Health System Assessment for process improvement and strengthening of the Health Information System: A mixed method study.

December 2023

Key Messages:

The global health community has recognized the importance of health interventions and their implementation strength to monitor progress towards global mortality and morbidity targets. Evaluation of all 6 Health System building blocks would be a time consuming and robust task. The objective of this Health Information System assessment is to diagnose the relative strengths and weaknesses of the national HIS, prioritize key areas for strengthening, and identify potential solutions or recommendations. It was a mixed-method cross-sectional study, using both the quantitative and qualitative approaches.

98.8% of the respondents felt DHIS-2 had improved the quality of patient data entry & retrieval. Besides 98% of respondents agreed that it was convenient to use DHIS-2 where 97% agreed that it was user-friendly software for data entry. Although 98% of respondents agreed that they need more training for this software.

The respondents complained about poor internet connection, lack of equipment compared to the scale of necessity, lack of timeliness, accuracy, and completeness of data. To change the situation, the willingness of Program leaderships to use the data from HIS is necessary. It may motivate the MIS and the field administration and could enhance further development of the system.

Background

In order to monitor the progress towards global mortality and morbidity targets, the global health community has started recognizing the importance of health interventions and their implementation strength (1). The primary foundation of decision-making across all health system building blocks is sound and reliable information essential for policy development and implementation of the health system (2). The health information consists of four essential functions, which are: (i) generation of data, (ii) compilation of data, (iii) analysis and synthesis, and (iv) communication and use (3). Thus, the health information system (HIS) collects data from health and other relevant sectors, undergoes the analysis of data as well as ensures the overall quality, relevance and timeliness of the data, and converts the data into information for health-related decision-making (4). In addition, health information system provides broader objectives, which include providing an alert and early warning, giving support to patient and health facility management, enabling planning, underpinning and stimulating research, permitting health situation and trends analyses, orienting global reporting, and reinforcing communication of health challenges to diverse users (5). Information is of little value if it doesn't meet the needs of multiple users, i.e. policy-makers, planners, managers, healthcare providers, communities and individuals (6).

DGHS and DGFP separately organize the HIS with poor linkage between the two directorates' systems at the central and peripheral levels. During the last 10-15 years, there has been tremendous improvement in the HIS under DGHS, where several digital tools have been introduced to improve the functioning of the national HIS. Among them, one of the most important is implementing the District Health Information

System-2 (DHIS2) software, a modular web-based package for collecting, validating, analyzing, and presenting statistical data tailored to health service delivery activities. Bangladesh is one of the world's largest deployers of DHIS2, where information can be input and accessed from over 13,500 community clinics spread throughout the country.

Now, more than 70 individual and aggregate-level datasets are managed by DGHS using DHIS2. Other digital tools introduced in the national HIS include: (a) an OpenMRS-based electronic health records in hospitals, (b) Human Resource Information System (HRIS) (c) Shared Health Records (SHR), a longitudinal health record at the community level, (d) Office Attendance Monitoring System, (d) Complaint-Suggestion through SMS, (e) Health Services through Mobile Phones, (f) Facility registries, (g) Health Call Centers (Shastho-Batayon) and OpenMRP (Open Smart Register Platform) for multi-purpose health volunteers.

An online open-access web portal (or public dashboard) has been developed using data from DHIS2 and other digital systems to provide all citizens with real-time data on the health system's performance. All health emergency data are organized through a separate dashboard for the Health Emergency and Response Centre of the DGHS to support early warning and preparedness for impending epidemics. A team of national and divisional experts was formed, as well as a national Core Committee Group at the central level with members from UNICEF, WHO, icddr,b, HIPS-Bangladesh, GIZ, Save the Children, BRAC and other organizations to guide policy and support successful implementation of DHIS2 and other digital tools introduced. The HIS in Bangladesh has been cited as a national public data system that adapted reasonably well to the COVID-19 pandemic and met organizational data requirements for an effective epidemic response. The COVID-19 dashboard developed by DGHS (with support from UNICEF) provided COVID-19 information from multiple routine administrative data sources on incidence, geographic distribution, isolations and quarantines, hospitalization, and outcomes (i.e., death and recovery) to the policy program managers, the global community, and to the general public in a timely and organized fashion to support epidemic preparedness and response. Policy makers and program managers could develop rapid response activities through regular monitoring and reviewing of COVID-19 dashboard data (7–10).

Therefore, Dissemination and communication are essential attributes of the health information system (11). Evaluation of the Health System would be a time-consuming and robust task (12). Hence, in the present proposal, we propose developing conceptual frameworks for strengthening health systems. The main objective of this assessment was to diagnose the relative strengths and weaknesses of the national HIS, prioritize key areas for strengthening, and identify potential solutions or recommendations.

Objective

General Objective

The main objective of this assessment was to diagnose the relative strengths and weaknesses of the national HIS, prioritize key areas for strengthening, and identify potential solutions or recommendations.

Specific objective

- To provide a brief, but well-informed, balanced and transparent assessment of the sector's performance.
- To assess the factors that likely to influence the performance of the HIS and their potential solutions.
- To develop recommendations for corrective measures through facilitating and structuring dialogue between the program and other key stakeholders.
- To inform all stakeholders—both public and private—about the key health systems challenges and to engage in a process for systematically gathering key information and engaging key stakeholders in order to identify solutions to prioritize problems (dissemination meeting).

Study Design

It was a mixed-method cross-sectional study, using both the quantitative and qualitative approaches.

Study Population
The quantitative data was obtained from the Statistician, Data entry operators & others working in MIS section of the DGHS of Upazilla and Districts around the country. The qualitative study population was the staff in MIS section of the DGHS around the country.

Quantitative Analysis
After getting quantitative data through email, data was entered in SPSS-26. After data cleaning and editing, a descriptive analysis was done.

Qualitative Analysis
A team of Anthropologists was employed to conduct Qualitative analysis. They used a qualitative descriptive approach to content analysis.

Study Findings:

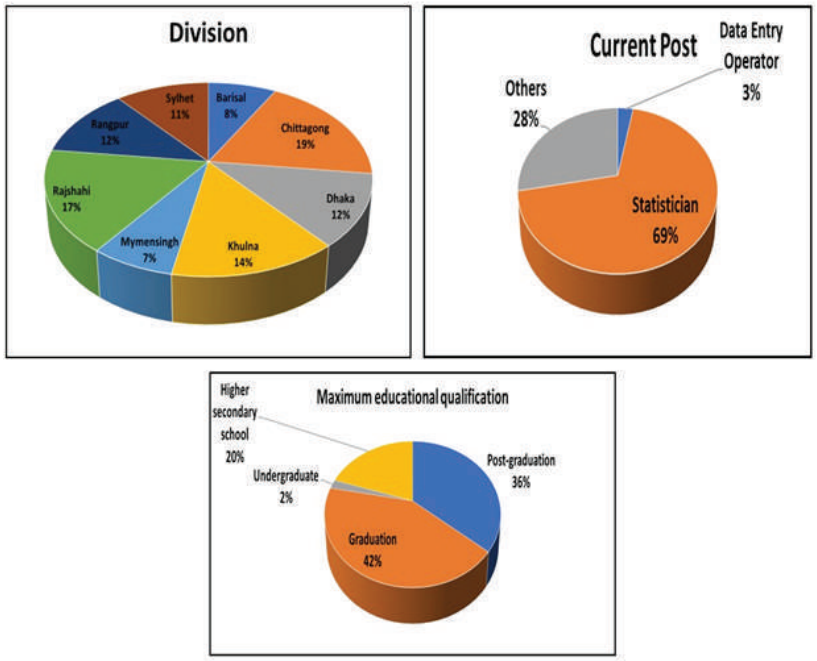

Figure 1: Distribution of respondents according to respondents' Division, Current Post, and Educational Qualification.

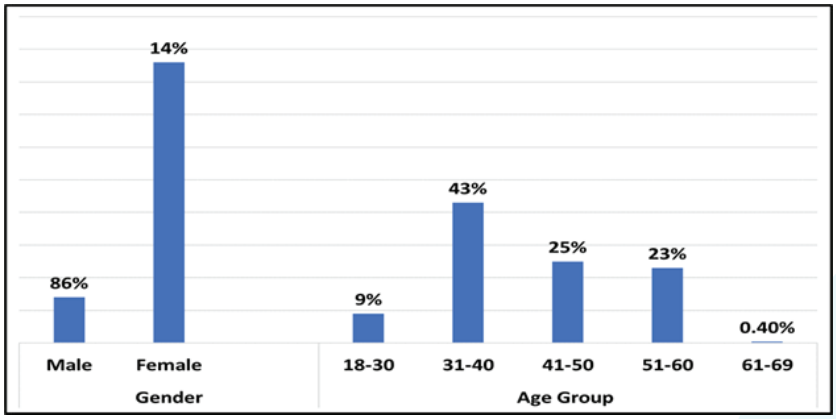

Figure 2: Distribution of respondents according to their Gender & Age Group (N=243)

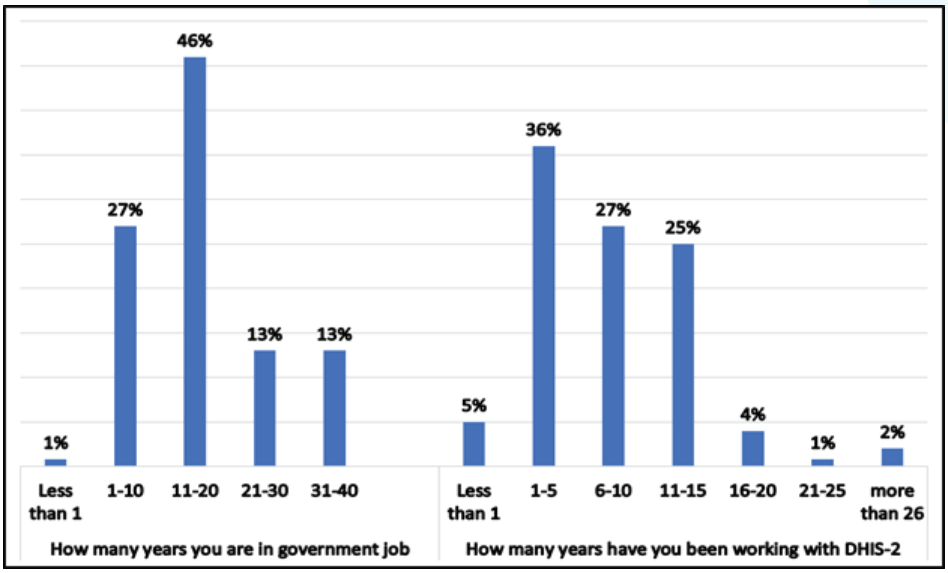

Figure 3: Distribution of respondents according to their Job Duration & Experience (N=243)

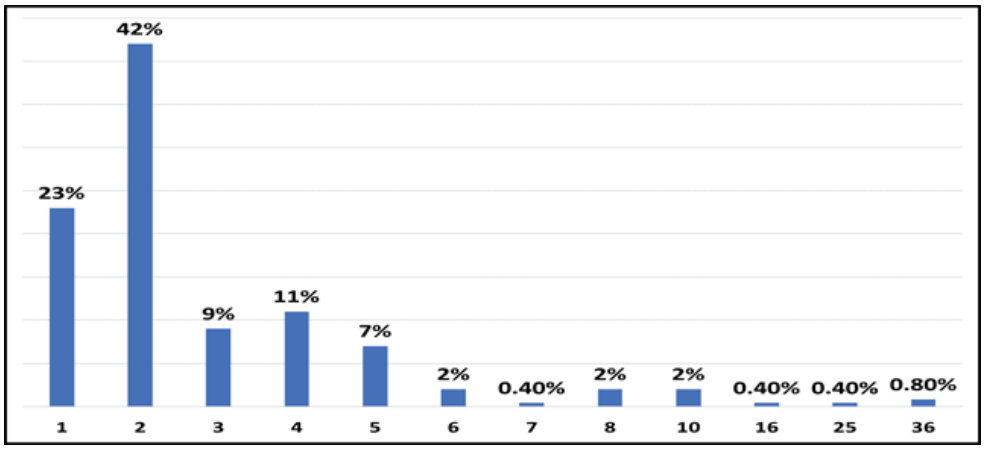

Figure 4: Distribution of respondents according to the Number of training sessions attended on DHIS-2 (N=243).

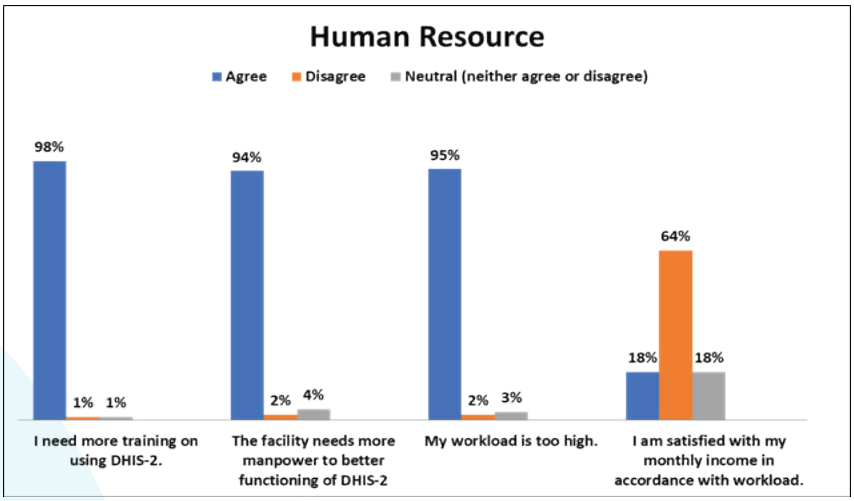

Figure 5: Distribution of respondents in accordance with their user satisfaction in terms of Human Resource (N=243)

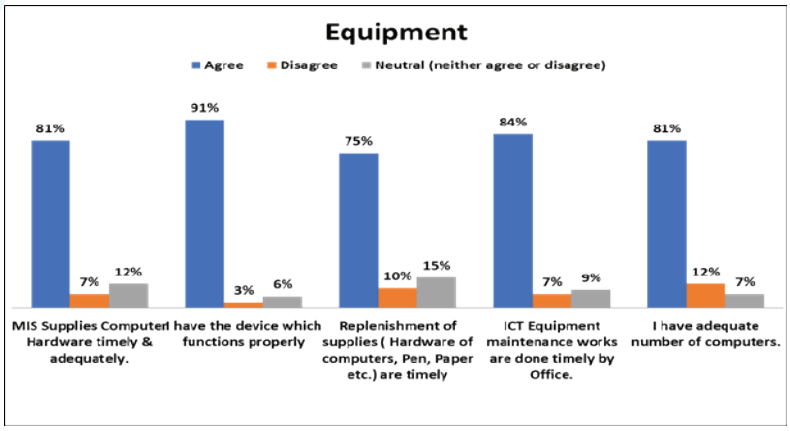

Figure 6: Distribution of respondents in accordance with their user satisfaction in terms of Equipment (N=243)

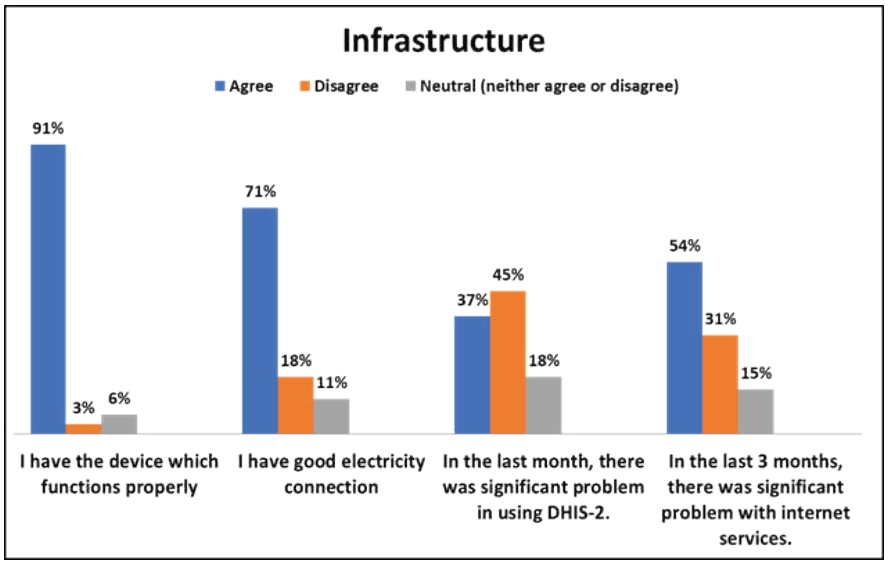

Figure 7: Distribution of respondents in accordance with their user satisfaction in terms of Infrastructure (N=243)

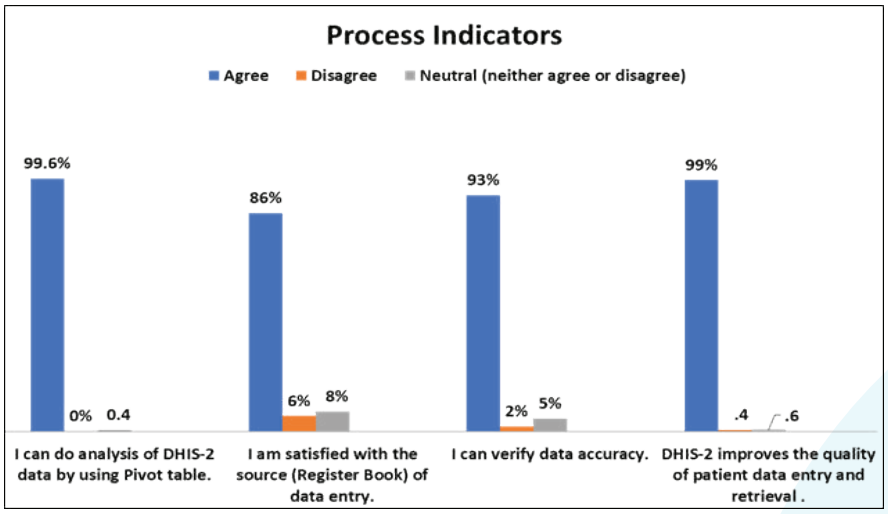

Figure 8: Distribution of respondents in accordance with their user satisfaction in terms of Process Indicators (N=243)

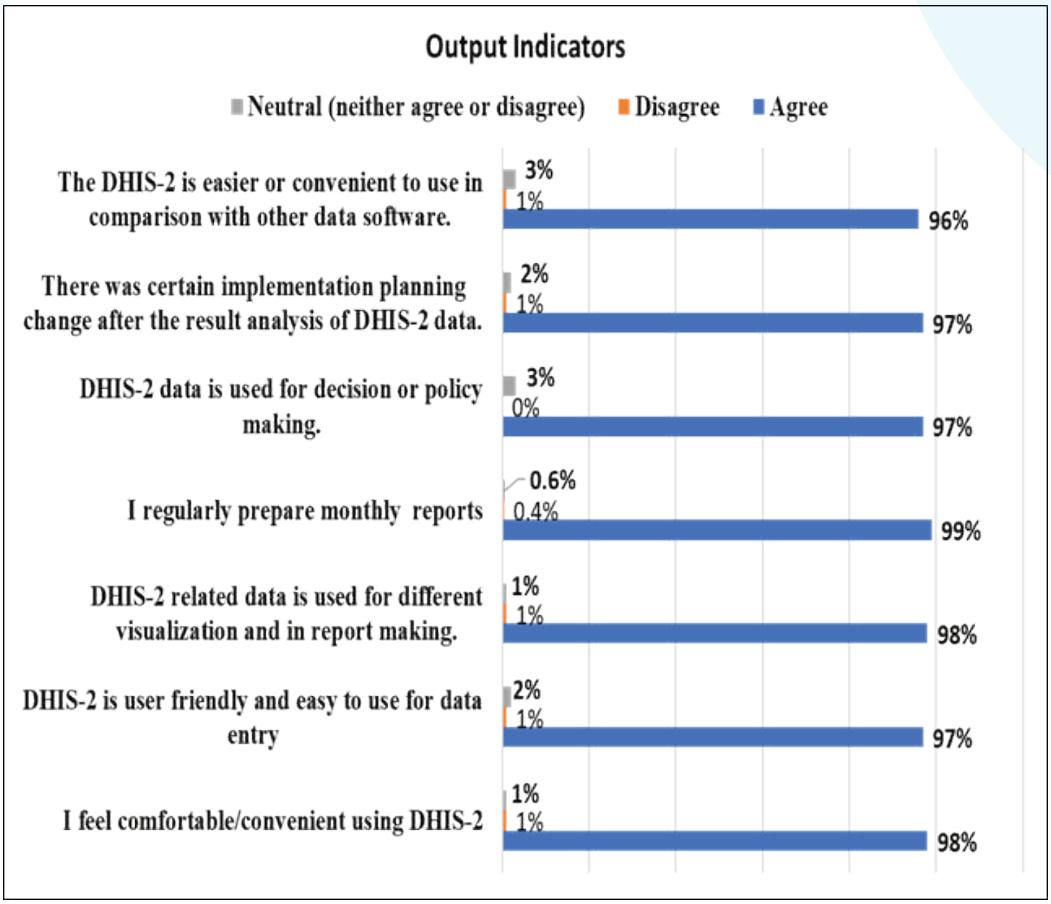

Figure 9: Distribution of respondents in accordance with their user satisfaction in terms of Process Indicators (N=243)

The problems or challenges mostly are not quantitative, rather qualitative. At this phase, next generation problems are already here so for moving on to them, challenges are with sustaining and reaping the most from the present infrastructure. Program level leaderships are less interested in developing program level and national level policies based on HIS data.

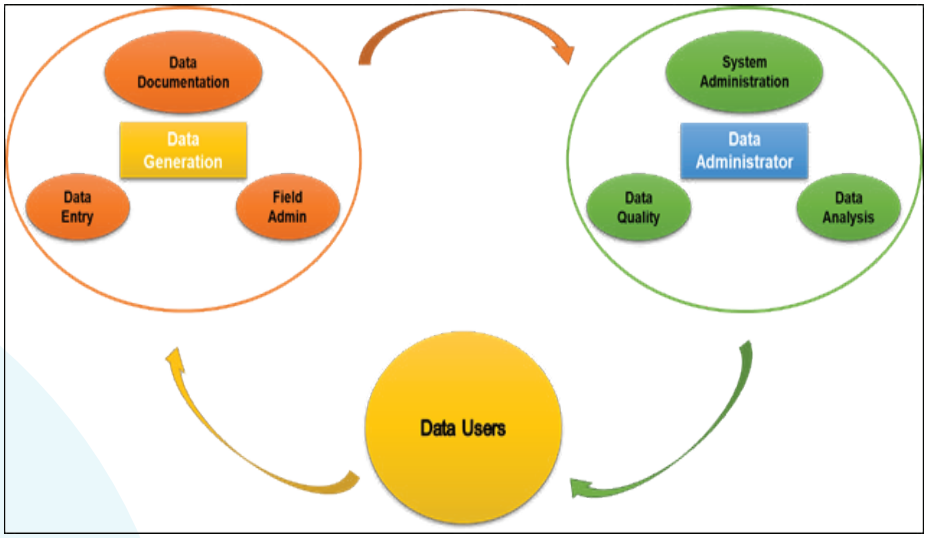

Figure 10: Methods and Techniques (Triangulation)

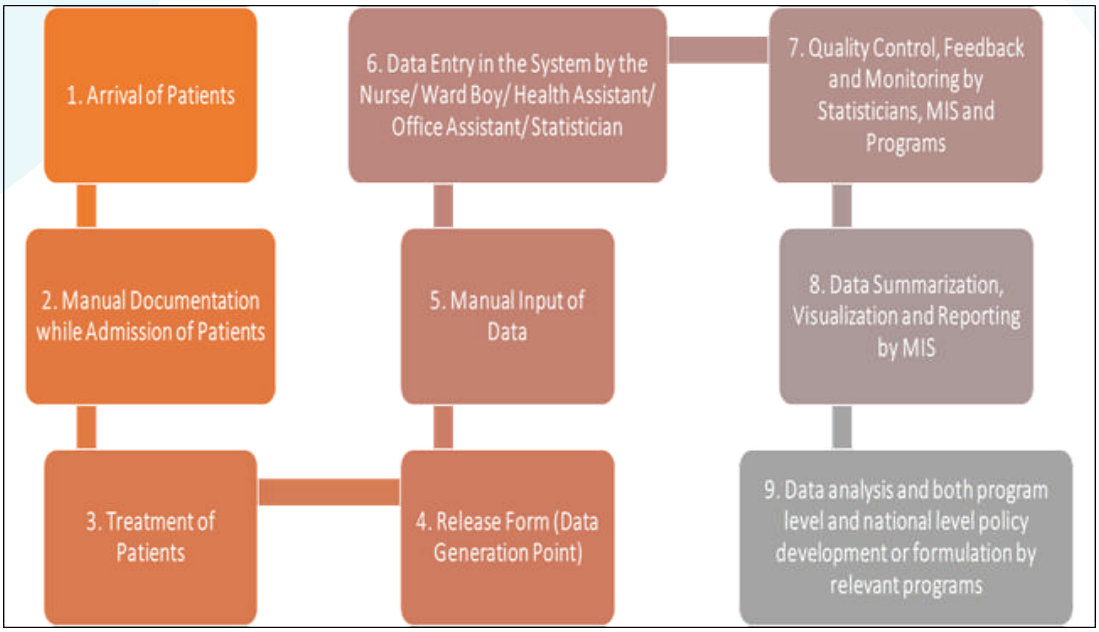

Figure 11: Existing Pathway of HIS (Indoor)

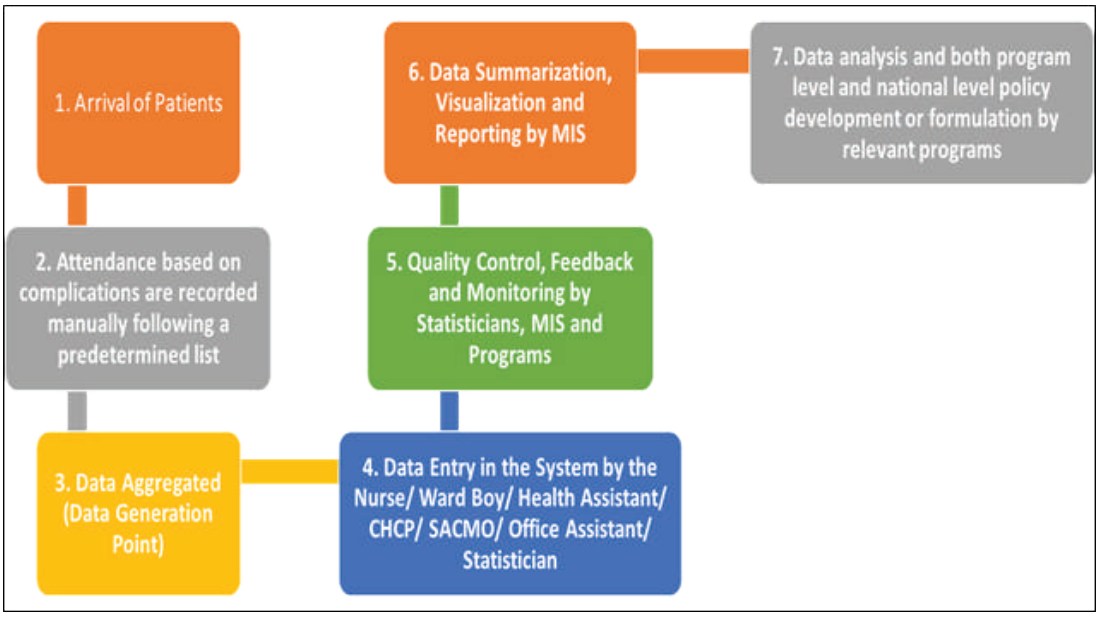

Figure 12: Existing Pathway of HIS (Outdoor)

Program leaderships mostly are not willing/ are reluctant to use the data from HIS. Their reluctance demotivates the MIS and the field administration and also hinders further development of the system. The programs are gradually de-prioritizing the HIS in their budget. Programs claim that in most cases the data lacks timeliness, accuracy, and completeness. Programs demand real-time data, and the present system cannot provide that. As a result, some programs go for their own specialized applications. The present interface doesn't provide secondary analysis or enough visualizations which is necessary for policy or decision making. Most programs don't prioritize training the relevant personnel in the field to make them understand their goals and updates. This results in poor output in data quality dimensions which in a cyclical order demotivates the programs.

Updating the variable list is a lengthy and complex process which demotivates the programs to continue partnerships with the MIS. All statisticians/ relevant person for monitoring the process at the institutional level faces hierarchical challenges. Because the ones responsible are from higher pay-grade and the bottom-up process is not welcomed in the culture. Since data is entered digitally, feedback is regular but not always on time. In cases of irrelevance for mandatory cells the responses are recorded as “0 (zero)”. Here, “0 (zero)” also means absence of observations in the DHIS2. This wrongly represents the aggregate data and also impacts the summarization. Success stories might get lost in the process.

One big issue is with documenting the disease codes for each patient. Doctors either forget to put the codes on the release document, or they mistakenly put wrong codes. The designated nurse/s or responsible persons have to register the codes that the doctors mention, or they try to write based on the treatment given or prescribed medication at the time of discharge from UHCs or MCs. It is very rare that the data are provided in the system regularly maintaining the timeliness. A minimum of at least 4 days to maximum 28 days delays were reported from both the generation and accumulation points. The present system doesn’t allow data monitoring and quality assurance during the primary data collection or at the data generation points.

In maximum cases the persons responsible for data entry are not officially trained at all. Again, those who have training were mostly just introduced with the interface. From the surveyed organizations, one-third of the staff dedicated for data entry in the HIS were trained who opined that the training they received are not enough to understand the system and work perfectly. The lack of training not only contributes to the inefficiency but also the value of the task and the system or data is not clear to them. This maximizes their feeling of the HIS as an ‘extra burden added to their daily workload’.

It was observed that the persons holding the position of ‘statisticians’ don’t have any background in statistics or related subjects. Moreover, the position of ‘statistician’ is not available in all upazilas where there was supposed to be one in each. In addition to that, most of the created positions are vacant. Those working as statisticians do not receive any promotion due to the lack in provisions or scoping by the administration which highly affects their motivation or job satisfaction. In all cases the ‘statistician’ is also an ‘office assistant’ and has to play a dual role within the given time and salary. This overwork cause fatigue among them and hampers their primary responsibility.

The responsibility in MIS requires specialized knowledge of biostatistics or health informatics which are not initially present among the doctors who are posted here. Again, there are also a lot of doctors who are interested in these specializations and willingly get posted to the MIS. But, according to the present HR policy and management method of DGHS after a certain period they are automatically posted again in other places/ departments/ facilities which are not at all relevant to this specialty and the newcomers have to start from the scratch. So, this practice prevents the development of institutional knowledge base for the MIS hindering its development centrally and in the field. Also resulting in demotivation among relevant personnel to develop themselves for this specific department.

No independent coordination mechanism between Upazila and District within the system (DHIS2). Administrative coordination is maintained manually or on paper. No provision for disaster data or data structure in the present system which needs to be easily modifiable but uniform, and real time.
The infrastructural challenges don’t contribute much to the HIS’s performance related challenges, but there are some which are notable when considered case by case basis-

- Poor internet connection in specific locations.
- Tablet PCs are not available compared to the scale of necessity. And, for the available cases, if there are technical problems with those devices there are no chances for quick solution.
- As a result of ‘a’ and/ or ‘b’ the responsible personnel were found to have to use their own device and use internet package/ mobile data at their own cost for data entry.
- Technical glitches frequently impede the process of data generation but sometimes not understood or acknowledged by the MIS.

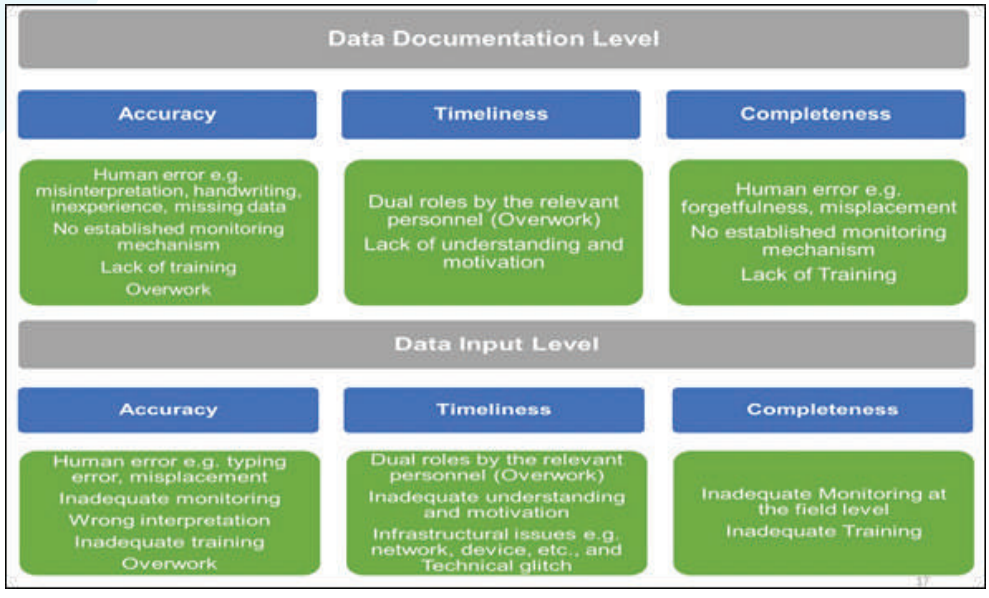

Figure 14: Findings- Problems with Data Quality Dimensions

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