

Survey on digital tools for an insecticide-treated net (ITN) mass campaign (January 2021): Analysis and report

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Background

Insecticide-treated nets (ITNs) remain the primary prevention tool for malaria control in many countries, and ITN mass distribution campaigns are a commonly used channel to rapidly deliver nets to an entire population of a country or to a sub-national targeted area. Mass ITN campaigns typically achieve high ITN access and use over a short period of time, thus contributing to achievement of objectives defined in national strategic plans for malaria control.

National malaria programmes and their implementing partners in most malaria-endemic countries now have extensive experience with planning and implementing mass ITN campaigns. Over more than a decade, national malaria programmes have assessed the effectiveness of their campaigns, identifying issues that have affected the quality of campaign implementation and achievement of campaign objectives in their post-distribution reports. For several years, national malaria programmes have turned to a more detailed examination of the potential for digital tools and applications to address systemic campaign challenges in several areas including:

- ITN quantification
- Microplanning
- Household registration and ITN allocation
- Social and behaviour change (SBC)
- ITN distribution
- ITN stock management, including reconciliation at the end of the distribution period
- Supervision, monitoring and evaluation
- Personnel payments

It is expected that the use of appropriate digital platforms will improve campaign efficiency and effectiveness across a range of country contexts.

The Alliance for Malaria Prevention (AMP), a global partnership that provides operational guidance and technical support to countries for ITN mass and continuous distribution based on requests from national malaria programmes, has seen increased interest and requests for technical support for transitioning from paper-based to digital data collection systems. As part of the ITN Campaign Efficiency Project, funded by the Bill and Melinda Gates Foundation (BMGF), AMP has undertaken a number of activities related to digital tools, including deploying an online survey and reporting on platforms currently in use by national malaria programmes and their partners for ITN mass campaigns, as well as their features¹.

This report summarizes the results of the online survey deployed to gather information from national malaria programmes and partners on current or planned use of digital platforms and applications. It summarizes the tools currently in use or planned for future ITN campaigns, the components of mass ITN campaigns being digitized, and the reason(s) for selecting the digital tools currently being used. It is important to note that the survey was undertaken in January and February 2021 and results may have changed in countries, both due to additional or fewer resources being available, as well as due to the mobilization of resources for COVID-19 response through the Global Fund's COVID-19 Response

¹ <https://allianceformalariaprevention.com/tools-guidance/improving-itn-campaign-efficiency-through-use-of-digital-tools/>

Mechanism (C19RM) which put an emphasis on digital tools as an effective COVID-19 mitigation measure.

A summary of the different digital platforms used, or planned to be used, explaining the platforms' features and use in ITN mass campaign is provided in Annex 1.

Objectives of the digital tools online survey

The primary objective of the digital tools online survey was to collect information from national malaria programmes and implementing partner staff about their experience with, or intention to use, digital tools for mass ITN campaigns. The digital tools online survey also aimed to understand why national malaria programmes were considering a switch from paper-based to digital systems, including the perceived benefits and limitations of the digital platforms in use or planned for ITN campaigns.

Methodology

The survey questionnaire was designed by Tropical Health (TH) with inputs from AMP to understand countries' experience with digital platforms for ITN campaigns, the objectives, limitations and benefits of digitization, as well as plans for roll-out of digital tools for future campaigns.

The questionnaire had 37 questions, 21 closed ended and 16 open ended questions. The survey was designed on Typeform², an online software for building surveys and forms, in English and French. It was designed for qualitative analysis and limited pre-testing was done with some members of the AMP staff and consultancy team. Based on the results of the pre-test, the questions were modified to improve comprehension and facilitate completion of the survey.

The survey targeted national malaria programme managers and/or vector control/ITN leads, as well as locally-based implementing partners, in 46 malaria-endemic countries in Africa Region, Region of the Americas, Eastern Mediterranean Region, Western Pacific Region and South-East Asia Region.

Results

The survey was initially sent to 44 national malaria programme managers, primarily in Africa, via the RBM Partnership to End Malaria (RBM), and to national malaria programme managers in malaria-endemic countries in Eastern Mediterranean region, Western Pacific region and South-East Asia region through the Asia-Pacific Leaders Malaria Alliance (APLMA) on 16 December 2020. A reminder message was sent by RBM and APLMA on 11 January 2021. Despite the reminder message, the survey response rate was still low, and it was decided to directly target national malaria programmes and campaign implementing partner staff at national, regional and global levels. Direct follow-up with national malaria programme and implementing partner staff was done by AMP and TH on 15/16 January 2021. AMP partners (such as Catholic Relief Services [CRS] and Population Services International [PSI]) supported follow-up with the national malaria programmes in their countries of operation. At the time of closing the survey, 41 countries out of the targeted 46 had provided responses.

The survey results are presented in two broad categories:

1. Plans to digitize future ITN campaigns, including:
 - Potential digitization of future campaigns
 - Availability of funding for transition to digitization
 - Digital platform planned to be used
2. Experience with digital platform for ITN campaigns, including:

² <https://www.typeform.com>

- Use of digital platform for ITN campaigns
- Reasons for digitization
- Digital platform used
- Reason for choosing the specific platform
- Time it took to set up the platform
- Type of device(s) the platform was used on (device compatibility)
- Information Technology (IT) support required to deploy the digital platform
- Campaign activities the platform was used for
- Features of the platform used
- Benefits of using the platform
- Challenges of using the platform

The results presented below are based on 54 responses received from the 41 countries (see Table 1 for list of participating countries). Of the countries that have responses registered in the database, four were in the South-East Asia region, 30 were in the Africa region, four were in Eastern Mediterranean region, two were in Western Pacific region and one from the Region of the Americas. In terms of respondents from each country, in many cases there were responses from both the national malaria programme staff and an implementing partner. Limitations linked to the non-specificity of the targeting of individuals for the survey are discussed later in the report (see limitations section).

Table 1: List of countries that submitted responses to the survey

Afghanistan	Guinea	Republic of Congo
Bangladesh	Kenya	Senegal
Benin	Haiti	Sierra Leone
Botswana	Liberia	Singapore
Burundi	Madagascar	South Sudan
Cambodia	Malawi	Tanzania
Cameroon	Mali	Tchad
Central African Republic	Mauritania	Thailand
Côte d'Ivoire	Myanmar	The Gambia
Democratic Republic of Congo	Mozambique	Togo
Djibouti	Niger	Uganda
Ethiopia	Nigeria	Yemen
Ghana	Pakistan	Zambia
Guinea-Bissau	Papua New Guinea	

The results from the survey are presented in sections one and two below focused on planning for use of digital platforms in future ITN campaigns and experience with digital platforms in previous ITN campaigns.

Countries planning to digitize next/future mass campaigns

1. Plans for digitization

Respondents were asked to indicate if they were planning to use a digital application or platform for their next campaign. Forty-three responses were received from 41 countries. Results indicate that 31 countries (72 per cent) are planning to digitize their next campaign and 11 countries (26 per cent) are not planning to digitize their next campaign. One country (2 per cent) did not respond to the question.

One country had conflicting responses from respondents regarding plans to digitize the next ITN campaign as indicated in Figure 1.

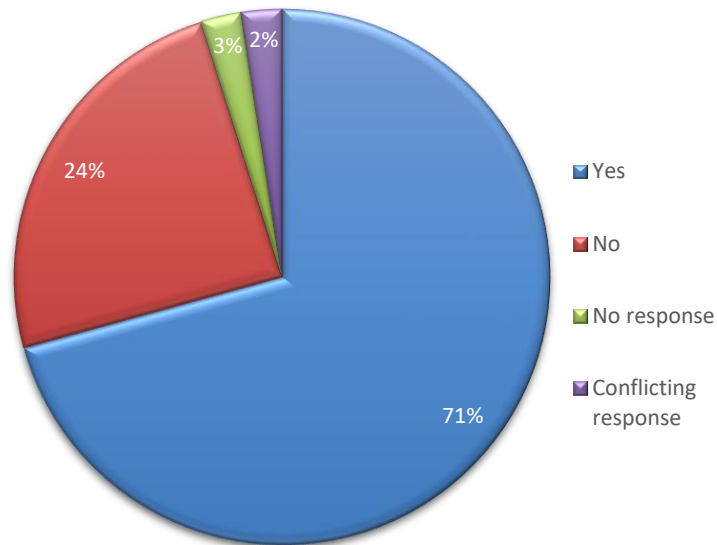


Figure 1: Proportion of countries planning to digitize next ITN campaign

Of the 26 countries that plan to digitize their next ITN campaign, 12 countries (46 per cent) have not decided on the platform to use.

1.1. Funding

Of the 31 countries that plan to digitize their next campaigns, only 16 countries (46 per cent) have secured funding and five countries (14 per cent) have requested funding that is yet to be approved. The remaining 14 countries (40 per cent) have not requested funding (see Figure 2).

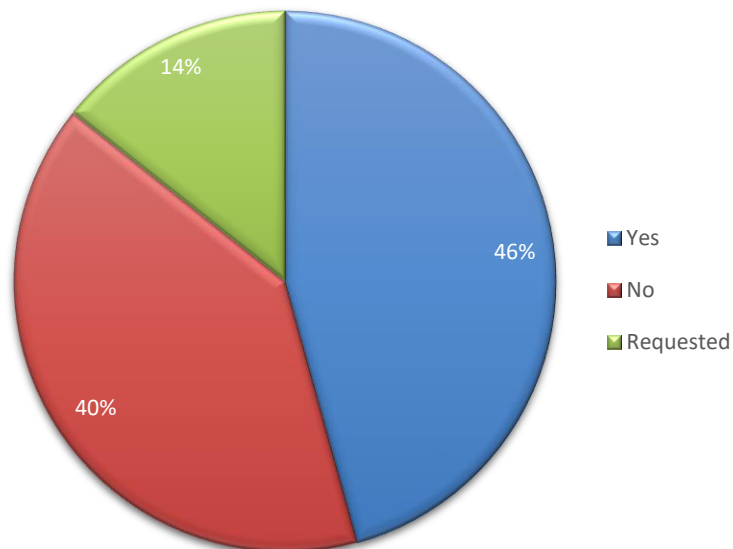


Figure 2: Proportion of countries with funding for ITN campaign digitization

1.2. Plans for applications/platforms

Respondents were asked to name the application or digital platform planned for use in the next campaign. Forty-one responses were received from 29 countries. Of the 29 countries planning for deployment of digital data collection, six countries (21 per cent) had conflicting responses on the choice of digital tool to deploy. Four countries (14 per cent) plan to use District Health Information Software 2 (DHIS2), three countries (10 per cent) plan to use Kobo Collect, two countries (7 per cent) plan to use RedRose, while Open Data Kit (ODK), CommCare, Interactive Voice Reporting (IVR system), NetApp, Electronic Data Management System (EDMIS)/Collaborative Communication Management Information System (CCMIS), and CDM³ were each planned for use by one country (3 per cent). Eight countries (28 per cent) are yet to determine the platform they will use for digital data collection for their ITN campaign. See Figure 3.

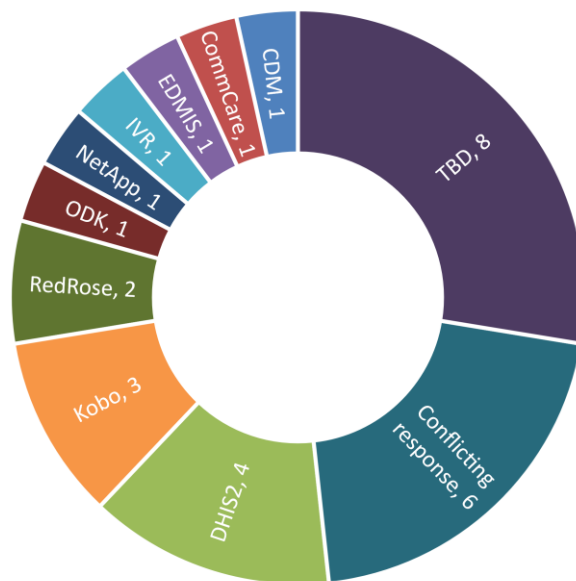


Figure 3: Digital tool choice planned for next campaign

Countries with experience with digitizing mass campaigns

2. Experience with digital platforms for ITN campaigns

Respondents were asked if they had used a digital application or platform for their most recent mass ITN campaign. Fifty-four responses were received from 41 countries. Results indicate that 16 countries (39 per cent) digitized their most recent campaign (see Figure 4). There are three countries (7 per cent) with conflicting responses.

³ CDM –this abbreviation unverified.

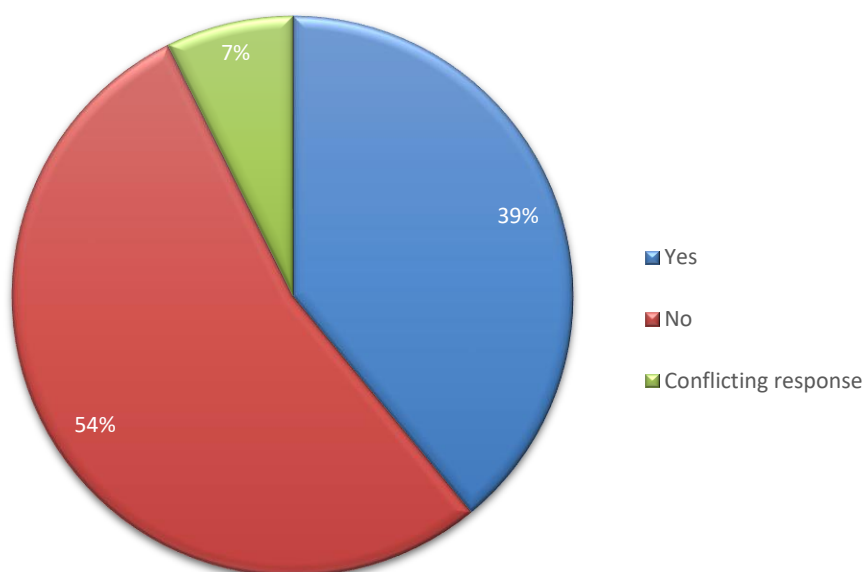


Figure 4: Proportion of countries that deployed a digital platform for their recent campaign

2.1. Reasons for digitization

Respondents were asked the reasons for selecting digital data collection applications and platforms for their ITN mass campaigns. Results indicate that national malaria programmes and their partners deployed digital platforms to minimize or overcome the following challenges:

- Delays and difficulties in reporting accurate ITN campaign data
- Errors in computation during summary of data
- Net leakage
- Inadequate tracking of ITNs within the supply chain pipeline
- Non- or incorrect net use
- No real time status/reporting/visibility into campaign progress
- Missed households; misrepresented household size; fraudulent activities by registration team
- Training/trainee fraud
- Individuals going to the wrong distribution points
- Stock-outs at distribution points
- Recipients not receiving the correct number of nets
- Low redemption rates during distribution
- Slow/delayed payments; being paid improper amounts; problems with electronic payments (phone number, bank account, name); payment processing
- Inaccurate ITN and resource (human and material) estimates based on poor population data

2.2. Digital platforms used for ITN campaign

Ten digital platforms/applications were used in recent ITN campaigns by 19 (46 per cent) of the 41 countries that responded to the survey. DHIS2 is the most used application with seven countries (38 per cent) having used it in their recent ITN mass campaign, followed by ODK (three countries, 14 per cent), Kobo Collect and RedRose (two countries each, 10 per cent) as indicated in Table 2.

Table 2: Digital platform used by countries for recent ITN campaigns

Digital platform	Countries
DHIS2	Cameroon, Guinea-Bissau, Democratic Republic of Congo (DRC), Zambia, Mali, Republic of Congo and Senegal
ODK	DRC, Yemen and Guinea
RedRose	Nigeria and Benin
Kobo	Liberia and Togo
CAMP MID (Campagne Moustiquaire à Imprégnation Durable)	Madagascar
CommCare	The Gambia
MRC-MIS (Mass replacement campaign/Management Information System)	Tanzania
EDMIS/CCMIS	Uganda
Interactive Voice Reporting and Mbrana	Ethiopia
NetApp	Ghana

For more information on the digital platforms, their benefits, campaign activities they can be used for, their functionality and their features see the AMP website⁴.

2.3. Reasons for choice of application/platform

Respondents that have used digital applications and platforms for their ITN campaigns were asked the reason for their choices. Responses have been grouped by application or platform.

RedRose [five responses from two countries]:

- To have good quality data as far as population and the real number of ITNs delivered are concerned, as well as timely reporting
- To improve accountability, efficiency and security of data
- Prompt payment of personnel

CommCare [two responses from one country]:

- Easier and more user-friendly than the IFormBuilder platform⁵ that was previously used
- It can be configured with DHIS2 which is used by the Ministry of Health for health data management
- To have real-time data

DHIS2 [ten responses from seven countries]:

- Timely availability of data
- The platform is widely used throughout the health system and is currently used for routine data
- Direct integration to the national information system

⁴ https://allianceformalariaprevention.com/wp-content/uploads/2021/06/AMP_Improving_Efficiency_Digital_Tools_21052021.pdf
https://allianceformalariaprevention.com/wp-content/uploads/2021/06/AMP_Improving_Efficiency_Digital_Tools_Feature_Table_Annex_062021.pdf

⁵ <https://www.zerionsoftware.com/iformbuilder>

- Availability and reliability of information on registration and distribution of ITNs
- Availability of in-country capacity to use and administer the tool
- It is a free platform

CAMPMID [one response]:

- Adaptability to country context
- Offline capability

EDMIS/CCMIS [one response]:

- To ensure real time accountability for nets distributed through validation of the data entered compared to the paper-based, which was prone to forgeries
- The electronic platform was also in line with the COVID-19 guidelines to ensure minimal interaction of data entry clerks with households

IVR and Mbrana [one response]:

- To strengthen and improve the ITN distribution data tracking through use of technology platforms

Kobo [two responses from two countries]:

- It was easy to use, and it analysed the data and helped with real-time central level update as data were entered at county level in the country
- It is a free and easy to use application. The hosting site is also free

MRC-MIS [one response]:

- For accountability purposes, and easy report generation after the campaign

NetApp [one response]:

- For data privacy, efficiency, and functionality

ODK [three responses from three countries]:

- For data collection and analysis
- The app has low technical requirements, is easy to host and maintain, and it is open source

2.4. Time to set up the application/platform and source of application/platform

This is a two-part question on the online survey. The first part looked at the time it took to set up the application and the second part asked if the application was built from scratch.

2.4.1. Time for setting up the application/platform

Respondents were asked how long it took to set up the application. Of the 28 responses received, only six respondents (21 per cent) provided the specific number of months it took to set up the application, as indicated in Figure 5.

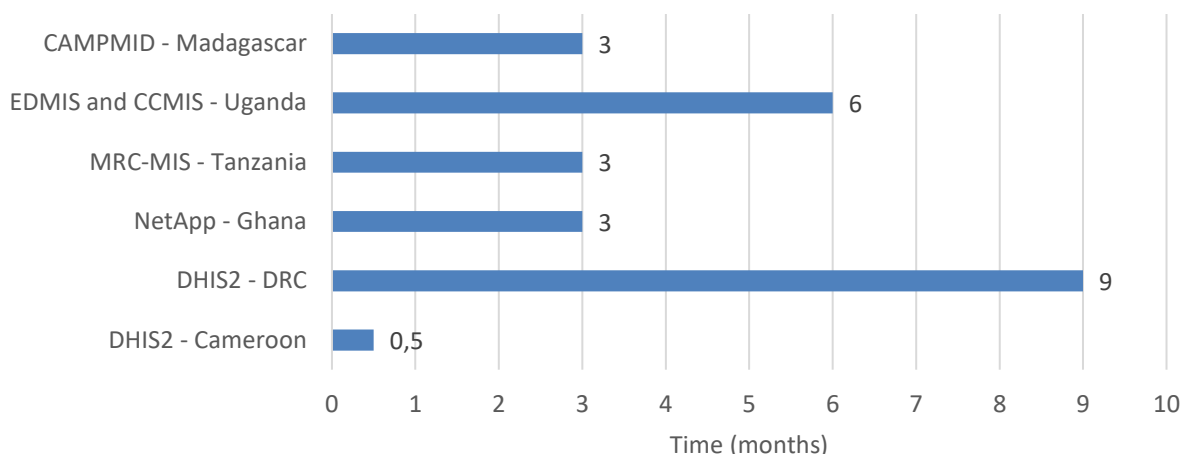


Figure 5: Timeline for setting up the platform

2.4.2. Source of application

Respondents were asked if the application was built from scratch. Of the 28 responses received, six respondents (21 per cent) confirmed that the application was built from scratch, 12 respondents (43 per cent) said the application was built on an existing platform and 10 respondents (36 per cent) did not answer this part of the question, as shown in Figure 6.

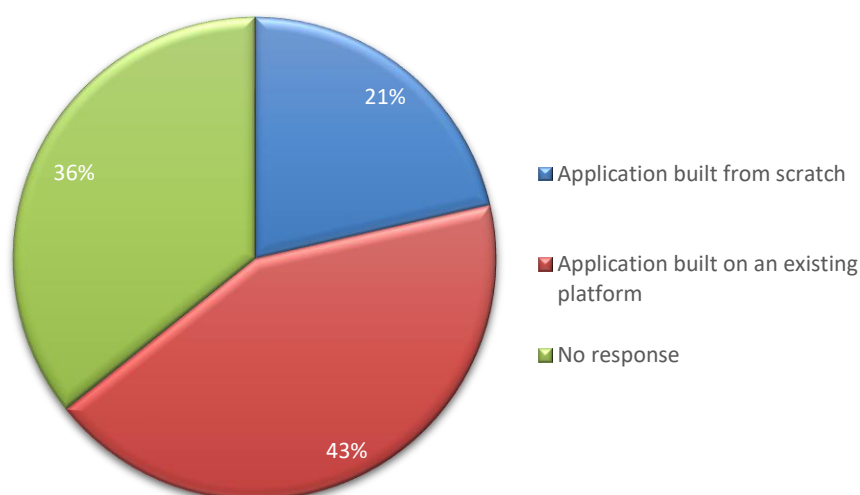


Figure 6: Proportion of applications developed from scratch

2.5. IT support requirements for deployment of applications/platforms used for the campaign

Respondents were asked about the IT support needs for the different applications/platforms used for digital data collection. Twenty-eight responses were received from 19 countries. Results show that all countries (100 per cent) that digitized their last campaigns used IT support either within the national malaria programme or Ministry of Health, from their implementing partners, from other projects/departments/agencies or through international support. Of the 28 responses, seven respondents (39 per cent) said in-country IT expertise was used, three respondents (11 per cent) said international expertise was used, four respondents (14 per cent) said both in-country and international expertise were used, and six respondents (36 per cent) did not respond on the specific type of expertise used, as presented in Figure 7.

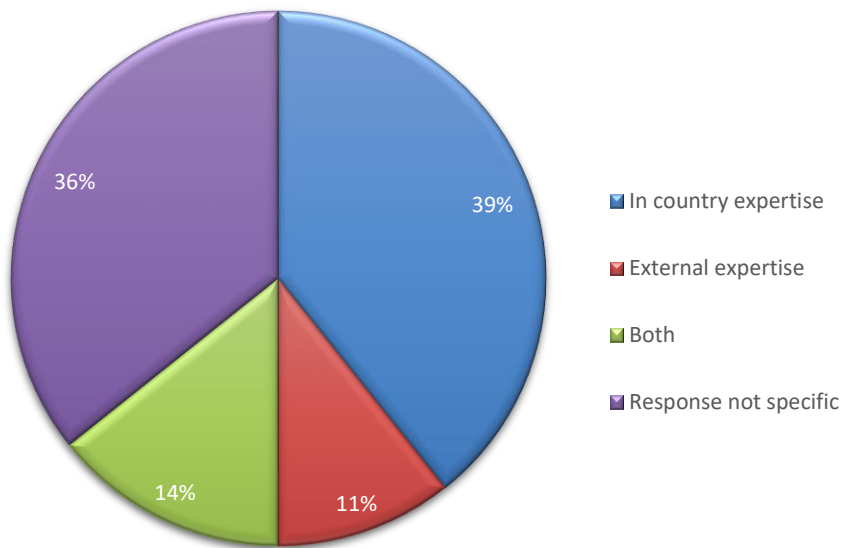


Figure 7: Type of IT support used for digital platform deployment

2.6. Campaign activities for which the application/platform was used

Twenty-eight responses were received from 19 countries on the campaign activities for which the digital platform was deployed. Table 4 shows the different platforms and the various campaign activities for which they were used.

Table 4: Campaign activities for which the platform was used

Digital platforms:	CAMP MID	CommCare	DHIS2	EDMIS/ CCMIS	IVR and Mbrana	Kobo	MRC- MIS	NetApp	ODK	RedRose
Campaign activities										
Microplanning			✓	✓			✓			✓
Training	✓		✓	✓						✓
Household registration	✓	✓	✓	✓		✓	✓	✓	✓	✓
Tracking transport of nets/delivery confirmation	✓		✓	✓	✓		✓		✓	✓
Distribution of ITNs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Tracking stock levels at storage sites	✓			✓	✓		✓	✓	✓	✓
Supervision checklists						✓		✓	✓	✓
Household questionnaires for M&E				✓		✓	✓		✓	✓
Messaging targeted populations directly (SBC)/social mobilization data	✓								✓	✓
Field reporting				✓						
Data storage			✓	✓						
Collaboration between different campaign coordination technical committees					✓					

2.7. Features of the platform

Respondents were asked if the platform had specific features, such as the ability to record location, identity confirmation features, ability to make mobile money payments, data analytics, etc., used for their ITN campaigns. Twenty-eight responses were received from 19 countries. Six countries with more than one respondent provided conflicting responses (i.e. yes and no) to some features. Conflicting responses were received related to DHIS2, Kobo Collect, ODK and RedRose. Table 5 shows the features available on each platform based on the responses received.

Table 5: Features of the platform used for the campaign activities

Digital platforms	CAMPMID	CommCare	DHIS2	EDMIS / CCMIS	IVR and Mbrana	Kobo	MRC-MIS	NetApp	ODK	RedRose
Features										
Record location		✓	✓	✓		✓		✓	✓	✓
Biometric or other identity confirmation features		✓			✓		✓			✓
Built-in means of communication with data collectors/campaign personnel		✓	✓				✓	✓	✓	
Record time worked or work completed to serve as a timesheet	✓	✓	✓	✓	✓		✓	✓	✓	✓
Built-in means to make mobile payments to campaign personnel							✓			✓
Data analytics	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Works offline	✓	✓	✓	✓		✓	✓	✓	✓	✓

2.8. Benefits of using the platform

The 28 respondents that have used digital platforms for their ITN campaigns were asked the benefits they experienced with using the platform beyond the reasons identified for platform selection. Table 6 lists the additional benefits of using the platform for mass ITN campaign planning and implementation.

Table 6: Benefits of using the digital platform for mass ITN campaign planning and implementation

Digital platform	Benefits
DHIS2	Secure archiving
	Easy synthesis upstream
	Speed of data collection and processing allowing for the possibility of guiding field operations for possible adjustment
	Availability of real-time data, real-time monitoring of data and ITNs during the campaign
ODK	Global Positioning System (GPS) location data is collected as a by-product to create high resolution maps
	Ease of data transmission (no need to re-code paper forms)
	Speed and paperless data collection
	Real time data and able to respond to challenges in good time
NetApp	Country owned and no cost to create user accounts, working offline after log-in, ease of use and troubleshooting by district supervisors
Kobo	Availability of real-time data
	Real time monitoring and improvement of quality of work
	Real time issue resolution
	Synthesis and ease of work
MRC-MIS	Real time registration data
EDMIS / CCMIS	Simplifies work related to data

2.9. Challenges with the platform

Respondents were asked about the challenges encountered while using the platform for their mass ITN campaigns. All 28 respondents (100 per cent) said internet connectivity was a problem in remote locations. Responses have been grouped by platform as shown in Table 7.

Table 7: Challenges of using the digital platform during ITN campaign

Digital platform	Challenges
DHIS2	The validation system before the data entry was challenging and the management of the paper-based pre-collection tool
	Turn-over of trained users
	Theft of devices
	Internet connectivity problems
ODK	Theft of devices
	Lack of internet and electricity in some rural locations
	No succinct platform to edit submissions after they are sent
IVR and Mbrana	Internet connectivity problems
	Inadequate commitments from some users to regularly (continuously) upload the data

NetApp	Data transfer challenges (lost data) in areas with bad network
	Internet connectivity issues in some areas
	Two separate dashboards for distribution and registration
Kobo	Internet connectivity problems
RedRose	Some software issues at the initial stages when the application was built and scaled up after the initial pilot
	Internet connectivity problems
MRC-MIS	Limited internet connectivity in some remote rural areas
	Some users from villages required special training/orientation
CommCare	Lack of internet and electricity in some remote areas
EDMIS / CCMIS	Limited internet connectivity and smart phone coverage
CAMPMID	Interoperability with DHIS2

Discussion

Interest in digitization:

In line with the increased number of requests for technical support for transitioning to digital data collection observed by AMP, the survey responses confirm the increasing interest of national malaria programmes to digitize their ITN campaigns. A 37 per cent increase (11 new countries plus 19 countries already using digital tools) in the number of countries with digital data collection will be seen if all of the national malaria programmes planning for the transition from paper-based tools actually implement a digital-based campaign. Despite the growing interest of national malaria programmes to transition to digital ITN campaigns, the survey results indicate that national malaria programmes lack information on which digital platforms are best suited to their needs and may lack the resource requirements, or have not sufficiently considered the needs, to deploy digital platforms for ITN campaigns.

Reasons for digitization:

National malaria programmes have different reasons for transitioning to digital platforms for ITN mass campaigns, including improving accountability and efficiency, monitoring the consistent attendance of trainees, tracking ITNs through the supply chain system, facilitating mobile money payments, minimizing simple math errors during household registration and ITN allocation, aggregating data automatically, and showing real-time results for household registration and ITN distribution. The wide variety of reasons for changing to digital data collection reinforces the importance of understanding the inefficiencies the national malaria programme and partners are trying to address before recommending a platform.

Funding for digitization:

Based on the survey results, 40 per cent of national malaria programmes that are planning to digitize their next campaign have not requested funding which may reflect a lack of available practical information to understand the resources required to transition from paper-based to digital data collection, even when free and open-source software such as ODK/Kobo Collect, DHIS2, etc. is being considered. Resource requirements include training of field agents/data entry clerks/supervisors, purchase of devices and/or data for internet, designing the electronic data collection forms,

management of the devices, IT experts to support the visualization dashboard, amongst others. The survey results reinforce the need to support national malaria programmes and their partners through peer learning, country to country exchange or technical support for successful deployment of digital data collection tools during ITN campaigns.

Limitations

Despite the wealth of information from the online survey results, some limitations were observed that need to be considered when interpreting the information including:

- Non-specificity of who was targeted for the survey: this aspect affected the survey responses in two ways:
 1. When the survey was sent to national malaria programmes, it was also sent to implementing partners and, in some cases, responses were received from both. The responses from different stakeholders in the same country at times contradicted one another, making it difficult to determine which response best reflected the country context. Amongst others, there were conflicting responses to the question on features of the platform used for the ITN campaign.
 2. The survey was not targeted to digitization specific experts, which may have limited the ability of respondents (who may have been malaria or ITN technical experts) to accurately answer the questions asked. For instance, the responses to the question on time it took to set up the digital tool were not robust. It is possible that the respondents may not be IT experts or involved in the set-up process. The response to the question on securing funding also indicated that some of the respondents may not be involved in budget development and/or management.

Future efforts to collect information from national malaria programmes and partners will clearly specify who is targeted for the survey and collect more detailed information on background characteristics of respondents.

- Lack of detailed responses to some questions: some respondents did not provide very much information in response to open-ended questions. For example, the objective of digitizing the campaign was not well described by some respondents, while others did not seem to have a good understanding of the digital platform or its features.
- The timeline for setting up the platform was not provided by most respondents. Only 27 per cent of the countries responded with a timeframe (in days/months) used to set up the application.

Conclusion

ITN campaigns have played an important role in reducing the malaria burden in malaria-endemic countries. As part of efforts to improve ITN campaign efficiency, national malaria programmes are increasingly adopting digital platforms to consolidate data in real time to inform planning decisions and minimize quality, accuracy and reporting risks. Digital platforms represent an opportunity to collect and utilize campaign data across a number of national health platforms and to minimize cash payments in the field.

To successfully deploy a digital platform for an ITN campaign, national malaria programmes must put in place plans and timelines for carrying out tasks such as identifying the inefficiencies to be addressed with a digital platform, undertaking a context analysis, choosing the platform to deploy and at what level(s) (regional or district or county or health facility levels), ensuring alignment with procurement procedures and timelines, designing the digital data collection templates, building capacity for deployment of the platform, ensuring IT needs and infrastructure are in place for the set-up, amongst

others. Most importantly, a solid plan and budget must be developed that include all activities to ensure that sufficient technical, human and financial resources are available.

Despite the benefits of using a digital platform for ITN campaigns, some national malaria programmes are not planning to digitize their upcoming campaigns due to funding limitations and prioritization of limited resources towards disease prevention and control interventions. Responses to this survey, as well as the report on the use of digital tools to improve operational efficiency of ITN campaigns⁶, demonstrate the potential of free open-source platforms to advance country plans to transition to digital data collection, as well as the innovation that is taking place at the national level to transition to digital platforms with limited funding through locally developed platforms and applications. Some countries used unique approaches to further reduce the cost of digital data collection, such as use of community devices during the Togo mass ITN campaign.

Important next steps for AMP include a retrospective review with national malaria programmes and partners that responded to the survey to gather more details and information through key informant interviews, linking national malaria programmes for exchange of experience, tracking decision-making and bottlenecks in countries transitioning to digital tools and providing support as needed to ensure that plans for digital tool deployment are successfully implemented. National malaria programmes planning to transition to digital platforms and partners supporting them are encouraged to ensure early planning and establishment of a timeline with critical milestones, as well as a budget including all sufficient financial resources, to ensure successful deployment of digital tools.

⁶ https://allianceformalariaprevention.com/wp-content/uploads/2021/06/AMP_Improving_Efficiency_Digital_Tools_21052021.pdf

Annex 1

Summary of each platform used for an ITN campaign mentioned in the online survey results:

- **DHIS2** is an open source, web-based platform most used as a health management information system (HMIS)⁷. It is used in ITN campaigns to compile data for household registration and ITN distribution to households, prompt repositioning of nets and management of stock balances as well as integration into the national HMIS.
- **ODK** is an open-source software used to build data entry forms⁸. It is used for ITN mass campaigns to register targeted households and record ITN distribution and compile data for both.
- **RedRose** is an end-to-end software solution that supports programme teams to collect, analyse, and manage data during each phase of a programme⁹.
- **CommCare**¹⁰ is a platform that provides e-coupons at registration; it registers targeted households and issues codes for ITN redemption.
- **Kobo** is a simple, robust and powerful tool for data collection. It is a free open-source tool that allows for mobile data collection either online or offline¹¹. The platform is used in the campaign for household registration data data, ITN distribution data and administering monitoring and supervision checklists.
- **MRC-MIS** is an information system used to report household registration and ITN distribution data for decision-making, and for coordination, control, analysis and visualization. The platform is used to track net stocks and monitor the campaign implementation.
- **EDMIS/ CCMIS** are data collection applications used to compile ITN campaign data. The EDMIS is used for household registration and ITN distribution data, while the CCMIS is used for microplanning, field reporting and supervision data.
- **IVR** is used to track ITN distribution by Health Extension Workers (HEWs) at the health post (distribution site). **Mbrana** is an inventory management software used to manage daily transactions of ITNs by district staff using smartphones provided to enter receipt and issue transactions.
- **NetApp** is an android-based application, designed and developed by information technology (IT) professionals to provide real-time monitoring of campaign registration and distribution, provide e-coupons at registration, register targeted households and issue codes for ITN redemption.

⁷ <https://dhis2.org/about/>

⁸ <https://getodk.org>

⁹ <https://ics.crs.org/cash-and-asset-transfer-platformred-rose>

¹⁰ <https://www.dimagi.com/commcare/>

¹¹ <https://www.kobotoolbox.org>

Acknowledgements

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- Afghanistan
- Bangladesh
- Benin
- Botswana
- Cambodia
- Cameroon
- Democratic Republic of Congo
- Ethiopia
- Ghana
- Guinea
- Guinea-Bissau
- Kenya
- Haiti
- Liberia
- Malawi
- Myanmar
- Mozambique
- Nigeria
- Pakistan
- Papua New Guinea
- Republic of Congo
- Senegal
- Sierra Leone
- Singapore
- South Sudan
- Tanzania Zanzibar
- Thailand
- The Gambia
- Togo
- Madagascar
- Mali
- Uganda
- Yemen
- Zambia