

## Evidence and Learning: Strengthening crisis and risk-related data and institutional education information systems

### Case Study – The role of DHIS2 for Education in response to Covid-19 emergency

#### Brief description of practice and the key learning

District Health Information Software (DHIS2) is an open-source web-based platform that has been used to capture, validate, and analyze health data for the last two decades in middle- and low-income countries.

Since 2011, the Ministry of Health (MoH) in Uganda has used DHIS2 as a national electronic Health Management Information System (eHMIS) and since 2019, Uganda has piloted and implemented DHIS2 for DEMIS (Decentralized Education Management Information System) at district level. This has allowed the districts to capture, validate, analyze, visualize and use EMIS data from schools to support routine planning and allocation of resources, monitoring and support supervision, and inform evidence-based decision making by the district leadership and education teams.

The ongoing implementation of DHIS2 for DEMIS provided a platform for collection of national learner and special needs enrollment statistics, teacher and WASH data to enable the Ministry of Education, districts and education development partners to plan for the phased [safe reopening of schools in October, 2020](#). This was the initial reopening before the second wave of the COVID-19 in the country. DHIS2-DEMIS was then further configured to support school-based COVID-19 surveillance reporting.

A key lesson from the implementation has been the demonstration of how cross-sector linkages between education and health can be strengthened through joint interventions and enhanced data sharing, with the surveillance data reported in the DHIS2-DEMIS being displayed in the Ministry of Health electronic Integrated Disease Surveillance and Response (eIDSR) for immediate action on any positive cases reported within learning institutions.

#### What challenges does the practice/initiative address and why was the change needed?

A problem analysis and information need assessment at district level highlighted the lack of a decentralized system and limited use of education data at district level. This was largely due to manual data management processes, centralized EMIS at the Ministry of Education and Sports (MoES), causing delays in feedback of the data collected at lower levels. These delays led to the use of outdated data for planning, resource allocation and decision-making purposes. The findings of the assessment informed the required DHIS2 configuration, infrastructure support and capacity building on data management best practices and system use provided during the implementation.

In addition, the COVID-19 pandemic demonstrated the vulnerability of national education systems to exogenous shocks and highlighted the need for strengthening collaboration and coordination between public health and education sectors.

### **What were you trying to achieve? How do the aims and objectives relate to improving the identification and monitoring of education needs and barriers in crisis-affected contexts and emergencies?**

Implementation was aimed to empower district education teams to manage and use their education data to inform planning and decision-making. Building on the experience of implementing DHIS2 in the health sector for routine health data management and response to public health emergencies, the DHIS2 for Education system in Uganda was leveraged on, to support management and use of routine education data and respond to the effects of COVID-19 pandemic in the education sector.

Amidst the COVID-19 pandemic, availability of data at the lower levels helped identify resource gaps and inform strategies to address these. For example, enrollment data enabled the implementing districts to identify the gap in the self-study materials supplied. This informed lobbying for resources from education development partners to print additional self-study materials and support the continuity of learning amidst closure of schools. The ability of district teams to capture, analyze, visualize and use their data enabled them to respond quickly to the emergent needs during the pandemic. The districts were able to provide timely data to inform resource mobilization and allocation.

In addition to supporting decentralized data use, it has been key to simultaneously build a system that is responsive to changing needs and unexpected challenges that might arise such as the COVID-19 pandemic. DHIS2 has a variety of tools in one open-source, fully customizable software platform, that can be used either for a single purpose – such as health, logistics or education data – or to triangulate aggregate and individual data from multiple sources and programmes in one integrated system.

Capacity building is at the core of DHIS2 implementations to ensure that ministries can customize the platform based on the rising data needs. In preparation for [initial phased school re-opening](#) the platform was quickly customized to collect national data from pre-primary and primary schools on enrollment, learners with special needs, staff and WASH facilities in schools. This data was collected in excel and imported into the DHIS2-DEMIS for quick analysis, visualization and use.

### **Did your practice meet the initial aims and objectives? What were the main results?**

The MoES central level team was equipped with skills to configure, support and maintain the system during the several end user trainings. This was key in ensuring sustainability by equipping the central level staff to support the districts and have the ability to respond to new data demands such as school-based COVID-19 surveillance.

At district level, the district teams were empowered to use DHIS2-DEMIS for data capture, validation, analysis, presentation and use. Key indicators from the system informed procurement of additional desks, textbooks, construction of classroom blocks, reallocation of teachers, and allocation of capitation grants. Using the self-service dashboard applications in the system, the districts have been able to visualize, display and present their data on key performance indicators like the pupil-teacher ratio, pupil classroom stance ratio, enrollment by sex and pass rates on district dashboards and notice boards. This data is further shared and utilized during the district planning meetings. Data from the system was also used

to inform printing and distribution of self-study materials for learners, resource mobilization from partners, provision of support to private teachers during national lockdown and closure of schools and procurement of WASH facilities in preparation of school re-opening.

To enhance the response to the COVID-19 pandemic, the DHIS2 team conducted a pilot in two districts, which paved the way for a detailed joint implementation plan where the MoES and MoH together with partners collaborated and supported the national roll-out of vaccination campaigns for teaching and non-teaching staff as well as COVID-19 surveillance and response in all learning institutions through an SMS-based reporting mechanism.

To ensure safety of learners and early detection of cases from learning institutions for referral and management, the DHIS2-DEMIS SMS-based reporting that was piloted in the DEMIS implementing districts was approved by the MoES and MoH as the national system for school based surveillance in the country. The joint implementation plan has guided the national roll out in collaboration with other partners like UNICEF. This was officially launched by the Hon Minister for Primary Education Hon. Joyce Moriku Kaducu.

Beyond the COVID-19 response, enrollment data from the system has informed targets for learner vaccinations during Polio-Measles Rubella and HPV vaccination campaigns in the DHIS2-DEMIS implementing district strengthening the cross-sectoral linkages between health and education.

### **What stakeholders were involved? How did you ensure their involvement was participatory and collaborative?**

The implementation of DHIS2-DEMIS has been a collaborative participation of stakeholders at national, district and school level.

At **national level** there have been different engagements with the MoES top management such as Ministers and the Permanent Secretary for buy-in and support. Presentations were also made to the Basic Education and M&E technical working groups at the MoES for approval to pilot. Further engagements were made with the Commissioner Basic education, senior officials and various user department officials to harmonize data needs from multiple stakeholders into one system. Reporting needs from different departments included: Gender, Special Needs, HIV/AIDS, Guidance and Counseling, Human Resources, ICT as well and various partner reporting needs. The departments informed the selection of standardized tools to promote routine data collection, and minimize duplication in reporting. The central level team has been provided with smart display screens to view data on SDG 4 indicators progress and key district needs for effective planning like enrollment, % special needs enrolled, pupil- teacher ratio, pupil wash facility ratio, from the implementation sites and school surveillance daily reports from learning institutions.

DHIS2-DEMIS is positioning itself as a central repository system for the MoES data needs, where the team is exploring strategies with the planning unit to develop and maintain a harmonized Master institution/school list, import of population statistics for the calculation of SDG4 indicators, linkage to the National Examination Board for examination results and analysis of performance. In the meantime, with the support from the Planning Unit, population estimates and a detailed Master School List were obtained from Uganda Bureau of Statistics and uploaded into DHIS2-DEMIS. The list is updated and validated based

on feedback from the DEO during national data calls. Examination results have also been imported in the system using the import wizard app in DHIS2 as the team explores mechanisms for direct integration.

The linkage of school-based and national COVID-19 surveillance and reporting saw HISP Uganda working collaboratively with the Ministries of Education and Health to develop a national school based surveillance scale-up plan. This clearly stated the stakeholders' roles and budget for rolling out the SMS-based reporting in DHIS2 -DEMIS and how data will be utilized at the different levels. Partners such as UNICEF, Save the Children, USAID and UNHCR were engaged to support the national scale up of school based Covid-19 surveillance. These have been pivotal in supporting national and subnational trainings and enrolment of schools into the system as well as ongoing monitoring and support for timely reporting.

The system allows grouping of institutions with similarities based on funders, levels or any common characteristics to allow data visualization and comparisons. A list of institutions from pre-primary up to tertiary level (within and outside of camps) in refugee host districts was shared and uploaded and grouped in the system. Currently, data on school surveillance can be filtered to show reporting from various partner supported districts and institutions in refugee settlements.

At the **district level** the district leadership, the Chief Administrative Officers (CAOs) and Resident district commissioners, district planners, district education officers, school inspectors and politicians were oriented on the project and involved in the requirements gathering process that informed system design and project implementation..

The various stakeholders at national and district level have been involved in a number of capacity building activities such as data entry, analysis and use, support supervision and dissemination to improve system and data use. The central level team was further trained on system design and customization to support the maintenance and use of the system.

At **school level**, focus group discussions, school visits and orientation workshops for the school administrators and head teachers have also been conducted to support learning through knowledge sharing and improve data management practices at school level.

Partnership with Save the Children Uganda, a close partner of the MoES made the collaboration and engagements with the different stakeholders easy due to an existing memorandum of understanding between the MoES and Save the Children.

### **How did the practice interact with and potentially strengthen the institutional education information systems in the context?**

In the implementation sites, population estimates, enrollment and examination data in the DHIS2-DEMIS has supported the development of district level dashboards with key indicators like gross enrolment, performance index, pass rates, pupil-teacher ratio and indicators on accessibility and inclusiveness. Learning from the implementation of DHIS2-DEMIS has informed ongoing updates of the EMIS policy to advocate for district education statisticians who are key in promoting data analysis and use at district level.

A national implementation plan and budget for the roll out of school-based Covid-19 surveillance and reporting was shared with education development partners. Under the stewardship of the MoES and MoH and building on the implementation success in the initial pilot districts, partners have joined efforts to support the national scale of school-based Covid-19 surveillance, promote actionable data use and ensure safety of learners in schools.

### **What challenges and barriers did you face and how did you change your approach to overcome these?**

Challenges included lack of an education statistician at the district level, numerous data calls without standardized reporting formats leading to duplication, unharmonized master institution list, internet connectivity and low technological capacity at the district level.

The implementation of the decentralized DHIS2-DEMIS requires a dedicated statistician for management of education data based on learnings from the health sector. In the absence of this resource, the team trained inspectors of schools, district planners, District Education Officers and volunteers within the districts to support the implementation and utilization of the system. In addition, a termly data collection tool harmonizing all MoES and partner reporting needs was developed and will be used to collect more routine data that can be used across all levels of the education sector

The lack of a harmonized institution Master School List largely affected import of data during national data calls, data sharing and analysis. In order to mitigate this challenge, the team has worked closely with the District Education Officers to obtain lists of updated learning institutions and harmonized these with data from the Uganda Bureau of Statistics to ensure continuous update of the Master School List in DHIS2-DEMIS.

The districts lacked internet connectivity and infrastructure like laptops to support the implementation. Those that had desktops were outdated and used mostly for clerical work. Project funds were utilized to set up districts with reliable internet, desktops and laptops. Districts have been urged to incorporate the infrastructure maintenance costs within their district budgets for sustainability.

### **What was the key learning from your practice? If you did it again, what would you do differently? What pointers would you give to help someone from another organization facing similar challenges?**

**Strengthening cross-sector linkages:** Linkages between education and health data are critical for successful implementation of health programmes in learning institutions, response to emergencies and utilization of limited resources. The implementation demonstrated the need and value add of strengthening cross-sector linkages between the health and education sectors to implement joint interventions formalized through joint implementation plans, which can enhance data sharing and utilization of the limited resources through sharing of resources between the two sectors like funds for trainings, shared wireless internet connectivity.

Optimizing the use of resources such as the setting up of the internet at district level and beyond the education sector eased communication and work. Amidst the pandemic, the internet connectivity became crucial for online meetings, sharing and submission of data. Finding solutions such as working with a telecom company to install low cost, unlimited wireless internet and centrally procured zero rated

data have been useful to ensure dedicated education & health URLs that are accessed at both district & national level by the Biostatisticians, HMIS focal points, disease surveillance focal points, School Inspectors and MoH staff to support data sharing & use between the two sectors.

Integrated data collection and reporting needs for partners, districts, MoES and MoH minimized the duplication of reporting and wastage of limited resources in numerous ad hoc data calls, sometimes collecting similar data like enrollment.

During the roll out of the Covid-19 school based surveillance, the biostatisticians with longstanding experience in the use of DHIS2 for health, have been crucial in supporting the district education teams to register school level reporters in the DHIS2-DEMIS and utilizing the district surveillance focal persons (DSFPs) follow up with schools in case any positive cases are reported. Online capacity building webinars on system utilization have also been combined for the two teams (district health teams and education teams) to ensure learning and transfer of knowledge on use of the DHIS2 platform from existing capacity established in health.

**Stakeholder engagement and buy-in:** Different stakeholders play different roles within an implementation both at the national and district level. Key for projects to orient stakeholders including top-level management like the Permanent Secretary, Ministers, Commissioners of the different user departments and district leadership for improved data utilization and linkage.

**Ministry ownership:** The MoES Basic Education Department took lead in implementation of all activities in the pilot districts. MoES was responsible for all official communications to the districts, took part in district entry meetings, training and support supervisions. MoES stewardship role in implementation increased ownership of the system by the districts.

**Training of a multidisciplinary team in use of DHIS2-DEMIS:** In absence of a statistician in the education sector at the district level, end user training targeted the district education officers, district planners, inspectors of schools, biostatisticians and data volunteers. This was to create a pool of staff with skills in use of DHIS2-DEMIS. The Biostatisticians with experience in use of DHIS2 in the health sector, at the district level shared experience and supported the education teams on system utilization.

**Partnerships important for scale:** It is important to work with other partners to avoid the duplications and working in silos. The collaboration with Save the Children which has implemented projects in Education for over 50 years was important in securing buy-in and support from the MoES. The implementation has presented opportunities to explore further engagements with the MoES education departments/entities such the Uganda National Examination Board (UNEB), Teacher/Tutor Instructor Education and Training (TIET) and the Planning department on the use of the mature DHIS2 web API (application programme interface) to integrate examination, teacher data into the DHIS2-DEMIS. This will enable calculation of key indicators using additional data not directly captured within the DHIS2-DEMIS.

**Utilization of existing tools:** The implementation did not create new data collection tools but rather utilized the existing EMIS forms by MoES and customized them into DHIS2. This made the initiative more aligned to ministry objectives rather than just a one off donor initiative. The project looks at enhancing and streamlining the MoES rather than working parallel to it, which made the district implementation easier. There is however a need to provide lessons of learnings from the implementation with the different stakeholders, Although the EMIS tool was customized and used for pilot , this indicated the gap in routine

data collection, since the EMIS form was collected once on annual basis leading to different ad hoc data calls in the system for different data needs .

**Promote data use culture at all levels:** The implementation has shown that decentralization of education data management improves data utilization at lower levels. The culture of data use should not only be promoted at national and district level but also at the lower levels like schools and the community.

### Submitted evidence

Shared google folder [here](#).

- Uganda Final Assessment Report June 2020 - DHIS-DEMIS pilot in Gulu and Mayuge Districts
- Uganda DHIS2 Report Mayuge - Data Application in Education Dpt Since Closure due to COVID-19
- Uganda DHIS2-DEMIS Gulu City Report - Data Use During Lockdown
- National implementation plan and budget for school-based COVID-19 surveillance and reporting
- Report on National data collection in pre-primary and primary schools for covid response
- Requirements specifications for pilot
- Verification of school details for IPFs 2021\_2022
- MoES and MoH roll-out confirmation letter