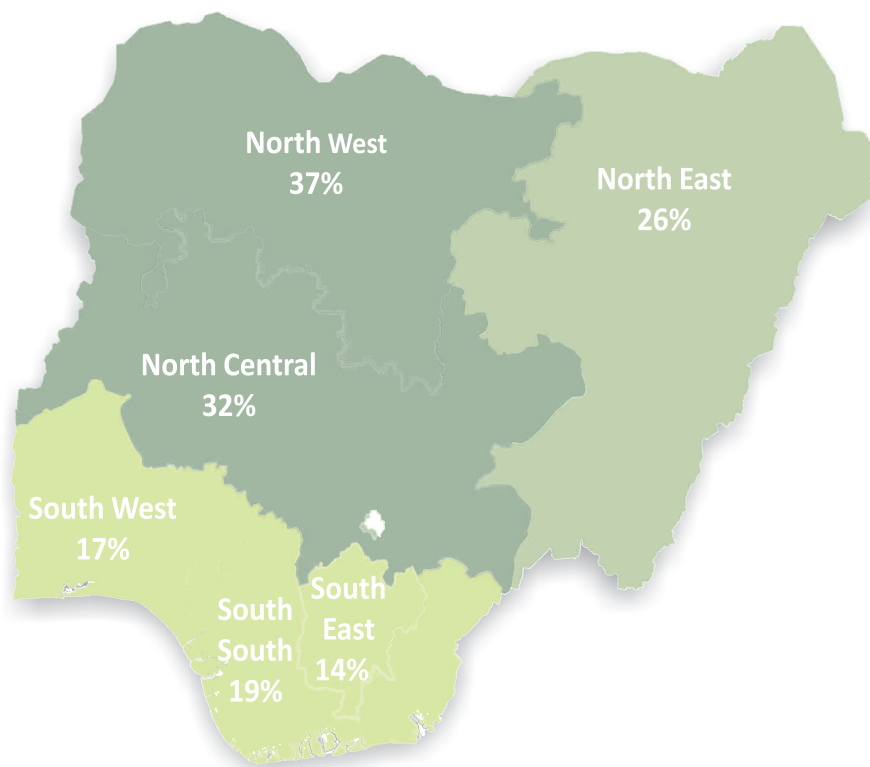




NATIONAL MALARIA OPERATIONS RESEARCH AGENDA 2017-2020



**National Malaria Elimination Programme
Federal Ministry of Health
Abuja**



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FOREWORD

Malaria control interventions in Nigeria have evolved over the years with many laudable strides made in the implementation of malaria control interventions/strategy in Nigeria. There has been a scale up of all malaria interventions across the country resulting in decline of malaria burden; for example, malaria prevalence has declined from 42% in Malaria Indicator Survey (MIS) 2010 to 27% in 2015. This decrease notwithstanding. Malaria is still a major cause of morbidity and mortality in Nigeria.

The goal of the National Malaria Strategic Plan (NMSP) 2014 - 2020 is to reduce malaria burden to pre-elimination levels and bring malaria-related mortality to zero. To achieve this ambitious goal, the NMSP amongst other things, has prioritized malaria operations research as a key strategy for malaria control & eventual elimination in Nigeria. The key element in achieving this goal in the context of malaria operations research (OR) is the prioritization of malaria operations research questions, which when implemented would provide solid evidence that can be used to inform policy in the programme implementation.

Resources for malaria control activities have improved in the last decade, including availability of antimalarial commodities, vibrant research community and expertise for malaria operations research, but there is still paucity of fund for malaria operations research. The NMSP 2014-2020 has recommended 40% of the total Monitoring and Evaluation budget for malaria operations research. Adherence to this recommendation by all our partners, donor organizations and governments would make fund available for OR activities.

I am happy to note that the development of the National Malaria Operations Research Agenda (NMORA) for Nigeria was done by NMEP in collaboration with all malaria stakeholders, including technical and development partners, research institutions, the academia and non-governmental organizations. This underscores the fact that all of us are expected to align with the NMORA. I therefore call on all our development partners to make adequate resources available for implementation of malaria OR activities and also our researchers to align with NMORA to generate evidence-based information for policy decision-making.

While reassuring all development partners and researchers that coordinate of OR activities would be done effectively and efficiency and research findings will be used for decision-making, I want to thank all who contributed immensely to this process.

Thank you.



Professor Isaac F. Adewole, FAS, FSPSP, DSc (Hons)
Honourable Minister of Health.

ACKNOWLEDGMENTS

The National Malaria Operations Research Agenda (NMORA) is intended to provide a situational analysis of the progress in malaria research and guide researchers, academic institutions, program implementers, health development partners, donors, policy makers, non-governmental organizations and other stakeholders on Nigeria's malaria research priorities by thematic areas. This is the first time a concise national malaria operational research agenda is being produced for Nigeria. A lot of hard work from malaria stakeholders must have gone into its production, for which the Government of the Nigeria is grateful.

The National Malaria Elimination Programme wishes to specially acknowledge the contributions of the World Health Organization (WHO), West Africa Infectious Diseases Institute (WAIDI) and Africa Field Epidemiology Network (AFENET)/ Nigeria Field Epidemiology and Laboratory Training Programme (NFELTP) for providing technical assistance and support for the development of this document. We also appreciate all malaria researchers from various academic and non-governmental organizations for their participation and contributions.

The contributions of members of both the Malaria Operations Research Agenda Expert Group (MOREG) and M&E subcommittee to the development of this document are highly appreciated.

It is my sincere hope that all malaria researchers (individuals and institutional in Nigeria would use their research to find answers to the operational questions in the National Malaria Operational Research Agenda to aid the National Malaria Programme in solving operational research issues using research evidence.



Dr. Evelyn Ngige
Head, Department of Public Health
Federal Ministry of Health

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List of Acronyms

Acronyms	Meanings
ACSM	Advocacy, Communication, and Social Mobilization
ACT	Artemisinin-based Combination Therapy
AMFm	Affordable Medicines Facility for malaria
ANC	Antenatal care
BCC	Behavior change communication
BMGF	Bill and Melinda Gates Foundation
CDC	U.S. Centers for Disease Control and Prevention
CHAI	Clinton Health Access initiative
CHW	Community Health Worker
CMS	Central medical store
CRS	Catholic Relief Services
DfID	Department for International Development
DHIS	District Health Information System
DHS	Demographic and Health Survey
DPRS	Department of Planning, Research and Statistics
DOD	U.S. Department of Defense
DOT	Directly observed therapy
EPI	Expanded Program on Immunization
FANC	Focused antenatal care
FIRS	Federal Inland Revenue Service
FMOH	Federal Ministry of Health
FY	Fiscal year
GHI	Global Health Initiative
GFATM	Global Fund to Fight AIDS, Tuberculosis, and Malaria
GoN	Government of Nigeria
HC3	Health Communication Capacity Collaborative
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
HMIS	Health Management Information System
ICCM	Integrated community case management
IPC	Interpersonal communication
IPTp	Intermittent preventive treatment for pregnant women
IR	Implementation Research
IRS	Indoor residual spraying
LGA	Local Government Area
LLIN	Long lasting insecticide treated net
LMIS	Logistics Management Information System
MC	Malaria Consortium
M&E	Monitoring and Evaluation
MDG	Millennium Development Goal
MICS	Multiple indicator cluster survey
MIP	Malaria in pregnancy
MIS	Malaria Indicator Survey
MNCH	Maternal, Newborn and Child Health
MOP	Malaria Operational Plan
NAFDAC	National Agency for Food, Drug Administration and Control
NMCP	National Malaria Control Programme
NMEP	National Malaria Elimination Programme
NMORA	National Malaria Operations Research Agenda
NMOREG	National Malaria Operations Research Expert Group

NFELTP	Nigeria Field Epidemiology and Laboratory Training Programme
OR	Operations research
PMI	U.S. President's Malaria Initiative
PPMVs	Proprietary Patent Medicine Vendors
PSI	Population Services International
PSM	Procurement and Supply Chain Management
QA	Quality assurance
QC	Quality control
RA	Resident Advisor
RBM	Roll Back Malaria
RDT	Rapid diagnostic test
RIA	Rapid Impact Assessment
SFH	Society for Family Health
SM&E	Surveillance, Monitoring and Evaluation
SMEP	State Malaria Elimination Programme
SP	Sulfadoxine-pyrimethamine
UNICEF	United Nations Children's Fund
USDoD	United State Department of Defense
USAID	United States Agency for International Development
WAIDI	West Africa Infectious Diseases Institute
WHO	World Health Organization

1.0 BACKGROUND

1.1 Institutional Framework of NMEP

The National Malaria Elimination Programme (NMEP) is domiciled in the National Malaria and Vector Control Division in the Department of Public Health of the Federal Ministry of Health. It has the leading role of overseeing and coordinating efforts to control malaria.

The NMEP has the mandate to formulate and facilitate policy and guidelines, coordinate the activities of partners and other stakeholders on malaria control activities, provide technical support to implementing bodies including states, LGAs and stakeholders, mobilize resources, monitor and evaluate progress and outcomes in malaria control efforts. In order to fulfil its role, NMEP is organized into seven branches as shown below with other supporting units and entities that provide financial, technical and human resource support as may be required.

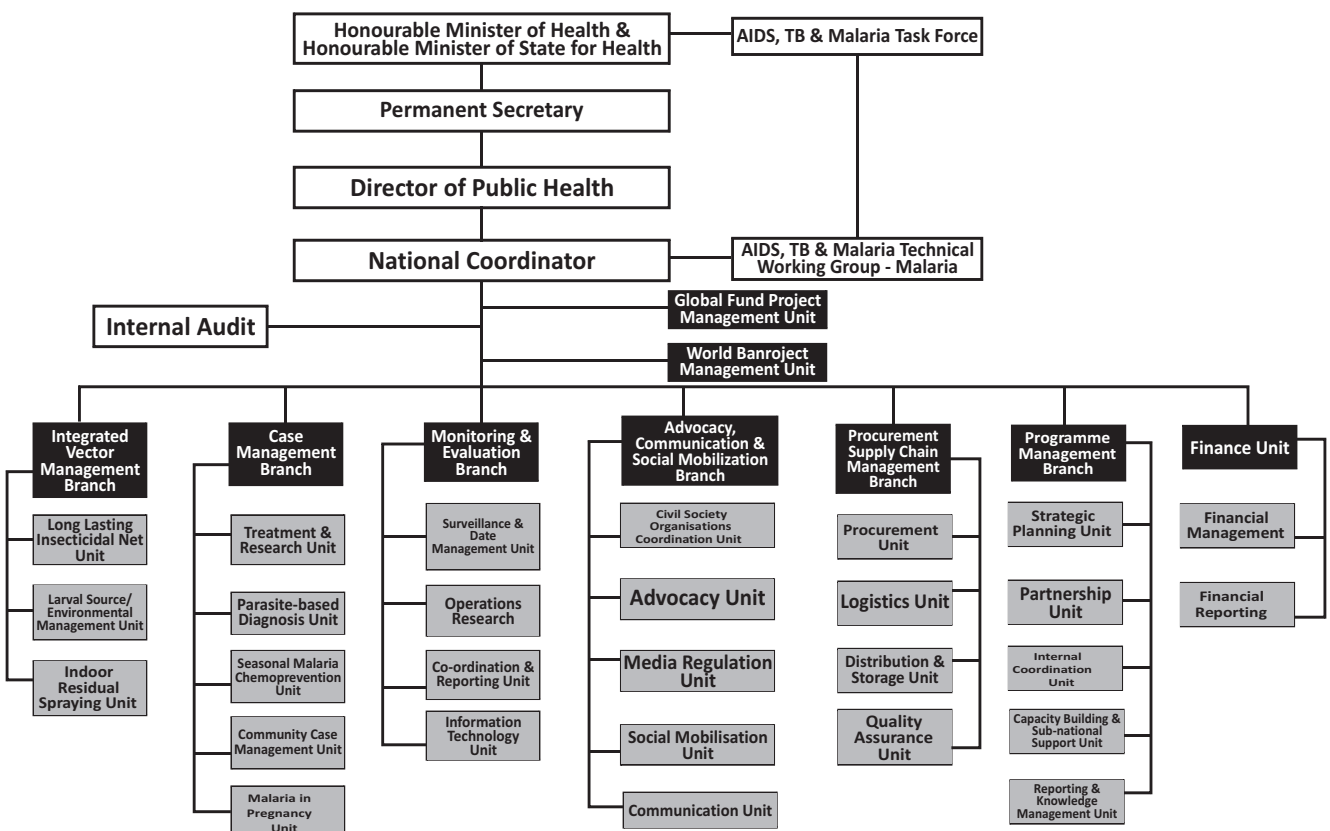


Figure 1: NMEP's Organogram

1.2 Burden of Malaria

Globally, millions of deaths attributable to malaria are still being recorded. The disease constitutes a huge epidemiologic burden in Africa and continues to cripple the economic development of the region especially sub-Saharan African countries, which include Nigeria.

In Nigeria, the disease is responsible for 60% of outpatient visits to health facilities, 30% childhood death, 25% of death in children under one year and 11% of maternal death. The financial loss due to malaria annually is estimated to be about 132 billion naira in form of treatment cost, prevention, loss of man-hours etc.; yet it is a treatable and completely preventable disease.

In view of these economic and health burden of malaria, efforts were put in place to control, eliminate and ultimately eradicate malaria. These efforts led to deployment of various interventions. Unfortunately, the existing malaria indices do not correlate with the magnitude of investments going into malaria programmes. Several factors have been identified to contribute to this; prominent among these is the lack of harmonization and coordination of malaria research.

To achieve the NMSP 2014-2020 vision and goal towards making Nigeria a malaria free country, it is paramount to have a system not only of assessing the programme's interventions but also providing answers to questions arising from the implementation of interventions to guide decision-making.

2.0 OVERVIEW OF NATIONAL MALARIA OPERATIONS RESEARCH AGENDA (NMORA)

Malaria control has enjoyed a huge support resulting to some level of progress worldwide. The World Malaria Report in 2013 showed that four countries have been certified to have eliminated malaria, seven countries were at the prevention to re-introduction phase and 19 countries are at the pre-elimination or elimination stage (WMR, 2013). However, the risk of exposure is still very high. Majority of people have been reported to lack access to preventive interventions; care-givers treat unconfirmed malaria cases and malaria surveillance systems can only detect just about 14% of cases worldwide (WHO, 2013); and most cases and deaths continue to go unregistered and unreported (Aribodor *et al.* 2016).

Nigeria, the most populous country in Africa, is projected to have a total population of approximately 205 million by 2018 with an estimated annual growth rate of about 3.2%. At present, 97% of the country's population is at risk of malaria (USAID, 2016) and Nigeria accounts for 25% of global malaria burden (WHO, 2012). In the last decade, Nigeria has received a huge support from donor agencies, partners and government in the fight against malaria scourge, resulting to reduction of malaria burden. For example, malaria prevalence has declined from 42% in 2010 to 27% in 2015 (MIS 2015).

The National Malaria Programme has successfully implemented 3 Strategic Plans over the last one & half decades with Operations Research (OR) issues highlighted, but they were not pragmatically implemented. In the current Strategic Plan (2014 – 2020), OR was prioritized as a key strategy for malaria control & eventual elimination in Nigeria. Operations Research is a very critical component of programme implementation aimed at providing solid evidence that can influence policy & strategies, improving quality and effectiveness of programme performance and providing information on knowledge gaps and skill enhancement. The National Malaria Elimination Programme in collaboration with its Partners has organized five OR Meetings/Workshops in 2010, 2012, 2013, 2014 & 2017 with strategic outcomes achieved. The expected outcomes of the 2017 National Malaria Operations Research Stakeholders' Workshop were:

- ☞ Development of a prioritized list of harmonized OR questions for relevant stakeholders especially the Universities, research institutions and developmental partners
- ☞ Identification of investigators and institutions working on malaria research and enlisting them in a national malaria OR database at NMEP.
- ☞ Identification of Funding Partner(s) for the different prioritized OR questions.
- ☞ Development of implementation timeline for the prioritized OR questions
- ☞ Development of a National OR Agenda for malaria

3.0 Operations Research Agenda 2017 - 2020

3.1 Definition

Operations research (OR) is a discipline that deals with the application of advanced analytical methods to help make better decisions. It is the same as “the search for knowledge on interventions, strategies, or tools that can enhance the quality, effectiveness, or coverage of programmes in which the research is being done” (WHO, 2014). Analytical methods refer to the management science, which uses various scientific research-based principles, and strategies to improve an organization's ability to enact rational and meaningful management decisions. Essentially this is concerned with development and application of models and concepts that may prove useful in helping to throw light on issues and solve problems. Typically, application of OR deals with decisions involved in planning the efficient allocation of scarce resources – such as materials, skilled workers, machine, money and time – to achieve stated goals and objectives over a span of time. Efficient allocation of resources may entail establishing policies, designing

processes, or relocating assets and in all OR reduces the reliance on trial and error.

The operations research encompasses a wide range of problem-solving techniques and methods applied in the pursuit of improved decision-making and efficiency that transcends all areas and programs.

The key elements of operations research are that the research questions are generated by identifying the constraints and challenges encountered during the implementation of programme activities (prevention, care, or treatment), and the answers provided to these questions should have direct, practical relevance to solving problems and improving health-care delivery. It is often a continuous and iterative process and has strong connection existing between good monitoring and evaluation of infectious-disease programmes.

The OR methods and techniques can be:

- a) Computer simulation which allows approaches to be tried out and ideas tested for improvement;
- b) Optimization, which involves narrowing choices to the very best among the multitude of feasible options, circumventing the tedious task of comparing them individually;
- c) Probability and statistics which measure risk, collect data to establish valuable connections and insights in business analytics, test conclusions and make reliable forecasts;
- d) Problem structuring which is necessary when complex decisions are needed in situations with many stakeholders and competing interests.

In summary, every operations research activity aims to generate timely, accurate and relevant information for policy and decision-making.

Generating sound evidence is a priority area for the National Malaria Operation Research Agenda activities. This will facilitate implementation of evidence-based malaria-related health care interventions, which will lead to efficiencies in planning and resource utilization.

3.2. Goal, objectives, and guiding principles

3.2.1 Goal of the NMORA

The goal of NMORA is to provide a situational analysis of the progress in malaria research and guide researchers, academic institutions, program implementers, health development partners, donors, policy makers, non-governmental organizations and other stakeholders on malaria research priorities by thematic areas for Nigeria.

3.2.2 Objectives of the NMORA

- 1. To identify priority areas for malaria research needs and gaps in Nigeria according to the NMEP goals and objectives as stated in the strategic plan.
- 2. To promote the conduct of malaria research in response to the priority needs and identified gaps in Nigeria.
- 3. To initiate and promote multidisciplinary collaboration in the conduct of comprehensive malaria research.
- 4. To enable the facilitation of the coordination of malaria research conducted by various stakeholders.
- 5. To improve and strengthen capacity building for the conduct of malaria research in Nigeria.
- 6. To facilitate the translation of malaria research findings into policy and practice towards malaria elimination in Nigeria.
- 7. To facilitate the mobilization of scarce resources for the conduct of locally relevant and prioritised malaria research.

3.2.3 Guiding Principles

To achieve the set goal and objectives of NMORA the following guiding principles shall be observed:

- 1) Ensure proper coordination of all malaria researches conducted in Nigeria based on the updated malaria operation research agenda.
- 2) Build and strengthen capacity for malaria research through training of young Nigeria researchers and collaboration between researchers and health institutions.
- 3) Encourage and build strong mechanisms for multidisciplinary collaboration between researchers, institutions, partners, donors and program implementers for malaria research in Nigeria.
- 4) Timely dissemination of all research findings to all relevant stakeholders
- 5) Ensure the use of evidence-based malaria research for policy formulation

4.0 Malaria Operations Research Questions

4.1 Methodology-Preamble

The NMEP, in collaboration with her partners, embarked on the process of formulating and producing a harmonized National Malaria Operation Research Agenda. The process involved the following activities:

4.2 Inauguration of Malaria OR Expert Group (MOREG)

Malaria Operations Research Expert Group (MOREG) was inaugurated to provide technical advice, with NMEP as secretariat, for effective and efficient implementation of OR agenda in Nigeria. A university professor chairs the MOREG, with World Health Organization (WHO) as co-chair.

4.3 Planning Meetings

A series of planning meetings was held under the leadership of malaria operations research expert group (MOREG). The aim of the meetings was to discuss the objectives, process and the expected outcomes of the National Malaria Stakeholders Workshop on Operations Research. The meetings also provided opportunities for the selection of key participants, workshop facilitators and venue of the workshop. The agenda for the workshop was equally developed and finalized during the meetings.

4.4 Desk Review

The NMEP in collaboration with relevant stakeholders held a two-day workshop to conduct a situation analysis of the progress in malaria operations research priorities by thematic area. Participants at the desk review included heads of thematic areas of the National Malaria Elimination Programme (NMEP), WAIDI staff and fellows, NFEPT residents and other stakeholders.

4.5 Preliminary Study

In line with WHO guideline on OR, a preliminary study was carried out to identify research needs and gaps by reaching out to relevant larger stakeholders. The method of data collection involved online survey, face-to-face interviewer-administered questionnaire, in-depth interviews, focus group discussion (FGD) and Delphi method post-survey.

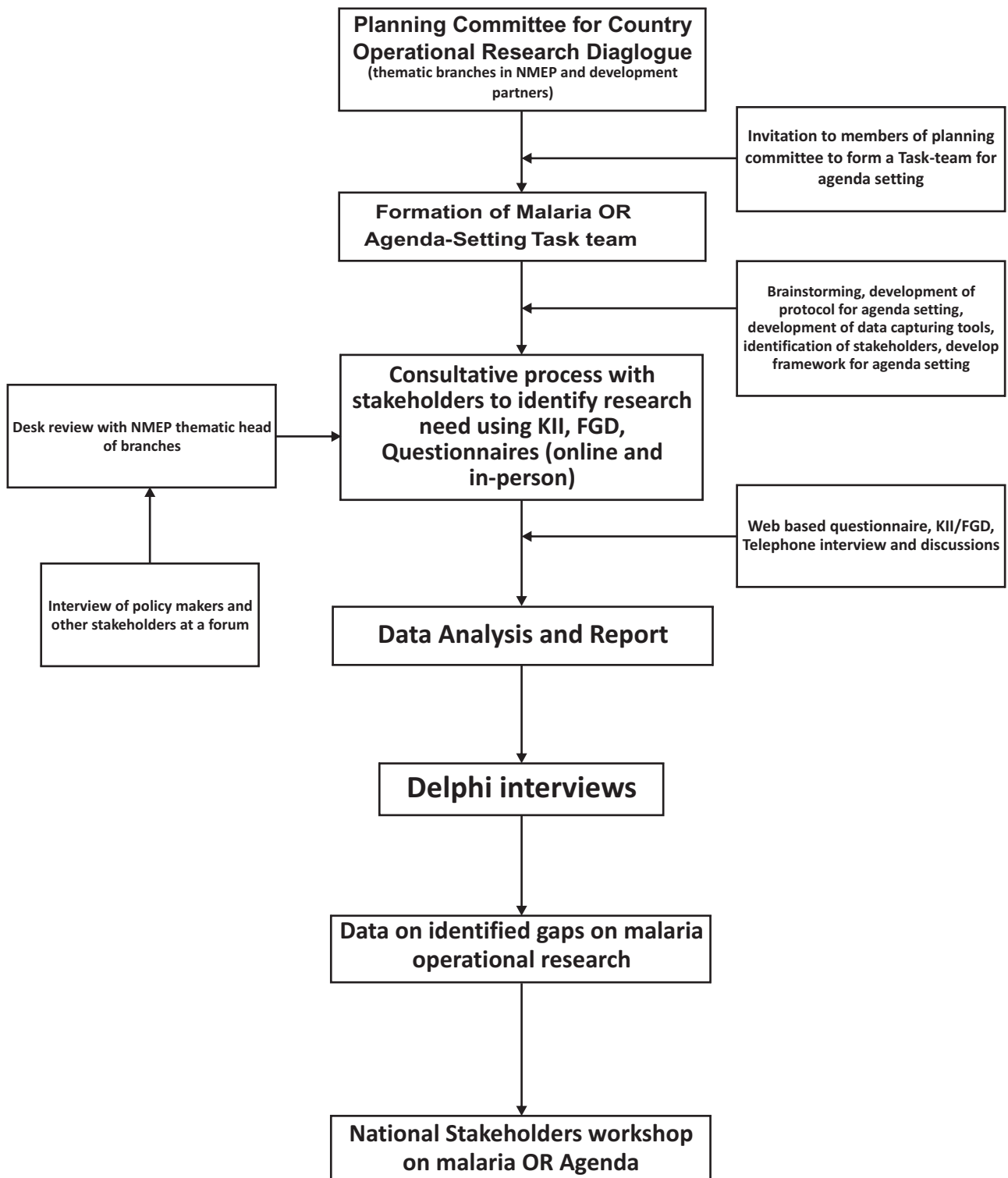


Figure 2: Framework for structured approach to generating gaps for malaria Operation Research

4.6 Stakeholders' Workshop

The National Malaria Elimination Programme (NMEP), in collaboration with its partners, held a two-day National Stakeholders' Workshop on Malaria Operations Research (OR) on the **8th and 9th of February 2017 in Abuja, Nigeria**. The aim of the workshop was to review/update the 2014 harmonized list of malaria operations research questions in order to produce a National Malaria Research Agenda for Nigeria.

Participants included malaria researchers, academia, development partners, non-governmental organizations and other key malaria stakeholders.

4.7 Workshop outcomes:

1. Desk review showed that many of the thematic OR questions harmonized and prioritized in 2014 were not answered. It also identified implementation bottlenecks/challenges in the various thematic areas.
2. The OR situation assessment survey revealed extensive gaps, challenges and needs in malaria OR. These gaps and needs transcend all the components of NMEP: case management, prevention, vector control, health systems etc.
3. Priority OR questions for 2017 – 2020 were updated and produced, potential funders identified, list of malaria researchers produced and draft NMORA produced.

5.0 Implementation framework for NMORA

5.1 Coordinating Structures of the NMORA

As the secretariat of National Malaria Operations Research Expert Group (NMOREG), NMEP shall ensure effective and efficient coordination from planning to dissemination of all malaria researches conducted in Nigeria based on the updated and prioritized malaria operation research questions. The programme shall also encourage malaria researchers in Nigeria to align with the prioritized questions. The coordination activity of NMEP would also include data management, meetings/workshops, guidance on the choice and implementation of questions, printing and distribution of OR Agenda documents, etc. NMEP shall engage in any other activities that will strengthen the link between her and research community.

5.2 Resource Mobilization

Nigeria has a vibrant research community and strong expertise to conduct OR, but paucity of fund has impeded its implementation over the years. To mitigate this challenge, funding for OR should be sourced locally and internationally. Governments at all levels should make budgetary provision for OR activities which should reflect in the Annual Operational Plan (AOP) for malaria programme. Both NMEP and Researchers should also make efforts to source funds for malaria OR through grants, aids, donations, etc.

5.3 Potential Role of Stakeholders

5.3.1 National Malaria Elimination Programme

1. NMEP shall have overall coordination and provide oversight to all malaria operations research activities in Nigeria
2. NMEP shall ensure research findings are used to inform policies and decision-making.
3. It shall also review research methodology with researchers;
4. The programme shall also monitor the implementation of OR activities

5.3.2 Donors

Development partners and private sector organisations should provide resources (technical, material and financial) for OR activities. They shall also participate in the monitoring of OR implementation.

5.3.3 Researchers

1. Research institutions including private researchers are expected to implement OR questions.
2. They shall present research findings to NMEP and other relevant stakeholders.
3. They shall provide regular feedback to NMEP on OR implementation process and findings to communities where the research is conducted.

5.3.4 Partners

1. Partners shall align their researches with the prioritised OR questions of NMEP.

2. They shall fund the implementation of OR questions and dissemination of findings.
3. They shall also participate in the monitoring of the implementation of OR questions.

5.4 Capacity Building

Researchers and partners involved in OR implementation shall ensure regular transfer of knowledge and skills to the programme officers. This transfer of knowledge could take the form of training, interactive session with programme officers through workshop/meeting.

5.5 Timing, scope and structure of NMORA document reviews

The National Malaria Operations Research Agenda (NMORA) is aligned with the National Malaria Strategic Plan (NMSP) that has a life span of seven years. However, the review period of NMORA should be five years to accommodate any emerging OR questions/issues. There should be comprehensive review of all components of NMORA. NMEP shall convene a meeting/workshop of all stakeholders to review the document.

5.6 Monitoring and Evaluation of the NMORA

The mechanisms to monitor and evaluate the implementation of OR prioritized questions should be put in place by NMEP. These include biennial review of OR implementation, end-year evaluation of OR questions implementation and annual review due to emerging issues arising from OR implementation. These reviews and evaluation should be done by NMEP in collaboration with OR stakeholders to determine whether the OR questions are answered and the findings useful to inform policy decisions.

5.7 Dissemination of Research Findings

Dissemination of research findings is one of the key data management processes. Though several local research groups within institutions in Nigeria have been involved in extensive malaria research for many years, many of the findings are not disseminated internationally or more so locally to guide policy directions. Deliberate efforts to address these challenges and review/update OR priority questions would be made by NMEP and other malaria stakeholders to ensure that all research findings are disseminated nationally and annually. The dissemination should be done centrally amongst malaria stakeholders to save cost. Format for dissemination would include PowerPoint presentation, discussion, fact sheets and group work to inform programme implications/direction.

6.0 General Implementation Framework of Operations Research Flowchart

6.1 Implementation Flow chart

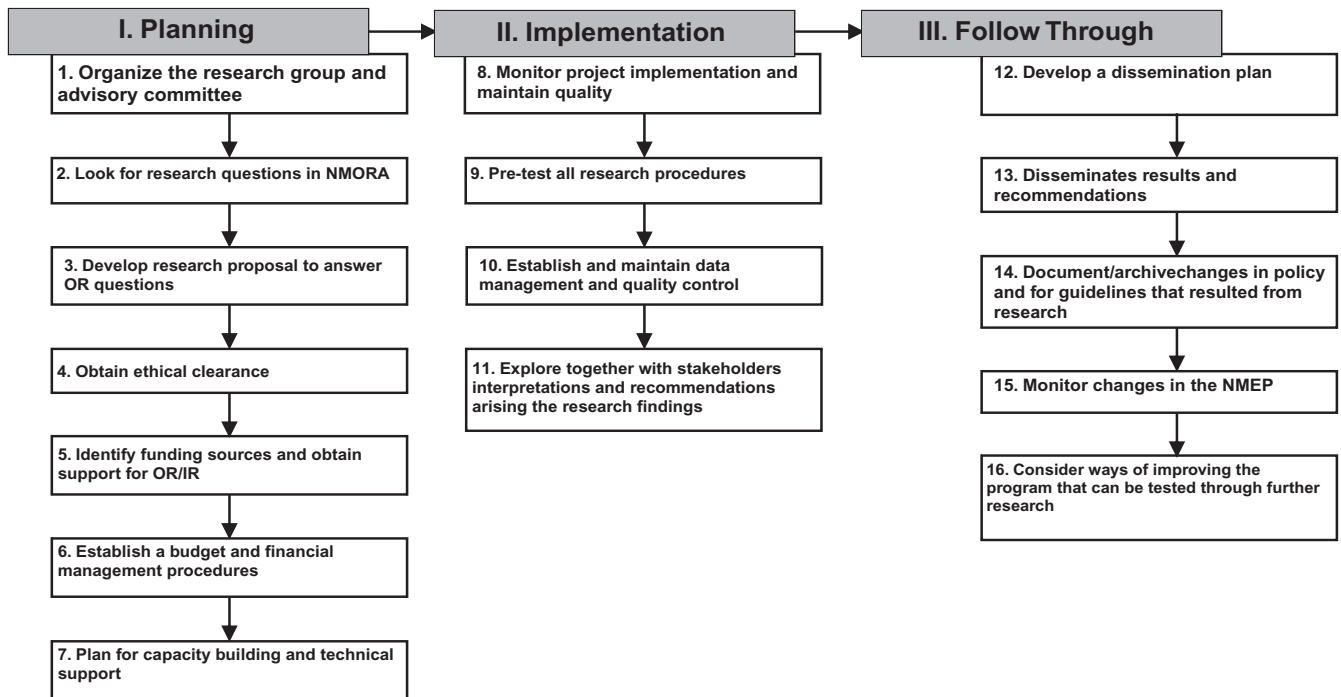


Figure 3 : General Flowchart of the Implementation Framework of Operations Research in Nigeria

Adapting from Framework for Operations and Implementation Research in Health and Disease Control Programs document developed by WHO and partners (ref). The framework consists of a flowchart of 16 steps that will lead from conceptualization and the design of OR through implementation into strategies to ensure dissemination and uptake of the findings to improve malaria control and elimination efforts. Note that this process is not always step-by-step, as several activities may be happening simultaneously.

6.2 Description of steps

Planning

STEP 1: Organize the research group

a) Selecting the Researchers

Because of their major work responsibilities, program managers and staff will rarely conduct the OR themselves, but may contract with a university, research institute, NGO or even another unit within a health ministry (e.g., a planning/research unit) to carry out the day-to-day research activities. Program managers therefore need to identify and choose the researchers relatively quickly. Depending on national regulations, the choosing of a research group may need to be put up for competitive bid or it may simply be a matter of requesting a proposal from an experienced and trusted group.

An important criterion for choosing an appropriate research team will likely be the availability of members with multidisciplinary backgrounds. Since OR deals with real-life program challenges, researchers may need a mix of backgrounds such as public health management, health behaviour change, epidemiology, biostatistics, clinical services and laboratory investigation, to name a few. As people begin to consider the first step below, the nature of the OR will become clearer and so will the specific research skills needed.

b) Form an advisory committee or working group

After researchers are chosen, the program managers and staff still have an important role to play in the

OR to ensure the results meet program needs. A working relationship between program managers/staff and the researchers must be built. Since OR should be a relatively short process, this relationship does not have to involve establishing a formal group. A simple advisory committee or working group that consists of five to six people including researchers, program managers and if possible, constituencies of people affected by the issue/problem could meet on a regular basis (e.g., monthly) to ensure that there is ownership of the results by all concerned parties and that the results are put to use in a timely fashion.

Advisory committee meetings can be used to update committee members and seek their advice about any implementation problems encountered. Toward the end of the research the advisory committee can play an active role in planning dissemination activities.

STEP 2: Look for research questions in NMORA

The first step in undertaking OR is to identify an appropriate research question that will serve to improve the functioning of a health (malaria) program. Questions addressed by OR should arise out of the actual implementation of a health or disease control program and should emerge from discussions with program managers, researchers and clients of the services. OR questions should relate to specific challenges faced in implementing and managing health (malaria) programs, such as service delivery or program uptake problems, and should thus serve to provide answers that will improve overall program performance. Additionally, it is important to distinguish between questions that are appropriate for OR and those that are not. For example, finding out the number of people served by a program is not a research issue, but rather should be a part of regular program monitoring.

The NMEP had developed prioritised operations research questions by thematic areas, this is being reviewed periodically. The list has captured issues as regards to the problems based on M&E reports that there is a problem in program performance or service uptake, considering underlying reasons and testing possible solutions. Researchers are encouraged to consider prioritising this list in order to address and align with NMEP's goals.

STEP 3: Develop a research proposal to answer OR questions

A research proposal is a document that outlines- in as much detail as possible - what the research is about, why it is important, how the researchers plan to carry it out and how the results may be used. Sometimes one sees requests for proposals that provide a specific preferred outline that one must follow. Sometimes a group develops its own proposal and looks for donors, foundations and other potential funders.

These are common elements found in a research proposal: 1. Title page, 2. Abstract/summary, 3. Statement of research questions and objectives. 4. Statement of purpose, rationale and importance of the research 5. Background information from reports and published articles on what is known about the research to the problem and how it has been approached in the past (literature review) 6. Overview of the study area providing information that is relevant to the problem at hand, the communities involved and the nature of the health system 7. Description of the intended research team (membership capacities) including involvement of actual program management staff; 8. Ethical consideration and approval processes; 9. Research methods a. Type of study design (cross-sectional, intervention, quasi-experimental, case control, etc. and whether the approach is qualitative, quantitative or mixed) b. Study population (this could be individuals, clients, health staff, health facilities, etc.) c. Sampling procedures d. Key variables under study (related to study objectives) e. Specific data collection instruments linked with study variables f. Plan for data collection in the field g. Procedures for data management, entry and ensuring data quality h. Possible sources of bias, error and limitations and means to address these i. Data analysis plan including some empty/sample (dummy) tables; 10. Plans for dissemination and use of findings; 11. Budget for the proposed project; 12. Budget justification; 13. List of references for literature cited.

STEP 4: Obtain ethical clearance

Any research that studies human beings – whether they are community members or health workers – may put those people at risk. Most OR activities will involve human beings who are receiving various health and disease control services. Researchers may be simply asking people to answer questions on a questionnaire or during a focus group, or they may be asking participants to take different medicines or to provide blood or urine samples. The latter are said to be more “invasive” and have a greater potential harm than the former. Even with “simple” interviews there are costs involved, such as time of the respondent and risks involved in sharing personal information with a stranger (the interviewer).

In all cases, researchers must be sure that the potential for risk and harm is known and minimal and that procedures are set in place to explain the potential risk in easily understandable terms to the people included. How to apply/submit a “Letter of Intent” Interested groups are invited to submit a letter of intent of not more than four pages (size A4, font 12pt) outlining the following:

1. Project title
2. Background and statement of the research question
3. Overall and specific objectives
4. Methods
5. Estimated budget
6. Relationship with any ongoing program, research project, network, any previous research experience with CDI and network
7. Proposed principal investigator, research institution and study team.

Curriculum Vitae of the principal investigator should be attached. Letters of Intent must be submitted not later than the study so that they can voluntarily make an informed choice whether or not to participate. As part of the proposal, researchers need to spell out the details of how they will explain research procedures and risks to potential participants and obtain evidence (a signature, a mark) that participants agree to take part in the research. Most organizations that fund research require not only that the researchers spell out these procedures, but that researchers show evidence of having gotten approval for these procedures. Note that consent forms must be written in a language that research participants/respondents can understand.

Most research institutions in particular have an “institutional review board” (IRB) or a “committee on human subjects” that reviews and approves the ethical and safety issues surrounding a research proposal before it can be implemented. Studies that involve more than one state requires to undertake review from the national institutional review board also – National Health Review Ethics Committee (NHREC), which can undertake review for government agencies and other organizations that do not have their own IRBs. Some funding agencies require this ethical approval prior to considering the proposal. One needs to contact an ethical review board and follow their procedures to ensure that the OR procedures are approved.

STEP 5: Identify funding sources and obtain support for OR

Funding for OR may come from different sources both locally and internationally. Federal and state governments have available funds through the Tertiary Education Trust Fund (TETFUND), generated from education tax through FIRS to fund researches and publications among other education sector interventions. The Global Fund, PMI/USAID and DfID also make available funds for malaria operations research within their proposals to the country of support. Other potential source of funding includes Pharmaceutical companies and those who produce disease control products often offer small grants for OR in the countries where they work. Bilateral donors often set aside a small number of funds for OR related to the implementation of programs they are assisting in order to make these relevant to the countries concerned.

Research firm or agency could develop an OR/IR proposal and check with other potential funders who

might be interested. This will require talking to various donor agencies in the country to learn about their interests and priorities. The first step is often sending a potential foundation, donor or funding agency a short letter of intent that briefly describes the intended project. If the funder is interested, they may ask for a more detailed proposal.

STEP 6: Establish a budget and financial management procedures

Funding agencies will expect that the researchers will have devised a comprehensive budget and can justify the need for each item. Since researchers are planning OR, researchers may have budget items that relate to the research itself as well as to any programming activities that are being tested. The chart below outlines some of these cost/budget items.

STEP 7: Plan for capacity building and technical support

Capacity building for OR means ensuring that all persons involved in carrying out the research have the skills and knowledge necessary to perform their roles. These people might range from staff at the institution responsible for the research to the interviewers, field workers and other assistants they hire or health workers in the facilities where new health and disease control interventions are being tested and community members who may take part in delivering and monitoring services at the grass-roots level.

Implementation Phase

In implementation - as in planning - there is a need to continue to involve key program managers, staff and communities in the process (e.g., through the advisory committee) to ensure that the OR/IR remains based in and addresses the needs of the health or disease control program. It is quite possible that during the process of developing and formulating the research questions the team found that in fact cultural issues were among the reasons that health and disease control programs were experiencing difficulties. Therefore, one needs to be sensitive to gender, social and cultural issues when implementing the research. For example, in some places women feel more comfortable talking to other women, and if the issue concerns something like pregnancy and reproductive health, women might be more comfortable talking with other women who have been pregnant before. This understanding could guide selection of research staff and determine how they interact with people in the field.

STEP 8: Monitor project implementation and maintain quality

A key issue of quality control in research is maintaining fidelity to implementation of the research as planned. Once a proposal has been accepted for funding it is important for the team to develop a research protocol that spells out in detail the steps to be taken in implementing the project, ranging from sampling procedures to staff preparation, instrument development, data collection procedures, field work procedures, data management processes and reporting standards, to name a few.

The mechanisms to monitor and evaluate the implementation of OR prioritized questions should be put in place by NMEP. These include biennial review of OR implementation, end year evaluation of OR questions implementation and annual review due to emerging issues arising from OR implementation. These reviews and evaluation should be done by NMEP in collaboration with OR stakeholders to determine whether the OR questions are answered and the findings useful to inform policy decisions.

STEP 9: Pre-test all research procedures

Research instruments, whether quantitative (questionnaires, observation checklists) or qualitative (FGDs, in-depth interviews) should be both valid and reliable. Valid instruments elicit the "truth" from respondents. Reliable instruments provide consistent information. If questions are vague and use complicated language or if checklists seek items that are difficult to observe, then they may not achieve the aims of validity and reliability. It is therefore necessary to test out the instruments under the type of circumstances where they will be used in the field, possibly in a different community not within the study area with similar characteristics to the study community.

STEP 10: Establish and maintain data management and quality control

Quality data management begins with the design of the research instruments. As noted above, these need to be pre-tested to ensure that they elicit reasonable and truthful responses. Reviews by colleagues and experts who compare the instruments against the research questions and objectives are needed to ensure that the data collected actually corresponds with the variables that should be studied. In short, one needs to ensure that the study variables are operationalized to reflect the objectives of the study.

STEP 11: Explore together with stakeholder's interpretations and recommendations arising from the research findings

The next phase, the “follow-through”, involves the actual dissemination and use. Prior to dissemination it is important for the research team and the stakeholders (e.g., community leaders, program managers/staff, donors) who were likely members of the project advisory committee or working group to review the results and have a clear and shared understanding of the implications of these findings.

Follow Through

STEP 12: Develop a dissemination plan

Dissemination activities must be matched to key audiences, including policy-makers, program managers, service providers, program beneficiaries and donors (Marin and Bertrand, 2003). In planning dissemination, researchers need to distinguish between “internal” and “external” audiences. Researchers can make the following distinctions when planning to disseminate the findings:

- a. Using the Results focused on one set of people – an “internal” audience
 - Approaching those who can directly and immediately act on the knowledge and lessons generated
 - Recognize that the main purpose is to use the information
- b. Sharing the Results looking at a broader set of people – an “external” audience
 - Approaching those who might adapt the information
 - Those who may have general interest

Dissemination plans for external audiences may include:

- Annual presentation of research findings at national and international conferences
- Publication of research findings in national and international peer-reviewed journals
- Meetings with local and national stakeholders to discuss research findings
- Use of videotaped life histories of patients in advocacy work with the permission of interviewed subjects
- Regular reports to the funding agency (e.g., TDR requires annual reports)
- Press releases and briefings

STEP 13: Disseminate Results and Recommendation

Dissemination itself involves carrying out the suggested steps and activities as planned. The research team needs to involve the advisory committee as mentioned. An important role of the committee is serving as a reality check. Though several local research groups within institutions in Nigeria have been involved in extensive malaria research for many years, many of the findings are not disseminated internationally or even locally to guide policy directions. Deliberate efforts to address these challenges and review/update OR priority questions would be made by NMEP and other malaria stakeholders to ensure that all research findings are disseminated nationally and annually. The dissemination should be done centrally amongst malaria stakeholders to save cost. Format for dissemination would include PowerPoint presentation, discussion, fact sheets and group work to inform programme implications/direction.

Issues like timing, venue and opportunity need to be considered. There are several elements to timing, including presenting the results after the research has been fully concluded. Early results may be misleading and create false expectations. The presentation of results also needs to be timed for when it is most likely to be used. If a country completes its budgeting process in June or a donor requires that renewal proposals for a grant are due in July, it does little good to present the results in August.

Dissemination must take into consideration the convenience of the audience/stakeholders. Staff from the ministry of health may be reluctant to attend a meeting at the university campus some miles away. Hold an event in the ministry auditorium or venue close to Ministry of Health.

STEP 14: Document/archive changes in policy and/or guidelines that resulted from the research

Marin and Bertrand (2003) encourage OR teams to ask, “Did the implementing/collaborating organization(s) “act on” the results (i.e., continue to implement the activities tested in the OR study after its completion if effective or not implement/discontinue this activity if ineffective)?”

They explain that “acting on the results” consists of implementing the actual services of the intervention or the activities to support those services (e.g., training courses, development of service delivery guidelines, changes in allocation of personnel, production and testing of IEC materials, supervision, monitoring) if the intervention was effective, or not implementing or discontinuing these services and activities.

Also, NMEP will provide an archive where research results and publications will be stored. This will serve as data repository especially for epi analysis when the need arises.

STEP 15: Monitor changes in the revised program

At this point, NMEP will be responsible to ensure the research results pass back to all stakeholders, although the researchers may still have a role to play. It is incumbent on NMEP to use its existing M&E mechanisms (Health management Information Systems) to report on key indicators that show whether the changes were effective on the larger scale, in particular if the OR/IR was carried out to address a program performance bottleneck, and the suggested changes in policy and procedures have been implemented.

For example, an OR field test may have found that in several communities, distribution of ITNs by community-chosen volunteers achieved greater coverage and use than campaigns based at the district health facilities. If the national malaria control program adopted and implemented this new approach, one would want to monitor whether in fact after scale-up the coverage increased uniformly across the country. The original OR team could still be involved in conducting coverage and use surveys around the country, even though this activity would be part of routine M&E activities.

STEP 16: Consider ways of improving the program that can be tested through further research

The above example about changing the ITN distribution strategy provides a good example also of how monitoring the results of implementing one set of research findings may lead to new research questions. The regular program monitoring surveys just mentioned may find that in most areas of the country ITN coverage and use did in fact increase and reach program targets. Unfortunately, the surveys might have found that in a riverine/coastal area or among a group of primarily nomad people the new strategy did not work any better than the previous campaign approach. This finding raises new OR/IR questions and can start the OR/IR process over again with a new focus. Program improvement is an ongoing process.

7.0 National Malaria Operation Research Questions

The list of OR questions harmonized in 2014 was reviewed and prioritized by all stakeholders to have a new list of malaria OR questions for implementation from 2017 to 2020 as shown in the table below. In addition, new questions were generated from a preliminary survey among robust stakeholders to

Table 1: Malaria Operations Research Priorities for NMEP 2017-2030

Thematic Area	OR question or gap	Potential partners	Priority rank (e.g. 1, 2, 3)	Comments (if any)
Case Management				
Diagnosis				
	1. Can the use of job aid posters improve adherence to guidelines and SOP for malaria diagnosis?	NME, Universities, USDoD	High	Compare use of job aid posters to use of printed guidelines and SOP
	2. What are the QA & QC measures available for malaria diagnosis and treatment and how can these be improved?	DfID, USDoD, WHO - FIND	High	
	3. What is the PPMVs awareness and adherence to pre-treatment RDT-testing? What are the barriers to acceptability and utilization of RDT for testing before treatment among PPMVs?	WHO, SFH, ANDI Centre, CHAI	High	Find out a bout awareness, acceptability and use.
	4. What are the challenges to HCWs with managing RDT negative results and how can these be solved?	DfID, UNICEF, WHO, PAN	High	
	5. What are the KAP of clients on uptake of malaria diagnosis and treatment?	Universities, DfID, USAID	High	
Treatment				
	1. What factors promote the use of non-ACT malaria drugs?	WHO, Pharmaceutical companies that produced ACTs (Novartis)	High	In both private and public sectors
	2. What is the pattern of artemisinin resistance in Nigeria across the six geo-political zones?	Government, DfID, Global Fund, WHO, PMI	High	Periodic DTET by the Programme and Partners
Malaria in Pregnancy (MiP)				
	1. What is the quality of MIP services in the Private sector and public sector and what factors account for the quality? (a comparative analysis)	GoN, PMI, DfID	High	According to the result, appropriate intervention will be deployed
	2. Is community delivery of SP feasible and acceptable in Nigeria?	GoN, Global Fund, DfID, MC, Jhpiego	High (Low)	Explore novel approaches for improving care of pregnant women (existing work available)

	3. What is the feasibility and acceptability of screening for pregnant women with fever (symptomatic) using RDT at community level?	GoN, PMI	High	
	4. What is the impact of focused training of HCWs on IPTp Uptake?	GoN, PMI	High	
	5. Does Communication and Social mobilization impact positively on the Knowledge, Attitude and Practice of IPTp		High	
Vector Control				
LLIN	1. What is the efficacy and durability of LLIN over time? • Physical integrity • Durability • Effectiveness	VectorWorks, Global fund, PMI	High	Ongoing
	2. What are the strategies or delivery systems that can be exploited to increase and sustain LLIN coverage?	DFID, WHO, PMI, GoN, UNICEF, USAID, Global fund, Private sector	High	Ongoing
	3. What are the best options to achieve and maintain LLIN ownership and utilization among susceptible groups?	Research institutions and Universities, PMI/Abt, Global Fund, CBO	Medium	Ongoing
Vector Behaviour	1. What is the magnitude of Residual Malaria Transmission in Nigeria?	Research Institute, Academia, PMI, Abt Associates	Medium	Ongoing
	2. How does the ongoing climate change affect the malaria vector composition in the different eco-zones?	Research Institutions, Universities, Donor agencies, GON (FMoH, FMoE), Private sector participation (NNPC, Shell, Chevron)	High	No
	3. What is the ecology and distribution of secondary malaria vectors in Nigeria?	Research Institutions, Universities, Donor agencies, Private sector participation (NNPC, Shell, Chevron)	High	No
	4. What is the relative Entomological Inoculation Rate (EIR) of the dominant malaria species in the different geo-ecological zones?	Research Institutions, Universities, Donor agencies, Private sector	High	Ongoing
	5. Does insecticide pressure select for behavioural changes in the major malaria vectors?	Research Institutions, Universities, Donor agencies, Private sector	High	No

Environmental Management	1. What are the new interventions or strategies that can be exploited for malaria elimination (LSM), Environmental Management?	NMEP, Research Institute, Universities, Consultants, Valent Biosciences, Harvestfield, Dow Agrosciences	Medium	Ongoing
	2. What is the distribution of breeding habitats of malaria vectors in Nigeria?	Research Institutions, Universities, Donor agencies, Private sector, NASRDA, NIMET	High	No
	3. Are communities well involved in environmental management practices targeted at malaria vector breeding sites?	Research Institutions, Universities, Donor agencies, Private sector participation (NNPC, Shell, Chevron)	High	No
Insecticides	1. What is the level and spread of insecticide resistance and mechanism in different ecological zones in Nigeria?	Research Institutions, Universities, Donor agencies, Private sector participation (NNPC, Shell, Chevron)	High	Ongoing
	2. What are the other insecticide alternatives, formulations or combinations for LLIN and IRS?	Private sector partners, Research Institutions	High	No
	3. Does insecticide resistance lead to failure of insecticide-based interventions at the programme level?	Research Institutions, Universities, Donor agencies, Private sector participation (NNPC, Shell, Chevron)	High	No
ACSM				
	1. Effectiveness and efficacy of the various channels of communication across different cultural & geo-political zones?	Hc3; Global Fund	High	
	2. Will the use of SMS/mobile device by HCW improve client's uptake of IPTp?	GoN, PMI, DfID, Global Fund	High	To scale up use of SMS for effective implementation of policies and guidelines (ideal for pregnant women)
	3. Is there a relationship between the risk perception of malaria by pregnant women, their knowledge of malaria intervention and their preventive practices?	GoN, PMI, Global Fund	Medium	To improve practice

	4. What are the socio-cultural and behavioural factors responsible for the low uptake of IPTp?	USAID	High	
	5. What are the factors influencing mutually reinforcing coordination in the production of IEC/BCC materials?		Low	
PSM				
	1. What are the main causes of delays in the international procurement of malaria commodities and their implications for availability of malaria commodities for the program?	GoN; Global Fund, WHO/UNICEF; USAID; USAID/PMI; DfID; BMGF	High	
	2. What is the current situation of domestic (in-country) malaria commodity production & procurement by the public and private sectors?	GoN; Global Fund, WHO/UNICEF/UNIDO; USAID; USAID/PMI; DfID; BMGF Private Pharm. Sector,	High	
	3. What are the main factors responsible for the constraints in downward distribution of malaria commodities and at what levels do these have most significant impact?	GoN; Global Fund, WHO/UNICEF; USAID; USAID/PMI; DfID; BMGF Private Pharm. Sector,	High	
	4. Push vs. Pull systems of commodities-Which is more effective?	GoN; Global Fund, WHO/UNICEF; USAID; USAID/PMI; DfID; BMGF/PSI International/Domestic Manufacturers/ Private Pharm. Sector,	Medium	
	5. What are the constraints and challenges of standard documentation of malaria PSM activities-at different levels of malaria programme implementation, using the PSM Cycle?	GoN; Global Fund, WHO/UNICEF; USAID; USAID/PMI; DfID; BMGF/PSI Private Pharm. Sector,	High	
	6. What are the implications of poor storage at facility level to the eventual quality and uninterrupted availability of malaria medicines and commodities?	GoN; Global Fund, WHO/UNICEF; World Bank/USAID; USAID/PMI; DfID; BMGF Private Pharm. Sector,	High	

	7.What are the main issues to be addressed (with recommendations on possibilities) to ensure that Nigeria establishes consumption based distribution and inventory management of malaria commodities?	GoN; Global Fund, WHO/UNICEF; USAID; USAID/PMI; DFID; BMGF Private Pharm. Sector,	High	
	8. What are the implications of the differential packaging sizes of ACTs per age/weight group for procurement, stock management/inventory control, dispensing, and recording of consumption of ACTs?	GoN; Global Fund, WHO/UNICEF; USAID; USAID/PMI; DfID; BMGF International/Domestic Manufacturers/ Private Pharm. Sector	High	
	9. How does the malaria programme operationalize feasible mechanisms to improve its response time to stock management needs?	GoN; Global Fund, WHO/UNICEF; USAID; USAID/PMI; DfID; BMGF International/Domestic Manufacturers/ Private Pharm. Sector,	High	
M&E/Surveillance				
	1. Does the provision of incentives (capacity-building, awards, and other non-monetary rewards) make a difference in the quality of data reported?	GoN	High	Implementation: Nationwide (cross-sectional) NMEP to cascade M & E to develop monitoring tool
	2. Do the provision of advocacy, specific data capturing tools and training improve routine data reporting from secondary and tertiary health facilities through HMIS/DHIS?	GoN, PMI, Global Fund	High	Implementation: Zone level (one state /zone) then later cascade to other states. FMoH/NMEP to cascade. Monitoring: NMEP
	3. How will increased mentoring on data demand and use at HF & LGA levels affect the quality of data?	GoN, Global Fund	Medium	Implementation: FMoH/NMEP. Sample some HFs and LGA Role: NMEP to integrate
	4. How will integrated and structured reporting system improve malaria surveillance in Nigeria?	GoN, WHO, Global Fund, PMI	High	Implementation and cascading: NMEP/WHO/CHAI Management and coordination: NMEP/WHO

	5. What are the current burden estimates of malaria in pregnancy, in under-five children and infants in Nigeria?	GoN, All partners	High	Figures currently quoted are out dated. Burden refers to morbidity and mortality
	6. Can advocacy and establishment of basket funding improve malaria surveillance in Nigeria?	GoN	High	Implementation: NMEP/WHO. Selected states, then cascade to others Role: NMEP to initiate and monitor
	7. Refresher training: On-the-job versus classroom training; which is more effective in capacity building of M&E officers?	GoN, WHO	Medium	Implementation: GON/DFID Role: NMEP M&E: NMEP
	8. Pilot study: compliance of M&E officers on accurate facility data entry on the DHIS. Will the use of specific state officers checking and monitoring data entry ensure good data quality?	GoN, PMI, Global Fund, NFELTP	High	Implementation: Zone level (one state /zone) then later cascade to other state. This should be simultaneous with 7 above. FMoH/NMEP to cascade. Monitoring: NMEP
	9. What are the methods used to monitor malaria burden and trends across populations? Compare these methods using criteria such as effectiveness, sustainability and cost.	GoN, Global Fund, PMI	High	Implementation: Firm out to consultant for implementation (meta-analysis) Role: NMEP Monitoring: NMEP
	10. Can the use of new approaches (e.g. cohort register) for pregnant women attending ANC be used in the collection of data on IPTp?	GoN, Global Fund, PMI	High	Compare HFs with cohort registers with HFs without cohort registers
	11. What are the economic impacts of malaria control in Nigeria?	GoN, Global Fund, PMI	High	Implementation: Firm out to consultant for implementation (meta-analysis) Role: NMEP Monitoring: NMEP
Program management & Resource mobilization				

Coordination	1. How would an effective and efficient public private-partnership unit in NMEP help improve fund drive towards programme implementation across the country?	NMEP, FMOH, Global Fund	High	
	2. What would the State programme managers need to do in order to engage researchers better and vice-versa?	Global Fund, NMEP	Medium	
	3. How can coordination process in malaria operations research (OR) be improved?	PMI	Medium	Lessons for future progress
	4. What implementation, feedback and dissemination mechanisms can be adopted to improve interactions between malaria stakeholders (partners, researchers, programme managers, as well as policy makers)?	NMEP	High	The outcome will help strengthen the link between the research community and the programme
Policy	1. What enabling and constraining factors exist in the translation of malaria research findings/evidence into strategies, policies and practice in Nigeria?	PMI, Global Fund, GoN	High	
	2. What is the political - economy of policy and decision-making for malaria OR and control in Nigeria?	GoN, PMI, WHO	High	
	3. Which key research groups, organization and individuals are involved in malaria research and how can their strengths be harmonized?	WHO, UNICEF, NMEP	Medium	Desk review
	4. What is the cost-effectiveness of different organizational models for malaria control at sub-national levels?	NMEP, PMI, CRS, Global Fund	High	
Funding				
	1. How can we make more efficient use of available resources for malaria control in Nigeria?	NMEP, SMEP, Global Fund	High	Desk review

	2. What accountability and leadership mechanisms exist for malaria control in Nigeria and how can they be strengthened?	GoN, NMEP, BMGF	High	
	3. What is the existing donor landscape for malaria control and research in Nigeria and how can it be effectively harmonized towards UHC of malaria control in Nigeria	PMI, DfID, Foundations, Global Fund	High	Partners' profiling and research output
	4. What financing and capacity development systems are required to promote malaria OR in Nigeria?	BMGF, USAID, Global Fund, NMEP	High	
	5. What are the available community resources that can be harnessed /utilized for sustainable malaria intervention?	USAID, Private sector	High	

Annex 1: Attendance of stakeholders' workshop on operations research held at Barcelona hotel on the 8th and 9th of February 2017; participants list from universities/ research institutes

S/N	NAME	DESIGNATION	INSTITUTION
1	Dr A. A Abubakar	Senior Lecturer	ABU Zaria
2	Dr. Catherine Adegoke	Consultant PSM	Independent Consultant
3	Nwangwu Udoka	Entomologist/ Researcher	NAVRC, Enugu
4	Prof. Nwansat Georgina	Professor	UNI JOS
5	Prof. C. A. Nwauche	Professor	UNI PORT
6	Emmanuel Ezedinachi	Professor	UNICAL
7	Prof. Abba Umar	Professor	UNIMAID
8	Dr. M.D. Dairo	Senior Lecturer	NFELTP
9	Dr. Segun Bello	Lecturer	University of Ibadan
10	Prof. Catherine Falade	Professor	University of Ibadan
11	Jegede Ayodele	Professor	University of Ibadan
12	Ughasoro M.D	Lecturer	UNN
13	Osuagwu C.S	Lecturer	UNILAG
14	Dr.Yayo A.M	Principal Investigator	BUK
15	Prof. Abdulrazaq G. Habib	Professor	BUK
16	Dr. Ananaba	Managing partner	HCSL
17	Dr. Emem Basse	Senior Lecturer	UUTH, UYO
18	Prof. Stephen Oguche	Principal Investigator	UNI JOS
19	Dr. Adeogun Dapo	Research Fellow	NIMR Lagos
20	Dr. Olapeju Otsemobor	Researcher	Wajomate Consulting
21	Prof. Obinna Onwunjekwe	Researcher	UNN
22	Prof Rich E Umeh	Researcher	UNN
23	Prof. O.A Mokuolu	Professor / Researcher	University of Ilorin
24	Dr. IkeOluwapo O. Ajayi	Reader/Malaria Epidemiologist	University of Ibadan

Annex 2: Stakeholder_workshop on operations research held at Barcelona hotel on the 8th and 9th of February 2017; participants list for state programme managers

S/N	NAME	DESIGNATION	STATE
1	Obazele Blessing O.	SMEP Manager	EDO
2	Uja Uzoamaka	SMEP Manager	Abia
3	Adeyinka S. Olamide	SMEP Manager	Ogun
4	Umar Babuga Abubakar	SMEP Manager	Bauchi
5	Christopher Bewa	SMEP Manager	Plateau
6	Yusuf Mohhamed	SMEP Manager	Kaduna
7	Nwankwo L. O	SMEP Manager	Ebonyi
8	Dr. O. Adeyemi	SMEP Manager	FCT
9	Dr.A. Osinowo	SMEP Manager	Lagos
10	Mala A Waziri	SMEP Manager	Borno
11	Munira M. Ismail	SMEP Manager	Zamfara
12	Dr. Iwara Iwara	SMEP Manager	Cross River

Annex 3: Stakeholders workshop on operations research held at Barcelona hotel on the 8th and 9th of February 2017; participants list for partners

S/N	NAME	DESIGNATION	INSTITUTION
1	Geoffrey Namara	Malaria Surveillance Officer	WHO
2	Oluwaseun Odeyinka	Research Fellow	UI
3	Al-mukhtar Yahuza A.	WAIDI Fellow	WAIDI
4	Ikeoluwapo O. Ajayi	Malaria Epidemiologist	U.I/ Nfeltp
5	Salami. S. Kunle	Nfeltp Graduate	AFENET
6	Olusola Adeoye	SMEO	ARFH
7	Modasola Balogun	WAIDI Res Officer	WAIDI
8	Emmanuel Obi	T-Regional/ M&E	TH
9	Ndukwe Ukoha	Malaria	HSDF
10	Prof. F.T Ogunsola	WAIDI AA	Coll. of Medicine, Univ of Lagos
11	Iorwa Apera	WAIDI	WAIDI
12	Olubumi Titi-Ejinaka	Prog. A.A	PMI
13	Abidemi Okechukwu	Prog. Mgr	PMI
14	Babalola Obafemi	Graduate	Nfeltp/ AFENET
15	Chinwe Obi	M&E Advisor	HC3
16	Olusola Oresanya	Country Technical Coordinator	MC
17	Olufemi Ajumobi	AFENET Field Coordinator	AFENET
18	Omaiye Benson	Administrator	AFENET
19	Onasanya Oluwatosin	Resident	Nfeltp
20	Udeh Sylvester	Resident	Nfeltp
21	Akar Stephen	Resident	Nfeltp
22	Obagha Chijoke	Resident	Nfeltp
23	Jeremiah Daikwo	Resident	Nfeltp
24	Ogbonnaya I.O	Resident	Nfeltp
25	Alinu Mamman Nauzo	Resident	Nfeltp
26	Aliyu Muhammed Sabiu	Resident	Nfeltp
27	Godwin Ettl	Resident	Nfeltp
28	Dahiru Shafiu Gumel	Resident	Nfeltp

29	Akubue A.U	NPO	WHO
30	Yemisi Ishola	M&E	SFH
31	Dr Chimah U. C	Director public Health	MOD
32	Chinazo Ujuju	M&E Manager	SFH
33	Prof E.C. Ejiogu	Partner	MIRAI DENCH INC
34	Lynda Ozor	NPO	WHO

Annex 4: Stakeholders workshop on operations research held at Barcelona hotel on the 8th and 9th of February 2017; Participants list for NMEP/FMOH

S/N	NAME	DESIGNATION	INSTITUTION
1	Dr Evelyn Ngige	DPH	FMOH
2	Dr Bala M Audu	NC	NMEP
3	Dr. Uhomoibhi Perpetua	Dir /M&E	NMEP
4	Okoh O. Festus	DD/OR/M&E	NMEP
5	Adewumi Agbomola	Database Officer	NMEP
6	Mukhtar Ibrahim	Database Officer	NMEP
7	Dr. Shekarau Emmanuel	SMO/ CM	NMEP
8	Dr. Ibrahim Maikore	SMO/SDM	NMEP
9	Brooks.G. A	DD/ R&KM	DPRS/ FOMH
10	Itohowo Uko	H/ACSM	NMEP
11	Dr. Ntadom Godwin	H/CM	NMEP
12	Dr Akpan N	H/PM	NMEP
13	Ashiru Mujidat	MLT/M&E	NMEP
14	Dr. Omokore Oluseyi Amos	SMO/ FH	FMOH
15	Ahmed A. Kyari	SOI/ M&E	NMEP
16	Udeh I. Confidence	SAO/M&E	NMEP
17	Dr Ibanga Ekong	STA GF	NMEP
18	Omo Eboh M	PSO	NMEP
19	Onochie Nnenna	M&E officer	NMEP
20	Nneka Ndubuisi	CEHO	NMEP
21	Dr Taiwo Orimogunje	MO/M&E	NMEP
22	Musa Danjuma Zakari	SO/PM	NMEP
23	Ezechukwu Adaolisa	SMLS/ACSM	NMEP
24	Abdulahi Ahmadu	Driver M&E	NMEP
25	Mohammed Ahmed	Driver NC	NMEP

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