Implementation guide to the routine health information system toolkit

World Health Organization

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Contents

Abbreviations

CRVS	Civil Registration and Vital Statistics
DHIS2	District Health Information Software, version 2
HDC	Health Data Collaborative
HIV	Human immunodeficiency virus
HIS	Health Information System
HMIS	Health management information system
HRH	Human Resources for Health
M&E	Monitoring and evaluation
PHC	Primary Health Care
RHIS	Routine Health Information System
RMNCAH	Reproductive, Maternal, Newborn, Child and Adolescent Health
SCORE	Survey, Count, Optimize, Review, Enable
SDG	Sustainable Development Goals
SOP	Standard operating procedure
TB	Tuberculosis
UHC	Universal Health Coverage
WHO	World Health Organization
ICT	Information and communication technology

Introduction

This Implementation guide was produced with the support of grants from the Global Fund to Fight AIDS, Tuberculosis and Malaria

Background

The routine health information system (RHIS) is an integral part of the overall national health information system (HIS) (Figure 1). RHIS collects health service data directly from the health facilities, where they are produced regularly by the healthcare workers and community health workers. The sources of RHIS data are generally individual health records (paper-based and/or electronic), records of services delivered (e.g., health management information system- HMIS), and records of health resources (e.g., human resource, financial, logistics management, infrastructure and equipment) (Figure 2).

Figure 1: Interrelationship of Health management information system (HMIS), Routine health information system (RHIS) and Health information system (HIS)
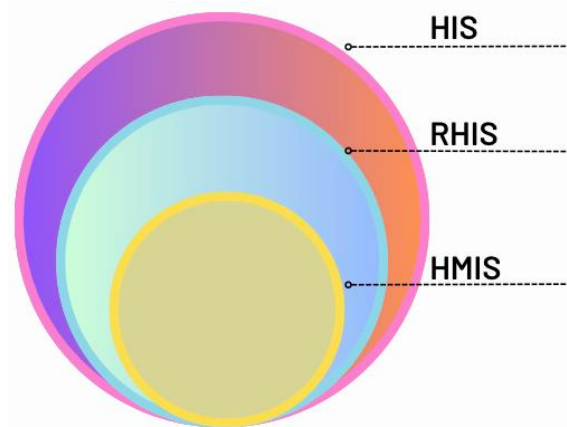
Routinely reported data from health facilities are an essential source of information for the planning, management, and delivery of effective health services. These data provide a basis for monitoring performance and progress in primary health care (PHC) to achieve Universal Health Coverage (UHC) and track Sustainable Development Goals (SDGs). The RHIS ideally consists of a single, comprehensive, integrated system or set of interoperable data systems.

Figure 2: Example of Routine health information system (RHIS) data sources

RHIS DATA SOURCES

- Individual health records
- Health facility service information system (IS)
- Laboratory and Imaging IS
- Disease Surveillance IS
- Surveillance systems for adverse events
- Civil registration and vital statistics
- Financial management IS
- Human resource IS
- Logistics management IS
- Infrastructure and Equipment IS
- Master health facility list
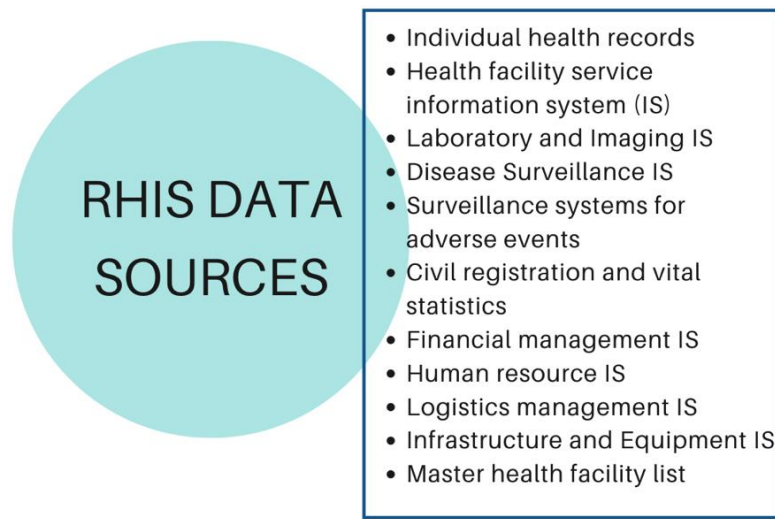
Despite substantial investments and progress in the RHIS, many countries continue to face multiple challenges related to facility data, including poor data quality, fragmented and siloed data systems, heavy reporting burden on frontline workers and limited capacity for analysis and use of data and information at all levels of the health system, including community, facility, subnational and national levels.

Fragmented and siloed data management systems used by disease programmes (such as HIV, TB, immunization, and epidemic disease surveillance) are often disconnected from a comprehensive national facility data system. To address these challenges, World Health Organization (WHO), in collaboration with partners of the health data collaborative (HDC), have been working to develop integrated, innovative approaches to strengthen and improve access to quality health facility data for better data analysis and use.

In 2018, WHO and HDC launched an initiative to develop a set of capacity-building resources to optimize the analysis and use of routine facility data, commonly known as the **_RHIS toolkit_**.

The toolkit, depicted in Figure 3, promotes an integrated, standards-based approach using a limited set of standardized core indicators with recommended analyses, visualizations and dashboards. The RHIS toolkit consists of a series of general and programme-specific modules, such as:

1. **Standards** for measurement and analysis of RHIS, including general principles, core indicators and metadata, and data quality review toolkit;
2. **Guidance** for planners and managers, including integrated health service analysis at the facility, district and national levels;
3. **Programme specific guidance documents, as well as training materials** (e.g., immunization, HIV, TB, Malaria, RMNCAH, rehabilitation, mortality, surveillance), which are continuously expanding to cover other programmes.

Figure 3: The RHIS Toolkit overview depicting a comprehensive set of resources
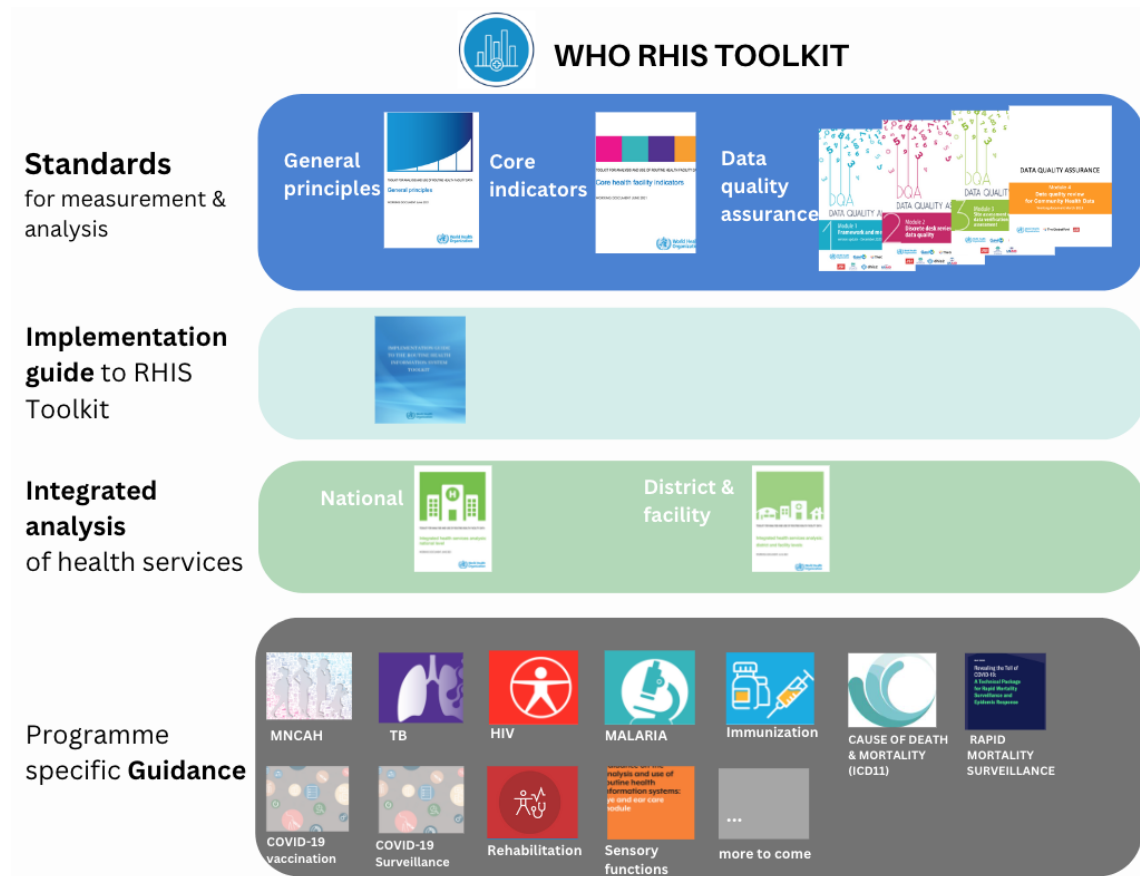
The modules in the RHIS Toolkit are designed to be software agnostic. With the collaboration of the University of Oslo, the modules have been digitalized into DHIS2 configuration packages.

By the end of 2022, the Toolkit has covered 10 programmes and has been implemented in 70 countries, primarily low and low-middle income countries. The toolkit is being expanded to include non-communicable diseases, neglected tropical diseases, nutrition, community health, and integrated disease surveillance. This approach allows countries to identify their needs and align with WHO's convening power to support coordination and regional support (Figure 4).

Figure 4: Country implementation procedures to align with WHO at regional and global levels.

Country
- Identify country needs
- Communication WCO and MOH for requesting support to the implementation
- Establish a communication channel, task force

Regional & Global

Functions
- Identify and understand country needs
- Coordination/regional support and technical assistance
- Funding mobilization and leverage
- Data flow and integrated data platform
- Capacity building

Points of contact
- Regional HIS/Data team; DDI/HQ
- Technical Programme Focal point
- Health information systems programme and regional hubs

About this document

The purpose of this document is to guide the implementation of the **RHIS Toolkit** in countries. The primary users of this document are the Ministries of Health and their collaborating partners working to strengthen RHIS, and WHO country offices.

The guide is in line with the Strategy for optimizing national RHIS[1] and SCORE (Survey, Count, Optimize, Review, Enable) initiative for health data technical package to support countries in strengthening data systems and building the capacity to monitor progress towards national and subnational health priorities and targets, the health-related SDGs and UHC.

The content in the following section is presented in a step-by-step manner to help countries prepare, implement and evaluate activities to continuously strengthen the RHIS as a core part of a national HIS. Figure 5 presents the overview of the step wise approach to implement and evaluate RHIS activities.

Figure 5: Step-by-step approach to plan, implement, evaluate RHIS activities

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[1] Strategy for optimizing national routine health information systems: strengthening routine health information systems to deliver primary health care and universal health coverage. https://iris.who.int/bitstream/handle/10665/376094/9789240087163-eng.pdf
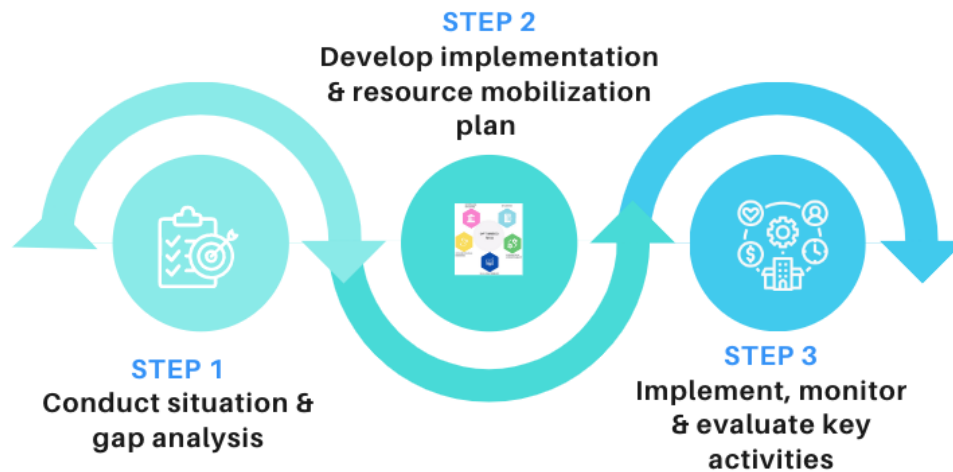
Step 1: Conduct situation and gap analysis

Step 1 is to conduct a situation and gap analysis that will serve as a baseline for planning activities, defining resource needs and developing an implementation and resource mobilization plan. This step should be conducted in collaboration with key stakeholders including all relevant functions in MoH, its collaborating partners and other relevant sectors.

Potential sources of information for this analysis include the SCORE assessment, health sector review, data quality review and other relevant evaluations.

WHO has developed the RHIS readiness assessment (RA) tool to help countries assess the current state of readiness for optimization of RHIS. The tool provides a holistic picture and is structured around eight domains (see Figure 6) covering a broad range of foundational aspects required for successful optimization of RHIS. The RA tool includes a grading system from 1 to 5 for each sub-domain and definitions to facilitate grading process. Annex 1 includes a PDF document of the Readiness Assessment. The original assessment in Excel format is available upon request.

Figure 6: Domains in the RHIS Readiness assessment tool

1 **LEADERSHIP AND GOVERNANCE**	**5** **USER CAPACITY AND TRAINING**
2 **STRATEGY AND INVESTMENT**	**6** **FACILITY AND POPULATION PROFILE**
3 **DATA SECURITY AND COMPLIANCE**	**7** **INFRASTRUCTURE**
4 **TECHNICAL SKILLS FOR RHIS/DHIS2 ADMINISTRATION AND MAINTENANCE**	**8** **HMIS- AGGREGATED DATA**

Step 2: Develop implementation and resource mobilization plan

The findings from the situation and gap analysis (Step 1) will inform a set of key actions to develop implementation and resource mobilization plan to effectively implement, operate and evaluate integrated RHIS.

The implementation and resource mobilization plan should be developed as a participatory and consultative process engaging the key stakeholders to achieve ownership and alignment. The implementation and resource mobilization plan should be aligned with national strategies such as HIS strategy, digital health strategy, and existing M&E frameworks.

The section below outlines the key actions grouped by five essential enabling components to support countries in developing the implementation and resource mobilization plan (Figure 7). These enabling components are aligned with the five strategic goals in Strategy for optimizing national RHIS and are to:

1. Strengthen governance and partnership structures for routine HIS.
2. Strengthen standards for RHIS data, including data quality and data management.
3. Improve integration and interoperability of RHIS subsystems as part of the overall health data ecosystem.
4. Build capacity for RHIS data analyses, use and dissemination.
5. Secure the necessary human and financial resources required for a sustainable routine HIS.

 The key actions should be adjusted based on country context, needs, requirements and availability of resources. Countries can add/remove actions based on the results from the situation and gap analysis.

Figure 7: Five enabling components for robust RHIS
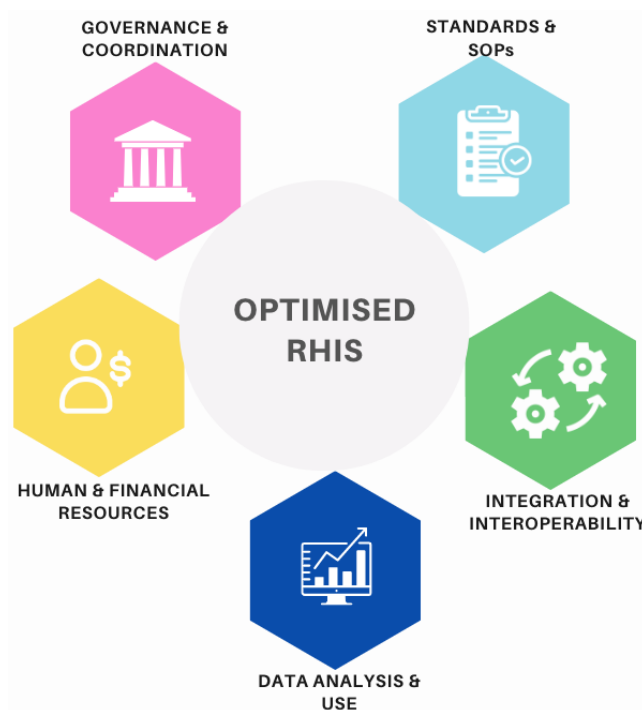
🏛 Governance and coordination structure

Strong governance and coordination are the foundations for creating an environment for effective alignment and management of resources, activities and performance monitoring at every health system level. The table below outlines key actions necessary to establish and enhance strong governance structure at all levels of the health system (community, facility, sub-national and national; referred to all levels) to optimize RHIS as core part of the national HIS.

Key areas	Actions
Leadership, Coordination	1. Establish a functional National Health Information body with an appointed position to oversee RHIS-related activities at a national level 2. Establish collaboration within all programmes in ministries of health, related national authorities (e.g., national statistics, CRVS, education ministry), private and non-governmental sectors, academia and key national partners to align priorities, resource mobilization and implementation of activities to optimize RHIS 3. Define the mandate, roles and responsibilities of key stakeholders (government and partners) and ensure fulfilment of these roles 4. Engage private, non-governmental health sectors to take an active role in planning, resource mobilization and implementation of activities to optimize RHIS 5. Take an active leadership role to ensure alignment with key stakeholders with national priorities for an integrated national RHIS 6. Develop a capacity-building roadmap to strengthen leadership skills at all levels 7. Develop a RHIS optimization roadmap including human, financial, technical and infrastructure resource needs and how the actions in all areas (governance; standards; data analysis and use; human and financial resources) will be financed and executed 8. Mobilize resources to implement, maintain and further enhance RHIS based on the implementation plan and RHIS optimization roadmap 9. Develop a monitoring and evaluation framework with indicators and relevant targets
Legislation, policy, procedures	1. Ensure all legal and policy requirements (national health strategy, eHealth/digital health policy, digital health governance framework) and procedures are developed, approved 2. Develop a plan to disseminate and integrate the latest legislations, policies and procedures into work processes at all levels

Standards and standard operating procedures (SOPs)

Data standards and SOPs are key elements in optimizing RHIS. They enable transparent and effective work processes and reduce redundancy in how data is managed. The table below outlines several areas of importance to consider while developing or refining standards and SOPs.

Key areas	Actions
Data standards, SOPs	1. Ensure regular revision, enhancement, dissemination and integration of the latest standards/SOPs in work processes at all levels 2. Ensure health workers use the latest data collection and reporting forms 3. Ensure the availability of the standards and SOPs, including the following: - SOPs for routine data management, including roles and responsibilities at all levels and how data is collected, coded, analyzed, quality assured, accessed, reported, used, represented, formatted, transmitted, disseminated and archived. ***RHIS Toolkit*** provides standards for measurement and analysis of RHIS including general principles, indicators and metadata - Standardized data collection and reporting forms at all levels - Enterprise data architecture (considering electronic and paper-based data management). Ensure principles for health data governance are considered and integrated in RHIS and overall national HIS. Example of principles can be found here: http://healthdataprinciples.org/principles; - Standards for data integration and interoperability between RHIS and other relevant HIS data sources. The interoperability areas include systems such as HMIS, disease surveillance, CRVS, community health information system, human resources for health, financial management system, master facility list, national health accounts, health insurance, logistics management information system, laboratory information system. - Standards for data integration and interoperability across national data repositories, regional and global reporting needs (e.g., WHO regional and global data reporting) - Data security and safety standards
Indicators & Metadata	Establish a list of national indicators and metadata. All common indicators and metadata should be agreed upon and streamlined across all health programmes and sectors. ***RHIS Toolkit*** provides guidance on health facility core indicators and metadata as well as indicators and metadata for a growing number of health programmes/diseases (e.g., HIV, TB, Malaria, immunization, RMNCAH, rehabilitation).

Integration and interoperability

Integration refers to the process of unifying various information systems to function as one. Interoperability is referred to as the alignment between independent systems so that they can share data. Ensuring integration and interoperability between different technologies and applications for better exchange, access, and use of data is a key component in optimizing RHIS[2]. The table below outlines areas of importance to ensure a robust, unified and integrated RHIS.

Key areas	Actions
Integration and interoperability	Ensure compliance with standards and SOPs such as: - Data integration and interoperability between RHIS and other relevant data sources. The interoperability areas can include systems such as HMIS, disease surveillance, CRVS, community health information system, human resources for health, financial management system, master facility list, national health accounts, health insurance, logistics management information system, and laboratory information system. - Enterprise data architecture and principles for health data governance - Standards for data integration and interoperability across national data repositories, regional and global reporting needs (e.g., WHO regional and global data reporting) - Data security and safety standards

Data analysis and use

Data analysis and use are essential in driving progress in the health sector. RHIS data use can vary according to the existing data use culture, availability of relevant data and the mandate, roles and responsibilities of key stakeholders across the healthcare chain. Health workers can use RHIS data at the community and facility level, sub-national and national levels for making informed decisions in program planning and management, service provision, and policymaking. The availability of action-based indicators is crucial to implement interventions and to evaluate their effectiveness. Data is at the core of monitoring and evaluation (M&E) cycles, including effective feedback loops across the health care chain.

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[2] https://www.who.int/publications/i/item/9789240055315

Key areas	Actions
Data analysis and use	1. Ensure availability of key indicators based on end-user's data needs, roles and responsibilities at all levels 2. Ensure the electronic systems are used to conduct necessary analysis to enable effective data visualization, dissemination and use and reduce time spent on data analysis for health workers 3. Integrate data use activities in routine and planned M&E, planning, and resource allocation cycles and ensure the generation of fit-for-purpose data and reports. E.g., integrate periodic assessment of RHIS into existing initiatives (systematic data quality review, joint appraisals, performance-based financing, programme and health sector reviews, monthly sub-national meetings). **RHIS Toolkit** provides Data Quality Review (DQR) Toolkit to support countries in assessing and improving the quality of RHIS data. 4. Implement standards and SOPs to generate necessary indicators from RHIS based on the data needs, roles and responsibilities 5. Set up routine data analysis mechanism and feedback loops (online, on-site, via meetings/workshops) across all programmes and levels. **RHIS Toolkit** guides planners and managers on integrated health service analysis at the facility, district, and national level. 6. Develop a mechanism to build capacity to analyze and use RHIS data at all levels (e.g., among HIS functions, health programmes, and managers) 7. Integrate data and evidence-based health programme management into pre-service and in-service training

Human and financial resources

Human and financial resources are vital for the sustainability and effective operation of the RHIS. Ensuring the continuous capacity building, availability and recruitment of human resources with various skill sets at all levels, from community to national, is a pivotal component to drive progress in RHIS. Step 1 in this guide provides a picture of the existing skill set, available resources including infrastructure, and gaps.

Streamlining and reducing duplications in RHIS activities and aligning all partners to work and achieve a shared vision will help to use the existing resources effectively, mobilize additional resources and show results.

Key areas	Actions
Human resources	1. Define a capacity building and staffing roadmap based on the results of the situation and gap analysis. Consider all required skill sets including leadership, management, health programmes, M&E, statistics, epidemiology, HIS, ICT functions (e.g., data architecture, data security, IT operations) 2. Consider short- and long-term capacity building mechanisms including: - Short-term: on-the-job training, refresher training, supportive supervision and routine feedback mechanisms. Consider on-site and on-line training methods. Refer to Resources for implementation of [Strategy for optimizing national RHIS](#) to obtain the latest information on capacity building for RHIS. [OpenWHO](#) has a comprehensive set of training courses in different languages. Make use of WHO Regional training hubs for continuous capacity building purposes. - Mid-and-long term: capacity building of cadres at higher education institutions. Close collaboration with the Ministry of Education and curricula revision of various programmes (e.g., public health, medicine, engineering, health informatics, epidemiology, management) is a key to educating necessary cadres and sustainable staffing. 3. Ensure availability of required competency for implementation, maintenance and sustainability of RHIS at all levels. E.g., electronic systems require availability of human resources to provide technical support, troubleshooting, implementing data enterprise architecture and safety measures. Point-of-care electronic systems require necessary structures close to communities and facilities.
Financial resources	1. Assign a resource mobilization group to oversee the coordination of the process together with all key partners and relevant sectors 2. Align all key stakeholders to mobilize resources based on one national, integrated plan to avoid duplication of efforts and proliferation of similar projects. 3. Consider short- and long-term goals when developing a budget to execute the implementation plan (STEP 2). If the plan is to fully digitize data management at all levels, ensuring the availability of necessary human, technical, financial, and infrastructure resources is paramount to the success and sustainability of interventions. 4. Plan necessary advocacy to ensure sustainable/increased financing from the national budget. Present required financial resources as recurring costs to the Ministry of Finance

Step 3: Implement, monitor and evaluate key activities and progress

Step 3 is executing the implementation and resource mobilization plan and monitoring and evaluating the progress (Figure 8). Monitoring and evaluating the progress within the five enabling components is one of the core processes to ensure RHIS is continuously optimized.

The M&E Framework and data-driven governance structure provides indicators, their data sources and possible targets to monitor progress towards the RHIS activities, deliverables and milestones. Effective M&E activities will support the key stakeholders in quickly identifying the gaps, mobilizing resources and implementing interventions to close the gaps.

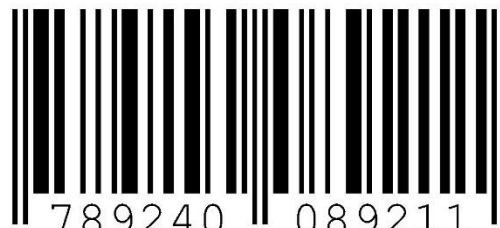*Figure 8: Monitoring, evaluation and action cycle*
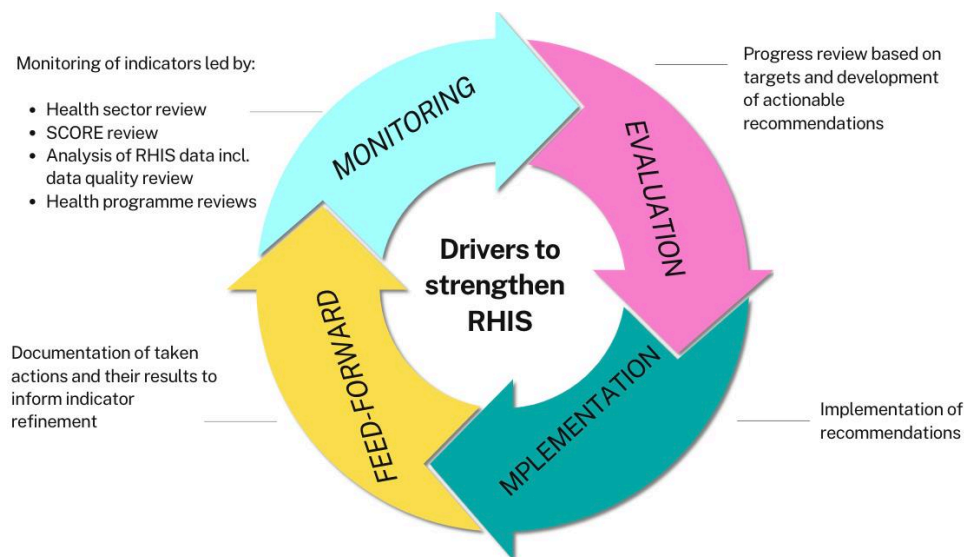
Monitoring and evaluating input, process, output, outcome and impact indicators will help the key stakeholders be accountable, drive progress and answer the following questions:

- Who is responsible for doing what?
- How are we doing and why?
- How can we do better?

Integrating RHIS M&E into the existing health sector reviews such as data quality reviews, health programme assessments, performance-based financing will minimize duplication of resources and maximize the value of the existing evaluation mechanisms.

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