Strategy for optimizing national routine health information systems

Strengthening routine health information systems to deliver Primary Health Care and Universal Health Coverage

World Health Organization

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Foreword

Robust data and statistics help prioritize and respond to health challenges by informing the allocation of resources. They are essential for monitoring and evaluating the effectiveness of those decisions. Routine Health Information Systems (RHIS) play a vital role in strengthening health systems by providing regular, systematic data that empower health managers and policymakers to take timely evidence-informed decisions. Over the last decade the structures and capacities of health information systems to collect routine data have progressed significantly.

This strategy was developed to further support countries in their efforts to strengthen their capacity to implement key interventions to optimize their RHIS, enabling the monitoring and delivery of Health Care Services, especially Primary Health Care (PHC). The strategy proposes principles for integrated, interoperable, evidence-informed, aligned and partnership-based RHIS through five strategic goals with measurable interventions.

The Strategy for optimising national RHIS is part of the World Health Organization's (WHO) *SCORE (Survey, Count, Optimize, Review, Enable) for Health Data Technical Package* to strengthen country health data systems and capacity to generate and use the information for health service management and monitoring of national and global targets. This strategy sets out to optimize RHIS and outlines a vision, supported by strategic goals, guiding principles, specific objectives and key interventions to improve health data collection, reporting, analyses and use at national, subnational (all levels below the national level including and not limited to public, private, nongovernmental) and community levels.

The *Strategy Resources* (Web annex 1) is the accompanying document which provides information on implementing guides, references and links to relevant tools and several country case studies. For example, the *Implementation Guide to RHIS Toolkit and Readiness Assessment* tool can help countries to conduct a situation analysis in preparation for adaptation and use of the toolkit. The *Strategy Resources* includes the steps and best practices to further help countries operationalize their strategy.

We hope that this strategy and its supporting documents will prove useful to countries and their partners in addressing their data gaps and strengthening the use of routine health data for health services management and monitoring progress towards national and global health related targets.

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Abbreviations

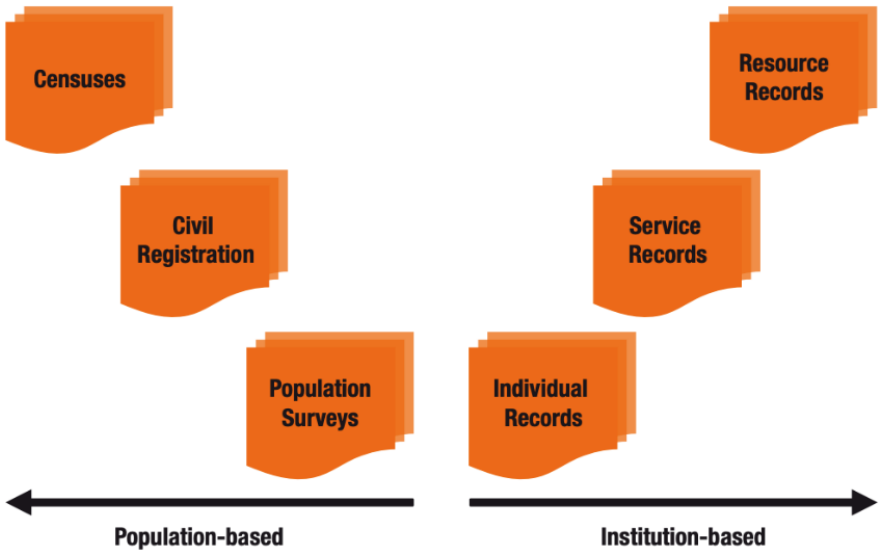
COVID-19	Corona virus disease 2019
CRVS	Civil Registration and Vital Statistics
DHIS2	District Health Information Software, version 2
HDC	Health Data Collaborative
HIS	Health Information System
HRH	Human Resources for Health
ICD	International Classification of Diseases
ICF	International Classification of Functioning, Disability and Health
M&E	Monitoring and evaluation
PHC	Primary Health Care
RHIS	Routine Health Information System
SCORE	Survey, Count, Optimize, Review, Enable
SDGs	Sustainable Development Goals
UHC	Universal Health Coverage
WHO	World Health Organization

Introduction

About Routine Health Information Systems

Routine Health Information Systems (RHIS) are an integral part of the overall national Health Information Systems (HIS), which is one of the six building blocks of the health system[1]. HIS provide a strong foundation for decision-making and has four key functions: data generation; data compilation; analysis and synthesis; and communications and use. HIS collect data from the health sector and other relevant sectors, analyse the data and ensure their overall quality, relevance and timeliness, and transform the data into information to support health-related decision-making[2]. HIS data sources are usually categorized into institution and population based.

Figure 1. Health information data sources



Source: WHO Framework and Standards for Country Health Information Systems, second edition.

RHIS data come mainly from institution-based sources, such as individual health records (paper-based and/or electronic); records of services delivered (e.g. immunization, antenatal care); and records of health resources (e.g., human resource, financial, logistics management, infrastructure and equipment).

Ideally national RHIS should consist of a set of comprehensive, integrated interoperable data systems that enable data collected from health facilities and communities to be shared, used and reused for different purposes by different entities throughout the health system.

RHIS are systems that collect health service data directly at the health facility, either by health care workers and community health workers or by diagnostic instruments, including machines (e.g., GeneXpert, Radiology etc.). RHIS process, report, and provide data and information on a regular basis for use by health managers, planners, and decision makers at different levels of the health system. RHIS collect data consistently, allowing for trend analyses and monitoring, improving the management of health services and outcomes.

[1] Monitoring the building blocks of health systems: a handbook of indicators and their measurement strategies. Available at: https://cdn.who.int/media/docs/default-source/service-availability-and-readinessassessment%28sara%29/related-links-%28sara%29/who_mbhss_2010_cover_toc_web.pdf

[2] WHO Framework and Standards for Country Health Information Systems, 2nd edition. Available at: https://www.who.int/publications/i/item/9789241595940

Staff at healthcare facilities routinely collect information about the services provided. This typically includes information regarding their patients' health and the types of treatments and tests administered. Managers at different levels of the health system also collect information, for instance about human resources, finances, medicines and supplies. Managers use this information to make decisions about how to organise and improve services. This is referred to as "routine health information systems (RHIS)" [3]

RHIS are the foundation of health data, helping to improve health outcomes for people all around the world through better-informed policies, planning, and management of health services. RHIS provide frequent, up-to-date information on service performance across all levels of the health system, enabling regular analyses of progress and timely identification of problems. However, RHIS are complex organisms, comprised of many different moving parts that require strong ownership and governance by Ministries of Health and Governments in general.

For efficient health management, the role of RHIS cannot be overstated. These systems provide crucial data to inform decision-making and policy formulation and assessment. However, RHIS in many countries face important challenges, not least reporting burden and fragmented and disjointed systems. It is essential to address these issues if RHIS are to deliver on their potential and properly support efficient and responsive healthcare delivery.

Benefits of RHIS:

- **Decision making**: Provides evidence for informed policy-making and effective resource allocation.
- **Performance monitoring**: Enables the tracking of health service delivery and various performance metrics, including workforce and logistics.
- **Disease surveillance**: Enables monitoring disease trends, promptly identifying outbreaks and facilitating a timely response.
- **Quality improvement**: Identifying gaps in service quality to support targeted interventions for continuous improvement.
- **Accountability**: Provides transparent information about health system performance, fostering public and stakeholder accountability.
- **Local data for local use**: Ensures the availability of localized data for context-specific decision-making and interventions.

Properly organised RHIS have the potential to generate regular, near real-time information on service performance and, to some extent, the quality of care across all levels of health systems. This capability allows regular monitoring of progress, identification and addressing of gaps in health services provision and management. A properly functioning RHIS is essential for guiding national policy and planning toward the achievement of PHC, UHC, and the SDGs (Figure 2).

Figure 2. Importance of RHIS data

[3] Leon N, Balakrishna Y, Hohlfeld A, Odendaal WA, Schmidt B-M, Zweigenthal V, Anstey Watkins J, Daniels K. Routine Health Information Systems improvements for strengthened health system management. *Cochrane Database of Systematic Reviews* 2020, Issue 8. Art. No.: CD012012.DOI: 10.1002/14651858.CD012012.pub2.

Challenges for RHIS:

- **Data Quality**: Ensuring accurate, timely, and complete health data is fundamental. Challenges in data quality, from the development of indicators to data registration, data collection to storage, remain challenging for many countries but are essential elements to the reliability of information.
- **Integration**: Coordinating and regulating data sharing across diverse platforms is essential. Seamless data sharing and integration mechanisms enable a more comprehensive understanding of health trends, outcomes and facility performance.
- **Capacity**: Working with data is a key task for healthcare workers employed at facilities. Building and maintaining the skills and knowledge of health workers so they can effectively use data from RHIS remains an ongoing challenge. Training programs are vital to empower professionals, ensuring they can navigate RHIS and leverage the benefits.
- **Technology**: Adoption and maintenance of suitable digital tools and infrastructure pose recurring challenges. Rapid technological advancements require health systems to continuously evolve. However, existing challenges in infrastructure, such as unreliable electricity supply or limited internet access, further complicate the adoption of the latest technologies. Overcoming these hurdles is essential for the efficiency and sustainability of RHIS.

The need for this strategy

Achieving health-related SDGs for the promotion, protection, and provision of health relies heavily on robust data and scientific evidence. One of WHO's strategic objectives is to establish best practices for every step of the data lifecycle (collection, analyses, and reporting etc.) so that every country will possess a strong HIS to address data gaps and leave no one behind.

Over the last decade, the structures and capacities of health data systems to collect routine data have progressed significantly. This is attributed to three main shifts:

- **Country ownership and strong governance**: There is an increased emphasis on country ownership and robust governance of national health information systems (HIS) at both national and district levels. This has been driven by the demand from countries for an integrated view of their health and service delivery systems.
- **Robust agile systems:** Modern HIS emphasize robustness and agility. Systems should be designed to be resilient and adaptable, so that they are capable of swiftly responding to changes and emergencies in the healthcare landscape.
- **Digital tools advancement:** Digital tools continually evolve, enhancing the capability to capture real or near real-time data. This will facilitate timely analyses, contributing to more effective decision-making.

These shifts underscore the dynamic evolution of HIS, aligning them with contemporary needs and challenges in healthcare. This has a significant impact on RHIS as they are some of the important health data systems in countries.

This strategy sets out a vision, guiding principles and a process that can be adapted by individual countries to strengthen their RHIS. It provides technical resources to support strategy implementation. It also outlines how WHO, at global, regional and country levels, will work together and engage with partners to support countries in building improved national RHIS.

The strategy is fully consistent with the objectives of ***SCORE***[4] *for Health Data Technical Package* to assist Member States in strengthening their national data systems and improving their capacity to monitor progress towards the health-related SDGs, UHC, and other national and subnational health

[4] SCORE for Health Data Technical Package. Available at: https://www.who.int/data/data-collection-tools/score

priorities. The SCORE technical package encourages stakeholders to invest in a selected number of interventions that are aligned with the WHO data principles[5] and which, synergistically positively impact on the quality, availability, analysis, use and accessibility of data in countries.

Reasons to optimize RHIS

Countries need data to inform national-level planning and management at programme and national, district and facility level. Progress on strengthening RHIS has not kept pace with ambitious goals set by countries to improve their health services. Despite the increasing demand for data and evidence, the first *SCORE Global report on health data systems and capacity*[6] showed that country capacity vis-a-vis RHIS in low and low-middle income countries is still limited. High-quality data are not routinely collected in sufficient detail to support regular computation of levels, trends and inequalities in health outcomes. Major health challenges are not adequately measured and monitored, affecting programme implementation at national and district levels and, subsequently, the health status of the population. In many countries, the capacity to use RHIS data to inform decision-making at subnational, facility and community levels is not optimal. The report also shows that only 5% of countries have sustained capacity to use data for policy and action.

RHIS should provide information to improve health service management through data analysis and communication of evidence to improve health services[7]. Countries need to have access to and use data to inform planning and management at national, subnational, facility and community levels. High-quality, regular and accessible health information is needed by ministries of health and national authorities, managers at subnational and facility level (public and private), as well as individual health-care providers, legislative bodies, communities, citizens, global stakeholders and the media[8] to:

- Better target health interventions;
- Efficiently adjust programming to meet evolving health needs;
- Optimize resource use and improve the quality and efficiency of health-care services;
- Measure and track population health determinants, outcomes and inequalities;
- Monitor health status in populations at greatest risk;
- Provide early warning of potential public health threats;
- Effectively plan and advocate for resources within and beyond the health sector;
- Hold health institutions and government authorities accountable for resource use and health outcomes; and,
- Support global monitoring.

To leave no one behind and provide information on access to health care services by population groups, including by age, sex and location, it is essential that RHIS can be linked with civil registration and vital statistics systems (CRVS). RHIS provide crucial data on births, deaths and causes of deaths required by CRVS. Conversely, CRVS provide the health sector with valuable information on target populations[9] and their characteristics.

Despite the increasing demand for data and evidence, the RHIS and CRVS currently being used in many low and middle-income countries (LMICs) are not fit for purpose[10]. Consequently, many important health challenges are not adequately measured, monitored or addressed. This affects programme implementation at national and subnational levels and negatively impacts efforts to improve the population's health status. Furthermore, even if the quality of the data are good, they are

[5] WHO Data principles. Available at: https://www.who.int/data/principles

[6] Global report on health data systems and capacity, 2020. Available at: https://iris.who.int/bitstream/handle/10665/339125/9789240018709-eng.pdf

[7] Saigí-Rubió F, Pereyra-Rodríguez JJ, Torrent-Sellens J, Eguia H, Azzopardi-Muscat N, Novillo-Ortiz D. Routine health information systems in the European context: a systematic review of systematic reviews. Int. J. Environ. Res. Public Health. 2021;18:4622. doi.org/10.3390/ijerph18094622

[8] World Development Report 2021: Data for Better Lives. Washington (DC): The World Bank; 2021.

[9] WHO civil registration and vital statistics strategic implementation plan 2021-2025. Geneva: World Health Organization; 2021.

[10] Scobie, H., Edelstein, M., Nicol, E., Morice, A., Rahimi, N., MacDonald, Noni E., Danovora-Holliday, C., Jawad, J. Improving the Quality and Use of Immunization and Surveillance Data: Summary Report of the Working Group of the Strategic Advisory Group of Experts on Immunization. 2020. Available at: https://pubmed.ncbi.nlm.nih.gov/32950304/

not used to improve the coverage and quality of health service delivery. Various organizational, behavioural and technological factors constrain effective data use and problem-solving.

CRVS can provide valuable births and deaths information for countries with population registers, providing governments with critical demographic patterns which can used to inform policies and plan services, amongst a range of other benefits[11]. In a public health emergency, such as the COVID-19 pandemic, basic CRVS, including birth and death notifications and registrations, medical certifications of cause of death and mortality coding, are vital to inform and support both national and global responses, including supporting up to date monitoring of the spread of fatalities[12].

Real-time surveillance and information systems and the timely sharing of case-based data between public health and private healthcare facilities is paramount for the early detection of outbreaks, identification of changes in epidemiological trends and planning of health services. The COVID-19 response showed how important routine facility data are for the monitoring of essential health services and rapid detection of public health threats – especially primary health care – as well as the management of adverse events following immunization (AEFI) and vaccine safety surveillance[13,14].

Country case study: Sri Lanka – How RHIS and the use of technology can support effective vaccine roll-out

In Sri Lanka, an open-source, web-based platform, used as a health management information system (HMIS) has been effectively deployed and customized to support COVID-19 vaccination efforts. This includes the implementation of surveillance to track COVID-19 immunization, monitoring stock and producing verifiable vaccination certificates. Sri Lanka was the first country in the world to deploy their national HMIS for the surveillance of COVID-19 in January 2020. As a result, almost exactly a year later, the country was ready to begin vaccinating its population against the Corona virus. To help manage and monitor this effort, health authorities worked with the software team in Sri Lanka and the WHO Country Office to design and configure a system for COVID-19 vaccine delivery. The system uses the District Health Information Software, version 2 (DHIS2) Tracker as an immunization registry based on individual-level data, aggregate data for vaccine stock management, and dashboards that combine data from different systems to facilitate better decision-making. For details, see: https://dhis2.org/sri-lanka-covid-vaccine/ (Accessed 20 March 2022).

Refer to Strategy Resources for more information and additional country examples

[11] WHO civil registration and vital statistics strategic implementation plan 2021-2025. Geneva: World Health Organization; 2021. P1.

[12] WHO civil registration and vital statistics strategic implementation plan 2021-2025. Geneva: World Health Organization; 2021. P4.

[13] Implementation of the 2030 Agenda for Sustainable Development. World Health Assembly document A74/11, 20 May 2021. Geneva: World Health Organization; 2021 (https://apps.who.int/gb/ebwha/pdf_files/WHA74/A74_11-en.pdf, accessed 20 March 2022).

[14] World Health Statistics 2021; a visual summary. Geneva: World Health Organization; 2021. Available at: https://www.who.int/data/stories/world-health-statistics-2021-a-visual-summary

Target audience

This strategy is developed primarily for country stakeholders working to strengthen RHIS. Key end-users include ministries of health and other public agencies, non-governmental organizations, private entities, academia, and international organizations actively involved in supporting country-led HIS initiatives.

Process

This strategy was developed through an extensive consultative process during 2021 and 2022, facilitated by the Department of Data and Analytics, under the Division of Data, Analytics and Delivery. An expert advisory group was regularly consulted on the content and structure of the strategy. Several rounds of consultation across different technical units in WHO HQ and with regional technical focal points were organized through the WHO Hub & Spoke mechanism. Consultations with partners were organized through the Health Data Collaborative (HDC) mechanism.

The highlight of this consultative process was the "*Global consultation to optimize Routine Health Information Systems to effectively deliver UHC and improve PHC in countries*[15]", held virtually over two days in September 2021, with contributions from more than 50 speakers and panelists representing WHO HQ, regional offices, ministries of health, and collaborating partners. This consultation reconfirmed the importance of RHIS for countries.

Vision

To nurture an information culture in countries to continuously strengthen RHIS to better track progress towards PHC, UHC, and health-related SDGs.

Purpose

This strategy aims to support countries, WHO regions and partners to improve RHIS within their overall health information ecosystems. The interventions recommended in this strategy aim to support countries in optimizing data collection, reporting, analyses and use at national, subnational, facility and community levels and to build national RHIS that are enabled by:

- Strong leadership and governance;
- Responsive and resilient health systems that generate routine data and address urgent requirements, such as those demanded during the COVID-19 pandemic;
- Culture of innovation which promotes effectiveness and efficiency; and,
- Use of interoperable technological tools that are fit-for-purpose.

Strategic goals

The strategic goals are to:

1. Strengthen governance and partnership structures of RHIS.
2. Strengthen standards for RHIS data, including data quality and data management.
3. Improve integration and interoperability of RHIS into overall health data ecosystems.
4. Build capacity for RHIS data analyses, use and dissemination.
5. Secure human and financial resources required for a sustainable RHIS.

[15] Routine Health Information Systems - Global Consultation. 1-2 September 2021. Available at: https://www.who.int/data/data-collection-tools/health-service-data/rhis-global-consultation

Guiding principles

The strategy to support countries optimize their RHIS is guided by four core principles, namely:

- **Integration**: Having one integrated national RHIS (one set of data for multiple uses) fed by multiple national data systems to avoid duplication and reduce reporting and collection burden;
- **Evidence-based**: Using scientific rigour and evidence-informed interventions with a focus on learning from experiences and evidence;
- **Aligned**: Aligning with country needs and global health development efforts towards the SDGs and universal health coverage; and
- **Partnership-based**: Leveraging on existing data governance, coordination, and integration at country, regional and global levels.

Figure 3. Strategy overview

WHO and partners will support countries to achieve the strategy goals, specific objectives and implement the key interventions, as presented below.

Strategic Goal 1. Strengthen governance and partnership structures for RHIS

Specific Objectives	Key interventions
1.1 Central/national governance structures and processes are established and functional.	1.1.1 Establish a functional National Health Information body to supply evidence and health statistics updates for the health sector and policy-makers. 1.1.2 Establish a functional governance structure for RHIS as a core part of a national HIS. 1.1.3 Identify a national set of core indicators, aligned with international classifications, coding systems and reporting requirements. 1.1.4 Strengthen national health data collection by regularly updating reporting standards, operating procedures and guidelines for data collection, analysis and use. 1.1.5 Develop a data enterprise architecture, including related governance framework and guidelines. 1.1.6 Establish and maintain a Master Facility List of health facilities aligned with international coding and naming conventions. 1.1.7 Where relevant, advocate for a legal review to enhance the enabling environment for the health sector strengthening of RHIS and essential systems, such as CRVS.

1.2 Subnational governance structures and processes are established and functional	1.2.1 Establish subnational health information entities to serve as hubs for collecting, interpreting and using RHIS data and for managing data flows from community to subnational to national levels with robust feedback loops. 1.2.2 Ensure robust processes for reporting all births and deaths in health facilities or detected by the health sector for accurate vital statistics at community level. 1.2.3 Ensure that subnational health information entities are resourced and capacitated to fulfil their role. 1.2.4 Establish a national standard, operation procedure (SOPs) for HMIS that includes all processes and roles of involved stakeholders.
1.3 Coordination mechanisms between the HIS and RHIS are led by the Ministry of Health to facilitate effective and regular implementation of RHIS-related activities at national and subnational levels.	1.3.1 Ensure there is effective and regular government-led coordination of all HIS-related activities across public, private, non-government health services/facilities and academia. 1.3.2 Establish a coordination and information-sharing mechanism between the health and other sectors, academia and partners to promote data use.
1.4 Comprehensive monitoring and performance reviews are held at national, subnational and community levels to inform annual work-planning to strengthen RHIS.	1.4.1 Conduct progress monitoring and performance reviews of RHIS activities, including a data quality review to identify interventions to further enhance RHIS. 1.4.2 Develop an annual work plan based on findings from reviews, including the roles and responsibilities at all levels.
1.5 Adequate and sustainable investment for infrastructure, logistic support, maintenance and supplies are available at all levels of the HIS, including information and communication technology (ICT) equipment at subnational levels and in health facilities.	1.5.1. Ensure adequate supply and maintenance of ICT resources (mobile devices, computer, Internet connectivity, electricity) at facility and sub-national level. 1.5.2. Strengthen human resources capacity and skills, ideally based on a country-specific competency framework (including job-aids).

SO1 Guiding principles

- Development of country HIS are owned and led by governments through appropriate institutions and health sector policy frameworks.
- Well-defined and integrated RHIS are clearly mapped out in a comprehensive national data enterprise architecture (eHealth blueprint[16]). The architecture should emphasize the principles of interoperability and common data standards to enable data use and access at all levels. Strong governance structures are required to address potential challenges in interoperability and system integration.
- Aligned stakeholders (public, private, academia and supporting partners) whose joint efforts support one plan, one budget and one Monitoring and Evaluation (M&E) framework led by countries.

Country case study: Lao People's Democratic Republic (PDR)
Lao PDR has a robust, integrated HIS that was built from the ground up. Among other factors, the WHO Country Office strategy (1) helped to secure government ownership early in the process and (2) aligned all development partners, ensuring the success of the initiative.

For details, see: Building a responsive health information system from the ground up.

Refer to Resources for more information and additional country examples.

[16] eHealth: Electronic health is the cost-effective and secure use of information and communications technologies in support of health and health-related fields, including care services, surveillance, literature and education, knowledge and research.

Strategic Goal 2. Strengthen standards for RHIS data, including data quality and data management

Specific Objectives	Key interventions
2.1 The national RHIS data structure is maintained and strengthened, if possible, as the central integrated platform for all routine health data systems, ensuring rigorous data verification at national, subnational, facility and community levels.	2.1.1 Ensure that the national RHIS database is well structured, flexible and managed to accommodate multiple and evolving data sets to generate the information required by different users. 2.1.2 Harmonize data collection, coding and reporting system(s), avoid duplication of common data collection from facilities. Ensure that the data principles (e.g., GATHER[17]) and recommended metadata standards are followed. 2.1.3 Assure data quality and oversee data management processes with feedback loops to support ongoing data quality assurance practices at all levels of RHIS. 2.1.4 RHIS management effectively responds to user needs, troubleshoots database problems and ensures that the database is up to date and functioning smoothly.
2.2 The national list of core indicators and its accompanying metadata, data dictionary is aligned with internationally recommended standards and is regularly reviewed and updated to ensure inclusion of all key indicators from national programmes and global frameworks.	2.2.1 Conduct a strategic review of the full set of national indicators to ensure inclusion of all key indicators from national and global frameworks, such as universal health coverage, health related SDGs, and national socioeconomic development indicators or equivalent. 2.2.2 Continue the development and integration of metadata for a national data dictionary and data catalogue that aligns with international statistical and WHO's recommended standards. 2.2.3 Review and integrate with relevant digital solutions, align with national data governance and regulations
2.3 Existing operational guidelines specific to each level are up to date, available and reflected in supervision guidance and RHIS training materials.	2.3.1 Review the existing RHIS data collection and reporting guidelines to ensure comprehensive coverage of all recommended integrated components – and align with any update of the strategic review (2.2.1). 2.3.2 Ensure that the guidelines and procedures are tailored to each level of the health system to standardize: • the collection of aggregate and patient-level data; • the way in which data are transmitted; and • analysis and use of data. 2.3.3 Ensure that updated RHIS guidelines are integrated into all training curricula (both pre-service and in-service) for both management and clinical/data staff. 2.3.4 Produce and disseminate guidelines on data quality assurance for use across all RHIS data sources. 2.3.5 Periodically review and ensure compliance with WHO international classification standards (ICD-11/ICF)[18] for morbidity and mortality reporting.
SO2 Guiding principles • A people-centred design that sees RHIS users as having distinct and varied needs. This means that the guidance and support required for different user groups will vary according to their needs and abilities. User-centred approaches are increasingly used for digital development and management and ensure a flexible, adaptable and responsive approach to system management. • Robust data quality assurance mechanisms will improve the integrity of RHIS data which will, in turn, increase the confidence that RHIS users have the data and therefore result in better data use practices. Routine data quality assurance, feedback loops, and desk reviews should be implemented to improve data quality. Increased data use in combination with rigorous routine data quality assurance practice will lead to higher-quality data.	

[17] Guidelines for Accurate and Transparent Health Estimates Reporting. Available at: https://www.who.int/data/gather
[18] WHO Classifications and Terminologies. Accessed December 7. Available at: https://www.who.int/standards/classifications

- To increase confidence in the completeness and reliability of the data, RHIS stakeholders must strive to enhance data quality and use at the level at which the data are first generated, e.g., at facility and community levels.
- A set of agreed core indicators is used to monitor progress and track service delivery trends, both in terms of national priorities and indicators for global initiatives such as universal health coverage and the SDGs. A periodic review of this list must be undertaken to ensure that the list remains relevant and streamlined to avoid unnecessary data collection.

Country case study: Nigeria

Working with the government of Gombe, the Healthy Newborn Network investigated the quality of routine data. The findings show that investment in integrated HMIS should include periodic data quality review, feedback and supervision. Even technology-based innovations need feedback and supervision to realize the potential of using routine data for improving the health and survival of women and newborns.

For details, see: A case study from Gombe State, Nigeria.

Refer to Resources for more information and additional country examples.

Strategic Goal 3. Improve integration and interoperability of RHIS into overall health data ecosystems and digital health solutions

Specific Objectives	Key Interventions
3.1 Digital health architecture is developed to enable interoperability across different relevant data systems	3.1.1 Establish unique patient ID to be applied across all health services. If patient ID is different from national ID, ensure linkage of ID number across health services 3.1.2 Ensure compliance with digital health interoperability standards and norms; and WHO digital health strategy[19] 3.1.3 Ensure compliance with national and international regulations on data privacy, confidentiality, and cybersecurity 3.1.4 Ensure compliance with digital health governance framework (1.1.5)
3.2 Interoperability between the central integrated HIS/RHIS platform and other relevant data sources is adequate to support regular data exchange so that all relevant summary statistics are presented on the central integrated platform[20,21] It should be noted that strong coordination and data governance are prerequisites for effective integration and interoperability of RHIS.	Below is a sample of areas where countries should consider integration or interoperation (other areas may be appropriate depending on the country context): 3.2.1 **HMIS**: Ensure HMIS data are shared across all related data systems using an integrated platform/database for optimizing data access and use for management of health services. Central platform regularly reports information on the performance of health services for decision-making. 3.2.2 **Disease surveillance**: Integrate data from selected surveillance systems, starting with indicator-based surveillance for vaccine-preventable diseases, such as measles and acute flaccid paralysis for polio. Where digital tool(s) are available, case-based surveillance should be considered. 3.2.3 Establish a well-functioning **civil registration and vital statistics** (CRVS) system that registers all births and deaths, issues birth and death certificates and compiles and disseminates vital statistics, including cause of death information. CRVS is a source of population data for RHIS especially for planning and for calculating coverage. 3.2.4 **Community health information system** (CHIS): Harmonise CHIS with the national HIS to have a holistic picture of service provision in communities. A CHIS involves data collection, management, and analysis of health and related services provided to communities outside of facilities. 3.2.5 **Human Resources for Health** (HRH): Consider integration of facility-based workforce data with RHIS where possible. Participation and a data-sharing mechanism between HRH data systems and RHIS would facilitate effective HRH management and collaboration between concerned sectors. 3.2.6 **Financial management system**: Consider integration between RHIS and financial management systems to enhance health care financial planning, costing and budgeting. 3.2.7 **National Health Accounts (NHA)**: Optimize RHIS data to strengthen data generation and analysis for NHA. 3.2.8 **Health insurance**: Enable interoperability of data between RHIS and health insurance schemes. Integration is important for effective financial protection for health, in addition to understanding of disease burden and services uptake. 3.2.9 **Drugs and medical supplies**: Present summary reports from the supply chain management system on drug and commodity stocks in hospitals and warehouses on the central integrated HIS platform.

[19] Global strategy on digital health 2020-2025. Available at: https://www.who.int/publications/i/item/9789240020924
[20] WHO guideline: recommendations on digital interventions for health systems strengthening, Geneva: World Health Organization; 2019
[21] Digital Health Platform: Building a digital health information infrastructure for health. Geneva: e International Telecommunication Union and World Health Organization; 2020 (https://www.ictworks.org/wp-content/uploads/2021/01/who-digital-health-platform-handbook.pdf, accessed 20 March 2022).

	3.2.10 **Laboratory information systems**: Record and manage the flow of specimens and associated data from clinical laboratories and improve laboratory efficiency. The interoperability will contribute to case-based management and follow-up (e.g., surveillance, antimicrobial resistance, non-communicable diseases etc.).
3.3 Appropriate digital tools and software are used to enable effective functioning of RHIS at all levels	3.3.1 Establish an integrated national data platform 3.3.2 Promote the use of open source platforms to enable interoperability (e.g., DHIS2, OpenEMR, OpenEHR. 3.3.3. Promote the establishment of standardised systems of electronic data capture with patient level where and when appropriate, applying internationally recommended interoperability standards.

SO3 Guiding principles

- Stakeholders are working towards developing a unified and integrated health information system with a central platform that presents data from all relevant sectors and data sources. Due to the varying levels of complexity and different stakeholder groups involved in the system development and management of these data sources, some data sets will be suited to full integration with the integrated platform. In contrast, others are better for routine data exchange to maintain system independence (and confidentiality in some systems).
- The civil registration system is the preferred source of vital statistics for the RHIS in terms of accuracy, completeness and timeliness. Vital statistics that are incomplete, inaccurate, not representative of the whole population and outdated are of little value for policymaking. Marginalised and hard-to-reach groups, people living in remote areas, and ethnic minorities may be systematically excluded.
- To work with and around the nuances of the different systems that make up the HIS, it is vital to ensure interoperability between the various systems. This means they must be able to communicate, exchange data and use the information that has been exchanged. Unified coding and common data standards are integral elements of ensuring interoperability.

Country case study: Argentina

The efforts of the Pan American Health Organization (PAHO) with Argentina to help strengthen telehealth services illustrate the exemplary use of technology and innovative tools to protect the population from epidemics and to strengthen the country's capacity in data and information systems. The effective mobilization of digital platforms and existing telehealth regulations, expertise, processes and infrastructure has bridged the gap between health care professionals and clients caused by COVID-19-related physical distancing and lockdown measures.
For details, see: Supporting Argentina's regional leadership in telehealth.

Refer to Resources for more information and additional country examples.

Strategic Goal 4. Build capacity for RHIS data analysis, data use and dissemination

Specific Objectives	Key interventions
4.1 Quality health information and reports are available for M&E of health sector activities and progress evaluation.	4.1.1 Strengthen data use for health sector M&E by generating regular health sector reports at all levels. 4.1.2 Develop a mechanism to build capacity of data staff to manage and use RHIS data.
4.2 Health information is effectively used to improve public health policy, health system management and clinical services, ensuring analysis to improve equity.	4.2.1 Ensure that evidence-based programme monitoring and management trainings are available to all Ministry of Health managers and decision-makers. 4.2.2 Ensure national health plan and policies are based on data and evidence. 4.2.3 Work with all district health offices to develop a comprehensive set of RHIS indicators for effective management and resource allocation based on their needs. 4.2.4 Work with vertical programmes to develop programme dashboards, including all relevant indicators for each programme. 4.2.5 Review the capacity of management and clinical staff down to district level to ensure a culture of active data use.
4.3 Public stakeholders have access to health information through improved management, education and public distribution channels.	4.3.1 Publish and distribute robust periodic health information and reports to all data users and the public, facilitating effective public advocacy. 4.3.2 Enable public access to the national health statistics in compliance with national regulations.

SO4 Guiding principles

- Leaders must nurture a culture of active data use at all levels of the system. Decision-makers must be encouraged to draw upon available evidence; however, service providers and managers at the health centre and community levels must also have access to relevant data for their decision-making. This requires effective feedback mechanisms, which will be facilitated by the existing HIS platform.
- Major capacity-building will be needed to introduce an information culture at subnational and facility levels through organisational and behavioural interventions (such as people-centred design and action-oriented problem-solving).
- Use data to improve equity. All efforts to strengthen the management of health services should focus on enhancing coverage with essential health services for the entire population, emphasising reaching currently underserved population groups. If efforts to reduce inequities in health are to be successful, robust disaggregated data must feed into service planning and delivery decisions in order to ensure access to good-quality health care based on need.
- Data from the RHIS should inform and strengthen national and local accountability mechanisms in terms of internal governance mechanisms, external civil society organisations, and citizen-related mechanisms. Health statistics data should ideally be open access.

Country case study: Ethiopia

"Two years ago, we were the least-performing *woreda* (district) in the zone. The training we received on how to use our performance data to make decisions and take action was an eye-opener. We knew very little about using our own data to identify our gaps and propose solutions. Now, we are completely data-driven. Soro Woreda health office has witnessed a growing interest in the use of performance data for decision-making, making it a cliché in the hearts and minds of health workers and managers in the woreda." Abenezer Bekele, Head of Soro Woreda Health Office, Ethiopia.
For details, see: RHIS_Create a Culture of Data Use in Health Information Systems.

Refer to Resources for more information and additional country examples.

Strategic Goal 5. Secure the necessary human and financial resources required for a sustainable RHIS

Specific Objectives	Key interventions
5.1 Human resource capacity for management and use of the RHIS is adequate to support the development, implementation, maintenance and sustainability of an integrated central HIS platform.	5.1.1 Identify key human resource skills and competency gaps and use this information to inform the development of a capacity-building plan and a set of defined roles and responsibilities covering all levels. 5.1.2 Strengthen the capacity of health staff through professional development schemes and continuous training in all areas of health information science, data management, and management and administration down to subnational and community levels of the country's health system. 5.1.3 Include general numeracy and analytical capacity-building in pre-service training. 5.1.4 Build WHO regional capacity to support countries through: · WHO internal training workshops and technical assistance; and · Regional training hubs that are developed in collaboration with academic institutions.
5.2 Financial resources from both domestic and development partner sources are available to support the implementation of the HIS-optimisation strategy, and steps are taken to move towards sustainable financing of HIS in the future.	5.2.1 Ensure that costing requirements for all HIS needs are presented as recurring costs to the Ministry of Finance in time for the next strategic budget allocations. 5.2.2 Review financing arrangements for this strategy with the aim of ensuring that sustainable financing from the government is secured and maintained. 5.2.3 Undertake a resource mobilization process based on the HIS sustainable financing roadmap.
SO5 Guiding principles · HIS staff at all levels of the health system are supported by a network approach to capacity-building so that HIS staff at the national level provide HIS knowledge and transfer of skills to staff at the subnational level, who in turn support the development of HIS staff at the community level. This network approach to capacity-building is extended to the regional level, with the Health Information Systems Programme providing capacity-building to national-level HIS staff. This network approach should be supported and institutionalized with data governance and standard procedure to optimize human capacity. · Sustainable financing mechanisms to gradually increase domestic funding for HIS are created and maintained to develop a resilient system for the future that relies less on external financing from development partners.	

Multi-country case study: Viet Nam

In 2020, in light of the increasing demand to level up knowledge among primary care workers, the WHO Viet Nam Country Office and Hai Phong Medical University (HPMU) leveraged the existing IBSA e-learning platform to disseminate additional training modules on COVID-19. Technical officers from the WHO Country Office translated COVID-19 courses developed by the OpenWHO into Vietnamese, enhanced the cultural-relevance of practices outlined in these courses and incorporated suggestions from health-care workers during the pilot-testing phase. Further, WHO supported HPMU to develop COVID-19 training materials specifically for primary health-care workers and to repackage these materials to match online learning formats.
For details, see: Leveraging an innovative learning platform to enhance health workforce preparedness in Viet Nam during COVID-19.

Refer to Resources for more information and additional country examples.

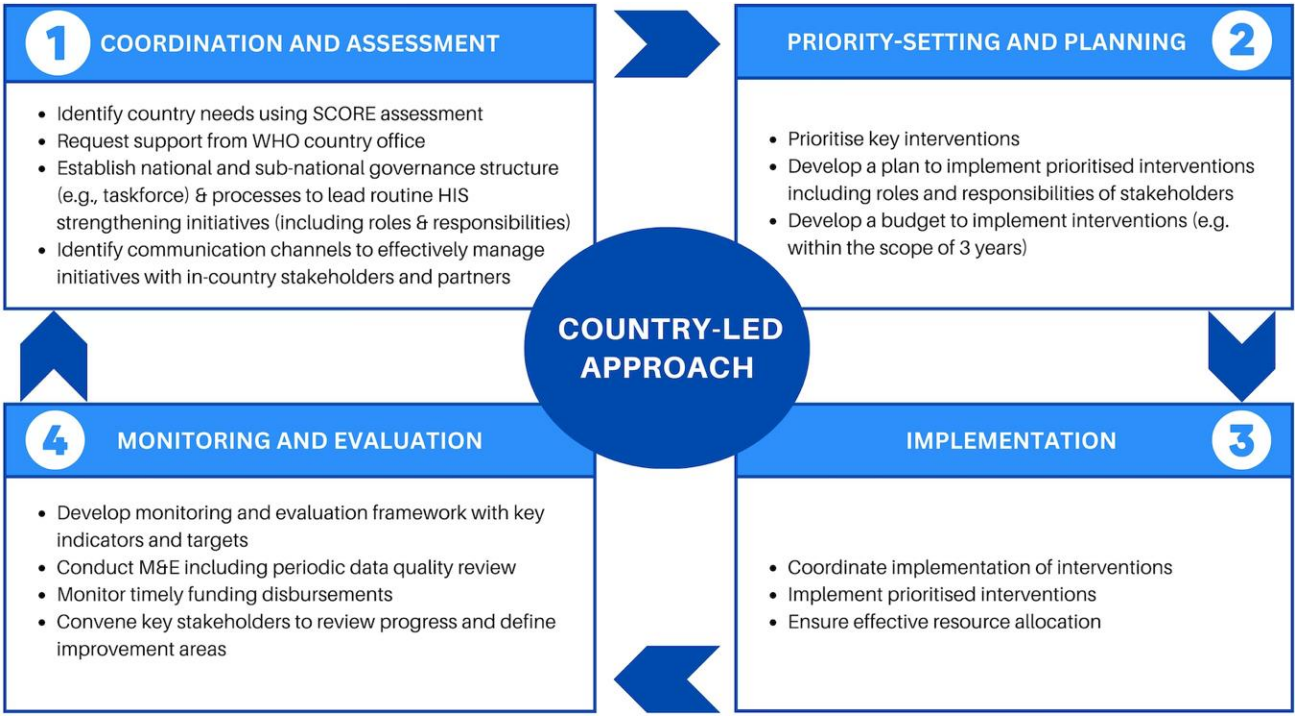
Operationalisation of the strategy

Role of countries

Country summary assessments in SCORE[22] can help countries determine specific priority areas and needs for improving HIS. Countries will lead priority setting to strengthen RHIS. As part of understanding and communicating a country's needs, it is essential to look beyond traditional health-sector areas and to review the national health sector strategic priorities; the national socioeconomic development strategy; the use of planning as a basis for RHIS strengthening; changing health dynamics and their potential implications; and the partnerships and stakeholders available within the health sector of each country.

This strategy document will guide countries to assess the current state of RHIS and existing gaps and draw a plan to strengthen the quality and use of RHIS as part of the wider HIS. Figure 4 outlines a country-led optimization of the RHIS.

Figure 4. Country-led activities to optimise RHIS.



[22] WHO SCORE Assessment Country Summary. Available at: https://www.who.int/data/data-collection-tools/score/country-summaries

Role of WHO at country, regional, global level

Countries will be supported by the three levels of WHO working together and with country development partners to implement this strategy.

Once country needs are identified, a request for support to implement the requisite changes can be made by the Ministry of Health through the WHO Country Office. This will open the communication channel with points of contact for health information at the WHO Regional Office and WHO Headquarters (across concerned technical programmes and departments).

WHO will support countries directly and indirectly across different areas. Examples include:

- advocating for country leadership and ownership of their RHIS;
- disseminating relevant standards in collaboration with partners;
- convening and actively participating in meetings of global and regional partner agencies to improve collaboration, partnership and funding alignment for an accelerated and coordinated RHIS initiative;
- providing leadership and facilitating knowledge generation and sharing, including by disseminating country experiences through global and regional mechanisms for impact; and,
- providing direct support, as required, to country-level interventions that enable local solutions and local approaches.

WHO will continue its work in collaboration with partners to seek appropriate new strategic partnerships at the global, regional and country levels. This joint effort by multiple global health partners to work alongside countries to improve the availability, quality, and use of data for local decision-making and for tracking progress towards health-related SDGs remains very effective[23]. Global partners need to ensure that the interventions they support are closely aligned with country, regional and global efforts to prevent duplication and ensure consistency of approach. The joint work between WHO and the Health Data Collaborative on *Making the case to invest in RHIS in Countries*[24], together with the priorities identified through the SCORE assessment, will be an effective starting point for governments to dialogue with relevant sectors and partners for effective investment and implementation of RHIS.

WHO headquarters performs a normative function and also provides technical support to inform WHO regional and country members of appropriate guidance based on the best available evidence for countries implementing activities to strengthen RHIS. The WHO RHIS toolkit can be used to empower countries. This toolkit will be further expanded to address the needs in countries to strengthen RHIS[25].

23 Health data collaborative. Available at: https://www.healthdatacollaborative.org/

24 Health Data Collaborative Operational Workplan, November 2020 – December 2023. Available at: https://www.healthdatacollaborative.org/fileadmin/uploads/hdc/Documents/HDC_Biannual_Global_Partners_Meetings/HDC_GPM_March2021/Session_2_Materials/HDC_Work_Plan_2020-2023_Final.pdf

25 WHO RHIS Toolkit. Available at: https://www.who.int/data/data-collection-tools/health-service-data/toolkit-for-routine-health-information-system-data/modules

Figure 5. WHO's support to optimise RHIS in countries

WHO SUPPORT		
WHO COUNTRY OFFICE	**WHO REGIONAL OFFICES**	**WHO HEADQUARTERS**
• Identify country needs • Monitor indicators against targets • Provide technical support to MoH to: set priorities based on the gaps; coordinate with partners to align support, provide technical support to address the gaps • Build capacity based on country needs • Convene MoH and partners	• Monitor indicator progress against targets • Provide technical support to countries based on their needs • Mobilize resources • Build capacity for region and countries • Further develop regional data hubs, health observatory • Provide feedback to countries	• Monitor indicators against targets • Conduct SCORE review • Develop/update standards, guidance • Build capacity based on country/regional needs • Develop global reports • Convene and align support among Global Health and Development Partners

Monitoring and evaluation

At country level, a detailed RHIS M&E framework should be aligned with the country's health sector strategy. This supports the collection and use of information to enable governments to report on global commitments, localised SDGs and universal health coverage indicators and targets, as well as national health development targets. Typically, a health sector strategy M&E framework comprises indicators for outputs (deliverables) leading to outcomes (expected changes) and on to impact.

The M&E framework should form the basis for progress and performance reviews of the overall health sector plan and should be kept up to date by the health information centre, or equivalent, in the health sector.

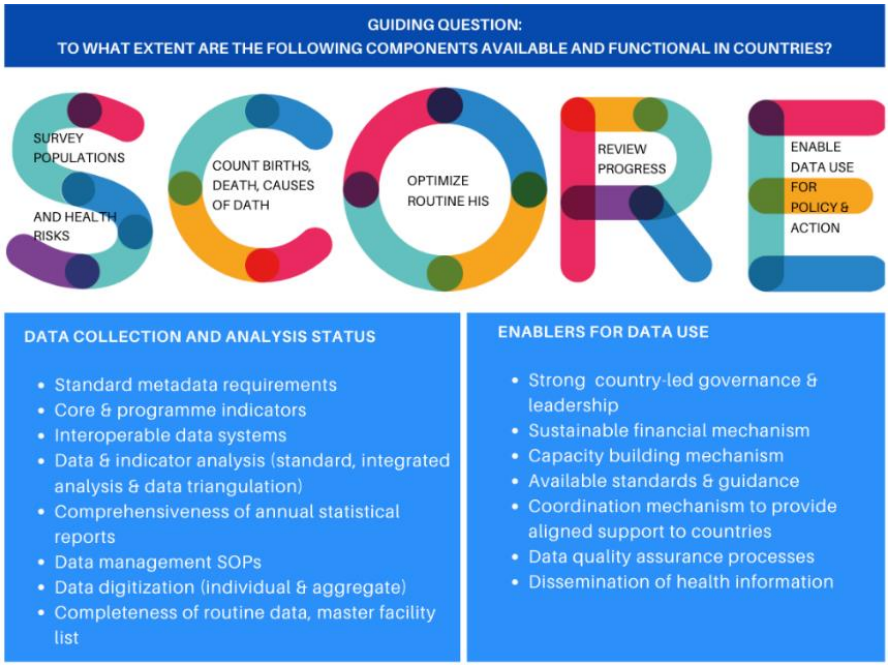
An annual RHIS data quality review and consultation involving all relevant stakeholders, both within and outside the health sector, should form part of HIS implementation and should be budgeted. The findings and recommendations of data quality reviews should be disseminated widely as part of a feedback loop. Findings should be brought to the attention of leadership for action towards better planning and more resilient health systems.

Global monitoring of the WHO strategy for optimising RHIS in countries is aligned with the SCORE technical framework. The results provided by the global SCORE assessment will inform the progress and achievement of the overall capacity of the HIS and RHIS in countries. Annual monitoring of countries and regions requesting support for implementing the RHIS strategy goals and objectives will be collected as part of the global monitoring process.

Several indicators collected in the SCORE assessment can be used as measurement of the capacity of the national RHIS as listed in figure 6 below.

Monitoring cycles will allow a refresh of strategic directions and actions as countries further strengthen their RHIS and develop new ways of working based on lessons learned from the effects of COVID-19. The following figure provides an illustration of a progress review based on SCORE for health technical packages and specific areas of support to optimise RHIS in countries[26]. SCORE will provide a comprehensive approach to evaluate progress in countries.

Figure 6. Components of SCORE for M&E



[26] SCORE for health data technical package: global report on health data systems and capacity, 2020. Available at: https://www.who.int/publications/i/item/9789240018709

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