Review of DHIS2 implementation experience

Findings and Lessons Learnt

July 2016
Introduction

To improve the timeliness and quality of health data reporting, the Ministry of Health is implementing DHIS2 (a web-based open-source health management information system). The MoH conducted pilots in 4 townships in 2014 and 2015 with funding support of various partners.

As part of the national HIS strengthening, the 3MDG Fund is supporting DHIS2 operationalization in its 26 Component 1 townships. This includes (a) DHIS2 training sessions in December 2015, conducted in close collaboration with the Ministry of Health HMIS focal point, for THD staff and implementing partner staff (who were requested to support THDs with data entry at the beginning); (b) Provision of laptops / desktops, modems and sim-cards with Internet connectivity; and (c) Follow-up with Implementing Partners (IPs) and Township Health Departments (THDs) on the status of implementation.

Rollout at the township level has begun in 2016 and will be gradual based on availability of funding and Internet connectivity. THDs are entering on a monthly basis aggregated facility-level data on services provided and annual demographic and HRH data into DHIS2. As of 22 July 2016, all 26 trained townships are already using DHIS2, with varying reporting completeness. At the time of this review, the MoH is planning to scale up DHIS2 to over 190 additional townships in 2016 with the funding support of the Global Fund.

Objectives of the review

This review of DHIS2 implementation experience in selected townships has the following objectives:

1) Identify the strengths and weaknesses of DHIS 2 implementation, and additional support;
2) Understand how townships are using or intend to use data from DHIS2, and
3) Identify success stories and lessons learnt for further scale-up (under GF support), in terms of training curriculum, logistical and system support arrangements, and other.

Scope, methods and tools

The review team has:

- Reviewed reporting completeness\(^1\) in DHIS2 for January-March 2016 and understanding reasons for gaps. This was based on desk review of data in DHIS2 and interviews with the THD / IP staff.
- Checked consistency of data in paper reports from health facilities and data entered in DHIS2. This was based on desk review of data for 3 randomly selected health facilities covering all HMIS indicators for each facility and all months for which data was available.
- Explored DHIS2 user experience in terms of satisfaction and difficulties experienced, as well as the existing and intended use of DHIS2 data. Got user inputs on what parts of the DHIS2 system might need to be enhanced or modified. This was based on interviews of THD and 3MDG Implementing Partner staff.

The DHIS2 review team, with inputs of the University of Oslo specialists, has developed customized tools for the review, consisting of (1) an Excel-based tools focusing on availability, timeliness and consistency of

\(^{1}\)Completeness here is defined as proportion of health facility reports entered in DHIS2 out of those expected.
data both at the township and RHC level, and (2) a questionnaire covering user experience on system functionality, technology aspects, data entry and data use.

Township selection

The review was conducted in two townships, selected purposively: one township with good DHIS2 reporting status and one township with weak status based on reporting completeness for January-March 2016. The field missions took place on 23-24 June and 30 June-1 July.

Review team

The review was conducted under the leadership of Dr Thet Thet Mu, the Director of Inspections, MoH (HMIS Champion). The review team was composed of:

- Dr Ohnmar Kyi, the DHIS2 Technical Expert and Consultant leading the scale-up
- Dr Ei Shwe Sin Win, Assistant Director, MoH
- Dr Lwin Lwin Aung, Assistant Director, MoH
- Gulia Allabergenova, 3MDG M&E Officer
- Dr Tin Aung Thant, 3MDG M&E Specialist (MNCH)
- Dr Min Min Zin, 3MDG M&E Analyst (MNCH)
- Dr Saw Min Thu Oo, 3MDG M&E Analyst (MNCH)
- Dr Khay Mar Aung, 3MDG M&E and Learning Analyst (HSS)

Dissemination of key findings

1) Prepare a presentation for advocacy meeting of DHIS2 for Region/State Health Directors and project managers (to be conducted with the Global Fund’s support).

2) Integrate a presentation of high-level findings of the review in the DHIS2 roll out training at respective region/state, in order to make focal person aware that such review may take place later in their townships.
Findings

Human resources

Both townships had personnel trained in DHIS2. However, the situation varied:

Township 1 had two DHIS2-trained focal points at THD and one DHIS2-trained IP focal point. All three of them were actively engaged in DHIS2 work at the time of the review. They demonstrated strong level of commitment, motivation and interest in using DHIS2 and learning further of its functionalities, particularly in terms of data utilization. Moreover, effective collaboration in DHIS2 use was observed between the THD and the 3MDG Implementing Partner. The DHIS2 data entry was done jointly by the THD and IP staff. Data utilization was driven and facilitated by the 3MDG Implementing Partner.

Township 2 originally had two DHIS2-trained focal points at THD (THN and HA1), as well as one DHIS2-trained IP focal point. However, the HA1 staff moved to another township at the beginning of the year and the position was still vacant at the time of the review. The second trained THD staff (THN) shared her key challenges for using DHIS2:

i. Difficulties using a computer and found mobile applications easier to use. However, she also conveyed to the review team that she was doing a course in basic computer skills, and
ii. Overloaded with other work, especially as the HA1 position was still vacant.

The IP focal point in Township 2 got engaged in DHIS2 work only since March 2016. It was explained to the review team that there had been a lack of clarity both within the THD, and between the THD and IP on who should enter data, the negotiation between THD and IP had taken place in January and February, and this is why data entry started only in March. The THD focal point has started using the system, jointly with the IP staff, only from May. Knowledge of the IP staff in using DHIS2 was not very robust, possibly because of the time gap between the training and starting use. The level of interest and motivation in using the system was low in comparison to Township 1.

In one of the townships, the TMO provided inputs in the review. In another township, one of the DHIS2 focal people from RHDs was present during the review. She was trained in DHIS2 in 2015, although started using it only recently.

Lessons learnt

1) The review has underlined the importance of basic computer skills and willingness to learn about technology. Therefore, for new townships, THDs should be requested to nominate as DHIS2 focal points those who either already have computer skills, or those who are motivated and willing to develop them. These people should be familiar with HMIS forms and requirements.

2) The IP support is useful, especially in the early stages of DHIS2 use. However, as shared by some 3MDG IPs, in some THDs there is a perception that DHIS2 is “IP’s business” rather than the MoH priority. The roles may need to be clarified i.e. the THD DHIS2 focal points are primarily responsible for DHIS2 data entry and the IP’s role is supportive.

3) The regional level participation could contribute to DHIS2 strengthening in the future.

4) The workload created by other eHealth and mHealth projects should not be underestimated. Resourcing needs should be estimated accordingly.
**Infrastructure and Internet connectivity**

Each of the townships was supplied with a laptop (primarily for DHIS2 purposes), modem and sim card. The laptop utilization status varied:

- In Township 1 the laptop provided was actively utilized, on a weekly basis, to say the least (but possibly more frequently). Sharing a laptop between two focal points was done without any issues.
- In Township 2 the laptop was not accessible for DHIS2 purposes. This prevented the DHIS2 focal point from practicing computer use and specifically DHIS2 data entry.

Both townships had Internet connectivity. Interestingly, modems were not used for connecting to the Internet, as it was mentioned that they were not functioning well. Instead, connection was established using a mobile phone.

In Township 1 the Internet access speed was not suitable for accessing GIS data. In Township 2, Internet speed is quite good to access data visualization as well as GIS.

**Lessons learnt**

1. Preventive measures need to be taken to minimize issues of accessing the laptop primarily given for DHIS2 data entry, like seen in one of the township. It was also learnt by the review team that there was a similar issue of access to the laptop in another THD.
2. Test modems before mass ordering them, to make sure they are functional.
3. Sim-cards may be best to be purchased by THD and to be for operators with best coverage in a given township.
4. Anti-virus software should be installed or at least recommended for installation during trainings. There are some free anti-virus products which can provide reasonable protection.
5. While this was not a big issue during the review, with a scale-up of DHIS2, user support arrangements need to be planned and adequately resourced (e.g. support on functionality or computer maintenance issues).
DHIS2 data entry

The review team has looked at such dimensions, as availability of the reports in the DHIS2 system, timeliness of data entry and consistency of entered data with the RHC reports. The review team mainly focused on January, February and March 2016. The scope of this review originally planned to cover Form 1 and Diseases Under National Surveillance (monthly report), Form 2 (quarterly report), and Form 3 (annual report for 2015). Subsequently, in the Township 2, the Form 3 was de-scoped from the review, as it was clarified by the MoH HMIS colleagues than it was not open for township data entry yet. In this regard, sharing of the brief report by DHIS2 external technical experts to all responsible HMIS colleagues is needed if external professional services are used.

In Township 1, both THD and IP focal staff are knowledgeable and diligent about DHIS2 data entry. They routinely access DHIS2 on weekly basis.

In Township 2, the use of the system started only in March, due to the issues explained in the Human Resources and Infrastructure sections. The use of the system has not been regular.

Availability

In Township 1, monthly data (Form 1) and DUNS data for January-March 2016 for all functioning reporting units (RHCs and Hospitals) were entered in DHIS2. Form 2 data was not yet entered in DHIS2 at the time of the review.

In Township 2, monthly data for 7 out of 8 functioning health facilities was entered into DHIS2 for January to March period. One health facility did not submit reports. Form 2 data – all facilities have been entered.

Moreover, in both townships, the review team has also found that some new health facilities were already displayed in DHIS2 system, although they were not fully functioning yet. Understandably, no reports have been received from these facilities and no data was entered in DHIS2, thus affecting the correctness of displayed status of reporting (for example, in Township 1 it should have been 100% but instead just over 90% was showing as reporting completeness). For both townships manual corrections were made to remove the facilities that were not yet functioning from DHIS2.

Timeliness

In Township 1, there was good timeliness of data entry for Form 1 (monthly report) for all three months. For example, all reports for January were entered into DHIS2 within 2 days after the deadline and all reports for March were entered by the deadline. For Form 2 (quarterly report) – data entry was delayed and not yet done at the time of the review.

In Township 2, DHIS2 was not updated timely. Data entry was only done twice since the rollout - once in March and another time in May, as claimed by the Implementing Partner. It was explained to the review team that there had been a lack of clarity between the THN and HA1, as well as between THD and IP on who should enter data. Negotiation between THD and IP had taken place in January and February, and this is why data entry started only in March. The subsequent check in the system by the review team suggests that the data entry started only in May.

Consistency

In Township 1, there was good data consistency between data entered in DHIS2 and RHC monthly reports. Average data verification across randomly selected 3 RHCs - Jan – 99%, Feb-98% & Mar -100%). For
DUNS data – some entry errors were found. The users have pointed out that the column heading row does not freeze, therefore difficulties and errors happen when reaching to lower rows where the column title is not displayed.

It was noted in Township 1, that there is a robust process in place to compile health facility report. Firstly, the HF monthly reports submitted to THD are checked by the Township Health Assistant and by the IP staff. Then they are entered into Excel sheet, data entry supported by IP, and thus a paper-based township report is prepared. Then data is entered into DHIS2. While this practice contributes to good data quality and shows personnel’s commitment, the disadvantage is that it doubles the workload. Moreover, dependence on the IP’s support in preparation of township monthly report by compilation of HF data is a risk to long-term sustainability.

In Township 2, while overall the consistency was over 90% for the Form 1 data entry (January 94%, February 98% and March 95%), quite a few inconsistencies were found in the Immunisation section. The error message for data validation appearing at the time of completing data set was not read and actioned accordingly. The inconsistencies in the Immunisation section were partly due to the fact that some HF were still using old Form1 in which some EPI indicator rows are not aligned with the township report Form1. It appears that this was exacerbated by the lack of understanding of HMIS data on part of the IP staff doing the data entry, and lack of joint data review by the THD and IP staff.

Among other findings, some discrepancies were found in Township 2 between data in health facility reports and data for the same health facilities in the township report (particularly in the EPI section), likely due to the inconsistent practices of using the HMIS form for new vaccination. These discrepancies may also be because changes made in the health facility data after the original submission are reflected only in the township report and not on HF report. This may pose some risks to data quality in DHIS2.

Overall, most DHIS2 user in both townships felt that data entry was not difficult. Some users noted that it was quite intuitive, as DHIS2 screens closely resemble HMIS forms. The difficulty on part of one of the THD users was associated not with DHIS2 but rather with the idea of having to use a computer (she had not used a computer before and was only developing some basic skills at the time of the review).

Lessons learnt

1) Addition of new HCs and removal of non-functioning HCs needs to be managed in DHIS2 in order to have an accurate reflection of the status of DHIS2 reporting. Particularly, with the scale-up of DHIS2, instructions may need to be given to THD DHIS2 focal points as part of the training on how to handle this issue.

2) Submitted data can be easily changed subsequently. The advantage is that this facilitates the correction of errors / making necessary adjustment; the disadvantage - this may result in discrepancies between data presented at various forums and data stored in the system.

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2 It was clarified by one of DHIS2 team subsequently that the user can see the name of data element at the right corner of the screen when the cursor is put in the cell.
DHIS2 data utilization

While DHIS2 data use is very important, it is worthwhile reminding the reader that the system is still in its early days. Therefore the main purpose of the review was to understand the experience and challenges of DHIS2 use from the perspective of skills, equipment and data entry. In addition, the subject of DHIS2 data utilization is addressed in the review, in order to get an idea and an early indication of the situation, and if further capacity building is required. It is not expected that DHIS2 data is fully utilized at this early stage.

In Township 1, data utilization was mainly encouraged and done by the Implementing Partner. The main experience and challenges in terms of data use are:

- DHIS2 dashboards and data visualiser are not used.
- For the majority of indicators, pivot tables for achievement data are absolute figures only, and not percentages. This is a limitation for presenting coverage and makes it difficult comparing one RHC situation to another one due to differences in the population size.
- Limited knowledge was observed in using indicator (coverage) in Pivot table rather than data element (absolute figure).
- Attempts to create a dashboard have resulted in some errors. Errors occurred due to selection of wrong function in data visualizer; choosing “Total” is correct function instead of “Detail”
- Limited use on dataset report in DHIS2 which facilitates township “Total” automatically after entering of monthly data from all health facilities.
- At present, there is no functionality for acceptance / approval of data by the TMO following its submission by the DHIS2 focal point. It is also not possible for data users to know whether the data entry has been completed or not. This resulted in some data use during a RHD meeting without the awareness of the TMO; it appeared subsequently that the presented data was not complete.

Despite the above challenges, it was shared with the review team that the data utilization has improved thanks to DHIS2, as data became more easily available and accessible, particularly for the Implementing Partner. For example, the IP uses DHIS2 data at monthly RHC level meetings for monitoring indicator progress (data is exported into Excel, estimated denominators added, coverage % calculated and used for target-setting). The outputs are used at RHC meetings for planning and monthly achievement comparison.)

In Township 2, DHIS2 was used only for data entry. Other functionalities were not used. The level of awareness of dashboards, data visualization and other features was low to non-existent among both the THD and IP staff. There was also lack of interest on the part of THD in utilizing DHIS2 data, due to perceived lack of value. This is more than likely due to limited understanding of the functionality and benefits that DHIS2 could offer, as well as lack of confidence and very limited direct experience to date in using the system.

Lessons learnt

1) DHIS2 data utilization by THD and SHD senior staff should be encouraged
2) There is a need for further capacity strengthening in using the DHIS2 functionalities to enable better use of data for decision making.
3) The functionality to indicate completion of data entry and approval of submitted data needs to be introduced and users trained accordingly.
Suggestions on DHIS2 functionality enhancements in the future

1) The functionality to indicate completion of data entry and approval of submitted data, as covered in more detail in section DHIS2 data utilisation.

2) At present DHIS2 shows both absolute figure as well as indicators, however indicator calculation is done on annual basis and cannot be viewed on monthly basis. Absolute data alone does not allow for comparison between the health centres. It would be useful if the system could display data on coverage of health services (in %) for some key indicators only on monthly basis to enable analysis and follow-up.

3) Provide the ability to freeze the column headings in DUNS section, as explained in the section DHIS2 data entry / Consistency.

4) At present only two CHW-related data fields are included in DHIS2. Integration of an expanded dataset on services delivered by Community Health Volunteers in future releases of DHIS2 would be useful. Making this operational would depend on when the nationwide system is implemented for collecting data from community health workers and volunteers.

Opportunities for future evolution of DHIS2 use

1) Design and conduct a training dedicated to DHIS2 data utilisation. The emphasis should be placed on the value of using data for decision-making at township level and how DHIS2 data could support and facilitate work-planning. This could initially be trialed on the 26 3MDG-supported THDs and IPs where DHIS2 is already in use. Involve not only the DHIS2 focal point but also the TMO (or other senior THD member who can champion data use) and SHD staff who will be in charge of supervisions.

2) For the scale-up trainings (with the Global Fund’s support), consider integrating a couple of sessions focused on practical data utilization.

3) Within 3 months of this training (with the Global Fund’s support), set up supportive supervision on data utilization at the time of the monthly data compilation.

4) Encourage sharing Successes and Lessons Learnt from DHIS2 use at RHD / SHD-level meetings.

5) If the paper-based reporting from the township level up continues as a back-up to electronic reporting, it may be important to think of a way whereby the electronic system and paper-based system would be somewhat complementary and enable some efficiency. For example instead of manually calculating data for the paper-based township report from HF reports and then entering into DHIS2, the HF-level data could first be entered into DHIS2 first and then aggregated figures (calculated automatically) could be copied from the system into the township paper report.

6) A process needs to be defined on how to handle changes in reported data by HF's, if they occur, after the original submission and entry into DHIS2. The explanation of the process needs to be included in the training to ensure consistent application.