

Routine Health Information Systems that Operate in Tanzania

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Introduction

In the implementation of health sector reform, the Government of Tanzania places great emphasis on health management information systems (HMISs) as one of the key tools for monitoring and evaluation, particularly with regard to assessing progress in achieving strategic sectoral plans and quality assurance of health care provision. The generation of burden of disease (BOD) information, essential for planning and decision making, is another emerging responsibility. In the short term, this is being shared with the Epidemiology Section of the Ministry of Health (MOH) and sentinel site surveillance systems such as the Adult Morbidity Mortality Project (AMMP), Tanzania Essential Health Intervention Project (TEHIP) CSPD, and National AIDS Control Program (NACP). Therefore, this paper looks at various HMIS issues, including background of the system and its rationale; methodology for data collection, analysis, and dissemination; success and problems; and recommendations and future plans to strengthen the system.

What is the Health Management Information System?

The health management information system (HMIS) is a routine reporting system that covers all health facilities in the country. The role of this system is to provide solutions to management questions through developed indicators. In this case, the indicators are the basis of the process of determining management problems at all levels of the health delivery system. Indicators could be defined as anything that can identify a problem or a success of any activity. HMIS indicators are in the form of ratios, rates, and absolute numbers, and each has a threshold and target value that is used as the standard measure for monitoring and evaluation. Data recorded in the HMIS tools are used mostly as numerators; however, some of them are used as denominators.

Background of HMIS

Before HMIS came into existence, several systems were operating. Most of these systems existed in public and nongovernmental organization (NGO) health facilities. In addition, programs such as the Expanded Program for Immunization (EPI), TB and Leprosy and the National AIDS Control Program (NACP) had their own separate reporting systems. In the 1980s, several studies of existing systems were undertaken by internal and external consultants, and they revealed the following weaknesses:

- The systems were fragmented. A lot of data were collected with little capacity for analysis, interpretation, or use at all levels of delivery, but most of the vertical programs had limited capacity to analyze and use the data.
- The flow of data was from the bottom up. There was no significant feedback between the higher and lower levels.
- Health facility workers were overburdened with having to fill out several forms from different programs.
- Resources were wasted.
- Policy and legal guidelines from the MOH directing data collection activities in the health sector were lacking.

These problems rendered the existing systems ineffective and unreliable. During the design stage, one of the objectives was to have a decentralized, integrated, functional, and reliable system. Also, different stockholders were involved to ensure that their interests were addressed. Thus, the new HMIS provided a comprehensive picture of health service performance at each level of administration. Integrating different systems has resulted in the following advantages:

- Gaps and overlaps are avoided.
- The quantity of data demanded from collectors has been reduced.
- The system does not require routine feedback to low levels.
- The data generated are used first for management purposes at all levels of the health delivery system .

Implementation of HMIS

Implementation of the HMIS was done in phases, with the largest share of support coming from DANIDA. However, other donors, such as the World Bank, UNICEF, GTZ and KUWAM contributed in one way or another. Development of HMIS concepts and materials began in 1989–90. A number of professionals from different programs were involved, with the assistance of an external consultant. The pilot-test was done in the Mbeya and Iringa regions between June and November 1991. The outcome of this test enabled necessary corrections to be made to the systems, and from that time, the HMIS was a practical and useful management tool for the health sector. Beginning in 1993 the system was operational, first in the Mbeya region and, by 1997, all 20 regions were implementing the new system. However, referral hospitals were excluded because the system had to be developed further to capture data that are not generated in smaller facilities. The system has been developed, and training has started.

Primary data collection analysis and reporting

Health facility level

The health facility is responsible for patient care and preventive services. When they provide these services, information is generated and documented in registers, ledgers, and forms, the primary tools for data collection. These tools are classified as follows:

- **Book no. 1: Guidelines Manual**

Used as a reference by health facility staff, this book explains how to collect and compile raw data.

- **Book no. 3: Community Book**

In Tanzania each community is assigned to one health facility that belongs to the government or NGOs. Staff from those health facilities are supposed to conduct community outreach to improve the environment, knowledge, and community health. The HMIS provides a register known as a community book for recording information about that community—e.g., total population, deaths, births, etc. These books are kept at the health facilities and taken along on each community visit.

- **Book no. 4: Ledger Book**

This book is used to collect the information that is used for monitoring the flow of drugs and other medical supplies. Keeping it up-to-date allows for monitoring to avoid stock-outs and oversupplies.

- **Book no. 5: OPD Register Book**

The register is used to collect outpatients', such as person attending, his or her name, village/street, age, and sex; new attendance; diagnoses; return visits; referrals; and treatment. The last pages of a register are used to record notifiable diseases. Information about laboratory results and immunization status is also included.

- **Book no. 6: Antenatal Register**

This register is used to monitor pregnant mothers, from their first visit to the health facility up to the last visit of their pregnancy. Information recorded includes date of first visit, re-attendances, risk factors, and whether the last child born to the mother is still alive.

- **Book no. 7: Child Register**

This register is used to record information about all of the children who come to a health facility, including children who come as newborns, children who are transferred from other facilities, and children who are registered during community outreach. The main function of this register is to monitor all child immunizations. A child is monitored until he or she reaches the age of five.

- **Book no. 8: Family Planning Day-to-Day Book**

This book is used to record all family planning clients, including those who are continuing with the program and new acceptors. The register keeps track of the quantity of contraceptives supplied to customers.

- **Book no. 9: Diarrhea Treatment Corner (DTC Register)**

This register is used to record information about the management of all patients referred to the DTC from OPD and MCH clinics. Data recorded include date, name, village, age, weight, degree of dehydration, amount of oral rehydration salts (ORS), registration number, symptoms, treatment other than ORS, time spent at the facility, and outcome.

- **Book no. 11: Dental Register**

Used at dental clinics, this register tells health centers or hospitals that provide emergency oral care the patient's name, village/address, sex, age, diagnosis, referral, whether he/she is a new or returning patients.

- **Book no. 12: Laboratory**

This is a record of work done in the laboratory. It includes date, serial number, name, age, sex, patient number, investigation, test requested, results, abnormalities, and remarks.

- **Delivery Register**

The register contains information both on mothers and their newborn babies. It is supposed to be used at health centers and hospitals but, due to the births taking place at dispensaries, this register can also be used at that level.

Tools for health centers and hospitals

- **Register for admission**

This register is used at health facilities that admit patients. Information recorded in it includes inpatient number, ward, name, address, next of kin, age, date in, diagnosis, final status (recovered, improved, died), and date out.

Forms

Forms for data collection tally sheets and monitoring are:

- F201 Child Tally Form. This form is used to capture children's attendance and to record the weight of children who come for measles immunizations.
- F202 Immunization and Vitamin A Tally Form. This form records information on immunizations and vitamin A supplementation for children.
- F203 General Tally Form. This form is used to prepare summaries from different registers
- F204 Neonatal Tetanus. This form is used to monitor neonatal tetanus disease.
- Inpatient Treatment Form. This form records information kept in the inpatient register.

Secondary data book

Secondary data books are Health Facility data and book for reporting. Details of these books are follows:

- **Book no. 2: Health Facility Book Data**

This book contains summaries that are transcribed from the primary books. It also has different tables that are used to do simple analysis. The book is organized by management topics by which final management indicators are computed. Summary tables and management indicators are put in the following groups:

- Information on administration issues, including information on personnel, finance, and performance indicators
- Community outreach
- Target population estimates, provided by Council Health Management Teams and used as denominators in computing various performance indicators
- Monitoring of drugs and consumables
- Information on outpatients
- Information on inpatients
- Information on laboratory
- Dental clinics
- MCH services

- **Book no. 10.**

This book includes forms that are used to prepare health facility reports. The types of reports prepared are:

- **Staff Listing Form F001** (reported by all health facilities).

This form is completed and submitted at the beginning of the year. All staff employed at the health facility are listed on this form, with specific information about each staff member. The form is completed in duplicate; one copy is kept at the health facility, and one is sent to the office of the District Medical Officer (DMO)

- **Equipment Inventory F002** (reported by all health facilities).

Completed and submitted at the beginning of the year, this form lists all equipment. In large health centers and hospitals, separate pages can be used for each department or section. The form is completed in duplicate; one copy is kept at health facility, and one is sent to the DMO's office. (If a department wishes to keep a copy, the form is completed in triplicate.)

- **Physical Structure Inventory F003** (reported by local government health facilities and all government hospitals).

This form, completed at the end of the year and submitted immediately, lists all rooms in all buildings. It is completed in duplicate; one copy is kept at the health facility, and one is sent to the DMO's office

- **Health Facility Quarterly Report F004** (reported by all health facilities).

This report is filled at the end of each quarter (at the end of March, June, September, and December). All of the information is described in the Guidelines Manual, and recorded in the health facility data book. The form is completed in duplicate; one copy is kept at the health facility, and one copy is sent to the DMO's office

- **Health Facility Annual Report F005** (reported by all health facilities).

This report is filled out at the end of the year and submitted immediately. Based on data collected throughout the year, the form is completed in triplicate: one copy is kept at health the facility, one copy is sent to the DMO's office, and one copy is sent to Regional Medical Office.

- **Renovation/Maintenance Report F006** (reported by local government health facilities and all government hospitals).

This report records equipment repair or replacement and renovation and maintenance work done at health facilities during the year. The form, which is submitted at the end of the year, is completed in duplicate; one copy is kept at the health facility, and one copy is sent to the DMO's office

- **Equipment Breakdown Report F008** (reported by local government health facilities). This report is filled when and if there is a breakdown of any essential equipment at the health facility. Each breakdown is reported only once. The form is completed in duplicate; one copy is kept at the health facility, and one copy is sent to the DMO's office

- **Notifiable Disease Report F009** (reported by all health facilities). This report is required immediately when a notifiable disease is suspected by the health facility. It is sent to DMO's office as soon as possible.

Data Processing at District Level

Districts get their raw data from health facility reports. Once the report is received the data are transcribed immediately into the district processing file. The file has the working sheets that are used to transform transcribed data into district aggregates and indicators. In general, the district processing file is a data bank for the district and is used in the same way as the health facility data book.

District reports

- District Staff list (D001). This report is prepared at the district level and sent to the region at the beginning of each year
- District Quarterly Report (D004). This report is prepared at the district level and sent to the region.
- District Annual Report (D005). This annual report is prepared at the district level and extracts information from the F005 report.

The district processing file is divided into the following sections:

STRUCTURE OF THE DISTRICT PROCESSING FILE

SECTION 1: Basic Information

D1.1–D1.7

SECTION 2: Staffing, Equipment, and Physical Structure

D001: District Staff Summary Report

D2.1–D2.5

SECTION 3: Notifiable Diseases

D3.1–D3.2

SECTION 4: Quarterly Reports

D4.1–D4.9

D004: District Quarterly Report

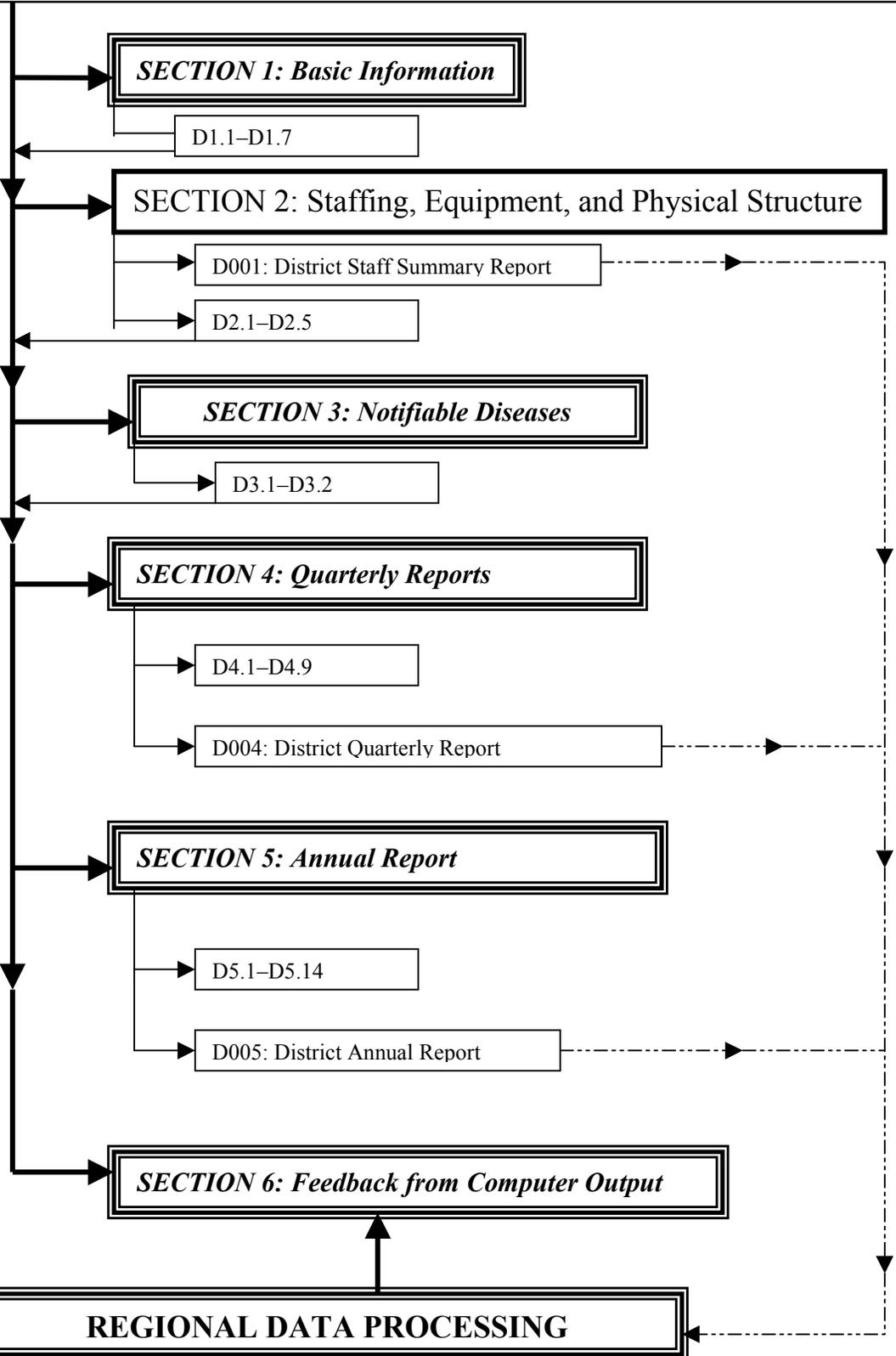
SECTION 5: Annual Report

D5.1–D5.14

D005: District Annual Report

SECTION 6: Feedback from Computer Output

REGIONAL DATA PROCESSING



Regional level

The system is computerized at the district level, where data are entered. Data for the regional computer come from the following reports:

- Annual Health Facility Report (F005)
- District Staff list (D001)
- District Quarterly Report (D004)
- District Annual Report (D005)

National level

At the national level, the system is computerized and no data entry is done. The data are transferred from the region to the national system through floppy diskettes that are sent to the central level monthly.

Computer data analysis and output*Data analysis*

Data currently are analyzed at all levels of the health delivery system. Data analysis is done manually at health facilities and at the district level. At the regional and national levels, data analysis is done by computer. It is possible to retrieve customized reports from computer analysis.

Type of report	Time	Specific Report
1. Resource Management	1. Quarterly Data	<ol style="list-style-type: none"> 1. Commodity Data 2. Commodity Statistics
	2. Annual Data	<ol style="list-style-type: none"> 1. Staffing Data 2. Service Provision Data 3. District Supervision 4. Titles of In-charges Data 5. Structures and Equipment Data
2. Community Outreach	1. Quarterly Data	<ol style="list-style-type: none"> 1. Community Activity Data and Statistics
	2. Annual Data	<ol style="list-style-type: none"> 1. Community Resource and Amenity Data 3. Community Resource and Amenity Statistics
3. Health Facility attendance	1. Quarterly Data	<ol style="list-style-type: none"> 1. Attendance Data 2. Curative Statistics 3. Preventive Statistics
	2. Annual Data	<ol style="list-style-type: none"> 1. Attendance Data 2. OPD Diagnoses Data and Statistics 3. Hospital OPD Diagnoses Data and Statistics 4. IPD Admission and Death Data 5. Hospital IPD Admission and Death Data 6. IPD Census Data and Statistics 7. Maternity Data 8. Special Services Data 9. Laboratory Data 10. Curative Statistics 11. Maternity Statistics 12. Preventive Statistics 13. Single OPD Diagnosis by Area 14. Single IPD Admission by Area 15. Single IPD Death Diagnosis by Area
District Indicators	Quarterly D004 Indicators	
	Annual D005 Indicators	

Successes and problems of the system

In January 2000, the HMIS was reviewed by a team of external consultants. After analyzing the basic data collected from different sources, the team came up with a list of findings that cover all aspects of the HMIS and other information systems.

Absence of information strategy/policy guidelines in the MOH

- There are 15 parallel systems that are not coordinated centrally by HMIS; some are national, some sentinel site-based, and some project- or donor-initiated.
- Current procedures for reporting information from lower to higher levels and feedback from higher to lower levels are ineffective.
- There is no standard procedure for sharing information among departments within the MoH, other ministries, or partners in health.
- There are separate data banks in the MoH, and each department, program, and project is responsible for the data it collects.
- There is no information officer with a detailed and comprehensive overview of health information available in Tanzania, nor is there an information unit responsible for information and communication.

HMIS benefits

- A wide range of information, which covers different programs and services, is collected countrywide. Most of it is facility-based, but it does include some data from the community.
- Registers and records are generally located in all health facilities;
- If supervision is effective and/or local procedures for submission of reports are devised, timeliness and completeness of reporting could reach an acceptable level.
- The district processing file is a well-developed tool for local evidence-based decision making and performance monitoring, but it is not generally used for that purpose.
- National statistical abstracts have been published annually since 1993.
- Data collection tools are well developed.

HMIS weaknesses

- Data quality and accuracy is not sufficiently assured through simple validation or verification procedures.
- Information is generally used insufficiently. Data presentation, analysis, and feedback is generally very weak.
- Timeliness of reporting is generally.
- HMIS-related activities result in high workloads, especially for health staff at the dispensary and health center level.
- Accessibility to data is unsatisfactory at the district, regional, and central levels.
- HMIS-generated information is not linked to planning and budgeting.
- Software and hardware problems at the regional and central levels cause major inefficiencies in the system.
- The capacity of the central HMIS unit is limited for the task at hand.
- HMIS indicators are mainly service and output indicators.

HMIS main opportunities

- The local government reform presents the right opportunity for the HMIS to move from recording and compiling data to analyzing and using those data for planning, management, and evidence-based decision making. In that sense, health sector reform may become the impetus for HMIS to become productive.

- Data for comparing district performance are largely available in the HMIS, and performance indicators can be developed on the basis of the current system.
- If data are analyzed and used, the HMIS may become a powerful tool for decision making.

Reasons for low use of information from HMIS

- Processed Information is not available when it is needed.
- Information bypasses decision makers (DHMT, DPLO).
- There is little incentive to use the data locally because authority for decision making is still centralized, and lower levels are not involved effectively in the planning process.
- Initial HMIS training during the introduction of the program focused primarily on data collection, compilation, and reporting.
- The local level has little ability to organize, extract, and present information in a user friendly way;
- There is a high workload related to HMIS activities, especially at lower-level health facilities.
- The HMIS unit lacks the capacity and competence or skill mix to lead the whole exercise, which is even more difficult in the absence of an MoH information strategy and poorly performing regional level.
- There is generally poor capacity in evidence-based decision making, because of the lack of lack of preservice and inservice training.

Recommendations

Recommendations listed in this presentation correlate with the main problem areas. The problem issues and suggested recommendations are as follows:

Problem issue: Information effort seen as a burden

- Constraints to work should be minimized.
- Adequate technological support should be ensured.
- Select data collection and management tools should be improved.
- Creativity should be accommodated in the HMIS, and local needs should be acknowledged.

Problem issue: Inadequate access to data

- The quality, timeliness, and rate of reporting need to be improved.
- The data storage and retrieval system needs to be improved.
- Management of inpatient information needs to be improved.

Problem issue: Poor preparation of data for use

- There is a need for widespread use of a minimum package of information to support health care decisions.
- HMIS quality control needs to be improved.

Problem issue: Weak analysis of data

- Human resource involvement in HMIS needs to be rationalized at mid- and senior management levels.
- Improved information products need to be made available from the district, regional, and central levels.
- Evidence needs to be available to show how data analysis is being used for planning and evaluation.

Problem issue: Poor capacity for decision making

- An HMIS capacity development plan should be in place and implemented.
- A system review process/plan should be in place and implemented.

- There should be evidence of information-based decisions and priorities at all levels.

Problem issue: Little initiative for using data

- There should be a functioning system of supportive supervision.
- The supervision and feedback system should be linked to improved use of information.
- Linkages between performance and funding should be strengthened.

Problem issue: Central HMIS unit unable to contribute effectively

- An information strategy for the health sector (MOH) should be in place, understood, and implemented.
- An HMIS should be institutionalized that enhances involvement with information strategy and utilization products.
- The role of regions in the HMIS should be clarified.

Future plans

- Conduct needs assessment and capacity-building plan for the HMIS and National Sentinel System.
- Develop an essential/minimum package of information.
- Develop tools for data use.
- Undertake capacity-building and skills enhancement.
- Develop an information strategy.
- Train HMIS staff in information technology.
- Develop a national data bank.
- Purchase and install computers in districts and hospitals.