PERFORMANCE OF DISTRICT AND FACILITY LEVEL HEALTH INFORMATION SYSTEM IN A POST-CONFLICT ENVIRONMENT: THE CASE OF SOUTHERN YEMEN

BACKGROUND

Timely and routine health information is one of the foundations of effective health services management. In Yemen, health facilities are supported by multiple humanitarian organizations with varying data platforms and requirements. At the same time, the routine health information system (RHIS) is partly standardized with separate data collection methods and reporting streams for five programs (reproductive health, surveillance/early warning system, IMCI, immunization, and nutrition), with only reproductive health and surveillance using electronic platforms, and the remaining using paper/Excel. As a result, the HMIS is fragmented, hindering the ability of the Ministry of Public Health and Population (MoPHP) to access reliable and timely routine information for timely decision-making. The building of a coherent HMIS has so far received limited support from partners.

One of the objectives of the Systems, Health and Resiliency Project (SHARP) is to strengthen Yemen's HMIS by strategically piloting and implementing interventions in collaboration with the MoPHP. This included conducting a Routine Health Information System (RHIS) assessment using the Performance of Routine Health Information System Management (PRISM) framework. This assessment will inform the development of a strategic and operational plan to strengthen the RHIS.

OBJECTIVES OF THE ASSESSMENT

The overall objective of this assessment was to provide a baseline for RHIS performance, including data quality and the use of information for evidence-based decision-making at all health system levels.

METHODS

A cross-sectional observational survey was employed in selected districts in the three project intervention governorates. Data accuracy and other aspects of data quality were assessed over a three-month period for selected health indicators.

SHARP used purposive sampling to select three districts (one in each governorate) from the perspectives of accessibility, stable environment, and supportive local authority, which covered all types of facilities. The PRISM data collection instruments used include:

- RHIS Overview Tool: Collect data about the existing information system and available recording and reporting tools; establish the links among the recording tools maintained at the health facility/community level, and the reports generated by the health facility/community health workers (CHWs); and establish the flow of information from health facility/community to each administrative level of the health system.

- District RHIS Performance Diagnostic Tool: Identify RHIS data quality, gender-disaggregated data, and information use issues; quantify the levels of data quality (accuracy, reporting timeliness, and completeness) and information use status (access to RHIS data, existence of analyzed data, and use of RHIS data for monitoring and planning); and identify issues/problems with data processing and processes for information use.

- Management Assessment Tool: Collect data about RHIS management practices at

MoPHP from respondents from the primary health care sector.

- Facility/Office Checklist: Conduct an inventory of available resources, such as equipment, utilities, storage of information, communication capacity, and RHIS forms and registers.

- Organizational and Behavioral Assessment Tool: Assess whether the organizational mechanisms are in place for producing the desired results in RHIS performance; identify the commitment and support of upper management for enhancing an information system; and quantify the health staff's motivation, knowledge, and skills to perform RHIS tasks.

The quantitative data were collected electronically. In addition, key informant interviews, observations, and self-assessment checklists were employed. The study population included the district manager, district data officer, and the program team coordinator/supervisor or case team leader from each district health office.

The PRISM conceptual framework sets forth the premise that the success of RHIS depends on success in three interrelated areas:

Behavioural determinants: The knowledge, skills, attitudes, values, and motivation of the people who collect, analyse, and use health data

Technical determinants: The RHIS design, data collection forms, processes, systems, and methods

Organizational determinants: Information culture, structure, resources, roles, and responsibilities of key contributors at each level of the health system

The assessment covered 54 health facilities (hospitals, health centers and health units) in three districts: Al Buraiqa (Aden Governorate), Al Mawasit (Ta'izz Governorate) and Tuban (Lahj Governorate).

The assessment covered five health service indicators:

- Antenatal care first visits (ANC1)
- DTP3 (Penta3) in children under one
- Admission for children under five years (U5) with severe acute malnutrition (SAM)
- U5 children with acute respiratory infections (ARI)
- Confirmed malaria cases

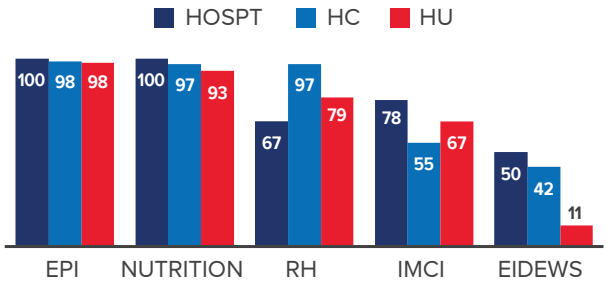
KEY FINDINGS

District health office level findings

The assessment found that most of the data quality assurance mechanisms and practices were not in place in any of the three assessed districts. This was due to the low level of knowledge of the staff on how to conduct data quality verifications, the absence of any designated person to check/review quality of reported data, lack of guidelines and data quality assessment or validation tools.

Completeness of reporting was reviewed across five programmatic areas: Expanded Program on Immunization (EPI), nutrition program, reproductive health (RH), Integrated Management of Childhood Illness (IMCI), and the electronic Integrated Disease Early Warning System (eIDEWS).The completeness of reporting rate from health facilities to the district health offices ranges from 50 percent for health centers to 90 percent for hospitals. Programmatically, IMCI and the early warning system have the lowest reporting rates over a three-month period compared to the EPI, nutrition, and reproductive health programs (Figure 1).

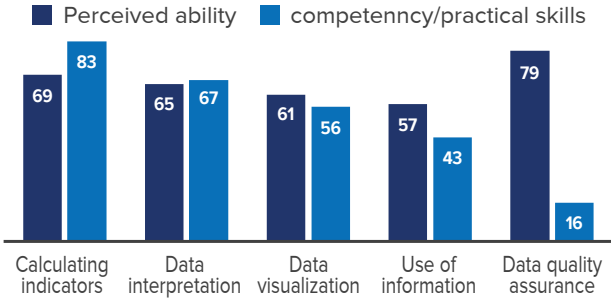
Figure 1. Reporting Rates from Three Districts by Program and by Health Facility Level



Similarly, evidence of data analysis and displaying practice and formal feedback loops from higher to lower levels are non-existent. The use of routine health data for producing analytic reports, planning, and/or target setting was not observed in the studied districts.

On average, the staff's confidence level to perform routine HMIS tasks is 66 percent. The staff confidence level ranges from 57 percent for using the information to solve problems and make decisions to a maximum of 79 percent for the ability to check/ensure data quality. However, there was a mismatch between confidence (self-perceived ability to perform HMIS tasks) and competency (actual skill to perform HMIS tasks), specifically in the area of data quality assurance where confidence was highest and competency lowest (Figure 2).

Figure 2: Confidence (perceived ability) Compared to Competency of DHO Staff to Perform RHIS Tasks



Facility level findings

RHIS performance, as measured through PRISM, is determined on the bases of data quality, information use, data management and processing, and organizational, behavioral, and technical determinants.

Completeness of source documents

This was assessed at the health facility level by reviewing the "completeness" (completely filled) of a primary source document for selected program indicators across facilities that report on a given indicator. Primary source documents include registers, patient records, and/or other documents used to record information for a relevant indicator.

The results show that completeness of the source document is highest for ANC1 visits and U5 SAM admissions at 83 percent each. Indicators with lower rates of source document completeness are U5 children with ARI and U5 children with confirmed malaria cases treated (43 percent and 48 percent, respectively). Hospitals and public health units have better completeness of source documents than health centers (Figure 3).

Figure 3. Completeness of Source Documents, by Program

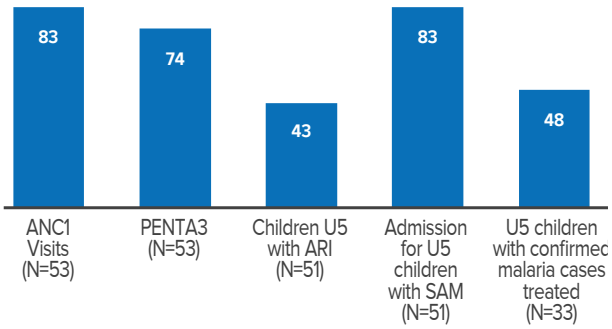


Table 1. Overall Information Use and Dissemination at Health Facilities

Indicator	Percentage	Number of Health Facilities (Sample size)
Use of data to produce narrative analytical reports	9	54
Use of information for performance review	0	54
Use of information for planning and target setting	71	17
Data dissemination outside the health sector	4	54

Data management and processing

We also assessed the existence of formal feedback loops from higher to lower levels, including regular written feedback received from DHOs and/or MoPHP to health facilities on their performance and the quality of reported data. Accordingly, only 20 percent of the 54 health facilities have data quality assurance mechanisms in place, and only 11 percent of facilities reported receiving regular feedback from higher levels. None of the four surveyed hospitals have a feedback mechanism to ensure data quality and use.

Overall, information use was limited. Only five of the 54 facilities reported holding management meetings or performance monitoring forums. While these mechanisms exist in some facilities, they are held irregularly and there is no evidence of using data for performance review or decision-making in any of the facilities. This is partly due to the absence of written meeting records to verify the existence of such practices. As Table 1 indicates, only nine percent of facilities (one hospital, one health center, and three health units) reported the use of routine health data for producing analytic reports. Seventeen facilities were observed to have an annual plan for the current year. Of these 17 facilities, 71 percent use RHIS data for planning and target setting (Table 1).

The findings indicate that the availability of recording and reporting tools is low across facilities. Stock out of RHIS forms was common across facilities. More than half reported a type of stock out in the last six months. Ninety-six percent of facilities that experienced stockouts reported that they were longer than 20 days (Table 2).

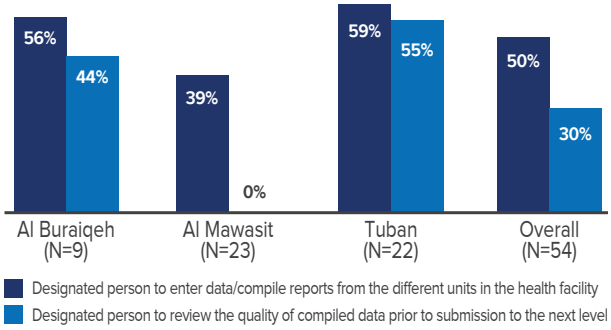
Table 2. Availability of RHIS recording tools

Indicator	Percentage	Number of Health Facilities (Sample size)
Percent of facilities with available recording and reporting forms	25	54
Percent of facilities that experienced stock out of recording and reporting tools in the last 6 months	52	54
Duration of stock out (more than 20 days)	96	28

Availability of staff to perform HIS tasks

The availability of trained staff to conduct HIS tasks, including completing registers and tally sheets, compiling reports, ensuring data quality, analyzing data, and preparing appropriate visuals for informed decision-making, is critical. In this assessment, only half of the facilities have a designated person to enter and/or compile reports from different units. Just 30 percent of facilities have a designated person to review the quality of compiled data prior to submission to the next level. None of the facilities in Al Mawasit District reported having a designated staff to review the quality of compiled data prior to submission (Figure 4).

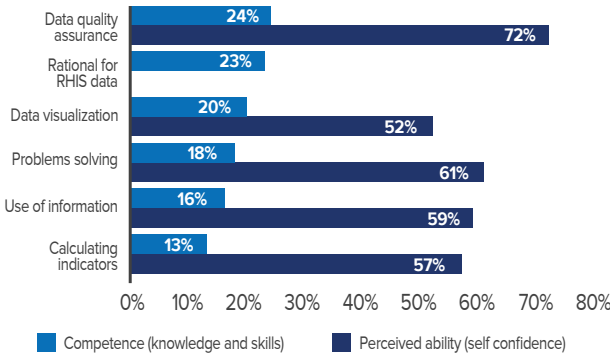
Figure 4. Percentage of Health Facilities that have Designated Staff to Compile and Review RHIS Reports by District



Technical determinants for HIS performance

The assessment showed that the current routine RHIS is fragmented, with separate data collection methods and reporting streams for five programs (reproductive health, surveillance/early warning system, IMCI, immunization, and nutrition), with only reproductive health and surveillance using electronic software platforms, and the remaining using paper/Excel. It is cumbersome and time-consuming with 32 recording tools (registers, tally sheets, patient cards, etc.) in use in health facilities. The health facilities are required to send several monthly paper-based reports to DHOs through parallel reporting channels. Some facilities are overburdened because they have additional reporting responsibilities to the supporting partners.

Figure 5: Staff Confidence (perceived ability) vs. Competency of HR staff to Perform RHIS Tasks[1]



Behavioral determinants for HIS performance

There is a mismatch between confidence level (self-perceived ability to perform RHIS tasks) and competency level (actual skill to perform RHIS tasks) among HF staff. The staff's capability score to perform the various RHIS tasks is below 55 percent The average confidence level (perceived ability) among facility staff who perform RHIS tasks is 60 percent with a minimum of 52 percent for perceived ability to present data visually (e.g., via chart or graph) and a maximum of 72 percent for perceived ability to check/ensure data quality.

[1] Perception not assessed for problem-solving, and rationale for RHIS data.

Table 3. Number of recording tools and type of data captured at DHOs and health facility level

Type of data captured	Number of recording tools used at HF level
General outpatient department (OPD) services	18
Inpatient services	4
Immunization services	13
Family planning (FP) services	2
Maternal health services	17
Child health services	14
TB	4
Malaria	7
Nutrition services	19
Notifiable diseases (integrated disease surveillance and response [IDSR])	10
Medicine, vaccines, contraceptive stock	7
Equipment	1
Total	32

CONCLUSION

The studied health information systems are not capturing the necessary information in a timely and accurate fashion in order to produce outputs that are adequate for the government's decision making. The surveyed areas have a fragmented HMIS, managed at the central level with limited support from partners. The technical, organizational, and behavioral determinants played important roles in the health facilities' poor performance in RHIS management. Knowing the rationale for collecting routine health data has an implication for the value of data and its use for action.

The fragmented system emphasizes the need for an integrated routine HMIS, including a digital platform to improve completeness and timeliness of reporting so that data can be used for timely decision-making. A comprehensive strategic plan should be developed to address identified barriers and strengthen the current HMIS. The results also show that capacity-building efforts are needed to fill the identified skill gaps by focusing on data quality assurance techniques and procedures, steps in information use, data visualization, and analysis.

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