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e-Learning

Curriculum on Routine Health Information Systems

Guide for Facilitators

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ABBREVIATIONS

| | |
|-------|------------------------------------------------------|
| ART | antiretroviral therapy |
| DCI | data collection instrument |
| DHIS2 | District Health Information Software, version 2 |
| DQR | data quality requirements |
| GIS | geographic information system(s) |
| HIS | health information system(s) |
| HMIS | health management information system(s) |
| HMN | Health Metrics Network |
| JSI | John Snow, Inc. |
| LMIS | logistics management information system(s) |
| M&E | monitoring and evaluation |
| PRISM | Performance of Routine Information System Management |
| RHIS | routine health information system(s) |
| USAID | United States Agency for International Development |
| WHO | World Health Organization |

INTRODUCTION

Background

MEASURE Evaluation—a project funded by the United States Agency for International Development—supports the monitoring and evaluation (M&E) of health sectors and strengthening country health information systems (HIS). The project enables countries to strengthen their national, community, and facility-based systems to generate high-quality health information and use it to inform decisions on policies, programs, and resource allocations at all levels of the health system.

To achieve this, four intermediate results or expected outcomes guide implementation:

- Strengthened collection, analysis, and use of routine health data.
- Improved country capacity to manage health information systems, resources, and staff.
- Methods, tools, and approaches improved and applied to address health information challenges and gaps.
- Increased capacity for rigorous evaluation.

Decision making in the health system should be based on good-quality information. Much of this information comes from data produced by routine health information systems (RHIS), which document health status, health services, and health resources. These data are gathered by healthcare providers as they go about their work, with contributions from supervisors and ongoing health facility surveys.

All health system staff play a role in an RHIS and need the knowledge and skills to fulfil their responsibilities. Some health system staff need the knowledge and skills to collect, analyse, and manage the data, and make decisions using them. Others may need the capacities to design, develop, and strengthen an RHIS.

In 2016, MEASURE Evaluation joined with global partners to develop a basic workshop-based course on RHIS to meet the capacity-building needs of RHIS staff at national, intermediate, and facility levels; policymakers and senior managers; care providers and health technicians. This two-week, trainer-led, face-to-face course has been used with success globally to build RHIS capacity and improve the use of RHIS information, thus improving public health practices and health service delivery.

Advancing Partners and Communities (APC), funded by the United States Agency for International Development (USAID), implemented the Health Management Information System (HMIS) Scale-Up Project to provide technical assistance to the Ethiopian Federal Ministry of Health (FMOH) to strengthen that country's RHIS. One of the strategies of the project was to build RHIS core competencies of the FMOH and Regional Health Bureau managers and staff. Workshop-based training activities were conducted using the MEASURE Evaluation RHIS curriculum and a group of trainers were trained to cascade the RHIS training to the health centres and health posts.

The RHIS curriculum was adapted into an online course in 2019 in an effort to increase the accessibility of this content to a larger audience and reduce the need for time spent in workshops. The RHIS e-Learning Curriculum covers the basics of RHIS and how to develop, govern, and/or manage RHIS through a series of short online modules. The online medium enables learners to train intermittently, repeatedly, and for durations that accommodate their schedules.

Although online modules may be taken by individuals, independently in a self-directed fashion, having a course facilitator can enhance the learning process for individual learners and groups of learners. Facilitators can help participants tie learning to specific responsibilities of their jobs, enable peer learning, motivate participation and interaction, and provide individualized feedback on key elements of the course.

Purpose of This Guide

This guide was developed to help facilitators navigate the online RHIS course, select classes that meet learners' capacity-building needs, support learning using adult learning principles, and provide updates and modifications to class content, as needed.

This document provides an outline of the content of the online modules including learning objectives, quiz questions and answers, sample discussion questions that facilitators can use with learners, and definitions of key terms/concepts covered in the course, as well as an index of where those terms/concepts are covered in the modules.

Also included in the document are tips on facilitation to improve adult learner engagement and the transfer of learning to the workplace. The online curriculum may also be used for teaching university students. This guide does not cover the specifics of using online materials with traditional students.

The original workshop-based curriculum can be found at the following site:

<https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules>.

OVERVIEW

RHIS: A Curriculum on Basic Concepts and Practice

The RHIS e-learning curriculum is composed of the following eight modules:

1. Health Systems and Health Information Systems
2. Indicators and Data Collection and Reporting
3. Data Management Standards for RHIS
4. Data Quality
5. Data Analysis
6. Data Demand and Use
7. Governance and Management of Resources
8. RHIS Strengthening

The modules are broken down into classes that, because of length, may then be further broken down into class parts. Each class part requires approximately 15 to 30 minutes to complete.

Each class includes the following:

- Defined learning objectives that describe what a learner will be able to do once they complete a class
- A pretest to help the learner determine what he or she already knows about the topic
- Narrated content slides
- Practice questions or exercises
- A conclusion

Some classes contain optional slides. Classes are marked by the system as complete when the learner has viewed a set percentage of slides.

A posttest at the end of each class measures mastery of the learning objectives. Access to posttests requires completing a minimum number of slides in each class part. A learner must score a minimum of 80 percent to pass the posttest and may attempt the test three times. If the learner has not passed the test after three attempts you, the facilitator, will need to administer the test orally and record the results.

More information about modules and classes is provided below in the section entitled “Module Details with Suggestions for Facilitators.”

Who Should Facilitate e-Learning

An RHIS e-learning course can be facilitated by trainers or program or human resources managers who have a working knowledge of adult learning principles. University lecturers may also wish to use all or parts of the online curriculum with their students.

As with face-to-face learning, the relationships that develop in an online course are key for success. The facilitator plays an essential role in encouraging learners to ask questions, share insights, and be active in the course.

Advantages of e-Learning

As stated above, this training was originally designed for face-to-face training; however, using the e-learning modules imparts the following advantages:

- Reduces time away from work
- Reduces travel costs
- Can be used with an individual or a large group of learners

- Increases flexibility, as learners control when they are engaged with the content, from where, and how much time they spend to master the material
- Standardizes content and learning assessments

Advantages of Facilitating RHIS e-Learning Modules

The RHIS e-learning curriculum can be used independently by individuals who want to increase their knowledge and skills; however, having a facilitator support learning offers many advantages:

- Support from a facilitator can keep learners motivated and increase their engagement.
- Facilitators can provide personal feedback to help learners determine why they are making errors and correct misunderstandings.
- Facilitators can customize training to make it locally relevant.
- Facilitators can customize training to fit a learner's needs and support transfer of learning by providing context and examples from the learner's job.
- Facilitators can promote peer learning and sharing of experiences.

FACILITATING E-LEARNING FOR ADULT LEARNERS

Tips for Facilitating e-Learning Based on Adult Learning Principles

- Tell your learners what they need to know and do and why they are being asked to learn it.
- Let learners control the pace of their learning as most adults have time constraints.
- Create an environment where learners feel free to comment and ask questions.
- Build on what your learners already know and do.
- Give learners the chance to figure things out for themselves.
- Give learners the chance to reflect on what they have learned and how they will use their new knowledge and skills.
- Promote peer-to-peer learning so that learners can support and learn from each other.
- Keep learning relevant to the learners' context or work and remind learners of this relevance.
- When possible, plan for the practical application of knowledge, attitudes, and skills such as practice. using local data collection tools, selecting appropriate charts to illustrate real data, or cross-checking data from real sources.

Tips for Being an Effective Facilitator

- Introduce yourself and let learners know who you are as a person.
- Be available and pay attention to learners' progress.
- Stay on schedule, but be ready to adapt based on learner feedback.
- Show interest in your learners' success.
- Respond to requests for assistance quickly so that learners can proceed with their work and remain motivated.
- Step back and allow learners to build understandings together, but redirect discussions when necessary.
- Give constructive feedback.
 - Start with something positive.
 - Praise publicly and correct individuals privately.
 - Reread your feedback before sending, imagining yourself as the recipient—messages online can often be misinterpreted.
- Privately encourage those who fall behind and help them deal with challenges to their participation.

Steps to Facilitating an Online RHIS Course

Follow the steps below to help ensure positive learning outcomes for online learners. You will find a checklist on page 14 that summarizes these steps.

Before the Course

1. Explore the website

Although you do not need to complete all of the modules on the website to support learners, you should register for the course, familiarize yourself with the way the website is set up, take the class on navigating the website, and visit other classes to see how they are structured and what your learners will experience.

a. Registering for the RHIS e-Learning Curriculum

Access the online curriculum at <https://elearning.jsi.com>. Each learner must create a JSI e-learning account. The **learner must have an email address to complete this process**. Once logged in, the learner can access the course “Routine Health Information Systems” under “JSI e-Learning Courses.”

b. Completing classes

Most online modules are divided into classes, which may then also be divided into class parts. A pretest is included at the beginning of every class. This pretest is provided to help the learner gauge what he or she already knows about the topic and the scores are not recorded.

Class parts are marked as “complete” when a learner views a certain percentage of slides.

Learners may download a transcript of the narration of a class, but reading the transcript is not counted by the system as completing the class.

c. Passing posttests

Each class has a posttest that is locked until the class is completed.

You can review posttest questions and answers in the section entitled “Module Details” of this guide.

2. Create a training plan for learners

a. Identify your learners and decide if e-learning is a good choice for them.

Take into consideration the following about your learners:

- Availability of time to complete the training. Will supervisors provide time for the training? Will travel or other commitments make participation difficult?
- Availability of computers and internet connectivity
- Motivation to complete the training

b. Identify learning needs.

What gaps in knowledge and skills exist that make it difficult for learners to perform their current or future jobs in regard to RHIS design, development, or use?

c. Describe what learners should be able to do after the training.

Write your goals for the training.

d. Identify modules in the e-learning curriculum that relate to your goals.

Review the learning objectives for the RHIS e-learning modules (see “Module Details with Suggestions for Facilitators” below) and choose the appropriate modules or classes to assign to your learners. Avoid the tendency to assign all of the modules if the learners are only responsible for one area of RHIS.

You may also use the “Keyword Index” (below) to identify where content is covered in the curriculum.

If the modules do not cover all of your goals, you will need to either modify your goals or supplement the modules with extra reading, discussions, or practice.

e. Keep the course relevant.

The RHIS e-learning curriculum was developed for a global audience, using resources that were available at the time of development. RHIS guidelines, procedures, and policies are described that may be outdated or different from those used in your learners’ setting. As a facilitator, it is your responsibility to provide your learners with up-to-date RHIS guidelines, procedures, and policies and examples that are relevant to their work. Before the course starts gather documents and plan how you will:

- Provide learners with the most recent RHIS-related guidelines, policies, and procedures
- Discuss how these documents are used
- Provide local examples, when possible, that illustrate course concepts
- Refer to local policies and procedures whenever applicable

f. Use this guide to plan discussions with learners.

In the section entitled “Module Details with Suggestions for Facilitators,” you will find information about each class in the curriculum. Sample discussion questions are included that you can use to reinforce learning and promote the sharing of experiences.

g. Write a course syllabus that outlines the specific assignments and deadlines for your course.

Plan carefully and thoroughly. Take into consideration the following:

- The number and sequence of classes you will assign
- The time needed to complete each class (approximately 15 to 30 minutes for each class part)
- How often you want learners to discuss what is being learned
- Scheduled trips and visits that will affect your availability or your learners’ availability
- How training will be affected by job responsibilities—e-learning allows flexibility as to when training occurs, but it is unrealistic to assume that a staff member will use personal time to complete the training
- Any supplemental reading, exercises, or practice that will be included

3. Define expectations and ways to communicate.

Establishing clear expectations with learners is important for successful e-learning. In the case of the online RHIS course, you should make decisions about the following:

- How learners should communicate with you (email, phone, text, other?); provide your contact information
- How quickly they should expect a response; for example, you could tell them that you will respond to emails within 24 hours or that you will reply on Tuesdays and Thursdays—it is unrealistic to think you will reply 24/7, so let your learners know what to expect
- Your expectations for participation in group discussions; telling your learners that it is important that they participate is not enough: be specific with what you expect and stick to it (for example, you may request that each learner respond at a minimum to one discussion topic per week or that they add to each discussion topic)

You will need to **create a way for learners to discuss class topics and work together**. If your learners are located nearby you may decide to physically meet once a week or during regularly scheduled meetings. You will also need a way for learners to communicate between meetings. If your learners are geographically dispersed you may decide to create a discussion forum through a WhatsApp group chat, a simple webpage with Google Sites, or find another way for learners to communicate as a group.

4. Develop a final course evaluation form and certificate.

Plan how you will have learners evaluate the course before you begin.

There is a general course evaluation included at the end of the RHIS online curriculum that is for individuals who complete the course on their own. You should create your own evaluation form that reflects the course that you offer including adaptations you make to the content, learner interactions, and course facilitation. Google Forms is an easy tool for creating and collecting evaluation results.

You will also need to create a certificate of completion that indicates the training that was provided.

5. Contact learners, welcome them to the course and provide them with what they need to start the course.

Include the following:

- Course syllabus
- Course expectations
- Contact information
- Clear login instructions

If you are creating a website for the class, you may direct them to the website where they will find the information listed above.

At the Beginning of the Online Course

The first week of an online course is important for establishing rapport, group trust, and confidence in successfully completing the course.

1. Check that learners can enrol at <https://elearning.jsi.com/>

Provide support and troubleshoot as needed. Technical support is available through the website for login issues. Notes about navigating the course are provided at the end of this guide.

2. Facilitate introductions.

Have all learners introduce themselves at your first meeting or by using the discussion forum. You can also use icebreakers with your learners. You can find online icebreaker ideas at:

- <https://www.mindtools.com/pages/article/virtual-ice-breakers.htm>
- <https://adjunctworld.com/blog/5-creative-icebreakers-assignments-for-the-online-classroom/>
- <http://www.onlineteachingtips.org/icebreakers.html>

3. Confirm expectations, schedule, and contacts.

4. Emphasize the importance of interaction and encourage sharing of experiences.

During the Course

1. Be a positive online role model.

Being responsive, showing encouragement, and following the schedule outlined in the course syllabus are ways that you can be an effective online role model.

2. Provide guidance and direction to learners as needed in a timely fashion.

Let learners lead online discussions, but be ready to guide them back on track if discussions veer off topic or if content has been misunderstood. Instead of “giving the answer,” ask questions that help the discussion get back on track.

3. Verify learner progress and follow-up as required.

a. Progress with modules

Unlike facilitating an online course that is housed on your organization’s learning management system where you would have access to reports and quiz results, you must rely on each learner to monitor progress in the RHIS curriculum.

- Create a spreadsheet that will help you keep track of each learner’s progress in the course.
- Make sure that learners are not experiencing problems with the website or with the schedule.

- Ask each learner to email you a screenshot of their posttest results for each class. Make sure that your learners know how to make and send the screenshot and that they have your email address.
- Encourage learners to share problems they have with quiz questions or practice exercises. One of the advantages of participating in a facilitated course is that fellow learners and facilitators can help explain confusing content.

b. Monitor participation in online discussions or participation during meetings as outlined in your course expectations.

Remind learners of the importance of participation.

4. Keep learning relevant.

Remember to provide and discuss documents that are used locally. Give local examples to illustrate course concepts and tie practice to what the learner will experience in his or her work setting.

5. Encourage collaboration and discussion.

- Ask about past experiences and how they relate to the content being covered.
- Encourage discussions of how they will be applying what they are learning.
- Use concrete examples from the work environment to reinforce what is being learned.

6. Serve as a liaison with the learner's worksite, when necessary.

If a learner is not getting the support needed to complete the course, contact the supervisor to explain the situation and work towards a solution.

7. Provide constructive feedback.

See "Facilitating e-Learning for Adult Learners" above.

8. Administer your course evaluation.

Following the Course

1. Provide certificates to learners who complete the course on schedule and thank all for their participation.

If possible, try to accommodate learners who are not successful in completing the course within the scheduled time, but who are still interested. E-learning requires time and resources that are sometimes unavailable for adult learners.

2. Review learner feedback and make recommendations for improving future courses.

Reviewing learner feedback will help you keep track of changes you would make for a future course. Although you cannot change the online class content, you can supplement content from the online classes or even, if necessary, substitute your own content through different means. Keep track of which classes might need more adaptation.

Review how learners stayed motivated and how they interacted with one another and how you could improve interaction in the future. Also consider how the course experience was for you. Make notes about all changes you would like to make in the future. You will be able to apply what you learn from facilitating the course for other online courses, as well.

3. Contact the learners' supervisors, when possible.

When appropriate, contact the learners' supervisors to discuss his or her completion of the course. Learning will be reinforced if the learner is provided opportunities to use his/her new knowledge and skills in their work, as soon as possible.

Online Course Facilitation Checklist

Use this checklist to guide you when you facilitate a course using the RHIS e-learning modules. Use the comments/notes column to detail how you achieved the task or where details can be found.

Before the RHIS course

| Completed | Task | Comments/notes |
|-----------|-------------------------------------------------------------------------------|----------------|
| | Get to know the RHIS course and website | |
| | Create a training plan | |
| | a. Identify learners | |
| | b. Identify learning needs | |
| | c. Write training goals and objectives | |
| | d. Identify RHIS modules/classes to use in training | |
| | e. Gather documents, case studies, practice exercises to make course relevant | |
| | f. Plan discussion questions | |
| | g. Write course syllabus | |
| | Define expectations and ways to communicate | |
| | Develop final course evaluation and certificate | |
| | Welcome learners and provide necessary information | |

During the first week of the RHIS course

| Completed | Task | Comments/notes |
|-----------|----------------------------------------------|----------------|
| | Check that learners can enrol | |
| | Facilitate introductions | |
| | Confirm expectations, schedule, and contacts | |

| | | |
|--|---------------------------------------|--|
| | Emphasize importance of participation | |
|--|---------------------------------------|--|

During the course

| Completed | Task | Comments/notes |
|-----------|----------------------------------------------------------------------------------|----------------|
| | Be a positive online role model | |
| | Provide guidance in a timely fashion | |
| | Verify learner progress and follow-up as required | |
| | <ul style="list-style-type: none"> • Progress with modules | |
| | <ul style="list-style-type: none"> • Participation in discussions | |
| | Keep learning relevant to learners' needs | |
| | Encourage collaboration and discussion | |
| | Serve as liaison with learners' worksite/ supervisors | |
| | Provide constructive feedback | |
| | Administer course evaluation | |

During the course

| Completed | Task | Comments/notes |
|-----------|-------------------------------------------------------|----------------|
| | Issue certificates | |
| | Review learner feedback, identify future improvements | |
| | Contact learners' supervisors, when possible | |

Key Concepts from RHIS: A Curriculum on Basic Concepts and Practice

| | |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Architecture | The way that information systems are structured to communicate |
| Census | An official count or survey of a population, typically recording various details of individuals |
| Confidence interval | The range of values that should include the true value of what is being measured |
| Confidence limits | The values at the upper and lower end of the confidence interval |
| Data | An aggregation of data elements, in the form of numbers, characters, and images; facts or statistics used for reference or analysis |
| Data aggregation | A process in which data from clinical records or registers are gathered, summarized, and presented |
| Data dictionary | A repository that stores all the information about different data, such as meaning, relationships to other data, origin, usage, and format |
| Data element | A recorded event |
| Data disaggregation | Breaking down information into smaller subpopulations, often by age, sex, or geographic location |
| Data flow | How data are moved from one point to another |
| Data management | Covers all aspects of data handling, from collection, storage, quality-assurance, and flow to processing, compilation, and analysis. In addition, data management also includes data availability and accessibility, interoperability of data systems, data visualisation, and feedback loops |
| Data quality | An assessment of "fitness for use" of a collection of data |
| Data quality assurance | The systematic monitoring and evaluation of data to uncover inconsistencies in the data and data management system; a system to ensure that data are collected, maintained, monitored, and transformed into useful information, and interpreted in ways that maintain high quality and accuracy for all users |
| Data use | Data applied to the decision-making process |
| Data visualisation | Presentation of data in a pictorial or graphic format |
| Data warehouse | A central repository of data created by integrating data from one or more disparate sources and is used for data analysis and reporting |
| Descriptive analysis | Describes the sample or target population and tells you what is happening, but not why |
| Domain | A sphere of knowledge, influence, or activity |

| | |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fragmentation | The absence, or underdevelopment, of connections among the data collected by the various systems and subsystems |
| Governance | The way that organisations or countries are managed at the highest levels, and the systems for doing this |
| Health information system (HIS) | Any system that captures, stores, manages, or transmits information related to the health of individuals or the activities of organisations, which will improve healthcare management decisions at all levels of the health system |
| Health system | The sum total of all organisations, people, resources, and all activities whose primary purpose is to promote, restore, or maintain health |
| Indicator | A measure that helps quantify the achievement of a goal |
| Information | Interpreted data; data that are processed, organised, structured, or presented in a specific context |
| Information culture | An organisation conducive to effective information management, that recognizes the value and utility of information for achieving operational and strategic goals and that information forms the basis for organizational decision making |
| Interoperability | The extent to which systems and devices can exchange data and interpret that shared data |
| Knowledge | Information that is analysed, communicated, and acted upon |
| Metric | Calculation or formula on which an indicator is based |
| Missing value | When reportable events occurred but were not in fact reported |
| Pay for performance | A system that offers financial incentives to physicians, hospitals, medical groups, and other healthcare providers for meeting certain performance measures |
| Proxy data | Data that can be substituted to represent the value of something in a calculation |
| Proxy Indicator | An indicator that does not capture the exact concept or single aspect of your activity's result, but instead aims to measure a concept that approximates the true or ideal indicator |
| Routine Health Information System (RHIS) | The ongoing data collection of health status, health interventions, and health resources for decision making; also known as facility-based health information systems and community-based health information systems |
| Stakeholder | Any individual or organisation who has an interest in a health decision |
| Standard | A norm or acceptable level of quality |

| | |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transparency | A characteristic of government, companies, organisations and individuals that are open in the clear disclosure of information, rules, plans, processes, and actions |
| True zero value | No reportable events occurred during the specified reporting period |
| Valid indicator | An indicator that accurately measures the phenomenon that it is intended to measure and provides direct and focused information about the target or result it aims to measure |
| Variable | An element, feature, or factor that is liable to vary or change |
| Verification factor (VF) | An equation used to determine the level of under or overreporting, if any, for RHIS data items. VF equals the recounted number of data elements divided by the reported number and expressed as a percentage |

MODULE DETAILS WITH SUGGESTIONS FOR FACILITATORS

This section of the guide provides details about each class and module, including the number of class parts, the learning objectives for the class, the topics covered, sample discussion questions, references and resources, and quiz questions and answers for each class.

Use the information provided to:

- Identify which classes to assign to meet the needs of your learners
- Identify which reference materials to provide to learners in order to update content and make it relevant to their work environment
- Plan discussion questions to use when meeting with your learners or when conducting virtual group discussions; you will find space to write your own discussion questions that are the most appropriate for your learners

Module 1. Health Systems and Health Information Systems

Objectives

- Describe the essential link between the health system and the health information system
- Identify the six components of a health information system, according to the Health Metrics Network (HMN) framework
- Describe sources of health data and give examples of population-based and institution-based sources
- Describe a RHIS

Topics Covered

- Health system and health-system building blocks
- Foundational role of health information for decision making
- HIS and HIS components and standards according to the WHO HMN
- Information needs for each level of the health system
- Sources of health information and how they are categorized
- The role and data sources of RHIS
- Criteria for a RHIS to function well

Discussion Question Suggestions

Ask a question or two that are appropriate for the learners' level of experience and job responsibilities. Allow learners to provide ideas and discuss among themselves before responding.

1. Why do you think that health information is important for the health system?
2. Do you think your colleagues understand the importance of information for decision making? How could we improve their understanding?
3. How would you describe our RHIS to a health data manager from another country? What are the sources of the data we use in our RHIS?
4. Is there anything that you learned in this module that you think you will be able to apply quickly to your work? How will you do that?
5. Other (fill in):
6. Other:

References and Resources

The World Health Report 2000 - Health Systems: Improving Performance

<http://www.who.int/whr/2000/en/>

International Health Partnership + Related Initiatives (IPH+) and World Health Organization (WHO). (2011). Monitoring, Evaluation and Review of National Health Strategies: A Country-Led Platform for Information and Accountability. Geneva, Switzerland: WHO.

http://www.who.int/healthinfo/country_monitoring_evaluation/documentation/en/

World Health Organization (WHO), Health Metrics Network. (2012). Framework and Standards for Country Health Information System, 2nd Edition. Geneva, Switzerland: WHO.

<http://www.hrhresourcecenter.org/node/746>

Everybody's Business: Strengthening Health Systems to Improve Health Outcomes: WHO's Framework for Action. (2007). Geneva, Switzerland: WHO. <http://www.who.int/healthsystems/strategy/en/>

Quiz Questions and Answers

Pretest (Used for Self-Assessment)

Select whether each of the following statements is true or false.

1. Production and meaningful use of reliable information is the most important building block of the health system. **FALSE**
2. According to the WHO Health Metrics Network, health information systems include the following components: HIS resources, indicators, data sources, data management, information products, and dissemination and use. **TRUE**
3. Data from a census is an example of a population-based source of health data. **TRUE**
4. Routine data collection refers to data that are collected continuously, with processing and reporting more often than monthly. **FALSE**

Posttest

Select whether each of the following statements is true or false.

1. Routine data collection refers to data that are collected continuously, with processing and reporting more often than annually. **TRUE**
2. Data from institution-based sources are mostly gathered by supervisors. **FALSE**
3. RHIS can be defined as the ongoing data collection of health status, health interventions, and health resources for decision making. **TRUE**

Multiple choice, choose the best response to the following questions.

4. Which of the following are components of health information systems?
 - A. Financing
 - B. Health workforce
 - C. Data management
 - D. All of the above
 - E. A and B only

The answer is **C**. Components and standards of health information systems include resources, indicators, data sources, data management, information products, and dissemination and use.

5. Institution-based sources of health data include:
 - A. Resource records

- B. Service records
- C. Civil registration
- D. All of the above
- E. A and B only

The answer is **E**. Resource records and service records are institution-based sources of health data. Civil registration is a population-based source of data.

6. Routine health information system characteristics include:
- A. Generate data at regular intervals
 - B. Most data are gathered as healthcare providers go about their daily work
 - C. Data are collected at public and private health facilities as well as community-level healthcare posts and clinics
 - D. All of the above
 - E. A and B only

The answer is **D**. All of these are characteristics of RHIS.

Module 2. Class 1 of 2—Indicators and Data Collection and Reporting

Objectives

- Describe the importance of health indicators
- Explain the five criteria of a good indicator
- Describe factors to consider while selecting indicators
- Identify examples of good indicators.

Topics Covered

- Definitions of indicator and health indicator
- Uses of health indicators
- Indicator metrics
- How to classify health indicators
- Rationale for health indicators
- Characteristics of good indicators (specific, meaningful, agreed upon, replicable, and timebound [SMART])
- Proxy indicators
- Selecting indicators
- Common pitfalls in indicator selection
- Evaluate indicators periodically

Discussion Question Suggestions

Ask a question or two that are appropriate for the learners' level of experience and job responsibilities. Allow learners to provide ideas and discuss among themselves before responding.

1. What is the importance of indicators in your work?
2. Have you ever had to deal with a poorly defined indicator? What problems did that cause?
3. Can you think of a proxy indicator that we use in our RHIS?

4. Is there anything that you learned in this module that you think you will be able to apply quickly to your work? How will you do that?
5. Other (fill in):
6. Other:

References and Resources

UNHCR. Emergency Handbook. Disease Surveillance Thresholds. Version 1.7.
<https://emergency.unhcr.org/entry/115610/disease-surveillance-thresholds>

Handout 2.1A Core Indicators for Routine HMIS. From MEASURE Evaluation Handout 2.1.3 RHIS Curriculum Modules. <https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-2-indicators-and-data-collection-and-reporting>

Handout 2.1B Sample Indicator Reference Sheet. From MEASURE Evaluation Handout 2.1.1 RHIS Curriculum Modules. <https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-2-indicators-and-data-collection-and-reporting>

Handout 2.1C Change in Indicators Over Time. From MEASURE Evaluation Handout 2.1.2 RHIS Curriculum Modules. <https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-2-indicators-and-data-collection-and-reporting>

Quiz Questions and Answers

Pretest

Select whether each of the following statements is true or false.

1. Indicators can be used to measure only outputs and outcomes. **FALSE:** Indicators can be used to measure all aspects of health and the health sector.
2. Indicator metrics include counts, calculations, composite measures, and thresholds. **TRUE**
3. Indicators are vital in health interventions because, when monitored regularly, they can:
 - A. Provide a **reference point** for health intervention planning, management, and reporting
 - B. Allow managers of health interventions to **assess trends and identify problems**
 - C. Act as **early warning signals** for corrective action
 - D. All of the above
 - E. A and B only
 The answer is **D**.
4. At the program level, selecting indicators starts by determining your objectives, targets, and activities, so that indicators can be linked directly to them. **TRUE**
5. SMART indicators are specific, meaningful, agreed upon, replicable, and timebound. **FALSE**
6. An example of a good indicator for early infant HIV testing coverage would be “percentage of HIV-exposed infants receiving a virological test for HIV within two months of birth.” **TRUE**

Posttest

Select whether each of the following statements is true or false.

1. An indicator is a measure that helps quantify the achievement of a goal. **TRUE**
2. Good indicators should be SMART: Specific, measurable, agreed upon, relevant, and timebound. **TRUE**
3. Selecting indicators for RHIS begins with conducting an analysis of management functions. **TRUE**

4. An example of a good indicator for hospital admission rates would be the percentage of available beds which have been occupied over a given period of time. **FALSE:** A good indicator would be “percentage of available beds which have been occupied over a given period of time.”
5. When selecting a set of indicators, it is important to have indicators for every activity of a programme in order to get a complete assessment of programme activities. **FALSE:** Your indicators should reflect only the things that are most important to know.
6. One type of metric is a formula with a numerator and denominator that an indicator is based on. **FALSE:** Types of metrics include counts, calculations, indexes, composite measures, and thresholds.

Multiple choice, choose the best response to the following questions.

7. Select the best indicator for the distribution and density of health workers by cadre.
 - A. The number of new health workers recruited to a district by cadre in the last quarter.
 - B. The number of health workers by cadre and district per 1,000 population at a given time.
 - C. The number of districts with full coverage of health workers by quarter.
 - D. All of the above.

The answer is **B**.

8. Select the best indicator for (antiretroviral therapy) ART retention rate.
 - A. Percentage of people living with HIV and on ART who are retained on ART 12 months after initiation.
 - B. Total number of people on ART by quarter.
 - C. Number of people living with HIV who are offered ART and return for follow-up at 6 months.
 - D. All of the above.

The answer is **A**.

Module 2. Class 2 of 2—Data Collection and Reporting Tools

Objectives

- Describe how data collection is linked to identified indicators
- Define key data collection concepts
- Describe data collection instruments for RHIS data
- Use an RHIS procedure document to identify data sources for obtaining needed RHIS data to manage a health programme
- Match challenges in collecting data with how to overcome them
- Explain gender-sensitive data, sex- and age-disaggregated data, and links with data collection tools
- Interpret a data flow graph
- Identify the components of a reporting structure

Topics Covered

- RHIS data overview
- Methods for collecting RHIS data at different levels of the health system
- How data are recorded
- Adapting/creating data collection instruments (DCI)
- Data confidentiality
- Data collection
- DCI examples and descriptions (including HMIS procedure manual)
- Data aggregation and reporting
- RHIS reporting

- Data storage and data flow
- Challenges in RHIS data collection and reporting

Discussion Question Suggestions

Ask a question or two that are appropriate for the learners' level of experience and job responsibilities. Allow learners to provide ideas and discuss among themselves before responding.

1. Which RHIS data sources do you find are the easiest to access and interpret? Are there some sources that are not so easy to access or use?
2. How would you improve the data collection instruments you use if you were given the opportunity? Are you collecting data on sex and age? Are you collecting too much data?
3. Look at your most recent HMIS procedures manual. Is there any information it contains that was not described in the class? How do you think you should use the manual?
4. How does your organization store data?
5. Describe your organization's data flow?
6. Is there anything that you learned in this module that you think you will be able to apply quickly to your work? How will you do that?
7. Other (fill in):
8. Other:

References and Resources

Heywood, A. & Boone, D. (2015). Guidelines for data management standards in routine health information systems. Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina.

<https://www.measureevaluation.org/resources/publications/ms-15-99>

Lippeveld, T., Sauerborn, R., Bodart, C., & World Health Organization. (2000). Design and implementation of health information systems/edited by Theo Lippeveld, Rainer Sauerborn, Claude Bodart. Geneva, Switzerland: World Health Organization. <https://apps.who.int/iris/handle/10665/42289>

World Health Organization. (2018). Global Reference List of 100 Core Health Indicators (plus health-related SDGs). <http://www.who.int/healthinfo/indicators/2018/en/>

Zegeye, D. (2011). Introduction to Routine Health Information Systems.

<https://www.slideshare.net/oerafrica/introduction-to-routine-health-information-system-slides>

Handout 2.2A: Illustrative Maternal Health Card. From MEASURE Evaluation Handout 2.2.2A. RHIS Curriculum Modules. <https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-2-indicators-and-data-collection-and-reporting>

Handout 2.2B: Sample Generic HIV Care Data Collection Tools and Instructions. From MEASURE Evaluation Handout 2.2.2B. RHIS Curriculum Modules. <https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-2-indicators-and-data-collection-and-reporting>

¹Handout 2.2C: HMIS Procedures Manual (Ethiopia) 2010. From MEASURE Evaluation Handout 2.2.4C. RHIS Curriculum Modules. <https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-2-indicators-and-data-collection-and-reporting>

¹Handout 2.2D: HMIS Indicator Definitions (Ethiopia) 2014. From MEASURE Evaluation Handout 2.2.4B. RHIS Curriculum Modules. <https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-2-indicators-and-data-collection-and-reporting>

¹ Newer versions of these documents are available and should be shared and discussed with learners.

Quiz Questions and Answers

Pretest

Select whether each of the following statements is true or false.

1. When data are organized with reference to a context which gives them meaning, it is considered knowledge. **FALSE**
2. RHIS data are used to measure indicators which help us improve health system performance and understand the health status of the population. **TRUE**
3. Tally sheets are used at the health facility and community level to mark the number of clients who use specific services. **TRUE**
4. Data collection instruments should be administered by data analysts. **FALSE.**
5. Data may be aggregated for routine reporting or to measure health unit performance. **TRUE**

Posttest

Select whether each of the following statements is true or false.

1. Individual medical records are data related to operational decisions such as service delivery and resources management decisions. **FALSE**
2. Help desk support should be available for electronic data collection instruments. **TRUE**
3. Data collection tools should be designed to collect sex and age to allow for gender-sensitive data disaggregation and reporting because health conditions differ by gender and age. **TRUE**
4. Data reporting should include the names of the individuals whose data has been collected in order to easily correct data errors. **FALSE**
5. As data flow from lower to higher levels, more data are required. **FALSE**
6. An RHIS reporting structure should describe sources of information and feedback, who is responsible, and deadlines for specific information to be reported at each level of the health information system, storage, data aggregation, transmission, data quality assessment, and submission and archiving. **TRUE**

Module 3. Class 1 of 2—Data Management Standards for Health Facility and Community Level

Objectives

- Describe how to foster a culture of information and demand for data
- Explain the benefits of using standards for RHIS
- Describe when and how standards should be applied to RHIS systems
- Identify domains and subdomains of data management and the standards defined for each

Topics Covered

- Information culture
- RHIS data management domains
- RHIS data management standards and how to apply them
- Assessing RHIS data management standards

Discussion Question Suggestions

Ask a question or two that are appropriate for the learners' level of experience and job responsibilities. Allow learners to provide ideas and discuss among themselves before responding.

1. What is one change that would improve the information culture in your organization?
2. Describe your experience applying standards in your work?
3. Is there anything that you learned in this module that you think you will be able to apply quickly to your work? How will you do that?
4. Other (fill in):

References and Resources

Health Metrics Network, & World Health Organization.(2008). Assessing the national health information system: an assessment tool, Version 4.00. World Health Organization.
<https://apps.who.int/iris/handle/10665/43932>

Heywood, A., & Boone, D. (2015). Guidelines for data management standards in routine health information systems. Chapel Hill, NC, USA: MEASURE Evaluation.
<https://www.measureevaluation.org/resources/publications/ms-15-99>

World Health Organization. (2011). Monitoring, evaluation and review of national health strategies: A country-led platform for information and accountability.
https://www.who.int/healthinfo/country_monitoring_evaluation/1085_IER_131011_web.pdf

Handout 3.1A: RHIS Data Management Standards. From MEASURE Evaluation Handout 3.2.1. RHIS Curriculum Modules. <https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-3-guidelines-for-data-management-standards-in-routine-health-information-systems>

Handout 3.1B: RHIS Rapid Assessment Tool. From MEASURE Evaluation Handout 3.2.3A. RHIS Curriculum Modules. <https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-3-guidelines-for-data-management-standards-in-routine-health-information-systems>

Handout 3.1C: RHIS Data Management Standards Service Delivery Level Results. From MEASURE Evaluation Handout 3.2.3D. RHIS Curriculum Modules. <https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-3-guidelines-for-data-management-standards-in-routine-health-information-systems>

Quiz Questions and Answers

Pretest

Select whether each of the following statements is true or false.

1. All levels of a routine health information system need and can use the same collection of data. **FALSE**
2. RHIS standards are based on theoretical best practices instead of real experience to make them more practical. **FALSE**
3. Standards should be applied when developing new RHIS and when trying to improve a system. **TRUE**
4. RHIS data management activities can be divided into three domains. **FALSE**

Posttest

Select whether each of the following statements is true or false.

1. Following RHIS standards helps to identify areas of weakness in information systems. **TRUE**
2. The RHIS “Management and Governance” domain is divided into three subdomains including policies and planning, management, and information dissemination. **FALSE:** The “Management and Governance” domain is divided into three subdomains including policies and planning, management, and human resources.
3. Using visual methods to convey information helps foster an information culture. **TRUE**
4. For an RHIS to work, information must form the basis of organizational decision making. **TRUE**

5. The more that decision making and funding are centralized, the better the chance that information will be in demand and used at lower levels to improve service delivery. **FALSE:** The more that decision making and funding are decentralized, the better the chance that information will be in demand and used at lower levels to improve service delivery.

Use Handout 3.1A to help you answer the following questions.

6. The standards for the subdomain “Management & Governance: Policies and Planning: Legal and Regulatory” include all of the following EXCEPT:
- A. There is up-to-date legislation and detailed regulations for facility-based information, including private health facilities.
 - B. Health information legislation and regulations clearly articulate roles and responsibilities at all levels.
 - C. Legislation or policy includes mechanisms to ensure privacy and confidentiality of personal information.
 - D. There is a schedule/plan for update, reproduction, and distribution of data collection tools.

The answer is **D**.

7. The standard for the subdomain “Data Collection & Processing: Collection & Management of Individual Client Data: Guidelines” is:
- A. Tools used for data analysis, such as summary tables, graphs, geographic information systems (GIS), pivot tables, decision support systems, etc., are appropriate for the level.
 - B. Printed guidelines are available at all health facilities (and in applicable community-based programs) to assist with client-level data collection.
 - C. Appropriate guidance is available on data collection, reporting, analysis, dissemination, and use of data appropriate for the different levels of the health system.
 - D. Indicators are harmonized with donors and implementing partners.

The answer is **B**.

Module 3. Class 2 of 2—RHIS Data Integration and Interoperability

Objectives

- Identify causes of RHIS data fragmentation
- Explain integration and interoperability in the context of RHIS
- Identify the key principles for RHIS data integration
- Describe challenges of linking data

Topics Covered

- Data fragmentation
- RHIS data integration principles and challenges
- Health information system interoperability

Discussion Question Suggestions

Ask a question or two that are appropriate for the learners’ level of experience and job responsibilities. Allow learners to provide ideas and discuss among themselves before responding.

1. Have you had an experience with problems caused from data fragmentation in the past? What caused the fragmentation?
2. What challenges for data integration does your organisation face?

3. Can you describe an example of data interoperability in your RHIS?
4. Is there anything that you learned in this module that you think you will be able to apply quickly to your work? How will you do that?
5. Other (fill in):

References and Resources

Heywood, A., & Boone, D. (2015). Guidelines for data management standards in routine health information systems. Chapel Hill, NC, USA: MEASURE Evaluation.

<https://www.measureevaluation.org/resources/publications/ms-15-99>

Kibria, M.G., Sujan, J., Santos, M., & Taleb, M.A. (2017). DHIS2 and e-TB Manager Interoperability: Creating a Stronger Digital Health System in Bangladesh. *SIAPS Technical Notes*.

<http://siapsprogram.org/publication/dhis2-and-e-tb-manager-interoperability-creating-a-stronger-digital-health-system-in-bangladesh/>

Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. (2014). Considerations for the Integration of HMIS and LMIS. Arlington, VA: Management Sciences for Health.

http://siapsprogram.org/wp-content/uploads/2014/06/14-126-Considerations-for-the-Integration-of-HMIS-and-LMIS_format.pdf

Quiz Questions and Answers

Pretest

Select whether each of the following statements is true or false.

1. Fragmentation of RHIS is the absence, or underdevelopment, of connections among the data collected by the various systems and subsystems. **TRUE**
2. Integration takes systems and blends and coordinates them into one unified, stronger system. **TRUE**
3. Interoperability is the term for one information system that can replace another system. **FALSE**
4. One key principle of RHIS integration is a need for short-term capacity building on data management and information use. **FALSE**

Posttest

Select whether each of the following statements is true or false.

1. The causes of fragmentation in an information system may be institutional, technical, or behavioural. **TRUE**
2. Three of the challenges of information system integration are an increased workload for data collection, the independent nature of most health system components, and technical challenges that arise from how data are aggregated and reported. **FALSE**: Challenges of integration are organizational, technical, and stemming from data source issues. Integration usually results in a decreased workload for data collection.
3. Advocacy and awareness-raising of the benefits of an integrated RHIS by good governance and leadership is a key principle of RHIS integration. **TRUE**.
4. The value of linking information is reduced if one of the systems has poor data quality. **TRUE**
5. When information systems are integrated, the need to use standard indicators is reduced because of the strength of the system. **FALSE**: Agreeing on and developing standard indicators and related data sets is an essential first step in developing an integrated RHIS.
6. Interoperability is the extent to which systems and devices can exchange data and interpret that shared data. **TRUE**

Module 4. Class 1 of 3—Introduction to RHIS Data Quality

Objectives

- Describe the importance of data quality
- Identify the components of the data quality conceptual framework
- Explain what different RHIS management levels can do to ensure data quality
- Identify the main types of data quality problems

Topics Covered

- Data quality and the importance of data quality
- Signs and causes of data quality problems
- RHIS Data Quality Conceptual Framework
- Common problems affecting data quality

Discussion Question Suggestions

Ask a question or two that are appropriate for the learners' level of experience and job responsibilities. Allow learners to provide ideas and discuss among themselves before responding.

1. How would you describe data quality to a colleague who has not taken this class?
2. Have you experienced data quality problems in your work? What were the results?
3. Think of the RHIS data quality conceptual framework. Do you think your organization has the functional components needed to ensure data quality?
4. Is there anything that you learned in this module that you think you will be able to apply quickly to your work? How will you do that?
5. Other (fill in):

References and Resources

WHO, Gavi, The Global Fund to Fight AIDS, Tuberculosis and Malaria (The Global Fund), & United States Agency for International Development (USAID)/MEASURE Evaluation. (2017). Data Quality Review Module 1: Framework and Metrics. https://www.who.int/healthinfo/tools_data_analysis/dqr_modules/en/

Quiz Questions and Answers

Pretest

Select whether each of the following statements is true or false.

1. The quality of data is not a problem for managers because there are tools they can use to fix the data before using it. **FALSE**
2. The four functional components of a data management system that are needed to ensure data quality include: Data management processes, data management standards, indicators, and data collection and reporting forms. **FALSE**
3. All RHIS management levels can help ensure data quality by routinely analysing and using data. **TRUE**
4. Two organizational problems that affect data quality are an absence of a culture of information use and no review process before report submission. **TRUE**

Posttest

Select whether each of the following statements is true or false.

1. Data quality is an assessment of “fitness for use” of a collection of data. **TRUE**
2. It is important to use high-quality data, as they help providers and managers form an accurate picture of health needs, programs, and services in specific areas. **TRUE**
3. The data quality conceptual framework is divided into three parts: reporting levels, standards for data quality, and the five functional components of data management systems. **FALSE:** The data quality conceptual framework is divided into three parts: Reporting levels, metrics of data quality, and the five functional components of data management systems.

Multiple choice, choose the best response to the following questions.

4. At the health facility level, managers should do the following to maintain data quality:
 - A. Routinely analyse and use data.
 - B. Summarize patient data and check quality of registers.
 - C. Review reports received and submit aggregated reports.
 - D. All of the above.
 - E. A and B, only

The answer is **E**.

5. At the National level, managers should do the following to maintain data quality:
 - A. Routinely analyse and use data.
 - B. Monitor quality of data captured and reported.
 - C. Provide guidelines on data collection, reporting, and management procedures.
 - D. All of the above.
 - E. A and B only

The answer is **D**.

6. Technical problems that commonly affect data quality include:
 - A. Complex design of data collection and reporting tools.
 - B. Misunderstanding of how to compile data, use tally sheets, and prepare reports.
 - C. Organization incentives for reporting high performance.
 - D. All of the above.
 - E. A and B only.

The answer is **A**.

Module 4. Class 2 of 3—Data Quality Metrics

Objectives

- List and define data quality dimensions and metrics:
 - Completeness and timeliness
 - Internal consistency
 - External consistency
 - External comparisons
- Calculate and interpret data quality metrics

Topics Covered

- Four dimensions of data quality metrics
 - Completeness and timeliness of data
 - Completeness and timeliness of reporting at different administrative levels
 - Completeness of indicator data
 - Missing values and zeros
 - Internal consistency of reported data
 - Verification factor
 - Outliers
 - Consistency over time
 - Consistency between related indicators
 - External consistency with other data sources
 - Potential problems with survey results
 - Confidence intervals
 - External comparisons of population data

Discussion Question Suggestions

Ask a question or two that are appropriate for the learners' level of experience and job responsibilities. Allow learners to provide ideas and discuss among themselves before responding.

1. Which dimension of data quality metrics do you think is the most important for data quality in the health system? Why?
2. Have you had any experience verifying data? Is this class in line with what you did and what you learned?
3. What source(s) have you used when determining population data?
4. Is there anything that you learned in this module that you think you will be able to apply quickly to your work? How will you do that?
5. Other (fill in):

References and Resources

World Health Organization, Gavi, The Global Fund to Fight AIDS, Tuberculosis and Malaria (The Global Fund), & United States Agency for International Development (USAID)/MEASURE Evaluation. (2017). Data Quality Review Module 1: Framework and Metrics. https://www.who.int/healthinfo/tools_data_analysis/dqr_modules/en/

Quiz Questions and Answers

Pretest

Select whether each of the following statements is true or false.

1. The metrics in the dimension “completeness and timeliness of data” measure the extent to which data that are reported through the system are available and adequate and recent enough for planning, monitoring, and evaluation. **TRUE**
2. The dimension “internal consistency of reported data” addresses the plausibility and accuracy of reported results for selected indicators based on history, trends, and comparisons with related indicators. **TRUE**
3. The dimension “external consistency with other data sources” examines the level of agreement between two sources of data measuring the different health indicators to make sure that the results are similar. **FALSE**
4. The metrics for external comparison of population data can only be calculated at the national level. **FALSE**
5. If the verification factor percentage is less than 100%, the data is underreported. **FALSE**

Posttest

Select whether each of the following statements is true or false.

1. The metric “completeness of indicator data” is measured in two ways: first, by calculating the proportion of blank cells where a specific indicator value should be recorded on reporting forms; and second, by measuring the proportion of cells with a zero recorded as the value. **TRUE**
2. The metric “timeliness of administrative unit reporting” is defined as the number of reports from subnational administrative units received by the national level by the reporting deadline divided by the number of reports that are expected to be received. **FALSE:** The metric is defined as the number of reports from subnational administrative units received by the national level by the reporting deadline divided by the number of reports **actually received**.
3. At the national level, the ratio of values of indicators measured by RHIS data and the values from survey data can be compared to assess external consistency with other data sources. **TRUE**
4. If the consistency between two related indicators at a district is 1.09 and it is 1.01 at the national level would the data for the district should be flagged for follow-up if the quality threshold is $\geq 10\%$? **FALSE:** The difference in the percentages is 0.08 which is within the acceptable range.
5. The purpose of the external comparison of population data is to determine the adequacy of the population data used in calculating indicators. **TRUE**

Matching

6. Match the following data quality terms with their definitions:

| | |
|---------------------|-----------------------------------------------------------------------------------------------------|
| Verification factor | The recounted number of data elements divided by the reported number and expressed as a percentage. |
| Confidence interval | The range of values that should include the true value of what is being measured. |
| Outlier | An observation point that is distant from other observations. |
| True zero value | No reportable events occurred during the specified reporting period. |
| Missing value | Reportable events occurred but were not in fact reported. |

Multiple choice, choose the best response to the following questions.

7. A country has four regions with the following occurrence of moderate outliers for monthly reported values for an indicator over a year:

Region 1 = 0 outliers

Region 2 = 3 outliers

Region 3 = 0 outliers

Region 4 = 1 outlier

What is the percentage of outliers at the national level?

- A. 50%
- B. 4%
- C. 25%
- D. 8%

The answer is **D**. The percentage of outliers at the national level is calculated as the number of reported outliers divided by the number of expected reports. In this case, there are four outliers and $4 \times 12 = 48$ expected monthly values ($4/48 \times 100 = 0.08 \times 100 = 8\%$).

Module 4. Class 3 of 3—Data Quality Assurance

Objectives

- Define data quality assurance
- Explain the importance of data quality assurance
- Describe WHO's Data Quality Review – a framework for data quality assurance
- Identify select tools for measuring data quality
- Compare methods for data management assessment

Topics Covered

- Importance of high-quality data
- What data assurance is
- Roles and responsibilities for maintaining data quality by RHIS level
- Data quality assessments
- Data quality assurance tools (data quality review, routine data quality assessment, and RHIS Performance Diagnostic Tool [PRISM])
- Differences in data quality assessment methods and choosing tools

Discussion Question Suggestions

Ask a question or two that are appropriate for the learners' level of experience and job responsibilities. Allow learners to provide ideas and discuss among themselves before responding.

1. How can you produce and encourage high-quality data in your work setting?
2. What experience have you had with using data assurance tools?
3. What is your experience with data quality assurance?
4. Which type of data quality assessment do you think would be most appropriate for your setting, independent assessments/audits or supportive supervision/self-assessments?
5. Is there anything that you learned in this module that you think you will be able to apply to your work? How will you do that?

6. Other (fill in):

References and Resources

World Health Organization, Gavi, The Global Fund to Fight AIDS, Tuberculosis and Malaria (The Global Fund), & United States Agency for International Development (USAID)/MEASURE Evaluation. (2017). Data Quality Review Module 2: Desk Review of Data Quality.

https://www.who.int/healthinfo/tools_data_analysis/dqr_modules/en/

Quiz Questions and Answers

Pretest

Select whether each of the following statements is true or false.

1. Data quality assurance is a system to ensure that data are collected, maintained, monitored, transformed into useful information, and interpreted in ways that maintain high quality and accuracy for all users. **TRUE**
2. Data quality assurance is most effective when led by the national level of a health information system in order to maintain standardization. **FALSE**
3. The World Health Organization's data quality review framework provides tools designed to verify the quality of reported data and assess data management and reporting systems in health facilities. **TRUE**
4. Independent assessments or audits are the preferred methods to assess data quality if you want to improve the RHIS system. **FALSE**

Posttest

Select whether each of the following statements is true or false.

1. Data quality assurance uses a single method to systematically monitor and evaluate data in order to uncover inconsistencies in the data and the data management system. **FALSE:** Data quality assurance uses an explicit combination of methods and activities to monitor and evaluate data.
2. Data quality assurance efforts target all levels in the RHIS to eliminate inconsistencies. **TRUE**
3. WHO's data quality review (DQR) only involves self-assessments or supervisory visits to verify data quality. **FALSE:** The DQR involves a system of checks during supportive supervision, an annual independent assessment, and periodic in-depth reviews of data quality that focuses on single diseases and priority health programme areas.
4. Local capacity building is not a primary objective of independent assessments of data quality. **TRUE**
5. If you want to focus on how data is used in an RHIS, the RHIS Performance Diagnostic Tool would be a good choice for data quality assurance. **TRUE**

Multiple choice, choose the best response to the following question.

6. Data quality assurance does all of the following EXCEPT:
 - A. Checks the components of the RHIS
 - B. Employs documented data review procedures at all levels
 - C. Makes necessary corrections to ensure data of high quality
 - D. Identifies standard indicators to measure programme performance

The answer is **D**. Data quality assurance may address indicator definitions, but it does not address which indicators should be used to measure programme performance.

Module 5. Class 1 of 3—RHIS Data Analysis Key Concepts

Objectives

- Define key concepts of data analysis
- Use data analysis terminology
- Select the appropriate chart for visualizing and presenting data

Topics Covered

- Purpose of data analysis
- Basic data analysis terminology and concepts
- Data organization
- Choosing charts for data analysis

Discussion Question Suggestions

Ask a question or two that are appropriate for the learners' level of experience and job responsibilities. Allow learners to provide ideas and discuss among themselves before responding.

1. What do you think can be confusing when choosing whether to use percentages, proportions, rates, or ratios?
2. Have you ever been given something to review where you felt the wrong choice was made between using mean and median? Why was this important?
3. How do you usually decide what kind of chart to use when you are analysing data?
4. Is there anything that you learned in this module that you think you will be able to apply to your work? How will you do that?
5. Other (fill in):

References and Resources

Lyons, J., & Evergreen, S. Qualitative chart chooser. <http://stephanieevergreen.com/qualitative-chart-chooser/>

Quiz Questions and Answers

Pretest

Select whether each of the following statements is true or false.

1. The purpose of data analysis is to provide answers to questions being asked by a health program. **TRUE**
2. Use the mean to find the central tendency if your data has outliers. **FALSE**
3. Trends are easily shown by using pie charts. **FALSE**
4. Bar charts are an appropriate choice of chart to use when you want to compare more than 10 items. **TRUE**

Posttest

Select whether each of the following statements is true or false.

1. The median is a more appropriate measure of central tendency when your data set has outliers or is skewed. **TRUE**
2. The mean of the data set 5, 12, 8, 9, 10, 10 is 9. **TRUE**

3. The median of the data set 5, 12, 8, 9, 10, 10 is 9. **FALSE**. When the data set has an even number of elements the median is the average of the two middle numbers when the data are in order. In this case, the data set would be 5, 8, 9, 10, 10, 12. The median would be $(9+10)/2 = 9.5$.

Multiple choice, choose the best response to the following questions.

4. Scatter plots are appropriate when you want to do the following:
- A. Compare values
 - B. Understand the distribution of data
 - C. Show the composition of something
 - D. All of the above
 - E. A and B only

The answer is **E**. Scatter plots show the distribution of individual data points. This kind of chart can show relationships between two variables or reveal trends.

5. Which chart would you select to use if you wanted to analyse trends in the availability and use of mosquito nets by pregnant women and the rates of morbidity due to malaria over time?
- A. Bar chart
 - B. Column chart
 - C. Dual-axis chart
 - D. Scatter plot chart

The answer is **C**. A dual-axis chart is the most appropriate choice of the chart types listed. Dual-axis charts should be used with 2–3 data sets, with at least one being a continuous data set, and another suited to being grouped by category.

6. Which chart would you select to use if you want to show how individual parts make up the whole of something?
- A. Bubble chart
 - B. Column chart
 - C. Line chart
 - D. Stacked bar chart

The answer is **D**. Of the charts listed, a stacked bar chart is the best choice for showing the composition of a whole.

Module 5. Class 2 of 3—Conducting Data Analysis

Objectives

- Describe the five steps of data analysis
- Select appropriate indicators for data analysis
- Select appropriate denominators
- Interpret comparisons of findings from routine data with findings from other data sources

Topics Covered

- The five steps of data analysis
- Selecting indicators and their numerators
- Avoiding poorly defined indicators
- Reviewing data quality
- Selecting appropriate denominators
- Estimating population size

- Checking data quality of estimates
- Reconciling findings with estimates from other data sources

Discussion Question Suggestions

Ask a question or two that are appropriate for the learners' level of experience and job responsibilities. Allow learners to provide ideas and discuss among themselves before responding.

1. What do you think is the most challenging aspect of selecting core indicators for data analysis?
2. Why is selecting appropriate denominators so important? Why is it sometimes challenging?
3. What are the procedures you use for conducting data analysis in your organization? Are they adequate?
4. Is there anything that you learned in this module that you think you will be able to apply to your work? How will you do that?
5. Other (fill in):

Quiz Questions and Answers

Pretest

Select whether each of the following statements is true or false.

1. The steps for data analysis at the district level include selecting a limited number of core indicators, reviewing data quality, selecting appropriate denominators, reconciling findings with estimates from other sources, and communicating key findings. **TRUE**
2. For district-level data analysis, select only indicators with numerators that can be measured with routine health data. **TRUE**
3. An example of an appropriate indicator for data analysis is “percentage of HIV-exposed infants receiving a virological test for HIV within 2 months of birth.” **TRUE**
4. Service statistics are the gold standard for population estimates. **FALSE**
5. Reconciling findings with estimates from other sources is necessary only when there is a doubt about the denominator used for measuring an indicator. **FALSE**

Posttest

Select whether each of the following statements is true or false.

1. The following indicator would be appropriate for data analysis at the district level: “Percentage of registered new and relapse tuberculosis (TB) patients with documented HIV status.” **TRUE:** The data for the numerator comes from routinely collected health facility data, the TB patient cards.
2. As many indicators as possible should be chosen for data analysis at the district level, as long as their numerators are measurable with routine health data. **FALSE:** A limited set of core indicators should be selected.
3. Data should be reviewed for quality before data analysis is performed. **TRUE**
4. Service statistics can be used to estimate the size of the target population if coverage is high and data are of high quality. **TRUE**

Multiple choice, choose the best response to the following questions.

5. Which of the following are appropriate for reconciling data analysis findings with estimates:
 - A. Compare data findings from two districts of similar population
 - B. Compare data findings with findings from the same district during the previous reporting period
 - C. Compare data findings with estimates from household surveys
 - D. All of the above
 - E. A and B only

The answer is **C**. Reconciling findings can be done by comparing parallel data sources, comparing findings with estimates from household surveys, and comparing estimates with internationally reported statistics.

6. Selecting appropriate denominators for data analysis includes which of the following:
- A. Estimate population size
 - B. Document your methods and assumptions
 - C. Check your data quality
 - D. All of the above
 - E. A and B only

The answer is **D**. These are the three activities involved in selecting appropriate denominators.

7. Place the steps for data analysis at the district level in the correct order.
- 1) Select a limited set of core indicators
 - 2) Review data quality
 - 3) Select appropriate denominators
 - 4) Reconcile findings with estimates from other sources
 - 5) Communicate key findings

Module 5. Class 3 of 3—Communicating Key Concepts of Data Analysis

Objectives

- Describe the basic steps for presenting data
- Describe how to use graphics to your advantage
- Select appropriate communication methods for different target audiences
- Explain the steps for effective communication.

Topics Covered

- Providing evidence
- Organizing data
- Steps for data presentation
 - Identify audience
 - Find the story in the data
 - Pick the right format
 - Keep it simple
- Enhancing visualization
- Engaging decision-makers
- Steps for effective communication

Discussion Question Suggestions

Ask a question or two that are appropriate for the learners' level of experience and job responsibilities. Allow learners to provide ideas and discuss among themselves before responding.

- 1. What do you think is the most important factor when you are determining how to present data?
- 2. Can you think of a recent instance when your organization could have enhanced visualization in one of their reports?
- 3. Describe your experience communicating results from data analysis. Did you follow the steps described in the lesson? How did you measure the results of your efforts?

4. Is there anything that you learned in this module that you think you will be able to apply to your work? How will you do that?
5. Other (fill in):

References and Resources

- Keihani, K. (2015). 3 Practical Tips for Effective BI Dashboard Design and Implementation. <https://www.smartdatacollective.com/3-practical-tips-effective-bi-dashboard-design-and-implementation/>
- MEASURE Evaluation. (2015). Defining Electronic Health Technologies and Their Benefits for Global Health Program Managers: Dashboards. Chapel Hill, NC, USA: MEASURE Evaluation. <https://www.measureevaluation.org/resources/publications/fs-15-165b>
- MEASURE Evaluation. (2009). Making Findings Actionable: A Quick Reference to Communicating Health Information for Decision-Making. Chapel Hill, NC, USA: MEASURE Evaluation. <https://www.measureevaluation.org/resources/publications/ms-09-39>

Quiz Questions and Answers

Pretest

Select whether each of the following statements is true or false.

1. Raw data should be used directly for decision making. **FALSE**
2. For most indicators, the data and the analysis should be disaggregated. **TRUE**
3. Holding community meetings would be an appropriate communication channel for reaching national-level decision-makers. **FALSE**
4. Assessing the effects of your communication efforts is an important step in effective communication. **TRUE**

Posttest

Select whether each of the following statements is true or false.

1. A routine health information system should provide raw data to decision-makers so that they can see for themselves what the data reveals. **FALSE:** An RHIS should present data in an organized form that is easy to understand and of interest to your audience.
2. For most indicators, the data analysis should be disaggregated, using separate numerators and separate denominators for each group. **TRUE:** Data disaggregation helps identify differences between indicator performance for different subpopulations, facility types, geographic areas, etc.
3. Using complicated graphics is a technique to impress and convince decision-makers. **FALSE:** Keep graphs simple and easy to understand.
4. Health statistics are best presented as rates or coverage. **TRUE:** Absolute numbers are often difficult to interpret and compare with statistics from other geographic regions or time.
5. League tables pull together data from various sources and update automatically with data from different sources. **FALSE:** League tables provide a comprehensive assessment of the overall performance of a national, regional, or district health systems by combining scores from a fixed set of indicators to calculate an index.
6. Setting measurable objectives for your communication efforts defines what you would like to get out of the communication of the health data. **TRUE**
7. Assessing results is an important step of communicating effectively. **TRUE**

Multiple choice, choose the best response to the following questions.

8. Your data analysis shows that public hospital admission rates in Region 1 have been steadily rising over the last four quarters in Districts A, C, and D and remaining constant or falling in districts B, E, and F, while the number and composition of staff has stayed the same. Who would be your target audience for this information?
 - A. Decision-makers for Region 1

- B. Hospital administrators in District F
- C. Hospital staff in Region 1
- D. Community leaders in District A

The answer is **A**. Decision-makers in Region 1 would be best suited to use this information for planning changes in resources to adapt to changes in hospital admission rates.

9. Your data analysis shows that the DPT vaccine dropout rate has been rising in Region B at the same time that no stockouts for DPT have been reported. One of your audiences for this information is the community, who need to be reminded of the importance of vaccination. Your time and funds are limited. What would be the best communication channel for this audience?
- A. Email
 - B. Face-to-face
 - C. Social media
 - D. Video

The answer is **C**. Social media is a way to reach many people with a simple message and does not require great amounts of time or funding.

10. Your district began recognizing facilities with the highest rates of report completeness and timeliness in January 2017 in an attempt to increase the rate of facility-level reports filed completely and on time. Data analysis of these two metrics in January 2018 shows a steady increase in rates of completeness and timeliness for six months. An overall 20% improvement was measured for the year. You would like to share your findings at an international meeting, but you have no funds to attend. What communication channel would be the best?
- A. Community meeting
 - B. Poster
 - C. Report
 - D. Website

The answer is **B**. Sending a poster would be the best way to reach attendees of an international meeting because it can draw attention and convey the message quickly and in an attractive manner.

Module 6. Class 1 of 4—RHIS Data Demand and Use Basic Concepts

Objectives

- Define basic terms regarding data demand and data use
- Describe the data-informed decision-making process
- Identify challenges to data-informed decision-making
- Identify actions that can be taken to strengthen the information culture of an organisation.

Topics Covered

- Data demand and information culture
- Data use
- Review of RHIS data
- Data-informed decision-making process
- Importance of data use at different levels
- Challenges to data-informed decision making

- Strengthening information culture

Discussion Question Suggestions

Ask a question or two that are appropriate for the learners' level of experience and job responsibilities. Allow learners to provide ideas and discuss among themselves before responding.

1. How would you describe the information culture of your organization?
2. How could your organization improve the use of RHIS data?
3. What do you think are the greatest challenges to data-informed decision making?
4. What steps could your organization take to strengthen its information culture?
5. Is there anything that you learned in this module that you think you will be able to apply to your work? How will you do that?
6. Other (fill in):

References and Resources

Ali, A. (2016). Success Stories from the Field-Integrated Family Health Program (IFHP). Ethiopia: Save the Children. DOI: 10.13140/RG.2.2.29304.96003.

Curry, A. & Moore, C. (2003). Assessing information culture: an exploratory model. *International Journal of Information Management*, 23(2):91–110.

Integrated Family Health Program. Improving Family Health: IFHP's Experience From SNNPR. https://www.jsi.com/JSIInternet/Inc/Common/download_pub.cfm?id=15135&lid=3

MEASURE Evaluation. (2011). Tools for data demand and use in the health sector: Framework for linking data with action. Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina. Retrieved from <http://www.cpc.unc.edu/measure/resources/publications/ms-11-46-b>

PATH. (2017). Data Use Partnership: The Journey to Better Data for Better Health in Tanzania. https://path.azureedge.net/media/documents/DHS_health_tanzania_rpt1.pdf

Quiz Questions and Answers

Pretest

Select whether each of the following statements is true or false.

1. In today's environment, data are mostly used to monitor programmes and make decisions about the health system. **FALSE**
2. Review of data should be linked to a specific decision-making process. **TRUE**
3. Reporting and presenting data are sufficient to create demand for data. **FALSE**
4. The data-informed decision-making process is a cycle. **TRUE**
5. Inadequate dissemination of information is a common challenge for data-informed decision making. **TRUE**

Posttest

Select whether each of the following statements is true or false.

1. Data demand is an internal process whereby individuals or organisations ask for data they need to make decisions. **TRUE**
2. Reporting and disseminating data to stakeholder are examples of data use. **FALSE**: Data use means that data has been applied to the decision-making process.

3. The data-informed decision-making process is a cycle; as data is used to make good decisions demand for data grows. **TRUE**

Multiple choice, choose the best response to the following questions.

4. The essential elements that must be present in order for data to be used include:
- A. Capacity, decision-makers, and decisions
 - B. Data, decision-makers, monitoring and evaluation
 - C. Data, questions, and stakeholders
 - D. Decisions, RHIS, and stakeholders

The answer is **C**.

5. Which of the following is NOT a challenge for data-informed decision making?
- A. Apprehension of accountability
 - B. Lack of ownership of data
 - C. Low technical ability to use data
 - D. Overburdened staff
 - E. Too much good quality data

The answer is **E**.

6. Actions that can be taken to strengthen the information culture and the data-informed decision-making process include which of the following?
- A. Hire more data analysts
 - B. Improve organisational capacity, attitudes, norms, and behaviour for demanding and using data for decision making within the organisation
 - C. Limit participation of difficult stakeholders
 - D. All of the above.

The answer is **B**.

Module 6. Class 2 of 4—Linking Data with Action

Objectives

- Describe the “7 Steps Approach” to using data for strategic decision making
- Describe how to use the “Matrix for Linking Data with Action”

Topics Covered

- The “7 Steps Approach” to using data for strategic decision making
- Matrix for linking data with action
- Identifying questions
- Prioritising questions
- Identifying data needs and potential sources
- Analysing data
- Interpreting information and drawing conclusions
- Crafting solutions and taking action

- Monitoring indicators

Discussion Question Suggestions

Ask a question or two that are appropriate for the learners' level of experience and job responsibilities. Allow learners to provide ideas and discuss among themselves before responding.

1. The “7 Steps Approach” should be done by a team. Who would you include on your team?
2. What has been your experience in the past with using data for decision making?
3. Is there anything that you learned in this module that you think you will be able to apply to your work? How will you do that?
4. Other (fill in):

References and Resources

MEASURE Evaluation. (2009). Seven steps to use routine information to improve HIV/AIDS programs: A guide for HIV/AIDS program managers and providers. Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina. <https://www.measureevaluation.org/our-work/data-demand-and-use/7-steps-to-improve-hiv-aids-programs>

Handout 6.2A: Framework for Linking Data with Action. From MEASURE Evaluation Handout 6.2.2. RHIS Curriculum Modules. <https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-6-rhis-data-demand-and-use-1>

Handout 6.2B: Framework for Linking Data with Action - Example. From MEASURE Evaluation Handout 6.2.3. RHIS Curriculum Modules. <https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-6-rhis-data-demand-and-use-1>

Handout 6.2C: Priority Question Scoring Worksheet. From MEASURE Evaluation Handout 6.2.4. RHIS Curriculum Modules. <https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-6-rhis-data-demand-and-use-1>

Quiz Questions and Answers

Pretest

Select whether each of the following statements is true or false.

1. The first step in the “7 Steps Approach” is to identify the data needed to answer priority questions. **FALSE**
2. Questions can be prioritized by evaluating a question's relevance to the programme, if the question is answerable, if the question is actionable, and how much time it will take to answer the question. **TRUE**
3. Data used for the “7 Steps Approach” should be limited to routine service statistics. **FALSE**
4. The “7 Steps Approach” should be carried out by an RHIS policy expert. **FALSE**

Posttest

Select whether each of the following statements is true or false.

1. The “7 Steps Approach” to data-informed decision making is mostly used for programmatic decisions. **TRUE**
2. The “7 Steps Approach” to data-informed decision making can be followed by individuals. **FALSE:** It is a team approach.

3. Questions can be prioritised by considering criteria such as to what degree the question is relevant to the programme, if it is answerable, if you can act on the question, and if other questions need to be addressed more quickly. **TRUE**
4. Key stakeholders should participate in the “data analysis” and “crafting solutions” steps of the approach. **FALSE:** Key stakeholders should be included in the “crafting solutions” and “take action” steps, but their involvement is not needed in the “data analysis” step which can be conducted by the core team.
5. When seeking potential reasons for findings in the data, additional information will often be needed. **TRUE**
6. The PRISM tool creates a timebound plan for data-informed decision making, encourages greater use of existing information, and monitors the use of information in decision making. **FALSE:** The name of this tool is the “Matrix for Linking Data with Action”.

Module 6. Class 3 of 4—Using Data to Inform Facility-Level Management

Objectives

- Explain how RHIS can be used at the facility level
- Describe how to identify the causes of problems indicated by data findings
- Describe how to identify causes of problems when documentation is missing

Topics Covered

- Roles of health facilities for data collection and data use
- Formulating problem statements
- Analysing the process
- Identifying documentation
- Cross-checking records
- Interpreting findings
- Methods of finding root causes of problems
- Crafting solutions/taking action

Discussion Question Suggestions

Ask a question or two that are appropriate for the learners’ level of experience and job responsibilities. Allow learners to provide ideas and discuss among themselves before responding.

1. What is your experience with using data to inform facility-level management? What challenges did you experience?
2. Do you think that in your organization you can easily find the documentation needed for every step when looking at a problem?
3. What method do you prefer when you are looking for the root cause of a problem?
4. Is there anything that you learned in this module that you think you will be able to apply to your work? How will you do that?
5. Other (fill in):

Quiz Questions and Answers

Pretest

Select whether each of the following statements is true or false.

1. Problems identified by data from facilities are usually analysed and solved at a higher level. **FALSE**

2. Comparing documentation of data elements from different records is an important step in identifying the causes of problems. **TRUE**
3. All problem identification should include root cause analysis. **FALSE**
4. When crafting solutions to problems, give priority to those solutions that can be implemented quickly. **TRUE**

Posttest

Multiple choice, choose the best response to the following questions.

1. Pick the best example of a problem statement for problems identified at the facility level.
 - A. Over the course of the year, the percentage of women coming for their first postpartum visit decreased from the desired 75% to 57%.
 - B. Four stockouts of tetanus vaccine were reported in the district in the fourth quarter.
 - C. An increase in the cost of mosquito nets has resulted in fewer nets being distributed by the local nonprofits.
 - D. The bed-occupancy rate for the month of July was 97%.

The answer is **A**. This problem statement comes from the facility level and indicates the desired rate.

2. Place in order the steps to solving a problem identified by data from an RHIS.
 - 1) Analyse the process
 - 2) Identify documentation
 - 3) Cross-check records
 - 4) Interpret findings
 - 5) Craft solutions and take action
3. Which of the following are techniques to identify the cause of problems when adequate documentation is unavailable?
 - A. Group discussion
 - B. Root cause analysis
 - C. Trial of improvement activities
 - D. All of the above
 - E. None of the above

The answer is **D**. These are all ways of identifying the cause of problems when documentation is unavailable.

4. Which of the following statements are true about crafting solutions and taking action?
 - A. Solutions should be chosen by facility administrators who can manage the resources needed.
 - B. Implement several changes at once to make sure that you get results.
 - C. It is important to monitor data to assess the change.
 - D. All of the above
 - E. None of the above

The answer is **C**.

Module 6. Class 4 of 4—Using Data to Inform Community-Level Management

Objectives

- Identify data sets and data elements that are collected at the community level
- Explain the importance of data at the community level for managing health services

Topics Covered

- Data collected at the community level
- How community data are used
- Case studies of community data analysis and use

Discussion Question Suggestions

Ask a question or two that are appropriate for the learners' level of experience and job responsibilities. Allow learners to provide ideas and discuss among themselves before responding.

1. What experience do you have of using data for community-level management? What were the challenges you encountered?
2. How do you think your organization could make better use of community data?
3. Which sources of community data are of greatest value for decision making?
4. Is there anything that you learned in this module that you think you will be able to apply to your work? How will you do that?
5. Other (fill in):

References and Resources

MEASURE Evaluation. (2015). Ethiopia's Family Folders: Small Package...Big Impact. Retrieved from <https://vimeo.com/140829594>

Handout 6.4A: Ethiopia Case Study: Analysis and Use of Data at the Community Level. From MEASURE Evaluation Ethiopia Case Study 2 Handouts Package. RHIS Curriculum Modules. <https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-6-rhis-data-demand-and-use-1>

Quiz Questions and Answers

Pretest

Select whether each of the following statements is true or false.

1. Data at the community level should be collected using paper-based tools. **FALSE**
2. Community-level data include data of a target population, individual and household data, aggregate service data, logistics data, and outreach data. **TRUE**
3. Data are used by community members and organisations to monitor health needs, advocate, and provide accountability. **TRUE**

Posttest

Select whether each of the following statements is true or false.

1. Data are collected at the community level but are rarely used by community health workers. **FALSE:** Community health workers use data for many activities.

2. Pictorial cards and books are no longer appropriate for data collections. **FALSE:** These data collection methods are very appropriate for less literate users.

Multiple choice, choose the best response to the following questions.

3. Which of the following data sets are collected by community health workers at the community level?
- A. Vaccination
 - B. Antenatal care Visit 4
 - C. Malaria
 - D. Under 5 pneumonia
 - E. All of the above

The answer is **E**.

4. How are data commonly collected by community health workers?
- A. District Health Information Software, version 2 (DHIS2)
 - B. Electronic tools on tablets and mobile phones
 - C. PRISM tools
 - D. All of the above

The answer is **B**.

Matching

5. Match who might use data collected at the community level for the following purposes:

| | |
|--------------------------|------------------------------------------------------|
| Community health worker | Identify individual patients/clients and households |
| Community leaders | Monitor community health needs |
| District health system | Detect early warning signals of disease outbreaks |
| Health facility managers | Plan outreach activities (or follow-up on referrals) |

Module 7. Class 1 of 2—RHIS Governance

Objectives

- Define governance
- Identify principles of good governance
- Identify tools for decision making
- Explain the importance of partnerships and coordination for good governance
- Explain the role of regulation and legislation for governance
- Describe how to ensure accountability for RHIS

Topics Covered

- Governance
- Principles of good governance
- Decentralisation
- Tools for decision making
- RHIS policy and strategic planning

- Partnership and coordination
- Regulation and legislation
- Accountability and transparency

Discussion Question Suggestions

Ask a question or two that are appropriate for the learners' level of experience and job responsibilities. Allow learners to provide ideas and discuss among themselves before responding.

1. How would you describe the governance of your RHIS?
2. How could partnerships be encouraged that would reinforce good governance of your RHIS?
3. Name one action you would suggest to ensure accountability for your RHIS?
4. Is there anything that you learned in this module that you think you will be able to apply to your work? How will you do that?
5. Other (fill in):

References and Resources

Management Sciences for Health. (2015). *Leaders Who Govern*. Arlington, VA, USA: Management Sciences for Health. <https://www.msh.org/resources/leaders-who-govern>

Handout 7.1A: United Nations Development Program's Principles of Good Governance. From Institute on Governance. Defining Governance. <https://iog.ca/what-is-governance/>.

Handout 7.1B: Common Tools Used to Enable Subfunctions of Governance in Health. From Barbazza, E. & Tello, J. 2014. A review of health governance: Definitions, dimensions, and tools to govern. *Health Policy*, 116(1): 1–11.

Handout 7.1C: Two examples of National Mechanisms of HIS Coordination and Partnership. From MEASURE Evaluation Handout 7.1.10. RHIS Curriculum Modules. <https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-7-rhis-governance-and-management-of-resources>

Handout 7.1D: RHIS Performance Indicators. Adapted from World Health Organization. (2008). Toolkit on monitoring health systems strengthening, health information systems. Geneva, Switzerland: WHO. http://www.who.int/healthinfo/statistics/toolkit_hss/EN_PDF_Toolkit_HSS_InformationSystems.pdf

Handout 7.1E: Case Study on RHIS Governance in Malawi. From MEASURE Evaluation Handout 7.1.13. RHIS Curriculum Modules. <https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-7-rhis-governance-and-management-of-resources>

Quiz Questions and Answers

Pretest

Select whether each of the following statements is true or false.

1. Governance determines who has power, who makes decisions, how other players make their voices heard, and how accountability is shown. **TRUE**
2. Principles of good governance include authority, speed, and decision making. **FALSE**
3. Regulation such as rules, procedures, decrees, and codes of conduct are important tools for decision making for RHIS. **TRUE**
4. A RHIS can provide proof of performance when plans are completed and approved, when reports are prepared and submitted on time, and when there is evidence that information has been shared and acted upon. **TRUE**

Posttest

Multiple choice, choose the best response to the following questions.

1. The dimensions of governance include which of the following? (Select all that apply.)
 - A. Accountability
 - B. Authority
 - C. Decision making
 - D. Equity
 - E. Strategic vision

The correct answer is **A, B, and C.**

2. Which of the following are principles of good governance as described by the UNDP? (Select all that apply.)
 - A. Consensus orientation
 - B. Cost
 - C. Documentation
 - D. Responsiveness
 - E. Strategic vision

The correct answer is **A, D, and E.**

3. Which of the following are tools for decision making? (Select all that apply.)
 - A. National health plan
 - B. National targets, goals, and performance measures
 - C. Multi-year strategic plan
 - D. Performance-based contracts
 - E. Performance standards, accreditation/licensing/certification

The correct answer is **A, B, C, D, and E.**

4. Which of the following are ways to foster partnership and coordination? (Select all that apply.)
 - A. Create committees, teams, and working groups to conduct needed activities.
 - B. Develop cross-ministry coordination.
 - C. Include representatives from government ministries, institutions with health functions, the private sector, donor agencies, and development projects.
 - D. Invite participation of only stakeholders who generate data.
 - E. Select an RHIS champion to lead the country's RHIS.

The correct answer is **A, B, and C.**

5. Advantages of regulation and legislation for RHIS governance include which of the following? (Select all that apply.)
 - A. Regulation and legislation define responsibilities.
 - B. Regulation and legislation enforce security protections.
 - C. Regulation and legislation include data privacy safeguards.
 - D. Regulation and legislation monitor and coordinate activities.
 - E. Regulation and legislation specify type and content of data to be reported by all.

The correct answer is **A, C, and E.**

6. Examples of RHIS accountability include which of the following? (Select all that apply.)
- A. Core health and service indicators are defined and updated, and data sources confirmed.
 - B. Data-quality monitoring and assessment are conducted, and deficiencies addressed.
 - C. Non-routine data surveys are completed on time.
 - D. Patient and facility records are properly maintained, stored, and protected.
 - E. Staff recruitment and appointment are completed.

The correct answer is **A, B, D, and E**.

Module 7. Class 2 of 2—Management of RHIS Resources

Objectives

- Describe the human, financial, and physical resources needed for an RHIS
- Describe the challenges of managing resources for an RHIS

Topics Covered

- Human, physical, and financial resources needed for an RHIS
- Challenges of RHIS resources management
- Addressing challenges of sustainability

Discussion Question Suggestions

Ask a question or two that are appropriate for the learners' level of experience and job responsibilities. Allow learners to provide ideas and discuss among themselves before responding.

1. Do you think the necessary resources are available for your RHIS?
2. Name one suggestion for how to build capacity for RHIS functions?
3. What challenges are faced to keep your RHIS sustainable?
4. Is there anything that you learned in this module that you think you will be able to apply to your work? How will you do that?
5. Other (fill in):

References and Resources

Heywood, A., & Boone, D. (2015). Guidelines for data management standards in routine health information systems. Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina.
<https://www.measureevaluation.org/resources/publications/ms-15-99>

Handout 7.2A: Common Health Service Subsystems and Related RHIS Functions Needing Staff Development. From MEASURE Evaluation Handout 7.2.3. RHIS Curriculum Modules.
<https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-7-rhis-governance-and-management-of-resources>

Handout 7.2B: Conditions and Challenges that Complicate the Planning and Budgeting of Critical RHIS Funding. From MEASURE Evaluation Handout 7.2.4. RHIS Curriculum Modules.
<https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-7-rhis-governance-and-management-of-resources>

Handout 7.2C: Case Study of Resource Sustainability for Lot Quality Assurance Sampling Health Monitoring in Uganda. From MEASURE Evaluation Handout 7.2.2. RHIS Curriculum Modules.
<https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-7-rhis-governance-and-management-of-resources>

Quiz Questions and Answers

Pretest

Select whether each of the following statements is true or false.

1. Human, physical and financial resources are required at all levels of the health system for an RHIS to perform correctly. **TRUE**
2. RHIS workforce preparation and capacity building are the same for all staff involved in an RHIS. **FALSE**
3. Mobilising and managing resources for RHIS is usually simple and straightforward. **FALSE**
4. Managing RHIS resources requires that needs are identified, and that resources are put in place and developed, and then regularly monitored and maintained. **TRUE**

Posttest

Select whether each of the following statements is true or false.

1. Human, physical, and financial resources are required only at the national level. **FALSE:** Human, physical, and financial resources are required at all levels of the health system for an RHIS to perform correctly.
2. Managing needed resources involves identifying needs, putting resources in place, and monitoring resources regularly. **TRUE**
3. Members of the health workforce who are often needed full-time for RHIS duties include RHIS technical staff, RHIS managers, and data managers. **TRUE**
4. Two of the general challenges to RHIS resource management include donor and external project involvement and limited staff availability to support RHIS functions. **TRUE**

Module 8. Class 1 of 2—RHIS Strengthening Guiding Principles and Pathways

Objectives

- Describe the six components of an RHIS, categorised as inputs, processes, and outputs
- Explain the guiding principles of RHIS development and strengthening
- Identify pathways to RHIS strengthening.

Topics Covered

- RHIS components
- Guiding principles for RHIS development and strengthening
- Determinants affecting RHIS success
- Pathways to strengthen RHIS (improved data quality, improved data use, improved RHIS management)

Discussion Question Suggestions

Ask a question or two that are appropriate for the learners' level of experience and job responsibilities. Allow learners to provide ideas and discuss among themselves before responding.

1. Which of the six guiding principles for RHIS strengthening do you think is the most challenging?
2. Give an example of a technical determinant that affects RHIS outputs. What could your organization do to affect this determinant?
3. What priority areas should your organization look at to strengthen your RHIS?
4. Is there anything that you learned in this module that you think you will be able to apply to your work? How will you do that?

5. Other (fill in):

References and Resources

MEASURE Evaluation. RHIS Curriculum Module 10: RHIS Design and Reform.

<https://www.measureevaluation.org/our-work/routine-health-information-systems/rhis-curriculum-modules/module-10-rhis-design-and-reform>

Quiz Questions and Answers

Pretest

Select whether each of the following statements is true or false.

1. Processes in an RHIS include three system components: indicators, data sources, and data management. **TRUE**
2. RHIS strengthening efforts should be led by specialized projects with minimal input from country leaders. **FALSE**
3. The three pathways for strengthening an RHIS are improved data quality, improved data systems, and improved RHIS monitoring and evaluation. **FALSE**

Posttest

Multiple choice, choose the best response to the following questions.

1. Which of the following RHIS components are considered inputs? (Select all that apply.)
 - A. HIS resources
 - B. Indicators
 - C. Data sources
 - D. Data management
 - E. Information products
 - F. Dissemination and use

The answer is **A**.

2. Which of the following RHIS components are considered outputs? (Select all that apply.)
 - A. HIS resources
 - B. Indicators
 - C. Data sources
 - D. Data management
 - E. Information products
 - F. Dissemination and use

The answer is **E** and **F**.

3. Which of the following are guiding principles for RHIS strengthening? (Select all that apply.)
 - A. Country leadership and ownership
 - B. Build on existing initiatives and systems
 - C. Implement full-scale efforts all at once for greatest impact
 - D. Emphasise integration and interoperability

The answer is **C**.

4. Which are behavioural determinants that affect efforts to improve data quality? (Select all that apply.)

- A. Provider, manager, and director's beliefs about the value of data for client, program, and health system management improvement.
- B. Institutionalized data quality review meetings at all levels of the health system.
- C. Development of standards, tools, applications, guidelines, and supervision systems for data quality assurance at all levels of the health system
- D. Providers and M&E staff skills to collect, manage, and aggregate data
- E. Data architecture that facilitates data quality processes

The answer is **A** and **D**.

Module 8. Class 2 of 2—The RHIS Strengthening Process

Objectives

- Describe the phases in the RHIS strengthening process
- Describe who should lead the RHIS strengthening process
- Identify stakeholders in the RHIS strengthening process and how and when they should be involved in the process
- Explain the importance of building consensus for RHIS strengthening
- Identify tools used for RHIS assessment
- Propose appropriate interventions based on RHIS assessment results

Topics Covered

- Three phases of the RHIS strengthening process
- Identifying leaders of the process
- Engaging stakeholders
- Building consensus
- Choosing RHIS assessment tools
- Defining and prioritizing problems
- Planning for RHIS strengthening
- Implementing, monitoring, and evaluating RHIS strengthening activities

Discussion Question Suggestions

Ask a question or two that are appropriate for the learners' level of experience and job responsibilities. Allow learners to provide ideas and discuss among themselves before responding.

1. Where should your organization start to strengthen your RHIS?
2. Who are the stakeholders you would need to engage and inform about the strengthening process? What would be the best way to engage them?
3. Class 8.2 suggests that RHIS strengthening interventions should be prioritized according to time required, cost, potential for improvement, and availability of resources. Are there any criteria that you think should be added to the list?
4. What did you find in the case study from Liberia that you think applies to your situation? How can you use what you learned?
5. Is there anything that you learned in this module that you think you will be able to apply to your work? How will you do that?
6. Other (fill in):

References and Resources

MEASURE Evaluation. (2018). PRISM Performance of Routine Information System Management Series. <https://www.measureevaluation.org/resources/tools/health-information-systems/prism>

WHO, & MEASURE Evaluation. RHIS Rapid Assessment Tool.

<https://www.measureevaluation.org/resources/tools/rhis-rat/routine-health-information-system-rapid-assessment-tool>

WHO. Data Quality Review Toolkit. https://www.who.int/healthinfo/tools_data_analysis/dqr_modules/en/

World Health Organization. (2018). SCORE for health data toolkit. <https://www.measureevaluation.org/his-strengthening-resource-center/his-assessment-tools/index.html/tool?ToolId=62>

Handout 8.2A: Stakeholder analysis matrix. Adapted from Brinkerhoff, D. and B. Crosby, Managing Policy Reform: Concepts and Tools for Decision-makers in Developing and Transitioning Countries, Kumarian Press, CT, 2002 and POLICY, Networking for Policy Change: An Advocacy Training Manual, 1999.

Handout 8.2C: Performance of RHIS Management in Liberia. Adapted from Rebuilding Basic Health Services Project. 2014. Performance of RHIS Management in Liberia: PRISM Assessment.

Handout 8.2D: Case Study Conclusions and Recommendations. Adapted from Rebuilding Basic Health Services Project. 2014. Performance of RHIS Management in Liberia: PRISM Assessment.

Quiz Questions and Answers

Pretest

Select whether each of the following statements is true or false.

1. The first phase of RHIS strengthening is planning. **FALSE**
2. The RHIS strengthening process should be led by someone in the health ministry who has decision-making power. **TRUE**
3. All stakeholders should be involved in all steps in the RHIS strengthening process. **FALSE**
4. Planning for RHIS strengthening involves defining objectives, proposing and prioritising interventions, and setting a timeline and assigning responsibilities. **TRUE**

Posttest

1. Put the phases of RHIS strengthening in order.
 - 1) Leadership, coordination, and assessment
 - 2) RHIS strengthening process planning
 - 3) Implementation and monitoring and evaluation

Multiple choice, choose the best response to the following questions.

2. Tips for building consensus about the importance of strengthening an RHIS include (select all that apply):
 - A. Choose all three types of interventions (behavioural, organisational, and technical).
 - B. Involve all stakeholders in every step of the RHIS strengthening process.
 - C. Involve donor agencies.
 - D. Involve stakeholders in analysis of data and acknowledge their contributions to promote their ownership of results.
 - E. Prepare and disseminate an easy-to-read RHIS assessment report.

The correct answer is **C, D, and E**.

3. Who are the stakeholders for RHIS strengthening? (Select all that apply.)

- A. Community leaders
- B. Health facility staff
- C. Local civil administration
- D. Ministry of Health officials at all levels of the system
- E. Nongovernmental agencies working in health

The correct answer is **A, B, C, D, and E**.

4. If a country needs to quickly identify gaps in an RHIS system, which would be the best assessment tool to use?

- A. Data Quality Review
- B. Performance of Routine System Management toolkit (PRISM)
- C. RHIS Rapid Assessment Tool
- D. SCORE for Health Data

The answer is **C**.

5. If a country needs to assess data management and reporting systems in health facilities, which would be the best assessment tool to use?

- A. Data Quality Review
- B. Performance of Routine System Management toolkit (PRISM)
- C. RHIS Rapid Assessment Tool
- D. SCORE for Health Data

The answer is **A**.

6. Which of the following is a behavioural intervention that could be used to increase data use in a country's RHIS?

- A. Establish a data warehouse to integrate data sources.
- B. Regularly share success stories of how information was used to improve health facility performance on the Ministry of Health's website.
- C. Institutionalise regular monthly meetings with stakeholders.
- D. Develop standard data management and data use training materials.

The answer is **B**.

KEYWORD/CONCEPT INDEX

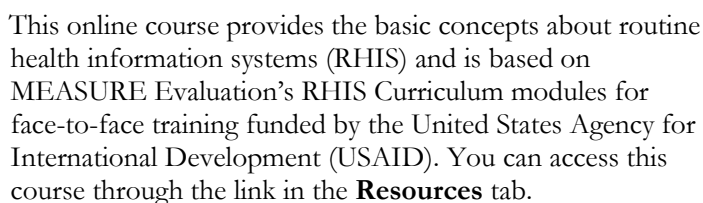
| | |
|----------------------------------------------------------------|----------------------------------------------------------------------------|
| Communicating findings | Module 5, Class 3 |
| Community-level management | Module 6, Class 4 |
| Data analysis | Module 5, Class 1; Module 5, Class 2; Module 5, Class 3 |
| Data collection | Module 1; Module 2, Class 2 |
| Data collection instruments | Module 2, Class 2 |
| Data confidentiality | Module 2, Class 2 |
| Data demand | Module 6, Class 1 |
| Data dissemination | Module 1 |
| Data flow | Module 2, Class 2 |
| Data fragmentation | Module 3, Class 2 |
| Data-informed decision making | Module 6, Class 1; Module 6, Class 2; Module 7, Class 1 |
| Data integration | Module 3, Class 2 |
| Data management | Module 3, Class 1 |
| Data quality | Module 4, Class 1; Module 4, Class 3; Module 5, Class 2; Module 8, Class 1 |
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| Data quality metrics | Module 4, Class 2 |
| Data reporting | Module 1; Module 2, Class 2; Module 5, Class 3 |
| Data Quality Review (DQR) tool | Module 4, Class 3; Module 8, Class 2 |
| Data sources | Module 1 |
| Data use | Module 6, Class 1; Module 8, Class 1 |
| Data verification | Module 4 Class 2 |
| Data visualisation | Module 5, Class 1; Module 5, Class 3 |
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| RHIS Data Quality Conceptual Framework | Module 4, Class 1; Module 4, Class 2 |
| RHIS Rapid Assessment Tool | Module 3, Class 1; Module 8, Class 2 |
| RHIS resources and resource management | Module 1; Module 7, Class 2; Module 8, Class 1 |
| RHIS development and strengthening | Module 8, Class 1; Module 8, Class 2 |
| Performance of Routine System Management (PRISM) toolkit | Module 8, Class 1; Module 8, Class 2 |
| Population size | Module 5, Class 2 |
| Proxy indicator | Module 2, Class 1 |
| SCORE for Health Data Technical Package | Module 8, Class 2 |
| Standards | Module 3, Class 1 |

Routine Health Information Systems: A Curriculum on Basic Concepts and Practice

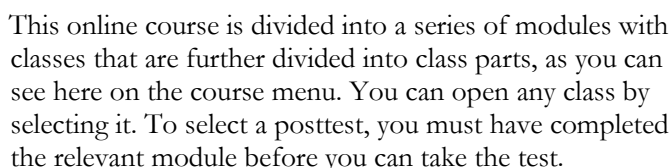
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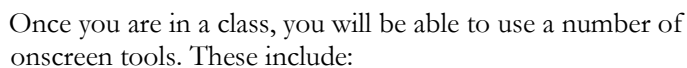


Slide
3



You can see your progress in the check boxes at right and you can check your grades, to the left.

Slide
4



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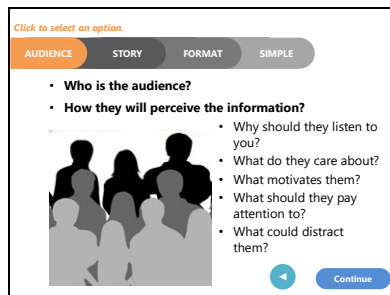
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Slide 5

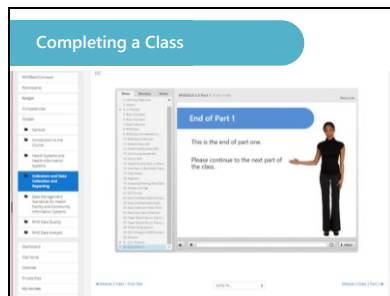


Sometimes, you will be asked to navigate to slides in a different way and the **Next**, and/or **Previous** buttons will not be available.

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Select the **Continue** button, now.

Slide 6



When you complete a class part you may move directly to the next class part or quiz by selecting the link in the bottom-right of your screen, or you can return to the course menu by selecting **RHISBasicConcepts** from the menu at left.

You may return to a class at any time. Note that you may take posttests up to three times. If you want to retake a test more than three times you will need to contact your instructor or the website administrator.

Slide 7



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