



**Qualitative research on
the development of and
access to innovations in
the fight against malaria
in Nigeria**

Final Report 30 October 2020

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Qualitative Research on the Development of and Access to Innovation in the Fight against Malaria in Nigeria

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1. Executive summary

Progress in malaria control has plateaued in recent years and finding new approaches to accelerate elimination is more important now than ever before. Innovative tools and approaches to implementation that ensure access to effective malaria tools are desperately needed. To date, voices from countries where malaria is endemic are often drowned out by donors and global bodies in global decision-making processes for innovation related to the disease. For malaria control to succeed, innovation is not only needed for commodities (treatment options, diagnostics, vaccines and vector control) but also in the financing and delivery of commodities to beneficiaries, surveillance approaches to better track and target interventions, and behaviour change approaches that match local contexts to ensure the uptake of effective interventions and maximize impact.

In August 2020, a comprehensive assessment of Nigerian perspectives on how to accelerate progress in the development and scaling up of innovation was conducted, consisting of an online survey and interviews with key informants. Half of the survey respondents were from government (26 per cent State Malaria Elimination Programme (SMEP), 14 per cent National Malaria Elimination Programme (NMEP), 8 per cent Federal Ministry of Health and 1 per cent regulatory). A third were from Civil Society Organizations (CSOs). The remainder were involved in research (15 per cent), were donors (5 per cent) or came from the private sector (2 per cent). In terms of the key informants, a third were from CSOs, a quarter from government (10 per cent from the Ministry of Health, 10 per cent from NMEP, 3 per cent from SMEP and 1 per cent regulatory), 20 per cent were involved in research, 4 per cent came from the private sector and 3 per cent were donors. The majority (95 per cent) of respondents focused on interventions as opposed to products.

Key findings from the study:

Increasing the funding and coverage of current interventions before prioritizing new products or interventions

- Only about half of respondents felt that the country was on track to eliminate malaria. Respondents felt that since gaps remain in coverage, more effort and funding are required – particularly through domestic government commitments – to achieve targets and drive down transmission. The majority (70 per cent) of respondents felt current tools were not sufficiently scaled up to ensure impact. Participants were generally more focused on the barriers to implementing existing programmes with existing tools and much less concerned about specific barriers to innovation. Overall, there was a consensus that the immediate focus over the coming years should be on increasing the funding and coverage of current interventions as contained in the current national malaria strategic plan before prioritizing new products or interventions.

Innovation to make current interventions more effective should however be considered

- There was further agreement that current interventions could benefit from some specific innovations to increase coverage and effectiveness and that any ways to overcome the barriers to existing programmes and tools will also benefit more substantial innovations in the future. In particular, the need to strengthen both demand generation and the use of data for decision-making. Respondents made recommendations they felt would improve access to innovative tools. Recommendations were largely (78 per cent) in line with existing interventions in the National Strategic Plan for Malaria 2014–2020, and focused on improving access to current tools, which were still regarded as innovative. The responses are summarized below. making related to existing interventions and tools were prominently cited as significant gaps. Respondents also shared details of some current promising initiatives to address these gaps:
- Demand generation – Many respondents focused on the need to strengthen individual malaria prevention and case management behaviour, citing the role of advocacy, communication and social mobilization (ACSM). There was a general impression that efforts had been effective but that more work is needed in terms of community engagement, improving behaviour and better tailoring outreach to target groups. Leveraging new technology and social media was also perceived as important going forward. Several respondents mentioned the Community Health Influencers, Promoters and Services (CHIPS) programme, initiated by the National Primary Health Care Agency to ensure there are trained community health workers able to provide a platform for the integrated community case management of malaria, pneumonia and diarrhoea.
- Use of data for decision-making – The National Malaria Data Repository was mentioned many times, together with other linked databases, as a crucial innovation. It triangulates routine and non-routine data from several sources, including the health management and logistics information systems, and was said to have contributed to reductions in stockouts. Respondents noted that feedback sessions with ward and local government personnel have led to improvements in local decision-making. They are able to follow up on flagged health facilities. More ways to integrate community-generated data into the system are needed. Likewise, the integration of private-sector data, is a significant gap, notably for case management.

Missed opportunities because of the verticalization of programmes

- A number of participants stated that the verticalization of disease programmes partly explained (i) the lack of domestic ownership and leadership and ii) the sub-optimal coverage rates of key interventions currently obtained. Integrated service delivery for health-facility based interventions like malaria in pregnancy and case management under a universal access agenda would likely lead to more effective use of resources and facilitate innovation.

Innovations are driven by the agenda of donors

- Respondents noted that funding, primarily via donor agencies, was the primary determinant of the type of commodities/interventions deployed and the scale at which these were made available throughout Nigeria. Donor voices were perceived as dominant in discussions to set the research agenda, alongside a lack of coordination across research institutions and insufficient political will and research governance and infrastructure to develop indigenous ideas and products. Respondents noted that sulfadoxine/pyrimethamine is produced locally and registered by the National Agency for Food and Drug Administration (NAFDAC). However, it is not yet WHO prequalified and donors insist that their funds be used only for WHO-prequalified products – with only one manufacturer at present.

Regulatory processes were felt to be a potential deterrent to innovation

- While many improvements were noted with NAFDAC registration processes, notably through the new online platform, several respondents stated that processes remained complex and long and that this has deterred some suppliers from pursuing or completing registration. Barriers were noted for the registration of both indigenous products and foreign products that could bring innovation in Nigeria.

A more enabling fiscal environment could encourage innovation

- Respondents suggested that tax incentives, including tax breaks, tax holidays, waivers for import duties on certain raw materials and pioneer status, could be used to reduce the fiscal burden and foster innovation.

Market forces were felt to be unfavourable for local production

- While respondents felt that the country's capacity was strong, they cited the lack of political commitment, the lack of an enabling environment, the difficulty and cost of accessing raw materials, and the high cost and uncertainty surrounding the availability of infrastructure (e.g. electricity) as major barriers to the competitive local production of malaria commodities.

Respondents made recommendations they felt would improve access to innovative tools. Recommendations were largely (78 per cent) in line with existing interventions in the National Strategic Plan for Malaria 2014–2020, and focused on improving access to current tools, which were still regarded as innovative. The responses are summarized below.

- While new tools may prove helpful, the priority is expanding services to reach target levels of coverage of long-lasting insecticidal nets, rapid diagnostic tests, artemisinin combination therapy, intermittent preventive treatment in pregnancy and seasonal malaria chemoprevention in targeted areas and ensuring all states are covered and supported.
- Continue to expand the use of local data via the health management information system (HMIS) and national malaria data repository, and ensure that data is aggregated in a meaningful way to make changes at each level of decision-making, with a particular focus on real-time dashboards and/or systems that empower health facilities to view and take action on their own data and that encourage improved data submission. Consider competition on malaria indicators between states, local government areas and wards.
- Ensure that access to insecticide-treated mosquito nets is achieved and maintained through the combination of large-scale campaigns and continuous distribution channels, such as school and community distribution.
- Incentivize rapid diagnostic testing and case reporting for state and national databases for private-sector health facilities. This could be done through registration renewal processes or other incentives.
- Treat malaria like COVID-19: galvanize a broad response, make data more widely available and expand integrated messaging across different platforms.
- Incentivize health workers to remain in rural areas to improve their distribution across the country.
- Significant support is needed to make local production competitive with manufacturing based in Asia, such as pioneer status, tax holidays, tax breaks for local production and technology transfers. However, these are unlikely to be sufficient in the absence of improved infrastructure. Regulatory processes should continue to be improved, and the potential of regional-level approvals/reciprocity should be explored further.
- Support community-directed interventions that make access to services and commodities easier for beneficiaries.
- Increase funding for malaria control from domestic sources.

2. Introduction

2.1 Research purpose and questions

Progress in malaria control has plateaued in recent years and finding new approaches to accelerating elimination is more important than ever before. While researchers develop innovative approaches to malaria vector control, diagnosis, vaccines and case management, translating this research into the uptake of innovation at the country and community levels is a complex and delicate process that involves a range of stakeholders, including national officials from ministries, regulatory bodies, local research institutions, community structures and the beneficiaries themselves. Stakeholders contribute a wide range of perspectives on innovation, from skepticism to early adoption. To date, voices from countries where malaria is endemic are often drowned out by donors and global bodies in global decision-making processes for innovation related to the disease. However, it is ultimately the countries themselves that adopt and scale up innovative approaches and that are best placed to advise on best practices, research bottlenecks, financing considerations, political and regulatory red tape, the scaling up of processes and the suitability of interventions for the local context.

It is in this context that the RBM Partnership Advocacy and Resource Mobilization Partner Committee has commissioned this research, with the aim of gathering country-level perspectives to inform global discussions on how to best accelerate progress in developing and scaling up innovations to fight malaria in countries where the disease is endemic. This report provides a synthesis of a comprehensive assessment of viewpoints from Nigeria, including perspectives from both the public and private sectors, since both are vital to success in the fight against malaria.



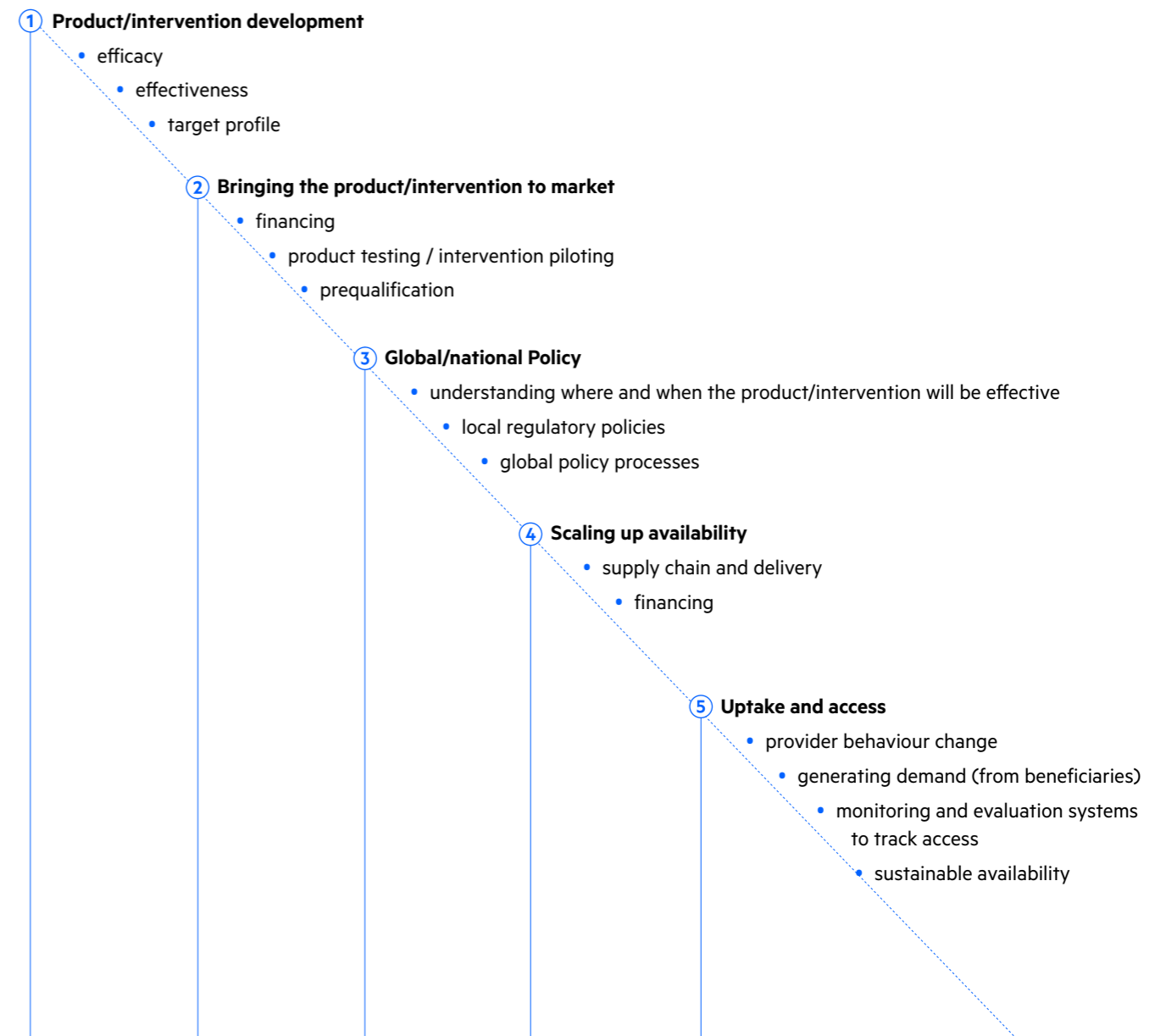
Photography by © Maggie Hallahan

2.2 Research scope

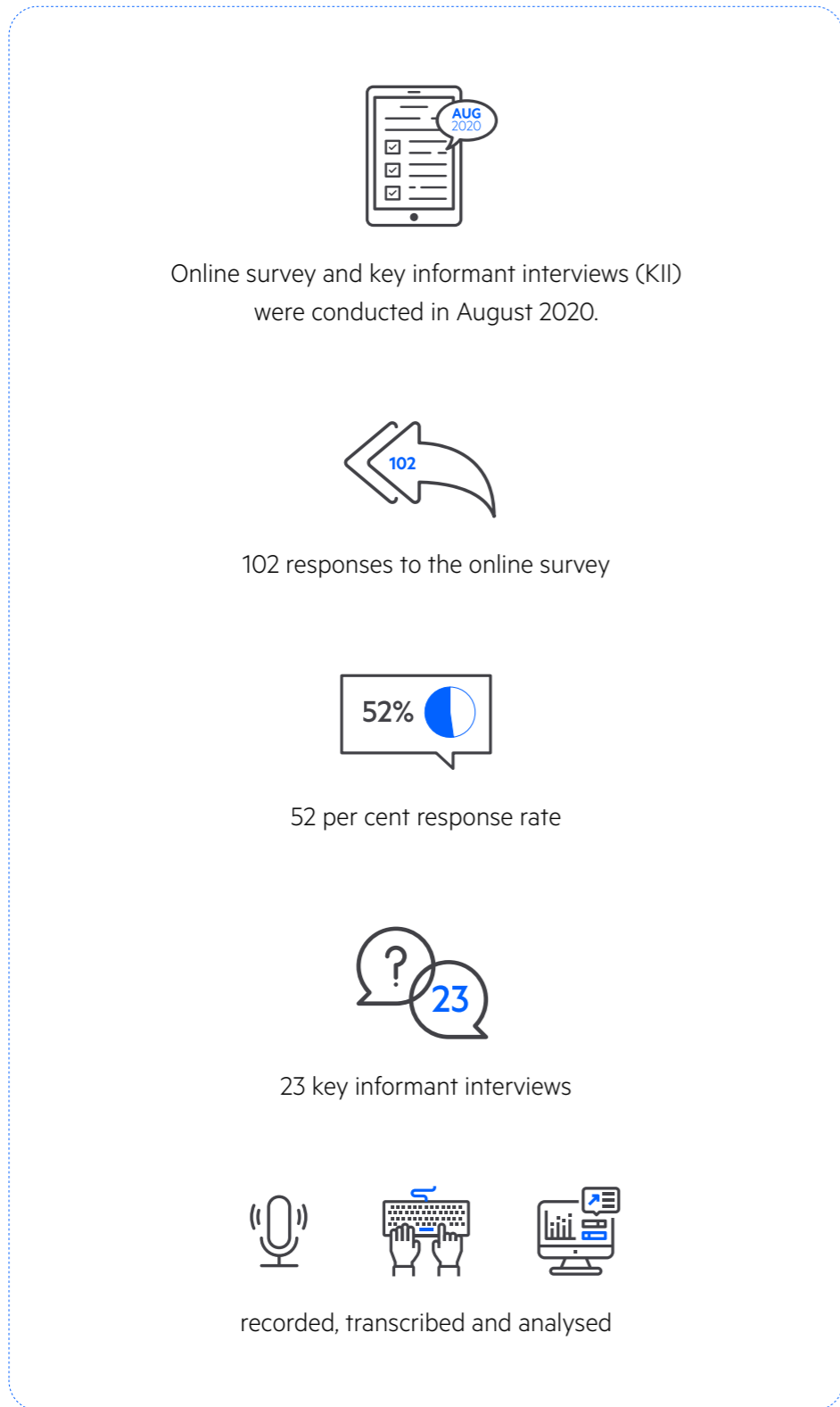
For malaria control to succeed, innovation is not only needed in commodities (treatment options, diagnosis, vaccines and vector control) but also in the financing and delivery of commodities to beneficiaries, surveillance approaches to better track and target interventions, and approaches for the generation of demand that match local contexts to ensure the uptake of effective interventions and maximize impact.

Insofar as possible, for each of these interventions, the research used the innovation development to access process in [Figure 1](#) as a framework to situate the key successes and bottlenecks on the path from the development of products/interventions to uptake and access.

Figure 1: Innovation process: development to access



3. Methodology



A full description of the methods is provided in [Annex A](#).

4. Results: respondent demographics

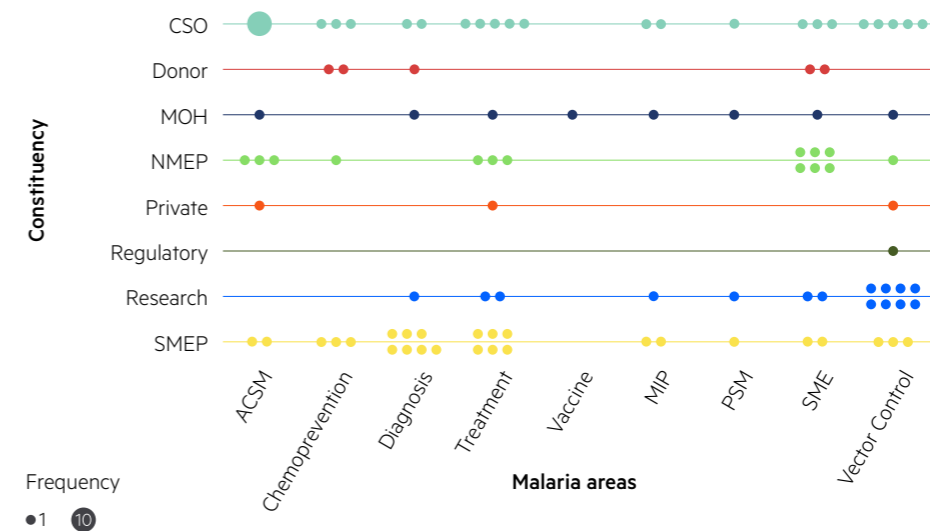
Eight constituencies were represented among the online survey respondents. Half of the 102 participants were from government (26 per cent State Malaria Elimination Programme (SMEP), 14 per cent National Malaria Elimination Programme (NMEP), 8 per cent Federal Ministry of Health, 1 per cent regulatory); a third were from Civil Society Organizations (CSOs); and the remainder were involved in research (15 per cent), donors (5 per cent) or came from the private sector (2 per cent).

In terms of the key informants, a third came from CSOs, a quarter from government (10 per cent Federal Ministry of Health, 10 per cent NMEP, 3 per cent SMEP, 1 per cent regulatory), 20 per cent were involved in research, 4 per cent came from the private sector and 3 per cent were donors.

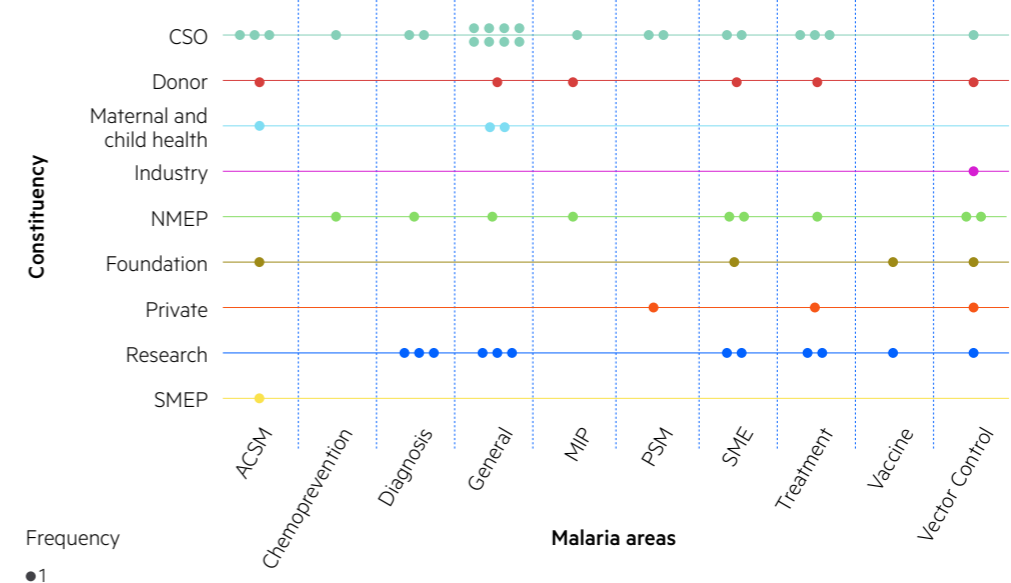
Among online respondents, 20 per cent were focused on vector control, 18 per cent on treatment, 16 per cent on advocacy, communication and social mobilization (ACSM), 15 per cent on surveillance, monitoring and evaluation (SME), and the remainder (11 per cent) on diagnosis, chemoprevention, malaria in pregnancy (MIP), procurement and supply management (PSM). In the key informant interviews informants could select a “general” category (24 per cent of respondents). Vector control, SME and treatment were selected by 12 per cent, followed by ACSM (11 per cent), diagnosis (10 per cent), and PSM, MIP, vaccine and chemoprevention (less than 5 per cent).

Figure 2: Composition of online and key informant interview groups by constituency and malaria area

Survey respondents constituency and malaria area matrix

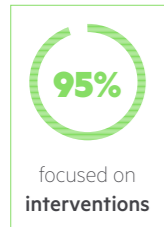


Key informant interview constituency and malaria area matrix



5. Results: innovation process

5.1 Product/intervention development



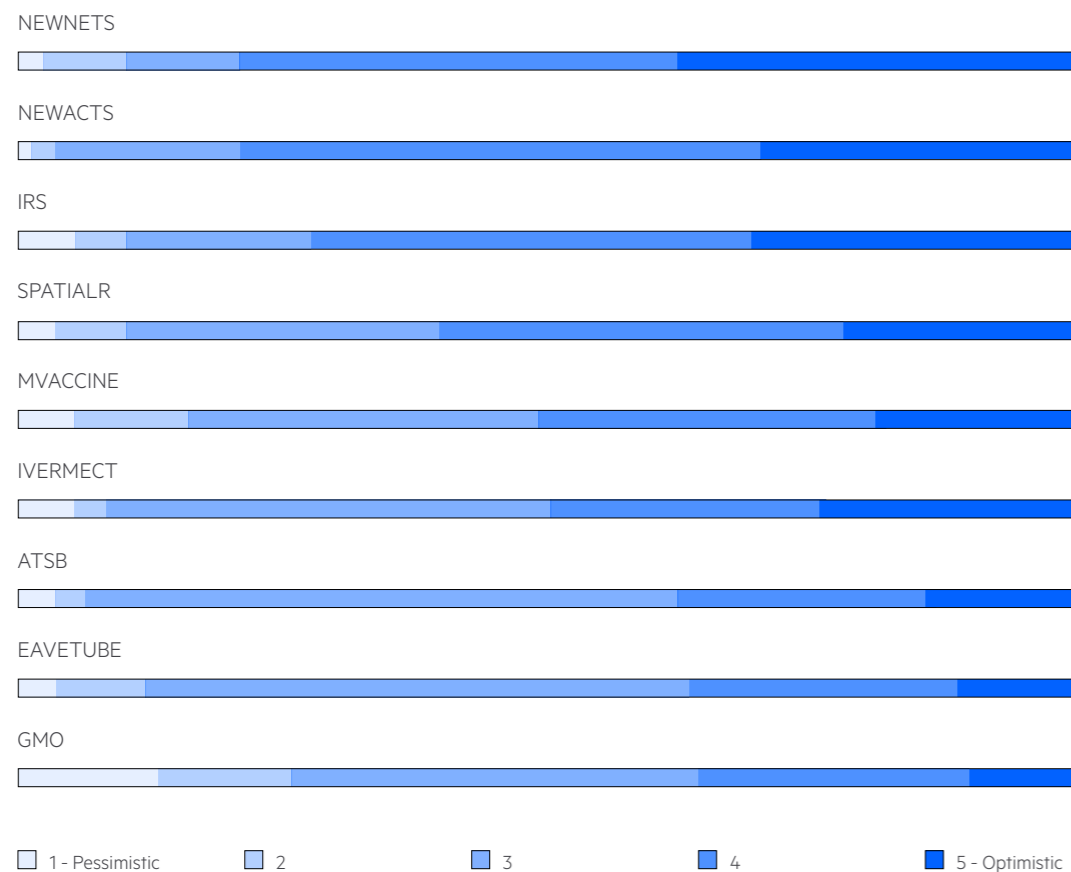
A majority of the stakeholders consulted focused their contributions to this research on interventions, with only 5 per cent referring to product development.

Funding for research into product development, particularly within Nigerian institutions, was cited as the main barrier by respondents. Respondents noted that universities and research institutions are generally poorly funded, contributing to brain drain. Some respondents felt support was lacking to strengthen research institutions as a whole and that researchers were too often engaged on an individual basis to the detriment of forging institutional relationships that would bolster sustainability.

Donor and external voices were perceived as dominant in discussions for setting the research agenda. Respondents also cited poor coordination across research institutions and insufficient political will, research governance and infrastructure to develop indigenous products.

Figure 3: Perspectives on new tools

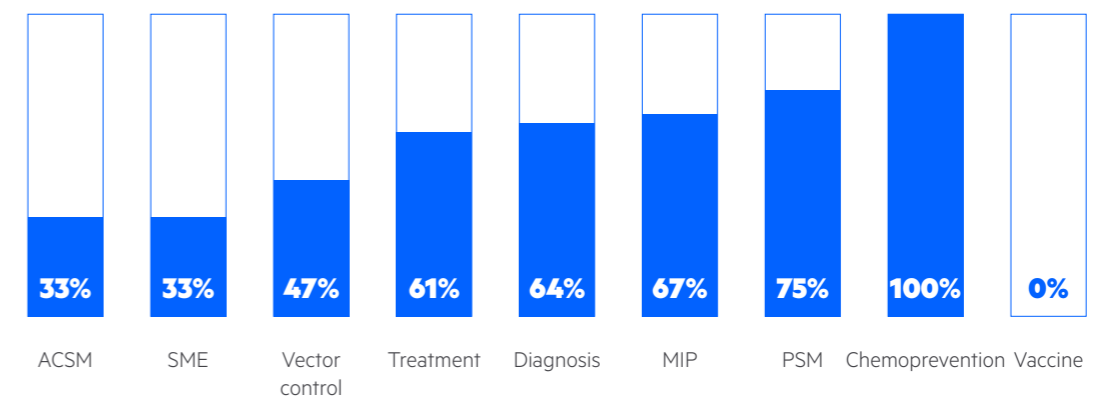
Optimism about new tools



On the product side, respondents in the online survey were asked about their level of optimism for the development and effectiveness of new tools, shown below. New tools included new types of insecticide-treated nets (ITNs), new artemisinin combination therapy (ACT) formulations, new indoor residual spraying (IRS) formulations, spatial repellents, malaria vaccines, ivermectin, attractive toxic sugar baits, eave tubes and genetically modified mosquitoes. Optimism was highest for tools whose deployment had already been widely discussed, such as new net types, new ACT formulations and new insecticides for IRS.

On the intervention side, respondents were asked whether current interventions were well adapted to end users, with responses varying by intervention. Chemoprevention and procurement/supply management were felt to be very well adapted. MIP, diagnosis and treatment interventions were felt to be fairly well adapted to end users. Vector control, SME and ACSM were largely felt to be not well adapted to end users. Vaccines were not considered well adapted, as the malaria vaccine is not available in Nigeria and is only being piloted in Ghana, Kenya and Malawi at present. Respondents noted that nets were not used consistently, particularly in urban areas, where people prefer other types of mosquito control products, and that insufficient quantities of nets were distributed to fully cover households. SME responses focused on the need to increase data entry at the facility level, as well as factors such as information sharing, cumbersome paper-based tools and poor adherence to rapid diagnostic test (RDT) results. For ACSM, respondents noted a lack of sustainability in approaches, poor targeting of messages, variable quality of message design and implementation across implementers, and the limited capacity at the state and local government levels to monitor and structure ACSM activities.

Figure 4: Are interventions well-adapted to end users?



While many respondents felt the current sets of tools were working well, they expressed a desire for tools that required less effort from users, particularly for vector control. Interventions that made health care providers' jobs easier was also a recurring theme, whether it was the process for seeing and treating clients or the process for managing and using data.

Several researchers felt that research on indigenous and natural products needed additional funding, for both antimalarials and pesticides. The traditional drug centre within the Nigerian Institute of Medical Research was reported to be working on toxicity studies for commercially available medicines that have no safety record or clinical trials. Several respondents felt that new active ingredients derived from local herbs should be looked at more closely in drug development pipelines. However, the main proponents were generally not actively involved in drug discovery research. There was a sense that it would be ideal if plants native to Nigeria could offer effective compounds for malaria treatment, repellents, etc., as this might facilitate local production and domestic contributions to the fight against malaria. However, respondents were generally not experts in the complexities of setting up drug discovery pipelines. Lessons learned from establishing such laboratories elsewhere in sub-Saharan Africa, such as the Holistic Drug Discovery and Development (H3D) centre in South Africa may be useful for Nigerian policymakers wishing to move this forward.

5.2 Bringing products/interventions to market

Respondents noted several barriers to bringing products and interventions to market. Lack of funding – or limited pilot funding without scaling up – was mentioned for vector control tools and case management approaches. The WHO prequalification process was felt to be slow, particularly the gathering of evaluation data for new interventions.

“If there is anything WHO can do at their level to speed up – it seems as if they don’t want to – or maybe there’s a point to what they are doing, controlling the speed of regulation so the space does not become too crowded”

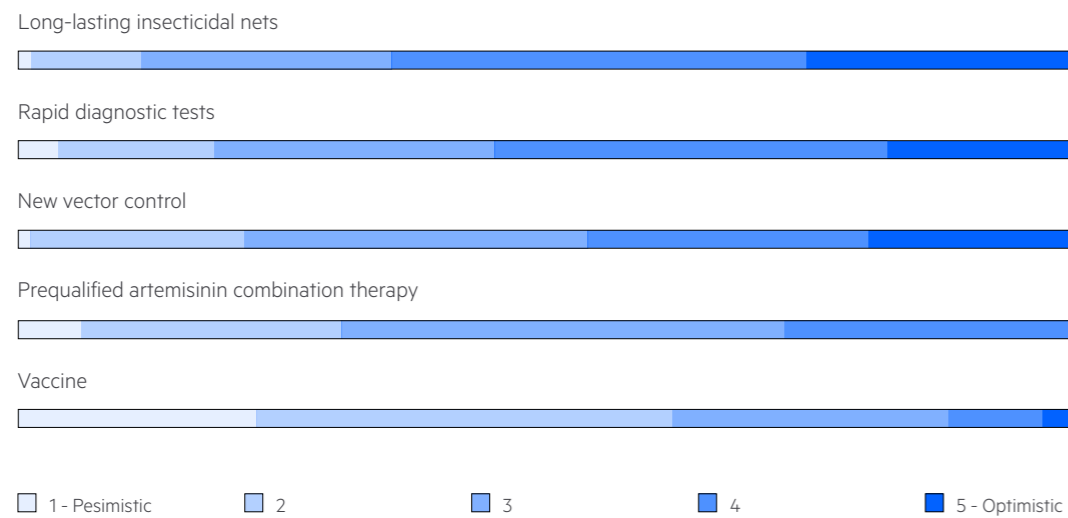
– Industry

Market forces were felt not to favour local production. While respondents felt that capacity in the country was strong, they cited the absence of political commitment, the lack of an enabling environment, the difficulty and cost of accessing raw materials, and the high cost and uncertainty surrounding the availability of electricity and water as major barriers.

“Local production is feasible for [nets, drugs, RDTs and new vector control tools], as there are existing local industries with the capacities needed to produce these products. The gap is having adequate WHO certification in the laboratories, which may be costly and the companies may not have the financial capacity to meet the requirements. However, financing from government and external partners could also be used to make the companies obtain the required certifications.” – NMEP

Figure 5: Perspectives on the feasibility of local production

Feasibility of local production



The main barriers for ITNs were the high cost of locally producing nets due to infrastructure and regulatory approval processes, alongside the unwillingness of donors to pay premiums for locally produced nets. Import duties and taxes on raw materials also created cost barriers, unless the Government was willing to provide waivers for these to benefit local producers.

Local production would require frequent monitoring and post-market surveillance to “ensure the standard of the products is not compromised”, remarked one SMEP official.

“I don’t know of any product for which we can say that everything was clearly manufactured in Nigeria. It is all just partial production, which is not bad in itself, but we need to move to the next level of producing everything in Nigeria. And that’s another area in which, I think, at the Government level, we need to do more. As a private company, we have tried to do our bit by starting the local production of LLINs [long-lasting insecticidal nets] in Nigeria, but because of all the associated risk, we decided to start with the compressing and bagging part of the project, because when you look at the other part, which is producing the yarn, making it into polyester and then making it into the material for the LLIN, we realized that its actually capital intensive. And unfortunately, the pricing of LLINs is regulated by the donors. This means that if you produce everything in Nigeria, from the cutting to making it into yarns and producing the final product, the pricing is usually more expensive than LLINs made in Asia and all the rest. Maybe government can encourage manufacturers to come into the field to invest more. But for you to invest more, you also need to give a lot of waivers so that your price still remains competitive because the truth is, the donors still don’t care. You’ve already submitted a price range and they won’t consider anything outside of that, unless they are going to give you a waiver, and that will only maybe be for a small quantity that you can produce, like what we are doing at the moment.” – Industry

For drugs, several respondents noted the high costs of local production due to underdeveloped infrastructure. The costs of obtaining WHO prequalification for antimalarials, certifying factories to international quality standards and conducting bioequivalence studies (which were seen as having to be done outside Nigeria) pose significant barriers for most local manufacturers. However, a handful of companies were reportedly working on these. Recommendations included providing financial support for certification and research capacity and for the National Agency for Food and Drug Administration (NAFDAC) to expand the number of drug trial centres to facilitate the process.

“Local production is not feasible if the current international politics of health is not addressed: WHO prequalification and the enabling environment from government through taxation, import duty exemption certificates, waivers for importing raw materials etc. However, it becomes feasible if international players support local production and rally round the pharmaceutical companies.” – Regulatory

“Nigeria has a vibrant drug production system, with local companies that have capacity to manufacture medicines. However, this is where it ends, as the capacity for manufacturing other products has not been the core focus for decades. We have relied more on imports because donors import these products all the time. Local manufacturers have not seen the demand for these other products and have not put their money into them.” – CSO

“It’s one thing to produce something, it’s another thing to market it. And it’s something else to have the structure for that product to undergo all the rigorous approvals before it becomes an integral part of policy. As of today, [the urine malaria] test is yet to be evaluated officially by WHO. There is no official statement to really guide its programmatic deployment. As a test itself, there are publications and it’s already out there for people” – NMEP

A few respondents noted that since sulfadoxine/pyrimethamine is produced in Nigeria, there is a Government policy that prevents it being imported. However, WHO insists that Nigeria use quality-assured sulfadoxine-pyrimethamine, which is only available from a single WHO-prequalified company in China. As a result, there are several processes required to obtain the full requirement of sulfadoxine-pyrimethamine for programmes. The goal of the government policy on sulfadoxine-pyrimethamine is to build the capacity of Nigerian pharmaceutical companies to produce high quality drugs. However, this has required government bailouts and other forms of support. There are also barriers to entering the market for foreign companies: a Chinese company that also intended to register their brand of sulfadoxine-pyrimethamine in Nigeria reportedly ran into challenges with NAFDAC and withdrew their registration.

Malaria vaccine production was felt to be even less feasible than other commodities. Respondents cited the uncertainty regarding the efficacy of the RTS,S vaccine and a lack of direct knowledge of the details of the vaccine and vaccine production, given it has not been piloted in Nigeria.

5.3 Global/national policy

5.3.1 Perspectives on donors and WHO



The majority of respondents felt generally positively towards felt positive about the contributions of donors and WHO, citing their technical guidance, and the impact of the funding for malaria interventions. However, respondents also noted an overemphasis on “one-size-fits-all” approaches, a lack of focus on communities and local solutions, and the slow process for approving new tools through both WHO policy channels and local regulatory agencies. As noted already above, respondents cited the requirement to procure prequalified products and a corresponding inability to certify, produce, and promote locally produced commodities such as like long-lasting insecticidal nets (LLINs) and ACTs.



“In recent times the emphasis on value for money makes countries to work from money to interventions and not from ideas to money. The latter path was how current solutions were developed.” – Researcher

“Although the donors allow countries to develop the programme so it is feasible and reasonable before approval, the often-overbearing [donor] control hardly allows for creativity, innovation, and emerging realities during implementation.” – CSO

“Donors are guided by standard strategies and may be limited when it comes to adopting local approaches. Reviewers from the donors and global partners sometimes do not have experience of local context and may be prescriptive.” – Donor

Some respondents noted that it is not necessarily the responsibility of WHO to innovate, but rather to provide normative guidance on interventions and products that are safe, effective, and proven.

“WHO have not been a critical facilitator of innovations. They give an it gives authenticity when the product comes out, but they're not really a primary facilitator.” – NMEP

The role of donors and government in decisions to implement integrated programmes versus vertical ones was also highlighted several times as a barrier. Respondents contrasted the desire for accountability within a vertical programme with perceived cost savings and the benefits to clients from integrated approaches. Respondents also expressed doubt that movements towards integration had the full support of donors. It was felt that reporting metrics and accountability systems favoured vertical programmes, despite the potential efficiencies and advantages of integrated services.

“Donors supporting malaria control in Nigeria actually say so many things that they don't mean. Donors in Nigeria talk about integration. But they actually only just say it. They promote verticalization. Donors in Nigeria talk about technology transfer. They only say it, they don't mean it. Donors in Nigeria talk about use of local technology and technology transfer. Most times they say it, they don't mean it. And I say this as a patriot. I'm also guilty because I've worked for so long in the donor community. Most of the time the donors don't walk the talk. For me it's very disappointing. I wish I had the capacity to change the paradigm.” – Researcher

“Government needs to show commitment. It needs to be at the forefront. It can't leave the fight to eliminate malaria to be driven by donors. Government needs to put its money where its mouth belongs. It must think of effective things that can be done. Given that resources from government are dwindling, it may want to promote the vertical integration of services. The same woman attending a facility for malaria treatment is probably the same woman coming to an antenatal care clinic, the same woman coming for reproductive health care. So, if there's a way – and I know we're already doing that – but government needs to do much more to say that there's integration of services to ensure that we use resources optimally and people are better served.” – Donor

5.3.2 Perspectives on local regulatory processes



Overall, local regulatory processes were seen as having improved significantly in recent years, although NAFDAC was felt to be underfunded for its role. Respondents discussed the successful accelerated process of obtaining new ITNs, citing a series of waivers and approvals with NAFDAC and the Ministry of Finance to obtain quality exemption certificates and product waivers. The speed was attributed to a strong professional relationship between NMEP and the regulatory agency.

The NAFDAC online platform was cited several times as accelerating submissions and approval lead times, although the system still experiences bottlenecks if a certain approver is unavailable. Expanding online processes beyond import duty exemption certificates to other regulatory processes was recommended, where possible.

For drugs, however, there were more challenges. Drug samples have to be sent to South Africa, Senegal or Singapore, as Nigeria does not yet have a certified laboratory. An attempt to certify a laboratory in Lagos was reportedly blocked by NAFDAC.

“It's a major issue because they must know where the factory is, they must do preregistration. So we have visions where we are bringing in some generic drugs from India and they say no, we have to go through the registration process. And that registration is something on which I think we should be able to work with NAFDAC from the beginning, but they have become so stuck in their ways that they don't want to know about innovation. They don't know the difference between a private-sector importer of drugs and a donor importer of drugs. So they treat you the same way. They want you to go through the same process. And the process of getting a waiver is even longer. Last time, I had to fast track... I had to go to the Ministry of Finance, go to the tax office to pull out the code or whatever they used to register, before we could get our drugs in. While I was doing this, for two weeks the drugs were sitting in the rain” – CSO

There were reportedly ongoing efforts to introduce regional harmonization among regulators, in terms of regulatory reliance. If a product is approved in one country within the cooperating region, the dossier can be forwarded, and it can be fast-tracked for approval in another within the regional forum. Tax holidays for companies that generate patents are said to be somewhat common in the telecommunications and oil sectors but less so for pharmaceuticals. The importance of support for the accreditation of local facilities to support quality assurance processes was also highlighted.

“We were able to support the NAFDAC diagnostic laboratory to attain the ISO accreditation for diagnostics. The idea behind this is that for RDT kits you can monitor the quality, what you have out there, and you must have a certification like [...], which can give us a valid verdict as to the quality of such RDTs. I think that's a good example because the regulator is empowered. They can now also embark on post-market surveillance of those RDTs and can produce the reports on them and their findings as part of their surveillance activities. Such reports are usually distributed among stakeholders within the space, which include agencies like the Nigeria Malaria Elimination Program and the Federal Ministry of Health, including the suppliers of these RDTs.” – CSO

Many respondents expressed satisfaction with the NAFDAC programme that allows consumers of ACT to send a text message to a code on the packaging and receive confirmation on the registration and quality assurance of the drug. Respondents felt that this system could be more widely used by consumers and also expanded and applied to pesticides and other drugs, not only to confirm product status but potentially to help identify falsified products and facilitate follow-up actions with manufacturers or importers of unlicensed medicines and other products.

Overall, while the capacity and intention to produce locally was felt to be strong, several bottlenecks prevented the expansion of competitive, quality-assured local production.

“The capacity in terms of ability is there in the country. But in terms of infrastructure, there perhaps remains some challenges in capacity. People are working, they are working in different laboratories, but then it stops short. Either there is a secondary component that has to be handled overseas, patent challenges... all of these issues begin to come up. It's only now that I think federal government through the Central Bank of Nigeria is releasing some specific funds to support innovative ideas.” – NMEP

5.4 Scaling up availability

5.4.1 Supply chain

Respondents noted some innovations in the area of supply chain improvements, primarily the logistics health management information system (LHMIS).

"LHMIS is one that I think has really worked and is now owned by the government, because it's enabling the government to plan, it's enabling the government to know how many malaria cases have been treated, where the drugs are, you know. So, as a whole, it is also triangulated as it feeds into the National Health Information System. I think that is one big tool that is functioning and will continue to function as it is now being institutionalized across the country." – CSO

States in Nigeria are now performing quantification and forecasting and using LHMIS to plan. Some have their own storage spaces and are redistributing commodities, tracking volume sizes and performing last-mile distribution. The country's states are also linking sources for quality-assured medicines, either directly to manufacturers or through community pharmacies. Further work is ongoing to roll this out in additional states.

However, many respondents noted widespread stockouts and that clearance and customs processes are significant barriers to maintaining stock availability.

"When they had RDTs they didn't have ACT; when they had ACT, they didn't have RDTs; or they didn't have either, and that was in Lagos state. I also know that Lagos has the reputation for being on the point with malaria. They have a lot of investment in malaria. But even they couldn't sustain supply chain management in that state." – Federal Ministry of Health

"I find it frustrating where for instance DFID or USAID bring drugs in free for the Government of Nigeria, and they have to go through the rigorous process for release at the port. They have to pay demurrage; they have to pay fees. I suggest that with NAFDAC, there should be a meeting between the development partners, the Federal Ministry of Finance and Federal Ministry of Health to let them know that these drugs that are being given will expire if we have all these long processes at the seaport." – CSO

5.4.2 Financing

Respondents noted that funding, primarily via donor agencies, was the primary determinant of the availability of malaria commodities throughout Nigeria. Overall, 70 per cent of respondents felt that current tools were not sufficiently scaled up to ensure impact.

"The CHIPS [Community Health Influencers, Promoters and Services] programme, like I've mentioned, only about seven states have keyed into the programme. And what we're hearing from state governments is that they don't have funds to support it. It is an obvious fact that in 36 states plus one, only seven are implementing it. You can see that is a very serious problem. And it needs political will to be able to drive this process" – CSO

Respondents noted that so-called "orphan states" – those without donors or partners supporting malaria control activities – have not benefited from malaria interventions but that with recent World Bank and Islamic Development Bank funding, 13 previously "orphan" states will shortly begin implementing malaria control activities. There was a strong desire to see increased government support. Respondents largely felt that the existing tools are working, but that further scaling up and improved coordination would enhance impact.

"There is still room for a lot of improvement in the coverage of current interventions, yet there is an appreciable decline in malaria burden. One would reasonably think that expansion of coverage of these interventions may be more cost effective than investing in new ones with a premium on innovation. Yet adding other interventions that are not necessarily new but which have worked elsewhere can produce synergies." – SMEP

"For SMC [seasonal malaria chemoprevention], I think we need to scale it up because there are too many pilots, I think, where we're rolling out programmes like this. Granted no donors can cover all the states but when this innovation is coming in, the government should be made to accept if the donors can do 40 per cent, the remaining 60 per cent must be government-led. Government should be able to accept it, otherwise you don't sign this agreement. In that way, you're able to roll out several things at the same time, and then look at the lessons you learn from rolling them out, as opposed to doing this small thing in about five states, then you pull out and it is never sustained in those states, and it never gets to any others." – CSO

The division of states among donors was identified as both a problem and a strength and, in terms of drug procurement for malaria, respondents felt this had streamlined processes. However, for maternal health or other integrated programmes, the procurement of commodities is not harmonized in the same way, contributing to stockouts of certain essential medicines.

"For integrated community case management of malaria, pneumonia and diarrhoea, we have commodities for malaria because we have partners who are supposed to donate funds for this. We don't have funds for pneumonia and diarrhoea, we don't have commodities for pneumonia and diarrhoea. And the argument has always been you cannot use malaria money to procure non-malaria commodities. So, the integrated community case management is not working effectively and there are no commodities available to implement that. So that becomes a problem on its own." – CSO

Private sector case management was a recurring theme. Respondents noted that with the affordable medicines facility for malaria and subsequent co-payment mechanism in the early 2010s, the private sector had access to cheap drugs through subsidy arrangements. To link these facilities into the national reporting system, incentives would be needed to facilitate data capture on computers or devices and recognition through accreditation programmes that allow the facility to offer national health insurance scheme services or malaria services. In some states, such as Lagos, Oyo and Akwa Ibom, the renewal of registration for private suppliers is tied to data submission, incentivizing the reporting of malaria data on the national district health information system (DHIS2). However, the federal government was said to have limited power to scale up similar registration renewal policies nationwide.

One respondent suggested working with state governments to make sulfadoxine-pyrimethamine available at all PHC facilities through state insurance schemes. The low cost of sulfadoxine-pyrimethamine makes it easier to include such a scheme. Respondents mentioned the poor uptake of intermittent preventive treatment in pregnancy in general but also noted that this was primarily a challenge for reporting, as opposed to stock availability or refusals to administer or take the drug.

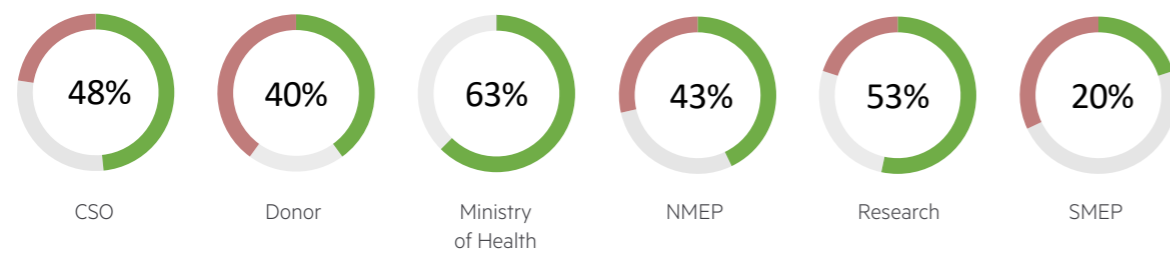
"I think intermittent preventive treatment in pregnancy is actually more widespread than reported. And what we noticed during monitoring is that for health workers, antenatal care providers have been trained, they actually give it, but they don't document it properly. And some of them don't talk to their patients [about what they are giving them]." – CSO

5.4.3 Operational efficiencies

Respondents in the online survey were asked to what extent they thought “doing more with less” is feasible. Overall, 42 per cent of respondents felt this was feasible, 33 per cent were neutral and 26 per cent felt this was not feasible. Responses varied by constituency (Figure 6), with SMEPs and donors the least supportive of this approach and the Federal Ministry of Health the most supportive. The difference in opinion between the Ministry of Health and the constituencies closer to implementation (SMEPs, NMEP, CSOs) is notable.

Figure 6: Perspectives on the feasibility of doing more with less

Is doing 'more with less' feasible? "Yes" (green), "No" (red), "Don't know" (gray)



The most frequently cited example of improved operational efficiency was the mobile app used to manage LLIN campaigns. The app was felt to provide increased accountability by using biometric recognition to confirm identities of trainees and distribution personnel, geocoding to track registration and distribution activities are occurring thoroughly and in the right places, efficient mobile payment of personnel, and real-time management with daily data reviews.

“We also had resistance from other donors because sometimes they look at the cost. It’s not so cheap to use technology, but you’re looking at the overall efficiencies, your gain eventually may actually be saving costs for you, because you’re sure that the commodities are getting to the beneficiaries, and that you’re really training people. Because this brings a lot of visibility. And you can track training, track the net, and have real time data monitoring, when the campaigns are going on, every day, we look at the dashboard. And we see the households that have been mobilized, the ones that maybe missed communities, it helps you to take decisions immediately on what are the areas that haven’t been covered, and all the areas that have not received nets. So for programming, it’s very, very useful.” – CSO

5.5 Uptake and access

5.5.1 Provider behaviour change

Much of the discussions on provider behaviour focused on managing negative malaria test results. Respondents felt that pre-service training was a crucial time to reach health providers with the right approaches and that in-service training was generally not effective. Most respondents observed that providers do not trust the results of RDTs and feel they provide a high rate of false negatives, leading to the over-prescription of ACT. Recommendations were to continue on-the-job supervision to reinforce differential diagnosis and help identify other causes of fever.

Respondents widely felt RDTs were an innovative tool that had been scaled up well and was facilitating improved access to appropriate treatment. Free testing for fever cases in all public health facilities, along with the expansion of RDTs in private health facilities, among proprietary and patent medicine vendors (PPMVs) and for community case management were seen as positive. However, respondents also noted that RDTs are not fully scaled up and that the quantity of ACT procured generally exceeds the number of RDTs. To implement the test and treat policy, far more RDTs would be needed. On the demand side, several respondents mentioned the challenge of providers either not trusting test results or prescribing ACT to make a profit on client visits, particularly in the private sector. One respondent mentioned a recent innovation of a change in client flow at the facility, whereby clients with fever get an RDT prior to being seen by the health provider. By the time they are called to see the provider, their RDT results are ready, reducing the time burden on both the client and the health provider. The change in check-in procedure was the result of a behavioural design process directly involving health care providers.

Respondents also frequently cited the Deki Reader pilot and the national malaria data repository (NMDR) as tools that have helped to identify overdiagnosis of malaria and facilitate feedback on provider performance in reading RDTs and for case management protocols.

“If you now look at our routine data on test positivity, it’s very high across almost all states, about 80 per cent. A lot of people worry about why we are constantly recording a very high test positivity rate across the country. It has something to do with data quality issues, sometimes it is related to the behaviour of health workers, recording positivity, because maybe they want to justify giving out ACT, or they don’t have the skills to do the right things. So now we are able [with NMDR] to detect those issues” – NMEP

Respondents also stated that RDTs were a tool that should have been scaled up to a much greater extent through use by community health workers. The barrier to this intervention was attributed to advocacy by medical groups that had concerns that non-medical personnel should not be involved in taking blood samples.

“The one intervention that seemed to have evaded being scaled up is the use of RDTs at the community level. You know, at one point, there was a tussle between the Lab Science Society and the pharmacies or PPMVs about being allowed to use RDTs because they said it was an invasive process, that you have to prick the client to get blood to perform the tests. This shouldn’t be conducted by PPMVs because they were untrained. I don’t know what’s happened at the end of the day because those things were meant to be used even by grandmothers that haven’t gone to school at all. You prick, you take blood samples. If you educate them on the need to prick and you recruit a supervisor to oversee from time to time the model caregivers that have been recruited in the community, there is no reason why using RDTs at the community level shouldn’t work” – Federal Ministry of Health

5.5.2 Demand generation

Many respondents focused on the need to strengthen individual malaria prevention and case management behaviour and cited the role of ACSM. There was a general sense that efforts had been effective, but that more work is required and that leveraging new technology and social media would be important moving forward. Respondents discussed the challenge of vertical health programmes that focus on specific messages rather than integrating health messages into family-centred or woman-centred campaigns. The life-stages approach to demand generation considers the key health concerns of children, adolescents, young adults, the newly married and older adults, and malaria messages. This was cited as an effective way to integrate messages across health campaigns in Nigeria and elsewhere. Coordination between maternal and child health and family planning departments was cited as crucial in advancing a coherent ACSM strategy. The need to tailor messages to particular subgroups, using local languages and locally supported communication channels or trusted informants, was also highlighted. Interpersonal communication was felt to be more effective than mass media, while acknowledging the high operational costs of scaling up this approach. This has meant that in some states only 50 per cent of wards in 50 per cent of local government areas were able to implement interpersonal communication, limiting the reach to just 25 per cent of the population at best. Respondents noted the need for ACSM to be self-reinforcing across multiple platforms, gender-informed and take into account the specific structural constraints faced by the target populations.

“The lack of education of females is a problem. When we try to discuss this at the state level in Zamfara, all the people who came for the stakeholders meeting and the malaria focal person representing the local government in that state were all male. I told them “you are coming to meet me, I’m a female, the topic is malaria and pregnancy. Please tell me how many of you have been pregnant before.” They were laughing. I said: “This is why women are dying, because they don’t know what to do. You cannot be there all the time to tell them do this or do that. It’s their body. When they know how they’re feeling and what they should do to make sure their children come out healthy, it’s to your own advantage.” – CSO

“The end users are never in the whole scheme. I don’t think they are in the customer experience cycle. When I came into the vector control space as the country manager for [manufacturer], the question I raised was in the whole scheme of things where are the users? Nobody knows what they want. Their opinion doesn’t count. So I don’t know how we can adapt tools to end users when they are not even involved in the whole chain of development. How do we expect interventions to be adapted to end users when the communities are not involved? I think this is a big gap.” – Industry

Respondents discussed the limited effectiveness of the current RTS,S vaccine being piloted in Ghana, Kenya and Malawi and their hopes that an effective vaccine would one day be available in Nigeria. Several respondents felt that the infrastructure costs of delivering a vaccine that requires multiple doses for one year of protection meant this would not be cost effective. However, it should be noted that the recommended four-dose regimen has been shown to reduce malaria cases by 39 per cent over four years among children 5–17 months of age at first vaccination, perhaps indicating an opportunity for greater education on this intervention. Others noted that even with an efficacy of 35 per cent [sic], “you take 35 per cent away from the current malarial situation or burden, I think that would be a huge, huge success” (research). Many respondents noted the current challenges in the country in terms of vaccine hesitancy for polio and rumours and misinformation related to COVID-19 that would be similar for any roll out of a malaria vaccine.

“The vaccine is a function of how we project it, a function of the efficacy of that vaccine, a function of the way we do the advocacy. And then a function of who else is using it, so if it is a vaccine that is used globally, people will buy into it. But if it’s a vaccine that is just used in Nigeria and Africa alone, they say: okay, why is not being used there? Like Depo-Provera for family planning is not used in the US but it is used in Africa, so that this politics of development needs to be streamlined, need to be teased out, and need to be properly packaged. But it needs to be owned by the communities themselves. You need to have advocates at the community level that understand and believe in it and are ready to push it.” – CSO

The main recommendations on vaccines were to engage community groups, community leaders, traditional rulers and the national primary health care development agency, and the role of the national immunization programme compared to NMEP in the roll out of any vaccine to encourage broad trust and uptake.

5.5.3 Monitoring and evaluation systems to track progress

Respondents noted recent innovations, particularly NMDR, which was explicitly mentioned by 17 per cent of online respondents, and other efforts to scale up the availability and use of DHIS2 data.

“The use of local data has helped in making the supply chain system more effective, reducing facility stockouts. Having these data available locally for planning the distribution of commodities has been helpful – NMEP

“The development of NMDR. This is a platform for warehousing data, and it has helped in presenting the data in real time while also allowing to drill down to improve data quality.” – Research

NMDR gathers data from routine and non-routine sources for use in commodity procurement, forecasting, distribution and capacity-building of officers across all levels. It triangulates data from the health management and logistics management information systems and has contributed to reductions in stockouts. Respondents noted that feedback sessions with ward and local government personnel have led to improvements in local decision-making and they are able to follow up on flagged health facilities. However, more ways to integrate community-generated data into the system are needed. Likewise, the integration of private-sector data, notably for case management, is a significant gap.

“The malaria programme in Nigeria is fortunate to have the DHIS2 platform and also the DPRS, having put out those HMIS tools. The source information can be obtained from the HMIS tools, which are supposed to be in all the country’s facilities. I think there’s already the infrastructure for great data. But how that data is captured and collected, in my own view, leaves a lot of room for improvement in terms of the reliability of the data. When you run DHIS2, you discover so many inconsistencies in the data. You find that the number of doses given is probably exceeding the number of cases that were there. And sometimes maybe the number of RDTs is lower but the number of tests done is much higher and may not be accounted for just by microscopy, so you begin to wonder where they got the other RDTs that they were testing. We even have facilities that never received RDTs, but they’re telling you that they tested so many people and they don’t even have a microscope. So I think the data is not reliable.” – Research

“We need to bring managers and the technical people collecting the data together, show the data, make them see its relevance, and how it can help them in programming or budgeting, or in allocating resources to the different local governments and to different programme areas. When people ask for things, it’s not because they are asking in abstract. This is what the program is doing with the funding, these are the women that are delivering in the facility, this is the quantity of intermittent preventive treatment in pregnancy being used, these are the nets that have been given to them to sleep under. And this is the result. One of the questions a former governor in Oyo state asked the United States President’s Malaria Initiative team when they came to Nigeria was, show me the value of these nets. You have put millions of dollars into bringing nets to my state. To what extent do you expect malaria prevalence to go down if people use them? Show me figures. So that ability to model, to show and communicate in a language that the managers will understand will also go a long way towards removing some of these barriers to data availability.” – CSO

Having data at a scale at which change must be monitored was mentioned. The shift from the zonal malaria indicator survey to a state-level one¹ allowed programmers to observe changes in malaria prevalence and the uptake of interventions at the state level. NMDR further allowed analysis of interventions at the local government area level conducted only within specific areas.

5.5.4 Sustaining access

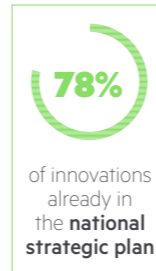
As noted in previous sections, the tendency not to scale up successful pilot projects was mentioned numerous times by respondents as a barrier to scaling up.

“I know that some non-governmental organizations also modelled caregivers in communities. Where it has been attempted, it has worked. A colleague in the Nigerian Institute of Medical Research educated PPMVs to test and administer ACT. He monitored them, and the results were good. So usually those things work. It’s just that they are not scaled up and they’re not sustained” – Federal Ministry of Health



Photography by © Maggie Hallahan

6. Results: innovation



Respondents mentioned specific innovations, primarily focused on the use of evidence and data to improve implementation, and ACSM elements, including community engagement, improving behaviour and better tailoring outreach to target groups. Within the online survey, 78 per cent of examples of innovation across different malaria interventions were interventions already detailed in the national strategic plan for 2014–2020 (e.g. scaling up ITNs and the use of door-to-door distribution during COVID-19; expanding digital data entry for DHIS2 and the NMDR; improving social and behaviour change approaches at community level; and the support of private-sector case management). The main innovations not included in the national strategic plan were community intermittent preventive treatment in pregnancy, Deki Reader to improve adherence and monitoring of RDT results, ivermectin, house screening, insecticide-treated wall paint, enhanced digital data collection through community health workers, human-centred design to inform behaviour change, drones for larviciding and environmental sanitation. A table of the innovations listed by the online respondents is provided in annex B.

Overall, respondents felt that Nigeria had potential, given its geographic size and diversity, as well as its local research capacity, to identify and develop medicinal compounds, including malaria drugs through evaluating local plants. Respondents also discussed the need to ensure that new malaria control products developed outside of the country were fully tested within Nigeria to ensure efficacy and effectiveness, and that the variation in malaria transmission and socioeconomic development offered a strong template for such evaluations. However, the type of innovation most frequently discussed by participants was the adaptation of interventions to the Nigerian context.

Several recent initiatives were top of mind for respondents. Several respondents mentioned the CHIPS programme, initiated by the National Primary Health Care Agency to create trained community health workers for integrated community case management of malaria, pneumonia and diarrhoea. The integration of ITN distribution with seasonal malaria chemoprevention (SMC) was also listed as an innovation by several respondents, along with the pilot of dual active ingredient nets under the New Nets Project. The TIPTOP programme to provide intermittent preventive treatment in pregnancy at the community level rather than at health facilities was also cited.

“This latest one in Zamfara is that the net card has improved the uptake of SMC. Understanding the fact that the programme has already succeeded in making people understand the importance of ITN, they are using this to make them take up prevention of malaria in their children. I think it’s a success. The community distribution of intermittent preventive treatment in pregnancy was so successful. Within how many weeks over 3,000 women receiving treatment. I think that was also an innovation that was successful. So anything that will make the people more comfortable and take away the cost, including the opportunity cost of coming to the facility, I think will work in rural areas. We need to think more outside the box on how we can get the intervention to the communities rather than them coming to the facility. Within the community structures how might we insert malaria intervention so as to help the families, including women and children, to increase uptake”

– CSO

“Community intermittent preventive treatment in pregnancy has been shown to be quite effective in Akwa Ibom, Ebonyi, Sokoto and Bauchi and is ongoing in the states of Ondo and Niger. The evidence has been promising but needs replication in all 774 local government areas in order to have the desired impact. This will complement intermittent preventive treatment services based in health care facilities. Other innovations to promote early antenatal care include conditional cash transfers for maternity care, the use of incentives like free LLINs and delivery/baby kits to promote early and comprehensive antenatal care. Social and behaviour change activities like radio/TV jingles and village dramas can also promote early antenatal care attendance by pregnant women”

– CSO

“I think what the country has done well, in recent times, is involving the communities in malaria work. This had been the missing link for several years. But I think we’re beginning to get it right. Basically, before now, we had different community health workers. It was a chaotic situation. You have the community drug distributors, you have the role-model mothers, you have caregiver mothers, you have interpersonal

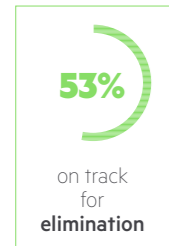
communicators and various others, based on the partners’ needs. Some are trained for two days, some for three days. Some are trained for five days. And it is also based on the funds available to partners. But more recently, the national primary care agency has come out clearly and has created the CHIPS programme. So the CHIPS programme has become an umbrella for all community health workers, and

then you have a specific length to train for 14 days. They are trained and you have harmonized training modules, and also harmonized tools for them to work. So this is also a success story at the moment, and also, like I said earlier, for me it is very innovative, because you have this group of people in the community, even when there is no health care facility, they will be there to provide services

at midnight when the child will be crying or have high fever, or when pregnant women need these treatments. This is good. But the other part is that the programme is underfunded and many of the states have not shown commitments or integrated these programmes into health service delivery at the primary care level.” CSO

7. Results: cross-cutting issues

7.1 Achieving elimination



Only about half of respondents felt that the country was on track to eliminate malaria. Nearly 70 per cent of respondents felt that achieving high coverage with existing tools was more important than rolling out new ones. Respondents felt that since coverage gaps remain, more effort and funding is required – particularly via government commitments – to achieve targets and drive down transmission. Environmental sanitation remained a recurring theme with some government and CSO respondents. There was strong support for the high-burden high-impact approach to stratifying the country based on malaria transmission and the suitability of interventions for different areas. Many respondents agreed with approach’s vision that “one size does not fit all” and that malaria interventions and tools must be tailored to specific epidemiological contexts through a process of stratification, aligning and prioritizing interventions and commodities.



“Interventions should be not be a one cap-suit-size-fits-all approach but should be tailored to specific states and local government areas’ peculiaritiesareas using evidence-based epidemiological data, socio-demographicsociodemographic, cultural and even religious peculiaritiescircumstances and entomological data to ensure interventions are adequately suited to each locality and acceptable ensure interventions are adequately suited for each locality and acceptable to the targetedto the target population.” – NMEP

“We as programmers, we must be open to learning. There’s no magic wand to address malaria. We have to keep thinking creatively. We have to think of unique solutions, which may differ from one geopolitical zone to another. There might not be a one cap -size-fits -all size approach to address the issue of malaria. We must try to promote and make sure that malaria prevention and control is community driven. Let’s make attempts to promote local production of health commodities. It will make these commoditiesthem less expensive. And given the condition we are in with COVID, that has limited quite a lot of things. There’s an opportunity to ensure there is there is availability and otheranother that will ensure that these commodities are always available to help our to help our people.” – Donor

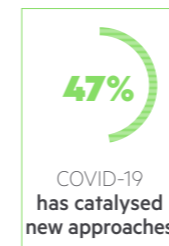
7.2 Key concerns and future desires

The primary concerns of respondents fell into five groups: child deaths; insufficient funding; poor quality data or lack of data use; local capacity; and government commitment/political will.

“Limited domestic resources at the national and subnational levels. Dependence on donors for key interventions including commodities. Inadequate accountability at most levels- providers. Poor quality in the private sector, especially at the private medicine stores. Huge overuse of antimalaria medicines as self-medication through over treatment of fever and inadequate parasite diagnosis” – Donor

To elicit the top priorities for malaria control, respondents were asked to name one thing they would fix if they had a magic wand. The top recommendations included increased funding and capacity, improvements in malaria-related behaviour and the expansion of vector control. A number of respondents expressed a desire to see consistent availability of commodities, improved data quality and improved social and behaviour change approaches. They also expressed a desire for highly subsidized or free diagnosis and treatment for all age groups and socioeconomic improvements, including housing and the environment. Some wished for a vaccine while others wished for mosquitoes to stop carrying malaria parasites or for vectors to be eradicated.

7.3 COVID-19



Respondents were asked whether the COVID-19 pandemic had catalysed any innovative approaches to delivering malaria interventions. Forty-seven per cent of online respondents said that the pandemic had resulted in innovative approaches, 33 per cent said it had not, and 20 per cent were unsure or did not respond. Respondents noted the growth and effectiveness of virtual meetings, particularly the ability for more people to join and participate in meetings for quarterly reviews and technical working groups. Virtual training and remote supervision were adopted. Respondents also cited the switch from fixed-point to door-to-door ITN distribution as a major change brought about by the pandemic, although some noted the success of the new approach has yet to be proven. Respondents discussed the integration of SMC and ITN distribution in the north.

“Certainly. For instance, a lot of online activities were carried out. LLIN distribution changed to house-to-house instead of using distribution points. It has also stimulated reflection on areas of integration between two mass campaign events. We have also developed a list of priority aspects of the malaria research agenda related to COVID-19.” – Research

“I think it will, although slowly for now. The use of a mobile curriculum for training service providers, the development of virtual mentoring tools, the use of WhatsApp for mobile health and data reviews, etc.” – CSO

“Yes it has!.. More conscientious planning and more judicious use of time and resources. More people attend virtual meetings and as such there are more ideas on how best to deliver malaria interventions.” – CSO

On the other hand, several respondents stated that the lockdowns and closures at ports have disrupted supply chains and led to stockouts. Likewise, research activity has been redirected towards COVID-19, leaving malaria aside. One respondent from the Ministry of Health suggested adopting contract tracing methods for malaria to improve access to services by vulnerable groups.

“Yes, the inability of the majority to access services at health facilities has triggered reflection on innovative approaches to delivering malaria services. Therefore, CSO engagement in delivering malaria services and logistics could be of significant help.” – Regulatory

8. Recommendations

Respondents made recommendations they felt would improve access to innovative tools. These were largely focused on scaling up earlier innovations through fully funding interventions at the scale they are needed and by improving implementation. The responses are summarized below.

- While new tools may prove helpful, the priority is expanding services to reach target levels of coverage of LLINs, RDTs, ACT and intermittent preventive treatment in pregnancy, ensuring all states are covered and supported.
- Continue to expand the use of local data via HMIS and NMDR, ensuring data is aggregated in a meaningful way to make changes at each level of decision-making, with a particular focus on real-time dashboards and/or systems that empower health care facilities to view and take action on their own data, and encourage improved data submission. Consider competition on malaria indicators between states, local government areas and wards.
- Ensure ITN access is achieved and maintained through combinations of timely mass campaigns and continuous distribution channels, such as school and community distributions.
- Incentivize RDT use and case reporting on state and national databases for private-sector health facilities. This could be achieved through registration renewal processes or other incentives.
- Treat malaria like COVID-19: galvanize a strong response, make data more widely available in real time to track progress and expand integrated messaging across different platforms.
- Incentivize health workers to remain in rural areas to improve their distribution across the country.
- Significant support is needed to make local production competitive with manufacturing based in Asia, for example pioneer status, tax holidays, tax breaks for local production and technology transfer. However, these are unlikely to be sufficient in the absence of infrastructure improvements. Regulatory processes should continue to be improved and the potential for regional approvals/reciprocity should be explored further.
- Support community-directed interventions that make access to services and commodities easier for beneficiaries.
- Increase funding for malaria control from domestic sources.

“

“There is an urgent need to step up domestic funding for malaria programmes in Nigeria. The budget allocation to federal and state ministries of health is currently nowhere near close to the agreed 15 per cent.”

CSO

“Enough tools are available but the programme needs more funding.”

CSO

“Skills of health workers to ensure all fevers are tested with malaria RDTs and only confirmed positive cases are given ACT (rational use of ACT). Strengthen supply chain. Triangulation of data.”

CSO

“There is a need for synergy between the federal and state governments. They should work towards same goal. National policies should be binding on the states and there should be a central control mechanism.”

NMEP

“Creation of a malaria agency rather than a programme. Domestic resource mobilization and strong political will.”

CSO

“Implement evidence-based interventions at scale (i.e. in all the country’s 774 local government areas). Piecemeal interventions are inadequate. Need to strengthen antenatal care services, subsidize user fees and make essential commodities available free of charge.”

CSO

“1. The robust support for malaria programmes at national level needs to trickle down to the states.

2. Governments at the national and subnational levels need to commit more funds to malaria elimination efforts to complement donor efforts.

3. Community level interpersonal communication activities need to cover more communities because digital and media channels are not effective for most rural communities in Nigeria.

4. More attention needs to be paid to provider behaviour change interventions to improve the quality of malaria services.

5. Malaria policies are available, but adherence is not enforced. Health authorities should focus on enforcement rather than reviews and dissemination.

6. There is a need to focus more on what the private sector is doing. Their services remain largely unregulated, resulting in a significant lack of adherence to national policies and guidelines.”

CSO

”

9. Annex A. Methodology

9.1 Gatekeeper advocacy

During the inception period, Tropical Health coordinated with the Advocacy and Resource Mobilization Partner Committee to secure a letter of support for the research from the RBM Partnership to End Malaria Chief Executive Officer. The letter was used by NMEP to secure buy-in from higher levels of the Ministry, namely a formal letter of support for the activity, which was provided with the invitations to the online survey and key informant interviews.

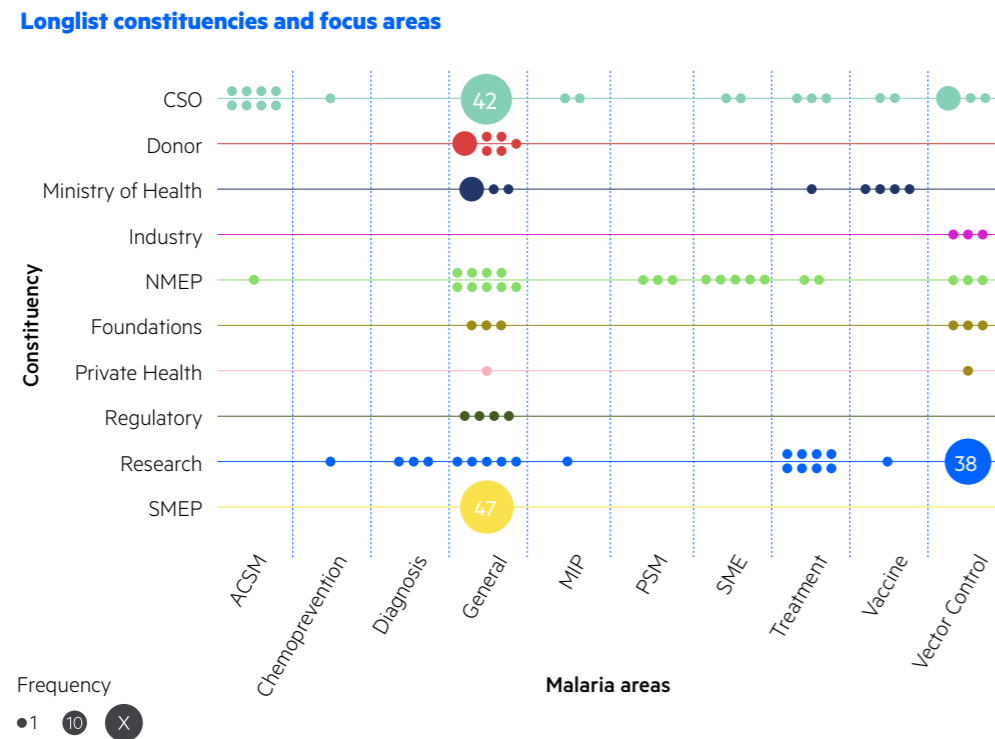
9.2 Approach to gathering data

9.2.1 Stakeholder mapping

The approach of Tropical Health to eliciting a representative sample of perspectives began with a thorough landscaping of potential stakeholders, facilitated by the senior country expert in Nigeria. Using a snowball sampling approach conducted via phone and e-mail and beginning with our own extensive network of malaria contacts, we developed a longlist of potential stakeholders for interview and categorized them into defined constituencies. We also classified stakeholders based on their malaria expertise area.

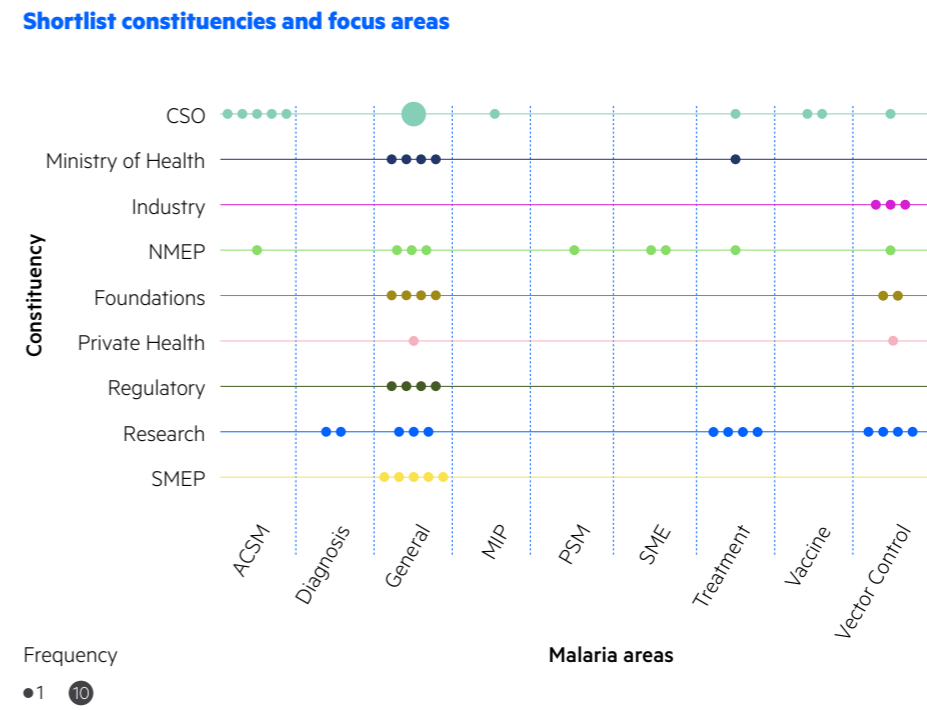
Our longlist included 196 individuals, broken down by constituency and malaria focus areas [Figure 7](#). Contact information was obtained for stakeholders on the longlist to create the database of targeted respondents to the online survey.

Figure 7: Longlist matrix of constituencies and malaria focus



The selection of respondents for key informant interviews aimed to achieve saturation on perspectives within each constituency. We used a matrix approach whereby within each constituency we aimed to interview representatives from various levels (national, state, local), products or across cultural-geographic zones. These key respondents are likely to be key decision makers within the various constituencies, with specialized technical knowledge on the uptake of innovation, particularly barriers to adoption. The original shortlist of 71 key informants is also broken down by constituency and malaria focus ([Figure 8](#)). The shortlist was reduced to 52 individuals prior to sending key informant interview invitations.

Figure 8: Shortlist matrix of constituencies and malaria focus



9.2.2 Development of interview guide and survey questionnaire

During the inception phase, Tropical Health drafted an **interview guide** and subsequently refined it for specific constituencies and sectors, building a customizable set of questions that we could instantly adapt for each interview. The guide included all potential questions that could be asked during interviews across sectors, but used Excel programming and inputs from each key informant on their constituency and malaria focus areas to limit questions asked during individual interviews. This enabled us to bring the most valuable answers to our enquiries.

The key informant interview guide was pre-tested with two short-listed individuals and then the question wording was further refined during the first few days of data collection in key informant interviews.

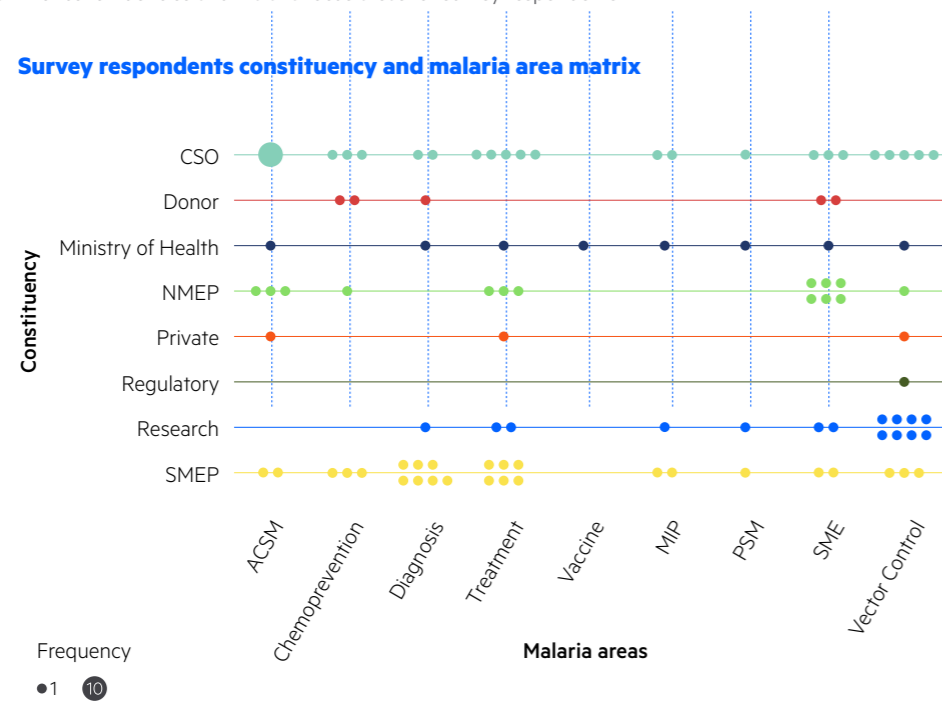
The **online survey** questionnaire was drafted during the inception phase and was programmed using a TypeForm® survey. It was kept short and practical, with a combination of closed-ended, rating and multiple-choice questions and limited to open questions to facilitate full participation. Two NMEP steering committee members pre-tested it prior to launch and their feedback was used to improve the questions.

9.2.3 Online survey

The **online survey** was administered through a secure survey platform (TypeForm®) that included an online informed consent process. We securely stored personally identifiable information and extracted this to customize a total of four reminder emails that were sent to maximize participation.

As mentioned above, the original longlist targeted 197 respondents. We received 102 responses, giving a total response rate of 52 per cent (62 per cent accounting for invalid e-mail addresses). [Figure 9](#) presents the breakdown of constituencies and focus areas. Note that in the online survey, respondents could only select one malaria focus area and could not select a “general” category. Their malaria focus area was used to tailor some of the subsequent questions.

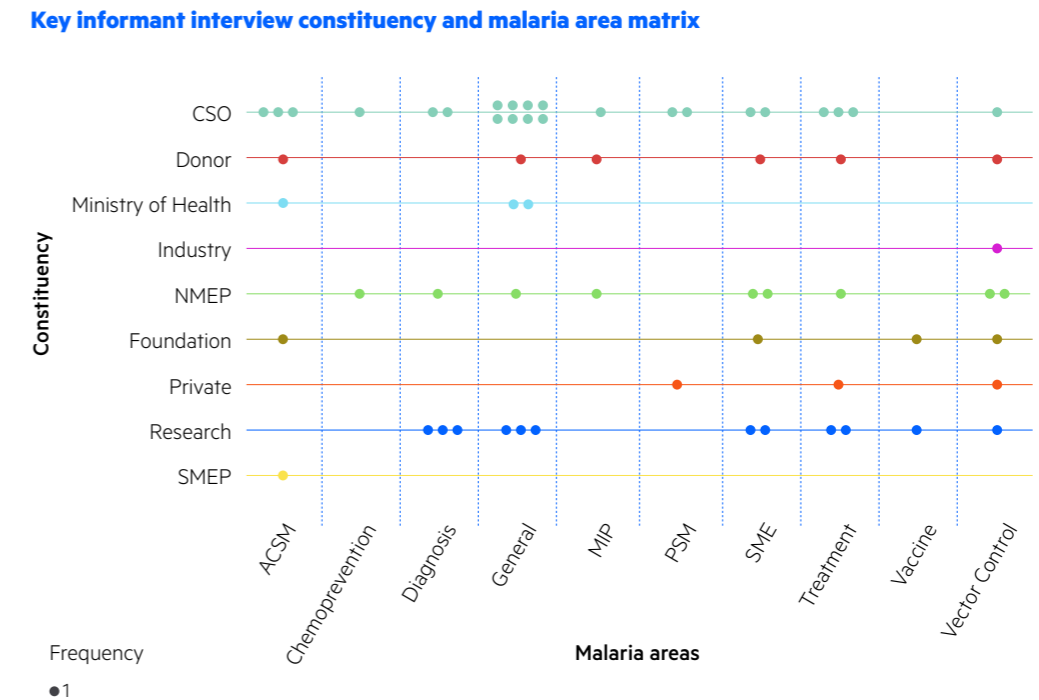
Figure 9: Matrix of constituencies and malaria focus areas for survey respondents



9.2.1 Key informant interviews

Tropical Health contacted individuals on the shortlist for a structured interview. Of the 52 individuals contacted for interview, 28 arranged interviews with the research team and 23 of these were held from 3 August 2020 through to 1 September 2020. During the interview scheduling process, key informants selected their constituency from a list and selected one or more malaria focus areas (including the “general” option). This information guided the interview questions. The breakdown of key informant interview constituencies and malaria focus areas is shown in [Figure 10](#).

Figure 10: Matrix of constituencies and malaria focus areas for key informants



Interviews were primarily conducted using open questions, with follow-ups to explore themes in more detail and capture nuances. Structured interviews with stakeholders were conducted using Zoom, recorded to the cloud and transcribed with Otter.ai, an artificial intelligence transcription service linked to Zoom. Transcripts were then reviewed for accuracy and corrected by the research team. Interviews were completed in 30–90 minutes, depending on the key informant’s availability. An overview of the questions to be covered during the interview was shared with key informants to allow respondents to prepare their answers in advance.

9.3 Challenges during data collection

No unanticipated problems were observed during data collection. Table 1 outlines the challenges encountered.

Table 1: Challenges and mitigation efforts

Challenges	Mitigation strategy
Numerous lines of enquiry; multiple and sometimes conflicting preferences for specific innovations	<ul style="list-style-type: none"> • Early engagement with steering committee and NMEP to identify priority lines of enquiry. • Focus the analysis on lines of enquiry (technical areas, constituencies), with the potential for significant gains in efficiency, access or cost savings. • Tailoring of key informant interview guide to key informant malaria focus area.
Limited availability of key informants for interview	<ul style="list-style-type: none"> • Four-week data collection period to accommodate scheduling and connectivity challenges, and facilitate the reach of key informants. • The team began scheduling phone interviews as early as possible (following steering committee review of shortlist). • Flexible, informant-driven scheduling portal allowed key informants to select a time slot that fits their own availability and easily reschedule as needed. • Key informants invited to participate in an online survey in lieu of an interview in final reminder. • Follow-ups by phone and WhatsApp with key informants who had not yet scheduled. • 60-minute and 90-minute time slots made available to accommodate availability. • Interview guide adjusted (priority questions) for shorter interviews where necessary (30 minutes focusing on two to three key questions).
Poor network connection	<ul style="list-style-type: none"> • Where the network connection presented challenges, interviews were planned to be conducted via phone and separately recorded. Fortunately, the majority of interviews faced few if any connection problems. Transcripts were reviewed and gaps filled in with interviewer notes.
Reduced response rate to online survey due to survey fatigue	<ul style="list-style-type: none"> • Online survey kept as short and direct as possible, with progress bar to show respondents how close they are to completion. • Questions tailored to respondent's malaria focus area to maintain focus and engagement. • Four reminder messages sent five to nine days apart for online respondents.

10. Annex B. Table of innovations from the online survey

Constituency	Malaria area	Innovation
CSO	ACSM	The use of stratification as a strategy, focusing interventions based on the epidemiological need need of individual regions.
CSO	ACSM	The involvement of religious leaders, getting them to institutionalize ACSM and social and behaviour change in churches and mosques.
CSO	ACSM	Mobilizing communities to own Malariatake ownership of malaria elimination through clusters that drive environmental environmental changes, as well as promptly malaria diagnosis and treatment, with incentives to communitiesfor community innovation that reduces the incidence of malaria.
CSO	ACSM	Using CSOs for advocacy at the community level.
CSO	ACSM	Community interpersonalInterpersonal communication activities at the community level.
CSO	ACSM	Among donors, and development partners, there appears to be increase in (a) demand for and use of evidence in planning ACSM interventions,; (b) the application of information technologyIT (mobile phones and animations)animation); and (c) the use of social media to disseminateshare ACSM messages and materials. These should be promoted at all levels of governance.
CSO	ACSM	Human-centred design approaches to tailor approaches to local communities.
CSO	ACSM	House Door-to house-door campaign/ / use of data to create awareness.
CSO	ACSM	The involvement of local/community structures in the implementation ofimplementing ACSM activities isshould worth promotingbe promoted in Nigeria as this encourages sustainability.
CSO	ACSM	Continued use of electronic and mobile platforms for social mobilization. and the use of malaria score cardmalaria score cards and evidence for advocacy.
CSO	Chemoprevention	Community systems strengthening approach.
CSO	Chemoprevention	People centeredcentred approaches like door -to -door campaigns are effective thoughbut expensive. I think that more needMore needs to be done to improve the integration of SMCsocial and behaviour change into facility management.
CSO	Chemoprevention	Interpersonal communication interventions
CSO	Diagnosis	Use of whatsAppWhatsApp and other social media platforms for ACSM activities and improved coordination of interventions.
CSO	Diagnosis	Using PPMVs - train: training them on malaria diagnosis using mRDT, linkRDTs and linking them up with qualityto quality supplies, and provideproviding adequate supervision.
CSO	MIP	The recent integration of MIP interventions into other reproductive, maternal, newborn and child health programming is positive.

Constituency	Malaria area	Innovation
CSO	MIP	Community intermittent preventive treatment in pregnancy has been reasonably effective in the states of Akwa Ibom, Bauchi, Ebonyi and Sokoto, and is ongoing in Ondo and Niger. The evidence so far is promising but it needs replication in all 774 local government areas to have the desired impact. This will complement intermittent preventive treatment in pregnancy services in health care facilities. Other innovations to promote early antenatal care include conditional cash transfers for maternity care, the use of incentives like free LLINs and delivery/ baby kits to promote early and comprehensive antenatal care. Social and behaviour change activities like radio and TV jingles and village dramas can also promote early antenatal care attendance by pregnant women.
CSO	PSM	Use of new generation nets for implementation of LLIN campaigns adopted to the nuances and context in each state or geography
CSO	SME	Improved documentation, reporting and data use by health workers and stakeholders
CSO	SME	Using independent monitors to track the indicators
CSO	SME	Monitoring of parasite behaviour at the malaria parasite sentinel sites
CSO	Treatment	Seasonal chemoprophylaxis
CSO	Treatment	Malaria health insurance
CSO	Treatment	Incentivizing (not necessarily with money) private-sector providers to test before treatment to comply with test results and to document and report.
CSO	Treatment	There are no new innovations in treatment except the introduction of an additional antimalaria regimen (dihydroartemisinin-piperaquine) to the recommended drugs in the guidelines.
CSO	Treatment	Increased use of RDTs for malaria diagnosis in primary health care centres and intermittent preventive treatment in pregnancy.
CSO	Vector Control	Door-to-door ITN distribution
CSO	Vector Control	Increased vector studies, which has informed the introduction of new nets in the country.
CSO	Vector Control	Introduction of new nets, use of technology (information and communications technologies for development) for data management and personnel payment, payment of personnel via bank platform (cashless).

Constituency	Malaria area	Innovation
		<p>The innovation is centred on ensuring that all eligible people are reached, irrespective of their location. If partners can leverage the technology available to us and adopt the use of a transparent accountability framework to effectively plan for ITN campaigns, malaria control and elimination would be possible. Three examples of these approaches are:</p> <ol style="list-style-type: none"> 1. The use of a pre-implementation dashboard to assess the state's level of preparedness at various stages of the campaign (three weeks, one week and three days to implementation). The pre-implementation dashboard had 17 variables: state implementation task force; local government area task force on implementation; schedule of activities; planning meeting; microplanning; daily implementation workplan; plan for hard-to-reach areas; logistics available; state-level training of personnel; local government level training of personnel; personnel availability; supervisory workplan; social mobilization committee (state and local government area); information, education and communication materials; jingles and radio programmes; plans for flag-off; and the LLIN distribution workplan. The pre-implementation dashboard helps assess the preparedness of states for the LLIN replacement campaign. The dashboard has a set of pre-determined yes/no questions, with the responses automatically coloured either green or red, respectively. The final output from the three-day pre-implementation status determines whether to implement or defer the campaign. 2. Quality assurance using trained independent monitors. The independent monitoring quality assurance (IM-QA) tool was developed using the Open Data Kit. The WHO-trained independent monitors administered the tool throughout the five-day distribution period. Depending on the demographics of the state, WHO selects 4–14 local government areas and posts one independent monitor per area. The selection criteria for areas for in-process monitoring used the EPI high-risk analysis tool. Each independent monitor in an assigned area visited 10 wards (two wards per day) and 20 distribution points (two per ward per day) and applied the IM-QA tool throughout the five-day distribution period and under the guidance of assigned local guides. The wards and distribution points were selected daily by a data clerk using a table of random numbers. 3. The lot quality assurance sampling tool, which uses the Open Data Kit app, aims to supplement the independent monitoring data shared by the state team, especially where there are significant quality concerns or where there is contradictory data. The lot quality assurance sampling technique was used to determine whether a group of individuals have achieved the required standard of performance by looking at a sample of that group. The tool provided useful information at a granular community level, where attention needs to be focused, and also helped identify areas where the plan is not working well. The lot quality assurance sampling tool was administered via the app to eligible households, (caregivers with at least a child under five years of age) by the WHO-trained field officers at least one week after the campaign.
CSO	Vector control	

Constituency	Malaria area	Innovation
		In the seven states I supported during the LLIN replacement campaigns in 2018–2019, WHO assigned me to train and deploy six lot quality assurance sampling officers to six local government areas (two areas per senatorial zone). The cumulative state-wide in-process monitoring data shared at the daily ERMs was used to select high and low performing areas from the three senatorial zones after ranking the local government areas in each senatorial zone using the state-wide coverage data. Where there was a tie in the performance, a random selection process was adopted. A table of random numbers was used to select two wards and from each ward, two settlements were selected, giving a total of four settlements per local government area. With the aid of the table of random numbers, each of the lot quality assurance sampling officers sampled 10 households per Settlements, completing 40 households per area. This meant that in each of the implementing states, a total of 240 households were selected from 24 settlements in 12 wards of the six local government areas. As such, in the seven states that implemented the campaign, a total of 18,260 eligible people were sampled from 1,680 households. If we can use innovative approaches for all interventions like this, malaria elimination will be possible in line with the WHO Global Technical Strategy framework.
CSO	Vector control	House screening (old innovation).
Donor	Chemoprevention	Scaling up intermittent preventive treatment in pregnancy and for infants and SMC.
Donor	Chemoprevention	The two approaches: group antenatal care and TIPTOP. The jury is still out on them.
Donor	Diagnosis	Behaviour change packages directed at health care providers.
Donor	SME	<ul style="list-style-type: none"> Consider digital reporting for selected facilities (e.g. direct entry from secondary and tertiary health care facilities) Support state-level ownership of the data: state health leadership should request the data monthly and make decisions on the data Strengthening supervision and data quality, starting with the data-collection points Reduce efforts from federal level to conduct data quality assessments State to provide resources for data-collection tools, training and data quality assurance activities.
Donor	SME	Monthly data validation (triangulation that includes laboratory results) below the local government area level: monthly, to allow corrections before submission to DHIS2, and below the local government area level so there is facility ownership and less cost.
Ministry of Health	ACSM	The innovations used in the elimination of polio in Nigeria are great. Traditional leaders and religious leaders were used to drive home the importance and benefits of immunization to children. These groups were frequently on social media platforms encouraging people to open their doors to the immunization teams.
Ministry of Health	Diagnosis	Training of primary health care providers and “chemists” on use of standardized RDTs for malaria diagnosis.
Ministry of Health	MIP	Community distribution.

Constituency	Malaria area	Innovation
Ministry of Health	PSM	Facilities/community directed PSM.
Ministry of Health	SME	Field officers, although they need technology support and capacity development/training to obtain more relevant data, such as GPS locations (coordinates).
Ministry of Health	Treatment	Enforcing diagnosis before treatment and avoiding the proliferation of antimalaria drugs plus continuous research.
Ministry of Health	Vaccine	None.
Ministry of Health	Vector control	Larvicide and environmental sanitation.
NMEP	ACSM	Encourage community ownership.
NMEP	ACSM	The implementation of SMC in the regions with seasonal rainfall (between 3 -4three to four months) and the introduction of PBOpiperonyl butoxide nets in areas where there iswith resistance.
NMEP	ACSM	Advocacy to increase national funding for malaria.
NMEP	Chemoprevention	Involvement of caregivers in the administration of SMC.
NMEP	SME	The use of electronic data capturingcapture devices for data collection is currently being promoted in Nigeria and it will add more value to SME if implemented across every activity. There is also the need to have aA video recording on how to implement SME activities is also required, especially for areas wherewith low technical capacity is low and the video. Video recordings can regularly provide guidance on what needs to be done.
NMEP	SME	Development of NMDR.
NMEP	SME	Advocacy and communication to achievingraise awareness through campaign.campaigns: <ul style="list-style-type: none"> IRS working strategy IRMInsecticide resistance management Synergies Insecticide treated nets.for ITNs
NMEP	SME	Migration into the DHIS2 and recent introduction of NMDR.
NMEP	SME	e.g. Use of Deki readers for malaria diagnosis and data capturingcapture and cloud storage, use of mobile androidAndroid devices for direct health care facility and community level data reporting and IT technology for data quality audits, etc.
NMEP	SME	Use of mobile technology for routine data reporting to the district health information system.
NMEP	Treatment	SMC targeting the U5 in the Sahel region
NMEP	Treatment	Use of vaccine

Constituency	Malaria area	Innovation
NMEP	Treatment	<ol style="list-style-type: none"> 1. Training of health workers 2. Health education of various groups in the communities. 3. Mass campaigns 4. Adverts and the use of the media to promote the treatment. 5. Making the guidelines available to health facilities
NMEP	Vector control	The use of Inesfly insecticide paint for vector control. The pilot trial of the paint has been carried out but requires further trials in all geopolitical zones in Nigeria, as recommended by IRS/VS expert group.
Private	Treatment	Intermittent preventive treatment and sustainable access to commodities for the private sector.
Private	Vector control	Larvicide.
Regulatory	Vector control	Social and behaviour change communication activities and in-school distribution to certain age groups, stratification between urban and rural communities and integration of LLINs into immunization/antenatal care.
Research	Diagnosis	Improved advocacy to include appropriate use of drugs, patronizing laboratory diagnosis before drug use and hygiene.
Research	MIP	Rapid testing and initiatives to reduce the cost of medication
Research	PSM	Local town hall meetings should be organized where the items should be distributed directly to the end users. Again, strict monitoring activities should be intensified to ensure compliance.
Research	SME	Door-to-door malaria drug distribution and informing residents to collect free nets.
Research	SME	Malaria vector insecticide testing.
Research	Treatment	None.
Research	Treatment	Availability of new ACT (artesunate-pyronaridine and dihydroartemisinin-piperaquine). Backward integration (public-private partnership) to ensure sustainable access to antimalarial drugs (Can explain later). Strategic engagement of physicians at tertiary health facilities on treatment policy changes helps to speed up the uptake of such drugs (especially by private health practitioners) because they tend to benchmark practices in a locality. Engagement of the PPMVs in a formal way can improve their quality of care.
Research	Vector Control	Use of piperonyl butoxide nets.
Research	Vector Control	Scaling-up IRS and larviciding using drones.

Constituency	Malaria area	Innovation
Research	Vector control	Stakeholders meeting in some states like Lagos, which integrates people from universities, research Institutes, ministries of health, PIs of different project partners and policymakers to share ideas and experiences.
Research	Vector control	LLINs are now distributed door-to-door in mass campaigns.
Research	Vector control	We have researched ivermectin, which is widely distributed in Nigeria to control onchocerciasis and lymphatic filariasis. Our study shows it has some mosquitocidal properties, with high potential for vector control. IMEP should sponsor more research to validate this.
Research	Vector control	Combining indoor residual sprayingIf promoted, combining IRS and the use of insecticide treated nets, if promotedITNs will make a significant contribution to controlcontrolling malaria significantly in Nigeria.
Research	Vector control	The COVID-19 response incorporation of the pandemic preventive measures for the COVID-19 pandemic while implementing vector control activities. The use of virtual means of communication in interaction, supervision, and the monitoring and evaluation of vector control activities.
SMEP	ACSM	Inspection and implementation of sanitation activities in the community.
SMEP	ACSM	Sustaining community dialogue.
SMEP	Chemoprevention	Reaching caregivers at the community level.
SMEP	Chemoprevention	The stratification for various programs. Aprogrammes. It is a good idea to address issues based on identified identified characteristics, especially for the vector. Alt is also a good idea having Vector Sentinel Sitesto have vector sentinel sites to identify resistance of the vector to ongoing programmes.
SMEP	Diagnosis	ContinuesContinue capacity -building /training/mentoring of end user,users. Adoption of behavioural economics prototype to addressingaddress health workersworkers' attitudes to Malariamalaria case management.
SMEP	Diagnosis	Diagnosis before treatment.
SMEP	Diagnosis	Strict adherence to treatment guidelines for malaria intervention.
SMEP	Diagnosis	Environmental management (making environmental sanitation mandatory).
SMEP	Diagnosis	Malaria RDT kits.
SMEP	Diagnosis	Use of LLINs.
SMEP	Diagnosis	Use of RDTs.

Abbreviations

ACSM	Advocacy, communication and social mobilization	M&E	Monitoring and evaluation
ACT	Artemisinin-based combination therapy	MIP	Malaria in pregnancy
ARMPC	(RBM Partnership's) Advocacy and Resource Mobilisation Partner Committee	mRDT	Malaria rapid diagnostic test
ATSBs	Attractive Toxic Sugar Baits	NGO	Non-Governmental Organisation
CHIPS	Community health influencers, promoters and services	NAFDAC	National Agency for Food and Drug Administration and Control
CSO	Civil society organisation	NHIS	National Health Insurance Scheme
DFID	Department for International Development (United Kingdom)	NIMR	Nigerian Institute of Medical Research
FMOH	Federal Ministry of Health	NMEP	National Malaria Elimination Programme
GF	Global Fund to Fight AIDS, Tuberculosis and Malaria	NMDR	National Malaria Data Repository
GMO	Genetically modified organism	PBO	Piperonyl Butoxide
GTS	Global Technical Strategy	PPMV	Proprietary and Patent Medicine Vendor
HMIS	Health Management Information System	PPP	Public-Private Partnership
ICCM	Integrated Community Case Management	PQ-ACT	Pre-qualified artemisinin combined therapy
ICT	Information Communication Technology	PMI	United States President's Malaria Initiative
IDEC	Import Duty Exemption Certificate	PSM	Procurement and Supply Chain Management
IPC	Interpersonal Communication	QA	Quality Assurance
IPTp	Intermittent preventive treatment in pregnancy	RBM	Roll Back Malaria Partnership to End Malaria
IRM	Insecticide Resistance Management	R&D	Research and development
IRS	Indoor residual spraying	RDT	Rapid Diagnostic Test
ITN	Insecticide-treated mosquito net	SC	Steering Committee
KI	Key informant	SBC	Social and Behavior Change
KII	Key informant interview	SMC	Seasonal malaria chemoprevention
LGA	Local Government Area	SME	Surveillance Monitoring and Evaluation
LHIMIS	Logistics Health Management Information System	SMEP	State Malaria Elimination Programme
LLIN	Long-lasting insecticidal net	SP	Sulfadoxine-pyrimethamine
LSM	Larval source management	UNICEF	United Nations Children's Fund
LQAS	Lot Quality Assurance Sampling	USAID	United States Agency for International Development
MCH	Maternal and Child Health	WB	World Bank
		WHO	World Health Organization
		WHOPES	WHO Pesticide Evaluation Scheme
		WHO-PQ	WHO Prequalification

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