Integrating NTD programme monitoring into routine health systems data: evaluating a DHIS2 tool for real-time mass administration of medicines (MDA) reporting

Research summary
April 2022

Sightsavers

Introduction

Mass drug administration (MDA) of neglected tropical diseases (NTDs) medicines, also known as mass administration of medicines (MAM) in Nigeria, has proven to be the most effective preventive global strategy for NTDs and is implemented every year in endemic areas in Nigeria. MDA campaigns are monitored during implementation to track activities at various levels using both paper and spreadsheet-based methods, which is a slow, inefficient and error prone process.

The Nigeria Federal Ministry of Health (FMoH) uses the district health information software (DHIS2) for reporting, analysis and dissemination of routine data for health programmes. In early 2020, the FMoH developed and began testing an electronic MDA reporting tool using DHIS2, supported by Sightsavers' Accelerate trachoma elimination programme funding. The testing took place in two states (Jigawa and Yobe) and aimed to establish the tool for future use in more states.

To set up the tool, dashboards are configured according to ministry needs, existing paper forms are digitised and community lists are uploaded. A new process is then agreed upon, including the frequency of data entry throughout the campaign and roles and lines of communication, as shown in figure 1 below.

**Figure 1: Example of roles and data flow during the MDA campaign**
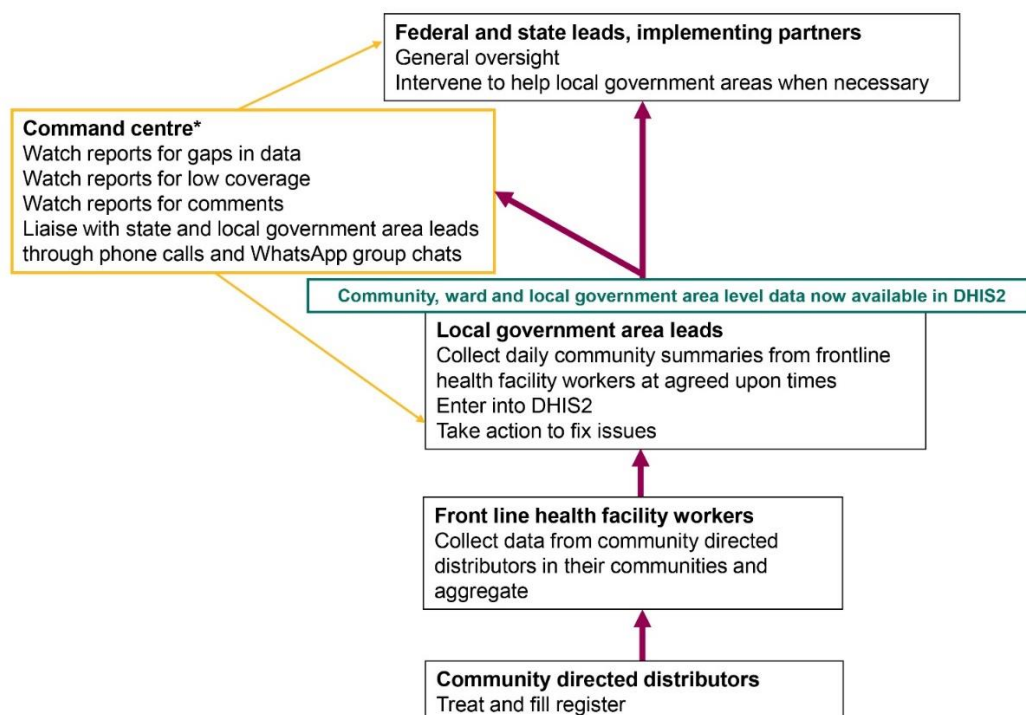
Prior to the start of MDA, community-level treatment targets and drug allocations are entered into the tool. As the MDA campaign progresses, community-level summary forms, including treatment and drug information, are entered by local government area (LGA) teams at agreed times. A ministry-led command centre set up at the state level monitors data entries for potential errors, low coverage and comments (as referenced in figure 1). Any issues that arise are communicated to state and LGA leads through phone calls and WhatsApp chats, creating a feedback loop.

Sightsavers

Once treatment ends, drugs returned from communities are entered and the command centre continues with data checks and verification. Data sets are then available for immediate review meetings and planning purposes.

This tool can replace district-level summary sheets and give the FMoH one central location for all historic and current MDA data (from the community level and up).

Figure 2: Example dashboard showing current coverage in each community
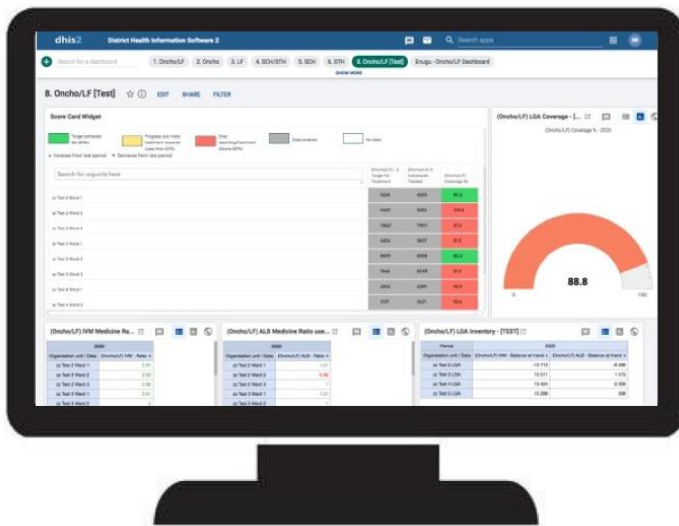
This research sought to evaluate the usefulness of this DHIS2 tool for planning, monitoring and reporting MDAs for national, state and LGA programmatic action.

Research questions:

1. How does a DHIS2 based real-time reporting tool for MDA strengthen quality, accessibility and the use of data for programmatic action at all levels?
2. Does the tool enhance government ownership of the data and the MDA programme in general?
3. Does the tool provide a reliable estimate of treatment coverage?
4. Can the tool be scaled up regardless of funder and location?
5. What improvements or adaptations are required to the tool or its processes?

The study was funded by The Task Force for Global Health through the NTD Support Center and undertaken in collaboration with the Federal and State Ministry of Health, Nigeria.

Why is this issue important?

In most countries, the current paper and spreadsheet-based MDA reporting systems have been shown to be inefficient, slow and error prone. They do not allow for real-time monitoring of campaigns and do not bring sub-district level campaign data into one central place for analysis and planning.

At the same time, DHIS2 is already in use in many NTD-endemic countries as a national health management information tool. The opportunity to use this established and open-source software for MDA reporting is significant.

Sightsavers

Evaluating at scale the tool's usefulness for planning, monitoring and reporting of MDA in Nigeria not only informs the scale-up of the tool in the Nigerian NTD programme but can also influence the use of a similar tool in other countries.

What did we do?

The selection of study sites was based on certain criteria, including geographic spread, the availability of upcoming MDA campaigns and the identity of the non-governmental development organisation (NGDO) implementing partner. The first pilot took place in Jigawa state from February 2020 to March 2020, and activity was then rolled out in Enugu, Jigawa and Kwara states from December 2020 to March 2021. Christian Blind Mission (CBM) and Health and Development Support Programme (HANDS) supported Jigawa, The Carter Center supported Enugu and Sightsavers supported Kwara. Data was collected using a mix of qualitative and quantitative research approaches.

Quantitative methods

Government ownership: government ownership indicators were explored and defined at a participatory workshop and later assessed. These are defined in table 1.

Table 1: Definition and assessment of ownership

Components of government ownership	Assessment statement
Data access (The ability to view and get information that you need so that you know what is happening during the MDA)	During the MDA, I can see and track treatment coverage data at community, LGA or state levels
	During the MDA, there is a place/person where I can access information about the MDA activities in my LGA/state
	Overall, I am happy with the level of access to information I have during MDA in my LGA/state
Data use (The ability to make evidence-based changes to the MDA programme to improve ongoing MDA activities)	During the MDA, I can use the information from the data to identify areas where improvements or changes may be needed
	During the MDA, I can make decisions and recommendations based on the data from the MDA
	Overall, I am satisfied with my ability to use the MDA data for identifying and making required programme changes before, during and after the MDA
Data control (The ability to understand and take charge of data entry aspects and viewing a response that you are involved with during and after MDA)	During the MDA, I understand the process of data entry/information and so can troubleshoot problems myself
	During the MDA, I feel that I am in charge of the data from the communities, LGA or state
	Overall, I am satisfied with the level of control I have over the data before, during and after the MDA exercise

Sightsavers

Treatment coverage surveys (TCS): Results from TCS conducted after each MDA exercise were compared to DHIS2 estimates and LGA-level programme estimates to assess the reliability of coverage estimates. Due to the COVID-19 pandemic, the TCS methodology was revised to be conducted remotely.

Programme data: Programme data from the paper-based spreadsheet was compared with data extracted from the DHIS2 based tool to assess its quality.

DHIS2 metadata: Metadata was analysed to understand accessibility (who is accessing the DHIS2 tool, when and to do what).

Qualitative methods

Field diaries: Participants used field diaries to record their experience while using the DHIS2 tool during the MDA implementation.

Call monitoring log: A record was kept of all communication from LGAs to the command centre via the toll-free lines so that LGA issues could be recorded, categorised and reviewed, as well as followed up.

Focus groups discussions/key informant interviews: Interviews with programme implementers to identify the ways that the DHIS2 tool enhanced government ownership with respect to the MDA.

What did we find?

> **Key messages**
>
> Using DHIS2 for MDA increases data access and use and would likely increase data quality over time. The ability to address errors and improve decision-making during campaigns are significant benefits.
>
> The reporting tool improved all three components of government ownership (data access, data control and data use) at all levels of the health system, though somewhat less so at the LGA level, where the burden of data entry is high. Successful scale-up will require action on the key recommendations included in the study report.

How does a DHIS2 based real-time reporting tool for mass drug administration strengthen quality, accessibility and the use of data for programmatic action at all levels?

MDA teams consistently reported that they were able to access data at any time and could track all changes made to data. The tool also allowed them to improve data quality by flagging entry errors as well as responding to MDA implementation issues in real time. Timeliness and the ability to act quickly on the data were big contributors to their satisfaction with and excitement for the tool.

The ability of the state and federal levels to spot errors and ask for them to be corrected was a major theme of the data quality in the qualitative findings. Similarly, those at the state level

Sightsavers

were able to spot occasions where they suspected the data had been manipulated and flag them for investigation.

> **Quality:** "We looked at it based on the target population and the numbers treated. I looked at the medicine given, what was used, what was wasted, the gap, the ratio and it was fun, easy to spot and make those corrections rather than wait for it to pile up till the end and then you start doing your data cleaning. With the DHIS2, we were able to pool everything, export to excel, analyse the data and then make an informed decision." (FMoH team member)
>
> **Accessibility:** "There is a significant improvement with regards to quick analysis correlation and the reporting of data – quick access, easy tracking of errors and less time-consuming. And it helped us significantly in having one unique and uniform data bank for us to go and access (the data) anytime. I need to visualise, analyse and take any proper action or decision-making concerning (the MDA) so, it's very important." (LGA coordinator)
>
> **Use:** "I now do it, within 10 seconds, I am happy…I set up the indicators in the pivot table and once I did that, for example, let me use yesterday; I came quickly and set up within 10 seconds. I was through with the pivot table and immediately looked at the community level…I quickly noticed the absence of data in one health post (Ikpakpara HP) under Okpu ward in Isi-uzo LGA to my greatest surprise. I quickly followed it up, and there is no MAM going on in the 20 communities under the health post under Ikpakpara HP." (State team member)

Despite positive reports, a few key challenges emerged in the research. One challenge was that the benefits of the tool, as listed above, were not necessarily equally perceived between administrative layers. Of the three levels (federal, state and LGA), LGA teams saw more challenges. One reason for this could be accessibility due to poor local connectivity. In general, this was better for federal and state levels, indicated both by field diaries and by the proportion of trained users who accessed the tool.

Another key challenge was around the completeness of the community lists, which were entered into the DHIS2 tool and reported against. To some extent, this challenge was expected, as one active objective of the DHIS2 tool was to better align community lists and bring NTD reporting in line with other reporting frameworks of the Federal Ministry. The qualitative element of the study revealed that these community listing challenges impacted both data quality and the experience of those entering and reviewing the data.

Does the tool enhance government ownership of the data and the MDA programme in general?

Integrating NTD programme monitoring on DHIS2 into the MDA activities improved all three components of 'government ownership' (as referenced in table 1). Participants were excited about the tool being a reliable replacement for the old paper-based system that was prone to losses and errors. Participants also believed that having a single source of treatment data that could be accessed by all the levels of the health system ultimately increased ownership across all levels. The ability to access data at any time and track any changes added to a sense of ownership. Additionally, the ability to view data entries after submission was

Sightsavers

perceived by LGA level participants as a way of strengthening ownership, as opposed to the current system where data submitted to the FMoH is out of their influence or reach.

Interestingly, both LGA and state teams shared experiences of increased collaboration with other local NTD teams through the use of the tool.

For example, a member of the NTD logistics team expressed how this tool allowed the states more data ownership with regards to implementing partners: "…now the state will be in the office and will be seeing all the information they need, so whether the partner goes to the LGA to collect the hard copy is immaterial – it doesn't really matter. So, they now own their programme. They have access to their programme. They have access to their outcome. They make decisions on their own with the outcomes. So, ownership has really improved on the side of the owners of the information."

Increased ownership was expressed through experiences of increased efficiencies, especially around the time saved from not needing to aggregate data at each level, travel to collect data or request access from partners. Increased ownership was also expressed through the ability of teams to take corrective actions as and when issues are identified instead of waiting until after the campaign when it may have been too late to rectify.

Does the tool provide a reliable estimate of treatment coverage?

The measures of coverage from the treatment coverage survey, the DHIS2 tool and the standard LGA-level spreadsheets did not align and there was no discernible pattern between them. Uncertainty around the denominator population was highlighted as a key problem. While the DHIS2 tool cannot mitigate this inherent issue, it is accepted that its ability to improve data quality and prevent manipulation of data will ultimately lead to more accurate coverage data.

Can the tool be scaled up regardless of funder and location?

The study provided some evidence that scaling was more successful in some locations than others. However, no considerable obstacles to scale up were identified; this is a likely reflection of the fact that the partners involved in this research were very supportive and engaged. Looking beyond the study areas, it needs to be recognised that successful scale-up into new locations will not be a 'one size fits all' approach. Each state and NGDO partner have different operating models, cultural contexts, existing technology capacity and levels of willingness to change.

What improvements or adaptations are required to the tool or its processes?

The qualitative and quantitative components of this research painted a picture of what would be necessary to scale this tool up regardless of funder or location in Nigeria. These recommendations are listed below.

Recommendations

LGA workload: The FMoH should create a clear validation process for the spreadsheets used at the LGA level to be replaced by DHIS2; the removal of this excel sheet will be

Sightsavers

integral to successful scale-up considering the reduction in the associated workload at the LGA level.

Community lists: Better and earlier engagement on the community listings, including a mechanism for LGAs to request community additions or removals will be essential moving forward.

Connectivity: Pro-active hardware and infrastructure assessments are needed at LGA and state levels to ensure that minimum requirements are in place or can be put in place prior to roll-out.

Capacity building: Training will be key to the success of this tool. The FMoH and state levels will need an increased focus on data quality and use (isolating both MDA and data entry issues), while the LGA level will need increased focus on tool interaction, especially on data visualisation.

Establishing a clear plan for handover to the FMoH: The handover plan needs to be clearly mapped out and agreed upon by all parties. One important component of this will be capacity building at the FMoH – on the process, configuration and tool management – creating a large group of experts to take this forward.

NGDO meeting led by FMoH: If the FMoH is planning a national scale-up of this MDA reporting tool, then NGDO (implementing partner) involvement is indispensable. The scale-up plan and budgetary implications using the tool (command centre and increased communication costs) need to be outlined in detail.

Support for timely state-level data review meetings: The data review meetings were extremely popular, and multiple requests that they are retained were recorded in the meeting notes. Although these meetings are part of the programme more generally and not specific to DHIS2 scale-up, the immediate availability of the data makes these meetings more feasible and of a higher utility.

Clearer guidance on roles and process: As this tool is standardised, terms of reference for each level need to be thoroughly documented and well communicated during each training, as well as during other MDA meetings such as planning or data reviews.

Separate drug tracking tool: A separate drug supply chain dashboard is needed on the tool, with additional data sources included so a full picture of drug use and availability at each level can be viewed by the logistics teams at federal, state and LGA levels.

Enhancements to the tool: Additional functionality with the aim of improving the quality of data entered can be set up in DHIS2, like introducing minimum and maximum ranges for certain indicators and using the data validation tool, making sure certain logical criteria are met within the data.

Limitations

- We were unable to obtain programme data from Enugu state, making it impossible to compare the data quality between all of the scale-up states
- Observation of DHIS2 feedback meetings could not be conducted as described in the protocol as review meetings were not a routine part of the MDA process. Instead, a

Sightsavers

review meeting was funded at the end of each MDA campaign in different states. Qualitative data collected during these meetings could have a potential bias as the meetings were organised by the research team

- The intention to assess improvement in data quality by comparing data from spreadsheets with data from DHIS2 could not be fully realised because the formal MoH reporting process was still using the spreadsheets. As a consequence, they were cleaned after the campaign where the DHIS2 dataset was not

- The practicalities of implementing the remote TCS methodology may have impacted the quality of that TCS – the training of community enumerators, network connections and remote training/supervision were all challenges

- Qualitative findings revealed limitations in using simple metadata from the DHIS2 tool to assess use. One example of this is that many LGA users shared computers and logins throughout the campaign

Suggestions for future research

Future research could focus on the time and resources saved when this tool fully replaces the current spreadsheet-based system. Other research could focus on a deeper dive into data quality improvements that focus on the aspects of availability, timeliness and completeness.

Learn more

- Summary author: Omosefe Osinoiki
- Sightsavers research team contact: Martins Imhansoloeva (**mimhansoloeva@sightsavers.org**)

Cover photo: © Sightsavers/Jason J Mulikita

Sightsavers