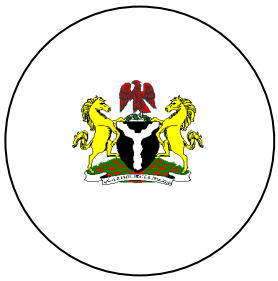
FEDERAL REPUBLIC OF NIGERIA



NATIONAL POLICY ON MALARIA DIAGNOSIS AND TREATMENT

Federal Ministry of Health
National Malaria and Vector Control Division
Abuja-Nigeria

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ACRONYMS & ABBREVIATIONS

ACPR	-	Adequate Clinical and Parasitological Response
ACT	-	Artemisinin based Combination Therapy
An.	-	Anopheles
BCC	-	Behaviour Change Communication
CBO	-	Community Based Organization
CHEW	-	Community Health Extension Worker
CORPs	-	Community Oriented Resource Persons
DOT	-	Directly Observed Therapy
DTET	-	Drug Therapeutic Efficacy Test
FCT	-	Federal Capital Territory
GIT	-	Gastro-Intestinal Tract
HIV	-	Human Immunodeficiency Virus
HMM	-	Home Management of Malaria
HRP2	-	Histidine Rich Protein 11
IEC	-	Information Education and Communication
IMCI	-	Integrated management of Childhood Illness
IPTp	-	Intermittent Preventive Treatment in Pregnancy
JCHEW	-	Junior Community Health Extension Workers
LGA	-	Local Government Area
LLINs	-	Long Lasting Insecticide Nets
NC	-	North Central
NDHS	-	National Demographic and Health Survey
NE	-	North East
NGO	-	Non-Governmental Organization
NPHCDA	-	National Primary Health Care Development Agency
NHIS	-	National Health Insurance Scheme
NW	-	North West
OTC	-	Over the Counter
PLDH	-	Plasmodium Lactate Dehydrogenase
PO	-	Prescription Only
PMV	-	Patent Medicine Vendor
RDT	-	Rapid Diagnostic Tests
RBM	-	Roll Back Malaria
SE	-	South East
SP	-	Sulphadoxine Pyrimethamine
SS	-	South South
SW	-	South West
TEN	-	Toxic Epidermal Necrolysis
UNDP	-	United Nations Development Programme
UNICEF	-	United Nations Children's Fund
USAID	-	United States Agency for International Development
VHW	-	Voluntary Health Worker
WHO	-	World Health Organization

Foreword

There are over 140 million people at risk of malaria every year in Nigeria and it is estimated that about 50% of the adult population in Nigeria experience at least one episode yearly while the under five children have up to 2 - 4 attacks of malaria annually. The yearly economic loss due to malaria in Nigeria has been put at 132 Billion Naira due to costs of treatment ad transport to source of treatment, loss of man-hours, absenteeism from schools and other indirect costs. Thus malaria imposes a heavy cost not only on a country's income, but also on its rate of economic growth and invariably on its level of economic development.

At the African Summit on Roll Back Malaria in year 2000, the Heads of Government and International Agencies signed the Abuja Declaration committing themselves to the "Abuja target", one of which stipulates that concerted efforts would be made to ensure that by the end of 2005 at least 60% of the vulnerable populations in Nigeria would have access to good quality, affordable and efficacious antimalaria medicines. At the end of 2005, this target was raised to 80% by 2010 in order to achieve the goal of reducing the malaria burden by 50%.

The spread and intensification of resistance to antimalarial medicines is one of the greatest challenges facing effective malaria control in the world today. This has been identified as a potent hindrance to the achievement of the set targets aimed at reducing by half the burden of malaria by 2010. The efficacy of the most affordable antimalarial medicines has declined remarkably in the last 15-20 years, and the development of new medicines development is not keeping pace with this trend.

In order to ensure that this trend does not abort the laudable targets set during the Abuja Summit, my Ministry has put in place effective machinery, including sentinel surveillance and pharmacovigilance, to monitor parasite resistance to antimalarial medicines, as well as possible adverse drug reactions that may result from the use of the new medicines, all with the objective of using the outcomes to inform treatment policy.

With the massive deployment of various interventions to combat the menace of the disease, it is fully expected that the prevalence of the disease will soon begin to take a downward trend. Consequently, the diagnostic component of malaria management is being strengthened to promote effective diagnosis of malaria in all age groups. Accordingly, this publication is a complete package which provides policy guidance on both the diagnosis and treatment of malaria in Nigeria. It is my hope and desire that it would serve as a practical and useful guide to all stakeholders working to ensure that all at risk of malaria in Nigeria would have access to appropriate antimalarial medicines, within 24 hours of the onset of symptoms of the disease.

I, therefore call on all major stakeholders in the fight against malaria to implement this policy and use it in scaling up the diagnosis and effective case management of malaria at all levels, in the home, community, and all health facilities throughout the country.

Prof. C.O Onyebuchi Chukwu
Honourable Minister of Health
June, 2011

ACKNOWLEDGEMENT

The development of the National Policy on Malaria Diagnosis and Treatment is a major leap towards the scaling up of effective case management in the country. The recent publication by the World Health Organization on the treatment of severe malaria which has shown that intravenous Artesunate is superior to intravenous Quinine has necessitated the further review of this document to accommodate the changes aimed at providing the best options to the people of Nigeria at all times.

The Federal Ministry of Health, Federal Republic of Nigeria, hereby wishes to acknowledge the contributions of the various organizations and their staff towards the successful development and production of this articulate document.

We also thank the team of experts from the Roll Back Malaria Partnership in Nigeria and the Global Malaria Partnership. Many individuals have also worked tirelessly to ensure the timely production of this document and these represent Research Groups, Professional Groups, Government Departments and the Private sectors. We appreciate your efforts and furthermore hope that in the spirit of true partnership, we shall all contribute to the implementation of effective case management of malaria in Nigeria.

Finally, the National Programme appreciates the support provided by the World Bank Malaria Booster Support Project for the timely funding of the processes that led to the development of this policy.

Dr. Babajide Coker

Coordinator, National Malaria Control Programme

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The responsibility for the interpretation and use of the material in this guideline lies with the reader, however, all issues arising from this document should be appropriately directed to:
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1. INTRODUCTION

This *National Policy on Malaria Diagnosis and Treatment* describes the goal of the Federal Ministry of Health, with respect to the diagnosis and treatment of malaria and the strategy by which the goal is to be achieved.

1.1 Goal of Malaria Case Management

The primary goal of treatment of malaria is to cure the patient of the infection and thereby reduce morbidity and mortality. A second purpose is to encourage the rational and safe use of medicines to prevent or delay the development of antimalarial medicine resistance. The ultimate public health objective of treating malaria infections is to reduce the reservoir of infection and, therefore, malaria transmission which, in turn, will result in reducing morbidity and mortality.

Malaria is an eminently preventable, treatable and curable infection. Medicines and other interventions for its prevention and treatment are widely available. Many of these are easy to apply and are affordable and accessible. There is therefore, no justification for Nigeria to continue to suffer under the severe disease and economic burden brought upon it by malaria.

In order to steadily reduce and, ultimately, eliminate the burden of malaria on Nigerians, we need to know more about what has made the disease persist at such a high level in our population. As malaria is not the only cause of fever in the country, the employment of quality diagnosis is an important step in confirming patients with malaria that should be given antimalarial medicine. Parasite-based confirmation of malaria will ensure that patient's condition is appropriately diagnosed to avoid the overuse of antimalarial medicines, provide best practices, and rationalize antimalarial use to avoid the onset of parasite resistance to current antimalarial medicines. In the fight against malaria, new remedies need to be developed and deployed to replace older ones with waning efficacy. Perhaps, more importantly, we need to develop a more effective use of existing remedies.

This policy therefore aims to:
Institutionalize evidence-based diagnosis, using microscopy and rapid diagnostic tests and treatment with effective Artemisinin-based Combination Therapies (ACT) in the management of malaria in Nigeria; and
Provide a quality assurance programme for malaria diagnosis – an important platform for quality malaria diagnosis, treatment and control,

Ultimately, the objectives include

- Reducing morbidity,
- Halting the progression of an uncomplicated malaria into severe and potentially fatal disease, and thereby reduce malaria mortality;
- Reducing the impact of placental malaria infection and maternal malaria-associated anaemia through intermittent preventive treatment,

• Minimizing the development of antimalarial medicine resistance.

1.2 Policy Strategy

'Roll Back Malaria' is a global initiative that has set specific deadlines for the attainment of explicitly defined milestones. One of such milestones is the reduction of malaria burden everywhere by 50% by the year 2010.The Nigerian strategy for the implementation of the malarial treatment policy is that of Roll Back Malaria (RBM), which seeks to establish a social movement in which the local communities, public and private sectors, all tiers of government and non-governmental development agencies etc would come together in a partnership and a network to implement malaria control interventions throughout the country.
The RBM intervention strategy has four key elements as follows:

i. Patients with malaria would have access to appropriate and adequate treatment within 24 hours of the onset of symptoms;

ii. Pregnant women, particularly in their 1st and 2nd pregnancies would have access to effective antimalarial prophylaxis and treatment;

iii. Insecticide treated nets and other materials would be available and accessible to persons at risk of malaria, particularly pregnant women and children under 5 years of age;

iv. Epidemics of malaria would be recognised and steps initiated for their containment within one week of their onset.

However, over the years the focus has expanded from prioritizing only the biologically vulnerable as primary target groups for interventions (pregnant women, children less than 5 years of age, people living with HIV/AIDS) to universal and equitable access of all the population in order to achieve the intended goal of reducing the malaria burden by the year 2010 through 2013.

It is obvious that achieving the goal of this policy would require the availability of appropriate antimalarial medicines and their proper management, including their storage and rational and safe use. This means that proper financial provisions should be made at all levels to make these medicines available either free or at highly subsidized costs. The consumers and providers have to be properly educated on malaria and its treatment. As well, an effective monitoring and evaluation system has to be set up to ensure that set objectives would be properly pursued.

The need for a new understanding of old problem is also important, and new challenges would require clarification as they arise. All of these call for continued strategic as well as operational research. These and other issues are addressed in this policy document.

2. THE MALARIA SITUATION IN NIGERIA

2.1 Background

Malaria is one of the common causes of hospital attendance in all age groups in all parts of Nigeria. It is also one of the four commonest causes of childhood mortality in the country, the other three being acute respiratory infection (pneumonia), diarrhoea and measles. It is estimated that 50% of the Nigerian population has at least one episode of malaria each year, while children under 5 have, on the average of 2 – 4 attacks in a year. Malaria has severe negative effects on maternal health and birth outcomes. It causes maternal anaemia, increases miscarriage and low birth weight.

P. falciparum is the most predominant parasite specie accounting for about 98% of malaria cases in the country. *P. malariae* usually occurs as a mixed infection with *P. falciparum*. *Anopheles gambiae* is the main vector of malaria in Nigeria, but An. *funestus* and *An. arabiensis* are also commonly encountered. *An. melas* is found in the coastal areas.

Malaria is characterized by a stable, perennial transmission in all parts of the country. Transmission is most intense in the wet season as compared to the dry season. This seasonal difference is more striking in the northern part of the country.

2.2 **The Economic Burden of Malaria**

Malaria impedes human development and is both a cause and consequence of under development. Every year, the nation loses several billions of naira, derived from cost of malaria treatment and absenteeism from work, schools and farms.

2.3 **Malaria Control Historical Perspectives**

In 1996, Nigeria developed its first National Malaria Control Policy. A yearly Plan of Action was developed for 1997 and 1998 and a three-year Plan of Action was also developed for 1999 – 2001. The Malaria Control units in the States were revitalized or reestablished and public awareness of the need to fund malaria activities was created. The highest advocacy point between 1996 and 1998 was the celebration of the 'National Social Mobilization Day' when the Malaria Control logo was launched by the then Minister of Health, Rear Admiral Jubril Ayinla.

The National Technical Committee (on Malaria) was resuscitated in 1998. The National Malaria Control Committee comprises National, State and some LGA malaria programme managers and officials, as well as representatives from the private sector and international agencies. The committee meets at the end of each calendar year and is responsible for reviewing the activities of the previous year and planning those of the following year.

In 1997 and 1998, Training of Trainers activities were carried out on management of severe and uncomplicated malaria. The training programmes were held nationally and in specified zones in the country. It was hoped that such training would produce

a core of trainers capable of handling the monitoring and evaluation requirement of malaria activities.

The year 2000 witnessed the launching of the ‘African Malaria Day’ and the adoption of 25th of April every year for the celebration of the day. In 2008, the celebration was accorded global recognition and was re-christened ‘World Malaria Day’. In the last five years, level of advocacy, political awareness and commitment to malaria control in Nigeria have all continued to improve.

2.4 **Roll Back Malaria in Nigeria**

RBM is an initiative to improve malaria control in the context of Health Sector Reform. It was initiated in 1998 through a joint partnership of WHO, UNICEF, UNDP and the World Bank. RBM consists of two phases - the inception phase and the implementation phase. After the Consensus Building Meeting for countries in West Africa in March 1999, Nigeria started the RBM inception phase.

Sensitization and advocacy on RBM at the highest level included letters to all Commissioners of Health in the States and the FCT, Abuja, ministerial press briefings to enlighten the public about the importance of RBM and the need for all stake-holders and partners to embrace the new approach to malaria control. Workshops were held for executives of media houses to inform them adequately on the technicalities of RBM and its envisaged benefits to Nigerian society.

Nigeria hosted and co-financed the African Heads of State Summit on RBM in April 2000, at which forty-four of the fifty malaria-affected countries in Africa where in attendance. Nineteen country delegations were led by the Heads of State while the remaining delegations were led by senior government officials. The Summit was also attended by the senior officials from each of the four founding agencies (WHO, UNICEF, The World Bank & UNDP) and other development partners.

The Summit concluded with the signing of the Abuja Declaration and Plan of Action. By this, African leaders had rededicated themselves to the principles and targets of the *Harare Declaration* of 1997 and committed to intensifying efforts to reduce by 50% the malaria mortality in Africa by the year 2010, through implementing the strategies and action of Roll Back Malaria (RBM) programme. The implementation of RBM has started with the Federal Ministry of Health (FMOH), States and LGAs carrying out specific activities as indentified in the *Plan of Action*.

3. THE SITUATION OF ANTIMALARIAL MEDICINES IN NIGERIA

Among the several strategies currently available for the control of the disease, one strategy that has been consistently used in the last three and a half centuries is chemotherapy. Malaria control in Nigeria relies heavily on early recognition, prompt and appropriate treatment.

3.1 Antimalarial Medicines Resistance

The development of resistance, defined as the 'ability of a parasite strain to multiply or to survive in the presence of concentrations of a medicine that would normally destroy parasites of the same species or prevent their multiplication' has continued to threaten the effective of antimalarial medicines. Resistance to *Chloroquine* has spread through South America, Southeast Asia to East Africa and eventually to all endemic countries of the continent. A similar but more rapid process has been recorded for Sulfadoxine–Pyrimethamine (SP). The important consequences of medicine resistance are: an increase in morbidity and mortality, a delay in initial therapeutic response and, an increased cost of treatment to the community. These consequences need to be urgently addressed in Nigeria. In the same vein, there is an urgent need to preserve and prolong the useful life of the currently available antimalarial medicines.

The results of the therapeutic efficacy studies, in 2002 and 2004 of antimalarial medicines carried out in the six epidemiological regions of the country are shown in Table 3.1. WHO guidelines advise policy review when an antimalarial therapeutic failure reaches 10%. The result of the 2002 Efficacy Studies indicated that Chloroquine and SP were no longer adequate for national first line use. As a result, further efficacy trials were conducted in 2004 by the Federal Ministry of Health on two suitable Artemisinin based combination therapies. Both combination therapies were found to be highly efficacious and thus suitable for use in the treatment of uncomplicated malaria.

Table: Therapeutic Efficacy of Anti-malarial Medicines in Nigeria (Adequate Clinical and Parasitological Response ACPR)

	Zones	Chloroquine*	Sulphadoxine/Pyrimethamine*	Artemether/Lumefantrine**	Artesunate/Amodiaquine**
1	SE	3.7%	14.9%	100%	100%
2	SS	9.1%	8.5%	87%	82.5%
3	NC	53.2%	82.7%	100%	96%
4	NW	77.3%	94.2%	100%	100%
5	SW	40.9%	75.6%	100%	100%
6	NE	50.8%	64.8%	100%	100%

* 2002 Drug Efficacy Study ** 2004 Drug Efficacy Study

3. THE DIAGNOSIS OF MALARIA IN NIGERIA

The mission of National Policy on Malaria Diagnosis and Treatment is to provide optimal diagnostic services in the management of malaria. This includes the use of microscopy and Rapid Diagnostic Tests (RDTs). The content of this document is in line with the content of the *Nigerian National Medical Laboratory Policy* document (2007). The strategy being adopted seeks to provide adequate laboratory support and capacity building for personnel with appropriate infrastructure facilities at various levels of health care at all tiers of government.

Parasitological confirmation is essential in all suspected cases of malaria. However, where parasitological confirmation is not possible for reasons of implementation, especially in areas of high transmission such as Nigeria, highly vulnerable groups (which include children under five years and those with suspected severe malaria) can be treated on clinical basis. Efforts should be intensified to rapidly expand access to malaria confirmatory services.

During pregnancy, parasitological diagnosis should be promoted to improve the differential diagnosis of fever and reduce the unnecessary consumption of antimalarial medicines. More particularly, individuals with HIV/AIDS who have fever should be appropriately diagnosed in view of the high incidence of febrile diseases, other than that caused by malaria among these groups.

4.1 **The Use of Microscopy**

Microscopy is the operational gold standard for the diagnosis of malaria. It is most cost-effective in situations where there is a high case load where a need for its use in the management of other diseases is required; as well as in referral facilities for managing severe malaria cases where the identification of species and parasite quantification is important for case and follow-up; and where skilled personnel is available to perform quality microscopy. In general, microscopy is appropriate at facilities with a functional laboratory and trained personnel (microscopists), usually in hospitals, large medical centres with in-patient care facilities, and in tertiary health care facilities.

4.2 **Rapid Diagnostic Tests (RDTs)**

RDTs are based on the detection of circulating parasites antigens.

Quality assured *Histidine Rich Protein 11* (HRP2) based RDTs is recommended for the diagnosis of malaria in all age groups.

Other available RDTs include *Plasmodium Lactate Dehydrogenase* (PLDH) and *Aldolase* based.

RDTs shall be deployed in the following situations:

- All levels of care where microscopy may not be possible due to lack of appropriate laboratory facilities or personnel;
- Secondary health facilities to compliment the use of microscopy; and
- Primary Health Care clinics and General Outpatient Clinics within tertiary health care institutions.

The handling of RDTs shall be carried out by all health care providers who have been trained to use it in primary, secondary and tertiary health care facilities. Where feasible, the use of RDTs shall be extended to community volunteers who have been specifically trained to perform the task, however, this must be followed up by regular supervision, in addition to measures to maintain field quality assurance.

There must be adherence by all concerned (private and public providers) to the minimum standards stipulated for laboratory diagnosis of malaria by the Medical Laboratory Science Council of Nigeria.

To achieve the goals specified in the policy document, the following would be required:

- Relevant diagnostic facilities and infrastructure in health care facilities at various levels of government.
- Skilled human resources at all levels of health care delivery.
- Making the coverage of malaria diagnosis an integral part of the National Health Insurance Scheme (NHIS) health package.
- Periodic evaluation through research, surveys, surveillance, DTET, etc and ensuring regular feedback to the programme.
- Institutionalizing Quality Assurance Systems for malaria diagnosis throughout the country;
- Putting in place appropriate Advocacy, Community Sensitization and Mobilization measures for malaria; and
- Providing adequate and sustained funding.

5. **THE TREATMENT OF MALARIA**

5.1 **Essential Antimalarial Medicines**

Essential antimalarial medicines are those that meet the needs of appropriate antimalarial treatment in the vast majority of the people. They should therefore be available at all times, in adequate amounts and in appropriate dosage forms and should be affordable to the people.

5.1.1 **Criteria for Selection**

The criteria for selection of essential antimalarial medicines should be the same as for the selection of essential medicines in general. They are as follows:

- The medicines should satisfy the antimalarial treatment needs of the vast majority of the people at all levels of health care.

- They medicines should be only those for which there is sufficient evidence of efficacy and safety from local and global controlled clinical studies, as well as from experience in general use.

- The preferred dosage forms should be those which have a reasonable shelf-life and are able to withstand the inevitable adverse environmental conditions in Nigeria's distribution chain. (For example, tablets and capsules are more stable in the prevailing Nigeria's ambient temperatures and humidity than mixtures, syrups and elixirs. Preferably, therefore, paediatric doses should be achieved from the use of either paediatric tablet strengths or scored tablets of standard tablet strengths.)

- Malaria medicines should be registered for wide distribution in the country;

- They should be medicines for which quality certification can be readily obtained from local institutions, from the country of origin or through the auspices of the World Health Organization (WHO);

- They should be medicines that can either be manufactured locally using locally produced or imported raw materials or that can be cheaply imported in bulk; and

- Medicines with known serious side effects but with an acceptable risk/benefit ratio (e.g. quinine), considering the severity of the situations in which they are to be used, may be included, provided that their procurement, storage, distribution and use would be subjected to the strict technical and ethical control measures normally associated with such medicines.

5.1.2 **The list of Essential Antimalarial Medicines**

This list is necessarily short since the number of programmatically effective antimalarial medicines globally is quite small. The list is presented under the

subheadings of (a) Current Medicines for uncomplicated malaria, (b) Current Medicines for severe malaria,

4.2 **Recommended medicines for the treatment of uncomplicated malaria**

Current medicines for treatment of uncomplicated malaria are *Artemisinin based Combination Therapies*. This combination takes advantage of the rapid blood schizontocidal action of the artemisinins and the long duration of action of the partner compound to effect rapid cure with low level of recrudescence. The medicines include the following:

5.2.1a **Medicine of Choice in the Treatment of Malaria**

Medicines*	**Dosage form**	**Presentation**	**Strength**
Artemether-Lumefantrine	Tablet	Co-formulated	20mg artemether + 120mg lumefantrine per tablet
Artemether-Lumefantrine	Dispersible (Children)	Co-formulated	20mg artemether + 120mg lumefantrine per tablet

Dosage Regimen for Artemether-Lumefantrine

Weight	Dosage Regimen
5 - <15kg	1 tablet twice daily for 3 days
15 - <25kg	2 tablets twice daily for 3 days
25 - <35kg	3 tablets twice daily for 3 days
≥ 35kg	4 tablets twice daily for 3 days

The first day dosage should be taken 8 to 12 hours apart.

5.2.1b **Alternate Treatment**

Medicines	**Dosage form**	**Presentation**	**Strength**
Artesunate - Amodiaquine	Tablet	Co-formulated	Artesunate – Amodiaquine Each tablet exists at ratio 1:2.7
Artesunate + Amodiaquine	Tablet	Blistered co-packed	Artesunate 50mg and Amodiaquine 153.1mg

The co-formulated medicines are preferred.

Dosage Regimen for Co-formulated Artesunate-Amodiaquine

Weight /Age	**Tablet Strength**	**Dosage Regimen**
≥ 4.5kg - < 9 kg 2 months – 11 months	25mg/67.5mg	1 tablet once daily for three days
≥ 9kg - < 18 kg 1 year – 5 years	50mg/135mg	1 tablet once daily for three days
≥ 18kg - < 36 kg 6 years – 13 years	100mg/270mg	1 tablet once daily for three days
≥ 36 kg or 14 years and above	100mg/270mg	2 tablets once daily for three days

The co-formulated *Artesunate-Amodiaquine* combination tablets exist in various strengths at the ratio of 1:2.7

5.2.2 **The Use of Monotherapy for the Treatment of Uncomplicated Malaria**

Monotherapy occurs when one component of antimalarial combination therapies is used for the treatment of uncomplicated malaria e.g. *Artesunate, Artemether, Amodiaquine* etc.

The use of antimalarial monotherapy medicines for the treatment of uncomplicated malaria is not recommended. Their use significantly increases the risk of development of resistance by the parasites.

Resolution 12.5 of the World Health Assembly, published in May 23, 2007, urges Member States to progressively discontinue the provision, in both the public and private sectors, of oral *Artemisinin monotherapies*, and to promote the use of *Artemisinin-combination therapies*, and to implement policies that prohibit the production, marketing, distribution and the use of counterfeit antimalarial medicines. Nigeria has complied with these requirements and the country's regulatory authorities have also stopped further registration of *Artemisinin monotherapies* and have prohibited the importation, and local production.

In 2005, the National Administration for Foods and Drug Control (NAFDAC), working in collaboration with the National Malaria Control Programme discontinued the registration of Artemisinin monotherapies in the country. In the same vein, NAFDAC has declassified the medicine of choice, *Artemether-Lumefantrine* and the alternate medicine, *Artesunate-Amodiaquine / Artesunate+Amodiaquine* from Prescription Only (PO) to Over the Counter (OTC) medicines.

5.2.3 **Medicines that are no longer Recommended for the Treatment of Uncomplicated Malaria**

These are medicines that were previously used on a wide programmatic basis for the treatment of uncomplicated malaria. Their efficacy levels have been undermined by the parasite resistance trend observed.
The medicines include the ones listed in the table below:

S/N	Medicines	Comments
1	Sulphadoxine Pyrimethamine	Not recommended for treatment of malaria. Reserved for intermittent preventive treatment in pregnancy (IPTp)
2	Chloroquine	Inadequate efficacy and therefore no longer recommended

5.2.4 **Treatment Failure**

This occurs when fever and parasitaemia fail to resolve, or recur within 2 weeks of treatment. It must be confirmed parasitologically preferably by microscopy. The alternate treatment should be given after confirmation has been made. Recurrence of

fever and parasitaemia more than 2 weeks after treatment could result either from recrudescence or new infection. In such a case, parasitological confirmation is desirable. However, treatment could be effected with the same medicine administered earlier or the use of alternate medicine.

5.3 **Treatment of Malaria in Special Groups**

5.3.1 **Treatment of Malaria in Pregnancy**

Pregnant women with symptomatic acute malaria are a high risk group; hence effective treatment must not be delayed. There is insufficient data on the safety and efficacy of most antimalarial medicines during pregnancy, particularly during the first trimester.

The antimalarial medicine considered to be safe and recommended for use during the first, second and third trimesters is *Quinine salt*. *Quinine* is administered orally as 10mg / kg body weight to a maximum dose of 60kg body weight, administered every 8 hours for 7 days.

More available evidences have shown that the *Artemisinin* derivates are safe in the second and third trimesters of pregnancy. *Artemether-lumefantrine* and *Artesunate-Amodiaquine* are safe and recommended for the treatment of uncomplicated malaria during pregnancy in the 2^{nd} and 3^{rd} trimesters of pregnancy. They can be used in the first trimester, if quinine is not available or compliance to treatment with quinine cannot be assured.

5.3.2 **Neonates and Children Less than 5Kg**

Neonates and children less than 5kg born to mothers in endemic areas are temporarily protected by the partial immunity acquired by the mothers. This begins to wane after the age of 3 months.

Fever in children less than 5kg should be well defined and treated with oral *Quinine* when malaria is confirmed. In the absence of *Quinine*, ACTs can be used.

Dosing of medicines in these age groups shall be based on weight.

5.4 **Severe Malaria**

Severe malaria is a medical emergency and requires parenteral treatment. Management of severe malaria should be carried out in secondary facilities with adequate facilities to manage complications or at specialist facility, however, the pre-referral treatment should be administered at the peripheral facility or at home as the case may be.

5.4.1 **Current Medicines for Severe Malaria**

The current medicines for the management of severe malaria are as shown in the table below:

Medicines	**Dosage formulation**	**Strength**
Artesunate	IV/IM	60 mg /1 ml vial
Quinine dihydrochloride	IV/IM	300mg / ml in 2 ml ampoule
Artesunate*	Suppository	50mg suppository

*Suppositories of *Artesunate* should be used only as pre-referral treatment.

5.4.2 **Follow-on Treatment for Severe Malaria**

Parenteral antimalarial medicines in the treatment of severe malaria should be administered for not less than 24 hours once started (irrespective of the patient's ability to tolerate oral medication earlier) and thereafter, complete treatment with a complete course of recommended ACT, in this case, Artemether-Lumefantrine or Artesunate-Amodiaquine..

5.4.3 **Adjunctive Medicines**

Adjunctive therapies are medicines used in the management of malaria for the relief of symptoms and complications. These are mentioned as appropriate in the Treatment Guidelines

5.5 **Updating the List of Antimalarial Medicines**

The list of antimalarial medicines should be a dynamic list. The medicines included should be reviewed regularly for efficacy and safety (pharmacovigilance) to determine their continued usefulness in malaria therapy. At the same time new medicines are becoming available in the country and those that are found to be useful should be added to the list.

A network for the surveillance of susceptibility of malaria parasites to antimalarial medicines has been set up in the country. Sentinel sites are being strengthened to generate reports on the performance of specific medicines in the treatment of malaria. Such reports are reviewed regularly by the malaria control authorities.

6. THE RATIONAL USE OF ANTIMALARIAL MEDICINES

The rational use of antimalarial medicines refers to appropriate use of antimalarials for the right indications and at the correct/adequate dosages. Antimalarial medicines will be needed for the treatment of uncomplicated malaria, severe malaria and chemoprophylaxis for groups at risk. The appropriate use of antimalarial medicines is determined by the goal of treatment and the person responsible for taking the primary decision on use of such medicines either at home or at the different health care levels.

6.1 **Community Management of Malaria**

6.1.1 **Definition of 'Community Management of Malaria'**

Community management of malaria (CMM) is a strategy by which cases of malaria can be recognized, using basic symptoms with simple diagnostic tools where available and treated promptly within the community by informed care-givers or trained Patent Medicine Vendor (PMV). It is the practice, decision and action that occur at this level that influence the management of uncomplicated malaria. Components of CMM include community education, adequate training of care-givers and the patent medicine vendors and the repositioning of diagnostics, medicines and all other tools.

The effectiveness of community based management will depend upon early diagnosis, prompt and appropriate treatment, and proper health education about malaria. Early commencement of appropriate treatment will ensure better outcome, and prevent the progression to severe malaria. An antimalarial medicine to be used at home must be safe, effective, affordable, easy to administer and preferably, in single dosage packs. All approved ACTs come in colour-coded, age specific packs and simple to administer dosage regimen.

6.1.2 **Diagnosis of Malaria in the Community**

At the community level, the Role Model Care Givers and trained Patent Medicine Vendors have been empowered to administered antimalarial medicines, especially in children less than five years presenting with symptoms of malaria.

Diagnosis of malaria in children less than 5 years at home will depend on proper recognition of symptoms and signs such as fever, vomiting and loss of appetite. The care providers at this level will be trained on the use of malaria Rapid Diagnostic Tests to improve diagnosis and also prevent wastage. They will be taught to recognize signs of severe malaria for which they must immediately bring a child to the nearest health facility. Pre-referral services will be improved upon to ensure that patients with possible severe malaria receive pre-referral treatment promptly. Efforts should be made to refer cases with other main symptoms, such as cough and diarrhea

6.1.3 **Home Treatment of Malaria**

Use Artemisinin based combination therapy (ACTs) for malaria

Age specific, pre-packed artemisinin based combination medicines, Artemether-lumefantrine, and the alternative, Artesunate-amodiaquine are recommended for community treatment of malaria in accordance with the dosage schedule indicated above. Medicines are to be taken every day for 3 days.
In communities where caregivers have been trained on the administration of Rectal Artesunate, the appropriate dosage should be given as pre-referral treatment.
In all cases, all medicines administered must be appropriately documented in the register provided.

6.2 **Disease Management in Health Facilities: Levels I, II and III**

6.2.1 **Level I:**

At the Primary Health Care Centres, Dispensaries and Health Posts, the Village Health Workers (VHW), Junior Community Health Extension Workers (JCHEW) or trained Patent Medicine Vendors (PMV) belong to this level. Capacity for laboratory diagnosis of malaria at this level is usually limited.
In addition to the treatment of uncomplicated malaria as described above, under community management, a health worker at this level shall give *Artesunate* suppositories or intramuscular *Quinine* as pre-referral treatment.
In facilities where there are neither microscopes nor RDTs, malaria diagnosis in children less than 5 years shall be based on clinical symptoms using the IMCI classification. The health worker should be able to recognize the general danger signs, give pre-referral treatment such as *Artesunate* suppositories or intramuscular *Quinine* and promptly refer patients with severe febrile disease.

6.2.2 **Level II:**

General Hospitals, Comprehensive Health Centres, etc and Private Hospitals staffed by Medical Officers, Community Health Officers or Nurses,

At this level, there may or may not be a laboratory. It is, however, desirable that a laboratory diagnosis of malaria be established when possible. Detailed history, physical examination and laboratory tests would be employed in the diagnosis of malaria in order to exclude other possible conditions, treatment failure and complications. Rapid Diagnostic Tests shall be provided to compliment microscopy.

Management capabilities would include using alternative antimalarials for failure of response to recommended medicine, providing urgent treatment for severe malaria or other severe febrile illnesses. Health workers at this level MUST, however, refer the following category of patients with severe malaria:

- who are unconscious and not responding to treatment
- with uncontrollable convulsions
- who have severe pallor (except if blood transfusion facility is available)
- with renal failure, or
- with any other severe manifestation.

6.2.3 **Level III**:

Specialist, Teaching Hospitals and Some Categories of Private Hospitals.

Three categories of patients may be anticipated at this level: patients presenting for the first time, those visiting for follow-up of the same illness, and those referred from other levels that have failed to respond to therapy or have severe complications.

The management of malaria at this level would focus on confirming diagnosis, giving the most effective treatment (including the use of appropriate antimalarial medicines where necessary), providing intensive care for patients with severe complications, and laboratory monitoring. Therefore, this level must be appropriately staffed and well equipped with needed medicines and laboratory supplies.

Level III facilities with units providing primary health care services shall be provided with Rapid Diagnostic Tests in addition to laboratory diagnosis using microscopes.

Quality Control mechanisms shall be set up at both Levels 11 and 111 facilities.

6.3 **Referrals**

The referral system starts from the caregiver at home who should visit the nearest health facility as soon as there is no perceivable response within two days of commencement of treatment without improvement or when the patient seems to be getting worse. In general, health providers and health workers at all levels should be able to recognize their limitations and make early referrals.

Referral should be a two way process whereby the health worker at the higher health facility also endeavors to give feedback to the lower level health facility on the outcome of the patient's management.

7. **PREVENTIVE USE OF ANTIMALARIAL MEDICINES**

7.1 **Chemoprophylaxis**

Malaria prophylaxis is generally not necessary in persons living in a malaria endemic area because it may slow down the ability of the individual to develop partial immunity which protects from developing the severe form of the disease.

7.2 **IPTp with SP in Pregnant Women**

In high transmission areas such as Nigeria, malaria may be asymptomatic during pregnancy. The use of Intermittent Preventive Therapy (IPT) with *Sulfadoxine-Pyrimethamine* has been used for several years in parts of Africa, and has shown to be effective. This is an evidence-based approach and is recommended for all pregnant women.

IPT is administered as a one-dose preventive treatment course after *Quickening* as Directly Observed Therapy (DOT) and the second dose is given not earlier than one month after the first dose.

Pregnant women who are HIV positive and are on *Co-trimoxazole* chemoprophylaxis, should not receive IPT with SP. This is because of their increased risk to the adverse effects of the *Sulphonamides*. They should be encouraged to use other preventive measures such as regular use of Long Lasting Insecticide Nets (LLINs).

7.3 **Children and Adults with Sickle Cell Anaemia**

Recent evidences have shown that Proguanil no longer protect individuals with sickle cell anaemia against malaria; hence this can no longer be recommended. All individuals with Sickle Cell Anaemia are to sleep under Longer Lasting Insecticidal Nets (LLINs) and also treat all confirmed cases of malaria promptly with ACTs.

7.4 **Non-Immune Visitors / Residents**

Non-immune visitors to areas of malaria transmission are considered to be at high risk of malaria infection. In addition to the provision of information concerning effective measures to reduce human mosquito contact, non-immune visitors to Nigeria should also be given chemoprophylaxis.

Recommended options for non-immune travelers coming to Nigeria include *Mefloquine* and *Atovaquone-Proguanil*.

Nigerians who have been away from the country for two or more years to non malaria endemic regions such as Europe tend to lose the partial immunity acquired over the years before travelling.

Doses should be taken prior to arrival in Nigeria and continued during stay in Nigeria and following departure from the country. In spite of this, if an individual develops malaria, a full course of an appropriate antimalarial medicine should be taken and it is advised that the patient visit the nearest hospital.

8. PHARMACOVIGILANCE

Although, *Artemisinin* based Combination Therapies have been deployed for the treatment of malaria in Nigeria because of their proven efficacies, there is need to use all medicines with caution. Artemisinin based medicines though with good track records of safety, are entirely new in sub-Saharan Africa and have not been adequately studied amongst the indigenous population to determine their safety. It, therefore, behoves all prescribers and users to report any adverse drug reaction(s) or untoward effect(s) that may be noticed when these medicines are used.

The National Malaria Control Programme collaborates with the National Pharmacovigilance Unit of the National Foods and Drugs Administration and Control (NAFDAC) to build the capacity of health care providers in the country.

In all suspected cases of adverse drug reactions, the Pharmacovigilance form should be completed at all levels of care. It is necessary to complete all section of the adverse drug reaction form before submitting or sent to the Centre.

Completed ADR forms should be sent to the following:

- The National Pharmacovigilance Centre (NPC) – NAFDAC
- Plot 2032 Olusegun Obansanjo Way, Wuse Zone 7, Abuja
- Through NAFDAC offices in the 36 states & FCT
- Reports can also be scanned & emailed to npcadr@nafdac.gov.ng
- By Telephone: 08086899571 or 07098211221

9. THE THERAPEUTIC EFFICACY MONITORING OF ANTIMALARIAL MEDICINES

In the last two decades, there has been a widespread resistance to Chloroquine and Sulphadoxine-pyrimethamine which had been the first and second line antimalarial medicines respectively. Evidence from the drug therapeutic studies conducted in 2002 in six sites in the country showed a high level of resistance greater than 60% for Chloroquine and equally high resistance level for Sulphadoxine-pyrimethamine. In response to this development, the country reviewed its treatment policy and adopted the Artemisinin based Combination Therapies (ACTs) for the treatment of uncomplicated malaria since 2005.

The increasing rate at which antimalarial medicines have developed resistance over the last few decades has further increased the need for monitoring and establishment of surveillance system, The sentinel sites have also been increased from the initial six to 14 with at least two sites per zone.

Drug Therapeutic Efficacy Studies are conducted biennially with seven of the sites used alternatively. The National Programme is upgrading all the sites to Sentinel Surveillance Centres.

10. PROPERTIES OF ANTIMALARIAL MEDICINES IN USE IN NIGERIA

The salient pharmacological properties of the antimalarial medicines currently in use in Nigeria are shown in tabular form below.

Except for *Chloroquine* and *Quinine*, the pharmacokinetics and the pharmacodynamic properties of many of the antimalarial medicines in use in Nigeria have not been studied in-depth in the indigenous population. It is essential that these be done.

Properties of antimalarial drugs in current use in Nigeria

Medicine	Mode of Action	Recommended Dosage	Route	Properties
1. Artemisinin derivatives	All artemisinin derivative medicines are schizonticidal. Prevent gametocytogenesis by effect on ring and early (stage I – III) gametocyte stages	Artemisinins are not are not administered as monotherapies except when used parenterally for the treatment of severe malaria		• Absorption: oral very rapid, but may be incomplete. • Artemisinin is five times less potent than dihydroartemisinin, artesunate or artemether • Artesunate and artemether are metabolized to dihydroartemisinin • Half life very short Artemisinin – 2 h Artesunate – 2 min Artemether – 3-6 h Dihydroartemisinin – 48min • Safe in pregnancy • Adverse effect: very few: fever, reduced reticulocyte count without anaemia, neurotoxicity at high doses in animals but not in man Should be used in combination with other slower acting antimalarial drugs for mutual protection
i) Artesunate		2mg / kg twice daily on 1st day then 2mg / kg daily for 4 – 6 days	Oral, Parenteral (IV/IM), Intrarectal	
ii) Artemisinin		10mg / kg twice on 1st day then 10mg / kg daily for4-6 days	Oral	
iii) Artemether		2mg / kg twice daily on 1st day then 2mg / kg daily for 4 – 6 days	Parenteral (IM)	
iv) Dihydro-artemisinin		10mg / kg twice on 1st day then 10mg / kg daily for 4-6 days	Oral, Intrarectal	
Quinine	Schizonticidal	10mg/kg 8–12 hourly for 5 – 7 days	Oral, IV, IM	• Peak plasma concentration 1-3h • Not concentrated in red cells • Plasma protein binding 75 – 85% • Wide tissue distribution • Plasma half life 9 – 12h • Metabolized to 3- and 2-hydoxyquinine and other polar metabolites • Clearance: hepatic 80% renal 20% • Has antipyretic effect • Safe in pregnancy (when used judiciously) • Adverse effect: GIT disturbances, tinnitus, vertigo, dizziness, hypoglycaemia Use: in severe malaria

11. THE MANAGEMENT OF ANTIMALARIAL MEDICINES SUPPLY

Malaria control in Nigeria is anchored primarily on early diagnosis and on prompt and effective treatment of cases. Successful implementation of the malaria treatment policy would depend upon the availability, accessibility and affordability of the antimalarial medicines needed at all levels of the health care system. In effect, there should be a regular supply of the medicines at all health care facilities and the people using them should be able to afford them. A reliable antimalarial medicine supply system should, therefore, be set up, beginning from the procurement stage (through national manufacture or importation), donations (by bilateral and multilateral donors and governments), through storage to ultimate distribution to end users.

11.1 **Procurements and Donations**

The purchase of ACTs shall be carried out centrally by appropriate authorities at the National and State level, through pooled procurement.

Procurement of antimalarial medicines shall reflect the two approved medicines, in such that the alternate medicine is available to take care of possible treatment failures and also for a certain proportion of the population that may not tolerate the medicine of choice.

The supply of antimalarial medicines to the country shall be either through local manufacture or importation. The private sector would be encouraged to manufacture antimalaria medicines. Some antimalarials are already being manufactured in Nigeria, albeit from bulk product rather than from basic raw materials. These companies should be encouraged and assisted to invest in the primary manufacture of co-formulated ACTs and other antimalarial medicines recommended in this National Policy.

Donations of antimalarial medicines to Nigerian government at state or federal level, shall reflect the recommendations of the National Policy on Diagnosis and Treatment of Malaria. However, other antimalarial medicines with proven efficacy and approved by the World Health Organization such as *Dihydroartemisinin-Piperaquine*, *Artesunate-Mefloquine* etc, donated to the Federal Government shall be provided to Nigerian institutions for research purposes.

11.2 **Packaging**

All antimalarial medicines should be prepackaged in age specific treatment courses and made available in colour-coded packs, in line with the nationally approved colours for the different age groups of the population.

11.3 **Storage**

Antimalarial medicines will be stored as far peripherally as possible in the supply chain. Appropriate storage conditions should, therefore, be met at every storage point to ensure the shelf life of the medicines are preserved.

Appropriate facilities would be provided at each storage point (for example, State, Central Medical Stores, hospital, clinic or community stores) to ensure that the medicines are kept near as optimum condition as possible. Provision shall also be made for the appropriate stocking of antimalarial medicines within the communities for easy access.

11.4 **Distribution**

The test of the effectiveness of the antimalarial medicine supply chain is how available and accessible the medicines are to the end users. The National Malaria Programme shall collaborate with partners and stakeholders to ensure that antimalarial medicines and other commodities are distributed using the already developed distribution framework.

11.5 **Cost Consideration**

All medicines provided by the Federal Government to the public facilities shall be at no cost to the clients. However, the Federal Government has put machinery in place to ensure that the approved medicines are available through the private sector at highly reduced cost to further improve access.

12. INFORMATION, EDUCATION AND COMMUNICATION (IEC)/BCC

The ultimate aim of IEC is to ensure that individuals, families, communities and health workers are taking preventive measures to prevent the disease, improve on their recognition of malaria and use antimalarial medicines rationally. Concerted efforts should be put in place to promote the use of ACTs. Intensive BCC and capacity development should be directed towards consumers and all cadres of health providers, using a combination of approaches and strategies, as described below.

12.1 **Approaches**

The key approaches of the IEC/BCC strategy being adopted for malaria control in Nigeria shall include:

- *Advocacy*: Malaria is a major public health concern, which will require a concerted efforts of all stakeholders in order to control it. Thus, advocacy would be necessary at different levels to influence policies and to obtain appropriate support for malaria control from partners;
- *Involvement of partners*: All tiers of government, non-governmental development agencies, civil societies, the private sectors and individual communities will have to be actively involved in combating the malaria burden;
- *Development of key messages*: Appropriate messages on the transmission of malaria, the use of insecticide treated nets, the diagnosis of malaria, home treatment of malaria, the recognition of danger signs and referral will have to be developed. The messages should be disseminated through the most effective means of communication in relation to the target audience. Options include

posters, pamphlets, the mass media (print and broadcast), special announcement in places of worship, etc;

- *Monitoring and evaluation of IEC efforts*: Evaluation effectiveness would be vital to every IEC efforts. There is a particular need to evaluate specific IEC messages in order to get feedback from the communities on the impact of the IEC initiatives and
- *Applied research*: This would be conducted by focusing on areas where gaps in antimalarial information currently exist.

12.2 **Key Strategies**

The envisaged strategies include the following:

(i) Conduct baseline surveys to determine the people's knowledge, attitude, beliefs, and practices on malaria control activities should be conducted;

(ii) Review and update the existing guidelines for malaria control for different levels and target groups in the country;

(iii) Design and produce appropriate messages to reach pregnant women, caregivers of under 5 year old children, health workers, community leaders, medicine vendors, pharmacists, etc;

(iv) The production and distribution of appropriate IEC materials to target groups nationwide;

(v) The training of health providers/workers at all health care levels on appropriate skills for community mobilization and use of IEC messages would be accorded high priorities;

(vi) Training on the causes, recognition, treatment and prevention of malaria should be extended to pregnant women, caregivers, heads of household, religious and opinion leaders and school children;

(vii) Formulate relevant and appropriate IEC workplans on combating malaria in all communities or wards of the Federation;

(viii) Holding of meetings and community IEC activities on malaria elimination, using traditional/local channels should feature prominently in concerted national efforts.

13. MONITORING AND EVALUATION

Effective monitoring and evaluation of Nigeria's antimalarial treatment policy is needed to ensure its continuing relevance to combating the malaria menace into the country.

This will usually involve the following processes:

(i) Monitoring the therapeutic efficacy of the recommended treatments, including:

- The precise determination of the proportion of treatment failures in a given patient population through simplified *in vivo* testing based on a minimum number of post-treatment checks and simple clinical assessment; and
- Using the modified WHO procedure manual for therapeutic efficacy testing of antimalarial medicines for level II or III health facilities.

(ii) Assessment of compliance to determine:

- The influence of patient compliance on treatment effectiveness, and the implications for treatment policy; and
- The influence of prescriber compliance on treatment effectiveness (i.e. quality of disease management in and outside the health services)

(iii) Routine monitoring of all treated cases;

(iv) Assessment of the pattern of antimalarial medicines, use to determine:

- The extent of, and reason for, medicine use within and outside the formal health sector; and
- The sources of the medicines, types and formulations available, distribution patterns, comparative costs, legislation on over the counter medicines and pharmaceutical advertising.

(v) Assessment of medicine tolerance and adverse drug reactions (pharmacovigilance) to determine:

- The types and frequency of medicine effects (e.g. vomiting, diarrhoea) which influence absorption and therapeutic efficacy of the medicines; and
- The types and frequency of medicine effects which compromise correct disease management (i.e. health seeking behaviour, acceptability, compliance);
- The types and frequency of serious medicine effects which are life threatening; and
- The types and relative importance of risk factors associated with medicine effects, including concomitant medication, medicine dosage, age, medical history, medicine accumulation.

This assessment may be done through the sentinel sites and surveys.

(vi) Monitoring the sensitivity of malaria parasites to antimalarial medicines *in vivo*. The objectives would include the following:

- A longitudinal follow-up survey of medicine susceptibility of the parasites where changes have been introduced, compared with those where such changes have not been implemented;
- Monitoring the pattern of cross resistance; and
- The establishment of baseline data on the response to a new antimalarial medicine, even before its deployment for treatment

vii Monitoring, including post-marketing surveillance, to assure the quality of antimalarial medicines being used in the country, in collaboration with relevant stakeholders.

viii Institute and strengthen supportive supervision, with an appropriate feedback mechanism, in collaboration with relevant departments and agencies.

Monitoring and evaluation should be built into all intervention activities and should be considered and approved at the same time that the activities are being approved. Funds for monitoring, evaluation and implementation, as well as for the training of the monitoring, and evaluation personnel, should be made available as, and when needed,

Process evaluation should commence as early as possible in each work-plan year, and outcome should, preferably, be evaluated annually. Process and outcome indicators should be developed as the work-plan is being prepared, and should be fully described in the work plan.

14. RESEARCH

The antimalarial treatment policy of a country should be supported by well focused coordinated research and development strategies if it is to succeed in reducing morbidity and mortality, as well as the cost of treatment to the population. The research in every instance must be need driven.

Government, other relevant national organization and collaborating international agencies should actively support the funding of research on malaria in Nigeria. Such research focus should include the following:

(i) Research in the basic medical sciences, especially research geared towards the discovery of new molecules, or new uses for old medicines and tools;

(ii) Vaccine development;

(iii) Operational research which seeks to maximize medicine use and minimize or delay the development of resistance in parasite and, specifically, periodic clinical efficacy and safety evaluation of existing antimalarial medicines and new candidate medicines or tools;

(iv) The evaluation of genetic, and other determinants of response to the currently available antimalarial medicines;

(v) Antimalarial medicine utilisation studies, including the pharmacoepidemiology and pharmacoeconomics of antimalarial medicines;

(vi) Operational research on health seeking behaviour, household decision making process and home management of malaria, the use and acceptability of mosquito nets, the quality of care at health facilities, the role of patent medicine vendors in the community and medicine distribution channels in the community.

(vii) The use of chemoprophylaxis, especially in pregnancy;

(viii) Other studies designed to reduce malaria transmission in the country, including the resistance of vector to currently available insecticides; and

(ix) Evaluation of the role of traditional medicine and herbal medicines in malaria control.

In Nigeria, research efforts have typically focused mainly on studies designed to evaluate the efficacy and safety of antimalarial medicines, and even then, such research has been on a low scale.

There is an urgent need to invest in other areas of research, as listed above; on a sustainable basis.

15. FINANCE

In order to attain the objectives of the National Policy on Diagnosis and Treatment of Malaria, there should be appropriate and adequate deployment of funds to malaria control. Funds would be needed to facilitate the implementation of preventive measures, ensure medicine availability and effective distribution at all levels, capacity building, and improved referral from one health care level to another. There would also be the need to provide funds for the monitoring and evaluation of all aspects of malaria control, for social mobilization, and for Operations Research, as specified in Section 14 of this policy document.

15.1 Sources of fund

Funding for malaria control would be provided by the Federal, State and Local governments. Appropriate proportion of the health budget of each tier of government, based on the precise gravity of the malaria burden and malaria related needs, shall be allocated and released by all tiers of government for malaria control, as and when the fund shall be required.

Others envisaged sources of funds include international and local non-governmental development agencies and organizations, communities and philanthropic individuals.

15.2 Resource Mobilization

Resource mobilization should be carried out and sustained through:

- Substantial increase in budgetary allocation to health by Governments at all three levels at the 15% level set by the Abuja Declaration;
- Effective Public/Private collaboration; A special appeal should be made to Nigerian corporate organizations to make specific contributions to their respective communities;
- Active community involvement, right from the planning stage through to programme execution and evaluation, as well as in monitoring the use of funds; and
- The proactive deployment of organizations operating within specific communities in the fight against malaria.

16. CONCLUSION

The objective of this policy document is to facilitate and standardize the diagnosis and treatment of malaria and its prevention in the country. It would improve malaria control, through prompt access to appropriate and effective treatment, using the recommended Artemisinin based Combination Therapy (ACTs). It is hoped that strict adherence to this policy would help achieve the goal of the Roll Back Malaria initiative, as stated in the Abuja Declaration. This document is strongly recommended to all stakeholders at all levels in the scaling up of malaria control interventions in Nigeria.