



Case Study

Reaching 10M Children within 10 days

Using personal devices for Seasonal Malaria
Chemoprevention in Nigeria



by: Nigeria National Malaria Elimination Programme and RedRose.

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Introduction

Across Nigeria's expansive landscape, Malaria poses a persistent health threat specifically to children under 5 years and with the population constantly growing, innovation becomes a necessity. Nigeria's National Malaria Elimination Programme (NMEP) and RedRose's collaboration birthed a transformative endeavor: The use of Bring Your Own Device (BYOD) approach in the digitalization of Seasonal Malaria Chemoprevention (SMC) campaigns.

Seasonal malaria chemoprevention

SMC is the intermittent administration of a curative dose of antimalarial medicine to children at high risk of severe malaria living in areas with seasonal transmission, regardless of whether they are infected with malaria. SMC was recommended in 2012 by WHO as a safe and cost-effective strategy to complement other control activities, such as vector control measures, prompt diagnosis and treatment of confirmed cases.

World Health Organization, 2023

This initiative unfolded over three pivotal years, spanning from 2021 to 2023, with a notable expansion in scope. What began as a modest effort in Gombe State blossomed into a multi-state operation, encompassing Gombe, Jigawa, Kano, Kwara, Adamawa, Kaduna, Katsina, Niger, Taraba, and Yobe by 2023. At the core of this large-scale digital transformation lay the innovative concept of using community workers' personal devices, commonly known as

"Bring Your Own Device" (BYOD).

It is, in fact, a simple yet dynamic concept. Instead of providing mobile devices to frontline health workers, they use their own personal devices. While this practice is common in Europe and America, few believed it would be effective in the rural communities of Nigeria. However, this approach has redefined the scale and cost-effectiveness of digital health interventions, especially in mass health campaigns.

Why mass health campaigns?

Mass campaigns are a large distribution project which sees tens of thousands of health workers visit each house in communities across the course of 3 days to a week. Some key operational tactics include hiring thousands of temporary staff to scale up quickly and monitoring their work very closely. Having the staff use a personal device for work saves money on purchasing devices which may sit dormant, or which may proliferate the number of "single app" devices health centers must maintain.



For the Global Fund supported SMC program, over the course of 3 years, more than **130,000 personal devices** were used. This revolutionized digital data collection and paved the way for a highly efficient and value-effective technique for implementing digitalized mass health campaigns. However, what challenges were faced during the early adoption of the BYOD approach? What were the key enablers, and more interestingly what were the surprises/outcomes?



Picture 1: Field coordination by health workers

Let us explore the prominent elements that fueled this innovative technique through technology’s “Golden Triangle” of **People, Process, and Technology**. A rubric of elements created to support the planning and adoption processes is available in figure1. We will only discuss some of the elements within the case study.

Rubric Components Considered

People

- Security & Privacy
- Digital literacy & smartphone availability
- Advocacy & Stakeholder Engagement
- Gender gap considerations
- Digital inclusion
- Equity and compensation

Process

- Security & Privacy
- Compatibility Evaluation
- Training
- Staff Turnover
- Device Management
- Pre-existing Processes
- Socio-cultural Considerations
- Complex Operating Environments
- BYOD incentives
- Recruitment criteria

Technology

- Security & Privacy
- Device compatibility & Standardization
- Network Infrastructure & Connectivity
- Support & Maintenance
- Periodic app updates
- Data synchronization
- Disaster recovery
- Online/offline capability
- Device internet data consumption

Figure 1: Rubric Elements

People & Their Technology, Year 1

The first order of business was to check perception against reality. Do community volunteers and health workers living and working in very remote areas where health interventions are most needed own personal devices that enable the deployment of BYOD? Most people assumed not. After several years of managing digital health campaigns across Nigeria, NMEP thought that perception could be incorrect. They conducted a field survey in selected remote communities in two northern states to ascertain if people living in such communities do own and use mobile devices that are compatible with digital data collection apps and software. And what stunned them was the revelation: a staggering 98% of the surveyed population possessed compatible devices perfectly suited for digital data collection. Armed with this data, it became easier to persuade stakeholders, accustomed to receiving devices to consider giving the approach a try.

Introducing New Processes, Year 1

Transitioning from multiple days of device setup work to device qualification reviews performed by the ICT4D team was not challenging. The questions and concerns from the community workers were much more than expected. Mostly related to their personal data security and data usage compensation, a more robust Frequently Asked Questions (FAQs) and release form helped health workers to trust the stakeholders. In addition, more robust training on application management was included to ensure health workers understand when it is active, and when it is not.

Relying on health workers' personal data plans at first proved more difficult than expected. The SMC program takes place over 4 months. The first month saw hesitancy from workers, even though they were assured the total data use is very small (in Kilobytes only) and they are promised compensation. They had to see it to believe it – that they would receive this compensation. A big advantage of the digitalization with ONEsolution in Nigeria since 2018 is that payments do come much faster, and by the 3rd month they believed it.

Finally feeling secure to turn on their data, two big surprises came along for the ICT4D team's investigation!

- Data is on, but nothing will sync. Why??
- Some GPS points are in odd places, like the middle of the ocean. Why??

The world is addicted to social media these days, and community workers are no exception. The convergence of two services for social media turned out to be the perpetrators in this case.



- Providers across Nigeria offer “Social data bundles” which allow people to scroll all day on Instagram and Facebook, check in on X (formerly Twitter), and keep up with friends on WhatsApp. Unfortunately, ONEapp is not included within these bundles. One of the key questions the coordinators and supervisors learned to ask was: The application is not working, and you have data. Are you sure it is mobile data not social data? It looks like an obvious question, but on the ground, it is never this obvious.
- Around the same time as the pilot, the government instituted a ban on Twitter. But that won't stop anyone! VPNs were installed! Which led to some quite unexpected results in GPS locations. Another quick update of the monitoring processes and FAQs!

Technology, Year 1

Surely not everything was perfect with the health worker's personal devices, right? Of course, there were the expected challenges. ONEapp is pretty far backwards compatible and designed for challenging contexts, but with more than 1,300 brands of Android devices out there some are bound to act a bit strange.

The number of devices with unusual behaviors (for example, strange text encoding) was very low and manageable. The biggest surprise was when the approved devices ended up having broken parts!

Also, part of the risk mitigation measure for using BYOD developed by NMEP, involved the procurement of buffer devices that is setup and quickly deployed in rare occasions where the health worker's personal device malfunctions in the middle of work. To ensure performance is not halted due to a broken device, the ICT4D team activates the buffer device deployment protocol (a protocol that also consists of a set of criteria to be met before activating and issuing out a buffer device). This helps in controlling buffer device issuance and manage retrieval also. The outcome of the use of buffer devices showed that not more than 10% of the entire buffer devices procured were activated for use at any given cycle for the three years.

Reading QR codes is a feature of modern life, and mass health campaigns use them heavily. From each worker's identification to fast access to a child's record, a device's camera is an essential component. When some cameras were found to be broken, these devices needed to be replaced and the evaluation checklist updated quickly. Compatibility goes beyond device model and OS versions!



Introducing Efficiencies, Year 2

One of the BYOD approach's greatest influences was its ability to empower health workers on the field. By capitalizing on present digital literacy tiers and integrating BYOD into health workers daily routines during campaign, participation rates elevated. It was surprising to find out that field teams were much more comfortable with their own devices. They have set them up to their preferences, they know it well, and there was no more charging an extra device, worrying about the safety of a provided device, or traveling far to a focal point if something went wrong. One of the biggest advantages was to rely on the person's personal routine of charging their phones and having an activated mobile data.

By year 2, even in new states there was a streamlining of training procedures. What before had a heavier focus on tool utilization and device management moved to time spent on technical expertise and operational efficiency. The BYOD approach enabled staff to perform their duties more effectively and with greater self-assurance.

Reaching 10M Children in a week in Year 3

While overall, more than 17M children were registered and treated for SMC across the 10 states where the BYOD approach was used, the statistic of 10M showcases the scale that using a BYOD approach can achieve. The 10M children were treated across 4 states operating simultaneously, with more than 22,000 devices active at one time.

Imagine trying to store, insure, update regularly, and deploy around 30,000 devices across different locations each week. Then imagine the scale out of device-based use across workers. For example, of the 22,000 health workers you want to have 7,000 supervisors monitor them from a device. Add in the technology support staff, another 7,000. The need for investment in devices is exponentially growing and



Picture 2: Health workers training.



Security of Data and of People

No case study on an ICT4D solution is complete without discussions around data security. Obvious factors, such as the permissions the app needs, when it collects location data, the encryption, security and accessibility of the data on the device were all evaluated. The rigorous real-time monitoring processes ensure that data does not “walk away” if a worker does and limits any data loss if a device bricks or is stolen during the work.

Data security is everyone’s responsibility, and the model now not only stepped forward the efficiency of frontline workers but also provided added trust which ensured the privacy and security of the records collected. The program operations rely on the health workers who are a part of the community. Health workers are already trained on good practices when collecting and managing sensitive data. Immeasurable but important, it eases the way for increased quality of data collected.

The security of people is also paramount. Year 3 also meant deployment in what is referred to as “Complex Operating Environments”, or COEs. Essentially these are the places where security proves to be a big challenge, and in Nigeria it is well known that some states qualify as complex. The approach of using personal devices kept health workers more secure, as they did not appear to have special equipment making them a theft target. It also allowed sustainable operating processes within inaccessible areas, exemplifying the success of remote monitoring and management procedures which ONEsolution supports.

Conclusion

Overall seen as a huge success, using personal devices with RedRose’s ONEsolution for Nigeria’s SMC Mass Campaigns in 10 states proved scalable, sustainable, and extremely cost effective.

This BYOD method not only showcased tremendous potential for scalability, but also demonstrated how utilizing the existing technology resources can increase outreach. Having reached over 10 million children in just a week while using the local resources proves that this model has the potential of revolutionizing similar campaigns world wide.

Lessons from the case study indicate that impact can be scalable with the same budgets allocated to countries, but with better resource identification and management. This will amplify local stakeholder engagement and co-innovative and efficient approaches which will drive local and sustainable change.



Attribution

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