DEPLOYING DIGITAL TOOLS FOR INSECTICIDE-TREATED NET (ITN) MASS CAMPAIGNS: SUMMARY OF KEY RISKS AND MITIGATION APPROACHES

NOVEMBER 2022

amp | The Alliance for Malaria Prevention
Expanding the ownership and use of mosquito nets

CONTENTS

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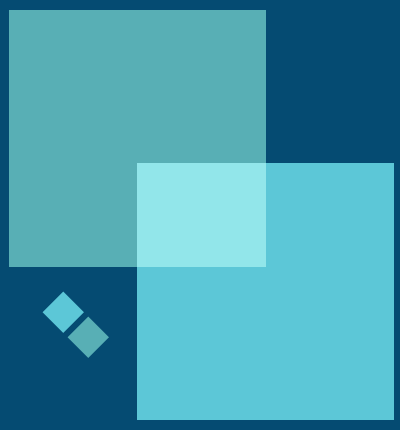

BACKGROUND

Nearly half of the world's population lives in areas at risk of malaria transmission in 87 countries and territories. Globally, there were an estimated 241 million cases and 627,000 deaths due to malaria in 2020[1]. Since 2000, an estimated 1.7 billion malaria cases were averted mainly through the use of insecticide-treated nets (ITNs) and indoor residual spraying (IRS) for controlling mosquito populations. ITNs are the primary tool for malaria vector control and ensuring universal access to nets, in combination with access to diagnosis and case management services, is key to global efforts to control and, in turn, eradicate malaria[2].

Many countries, especially in Sub-Saharan Africa, have implemented mass campaign distribution to achieve universal access to ITNs among targeted populations. Despite national malaria programmes' experiences in ITN distribution through mass campaigns, there remain several challenges with achieving high quality and efficient campaigns, including inaccurate denominators for quantification of needs, insufficient microplanning and management of information and data generated through campaign activities. Many countries are working to solve problems related to timely collection, compilation and analysis of campaign programme, logistics and monitoring and evaluation data to improve campaign quality and outcomes. In recent years, a good number of national malaria programmes have adopted the use of digital tools to reduce and mitigate these challenges. While many countries have seen great success with the deployment of digital tools and have improved their ITN campaign efficiency, planning and implementation of digital solutions can be complex, and many lessons have been learned through pilot and full-scale deployment.

The Alliance for Malaria Prevention (AMP), a global partnership that provides operational guidance and technical support to countries for ITN mass and continuous distribution, has received increasing numbers of requests for information, materials and tools for transitioning from paper to digital systems for ITN distribution and is working to fill gaps in available guidance and resources. In late 2020, AMP undertook a survey of national malaria programmes and partner organizations that were planning ITN campaigns to understand the intention to transition from paper to digital tools, as well as to gather information from countries that had already rolled out digital tools. In addition to gathering information from users, AMP undertook a review of the possible digital solutions for campaign processes (e.g. microplanning, household registration, supply chain management) and a review of the platforms that are in common use for ITN campaigns[3].

1. World Malaria Report 2021.
2. Achieving and maintaining universal coverage with long-lasting insecticidal nets for malaria control, WHO, 2017.
3. https://allianceformalariaprevention.com/wp-content/uploads/2022/05/AMP_Improving_Efficiency_Digital_Tools_EN.pdf

KEY INFORMANT INTERVIEWS:
OBJECTIVES AND SCOPE

This report is based on interviews with national malaria programme staff and partners across 13 countries that had planned and implemented digitalization for ITN campaigns. It highlights experiences from national malaria programmes in the use of digital tools by examining the processes, decisions and successes of ITN mass campaign digitalization. The report also highlights the common barriers programmes face when transitioning from paper-based systems to digital tools and key considerations for successful implementation.

The main aim of the key informant interviews was to gain an understanding of the use of digital tools in various settings. The interviews aimed to capture national malaria programmes' experiences of using digital tools to highlight critical factors that facilitate the use of digital technologies for ITN campaigns and identify lessons learned, best practices and recommendations to benefit countries transitioning from paper-based to digital data collection in future mass ITN campaigns. Representatives from 13 countries were selected from national malaria programmes and partners from a list of 16 countries that had used a digital application or platform for their most recent mass campaign based on responses to a survey conducted by Tropical Health and AMP in January 2021[4]. The results of virtual interviews with key informants from national malaria programmes and partner organizations in 13 countries (Benin, Cameroon, Congo, Djibouti, Ghana, Liberia, Madagascar, Pakistan, Senegal, Togo, Uganda, Yemen and Zambia) are summarized in this report.

The key informant interview guide was structured to gather information on several broad themes (e.g. what led to the decision to transition to digital tools, digital platform used for ITN campaign, COVID-19 modifications to digital platforms, and recommendations for campaign digitalization). The initial interview guide was piloted with the Liberia National Malaria Control Programme and was finalized based on feedback. Each interview took 60 to 75 minutes and was conducted via Zoom. One interviewer led the discussions and recorded the sessions for transcription. The data were analysed using Quirkos[5] version 2.5 software to perform thematic/content analysis to identify common themes out of the responses from the interviews. Oral consent was obtained from interviewees prior to each interview and for recording each session. The interview guide is provided in the annex to this report.

4. https://allianceformalariaprevention.com/wp-content/uploads/2022/05/AMP_Digital_tools_survey_analysis-report_EN.pdf
5. https://www.quirkos.com/

KEY HIGHLIGHTS

Benin

Digitalization was pursued primarily in response to issues with data availability and reliability identified in prior campaigns, including increases in the base population (denominator) to be used for procurement from one campaign to the next using the previous campaign's household registration data. The national malaria programme used RedRose and satellite imagery (Maxar) for its ITN mass campaign. Household registration and distribution of ITNs to households were the campaign components that were digitalized, along with electronic payment of campaign staff. Digitalized data were collected from the registration and distribution team at the household level. Benin's mass ITN distribution was the first to be implemented following the onset of COVID-19 and the digitalization facilitated adherence to infection prevention and control measures such as limiting exchange of vouchers between campaign personnel and household ITN recipients and ensuring maintenance of physical distancing[6]. Challenges included insufficient mobile devices and a lack of experience with digital tools.

Cameroon

The motivating factors behind the decision to digitalize the campaign were the need to solve the problem of delays in reporting campaign results, to speed up the process of generating reports and to facilitate quick decision-making to improve performance. Data quality, timeliness and completeness were also key benefits identified. The platform selected was DHIS2. In Cameroon, paper-based data collection continues at the level of the household registration and distribution teams and data are digitalized at district level and entered into DHIS2 which is online. Household registration, ITN distribution, logistics and M&E were the campaign activities digitalized.

Congo Brazzaville

The primary motivating factor for digitalization was the desire on the part of the Ministry of Health to have a single, consolidated platform for data collection and analysis. DHIS2 was selected as the digital platform. A second tool, Teleriver (SMS), was piloted for real-time monitoring of ITN stock levels and movements of stock in selected districts. Household registration data and ITN distribution data were collected using paper registers and entered into DHIS2 at district level.

6. https://allianceformalariaprevention.com/wp-content/uploads/2022/06/CS_Campaign_Benin_Distributing_ITN_COVID_052020_ENG.pdf

Djibouti

The key factors behind the decision to digitalize were the need to decrease the time to collect and access data and to improve data quality. The platform selected was Kobo. The components of the campaign that were digitalized were household registration and ITN distribution. Main challenges identified included inadequate capacity to manage the Kobo platform, insufficient devices, and lack of internet connectivity in some regions.

Ghana

The decision to adopt a digital approach was motivated by the need to address delays in getting data, to improve data quality and to ensure real-time data were available to make decisions during the campaign. The national malaria programme opted to develop its own in-house bespoke platform/tools (NetApp). The tool supports household registration, ITN distribution, logistics and M&E. Some of the challenges experienced include behaviour change of volunteers who were used to a paper-based system; inadequate technical staff to solve system bugs and incorporate feedback by users; loss and damage to the devices; poor internet connectivity in some areas; and insufficient number of mobile devices.

Liberia

Digitalization was adopted to ensure that real-time data were available to inform the campaign actors on the progress of the campaign activities. The platform/tool selected was Kobo. In Liberia, paper-based data collection continued at the level of the household registration and distribution teams and summary data were digitalized at county level. Major challenges identified included unreliable internet connectivity and insufficient resources to procure devices.

Madagascar

Digitalization was expected to improve the quality of reporting, availability and access to data in real time and also to help in decision-making. The system used was essentially SMS-based reporting of household registration, ITN supply and stock status and communicating on delivery schedules. Financial resources were only sufficient to provide Android devices which supported the SMS software in 56 of 110 districts. Another challenge was the limited capacity and lack of funds for proper training of data collectors on the use of the system.

Pakistan

The motivating factors for adoption of digital approaches were the need to avoid delays in transmission of data associated with the paper-based system and to ensure quality and reliability of data. The programme initially used an in-house ODK-based platform named White Rose, but this was subsequently replaced by the RedRose platform to better address accountability and reliability based on the experience of other malaria programmes. The main campaign activities digitalized were household registration and ITN distribution. Subsequently some logistics aspects were added. Security challenges and sustainability of the digital platform were the main challenges identified.

Senegal

Some aspects of the campaign were digitalized in the cross-border ITN distribution districts with The Gambia to take advantage of that country's previous experience in digitalization. The platform selected was DHIS2. Household level data were collected in the cross-border districts with The Gambia but other parts of the country digitalized only the district level summary data for household registration and distribution using DHIS2. The only significant challenge encountered was lack of funds to procure mobile devices for data collection in all parts of the country. Available devices were successfully deployed in the districts bordering The Gambia to ensure cross-border integration of systems and data and allow for rapid decision-making.

Togo

Digitalization of campaign data was a donor/partner requirement with the objective of improving data quality, timeliness and availability for decision-making. The programme developed an in-house Android app to support microplanning, household registration and ITN distribution. Due to lack of sufficient funding to procure devices, the Togo programme used community-owned mobile phones to implement its campaign[7]. The main challenge was inadequate internal capacity in the development and management of the digital platform, inadequate technical capacity at the local levels during implementation, and inadequate mobile devices.

7. https://allianceformalariaprevention.com/wp-content/uploads/2022/05/AMP_digitalisation_mass_campaign_Togo_EN.pdf

Uganda

The motivation for digitalization was to shorten the campaign and reduce the number of processes involved, as well as to satisfy a partner/donor requirement. The Uganda programme also wanted to combine registration and distribution data to reduce the time lags between these activity phases. At the onset of COVID-19, the programme recognized the opportunities, if digitalization were adopted, to minimize physical interactions with the public during the campaign while ensuring ITNs were distributed to households[8]. Uganda used a bespoke platform that comprises a Central Collaborative Management Information System (CCMIS) and an Electronic Data Management Information System (EDMIS). The CCMIS was used for microplanning, including collecting information from administrative units, numbers of people, stores, cadres of staff available in the districts, etc., while the EDMIS was used for household registration, distribution, logistics, monitoring and evaluation, supervision and payment of campaign staff. An electronic payment system (Mobile Money) was used to pay campaign staff. Challenges experienced included lack of mobile devices, poor connectivity, and lack of electricity in some areas, plus insufficient time available for pre-testing or piloting the platforms prior to deployment.

Yemen

The switch to digital systems was primarily done to support real-time monitoring and reporting and feedback to the warehouses and field teams and to improve control and timeliness of the data reporting processes. ODK/ Kobo toolbox was used for daily aggregation of household registration data, ITN allocations and daily distribution data summaries, while teams undertaking registration of households used paper-based registers. Inventory management, delivery tracking, stock tracking and repositioning management for ITNs were digitalized. Online dashboards supported supervision activities. The major challenges identified include low network coverage and low bandwidth in rural areas.

Zambia

Digitalization and use of detailed mapping were particularly employed to address the difficulties encountered in implementing a mosaic approach to vector control, whereby communities were allocated either ITNs or indoor residual spraying (IRS). The Zambia programme used a platform called Reveal, which is an open-source geographic information system (GIS) platform that can also collect household-level data, although the latter was not implemented during the campaign. At the microplanning stage, countrywide maps were prepared using open-source data obtained through GRID3, Google, Maxar and national statistics, and supplemented with data obtained from mapping health facility catchment boundaries across all 116 districts. The maps delineated the health facility catchment area boundaries, the residential structure count (for IRS) and the settlement population (for ITNs). Household and distribution data were collected on paper by volunteers and aggregated at health facilities and then entered in DHIS2. The DHIS2 platform was used for redeeming codes or coupons at ITN distribution points. Payments were made through Airtel Money or similar platforms. A major challenge was the fact that different tools and data sources produce different population estimates and this created difficulties in deciding which estimate was the most appropriate for planning purposes. In addition, mobile and internet coverage were patchy, especially in remote areas.

8. https://allianceformalariaprevention.com/wp-content/uploads/2022/06/CS_Campaign_Uganda_COVID_122020_EN.pdf

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MOTIVATION FOR ADOPTION OF DIGITAL TOOLS FOR ITN MASS CAMPAIGNS

The decision to adopt digitalization for some or all components of ITN mass campaign planning and implementation was influenced by several factors. The most frequently cited motivation or desired benefit of digitalization was to improve the availability of accurate and timely data to support campaign progress monitoring and decision-making, and to take corrective actions where necessary. The following were identified as key motivational factors for digitalization of ITN mass campaigns:

Availability of real time data for decision-making

The use of digital tools supports the collection of campaign data in near to real time to inform and improve decision-making during household registration and distribution. Digital tools enabled campaign monitors to have access to daily data on progress against targets for taking corrective actions to improve campaign coverage. Interviewees emphasized the importance of digital tools enabling data to be retrieved when needed, unlike the paper-based data entry and retrieval of information.

> "The switch to digital systems was primarily to support real-time monitoring and reporting and feedback to the warehouses and field teams and to improve control over and timeliness of the data reporting processes. Previously campaign data were only available at the end of the campaign."
>
> ***Yemen***

> "The campaign was originally paper-based, with an Excel-based data transmission, but we later realized it would be important to digitalize because it helps address delays in getting the data, data quality issues and the need for real-time data to make decisions during the campaign. There was a need to come up with digitalization to make this more efficient and effective."
>
> ***Ghana***

Improvement in data quality and accountability

The desire to improve data quality, timeliness and completeness was also a key factor in the decision of most countries to adopt digital tools. Interviewees emphasized the ability to automate household registration and distribution data rather than the labour-intensive task of manual data completion as a key benefit for transitioning to digital tools. The use of such tools can also enhance data accuracy, eliminating or minimizing errors associated with the paper-based approach, including calculations for determining ITN needs during registration and misallocation of ITNs during distribution. Digital tools also improve confidence in campaign data by offering a clear overview of household registration and distribution by all actors involved in the campaign and any red flags can easily be traced to the responsible person for redress. It improves accountability in the payment of campaign workers by providing data to support their involvement in the campaign.

> “The real problem that motivated the choice to switch to digitalization was a problem of data availability and reliability. During the campaign in 2017, there was a discrepancy between the campaign census data and the data from the statistical institute (INSAE). This led us to hope that digitalization could correct this type of discrepancy. The data collected during the (previous) campaign were not reliable and usable, especially coming from the household survey, which revealed many false declarations. We then decided that digitalizing the campaign by using electronic devices could mitigate the problem of false declarations at a certain threshold of tolerable errors.”
>
> ***Benin***

> “We wanted to improve data quality, as with the paper system there were many errors in data capture that were difficult to handle. With the digital tool we were able to introduce data validation rules embedded in the mobile app. This gave us control over the registration process and the ability to reduce the number of mistakes. A web-based application was used by supervisors for oversight over the process and dashboards to aid in supervision.”
>
> ***Uganda***

> “Thirdly was for improved accountability. Under the paper-based system it was not possible to track where issues were arising. Digital tools gave us better accountability of those involved in the distribution at volunteer and distribution point (DP) level. Also, it helped to ensure transparency of the various mechanisms because everyone can see the live data and there were daily updates from each DP level. Supports much better control compared to paper-based systems.”
>
> ***Pakistan***


© Togo 2017

Donor or partner requirement to digitalize ITN campaigns

The increasing use of digital tools in campaigns can also be attributed to requirements by some donors and partners. Many interviewees cited the global move towards digitalization as well as requirements by donors as the motivation for the use of digital tools for their campaigns. Some of the staff of national malaria programmes interviewed also benefited from already existing solutions used by other programmes or partners who already had digital platforms.

> "In relation to the digitalization for the 2017 campaign we had a partner which had requirements in relation to the contract we signed with them. The requirement was to digitalize all campaign data."
>
> ***Togo***

> "It was also the will of the state authorities to switch to digitalization. We work with the Country Coordinating Mechanism of the Global Fund. In agreement with the national malaria programme, a situation analysis identified the important shortcomings associated with paper-based data collection and proposed that we move on to digitalization and the country gave its agreement."
>
> ***Benin***

Experiences with digitalization of other health programmes

Other motivating factors influencing the decision to transition to digital tools included building on experiences gained from other interventions within the country or lessons from other countries' experience. National malaria programmes that had digitalized some programmes such as IRS, seasonal malaria chemoprevention or post-campaign assessments were motivated to digitalize their ITN campaigns to take advantage of lessons learned from the other programmes.

> "There has been some past digitalization experience with other programmes. The only basic experience we had was with the post-distribution monitoring after the 2017 campaign. This monitoring was digitalized and consisted of returning twice to the community to check whether the mosquito nets distributed in 2017 were available, hung, used and in good condition. We did it with the support of our partner. This digitalization concerned four regions in which we had distributed mosquito nets. It was a great experience on which we relied later."
>
> ***Togo***

Digitalization as a COVID-19 mitigation measure during ITN campaigns

The COVID-19 outbreak was also noted as a motivating factor for the adoption of digital tools for campaigns. Some of the country representatives interviewed reported that they were either implementing digitalization for the first time or modified the digitalized approach as a risk mitigation measure during household registration and distribution activities. Digital tools enabled the countries to register households without having to exchange vouchers during registration and distribution.

> “Even before COVID-19, the motivation for digitalization was to shorten the campaign and reduce the number of different processes involved. When COVID-19 came in, we wanted to minimize physical interactions with the public.”
>
> ***Uganda***

> “During COVID-19 we wanted to minimize exchange of paper documents, so we abandoned the use of code cards (unique codes still used, but not paper-based) and instead increased the number of options for redeeming a net. Previously, only two options were available: the unique code or the recipient’s name. Since COVID-19, recipients can also use their phone number, ID card, driving licence, etc. About 90 per cent of recipients use their ID card at registration, so they can use the same ID card at redemption. A component to monitor adherence with COVID-19 guidelines was also added to the app.”
>
> ***Ghana***

> “During COVID-19, the implementation of Kobo avoided collecting data on paper. Being unable to go into the field, data feedback through the system in place continued. COVID-19 made us more aware of the need for digitalization.”
>
> ***Djibouti***

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Reduce time and cost of data collection in ITN campaigns

Other motivating factors behind the decision to adopt a digital approach to campaign implementation included a desire to decrease campaign costs associated with the need to use large numbers of data entry personnel and costs associated with printing and distribution of paper-based tools to communities.

> “For the previous campaign, we were using a paper-based approach and it was difficult to collect and do the data entry and we had to recruit a lot of data entry operators. We spent a lot of money and at the end the data did not meet our expectations.”
>
> ***Togo***

Improve ITN campaign planning

The effective use of digital tools for microplanning has the potential to improve data driven decision-making for campaign delivery. The use of digital maps enabled the Zambia programme to effectively target and deliver both ITNs and IRS efficiently.

> “In 2017, Zambia’s national malaria programme strategy switched from blanket ITN coverage with focused IRS to 100 per cent vector control, with either ITNs or IRS. This mosaic approach was difficult to implement, especially at sub-catchment level and so to facilitate the microplanning of which settlements and sub-catchment areas would receive which vector control intervention, we introduced the use of countrywide maps using open-source data through GRID3, Google and Maxar, supplemented with our own data obtained from mapping health facility catchment boundaries across all 116 districts.”
>
> ***Zambia***

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CAMPAIGN ACTIVITIES AND PROCESSES DIGITALIZED

Microplanning

Togo, Uganda and Zambia were the only countries that had some experience in the use of digital tools for microplanning of mass ITN campaigns. Representatives interviewed from the other countries reported generally continuing to use paper-based systems or Excel spreadsheets to conduct campaign microplanning. The use of digital tools for microplanning included geospatial microplanning and an online tool that aggregates the data and cost of microplanning activities.

> “CCMIS. This digital platform was used for microplanning – to collect information from administrative units, numbers of people, stores, cadres of staff available in the districts, etc. All the data were validated and entered in the CCMIS.”
>
> ***Uganda***

> “Based on the Excel sheet, the ICT team was able to develop an in-house app that helped us to have the population estimate, to be able to identify the number of registered households, to identify the different distribution sites, the number of villages, to determine the supply of mosquito nets and even the transport routes to take. We had information on the number of villages per health facility and the number of teams needed. All these details were taken from the Excel sheet and translated into a more effective software app that allows more features and gives more flexible manipulation.”
>
> ***Togo***

© Cameroon 2015

Household registration

In many of the countries that had digitalized ITN campaigns, household registration was one of the campaign components where digital tools were commonly used. Almost all the national malaria programmes interviewed had digitalized some aspects of campaign registration activities including the use of mobile phone devices by door-to-door registration teams to collect household data from communities and automatic ITN allocation based on inputted data as well as daily aggregation of paper-based registration data at district level. Even though several of the countries were using digital tools to register households, there were still some countries including Liberia, Cameroon and Congo that used digital tools to aggregate registration data only at district level.

> “Community volunteers submitted paper registers to a health facility, where they were aggregated and moved to district level. District level data were then entered into DHIS2. The Reveal platform can be used to register households for ITN distribution.”
>
> ***Zambia***

> The digital platform was used for household data collection, registration data summary and cross-reference with microplanning data and ITN allocation. Registration figures within the app were then used to look at distribution coverage and ITN consumption. This identifies areas that may be running low in ITNs for example."
>
> ***Ghana***

> (Campaign personnel) were trained in the use of DHIS2 and all the registration data and then all the distribution data were collected by paper and other tools gathered at the health district level and entered into the DHIS2 system at the level of each district."
>
> ***Congo***

ITN distribution

In almost all the countries that had digitalized campaigns, ITN distribution was one of the components largely digitalized. Most national malaria programmes that had used digital tools for household registration also used digital tools to distribute ITNs to households. In addition to the use of digital tools to issue ITNs to households based on verification of already existing electronic household data, some countries also used digital tools only for the aggregation of summary daily distribution data at the district level.

> In 2019, with RedRose, the distribution was much easier. The household would attend the distribution where the voucher was scanned and the information on the household members and number of nets to be allocated would show on the screen and the voucher exchanged for the nets."
>
> ***Pakistan***

> The digital tool provides an interface where all allocated ITNs are linked to recipient details and the place of distribution. The system can tell whether the person to which the net has been allocated has received the net. There is a crosscheck of allocated versus received. It also has a component that helps us to perform random checks to see if person A registered has received a net or not. Two interfaces - one records persons who were allocated nets, the second records those to whom nets were distributed."
>
> ***Ghana***

Monitoring and evaluation

The use of digital tools in campaigns enables real-time tracking of performance of registration and distribution personnel activities. The web-based dashboards usually included in the digitalization package are easily accessible by campaign supervisors and facilitate rapid corrective action by providing feedback to registration assistants on daily performance. In almost all the countries that had digitalized campaigns, dashboards were a key feature that improved data access and helped national and sub-national level supervisors to monitor progress of the campaigns easily. Digital tools were also commonly used for monitoring and evaluation of campaigns including the use of mobile data collection tools for in and end process assessment of campaigns.

> “ITN distribution progress status is presented via LIVE online data visualization dashboard (MS Power BI Software) that reads cleaned data from the cloud. Data flows are managed and synchronized using cloud computing services that link the three levels.”
>
> ***Yemen***

> “We developed an in-house ODK-based monitoring checklist used by all monitoring officers in the field and which was consolidated daily. The checklist was very helpful in rapid monitoring of household registration.”
>
> ***Pakistan***

Logistics management

Some of the countries provided examples of various strategies and different uses of digital tools for commodity tracking and monitoring of stock levels during campaigns. Interviewees emphasized the importance of using digital platforms for inventory management, delivery tracking, stock tracking and management of inventory with the use of a web-based set of interactive data visualizations.

> “Commodity tracking in terms of movement of nets was handled by the National Medical Store but a digital platform was used to track nets from central warehouse to sub-counties. This included an SMS component to inform stakeholders of movements of nets from central warehouses to sub-counties. CCMIS was also able to handle other logistics apart from nets during COVID-19 such as movements of personal protective equipment (PPE) to the staff working on the ground.”
>
> ***Uganda***

Payment of campaign staff

To improve payment for campaign workers, some of the country representatives taking part in interviews reported that they had implemented electronic payments using mobile money applications. The payment process for campaign actors included electronically capturing work done, generating a payment sheet based on work done, payment verification, and payment processing through mobile money platforms. Zambia, Uganda and Benin had implemented electronic payments for their campaigns through telecommunication service providers.

> “Mobile Money was used for payments. Around 90 per cent of payments were made electronically, including to national level temporary staff employed for the campaign. This was not possible in Karamoja, however, as the number of mobile phones and access are both very limited. An external company was contracted to handle the electronic payments.”
>
> ***Uganda***

DIGITAL PLATFORMS USED FOR ITN CAMPAIGNS

This section presents an overview of some of the platforms used by malaria programmes and factors considered in the selection of the platform.

Type of digital platform used

A range of digital platforms was used, including bespoke applications usually developed in-house by the programme staff or in collaboration with partners (Ghana, Togo, Uganda), open-source platforms, e.g. DHIS2 (Cameroon, Congo, Senegal), Kobo (Djibouti, Liberia), ODK (Yemen), Reveal (Zambia), Microsoft BI dashboard (Yemen), and Teleriver SMS software (Congo) and proprietary platforms including RedRose (Benin, Pakistan).

Factors considered in the selection of the platform

The main factors that influenced the choice of digital platform included the following: security and trustworthiness, open source, ease of use, familiarity or use by other programmes, additional functionality and accuracy and reliability.

> “We felt that RedRose better addressed accountability and reliability and accuracy components compared to an ODK-based system. We compared the experiences with White Rose and RedRose. RedRose supported decision-making as it gave better visibility of real-time data and allowed central level to visualize the daily registration and distribution data and make decisions on how to address low redemption for example. Other factors included the QR code[9] capability.”
>
> ***Pakistan***

> “We decided to use a bespoke Android application, because Android is a platform commonly used in Africa and specifically in Ghana. Also, Android is less complicated to use than some of the other platforms. Android devices are relatively cheaper to obtain for the campaign staff. In 2018 we used just the Android version, but in 2021 the tool has progressed and now has a web interface with the same functionality.”
>
> ***Ghana***

9. A QR code is a type of matrix barcode, i.e. a machine-readable optical label that can contain information about the item to which it is attached.

“The main factor that guided our choice was ease of use. DHIS2 is used by several structures and programmes and most African countries use it. DHIS2 is a tool which is recognized by the Ministry of Health, and it was necessary to align with the tools already in use and validated by the MoH. Several tools were considered, including Kobo and ODK. What also guided us was the functionality of the system. The other tools are rather collection tools and not analysis tools like DHIS2.”

Cameroon

Table 1: Summary of tools used

Country	Digital tool used	Campaign phase digitalized
Benin	RedRose, Maxar	Household level registration and distribution, electronic payment
Cameroon	DHIS2	Data aggregation at district level (household registration and distribution)
Congo	DHIS2, Teleriver	Data aggregation at district level (household registration and distribution), logistics
Djibouti	Kobo collect	Household level registration and distribution
Ghana	NetApp, Kobo collect	Household level registration and distribution, supervision and logistics
Liberia	Kobo Toolbox	Data aggregation at district level (household registration and distribution)
Madagascar	SMS, Power Bi Dashboard	Data aggregation at health facility level (registration and distribution), logistics
Pakistan	RedRose	Household level registration and distribution, logistics
Senegal	DHIS2	Household level registration and distribution for the cross-border distribution with The Gambia. Data aggregation at health facility level (registration and distribution) for the rest of the country
Togo	MILDA application, Kobo toolbox	Microplanning, household level registration and distribution
Uganda	CCMIS, EDMIS	Microplanning, household level registration and distribution, logistics, M&E, supervision, electronic payments
Yemen	ODK Kobo, Microsoft Power BI	Macro-quantification, microplanning, data aggregation (household registration and distribution), commodity tracking, supervision and M&E
Zambia	Reveal	Microplanning, data aggregation at health facility level (household registration and distribution), supervision and M&E

KEY REQUIREMENTS FOR TRANSITIONING FROM PAPER-BASED TO DIGITAL TOOLS

Ensure adequate technical capacity to manage the digitalization

Almost all the respondents from national malaria programmes taking part in interviews acknowledged the need to ensure availability of technical capacity to manage ITN campaign digitalization. According to the respondents, programmes should recruit people with Information and Communication Technologies for Development (ICT4D) skills to support the campaigns. Programmes can rely on already existing ICT4D in other departments or create a new department to manage the campaign digitalization. This is particularly important in ensuring readily available technical staff to support with troubleshooting and fixing of challenges during implementation. Respondents also noted the need to run boot camps to train the existing health information system personnel at sub-national levels to support campaign digitalization. Where necessary programmes should plan to engage an expert to support with the exercise.

> “We have a well-trained IT staff supporting DHIS2 at the national level. They are the ones who helped us develop the module dedicated to the ITN campaign in 2019. We also have well-trained staff at the district level able to get the data into the system. We need to improve the training of agents using the tablets to collect data in the cross-border districts with The Gambia to improve the quality of collected data.”
>
> ***Senegal***

> “The digitalization process was led by the IT department with support from the intervention teams, programme management and M&E personnel. When cascading down from national level, we used the existing Ghana Health Service systems to train the sub-national levels on use of the app. The IT section supported all the technical level information to support troubleshooting.”
>
> ***Ghana***

> “We had a technical sub-committee that supported from the side and whenever there was an issue, there were people outside of the campaign management team we could turn to for solutions, e.g. in terms of server-side support.”
>
> ***Uganda***

Initiate ITN campaign digitalization planning early

ITN mass campaign digitalization involves a series of activities: decision-making on which system, development of the system, procurement of devices, training and pilot where digitalization has not been previously deployed at large scale. All these require ample time before a full-scale implementation. Interviewees stated that it takes between three months to one year to plan and fully operationalize a platform for digitalization of an ITN campaign. Several factors influence the timelines for transition to the use of digital tools including availability of ICT4D expertise, size and scope of campaign, experience in digitalization of other health interventions and type of platform.

> “There are quite a few difficulties when considering implementing large-scale digitalization, especially as large as a mass ITN distribution campaign. It takes a long time to prepare the stakeholders so that they are convinced of the added value. Apart from that there are a lot of difficulties from the government authorities like, why are you buying so many phones, is it not for spying? etc. There are a lot of worries to manage, even at the customs level. We had to postpone the campaign because the equipment was stuck at customs for months because they were investigating to find out what to do with it despite the intervention of the Minister of Health and other authorities.”
>
> ***Congo***

> “Decision to go digital was initially taken in June 2019 and implementation started around June/July 2020, so about one year. Implementation was delayed by budgeting processes and COVID-19”.
>
> ***Uganda***

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Leverage on existing programmes or other departments' experience and resources

Implementing digitalization of ITN campaigns involves a great deal of human and financial resources in the context of national malaria programme staff having several competing activities during the same period. Interviewees emphasized the importance of collaborating with other departments and partners with expertise in ICT4D. For instance, it was stressed that national malaria programmes can use temporary staff from other ministries or other agencies who have experience in implementing digital tools. Programmes can also leverage on existing mobile devices and platforms.

> "The composition of the ICT team members came from several programmes of the Ministry of Health. The ICT team was made up of technicians from different programmes and services, including the national health information system, database managers and computer technicians from different programmes. We also needed occasional external support."
>
> ***Togo***

Consider interoperability and link to existing health information systems

As programmes transition to the use of digital tools, it is important to consider the sustainability of such tools and how they are integrated with the existing tools used for other interventions. Interviewees highlighted the need to integrate campaign digitalization with the national health information system to leverage local skills in the deployment of digital data collection and cross-sharing of data for other programmes.

> "The interoperability of the platforms to be used needs specific attention as well. The platforms should be compatible with DHIS2 which is the MoH's current information, data collection and analysis system."
>
> ***Madagascar***

Build capacity and confidence of programme staff on the management of the system

While adoption of digital tools is essential in improving data access and quality, achieving the optimal benefits of ITN campaign digitalization will require effort at building ICT4D capacity of campaign personnel to implement and feel confident using digital tools.

> "The processes were carried out in parallel. We used the digital system for reporting along with the traditional paper-based system. This was the first experience, and we did not want to take too much risk. Maybe in the coming years we will be more comfortable with digitalization. It was the same teams that used both SMS and the paper-based system. SMS was only used for quick data collection during campaign activities. Agents collect the data on paper and send the result and figures by SMS."
>
> ***Madagascar***

> We perceive digitalization as perfection, and we must not go back to a paper-based system. But for the sustainability of this operation, you must think about two things. Do we have the possibility to guarantee the financing? When we do not have a partner to finance us, we risk returning to rudimentary methods. It is also necessary to think about a real and effective transfer of skills. In this regard, as we all see, digitalization is quite complex and requires certain skills that are not always easy to transfer. It is necessary to identify personnel profiles and strengthen their skills and capacities."
>
> ***Benin***

Budget for campaign digitalization

Digitalization requires investment both in terms of logistics and human resources. It is important that programmes consider different components of digitalization and budget for funding to adequately support the digitalization plan. Most of the programmes funded their campaign digitalization either through the Global Fund grants, from partners or government support, especially for human resources. According to the interviewees, campaign digitalization was often an afterthought and was therefore not adequately budgeted. Some of the countries therefore resorted to the use of community mobile devices or limiting the levels of digitalization mostly to the summary at district levels due to inadequate funds to support full scale transition. National malaria programmes should plan and adequately budget for digitalization of campaigns.

> Concerning the devices, we did not buy any. We just bought accompanying equipment, including power banks and various cables. I admit that this was an extreme case that we did not think about at the start of the campaign. We planned to buy 7,000 smartphones as part of the campaign. We were made to understand that the budget was not available. Facing this reality, we had to put in place a plan B. It was not at all obvious and partners were clearly doubtful about our chance of success."
>
> ***Togo***

> In terms of additional resources, our partner provided technical support in how best to process data and make them available in a timely manner. Also, we had organizations supporting free access to the system for end-users, e.g. a telecommunications company provided free internet access for data entry clerks so they did not need an internet data package. EDMIS is standalone apart from integration with CCMIS."
>
> ***Uganda***

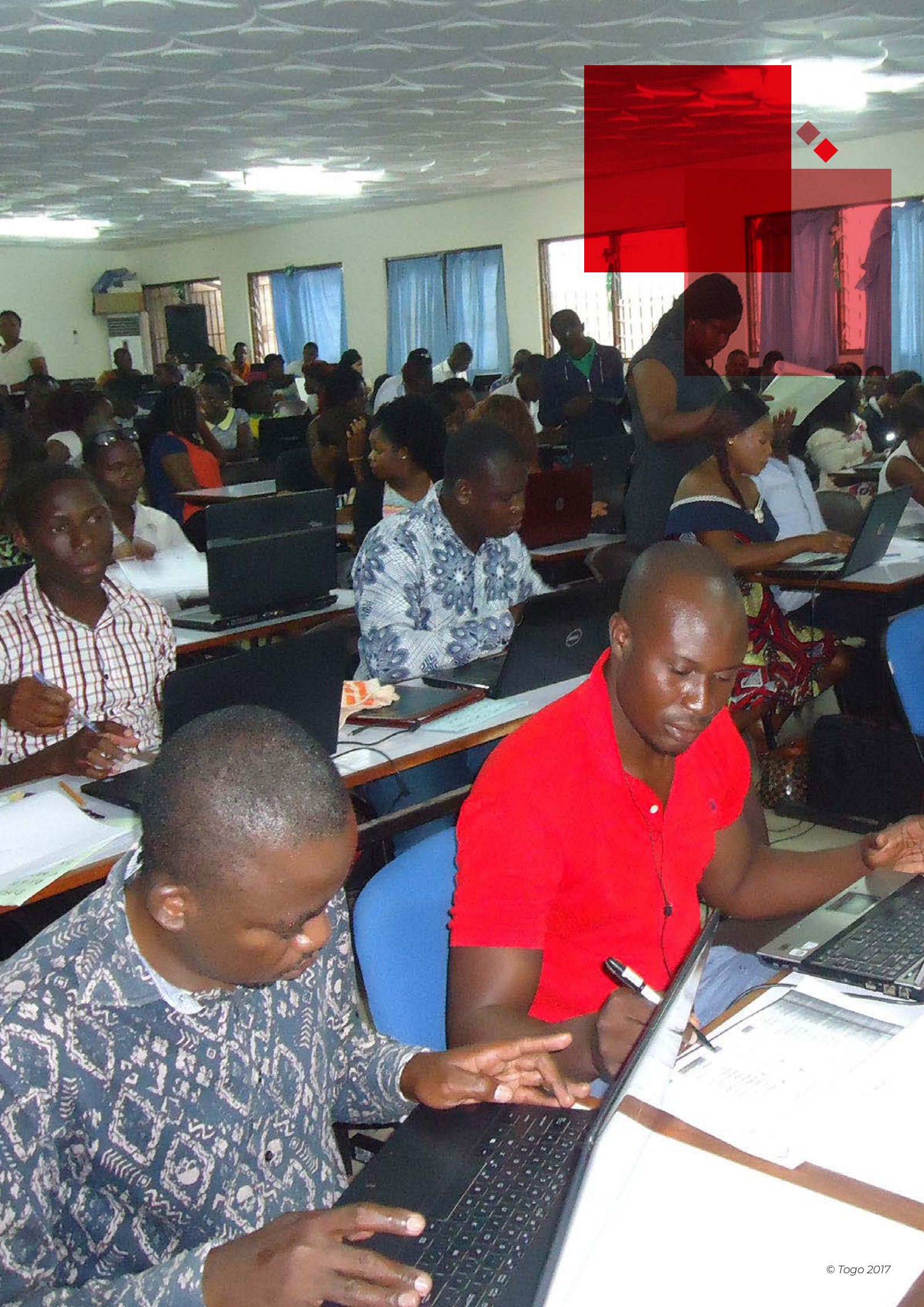
Consider infrastructure and local context

Most interviewees alluded to the fact that access to mobile network and electricity are vital in designing the most appropriate digital platform and determining the right devices. The availability and access to this infrastructure varies widely in different localities in most of the countries that participated in the interviews. Programmes need to do a comprehensive assessment of the local operational context to make informed decisions during the planning for digitalization of campaigns. Interviewees also highlighted the need to localize the digitalization at sub-national levels based on the security situation and restrictions in place.

> "I would recommend that the main requirement would be to have an effective M&E and other structures, including human resources already in place. Secondly appropriate infrastructure in terms of system hosting, security, hosting environment, good connectivity to support remote connections from the field. Experience with managing campaigns was crucial."
>
> ***Togo***

> "Piloting of the system is critical at quite a large scale, e.g. a district. Communication is vital. We had daily Zoom meetings with supervisors and WhatsApp groups were used to share information."
>
> ***Uganda***

> "I think the basic requirement is that the system be a sustainable system in terms of practical feasibility and easy to use. Let it be something that can be supported in the long term by the available financial resources. In my opinion, this is the primary requirement. The system must be mastered by everyone. Often people do not even master the paper system, when it is the paper system that they want to digitalize. You must master what you really want in the system you want to put in place."
>
> ***Congo***



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BARRIERS OR CHALLENGES TO DIGITALIZATION OF ITN CAMPAIGNS

Despite the known benefits of digitalization of ITN campaigns, interviewees noted several challenges encountered during the transition from paper-based tools to digital tools. In summary:

- **Poor infrastructure support:** Two main infrastructure issues were identified; internet or mobile network connectivity and electricity. In almost all the countries that participated in the KIIs, the use of internet was regarded as an important component in the transmission of campaign data from mobile devices to a central server making the data available to national and sub-national personnel in real-time. Despite the global increase in internet connectivity in most countries, some countries included in the interviews represent those with the least internet connectivity, especially in rural areas[10]. Mobile data collection devices were mostly used offline during registration and distribution exercises but required internet connectivity to synchronize the data daily. The inconsistently reliable network connectivity especially in rural areas affected synchronization of data. Lack of electricity needed to charge mobile devices daily in some remote areas also affected the implementation of digitalized data collection.

- **Inadequate resources for digitalization:** Digitalization of campaigns required additional funds to procure tablets and training of campaign actors in the use of the digital tools. Several countries reported challenges with lack of or inadequate funds to support digitalization. This challenge was often linked with inability to procure an adequate number of devices leading to campaigns running in phases according to the number of devices available. Respondents also identified that the use of a paper-based system for household level registration while using digital tools for entry of sub-national summary data was driven by inadequate funds to implement full scale digitalization of campaigns.

- **Inadequate human resource capacity in digitalization:** Inadequate technical capacity within the programmes to develop and manage proposed digitalization tools was also noted as one of the most significant challenges in deployment of digital tools for ITN campaigns. Respondents pointed out that programme staff had limited experience and knowledge in the use of digital tools to implement ITN campaigns. Most of the interviewees were implementing campaign digitalization for the first time in their countries. Inadequate knowledge and lack of specific guidance on the transition process often led to late decisions by programmes which eventually affected campaign timelines. In some countries, existing community volunteers were digitally illiterate and were not able to be trained on digital tools in time, requiring trained personnel to be moved from one locality to another to manage the digitalization process.

- **Security:** While there is an increase in the use of digital tools for campaigns, there remain challenges in some countries about how and where these tools can be deployed. In some areas security is an issue as mobile devices are not permitted by some agencies. This meant not all areas within the same country could implement digitalization for campaigns and led to hybrid systems that require more work for development of all materials for implementation and training, as well as training separate facilitation, supervision and monitoring teams based on the data collection methodology.

10. https://www.pewresearch.org/global/2016/02/22/internet-access-growing-worldwide-but-remains-higher-in-advanced-economies/

- **Managing tablets or devices:** Implementation of digitalization for campaigns most often involves the use of many devices that require management. End users can sometimes unintentionally damage the devices. Also, transportation of devices in a safe and secure manner to and from different parts of the country required additional funds and logistics to ensure device security and safety.

- **Perception that digitalization will solve all data related issues:** Even though digitalization has the potential to improve campaign efficiency, it does not solve all campaign data quality issues. It was noted that some of the implementing agencies relied heavily on the expectation that errors would not occur simply by using a digital platform and therefore focused on devices and their use at the expense of ensuring understanding of basic concepts that affected the quality of the collected data.

- **Underestimation of time needed for transition:** Planning for transition from paper-based to digital tools requires a rigorous process of ensuring readiness of logistics and human resources to implement the campaigns. In some cases, the national malaria programmes required more time than originally planned to implement the digitalization. Underestimation of time needed for the process is closely linked to lack of experience and guidance to implement large-scale campaign digitalization. The main challenges faced because of this included unrealistic timelines for development of the system and delay in procurement of mobile devices which often led to changes to campaign timelines.

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KEY RECOMMENDATIONS FOR ADOPTION OF DIGITAL TOOLS FOR ITN CAMPAIGNS

To address the above-mentioned challenges and barriers to transitioning from paper-based systems to digital tools, the following recommendations have been identified with the expectation that their implementation is based on understanding of the key considerations for transition of digital tools identified in this document.

- **Set up effective and well-functioning structures** e.g. M&E or ICT4D department as well as clear goals and objectives of the digitalization before attempting to digitalize ITN campaigns. A technical (programmatic) team should guide the digitalization process and ensure that ICT4D staff are given the necessary information to undertake their tasks.

- **Conduct a comprehensive assessment of the operational and environmental context** including mobile network coverage and internet connectivity, as well as availability of electrical power, before deciding on the most appropriate digital system and related infrastructure. This should also include an inventory of which systems, tools and approaches are already in use in the country, other programmes implementing digitalized data collection (particularly for campaigns) and what lessons can be drawn from them.

- **Leverage on existing and established digital tools with interoperability** with national health information systems such as DHIS2 or other national data systems. Use of systems that are not interoperable can often affect use of the registration or distribution data for other programmes and threaten sustainability of such tools.

- **Develop plans to train and build capacity at multiple levels of the health system** in the use and management of the digital tools with adequate supportive supervision for campaign staff. Sub-national level campaign supervisors should be trained and have the capacity to handle common troubleshooting challenges during implementation.

- **Ensure strong commitment, leadership, dedication and interest in adopting digital approaches** and platforms by the programme and allied partners. A significant advantage for the adoption and roll-out of digitalization is management commitment (in addition to technical support).

- **Strengthen supervisors' understanding and use of data to take corrective actions** through the implementation of in-process assessments and spot checks to improve data quality.

- **Ensure realistic expectations and mitigate against potential risk.** It is important to understand that digital tools will not solve all the problems experienced with a paper-based system. Digital tools will not make an ineffective programme effective but do provide an extra means to improve efficiency in delivery of campaigns.

- **Ensure large-scale pilots in different contexts in advance.** Digital tools need to be tested in different contexts and localities and lessons incorporated before embarking on full-scale campaign digitalization. Back-up plans for data collection should be in place should digital tools fail, particularly in hard-to-reach areas.

- **Adopt digital platforms and tools that are financially feasible and sustainable** with the resources and infrastructure available in the country. Map out existing platforms/tools in use and available and decide on which one the programme will be able to implement based on capacity and available resources. For instance, use open-source software compared to proprietary software to avoid payment of multiple licences at all levels and over multiple years where sustained resources are not available.

- **Gather feedback from end-users** to ensure that the system can evolve and improve over time. Programmes should implement a system to generate feedback on usability of the platforms to continuously improve the system and resolve any challenges identified for end users.

- **Explore the possibility of use of existing mobile devices at district and community level** by taking into consideration system requirements and incentives for owners. Programmes can work with community-owned devices to reduce costs of procuring new tablets for campaigns. Clear specifications of compatibility of types of devices to the platform and scoping should be done before implementing such an approach.

- **Adopt best practices from other countries** that have transitioned to the use of digital tools for ITN campaigns. Some of these best practices include setting-up prompts as verification mechanisms to guide data entry and reduce errors.

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ANNEX 1: DATA COLLECTION INSTRUMENTS FOR COUNTRIES (interview guide for national malaria programmes)

1	Introduction
	Introduction: "Hello, thank you for joining me today. My name is "_____" and I am a consultant with the Alliance for Malaria Prevention. AMP with funding from the Bill and Melinda Gates Foundation (BMGF) is compiling countries' experience with digitalizing ITN mass campaigns which can be used as a guide for countries planning to digitalize their future campaigns. We want to hear about your experiences, lessons learned and best practices when using digital platforms during your most recent ITN mass campaign. Your response will help us learn what went well with your digital tool deployment and what can be improved in the future. We will keep your responses strictly confidential within our evaluation team. Our interview will take about 75 minutes. Do you have any questions about the interview? Do you agree to be interviewed?" (if NO, thank the individual and end the call). "Do you agree to allow us to record our interview to be sure we record everything you share correctly?" (If NO, proceed with the interview without recording.)
2	**Identification**
	Date of interview
	Country
3	**Key informant's background: "Let's start with a few questions about yourself and your involvement in the campaign"**
	What is your full name?
	Gender
	What is your current job title?
	Name of your organization (national malaria programme staff/partner)
	Did you participate in the planning and roll out of the digital ITN campaign? if No, thank the individual and end the call
	What was your role in the ITN campaign digitalization?
	E-mail address
	Phone number

4	**Digital platform deployed for ITN campaign: "Now let's discuss how you decided to change to a digital platform used for your most recent ITN campaign."**
	I understand that you changed from paper-based data collection to digital data collection between your previous and most recent ITN campaigns. What led to the decision to digitalize the campaign? As needed, probe: what problem would digital data collection solve, which inefficiencies could be addressed, what advantages or benefits were foreseen with digital data collection?
	Which activities of the ITN campaign did you digitalize? As needed, probe: macro-quantification of ITNs, microplanning, training, household registration (HHR), commodity tracking/supply chain management, ITN distribution, social and behaviour change (SBC), supervision, monitoring and evaluation (M&E), payment of campaign staff, others (specify).
	Which processes were digitalized under each activity? Note: This should align with the response above. **1 – Macro-quantification of ITNs:** using previous digital campaign data to quantify ITN needs **2 – Microplanning:** use of GRID3 or other sources of information for population comparison, map development, route mapping for micro transportation, route mapping for registration teams, others – please specify **2 – Training:** tracking attendance, participant confirmation, virtual content delivery, gamification, participant payments, post training support, others – please specify **3 – HHR:** building footprints, data collection for household registration, daily aggregation of registration data, voucher management, issuance of e-voucher, barcode scanning in physical voucher, GPS coordinates of households, registration data summary, ITN allocation based on registration data, registration of children under five to support EPI or SMC planning, other – please specify **4 – Commodity tracking/supply chain management:** warehouse assessment, inventory management, delivery tracking, stock tracking at storage sites, waybill, reverse logistics, repositioning management, other – please specify **5 – ITN distribution:** voucher redemption (barcode scanning), ITN distribution data collection, daily aggregation of distribution data, distribution data summary, ITN stock-taking at distribution point, other – please specify **6 – SBC:** reminder to household on distribution period, SMS message to household on net use and care, two-way messaging with targeted household, Interactive Voice Response (IVR)system, accountability system (e.g. hotline), SMS for rumour management/misconceptions, other – please specify **7 – Supervision:** supervision checklist/forms, tracking supervision activities, real-time data aggregation, other – please specify **8 – M&E:** monitoring checklist/forms, analytics to identify problems in real-time, HHR quality assessment, post-distribution coverage and use assessment, other – please specify **9 – Payment of campaign staff:** capturing work done, payment verification, producing payment sheet based on work done, payment processing, account details verification/validation, other – please specify
	Overall, do you think that your transition to digital data collection was successful? Why or why not?

5	**Digital platform deployed for ITN campaign: "Now let's discuss the digital platform used for your most recent ITN campaign."**
	How did you decide on the platform or platforms to use? What were the main factors that you considered? As needed, probe: review of platforms in use in-country/in other countries, infrastructure and connectivity, cell phone penetration, funding, technical assistance requirements, in-house IT capacity, etc.
	How long did it take to develop the system? Did you experience delays and, if so, what were the sources of those delays? How were they resolved?
	Did you procure the devices? If YES, was the procurement done internationally or nationally? If INTERNATIONALLY: what were the major advantages of procuring internationally? What were the disadvantages? If NATIONALLY, what were the major advantages of procuring nationally? What were the disadvantages? As needed, probe: timeliness, selection, cost, quality If NO, what plan was put in place to ensure that enough devices were available to meet the required quantities? Were there any challenges? As needed, probe: community level phones and not all met minimum requirements
	What was required and put in place in terms of: Human resources, including technical support, to plan, develop, deploy and monitor the platform adopted? Alignment with other platforms in place within the national malaria programme or the Ministry of Health more broadly? As needed, probe: Is the ITN digital platform standalone or can it be integrated with DHIS2 or other national health platforms? Are there plans to disseminate experience and lessons learned with the platform to other MoH departments? Will the data be shared across and between different teams and departments?
	What challenges, if any, did you encounter during the development and deployment of the digital data collection system? As needed, probe: insufficient funding, technical challenges, infrastructure challenges, delayed decision-making, late pre-testing of system, limited human resources in the field for troubleshooting, etc.
	At any point during deployment of the system, did you need to revert to the use of paper-based tools? Why and for what activities or processes? What would you do to avoid this in the future?
	Would you use the same platform for future ITN campaigns or for other campaigns (like IRS or SMC) that are being implemented? If YES: are there any adjustments or modifications that you would make to improve the platform based on your experience in the ITN campaign? As needed, probe: review of platforms in use in-country/in other countries, infrastructure and connectivity, cell phone penetration, funding, technical assistance requirements, in-house IT capacity, etc. If NO: what are the major issues you identified with the platform and how did they affect the campaign? What modifications would you propose? As needed, probe: poor data synchronization and campaign delays

6	**COVID-19 IPC adherence - ONLY for countries with first-time deployment of digital data collection**
	Was your decision to use digital data collection linked to the need to prevent COVID-19 transmission or was this considered when planning for the deployment of digitalization? If YES: what specific COVID-19 infection prevention and control elements did you think that digital data collection could help with? As needed, probe: no need to exchange materials between teams and households, easier organization of the movement of teams and identification of missed households for follow-up, etc. If NO: skip to end
7	**COVID-19 modifications to digital platforms - ONLY for respondents that adopted digital technology prior to COVID-19 and implemented campaigns during COVID-19**
	Did you adapt or modify your digital data collection approach from previous campaigns to adhere to COVID-19 infection prevention and control? If YES: what specific digital data collection aspects were modified? As needed, probe: no distribution of voucher, door-to-door distribution, etc. If NO: skip to next question
8	**Final thoughts**
	If you had to design an ideal system for digital data collection for an ITN campaign in future, what are the three things you would identify as critical?
	If you had to advise a national malaria programme or their partners about the baseline requirements for changing from paper-based to digital data collection, what are the main things you would say?
	Are there any final thoughts you would like to share?
	Have you developed documents relating to the digitalization? e.g. proposal, budget, strategy document, write-up of experiences/lessons learned, etc? Would you be willing to share the documents with AMP? (AMP will review the document and use some of the information to develop case studies and develop operational guidance documents for digital campaign solutions.)
	"Thank you so much for your time. Your feedback will be valuable in improving future ITN campaigns."

AMP CONTACTS

To join the weekly AMP conference call each Wednesday at 10:00 AM Eastern time (16.00 PM CET) use the following Zoom meeting line:
https://us06web.zoom.us/j/2367777867?pwd=a1lhZk9KQmcxMXNaWnRaN1JCUTQ3dz09

You can find your local number to join the weekly call:
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