined plans.
- Implementation of best practices and strategic planning have attracted external partners and financial resources. As a result, more than US\$ 130 million was mobilized between 2005 and 2010 to scale up the fight against malaria to the national level.
- These funds were used to deploy various malaria prevention and treatment interventions, with the following results:
 - Nearly 6 million insecticide-treated mosquito nets will have been distributed by the end of 2010.
 - More than 300 000 household rooms have been sprayed with insecticide.
 - All of the country's 14 regions have received free intermittent preventive treatment for pregnant women, rapid diagnostic tests, and artemisinin-based combination therapies.
 - 1 million rapid diagnostic tests and 1.5 million artemisinin-based combination treatments have been distributed.
 - 17 000 health workers have been trained to use these tests and dispense these treatments.
 - Support for community associations was extended to all of the country's 69 districts.
- Thanks to active planning, the methodical deployment of interventions has resulted in good coverage rates at the national level:
 - In 2010, 82% of households own at least one insecticide-treated mosquito net, representing a 36% increase in less than two years.
 - 45% of children and 49% of pregnant women in the general population (regardless of mosquito net ownership) had used an insecticide-treated mosquito net the night before the post-campaign survey in early 2010. These rates went up 40% in one year.
- 52% of pregnant women received at least two doses of sulfadoxine-pyrimethamine during antenatal medical consultations in 2008/2009¹, compared with 13% in 2005.
- 86% of patients presenting with a potentially malarial fever were screened with a rapid diagnostic test in 2009.
- The high rate of coverage, for its part, provided a way to make an impact on health, to reduce the prevalence of the illness, and to save lives. In particular:
 - Under-five mortality was reduced by 30% between 2005 and 2008/2009.
 - Moderate anaemia (between 7 and 10 g/dL) in children under five dropped from 55% to 48.5% between 2005 and 2008/2009.
 - The number of confirmed cases of malaria decreased by 41% in one year.
 - The lives of 26 800 children under five have been saved since 2001, according to the Lives Saved Tool (LiST estimation model).
- These health interventions and achievements have reached the most economically disadvantaged rural communities and have helped to improve both the health system and maternal and child health programmes.
- Now that these control and prevention measures have proven to be effective, we must maintain the human and financial resources to keep rolling back malaria. Complacency will result in a rapid resurgence of this terrible disease.
- The next phase will require considerable effort, which will produce less spectacular results. If managed well, however, this phase may be the forerunner of an era in which malaria prevalence becomes negligible and its elimination within reach.

¹ The Senegal MIS-II survey was carried out in Dec. 2008–Jan. 2009.

Box 1: The extent of malaria in Senegal

Malaria in Senegal at a glance

- Senegal has 12.5 million inhabitants.
- Malaria is endemic and transmission is stable, with a seasonal peak from July to December.
- Epidemiological variations are Sahelian and hypo-endemic in the north, Guineo-Sudanese and hyper-endemic in the south.
- In 2005 there were about 2 million suspected cases of malaria and 2000 deaths attributable to malaria.
- Malaria is responsible for more than 20% of deaths among children under five.

The population of Senegal is approximately 12.5 million. The country is divided into 14 regions and 46 departments. The health system follows these administrative divisions, with a medical officer responsible for each region; some of the 69 health districts cover an entire department, while others cover only a part thereof. Each health district is placed under the authority of a chief medical officer. The health pyramid rests upon

913 health posts (placed under the responsibility of a head nurse) and 1383 health huts (managed by community health workers who report to the head nurse).

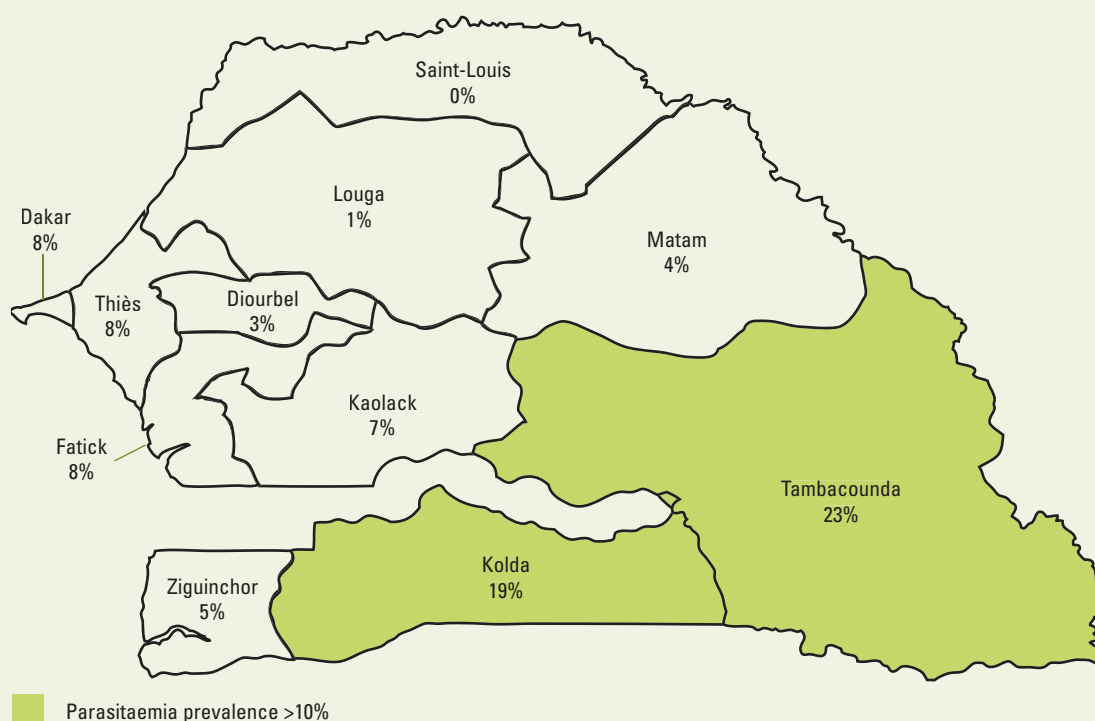
Malaria in Senegal is defined as endemic/stable with seasonal peaks. The rainy season lasts from July to October. As a result, malaria peaks between July and December.



Figure 1.1.

Prevalence of malaria parasitaemia in Senegal

There are significant epidemiological variations from north (Sahelian and hypo-endemic) to south (Guineo-Sudanese and hyper-endemic). These geographical variations partly explain the differences in the prevalence of parasitaemia recorded in 2008, which are shown on the map below.



Source: Senegal MIS-II, 2008/2009.

Malaria has been a longstanding public health problem for the people of Senegal:

- In 2005, approximately **2 million cases of malaria** (confirmed or not) were recorded at the national level, as were **more than 2000 deaths** attributable to the disease (NMCP, 2006).
- Malaria is responsible for **32% of outpatient consultations** and more than **20% of deaths in children under five**.
- The human and economic impact of the disease is a serious curb to economic development, either directly—through the costs of health care and hospitalization—or indirectly, through work days lost to personal illness or to caring for a sick child.



THE EARLY YEARS: BIRTH OF THE NATIONAL MALARIA CONTROL PROGRAMME, 1995–2003

“With US\$ 10 000 per year, one coordinator, one assistant, one driver and one supervision vehicle to cover the entire country, the results were bound to be very limited!”—Dr Bakary Sambou, National Malaria Control Programme coordinator from 1997 to 2000

For decades, the fight against malaria in Senegal revolved around a few sporadic efforts, mostly academic research programmes.

During the 1990s, the need to act on a larger scale became apparent. In 1995, the National Malaria Control Programme (NMCP) was created and placed under the responsibility of the Ministry of Health and Prevention. The “programme” consisted of only one focal point, one assistant and one simple office located in the National Department of Major Endemic Diseases, with no real resources. Its only budget was an allocation from the World Health Organization (WHO) of US\$ 20 000 every two years.

The turning point came in 1997, when WHO allocated US\$ 185 000 to concentrate efforts and funding on 12 of Senegal’s districts through the first Accelerated Malaria Action Plan. An external evaluation carried out in October 1998 was encouraging: the first results had been obtained. It became clear that with the human and financial resources to back it up, the fight against malaria had become a concrete entity capable of making an impact.

In 1999, when the Roll Back Malaria (RBM) Partnership was launched, Senegal was one of the pilot countries (along with Mali and Mauritania). In the context of the pilot, an analysis of Senegal’s malaria situation was carried out in collaboration with a private consulting firm. The movement it generated and the critical analysis it provided

attracted funds and partners: the Japan International Cooperation Agency, UNICEF, and the World Bank extended their support to the Senegalese government. They financed the purchase of mosquito nets, as well as the first national survey to identify needs and guide actions. The Ministry of Health was expanded.

In 2000, after the Abuja Declaration, a group of facilitators and a technical committee were set up. The Minister of Health lent his full support to an NMCP-led social movement: the “crusade against malaria”. A first strategic plan covering 2001–2005 was drafted based on the abovementioned malaria situation analysis and used as an advocacy tool, leading to additional funding.

In 2003, an RBM Partnership mission was used to identify needs and prioritize actions. Known as REAPING (RBM Essential Actions, Progress & Investment Gaps), this critical analysis led to an action plan, served as an effective advocacy tool, and led to Senegal’s first major malaria-control grant, during Round 1 of the Global Fund. Later on in 2003, Senegal changed its treatment policy, replacing chloroquine monotherapy with combination therapies (initially amodiaquine/sulfadoxine-pyrimethamine) and adopted intermittent preventive treatment for pregnant women.

Once the wheels were set in motion, the NMCP was able to widen the scope of its activities and ensure their effectiveness.

Box 2: Youssou N'Dour: On the front lines of the fight against malaria in Senegal

The fight against malaria has a heavy hitter in Senegal: superstar musician Youssou N'Dour. Already involved with UNICEF and the RBM Partnership, N'Dour joined forces with the NMCP early on in the belief that bringing the fight down to the grassroots level was the best way to achieve tangible, lasting results and support from partners.

In 2005, N'Dour headlined AFRICA LIVE: The Roll Back Malaria Concert, a star-studded event that reached an estimated billion people worldwide with both music from top African artists and messages about malaria, thanks to the concerted efforts of a diverse range of Roll Back Malaria partners. “Music can accelerate the rhythm of the movement to fight malaria,” said N'Dour at the time.

In keeping with that sentiment, N'Dour and his brother Boubacar created *Senegal Surround Sound*, a communication and education initiative designed to reduce the burden of malaria in Senegal.

To reach the public, *Senegal Surround Sound*, in association with the NMCP and the American nongovernmental organization (NGO) Malaria No More, launched a national campaign in 2009 called *Xeex Sibbiru* (“Let’s beat malaria” in Wolof). The campaign, which calls upon every segment of Senegalese society, is intended to inform the general public and to prompt them to take responsibility for protecting themselves from malaria. The message gets through to all audiences: business and sports personalities, the media, and religious leaders have all provided support to the campaign.

The *Xeex Sibbiru* campaign, an innovative public-private partnership, uses multiple communication channels to drive home its malaria prevention messages, including a national singing competition, the network of community health workers, and the mobilization of civil-society partners.





Activities orchestrated by this campaign include:

- **Support for the national ITN distribution campaign:** This insecticide-treated mosquito net (ITN) campaign opened with a concert broadcast nationwide to promote the distribution of 2.2 million ITNs. Community health workers used radio commercials featuring celebrities, songs, and certificates signed by

Yousou N'Dour to promote the distribution and use of the nets. N'Dour's song, *Xeex Sibbiru*, written for the occasion, was recorded in three languages—Wolof, Pulaar, and Serer—and was broadcast on the air and in more than 1300 health huts.

- **Commitment from religious leaders and the private sector:** During Ramadan 2009, N'Dour and the *Xeex Sibbiru* team went to Senegal's main spiritual centers to receive blessings from

the country's religious leaders and to confirm their commitment to encouraging their fans to use the ITNs. In the same timeframe, national and international companies like Africa Cola, ExxonMobil, and Senegal's Economic and Social Council joined the campaign as sponsors to help reach the target audiences.

- ***Xeex Sibbiru* singing competition:** The *Xeex Sibbiru* singing competition took place from March to June 2010. More than 1000 contestants took part, and related events were held in Senegal's 14 regions. To qualify, contestants had to demonstrate their knowledge of malaria, submit an original song about the disease, and work side-by-side with health educators to educate their communities. Publicity campaigns were held in every health hut, post, and centre around the country. Eight regional concerts were given, with the participation of artists including N'Dour and Viviane. The competition's final—broadcast on national television—took place on 9 June 2010 in Dakar and was attended by representatives from *Senegal Surround Sound*, the NMCP, Malaria No More, and the RBM Partnership. The winner, Djibril Diop, recorded his song against malaria with N'Dour and Viviane, and will continue to lend his voice to the fight against malaria.

The *Senegal Surround Sound* approach for the *Xeex Sibbiru* campaign

- **The right message:** Knowledge, Attitude, and Practice surveys helped determine the content of the messages to be used. Public figures like Youssou N'Dour worked with the NMCP to adapt the messages to be sure they would be “punchy” enough to reach the target audiences.
- **Well-known messengers:** A quantitative survey was used to determine which spokespeople would be the most effective in each region. Famous musicians, religious leaders, athletes, and actors thus came to represent *Xeex Sibbiru* in the public eye.
- **Multi-sector participation:** Well-known spokespeople and high-profile events helped the campaign to recruit key partners in religion, health, sports, the media, and business to expand the audience and boost impact.
- **Measures of impact** gathered during national surveys:

	Before <i>Surround Sound</i> (June 2009)	Since <i>Surround Sound</i> (November 2009)
Percentage of the population that remembers at least one part of the campaign	-	64%
Number of large companies or organizations actively fighting malaria	1	8
Number of national religious institutions involved	0	3
Number of well-known spokespeople at the national level (musicians, religious leaders, athletes, actors)	2	30

This strategy has spawned spin-offs. In April 2010, N'Dour went to Cameroon to explore the possibility of launching *Cameroon Surround Sound* to attempt to replicate the outcome of the Senegalese campaign. Other countries could follow.



Two questions for Youssou N'Dour

What advice would you give to countries inspired by what you have built in Senegal?

Use the talent and wealth of your local culture. International donors contribute very generously to improving life in Africa, but only Africans can create the lasting cultural transformation that is needed to win the fight against malaria. No one else can live our lives and understand our realities. As my brother Boubacar likes to say, "If we can get everyone in Senegal to know 500 songs by heart, we should be able to educate people about malaria!"

Is it important to involve private-sector partners, faith-based organizations, and the media?

It's crucial! We're lucky that international donors are interested in malaria for now, but the fight against malaria will be a marathon. In the long term, we will need the resources, talent and commitment of all sectors of Senegalese society if we want to maintain our success and eradicate malaria. It won't be easy and it won't be quick, but together we can make it happen.



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

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

- The NMCP was created in 1995.
- It underwent a major reorganization in 2005 after cancellation of the Global Fund (Round 1) grant.
- Management and planning capacities were significantly strengthened.
- NMCP personnel increased from 5 to 32 staff members in five years.
- Funding and activities have accelerated over the past five years.

The year 2004 did not begin well for Senegal's NMCP: a negative evaluation of its use of the Round 1 grant awarded by the Global Fund resulted in the grant's cancellation. This setback spurred the NMCP to quickly take the appropriate measures to improve the efficiency of its administration and management.

Following a series of fact-finding missions, the NMCP underwent a major reorganization in 2005 and increased its human resources. Senegal obtained a second grant from the Global Fund (Round 4) and drafted a second strategic plan covering 2006–2010.



The programme then intensified and accelerated its activities:

- 2006: National coverage of artemisinin-based combination therapy (ACT)
- 2007: National coverage of free rapid diagnostic tests (RDTs) and a third grant obtained from the Global Fund (Round 7)
- 2008: Introduction of home-based care (known as PECADOM, for *prise en charge à domicile*) for malaria cases in districts with high prevalence of malaria and low concentration of health posts
- 2009: Launch of the first mass distribution campaign of insecticide-treated mosquito nets (ITNs) on a national scale
- 2010: Redoubling of efforts
 - Extension of PECADOM coverage
 - Availability of free ACTs
 - Implementation of universal ITN coverage in 4 south-eastern regions
 - Review of NMCP performance (April–May)
 - Banning of artemisinin-based monotherapies to fight against the emergence of resistance (June)
 - Drafting of third strategic plan for 2011–2015 (June)
 - Submission of a new grant application to the Global Fund (Round 10; August).

The NMCP has always acted on the basis of operational research. A research commission was instituted within the programme in 1995. Headed by Professor Oumar Gaye of the medical school at Dakar's Cheikh Anta Diop University, it brings together Ministry of Health specialists, academics, local research institutes (Institut de recherche pour le développement, Institut Pasteur, vector ecology and medical entomology laboratory, etc.), WHO experts, and other international technical partners.

Through this commission, the NMCP plans and coordinates malaria research activities ranging from clinical trials, to drug quality control, to anti-malarial medication efficacy monitoring (resistance control). Feasibility studies may also be conducted, as was the case when rapid diagnostic testing was introduced. In this way, key interventions can be based on operational research data.

This far-reaching partnership with research organizations has helped to develop malaria research in Senegal, and has also been a source of resources for orienting, developing, and monitoring the NMCP's work.



Figure 2.1.
Objectives of Senegal's national strategic plan for malaria control

National strategic plan 2006–2010	
	Objective
Insecticide-treated mosquito net (ITN) coverage	> 80% of households own at least one ITN
Indoor residual spraying (IRS) coverage	>80% of eligible households in the target areas
Intermittent preventive treatment coverage for pregnant women (IPTp)	> 80% of pregnant women receive ≥ 2 doses of IPTp
Use of ITNs for children under five	> 80% of children under five sleeping under an ITN
Antimalarial treatment	> 80% of sick people treated with appropriate artemisinin-based combination therapy (ACT) within the first 24 hours

Since the 2005 reorganization, the NMCP team has grown from 5 to 32 members, thanks to the grants from the Global Fund, which pay for 18 of the 32 positions. The staff is made up of 4 doctors, 2 pharmacists, 2 engineers, 1 senior technician, 1 logistician, 1 economist, 3 accountants, 2 secretaries, 7 drivers, and 9 security guards, caretakers, and receptionists.

The main objectives guiding the second strategic plan, which will be completed at the end of 2010, are shown in Figure 2.1 above.

Every five years, the NMCP and its partners jointly develop a strategic plan. However, the programme has not had operational or financial implementation plans other than those drafted for the implementation of specific grants awarded by partners such as the Global Fund, the United States President's Malaria Initiative (US-PMI), and the Islamic Development Bank. To remedy this situation, the NMCP is developing triennial and annual operational plans, asking donors to sponsor all or some of the planned activities.

Box 3: Interview with Dr Pape Moussa Thior, National Malaria Control Programme (NMCP) coordinator in Dakar

The National Malaria Control Programme in Senegal is often cited as a success story for its achievements in reducing malaria-related morbidity and mortality. How did you achieve these reductions?

I think that for us, in Senegal, the wake-up call came when our first-round grant from the Global Fund was cancelled in 2004. Those involved at the political and technical levels realized that a great opportunity was being lost. The programme's management was evaluated, revealing major weaknesses.

The programme was completely overhauled. With support from the Global Fund, we were able to hire new staff members and the programme grew from a team of 5 to 32. We established a clear, functional organization chart with detailed, precise job descriptions.

For me, the keys to success lie in **programme management, decentralization**, and our **involvement in the field**, as evidenced by the high number of kilometres travelled each year by our staff and our vehicles!

What are the main strengths of the National Malaria Control Programme in Senegal today?

Above all, **political support**. To be able to count on unwavering support from the Ministry, to be encouraged in our work, to work together to overcome obstacles.

Next, **the internal organization** of our structure, based on properly assigned, specific tasks.

The renewed **support of our partners** provides us with vital resources and expertise, and helps us to target interventions within an agreed framework.

Finally, commitment from active, well-organized communities provides essential local support. Without these invaluable actors on the ground, none of our activities would have made an impact.

On the other hand, what weaknesses do you see?

I have long been disappointed in the insufficient involvement of the private sector (aside from NGOs). The private medical and paramedical sector springs to mind first; we will try to reopen and strengthen our lines of communication with doctors' and pharmacists' unions to obtain their active participation in our work. Next, private companies. They have done many useful things, but not enough. The telecommunications company Sonatel comes to mind—they helped to deliver free intermittent preventive treatment to pregnant women—as does TOTAL Senegal, which participated in distributing insecticide-treated mosquito nets.

The private sector could play a much larger role, joining wider civil society in the fight against this disease.

What next steps do you envisage?

We are in an evaluation phase, but are also expanding and intensifying the programme.

We were able to carry out the performance review for our programme according to WHO's new directives, then draft a new strategic plan (2011–2015), and finally submit a grant proposal to the Global Fund for Round 10. These successive accomplishments gave us a chance to reflect upon our strengths and weaknesses and to consider the work that lies ahead in years to come.

It seems to me that given Senegal's particular geographic and epidemiological situations, two main strategies must be adopted:

- The first strategy—for the northern areas, which are in the pre-elimination phase—must focus on strengthening monitoring: active, real-time detection of suspected malaria cases, with immediate intervention to try to



stop transmission. We need to invent flexible, reactive, and fast strategies. Why not, for example, take a page from the *SMS for Life* initiative tested in Tanzania by the Swiss Tropical Institute and combine ACT inventory management and rapid case detection?

- The second—for the southern regions with high malaria prevalence—will require targeting increased access to treatment through home-based care, improving communication, and working towards universal ITN coverage. These districts will remain in an intensified control phase.

What advice or suggestions do you have for fighting malaria across the region?

Mosquitoes don't stop at borders, so we need to have an integrated, cross-border approach. I think it is essential to share ideas, strategies, and research protocols.

That's what we are trying to do with the Trans-Gambian Initiative for Malaria Elimination (TIME project), which includes Senegal, the Gambia, Guinea-Bissau, Mauritania, and Mali. The member countries work together on operational research, whose results serve to define a pre-elimination strategy. We will need the same approach for epidemiology and specific malaria-control interventions, with support from RBM, WHO, the West African Health Organization, and all our partners.

The biological confirmation of malaria diagnosis using rapid diagnostic tests is now a must for all malaria control programmes. We can no longer treat all cases of fever as cases of malaria. Using the experience acquired by a few, we must support all countries to scale up rapid diagnostic test use across Africa. We must be bold, innovative, and avoid complacency. Only thus will we make significant progress in the fight against malaria.

b. Securing funding

Outside funding for malaria control in Senegal at a glance

- Various partners have committed more than US\$ 130 million to the malaria prevention and control programme in Senegal.
- In 2004, external funding amounted to US\$ 1 million, as compared with US\$ 30 million committed for 2010 by the Global Fund and US-PMI.
- Other partners, like the World Bank, WHO, UNICEF, and the Islamic Development Bank, are actively involved and making growing contributions.

The reorganization of the NMCP and the commitment of the Senegalese government quickly came to fruition. The implementation of good practices and the plans established attracted increasing numbers of partners and resources. As a result, after a positive evaluation in Round 4 of the Global Fund, external funding increased rapidly and substantially.

The Senegalese government's funding of malaria-control interventions began intensifying, and its health budget jumped from 36 billion CFA francs (US\$ 40 million) in 1998 to 90.5 billion CFA francs (US\$ 100 million) in 2008. Today, health represents about 10% of the federal budget. The share of this budget that is earmarked for malaria is difficult to estimate, since it includes support for health workers and structures (hospitals; health centres, posts, and huts; laboratories) providing most of the care.

Outside support grew considerably when the Global Fund awarded grants in 2005 (Round 4) and 2008 (Round 7), and gained momentum when Senegal was included among the countries supported

by the US President's Malaria Initiative (US-PMI), whose first funds were made available in 2006 and whose support became decisive in 2007.

Other partners joined them. The World Bank financed a malaria control project along the Senegal River basin. Several organizations provided technical contributions, advocacy, or reinforcement for services at the local level, especially WHO, UNICEF, and the Islamic Development Bank.

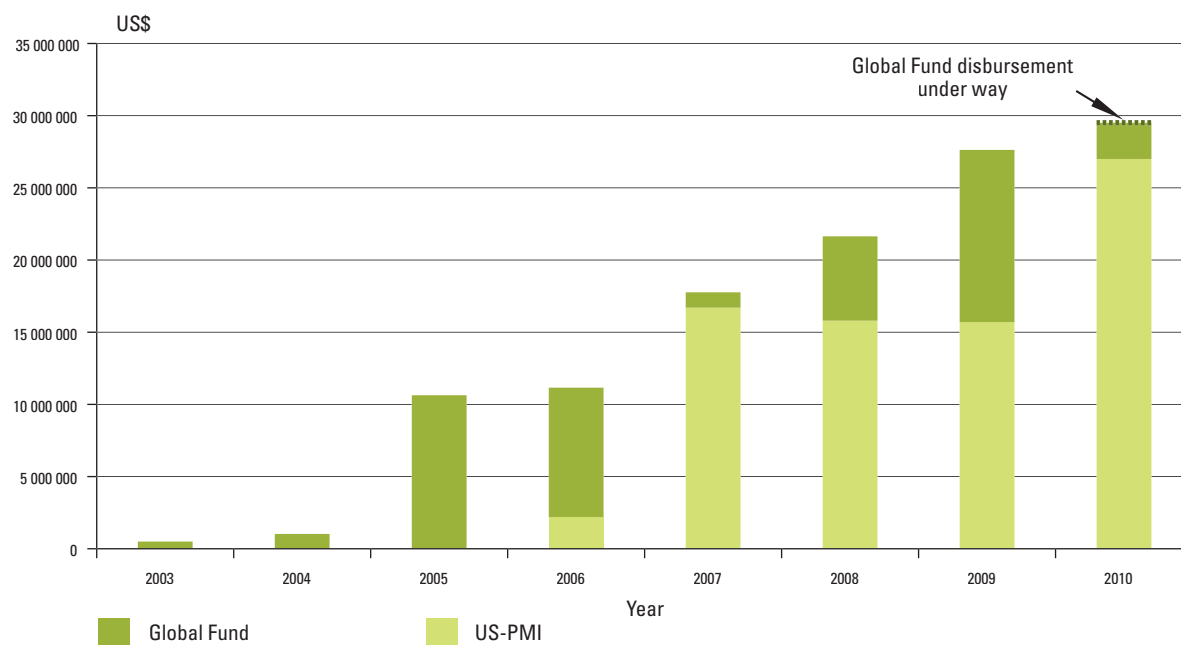
The Global Fund Country Coordinating Mechanism (CCM) was also restructured in 2005. Presided over by Professor Doudou Ba, Vice President of Senegal's Academy of Science and Technology, its 47 members represent all parties involved in programme implementation. Through quarterly meetings and field trips, the CCM oversees activities, providing advice and ensuring correct implementation to produce results. It has close ties to both the Ministry of Health, with which it maintains close contact, and the programme coordinators—all CCM members—who provide progress updates at each quarterly meeting.



Figure 2.2.

Grants from the Global Fund and US-PMI for malaria control in Senegal, estimates for 2003–2010

Annual funds are approaching the level required for malaria control between 2007 and 2014, as estimated in the most recent grant proposals submitted to international donors: US\$ 280 million, or approximately US\$ 40 million per year.



Source: Global Fund and US-PMI.

Box 4: The home-based care programme (PECADOM)

Most cases of fever are not evaluated in the context of the health system. Indeed, the last national survey on malaria (Senegal MIS-II), held in 2008/2009, revealed that of the 52% of febrile patients who received some form of health evaluation, 35% were seen outside a hospital or health centre/post. This is mainly due to distance.



To solve this problem, Senegal introduced a new kind of health worker, the DSDOM or *dispensateur de soins à domicile* (home-based care provider), thus allowing for home-based care (known as PECADOM, for *prise en charge à domicile*) in the event of a fever. The home-based care provider reports to the nearest health hut. The network of health huts has already resulted in improved coverage in areas without a health post close by; home-based care improves this coverage even further.

Home-based care providers are selected in their own villages and trained in diagnosis using rapid diagnostic tests (RDTs) and treatment with artemisinin-based combination therapy (ACT). Upon completion of their training, they receive a kit including ACTs, RDTs, a recycling container for sharp objects, data collection forms, two T-shirts, two baseball caps, two vests, a case, a satchel, a torch, and a box of gloves. The home visit, the RDT, and any necessary ACT treatment are provided free of charge. Home-based care providers can refresh their supplies of ACTs and RDTs at the health post upon presentation of their latest case log. Supervision is provided at several levels. On one level, the health-post nurse directly supervises the home-based care provider; on another level, the district medical team provides quarterly supervision; and, finally, the National Malaria Control Programme team holds twice-yearly inspections. The home-based care providers are all volunteers, but they receive a daily stipend during the training sessions, which serves as an incentive.

In 2009, of the 7198 patients seen by home-based care providers and suspected of having malaria, 6707 (93%) were tested with an RDT. Of the 2300 cases of malaria thus confirmed, 2226 (97%) were treated with ACT at the community level, and the recovery rate for cases of simple malaria was 100%. The remaining 74 patients (or 3%) had to be referred to the next level of the health system for more specialized medical care. No deaths attributable to malaria were recorded in the target villages.



c. Delivering interventions

Intervention delivery at a glance

- 4.7 million ITNs were distributed between 2006 and 2009.
- 6 million ITNs will have been distributed by the end of 2010.
- 330 000 rooms in three target districts received indoor residual spraying (IRS) between 2006 and 2009.
- In 2006, 89% of antenatal clinics offered women free IPT and ITNs during pregnancy.
- 1 million RDTs have been distributed free of charge since 2007.
- More than 1.5 million ACTs were dispensed, most of them in 2007.
- Roughly 100 people received malaria-specific training and 17 000 health workers were trained to use RDTs and dispense ACTs between 2008 and 2009.
- The country's 69 health districts all receive support for community information, education and communication activities (ABCD programme).

Malaria-control interventions on the ground had three main points of focus:

1. Providing easier access to insecticide-treated mosquito nets (ITNs)

Between 2006 and 2009, Senegal's Ministry of Health and Prevention and its partners bought and distributed **4.7 million ITNs**—more than half of them in 2009 alone—thanks to large-scale distribution

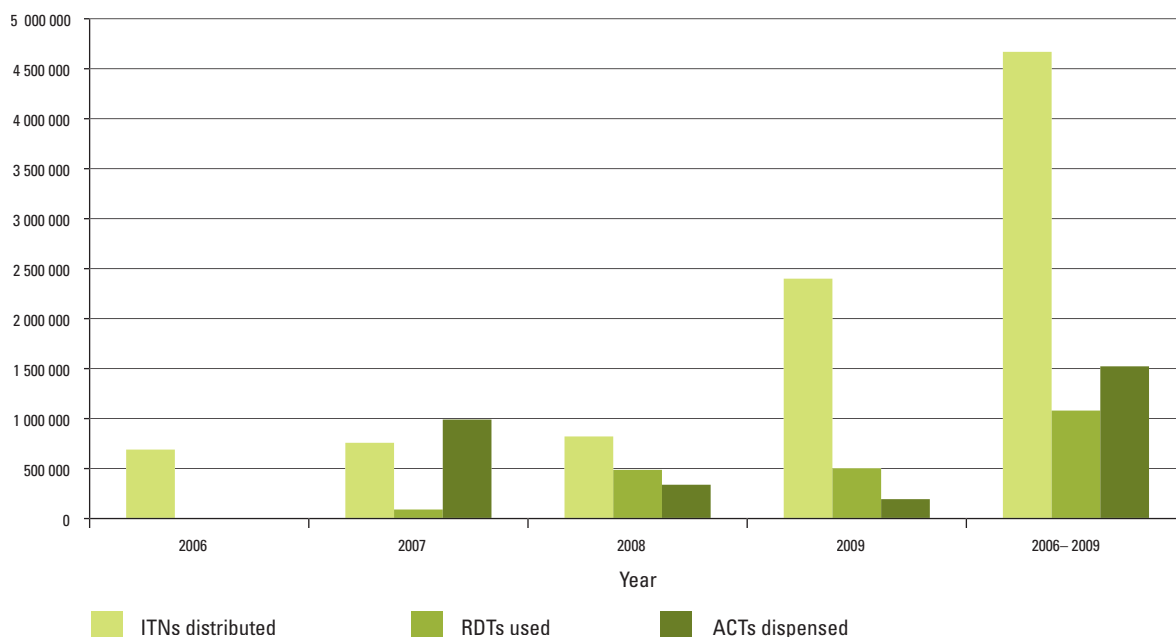
campaigns. The planning and management of the campaigns, which covered the country gradually, district by district, resulted in good rates of ITN coverage and use, especially in the country's rural and disadvantaged areas.

This effort has continued in 2010 and **distribution should reach the threshold of 6 million ITNs**, even closer to the level of universal coverage (estimated at around 8 million ITNs for the country).

Figure 2.3.

Number of insecticide-treated mosquito nets (ITNs) distributed (light green), rapid diagnostic tests (RDTs) used (medium green), and artemisinin-based combination therapies (ACTs) dispensed (dark green) per year in Senegal, 2006–2009

Services were provided following the receipt of external funding. The majority of the ITNs were distributed during the 2009 national campaign. The number of ACTs dispensed has diminished thanks to the diagnostic precision made possible by RDTs.



Source: NMCP, 2010.

2. Indoor residual spraying (IRS) campaigns

Between 2007 and 2009, IRS campaigns were carried out in three pilot districts in Senegal: 330 000 residential rooms—representing 95% of eligible rooms—were treated.

Activities included identifying the target areas, purchasing and dispatching insecticides and spraying equipment, training the spraying teams, carrying out the actual spraying, and, finally, setting up five sentinel sites to ensure quality control for each district.

In 2010, the extension of these activities to three other districts was made possible with support from maternal and child health programmes. The number

of target districts, where malaria morbidity and mortality remain high, should be increased to 16 in the coming years.

3. Implementing interventions (ITNs, IPTp, RDTs, ACTs) and training personnel in all of Senegal's 14 regions

Thanks to close ties between the NMCP and maternal and child health programmes, pregnant women were able to benefit from IPT with sulfadoxine-pyrimethamine and receive ITNs throughout almost the entire country. As a result, 89% of the maternal and child health clinics evaluated were able to provide these services to pregnant women in 2006 (evaluation data from the strategic plan).



Since 2007, after an intense, two-month training period, all of the country's health centres have been using RDTs provided free of charge to diagnose malaria. More than 1 million tests have been provided and used throughout the country.

Similarly, in 2007 and 2008, all public-sector health centres were supplied with ACTs and were able to use them—free of charge as of 2010—to treat malaria cases diagnosed with RDT. Overall, more than 1.5 million ACT treatments were provided to health centres, most of them in 2007 before the widespread distribution of RDTs. It is interesting to note that with the intensification of preventive measures and the wider use of RDTs, the number of ACT treatments required should continue to decrease, resulting in significant cost savings.

As concerns training, more than 100 people, including 70 chief district medical officers and 24 primary healthcare officers, took advanced malaria courses during 2008/2009. Over the same period, more than 17 000 health workers, including doctors, nurses, and community health workers, were trained to use

RDTs and ACTs. Fever management and malaria treatment algorithms were updated or developed.

In June 2010, a ministerial order was signed, prohibiting the use of artemisinin-based monotherapy. There are still frequent ACT shortages in the health centres, however, and 40% of the antimalarial drugs available on the Senegalese market do not comply with international recommendations.

At the community level, the NMCP supported malaria control activities through its ABCD (*Atteindre les Bénéficiaires Communautaires à travers les Districts*, or “reaching community beneficiaries through the health districts”) programme, which is now operational in all of the country's 69 districts thanks to Global Fund grants. Contracts were established between health districts and community associations, which are now able to organize a range of activities such as community rallies and home visits to educate people about malaria, ITN distribution and re-treatment campaigns, and events addressing hygiene and sanitation.

Box 5: Equity of malaria-control interventions and positive effects of the programme

Interventions and equity

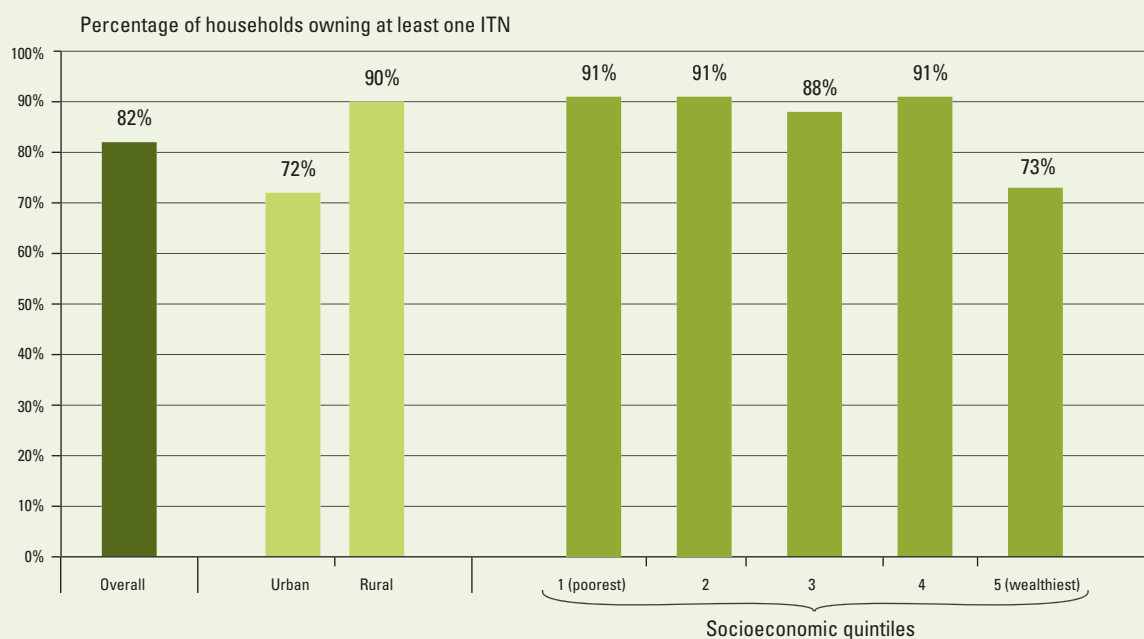
For each intervention, the data from the various surveys—when analysed by economic quintile or by geographic area—are in line with results from other countries. The most disadvantaged quintiles and rural areas enjoy a better rate of coverage.

Only access to diagnosis and rapid treatment of malaria seem to penalize the most disadvantaged rural areas. The expansion of home-based care coverage seeks to redress this inequality.

Figure 2.4.

Percentage of households owning at least one insecticide-treated mosquito net (ITN), Senegal, 2010

After the 2009 national distribution campaign, the percentage of households owning at least one ITN increased significantly. Households located in rural areas and/or representing the most disadvantaged socioeconomic quintiles were generally better covered.



Source: 2010 post-campaign survey evaluating the 2009 large-scale ITN distribution campaign.



Effects on maternal and child health

During the 2009 large-scale ITN distribution campaign, 90% of children under five also received mebendazole and vitamin A, demonstrating the breadth of the impact that malaria-control activities can have on other child health interventions.

Similarly, expanding coverage for intermittent preventive treatment during pregnancy made it possible to broaden both the message and the range of health interventions provided. During antenatal consultation visits—which are attended at least once by 80% of pregnant women—malaria prevention is discussed in the broader context of maternal and child health.

Effects on the health system

The training of thousands of health workers in the context of the fight against malaria has helped to strengthen the Senegalese health system as a whole.

But perhaps the most important contribution made by the NMCP to relieving the pressure placed on the health system is the reduction of malaria cases (see Figure 2.9). By drastically reducing the number of malaria cases, and by using early diagnosis to provide better treatment of malaria as well as non-malarial fevers, the NMCP not only strengthens the health system, but lightens its load.

Indeed, the number of malaria cases in children under five dropped from 400 000 suspected cases in 2006 to 78 000 confirmed cases in 2008, then to 30 000 confirmed cases in 2009. This shows both the reduction in the number of confirmed cases as a result of the malaria programme (from 78 000 to 30 000 cases in a single year, for example), and the impact (not quantified here) that early diagnosis of suspicious fevers (whether malarial or not) can have in children, likely leading to faster recovery and reduced mortality.

d. Increasing coverage of malaria-control interventions

Intervention results at a glance

- In 2010, 82% of households own at least one ITN: an increase of 36% in less than two years.
- 45% of children under five and 49% of pregnant women in the general population (regardless of mosquito net ownership) used an ITN on the night before a post-campaign survey carried out in early 2010. These rates rose 40% in one year.
- 52% of pregnant women received at least two doses of sulfadoxine-pyrimethamine during antenatal medical consultations in 2008/2009, compared with 13% in 2005.
- 86% of patients presenting with a suspected malarial fever were screened with an RDT in 2009.

The success of these malaria-control interventions is illustrated by the coverage rates obtained at the household and individual levels during field surveys.

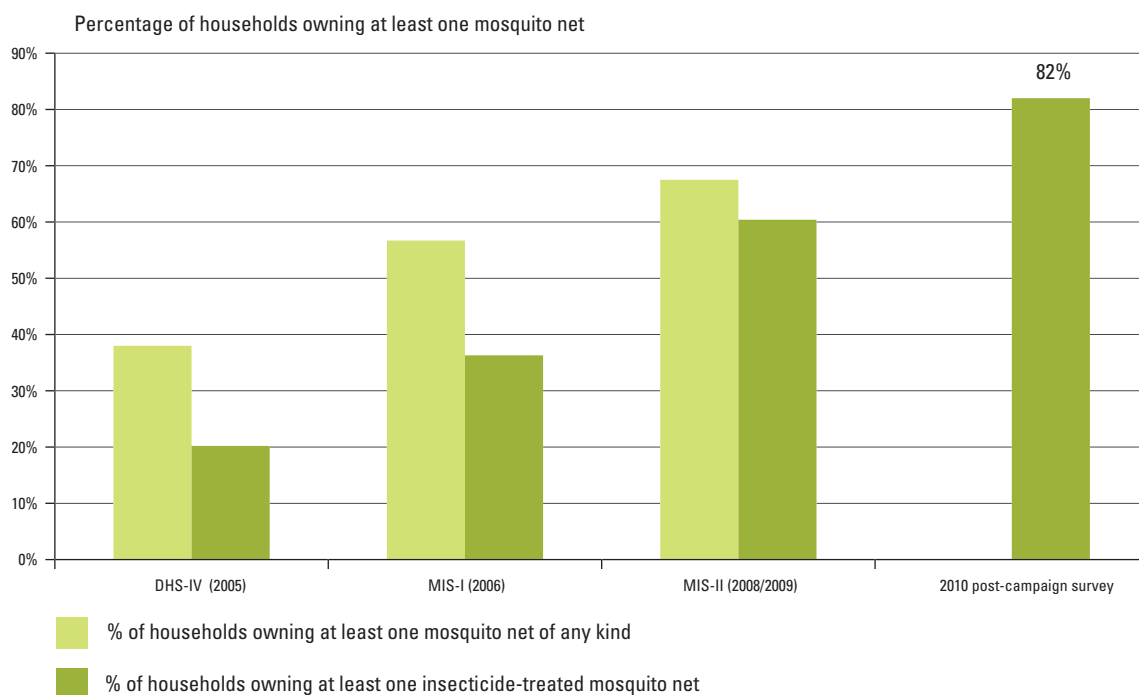
These rates rose significantly between the 2005 and 2010 surveys.



Figure 2.5.

Percentage of households owning at least one mosquito net of any kind (light green) or at least one insecticide-treated mosquito net (ITN, dark green), Senegal, 2005–2010

In 2005, only 20% of households owned an ITN, while in 2010, following the 2009 national distribution campaign, 82% of households own at least one ITN. In just five years, the proportion of households owning an ITN increased fourfold. Between 2008 and 2010, the percentage of households owning an ITN rose from 60% to 82%—an increase of 36% in less than two years.



Source: 2010 post-campaign survey evaluating the 2009 large-scale ITN distribution campaign.

The characteristics of the mosquito nets observed during the 2010 survey are as follows:

- 82% of mosquito nets are ITNs; 6% have never been treated.
- 67% of mosquito nets were obtained free of charge, 18% were subsidized through the purchase of a 1000 CFA franc (US\$ 2) voucher,

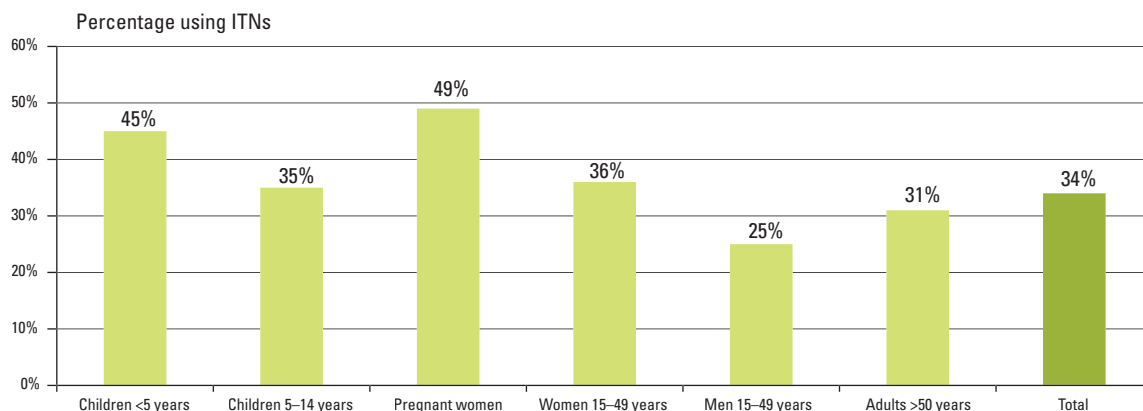
and 6% were purchased for more than 2000 CFA francs (US\$ 4).

- 75% of mosquito nets had been acquired during the 18 months prior to the survey.
- 46% of mosquito nets had been acquired during the 2009 campaign.

Figure 2.6.

Use of insecticide-treated mosquito nets among the general population (including households not owning any nets) during the night preceding the survey, Senegal, 2010

The highest rates of use were recorded for children under five (45%) and for pregnant women (49%). Awareness-raising about the increased risk of malaria among these vulnerable groups seems to have been effective.



Source: 2010 post-campaign survey evaluating the 2009 large-scale ITN distribution campaign.

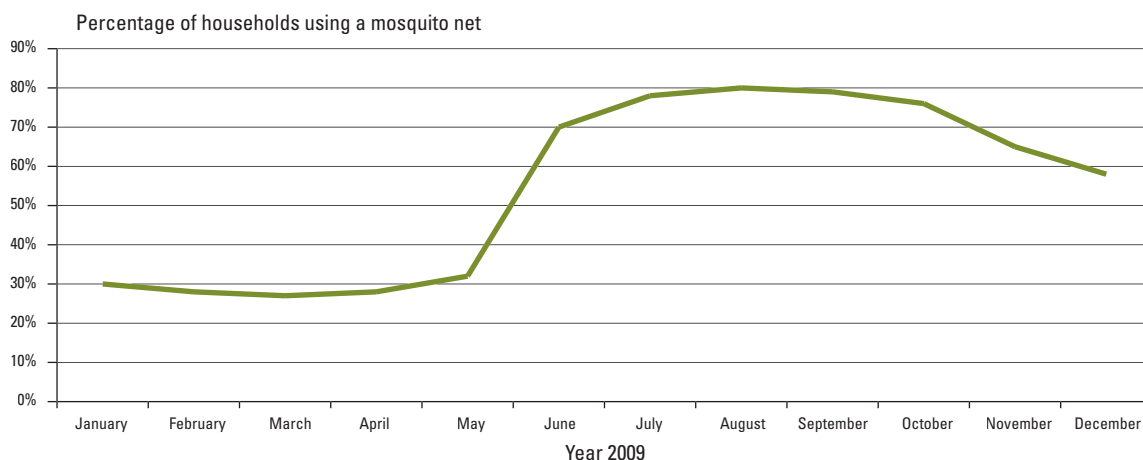
The rate of ITN use among children under five went from 28% in 2008/2009 (Senegal MIS-II) to 45% in 2010 (post-campaign survey). Over the same period, the rate of ITN use among pregnant women rose from 27% to 49%. These figures represent an increase of about 40% for both groups.

In households owning a mosquito net, the rate of use on the night before the survey was 65%. The main reason for lack of use was the perceived absence of mosquitoes (72% of cases).

Figure 2.7.

Percentage of households using a mosquito net during the year, Senegal, 2009

The use of mosquito nets varies markedly by season. Use increases during the rainy season from July to October, when transmission rates are high.

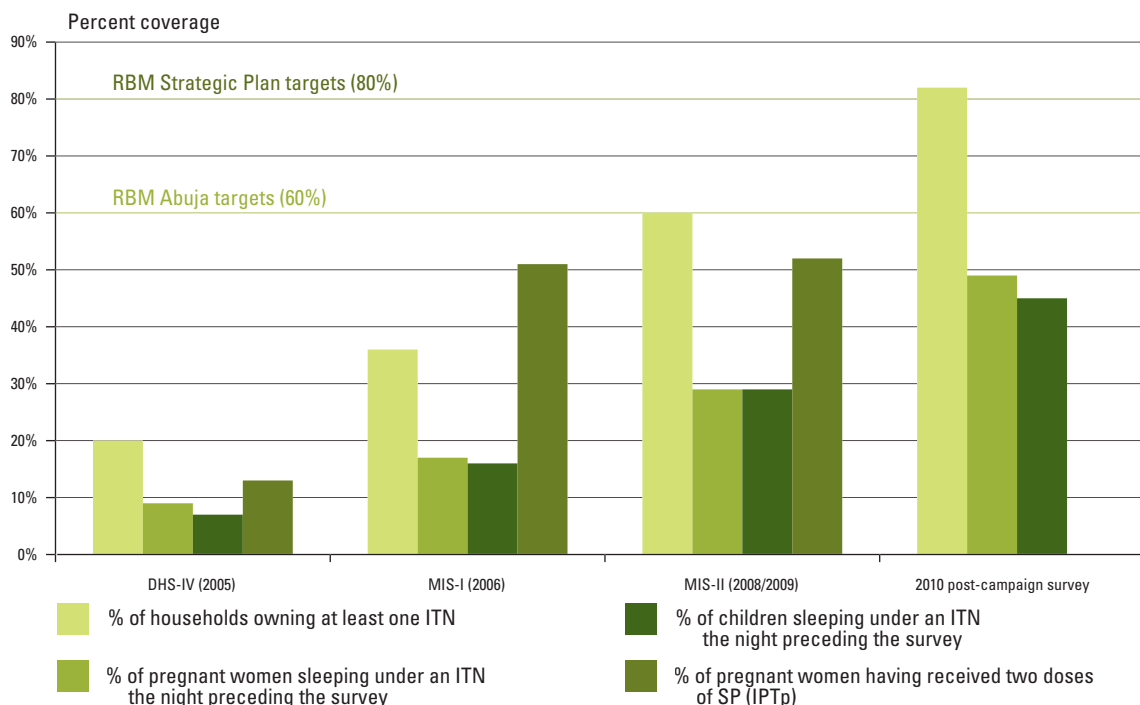


Source: 2010 post-campaign survey evaluating the 2009 large-scale ITN distribution campaign.

Figure 2.8.

Progress in intervention coverage, Senegal, 2005–2010

The increase in coverage rates is significant for all interventions between 2005 and 2010.



Source: NMCP, 2010.

The proportion of pregnant women having received at least two doses of sulfadoxine-pyrimethamine (SP) during antenatal visits rose from 13% in 2005 (DHS-IV) to 52% in 2008/2009 (Senegal MIS-II). This percentage could have reached 70% had drug shortages not prevented some women from receiving the recommended two SP doses during their antenatal visits. It is important to note that 78% of pregnant women received at least one dose of SP during antenatal visits.

The proportion of children under five having presented with a fever in the two weeks preceding the survey and having been evaluated in a health centre or by a health worker on the same day or the following day remained relatively stable, with rates going from 30% in 2005 to 31% in 2008/2009. This proportion is expected to increase after home-based care is expanded in regions with the fewest health centres.

On the other hand, the proportion of febrile children under five who were treated for malaria decreased significantly, from 27% in 2005 to 9% in 2008/2009 (DHS-IV, Senegal MIS-II). This drop is due in part to RDT distribution on a national scale, which enabled biological diagnosis of malaria (starting in 2007). In 2009, out of 585 000 patients evaluated at a health centre for a suspected malarial fever, 503 000 were able to benefit from an RDT: an RDT usage rate of 86% (NMCP data, 2010).

Of the 9% of febrile children treated for malaria, slightly more than half were treated with ACTs (Senegal MIS-II, 2008/2009). The proportion of childhood malaria cases treated by ACT is expected to increase significantly following the 2008 nationwide distribution of these treatments to health centres.

Box 6: Strengths and weaknesses in malaria control in Senegal

Strengths

1. Good integration of the National Malaria Control Programme into the health system

The NMCP's operations are well integrated into the national public health system, with many actors at different levels in the field carrying out NMCP-defined activities. The NMCP strengthens existing structures through ongoing training and technical and logistical support.

2. Strong political will at every level of the administration

Malaria control enjoys strong support from the health minister all the way down to local government representatives. There is regular interaction between each district's chief medical officers and their respective *préfet* (regional state representative), and home-based care providers are inaugurated by their *sous-préfet* (sub-regional state representative). Community support networks wield administrative clout, having been created by decree of the regional state representative (*arrêté préfectoral*).

3. Effective National Malaria Control Programme management

The management of the NMCP was strengthened considerably after 2005, when the Global Fund cancelled its Round 1 grant. Thanks to a subsequent increase in available financial resources, the NMCP staff grew from 5 members to more than 30. Due in part to institutional stability (there have been only four coordinators since the programme was created in 1995), the programme now benefits from strong, effective management. This is evidenced by the speed (less than six months) with which ACTs were distributed nationwide in 2006, followed by RDTs in 2007 and home-based care in 2008/2009. In each case, the implementation of national coverage was organized methodically, with required training courses held over a

two-month period, during which all NMCP staff members were deployed to the field.

4. Communication and the use of community networks

In each Senegalese village, there are women's clubs, youth clubs, sports clubs, and cultural clubs. The NMCP used these existing structures to set up community support networks. These networks held events to promote ITN use and to raise awareness of the importance of IPT for pregnant women, thanks to the Round 4 and 7 grants from the Global Fund. Similarly, events on hygiene and sanitation took place in several communities. *Tontines* (community savings schemes) raise funds to purchase ITNs, for example for the most disadvantaged pregnant women in the community.

Home-based care providers are often drawn from these community networks, both participating in monthly supervision meetings at the district level and submitting to targeted supervision investigations in the field.

5. Close interaction between the National Malaria Control Programme and the scientific research community

Thanks to the existence of several partnerships between the NMCP and university hospital centres and research institutes, the NMCP's actions are guided by scientific research. Tangible examples of this interaction include the end of chloroquine use to treat malaria (2003) and the introduction of the first combination therapies.

These partnerships also allow doctors and senior health technicians to receive appropriate, malaria-specific training. In 2000, about 10 doctors had received malaria-specific training. Today, more than 180 people overall have received this training,



including all of the chief medical officers, thanks to technical support from the Health and Development Institute at the Cheikh Anta Diop University in Dakar and from WHO, and to financing through Round 7 of the Global Fund.

Weaknesses

1. Supply shortages

There is a lack of coordination between the NMCP and the central pharmacy, which affects communities: once they have been sensitized to malaria-control issues, they may not be able to obtain sulfadoxine-pyrimethamine or artemisinin-based combination medications. For example, as cited previously, the 58% coverage rate for intermittent preventive treatment during pregnancy (two doses) would have risen to 70% were it not for the unavailability of sulfadoxine-pyrimethamine.

2. Weak cross-sector coordination

Cross-sector coordination in the field of malaria is not as strong as it is for HIV/AIDS. While the education sector is highly involved in malaria control, other sectors are less involved; the cross-sectoral steering committee needs to be re-energized.

3. Underutilized community networks

The organizational and operational capacities of the community support networks should be better utilized, especially for treatment and monitoring. At the moment, the resources available are insufficient to make the most of the opportunities represented by the strength of networks and clubs in the field.

4. Insufficient private-sector involvement

The network of private-sector doctors and pharmacists is not sufficiently involved in the national fight against malaria and does not follow the NMCP's national plan. While the segment of the population targeted by the private sector is small, conflicting information can cause confusion and inappropriate treatment can contribute to the emergence of drug resistance.

5. Weak epidemiological monitoring

There are only 15 sentinel sites in the flood-prone regions around Dakar and in the Senegal River valley. Epidemiological monitoring remains weak, especially at a time when the NMCP is looking toward a pre-elimination phase for the northern part of the country.

e. Saving lives and measuring impact

Impact at a glance

- Under-five mortality fell from 121 per 1000 births in 2005 to 85 per 1000 births in 2008/2009: a drop of 30%. Mortality for children aged 1–4 fell 48%.
- The prevalence of parasitaemia in children under five in 2008/2009 was 5.7% (the reduction in parasitaemia prevalence is substantiated by regional data).
- Moderate anaemia (between 7 and 10g/dL) in children under five dropped from 55% to 48.5% between 2005 and 2008/2009, representing a 12% reduction.
- The number of confirmed cases of malaria dropped 41% in one year, going from nearly 300 000 in 2008 to 175 000 in 2009.
- According to the Lives Saved Tool (LiST estimation model), the lives of 26 800 children under five have been saved by malaria-control interventions since 2001.

Evidence of the health impact of malaria prevention and control activities in Senegal continues to accrue, survey after survey, especially for children.

The Senegal MIS-II survey, conducted in 2008/2009, demonstrated the following:

- The prevalence of parasitaemia in children under five was 5.7%. There are no earlier, similar surveys to serve as a point of reference, but it is possible to use the regional data obtained by Cheikh Anta Diop University (Professor Gaye) in 2003.

Regions / Profiles	2003 basic data	2008/2009 basic data	Difference
St Louis (Sahelian)	3.8%	0%	- 3.8%
Diourbel (Sahelo-Sudanese)	14.6%	3%	- 11.6%
Kolda (Guineo-Sudanese)	21%	19%	- 2%

- Moderate to severe anaemia in children has also decreased, but not as conspicuously as in other countries; this may be due to associated nutritional deficiencies. The prevalence of overall anaemia (<11 g/dL) went from 83%

in 2005 (DHS-IV) to 79% in 2008/2009 (Senegal MIS-II). The prevalence of severe anaemia (<7 g/dL) remained stable at 7%, while moderate anaemia (between 7 and 10 g/dL) decreased 12%, falling from 55% to 48.5% between 2005 and 2008/2009.

- Under-five mortality decreased 30%, from 121 deaths per 1000 births in 2005 (DHS-IV) to 85 per 1000 in 2008/2009 (Senegal MIS-II).
- Infant mortality (children less than 1 year old) regressed moderately, from 61 per 1000 to 54 per 1000 births between 2005 and 2008/2009; a decrease of 11%.
- Child mortality (children between 1 and 4 years old) went down 48%, going from 64 per 1000 in 2005 to 33 per 1000 in 2008/2009.

The reduction in child mortality is clearly not entirely attributable to malaria-control measures, although they have had a great impact. Indeed, other interventions with an impact on infant mortality did not expand as significantly, and this drop in mortality did coincide with the intensification of malaria-control interventions.

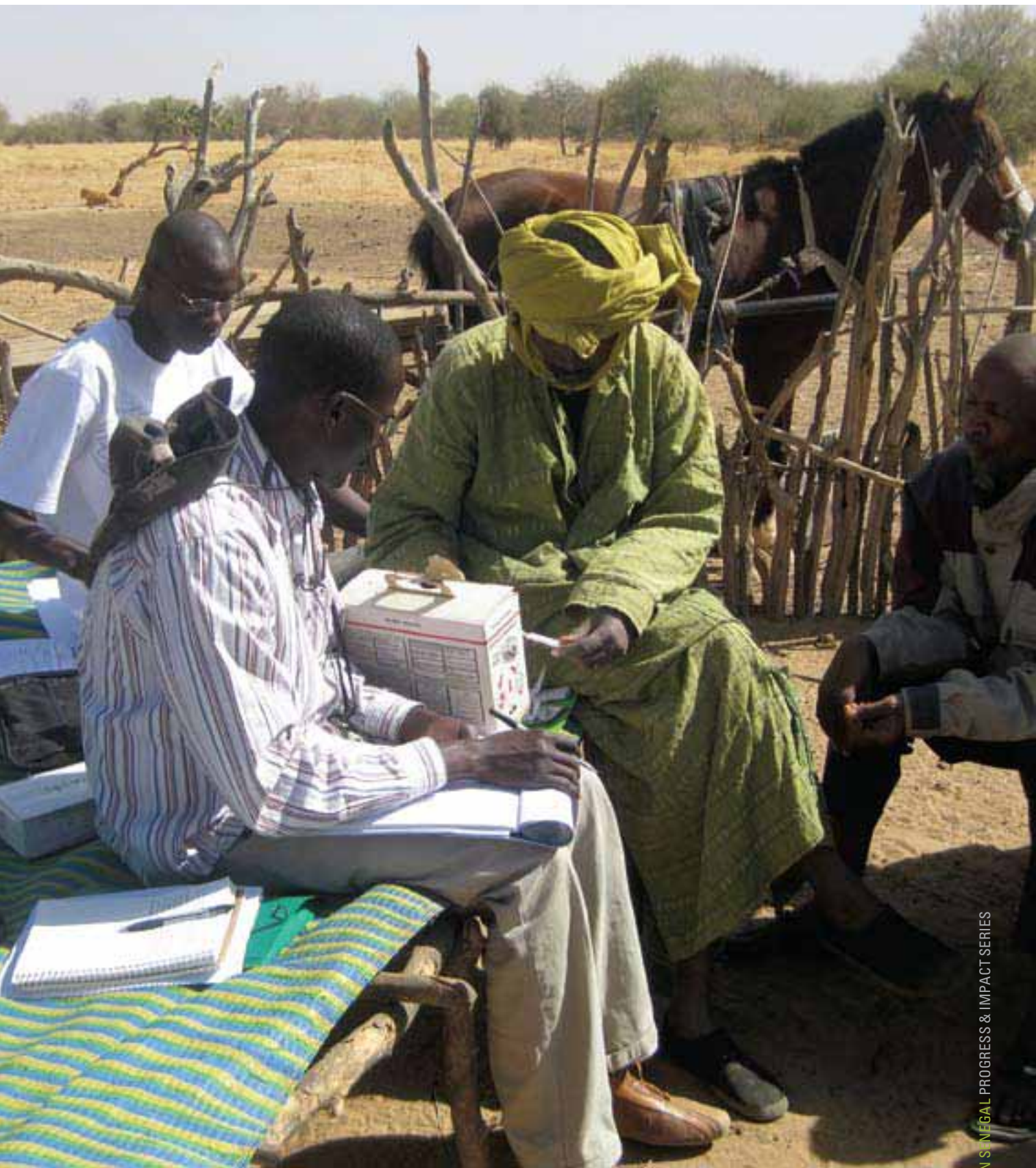
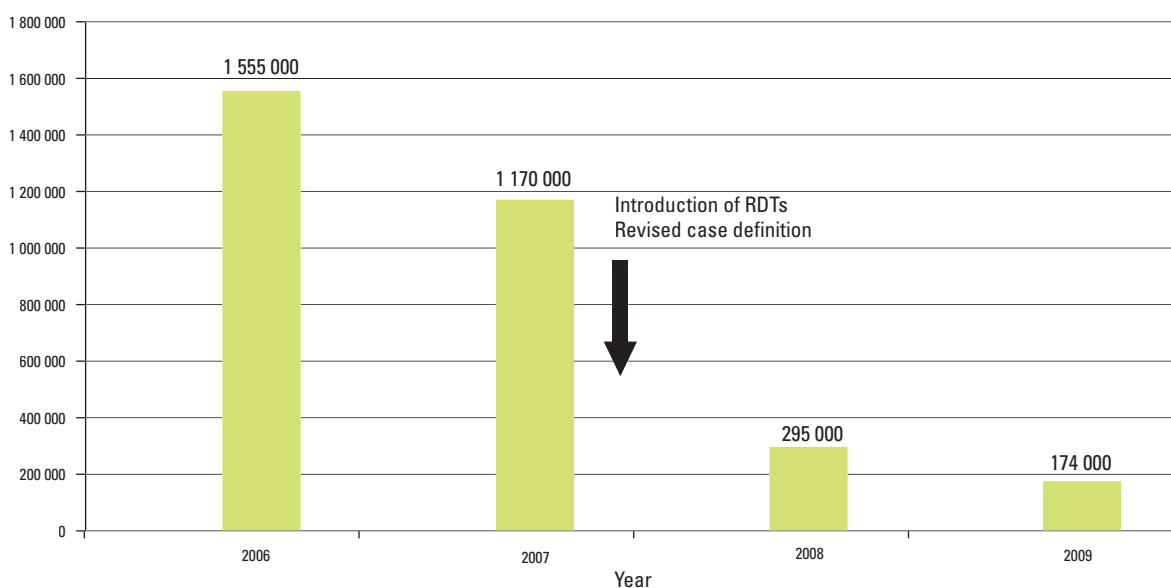




Figure 2.9.

Cases of malaria, Senegal, 2006–2009

The impact on malaria morbidity is also apparent, although it is more difficult to quantify because of a change in the way cases are defined. Before 2007, malaria cases included suspected cases with no laboratory confirmation by microscope or rapid diagnostic test, while from 2007 all reported cases of malaria were laboratory-confirmed. From then onwards, the data are genuinely comparable. The number of confirmed cases went from 295 000 in 2008 to 174 000 in 2009, a reduction of 41% in a single year.



Source: NMCP, 2010.

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 the various malaria prevention interventions.

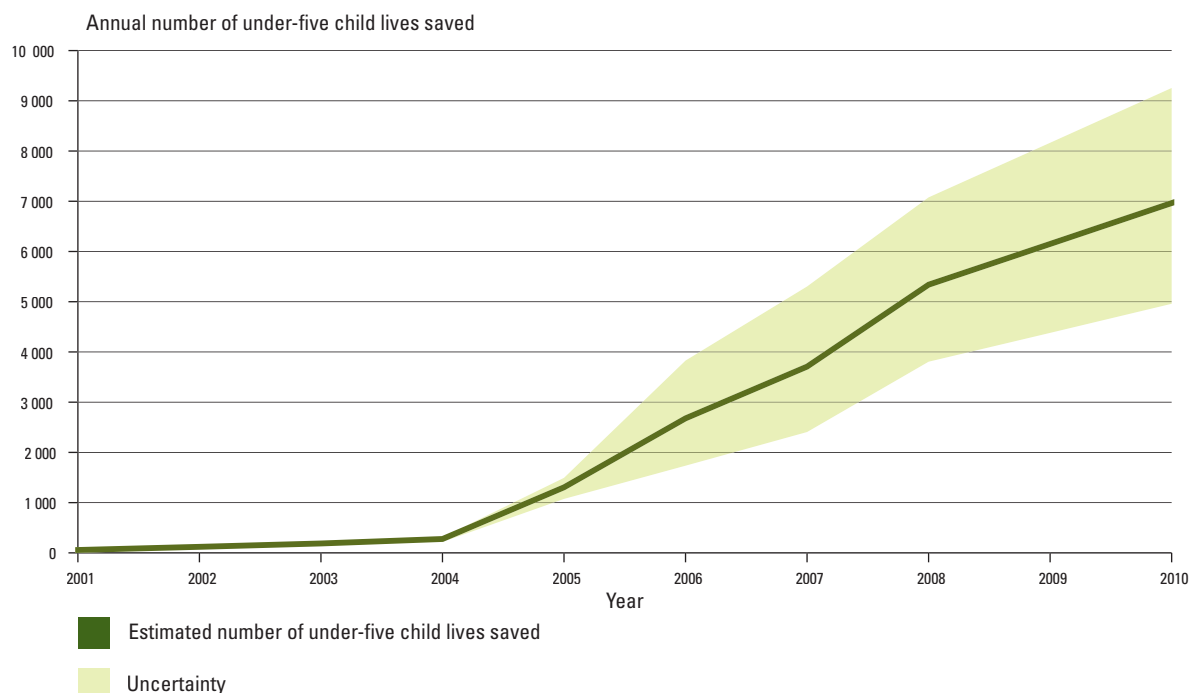
According to this model, approximately 26 800 deaths among children under five were averted in

Senegal between 2001 and 2010 thanks to the use of insecticide-treated mosquito nets and intermittent preventive treatment for pregnant women. This figure does not account for the other aspects of malaria control, such as early diagnosis and screening. It is therefore reasonable to assume that the actual number of lives saved by all malaria-control interventions is much higher.

Figure 2.10.

Under-five child lives saved by malaria prevention in Senegal, 2001–2010

Among the lives saved, the vast majority have been saved since 2004, when ITN coverage rates began to increase sharply.



Source: Data generated using LiST model (Eisele T and Larsen D, Tulane University), 2010.

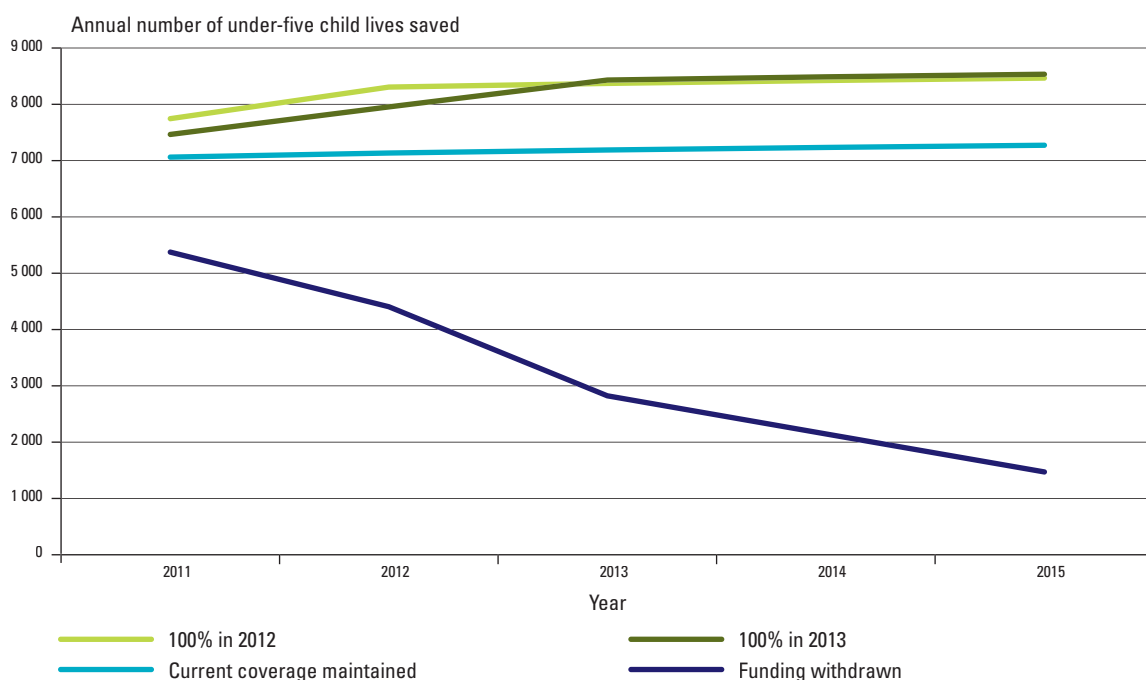
This number of lives saved represents a 21% reduction in malaria-related mortality in children under five since 2001. It is estimated that this mortality

rate for 2010 is 47% lower than it would have been had the NMCP not expanded malaria-control intervention coverage.

Figure 2.11.**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) maintains the annual rate of expansion to achieve 100% coverage (at least one insecticide-treated mosquito net per household) in 2012; the second (in dark green) achieves 100% coverage in 2013; the third (in turquoise) maintains the current rate of coverage (estimated at 85%); and the fourth (in dark blue) shows reduced coverage if funding were to cease. 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—8500 child lives saved per year. When the coverage rate is kept at 85%, the number of lives saved stabilizes at 7000 per year. By withdrawing funding, thereby reducing the rate of coverage, the number of lives saved would quickly shrink back to zero within five years.



Source: Data generated using LiST model (Eisele T and Larsen D, Tulane University), 2010.

Box 7: The Tivaouane curve

Tivaouane is located approximately 100 km north-east of Dakar, in the Thiès region. Dr El Hadji Yankhoba Dial is the chief medical officer of the Tivaouane district. He is in charge of 23 health posts serving approximately 250 000 people whose primary livelihoods are fishing and produce farming.

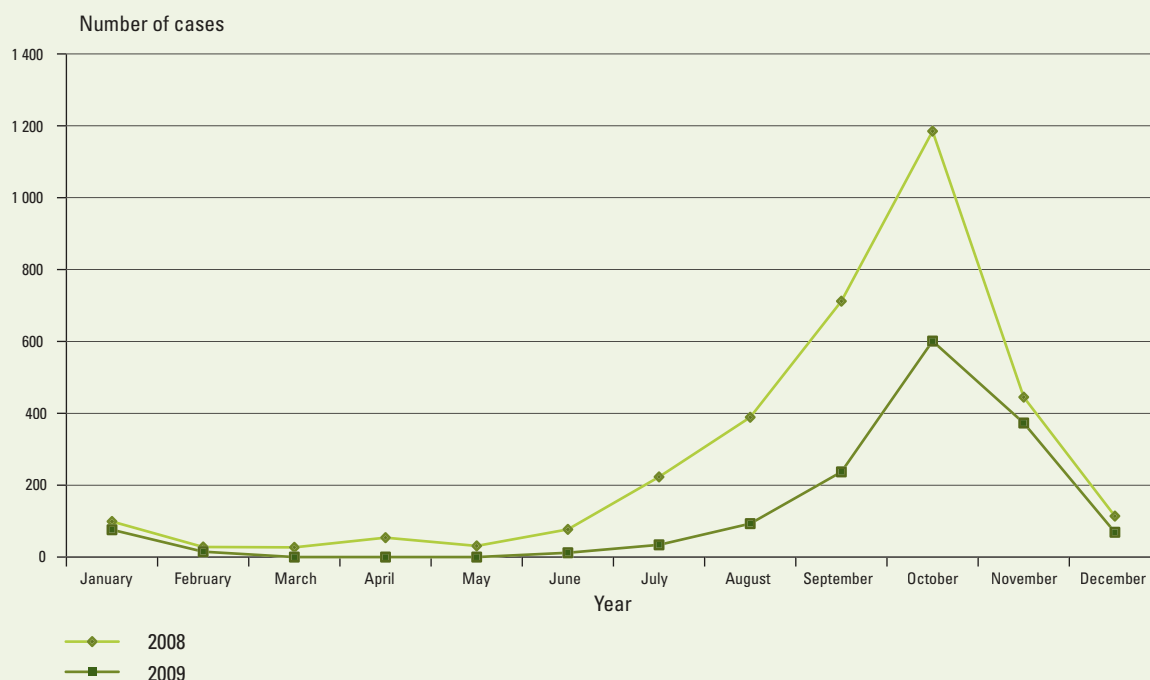
He enthusiastically describes the various waves of activity that have taken place in his district since 2006 (insecticide-treated mosquito net distribution during routine visits, antenatal consultations, or large-scale campaigns; mosquito net re-treatment campaigns; provision of free artemisinin-based combination therapy; provision of rapid diagnostic tests to all health posts and huts; and community education):

"These various activities have had a major impact on malaria, and people felt the difference within just a few years. People are aware of the issues, asking for mosquito nets and noticing improved health, especially in children. Today, in most of the district's health posts, nearly 80% of pregnant women receive both doses of sulfadoxine-pyrimethamine during pregnancy. More than 65 000 insecticide-treated mosquito nets were distributed over the last three years. The improvement felt by the community is borne out by the data in our reporting system."

Figure 2.12.

Confirmed malaria cases, Tivaouane, 2008–2009

"Malaria has truly receded in our district. I know that case definition has changed since 2006, but look at the chart showing the decline in the number of cases, all laboratory-confirmed this time, between 2008 and 2009. In 2008, we had approximately 3000 confirmed cases of malaria in the district; today we have 1500, which is half that! I think that speaks for itself!" —Dr El Hadji Yankhoba Dial



Source: Tivaouane health district data, NMCP, 2010.



NEXT STEPS: BOOSTING COVERAGE AND IMPACT

The focus of the coming years should be on sustaining results, maintaining efforts, and adapting malaria-control measures in light of new epidemiological data.

Next steps at a glance:

- Continue these effective malaria prevention and control efforts, in the knowledge that the most striking results have already been produced.
- Maintain human and financial resources in order to sustain the progress made thus far and avoid a resurgence of malaria.
- Follow a two-pronged strategy in the future, using a proactive approach to monitoring, detecting, and treating persistent cases of malaria in the north, while intensifying prevention and control measures in the south.

The data reported in this document all point to the same conclusion: malaria prevention and control measures work, and they produce remarkable results when they are implemented with adequate human and financial resources.

At the local level, the commitment from community associations and the success of home-based care have strengthened the progress made: the number of confirmed malaria cases has declined, and community engagement in the fight against malaria has increased.

The routinely collected data, evaluated over several years (when available), show a substantial decline in malaria-related morbidity and mortality. Survey data on a representative sample of the population confirms and validates the progress recorded.

From 2006 to 2010, Senegal strove to expand coverage of malaria prevention interventions (insecticide-treated mosquito nets and indoor residual spraying for households, intermittent preventive treatment and insecticide-treated mosquito nets for pregnant women) to the whole

country. Simultaneously, the health system offers patients with suspected malaria cases better diagnosis through rapid diagnostic testing and improved quality of care thanks to the distribution of artemisinin-based combination therapies down to the community level.

The expansion of the home-based care programme increased access to quality care for Senegal's many isolated, disadvantaged communities. The intensified, accelerated training of healthcare personnel also contributed to national efforts to broaden and improve access to care.

Today, Senegal is heading into the home stretch for reaching the recommended intervention coverage levels for malaria prevention; the most impressive successes in terms of reducing morbidity and mortality have already occurred. It will take considerable effort to maintain these rates of coverage, and this effort is likely to produce comparatively modest results. This could lead to a certain complacency vis-à-vis the intensity of the work ahead, and could result in reduced funding if priorities shift toward more “fashionable” causes.

But if efforts slacken, malaria will inevitably return—as has recently occurred elsewhere—accompanied by high associated morbidity and mortality. People must be kept motivated and funds mobilized; the fight must go on to keep malaria prevalence and transmission on the decline.

Going forward, Senegal will adopt a two-pronged strategy. In the north, where malaria prevalence is lower and isolated foci of cases will require early detection, a proactive approach emphasizing monitoring, detection, and treatment of persistent cases is most appropriate. The south, which has a higher prevalence of the disease and inequitable access to care, requires intensified control and prevention.

In any event, the increase in the rates of coverage and the reduction of malaria morbidity and mortality will be directly proportional to the intensity of the financial and human effort made by Senegal and its partners. As has already been shown elsewhere, a major, aggressive prevention and control programme will lead to faster and more noticeable progress against the disease. A more gradual increase in resources will result in more modest victories.





CONCLUSION

Following a successful reorganization in 2005 and thanks to decentralized, field-based management, Senegal's National Malaria Control Programme has been able to demonstrate its operational capacity.

Between 2005 and 2010, more than US\$ 130 million of aid from external partners, mainly the Global Fund and the US President's Malaria Initiative, have been used to implement well-planned prevention and control interventions.

These interventions are responsible for the fact that 82% of households in Senegal own at least one insecticide-treated mosquito net in 2010. Their impact has been remarkable: parasitaemia, anaemia, and under-five mortality in children are decreasing, and the number of children's lives

saved by malaria-control measures is estimated to be at least 26 800 over the last 10 years.

While the results achieved in malaria control in Senegal have indeed been remarkable, human and financial efforts must be maintained in order to sustain the progress made thus far and avoid a resurgence of malaria.

The coming years will be decisive. They will provide Senegal and its partners, if efforts are maintained and well-managed, with a unique opportunity: the chance to roll back malaria on a large scale with unprecedented force. Senegal could then serve as an example to other national malaria control programmes, sharing good practices and helping them to pave their way to malaria eradication.

ANNEX: LIST OF NATIONAL MALARIA CONTROL PROGRAMME PARTNERS

A variety of stakeholders joined the National Malaria Control Programme in implementing the activities and achieving the results described in this report. These stakeholders include:

National partners:

Alliance des religieux <i>Alliance of Religious Leaders</i>	Association des Femmes de l'Afrique de l'Ouest (AFAO) <i>West African Women's Association</i>	Association islamique Sopey Mohamed (AISM) de Thiénaba <i>Sopey Mohamed Islamic Association of Thiénaba</i>	Caritas Senegal	Cheikh Anta Diop University, Dakar (UCAD): Parasitology	Cheikh Anta Diop University, Dakar (UCAD): Vector ecology
Conseil National de la Jeunesse du Sénégal (CNJS) <i>National Youth Council of Senegal</i>	Entente des Mouvements et Associations de Développement (EMAD) <i>Coalition of Development Associations and Movements</i>	Environnement et Développement du tiers-monde (ENDA) <i>Environmental Development Action in the Third World</i>	Fédération des Associations de Femmes Sénégalaises (FAFS) <i>Federation of Senegalese Women's Associations</i>	Fédération Nationale des Groupements de Promotion Féminine (FNGPF) <i>National Federation of Women's Groups</i>	Fondation Sonatel <i>Sonatel Foundation</i>
Institut Pasteur de Dakar <i>Pasteur Institute of Dakar</i>	Jeunesse Action Développement (JAD) <i>Youth Action for Development</i>	Laboratoire National de Contrôle des Médicaments (LNCM) <i>National Drug Quality Control Laboratory</i>	Migration for Development in Africa (MIDA)	Organisations communautaires de base <i>Community-based organizations</i>	Pharmacie Nationale d'Approvisionnement (PNA) <i>National Pharmacy of Senegal</i>
Sahel 3000	TOTAL Senegal	Youssou N'Dour Foundation			

International partners:

African Development Bank (AfDB)	Africare	Catholic Relief Services (CRS)	ChildFund International	Coopération française <i>French Cooperation</i>	Counterpart International
Forum on China-Africa Cooperation (FOCAC)	Global Fund to Fight AIDS, Tuberculosis and Malaria	Institut de recherche pour le développement (IRD) <i>Institute for Development Research</i>	International Federation of Red Cross and Red Crescent Societies (IFRC)	IntraHealth International	Islamic Development Bank (IDB)
Japan International Cooperation Agency (JICA)	Malaria Control and Evaluation Partnership in Africa (MACEPA)	Malaria No More	Management Sciences for Health (MSH)	Medicines for Malaria Venture (MMV)	Organisation pour la mise en valeur du fleuve Sénégal (OMVS) <i>Senegal River Basin Development Authority</i>
Pfizer Inc.	Plan International	Roll Back Malaria (RBM) Partnership	Secours islamique France <i>Islamic Relief-France</i>	Thailand International Development Cooperation Agency (TICA)	United Nations Children's Fund (UNICEF)
United States Agency for International Development (USAID)	United States Centers for Disease Control and Prevention (CDC)	United States Peace Corps	United States Pharmacopeia (USP)	United States President's Malaria Initiative (US-PMI)	World Bank
World Health Organization (WHO)	World Vision				



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Avenue Appia 20, 1211 Geneva 27, Switzerland • www.rollbackmalaria.org • inforbm@who.int • Tel. +41 22 791 5869 • Fax +41 22 791 1587

