Data for Action - Developing a Multi-Country CLM Dashboard for Visualization, Reporting, and Program Management

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Background

Community-Level Monitoring (CLM) is a key way to improve healthcare quality and accountability. CLM of health care services involves independent communities and civil society organizations to routinely collect data on health services at health facilities or in communities, analyzing these data, providing feedback to duty bearers on the findings, advocating for changes in service delivery, and monitoring changes to ensure improvement in services.

Since 1999, the Ritsihidze program in South Africa has developed an online CLM data dashboard system to automate critical CLM efforts and project management functions. This system has been developed primarily through partnership with amfAR’s Andelson Public Policy Office and has been continuously developed with additional features to support emerging needs of the Ritsihidze program.

CLM has seen increasing support in recent years from donors including PEPFAR and the Global Fund to Fight AIDS, Tuberculosis and Malaria. Despite considerable early successes and impact by CLM projects, an emerging challenge in many programs is the need to rapidly clean and structure CLM data, conduct analysis of large volumes of data at different levels (facility, district, provincial, national), produce easily understood visualizations, and develop reports that facilitate real-time advocacy and accountability interventions. Doing so requires a level of technical skills that many civil society organizations implementing CLM do not have readily available as in-house expertise nor is it easily developed. This poster discusses a multi-country CLM data visualization platform to support these efforts.

Overview

The CLM data platform has been developed to support most critical data systems requirements of CLM efforts, including:

- **Data Collection:** Electronic and mobile-based data collection that can be completed on- and offline based on survey tools developed by each independent CLM efforts. Currently, the system supports **Data Collection** data collection collection platform, but has been developed to be platform agnostic, with alternative back-end support targeted for future development.
- **Data Extraction, Transformation, and Loading (ETL Pipeline):** All survey-based data collection systems require some transformation and re-structuring of the raw data collected to make the data suitable for data analysis and visualization. The CLM data platform collects data and performs these basic cleaning, transformation, and CLM project independently determined automated analysis functions before leading to the re-structured data on a separate MySQL/MariaDB database.
- **Data Visualization Dashboard:** Web-based portals that are branded and structured by each CLM effort individually support near-real-time visualization of CLM data at the facility, district, provincial, and national levels as well as the ability to access trends over time and create customized filters for different implementing partners, funders, or CLM organizations. Multiple languages are also supported.

- **Automated Reporting:** Each CLM project is able to develop automated PDF facility, district, and provincial/regional reports using a series of pre-built visualization modules or components (pie charts, bar charts, tables, etc.) as well as generate solutions and track commitments from duty bearers.
- **Project Management Support:** The CLM data platform enables project management through tracking of submitted forms against CLM derived criteria for data completion, user/organization monitoring, and tracking of issues that require urgent remediation (i.e. stockouts).

Description

The CLM data platform supports most critical data systems requirements of CLM efforts, including:

- **Overview:** Documented and standardized data collection procedures and survey tools developed by each independent CLM effort.
- **Summary:** The CLM data platform extracts data and analyzes collected to make the data suitable for data analysis and visualization. The CLM data platform

Processes and Components

- **Data Warehousing:** Recognizing the need to ensure data ownership by the community, CLM tools targeting support for multiple projects should not store multiple project’s data together in mixed database tables. Rather, all CLM data for each project can and should be maintained in separate databases to ensure data are always fully controlled by the individual CLM project and can be seamlessly moved to alternative platforms based on the needs and desires of the individual project. Where linkage to other data sources (Government, PEPFAR, G7) are desired, such linkages can easily be accommodated through linking identifiers and standardized naming conventions.

- **Indicator Analysis:** Automated scoring and ranking systems for each CLM indicator/survey question are essential for rapid analysis and tracking of results over time, accounting for unequal sampling sizes and lack of predefined performance targets. Most CLM indicators do not have clearly comparable results over time, accounting for unequal sampling sizes and lack of predefined performance targets. Most CLM indicators do not have clearly comparable

- **Granular Data Visualization and Reporting:** CLM projects are generally inherently focused on fixing issues at the local level. Issues that affect the quality of services are not uniform across sites. Visualization platforms generated at the national level or higher levels often overlook critical local service delivery failures and do not facilitate local accountability and advocacy. As a result, data visualization systems for CLM data must be oriented towards driving users to the levels of disaggregation where issues require resolution, namely identifying priority facilities that require intervention. However, having automated high-quality reports at facility, district, and provincial levels is an important tool for monitoring and sharing findings with health officials, conducting advocacy efforts, and obtaining buy-in from health facilities, without overwhelming the CLM project staff and capacity. Reports that contextualize successes and challenges relative to peers are the most effective. Failing to provide findings back to facilities directly not only undermines advocacy objectives of CLM projects, but also can create frustration among facility staff having to respond to questions routinely with no feedback provided in terms of the findings.

- **Project Management Tools:** Large-scale CLM implementation is administratively and logistically complicated. Project management tools for tracking data collection completion, administrator community monitors, and tracking issues is essential for easing the data collection burden on CLM projects as that time is available to focus on the data analysis, feedback, accountability, and advocacy elements of CLM projects.

Conclusion & Next Steps

As CLM efforts continue to develop and expand, there will be increasing need for data systems support. The CLM data platform we have developed will be freely released as an open source (GPLv3) project in the near future to allow for wide adoption by any interested CLM project. Additional features being considered for future development include:

1. Support for mobile data collection systems – currently, only Open Data Kit (ODK) is implemented. The CLM data platform could be developed to support other data collection platforms (HDS2-Tracker, ODK, etc.) could be developed.
2. Improved administrative back-end support for CLM projects to administer analytical visualization and on their own without dependent on any other software.
3. Data systems integration with other data systems, such as PEPFAR’s DATAMER & other databases.

The public Ritsihidze Dashboard is available online at: [http://data.ritshidze.org.za](http://data.ritshidze.org.za)

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**References:**

- **Background:**
  - Data visualization and reporting needs of CLM projects are dynamic and data support systems must be responsive to the changing advocacy needs of the community. As such, prioritizing long-term partnerships between CLM project staff and developers of CLM support tools over short-term technical assistance or contract development is essential to enable data system features to evolve along with the needs and goals of the CLM project.

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