Information Systems

Information systems is an overarching term that refers to the systems used for collecting, processing, storing, and transferring data and information that is used for planning, managing, and delivering high-quality health services. This module specifically addresses information systems for health, sometimes referred to as health information systems. Well-functioning health information systems yield high-quality and comprehensive data and information that is essential for enabling effective surveillance and priority setting, population health management, facility management, and the achievement of the core functions of PHC, including coordination, continuity, comprehensiveness, and person-centeredness. The Relevance to PHC section provides more detail on the relationship between information systems and PHC performance.

As identified by the World Health Organization, health information systems achieve four core functions:

1. Data generation - Data are recorded by health and other relevant sectors.
2. Compilation - Data are collected and organized from health and other relevant sectors.
3. Analysis and synthesis - Data are checked for overall quality, relevance, and timeliness and subsequently analyzed as needed.
4. Communication and use - Data are converted into information for health-related decision making in formats that meet the needs of multiple users (i.e. policymakers, managers, providers, and communities) and used to drive decision-making and planning.
Information Systems are a key input of strong primary health care systems

- Governance & Leadership
  - Primary Health Care Policies
  - Quality Management Infrastructure
  - Social Accountability

- Health Financing
  - Payment Systems
  - Spending on Primary Health Care
  - Financial Coverage

- Adjustment to Population Health Needs
  - Surveillance
  - Priority Setting
  - Innovation & Learning

- Drugs & Supplies
- Facility Infrastructure
- Information Systems
- Workforce
- Facility Organization & Management
- Funds

- Population Health Management
  - Local Priority Setting
  - Community Engagement
  - Empanelment
  - Proactive Population Outreach

- Service Delivery
  - Access
    - Financial
    - Geographic
    - Timeliness
  - High Quality Primary Health Care
    - First Contact Accessibility
    - Continuity
    - Comprehensiveness
    - Coordination
    - Person-centered
  - Availability of Effective PHC Services
    - Provider Availability
    - Provider Competence
    - Provider Motivation
    - Patient-provider Respect & Trust
    - Safety

- Outputs
  - Effective Service Coverage
    - Health Promotion
    - Disease Prevention
    - RMNCH
    - Childhood Illness
    - Infectious Disease
    - NCDs & Mental Health
    - Palliative Care

- Outcomes
  - Health Status
  - Responsiveness to People
  - Equity
  - Efficiency
  - Resilience of Health Systems

Social Determinants & Context (Political, Social, Demographic & Socioeconomic)
What can you learn about Information Systems from the Improvement Strategies?

SECTION 1
What is Information Systems?
What it is: Learn more about the core principles and goals of Information Systems.
Relevance to PHC: Learn about Information System's role in in PHC improvement.

SECTION 2
How do I assess my performance?
What it is: Learn more about some indications that improvements might be relevant in your context and what you can achieve by focusing improvements on Information Systems.
Vital Signs Profile: Use the information in your Vital Signs Profile to help determine relevant areas for improvement.

SECTION 3
How do I get started?
Case studies: Learn from implementation approaches and challenges in other country contexts.
Tools and Resources: Explore and identify useful tools and resources relevant to Information Systems.
What to ask: Use guiding questions to help determine how you might begin to plan and enact reforms in your country context.

Guided by the above considerations and relevant resources, start to build out an improvement plan with your CE lead and/or focal point.
Goals & Outcomes

✓ Ensures that the right type of data is available to the right stakeholders at the right time to make informed decisions about PHC planning and service delivery.
Information Systems – How do I assess my performance?

Learn more about whether you should focus on Information Systems in the Vital Signs Profile.
Use the information in the Vital Signs Profile to help determine relevant areas of improvement.
How do I assess my performance?

Use the information in the Vital Signs Profile to help determine relevant areas of improvement.
How do I assess my performance?

Use the information in the Vital Signs Profile to help determine relevant areas of improvement.
What are other indications that Information Systems might be an appropriate area of focus?

**Other Indications**

- **Poor data management**
  - Information systems produce untimely, unreliable, an/or incomplete data and systems to ensure data quality and security are not in place or are poorly enforced.

- **Ineffective information systems use**
  - Planners, providers, and patients have difficulties accessing and using data to support effective decision-making and service delivery.

- **Poor user capacity**
  - Information systems are not user-friendly and poorly integrate into existing workflows.

- **Fragmented platforms**
  - No reliable platform is in place to integrate and manage the different types of information systems.

- **Lack of data on PHC performance**
  - Existing information systems collect little to no data on PHC-specific indicators and PHC performance.

- **Poor technical capacity**
  - Information systems are limited in scope and lack the capacity to triangulate, exchange, and use comprehensive information across sectors and health care settings.
Information Systems - What is it?

Learn more about the **core principles** of Information Systems and what you can achieve by focusing improvements.
What is Information Systems?

Information Systems refers to the systems used for collecting, processing, storing, and transferring data and information that is used for planning, managing, and delivering high-quality health services.

This area focuses on the availability, coordination, and interoperability of these systems and the requisite infrastructure needed for their operation.
What is Information Systems?

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Why it’s important for PHC

At the policy level...
The information generated by information systems supports the capacity of the health system to sense and adapt to emerging and existing population health needs, create effective health policies, monitor health equity, and build health system resilience.

At the management level...
Routine use of information systems to establish targets, monitor progress, and implement ongoing improvement initiatives supports effective facility organization and management, including the availability, control, and appropriate management of inputs.

At the service delivery level...
Information systems collect critical information on local population health that support evidence-informed decision making, empower and engage patients, improve communication among team members, and improve continuity and coordination of care.
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Essential types of Information Systems:

- **Civil Registration and Vital Statistics Systems**
  Register all births and deaths, issue birth and death certificates, and compile and disseminate vital statistics, including cause-of-death information.

- **Logistics Management Information Systems**
  Records systems that supply chain workers and managers use to collect, organize, present, and use logistics data about the supply and demand for commodities.

- **Routine Health Management Information Systems**
  Facility reporting systems used to collect routine data from public, private, and community-level health facilities and institutions.

- **Financial Management Information Systems**
  System used to manage and track the flow of funds at the facility level, including expenditure, staff, line-item budgets, internally generated funds, and reimbursed pooled payments.

- **Personal Care Records**
  Systems used to provide a longitudinal health history of patients across a patient’s care experience.

- **Health surveillance information systems**
  Multimodal networks that bring together information from facilities and communities with a focus on specific notifiable disease and events.
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Characteristics of strong Information Systems:

- **Resilient**: Capacitated to withstand crises using systems for data backup, coordination with other sectors, and regular performance assessments.

- **Comprehensive and Coordinated**: Capture and monitor all health services and functions across all levels of the health system.

- **Functional**: Accessible and user-friendly technologies fit into existing workflows with systems in place to ensure data quality, appropriate communication and use, and appropriate training for health workers.

- **Interoperable and Interconnected**: Enables types of information systems and end users to connect, exchange, and cooperatively use information across all parts of the health system network.

- **Well-defined**: Standard operating procedures for data collection and analysis ensure that information systems capture data that is timely, reliable, comprehensive, and relevant.

- **Adaptable and scalable**: Interoperable and interconnected with clear standards, decision-making structures, and sustainability plans.

Resilient

Comprehensive and Coordinated

Functional

Interoperable and Interconnected

Well-defined

Adaptable and scalable
Information systems are systems for collecting, processing, storing, and transferring timely, reliable, and complete data for planning, managing, and delivering coordinated, continuous, and comprehensive primary health care.
CHARACTERISTICS OF STRONG INFORMATION SYSTEMS THAT SUPPORT THE DELIVERY OF HIGH-QUALITY PHC INCLUDE:

**RESILIENT**
Capacitated to withstand crises using systems for data backup, coordination with other sectors, and regular performance assessments.

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**WELL-DEFINED**
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**COMPREHENSIVE AND COORDINATED**
Capture and monitor all health services and functions across all levels of the health system.

**ADAPTABLE AND SCALABLE**
Interoperable and interconnected with clear standards, decision-making structures, and sustainability plans.
Information Systems – How do I get started?

Information Systems

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Derive information from What others have done, What to ask and the Tools and Resources tool to help determine where and how you might begin to plan and enact forms in your country context.
Planning for improvement in your context

The **guidance and recommendations** described within the Information Systems are **not intended to provide a one-size-fits all solution.**

The **considerations** involved in planning and implementing strategies will depend on your local context.

**Sample activities**

- Consider implementation challenges and approaches in other country contexts
- Consider **how the features of your health system**, such as how decisions get made and the role of the private sector, will impact your improvement plans
- Identify key elements that need to be in place to support improvements
- Use the guiding questions in the Improvement Strategies to spur thinking about Information Systems in your country context and stimulate ideas for improvement
- Start to develop an improvement plan
Planning for improvement in your context

While the **specific considerations** involved in planning and implementing strategies will depend on your **context**, you might consider...

- **What are some factors that impact the implementation of information systems?**
  - Governance and financial support
  - Existing information infrastructure (paper-based vs. electronic)
  - Facility leadership and management
  - Design and functionality requirements
  - Stakeholder buy-in and capacity to use these systems
Learn from what others have done

National eHealth Strategy | Ireland
Modernizing the national health information system through a person-centered eHealth Strategy

DHIS2 | Bangladesh
Improving the interoperability and quality of health information systems using DHIS2
Ireland: At-a-glance context

Europe & Central Asia | Western Europe

High-Income

English-speaking country
## Ireland: At-a-glance context

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Learn from what others have done: Ireland

Why reforms were needed

• Ireland has taken steps to modernize its health information system to address challenges many health systems are facing worldwide, including:
  • Long wait times
  • A rising burden of chronic disease
  • Out-of-date information infrastructure

Approach

Ireland launched its national eHealth Strategy in 2013 to transform its health system using innovative digital technologies.

Key components of the person-centered eHealth initiative include:

• The Knowledge Information Plan, which creates a national unified vision and plan for a health system supported by digital infrastructure
• The National Electronic Health Record and National Individual Health Identifier, which link the specification of patient data across the continuum of care to ensure the delivery of appropriate and comprehensive care at the right place at the right time
Learn from what others have done: Ireland

- **High-level investment and vision:** Backed by a unified, national vision and plan for a health system supported by digital infrastructure

- **Coordinated, person-centered information infrastructure:** Uses interoperable, personalized information infrastructure to coordinate patient information across the continuum of care

- **Innovative digital technologies:** Leverages electronic health solutions to strengthen service delivery and empower patients and health care workers, by way of greater transparency, access to services, and information
Ireland has already taken steps to support the longevity and modernization of the National IHI and EHR systems alongside other initiatives in its eHealth Strategy. Sustaining these ambitious reforms will depend on:

- Increased, targeted investments
- Continued multisectoral engagement and coordination
- Implementation support infrastructure, including supportive policies, legal and regulatory frameworks, and a skilled workforce
Bangladesh: At-a-glance context

- South Asia
- Lower-Middle Income
- Bangla-speaking country
## Bangladesh: At-a-glance context

<table>
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<td>64%</td>
<td>15%</td>
<td>164.7M</td>
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</table>
Learn from what others have done: Bangladesh

Why reforms were needed

Bangladesh's fragmented and disjointed health information system initiatives led to:

- Poor coordination of health data across health providers (public, private, and NGO)
- Poor quality of standardized data reporting and use
- Poor interoperability and interconnectedness across the different types of health information system initiatives

Approach

In 2009, Bangladesh introduced DHIS2 as the national health information management system to:

- Support the development of an interoperable, integrated information system by integrating the platform with other data systems, such as the e-TB Manager tool
- Support reliable data aggregation, analysis, and reporting for better information systems use and decision making at all levels of the health system
Learn from what others have done: Bangladesh

Strengths

- **Strengthens** the comprehensiveness and interoperability of existing health systems
- **Improves** coordination across different health programs
- **Improves** the quality, timeliness, and comprehensiveness of data
Learn from what others have done: Bangladesh

- **Strong technical capacity**: DHIS2 can be customized for a variety of different information purposes, host myriad health data from multiple sources and be integrated into existing in-country platforms.

- **Existing in-country information infrastructure**: Bangladesh’s precursory investment in electronic information system infrastructure laid the groundwork for using integrated, digital platforms like DHIS2.

- **Multisectoral coordination**: Planning and partnerships were established to develop DHIS2 as an overarching platform and make data accessible for managers and planners at different levels of the health system.

- **High-level investment**: To support the ongoing management and maintenance of this system, the MOHFW has allocated a budget and worked to create the necessary IT infrastructure to sustain the system without donor support.
Learn from what others have done: Ireland

DHIS2 implementation at the national scale (within the MOHFW) in Bangladesh has resulted in more timely, comprehensive, and quality data. **Sustaining this system in the long-term will depend on:**

- Improved, targeted investments
- More effective coordination and collaboration among in-country health information system initiatives, such as through an interoperability framework
- Implementation support infrastructure, including supportive policies, legal and regulatory frameworks, and local capacity building
The specific considerations involved in planning and implementing strategies will depend on your local context.

The questions listed may be a useful starting place to determine how you might begin to plan and enact reforms in your context.

Sample questions

- How comprehensive are your health information systems?
The specific considerations involved in planning and implementing strategies will depend on your local context.

The questions listed may be a useful starting place to determine how you might begin to plan and enact reforms in your context.

Sample questions

☐ How comprehensive are your health information systems?

☐ Do your information systems capture essential PHC indicators and enable tracking of PHC capacity and performance?
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Sample questions

- How comprehensive are your health information systems?
- Do your information systems capture essential PHC indicators and enable tracking of PHC capacity and performance?
- How interoperable and interconnected are your health information systems?
- Is the format of your information system electronic-based, paper-based, or somewhere in between?
Questions to ask to help you get started

The specific considerations involved in planning and implementing strategies will depend on your local context.

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Sample questions

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☐ How interoperable and interconnected are your health information systems?

☐ Is the format of your information system electronic-based, paper-based, or somewhere in between?

☐ Is the design and functionality of information systems compatible with the needs and skills of users across all levels of the health system?
Recap: Information Systems

System
- Governance & Leadership
  - Primary Health Care Policies
  - Quality Management Infrastructure
  - Social Accountability
- Health Financing
  - Payment Systems
  - Spending on Primary Health Care
  - Financial Coverage
- Adjustment to Population Health Needs
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  - Proactive Population Outreach
- Facility Organization & Management
  - Team-based Care Organization
  - Facility Management
  - Capability & Leadership
  - Information Systems Use
  - Performance Measurement & Management Outreach

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- Access
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- Health Status
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Social Determinants & Context (Political, Social, Demographic & Socioeconomic)
Information Systems

Information systems are systems for collecting, processing, storing, and transferring timely, reliable, and complete data for planning, managing, and delivering coordinated, continuous, and comprehensive primary health care.

- **Routine Health Management Information Systems**
- **Civil Registration and Vital Statistics**
- **Personal Care Records**
- **Financial Management Information Systems**
- **Surveillance Systems**
- **Logistics Management Information Systems**
Recap: Information Systems

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**Comprehensive and Coordinated**
Capture and monitor all health services and functions across all levels of the health system

**Adaptable and Scalable**
Interoperable and interconnected with clear standards, decision-making structures, and sustainability plans