Demand and Readiness Tool for Assessing Data Sources in Health Information Systems (HIS DART)

August 2018

USAID
FROM THE AMERICAN PEOPLE

MEASURE Evaluation

Demand and Readiness Tool for Assessing Data Sources in Health Information Systems (HIS DART)

Fern Greenwell, PhD, MPH
Sam Wambugu, MPH, PMP

August 2018

MEASURE Evaluation
University of North Carolina at Chapel Hill
123 West Franklin Street, Suite 330
Chapel Hill, NC 27517 USA
Phone: +1 919-445-9350
measure@unc.edu
www.measureevaluation.org

This research has been supported by the President's Malaria Initiative (PMI) through the United States Agency for International Development (USAID) under the terms of MEASURE Evaluation cooperative agreement AID-OAA-L-14-00004. MEASURE Evaluation is implemented by the Carolina Population Center at the University of North Carolina at Chapel Hill, in partnership with ICF International; John Snow, Inc.; Management Sciences for Health; Palladium; and Tulane University. Views expressed are not necessarily those of PMI, USAID, or the United States government. TL-18-14

ISBN: 978-1-64232-059-6

USAID
FROM THE AMERICAN PEOPLE

MEASURE
Evaluation

ACKNOWLEDGMENTS

The authors thank Shannon Salentine (MEASURE Evaluation, ICF) for the general direction and encouragement she provided throughout this project. For technical input, we thank the following colleagues at MEASURE Evaluation: Manish Kumar (University of North Carolina at Chapel Hill), Tajrina Hai (ICF), Eva Silvestre (Tulane University), Tariq Azim (John Snow, Inc.), and Scott McKeown (Management Sciences for Health).

In addition, for their careful review and overall input concerning data source modules, we extend our gratitude to Denise Johnson and Annah Ngaruro (ICF); Cristina de la Torre (MEASURE Evaluation, ICF); Philip Setel and Martin Bratschi (Vital Strategies); and Ties Boerma (University of Manitoba).

For technical support in the design and production of this tool, including the 12 questionnaires and instructions modules, we warmly acknowledge Beth Robinson (MEASURE Evaluation) and Cindy Young-Turner (ICF). We thank MEASURE Evaluation's knowledge management team for editorial and production services.

Suggested citation: Greenwell, F., & Wambugu, S. (2018). *Demand and readiness tool for assessing data sources in health information systems (HIS DART).* Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina.

CONTENTS

ABBREVIATIONS

ADX	Aggregated Data Exchange
CAPI	computer-assisted personal interviewing
COTS	commercial off-the-shelf
CPT	Current Procedural Terminology
DHS	Demographic and Health Survey
DICOM	Digital Imaging and Communications in Medicine
EHIS	European Health Interview Survey
EMR	electronic medical record
FMIS	financial management information system
GDP	gross domestic product
HAI	Health Action International
HFA	health facility assessment
HIS	health information system
HIS DART	Demand and Readiness Tool for Assessing Data Sources in Health Information Systems
HL7	Health Level 7
HRH	human resources for health
HRIS	human resources information system
ICD	International Classification of Diseases
ICD-10-CM	International Classification of Diseases, Tenth Revision, Clinical Modification
ICHA	International Classification for Health Accounts
ICHA-HC	International Classification for Health Accounts-healthcare functions
ICHA-HF	International Classification for Health Accounts-healthcare financing schemes
ICHA-HP	International Classification for Health Accounts-healthcare providers
ICHI	International Classification of Health Interventions
IHE	Integrating the Healthcare Enterprise
IHR	International Health Regulations
IMCCD	International Medical Certificate Cause of Death
LMIS	logistics management information system
MFL	master facility list

MSH	Management Sciences for Health
NCHS	National Center for Health Statistics
NEML	national essential medicines list
NMP	national medicine policy
OECD	Organisation for Economic Co-operation and Development
PAPI	paper-and-pencil interviewing
PCS	Procedure Coding System
PES	postenumeration survey
PSU	primary sampling unit
SCORE	Survey, Count, Optimize, Review, Enable
SHA	System of Health Accounts
SMoL	Startup Mortality List
SNA	System of National Accounts
UN	United Nations
UNGASS	United Nations General Assembly Special Session
USAID	United States Agency for International Development
WHO	World Health Organization

INTRODUCTION

The purpose of the Demand and Readiness Tool for Assessing Data Sources in Health Information Systems (hereafter, HIS DART) is to guide a systematic review of the demand for HIS data sources and the readiness of these sources to generate comparable data to monitor health system performance. The HIS DART provides an objective appraisal of the alignment of each data source with relevant national and international standards. Conducting this kind of review across data sources is important, because countries need objective evidence as a basis for prioritizing HIS-strengthening investments.

Each of the HIS DART modules corresponds to one of the 12 data sources introduced in the companion reference guide: Health Information System Strengthening: Standards and Best Practices for Data Sources (Greenwell & Salentine, 2018). The guide is available here: https://www.measureevaluation.org/resources/publications/tr-17-225. The United States Agency for International Development (USAID)-funded MEASURE Evaluation invested in the development of both the reference guide and the HIS DART, because, despite a growing menu of resources available to assess aspects of HIS, there was not a tool that focused specifically on the data source component of the national HIS. An array of technical standards, national and international, guide the implementation and modernization of HIS data sources, and the data sources are amenable to an objective assessment against these standards.

The HIS DART is a standards-based assessment in which the data sources are evaluated with respect to adopted standards. The questionnaires are designed to capture information that informs health authorities and other stakeholders about the alignment of data sources with these standards. To the extent that national data sources align with standard definitions, classifications, and coding mechanisms, as described in detail in the reference guide, then the data generated are valid and can be compared within countries over time, as well as across countries. If the data compiled are complete and accurate, then, in addition to being valid, the data are also reliable.[1]

Content and Methods

The HIS DART consists of a set of 12 HIS data source modules, with each module containing a questionnaire accompanied by detailed instructions, question by question, to help the administrator and respondents to elicit, convey, and record valid information. These modules are presented in this publication. The questionnaires for each module are available as editable Excel files and printable pdf files here: https://www.measureevaluation.org/resources/tools/dart/.

Depending on the data source, the number of questions in a questionnaire ranges from 15 to 30 (Table 1). The questionnaires contain skip patterns, so that questions that are not applicable do not require a response. Given that it is a standards-based assessment, the questionnaires require little or no adaptation.

[1] Valid data are those that correspond with that which is desired to be measured, hence, the importance of standard definitions, classifications, and coding. Reliable data are those that produce stable and consistent results.

Table 1. HIS data source modules and the number of questions per module

Title of module	Number of questions
Module 1: Individual records	17
Module 2: Health infrastructure information system	18
Module 3: Human resources for health information system	30
Module 4: Logistics management information system	30
Module 5: Financial management information system	14
Module 6: Health facility assessment	17
Module 7: Population census	13
Module 8: Population-based survey	15
Module 9a: Civil registration vital statistics system: Birth and death registration Module 9b: Civil registration vital statistics system: Cause of death certification	31 24
Module 10: Public health surveillance system	30
Module 11: Collective intervention records	24
Module 12: Health accounts	16

Where to Administer It

On the one hand, the HIS DART is grounded in data source standards, and therefore it is applicable to any country that aims to meet those standards. On the other hand, MEASURE Evaluation and other development partners prioritize the introduction of HIS resources to counterparts in low- and middle-income countries where they are actively supporting those countries to implement and strengthen the national HIS.

When to Administer It

The HIS DART may be most useful if it is applied before an annual or mid-term review of the progress and performance of the national health strategy[2] or the HIS strategy. It can be administered periodically to compare results and monitor the strengthening of the HIS over time.

Who Should Administer It

A designated person at the central level, such as a national HIS specialist working in the health ministry or in another governmental or non-governmental agency, would be qualified to lead the administration of the HIS DART. An international expert working closely with national HIS specialists may also be qualified. The designated person does not need in-depth knowledge about all the data sources, but he or she should ensure

[2] International Health Partnership+ & World Health Organization. (2011). *Monitoring, evaluation and review of national health strategies. A country-led platform for information and accountability.* Geneva, Switzerland: World Health Organization. Retrieved from http://www.internationalhealthpartnership.net/fileadmin/uploads/ihp/Documents/Tools/M_E_Framework/M%26E.framework.2011.pdf

that the required information is solicited from the appropriate data source specialist. This will likely require consultation and coordination with specialists across departments within the health ministry as well as with specialists in other agencies, depending on where the data source is housed.

Expected Results

The HIS DART can be completed within a few days if the designated lead person at central level is able to coordinate the required input from the data source specialists. We recommend that the information is obtained separately with each data source specialist, because the questions are quite specific and in some cases may need follow-up investigation to provide the information. The questionnaires may be printed out and filled in manually or completed electronically in the downloadable Excel version. Every effort should be made to respect the skip patterns and consult the detailed instructions provided in this document for each module.

Results on "Readiness"

Responses recorded in each of the questionnaires provide for results on the readiness of data sources to generate valid data: that is, data that are aligned with relevant standards. Each questionnaire module provides information on the following areas, roughly in this order:

1. Enabling environment of the data source in terms of legislation governing the collection and management of the data, and other regulations that guide the type and frequency of data collection, and the compilation and analysis of them
2. Attributes of the data that the data source generates as they relate to international or national standards. This information applies to relevant definitions, classifications, coding mechanisms, and methodologies that ensure that data can be statistically analyzed and compared over time and across units of analysis (e.g., facilities, subnational areas, or across countries).
3. Mechanisms of data collection (paper or electronic) and data exchange (interoperability)
4. Indicators of coverage, completeness, and quality

No adaptation of the questionnaires is required. If a country wants to make adaptations, then bear in mind that changes may compromise the comparability of results. However, a country may choose to expand responses to capture additional qualitative data, such as to specify an "other" category. These additional qualitative data may serve to document a richer context of the HIS environment that is useful for national stakeholders and that would not affect comparability of the basic results.

The tool was originally envisioned to produce automated results, but this version does not. Please see Next Steps.

Results on "Demand"

In addition to coordinating the completion of questionnaires, the designated HIS DART lead person is responsible for quantifying the relative demand for data from each data source. One way to do this is by mapping the data needed to compute each core health indicator to the data source—or its data *sources,* if an indicator draws data from more than one source—required to compute each indicator. Examples of the results

of this exercise using the World Health Organization (WHO) Global Reference List of 100 Core Indicators[3] and the Sustainable Development Goal indicators[4] are in Greenwell & Salentine (2008, pp. 11–12).

We recommend that countries carry out a similar mapping exercise, using their set of core health indicators. These indicators typically monitor performance of the health system and are defined in a national health strategy document and other plans and policies that define the country's vision, priorities, and courses of action (WHO, 2016).[5]

Alignment with WHO's Survey, Count, Optimize, Review, Enable (SCORE)

The information collected in the HIS DART can be used as a resource for enhancing other HIS assessment exercises. For example, MEASURE Evaluation's development of HIS DART paralleled the development of WHO's SCORE for health data technical package. The first three strategies in SCORE—"S" (survey population and health risks), "C" (count births, deaths, and causes of death), and "O" (optimize health service data)—also focus on the functioning of data sources. There may be opportunities to complement the results from SCORE with information from the HIS DART questionnaires.

Next Steps

Developers of the current version of HIS DART anticipate useful feedback from countries where it has been implemented. This feedback will serve to further streamline the questions and response categories, to help improve the tool before it is programed into an electronic application. An electronic application would take into account skips and logic functions, thus making the data more internally consistent prior to analysis. Based on the level of demand for administering the tool, an investment in automating the results may be justified; however, given the complexity of some of the skips and checks, it may not be feasible to automate all the results. A tabulation plan with detailed explanations of the contents is called for, to disseminate a summary and interpretation oriented toward decision makers about the demand and readiness of each data source, and where investments to strengthen the HIS may be the most worthy.

---

[3] World Health Organization (WHO). (2015). *Global reference list of 100 core health indicators.* Geneva, Switzerland: WHO. Retrieved from http://apps.who.int/iris/bitstream/10665/173589/1/WHO_HIS_HSI_2015.3_eng.pdf

[4] United Nations Economic and Social Council. (2016). *Report of the inter-agency and expert group on sustainable development goal indicators.* Statistical Commission, forty-seventh session, March 8–11, 2016. Retrieved from https://unstats.un.org/unsd/statcom/47th-session/documents/2016-2-IAEG-SDGs-Rev1-E.pdf

[5] World Health Organization. (2016). National health policies, strategies and plans: Why are national health policies, strategies and plans important? Retrieved from http://www.who.int/nationalpolicies/about/en/

MODULE 1

Individual Records

Module 1 Introduction

A comprehensive and standardized classification and coding system the patient level identifies medical diagnoses and procedures provided by physicians and other medical personnel. Public health officials at all levels use these codes for diverse health-related activities, for example, to monitor public health trends, conduct disease surveillance, and billing or claims reimbursement for healthcare services (Greenwell & Salentine, 2018). Module 1 contains questions on the reporting and compilation of data from individual records.

Excerpt from Module 1 Questionnaire

Module 1 Questionnaire: Individual Records			
No.	QUESTION	RESPONSE	SKIPS
1	Information on diseases and other conditions helps track a patient's health as well as monitor the country's healthcare delivery system. Does [COUNTRY] routinely compile data on diagnoses or morbidity conditions of inpatients?	YES NO	SKIP TO Q9
2	Does [COUNTRY] routinely compile data on reasons for office visits and other outpatient healthcare settings?	YES NO	
3	Has [COUNTRY] passed a law or established another legal basis for collecting diagnosis-specific morbidity data?	YES NO	
4	Has [COUNTRY] adopted a morbidity classification with a specific coding system for diagnoses or reasons for visits to healthcare providers?	YES, OFFICIAL VERSION YES, UNOFFICIAL VERSION NO	SKIP TO Q7
5	Is the morbidity classification and coding system based on ICD-10?	YES NO	

The complete questionnaire can be accessed at the following link: https://www.measureevaluation.org/resources/tools/dart/. The next section provides instructions for completing the questionnaire.

Module 1 Questionnaire Instructions and Background

Q1. This is a broad question to detect any routine compilation of medical diagnoses on patients who have been admitted to hospital, usually in the form of the main hospital discharge diagnosis.

Q2. This is a broad question to detect any routine compilation of patients' reasons to visit a healthcare facility.

Q3. This question asks whether the country has established a legal basis for collecting diagnosis-specific morbidity data. In the United States, the National Center for Health Statistics (NCHS) is the part of the federal statistical system that is responsible for compiling, analyzing, and disseminating health data, including

data on "diseases and health conditions such as obesity, diabetes, hypertension, cancer, heart disease, stroke, HIV/AIDS, lung diseases, osteoporosis, asthma, allergies, ADHD, arthritis, and pain" (NCHS, 2017).

Q4. This question asks whether the country has adopted a morbidity classification with a specific coding system. The International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) is a system used by physicians and other healthcare providers to classify and code all diagnoses, symptoms and procedures recorded in conjunction with hospital care in the United States. Other countries in Europe and elsewhere have similar morbidity classification and coding systems, although they may not be directly comparable with one another.

Q5. This question asks whether the morbidity classification and coding system is based on ICD-10. ICD is the international standard for reporting diseases and health conditions. It allows for comparisons of conditions between hospitals, regions, and countries, and for comparisons across different time periods (WHO, 2018). The ICD-10-CM (and the previous version, ICD-9-CM) as well as modifications used in many other countries are based on the WHO ICD. Classification and coding systems that conform to ICD conventions have the potential to map diseases and conditions to a common, comparable system.

Q6. This question asks whether the country has mandated that healthcare setting use the standardized classification and coding system to report diagnoses. In the United States, for example, the Health Insurance Portability and Accountability Act that Congress passed in 1996 directs the U.S. Department of Health and Human Services to establish national standards for healthcare information, including classification and coding systems for medical diagnoses and procedures. The Health Insurance Portability and Accountability Act also mandates healthcare organizations to implement these standardized mechanisms to report and exchange data.

The European Parliament passed the 2008 Regulation for Community Statistics on Public Health and Safety at Work, which has started standardized morbidity statistics at the European Union level (European Union, 2014).

Q7. This question assesses the completeness of patient morbidity information and medical diagnoses data that are compiled from all inpatient health facilities or all those on the master facility list (MFL).

Q8. This question assesses the completeness of patient morbidity information and medical diagnoses data that are compiled from all outpatient health facilities or all those on the MFL.

Q9. This question asks whether the country has a medical procedure classification for classifying and coding procedures performed on inpatients. In the United States, the NCHS is responsible for compiling, analyzing, and disseminating health data, including data on "health care use and services delivered by hospitals, hospital emergency and outpatient departments, physicians' offices, nursing homes, home and hospice care agencies, and residential care facilities" (NCHS, 2017). To do this, NCHS uses data from the ICD-10 Procedure Coding System (PCS), which is a procedure classification for classifying procedures performed in hospital inpatient healthcare settings.

Many other countries have similar classifications that may refer to surgical procedures, health interventions, etc. WHO is developing the International Classification of Health Interventions, a common classification that

may be adapted by countries that are not already using a healthcare intervention classification and coding mechanism.

Q10. This question asks whether the country has a medical procedure classification for classifying and coding service interventions provided to outpatients. In the United States, health providers use the Current Procedural Terminology (CPT) to report outpatient interventions, office visits, or emergency department visits.

Internationally, the WHO International Classification of Health Interventions (ICHI) may be adapted to classify the scope of health services, including acute care, primary care, rehabilitation, assistance with functioning, prevention, and public health.

Q11. This is a filter to check whether the country has a medical procedure classification for classifying and coding procedures performed on inpatients.

Q12. This question assesses the completeness of medical procedure (or health intervention) data that are compiled from all inpatient health facilities or all those on the MFL.

Q13. This is a filter to check whether the country has a medical procedure classification for classifying and coding procedures performed on outpatients.

Q14. This question assesses the completeness of medical procedure (or health intervention) data that are compiled from all outpatient health facilities or all those on the MFL.

Q15. This question asks whether the country has electronic medical records (EMRs) that contain information on diagnoses and medical procedures. The collection and aggregation of individual data using EMRs and interoperable databases facilitates their use for epidemiological analysis as well as routine monitoring and evaluation at the local or national level.

Q16. This question assesses the potential for efficiently compiling data on inpatient morbidity and medical procedures.

Q17. This questions asks whether the country has established a casemix or other system. A casemix is a patient classification scheme to group patients, their treatment, and associated costs into standard clinical or diagnostic groups that facilitate reimbursement. In the United States, the Diagnostic Related Group casemix system has been in effect since the 1980s. Other countries around the world use similar systems. Many countries, including Chile, Indonesia, Malaysia, Mongolia, Philippines, United Arab Emirates, Uruguay, and Vietnam, are adapting a standard United Nations University-Casemix Grouper software to implement a system. Casemix methods are developed using the medical diagnostic and medical procedure code sets based on WHO ICD.

Module 1 References

European Union (EU). (2014). *Morbidity statistics in the EU: Report on pilot studies.* Eurostat Statistical Working Papers. Luxembourg: Publications Office of the EU. Retrieved from

http://ec.europa.eu/eurostat/documents/3888793/5858521/KS-TC-14-003-EN-N.pdf/bd959e6e-10ed-4078-915e-308941c02811

Greenwell, F., & Salentine, S. (2018). *Health information system strengthening: Standards and best practices for data sources.* Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina. Retrieved from https://www.measureevaluation.org/resources/publications/tr-17-225

National Center for Health Statistics (NCHS). (2017). *Health statistics: Measuring our nation's health.* NCHS factsheet. Atlanta, GA, USA: NCHS. Retrieved from https://www.cdc.gov/nchs/data/factsheets/factsheet_Measuring_our_Nations_Health.pdf

World Health Organization. (2018). Classifications: ICD purposes and uses. Retrieved from http://www.who.int/classifications/icd/en/

MODULE 2

2

Health Infrastructure Information System

Module 2 Introduction

A health infrastructure information system requires a facility registry, or MFL, as the basis for uniquely identifying the universe of health facilities in a country. The centrally managed, complete inventory of health facilities allows for facility-level infrastructure and other attributes to be maintained and compared across facilities (Greenwell & Salentine, 2018). Module 2 contains questions on the implementation and management of the MFL.

Excerpt from Module 2 Questionnaire

Module 2 Questionnaire: Health Infrastructure Information System

No.	QUESTION	RESPONSE	SKIPS
1	Does [COUNTRY] have a listing of all health facilities in the country (i.e., a facility registry or master facility list [MFL])?	YES, COMPLETE LISTING 1 YES, BUT NOT COMPLETE 2 NO 3	SKIP TO END
2	A strong governance structure underpinning the MFL is necessary to ensure quality and completeness, dissemination and use, and institutionalization and sustainability. [COUNTRY] has a policy or other strategic framework that, at minimum:	YES NO PARTIALLY	
	(a) designates a responsible entity, such as a government unit, academic group, or a steering committee, to lead the design and implementation of the MFL	1 2 3	
	(b) defines the minimally required data elements in the MFL	1 2 3	
	(c) defines procedures for updating the MFL	1 2 3	
3	Where is the MFL housed?	CENTRALIZED MINISTRY OF HEALTH 01 OTHER GOVERNMENT AGENCY 02 NON-GOVERNMENTAL AGENCY 03 OTHER 04 DECENTRALIZED MINISTRY OF HEALTH 11 OTHER GOVERNMENT AGENCY 12 NON-GOVERNMENTAL AGENCY 13 OTHER 14 FEDERATED MORE THAN ONE AGENCY 21	
4	The signature domain of the MFL should include a unique identification for each facility to (1) prevent duplication or omission of facilities from the list, and 2) allow for information to be compared over time and across data sources for individual facilities. Does [COUNTRY] assign a unique identifiers to each health facility?	YES 1 NO 2	SKIP TO Q6
5	What type of coding system is it?	SERIAL NUMBERS 1 INFORMATION BEARING CODES 2 OTHER 3	

The complete questionnaire can be accessed at the following link: https://www.measureevaluation.org/resources/tools/dart/. The next section provides instructions for completing the questionnaire.

Module 2 Questionnaire Instructions and Background

Q1. This question establishes the existence of a national facility registry or MFL.

Q2. This question seeks information about the availability of an MFL policy or a framework in a country. It identifies three basic contents of an MFL framework: the responsible entity, minimum data elements, and procedures for updating it.

A sound governance structure is necessary for the optimal functioning of the MFL. Governance is the process through which rules and decisions are made, authority is granted, and institutions and stakeholders are managed. Governance ensures local ownership; defines procedures, roles, and responsibilities of various entities; and thereby promotes transparency and accountability (USAID, 2017).

Q3. This question identifies the government entity or entities with the mandate for overseeing the management of an MFL in a country. In some countries, MFL management may be the responsibility of more than one entity, (e.g., a government ministry or other agency), or it may be a shared responsibility of national and subnational-level government offices.

Q4. This question asks whether unique identifiers are assigned to each health facility. The *signature domain* in the MFL establishes a fingerprint for a facility and should not change over time. One of these data elements is a unique identifier in the form of a code, which is more efficient for linking and matching than the name or address of a facility.

Q5. This question asks about the type of coding system used. The unique identification code for a health facility can be a code made up of a combination of numbers or an alphanumeric code. Unique codes enable the MFL to easily exchange data with other systems.

Q6. This question asks about minimal data elements in the MFL. In addition to a unique facility code, the MFL should contain these other important data elements: (a) the *facility type* (e.g., private, government, faith based, institutional); (b) the *facility ownership/management,* that is, the name of the entity that oversees the management of the health facility (e.g., government, a faith-based organization, a civil society organization, a company); and (c) the name of *administrative area* in which the facility is located.

Q7. This question asks whether the MFL includes geographical coordinates of the health facility (longitude and latitude).

Q8. This question asks about whether recommended service domain data elements are included in the MFL. Service domain data in the MFL are useful to monitor the health infrastructure, building amenities, and the services available to the population. These items define minimum data elements that should be available in the MFL or be linked to other databases that contain the information.

Q9–Q10. These questions determine whether information in the MFL is regularly updated to keep it current.

Q11. This question seeks to establish the percentage of government-sponsored health facilities in the MFL that are currently providing services.

Q12. This question seeks to establish the percentage of non-government and private-sponsored health facilities in the MFL that are currently providing services.

Q13. This question asks whether the MFL is maintained in an electronic format. An electronic MFL facilitates data exchange with other information systems that have ability to receive and use the data.

Q14. This question seeks to determine the electronic format in which the MFL is maintained. An MFL can be created and maintained using one of an array of digital tools: spreadsheets, databases, or health management information system (HMIS) software. Some are better tailored to data management and exchange than others.

Q15. This question seeks to determine whether the MFL is readily available to users. The value of the MFL is most fully realized when it can be linked to other data sources (e.g., HMIS, logistics management information system [LMIS]) using the same unique facility code. Stakeholders may also need to have access to information in the MFL. The general recommendation is that the MFL should be readily available to users.

Q16. This question asks about the format in which the MFL is provided. When users want to access the MFL, it can be made available in paper or electronic format. There are several ways in which electronic MFL format can be made available, from rigid to interactive and editable formats.

Q17. This question asks whether the MFL has semantic interoperability with any other data systems. For the MFL to exchange data electronically with other information systems, it must have semantic interoperability with those systems. Semantic interoperability is the ability of computer systems to exchange data with consist "content and coding" (Ritz, Althauser, & Wilson, 2014).

Q18. This question asks about the data exchange standards used. Standards provide a common language that enable interoperability between systems and devices. A wide range of standards exist to drive the interoperability of electronic health information. Standards for data exchange include Aggregated Data Exchange (ADX), Fast Healthcare Interoperability Resources (FHIR), Integrating the Healthcare Enterprise (IHE), Digital Imaging and Communications in Medicine (DICOM) and Health Level 7 (HL7).

Module 2 References

Greenwell, F., & Salentine, S. (2018). *Health information system strengthening: Standards and best practices for data sources.* Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina. Retrieved from https://www.measureevaluation.org/resources/publications/tr-17-225

Ritz, D., Althauser, C., & Wilson, K. (2014). *Connecting health information systems for better health: Leveraging interoperability standards to link patient, provider, payor, and policymaker data.* Seattle, WA, USA: PATH and Joint Learning Network for Universal Health Coverage. Retrieved from http://www.jointlearningnetwork.org/resources/connecting-health-information-systems-for-better-health

U.S. Agency for International Development (USAID). (2017). *Master facility list resource package: Guidance for countries wanting to strengthen their MFL. Module 4: MFL governance* Washington, DC, USA: USAID. Retrieved from https://wiki.ohie.org/display/SUB/MFL+Resource+Package?preview=/28836615/28836918/4-MFL%20Governance%20May.pdf

MODULE 3

3

Human Resources for Health Information System

Module 3 Introduction

The purpose of a human resources information system (HRIS) is to provide data to track the status of the workforce in terms of the number, occupation, and geographic distribution of health workers (Greenwell & Salentine, 2018). Module 3 contains questions on the implementation and management of the HRIS.

Excerpt from Module 3 Questionnaire

Module 3 Questionnaire: Human Resources for Health Information System			
No.	QUESTION	RESPONSE	SKIPS
1	Does [COUNTRY] have a national human resources for health (HRH) plan, in the form of a detailed policy or strategic plan?	YES, STAND-ALONE DOCUMENT 1 YES, PART OF NATIONAL HEALTH POLICY/STRATEGY 2 NO 3	SKIP TO Q4
2	Does the HRH plan include: (a) Description of the current HRH situation (b) Estimates of the number and types of health workforce needed (c) Activities to monitor progress toward meeting HRH goals	YES NO 1 2 1 2 1 2	
3	In which year was the HRH plan published or last updated, whichever is most recent? RECORD YEAR	YEAR ☐☐☐☐	
4	Does [COUNTRY] have any national definitions of health workforce occupations?	YES, OFFICIAL DEFINITIONS 1 YES, UNOFFICIAL DEFINITIONS 2 NO 3	SKIP TO Q8
5	Do national definitions for health occupations include those for: (a) Health professionals (b) Health associate professionals (c) Personal care workers in health services (d) Health management and support personnel	ALL OCCUPATIONS / SOME OCCUPATIONS / NO 1 2 3 1 2 3 1 2 3 1 2 3	

The complete questionnaire can be accessed at the following link: https://www.measureevaluation.org/resources/tools/dart/. The next section provides instructions for completing the questionnaire.

Module 3 Questionnaire Instructions and Background

Q1. This question determines whether the country has a policy or strategic plan for human resources for health (HRH), either as an independent document or as part of another document. WHO recommends that countries adopt and implement a national HRH plan as part of a long-term national health strategy aimed to guide workforce needs.

Q2. This question asks about the contents of the HRH plan. The Global Strategy for Human Resources for Health: Workforce 2030 establishes that an HRH plan should include the following the basic elements: information about the current situation, estimates for the number and types of the health workforce needed for the country, and a monitoring and evaluation mechanism for HRH goals.

Q3. This question establishes how current the HRH plan is.

Q4. This question seeks to identify whether the country has national health workforce definitions. To ensure that health workforce data are comparable over time and across national and subnational areas, it is necessary to establish standard definitions of health workforce occupations for types of health professionals, health associate professionals, personal care workers in health services, and health management and support personnel. In addition, to report on international indicators, the national workforce definitions must be able to be mapped to approximately 40 health worker categories of International Standard Classification of Occupations (ISCO) (2008 revision).

Q5. This questions asks about classifications of national definitions for health occupations. Common classifications of health occupations include health professionals (e.g., doctors, nurses), health associate professionals (e.g., lab technicians), healthcare workers in health services (physician employed in a mining company), and health management and support personnel (e.g., accountants, HIS officers, drivers).

Q6. This question seeks to determine how many national health worker occupations are defined.

Q7. This question asks whether the national health worker occupations can be mapped to the ISCO categories. According to the ISCO, 2008 revision, there are about 40 health worker categories.

Q8. This question asks whether the country has a health workforce registry. The WHO minimum data set for a health workforce registry serves as the basis for the routine collection and analysis of the health workforce functional domains, including people entering the workforce, people active in the workforce, and people leaving the workforce.

Q9. This question asks for the year in which the workforce registry was deployed.

Q10. This question asks whether the health workforce registry contains data elements for each health worker. WHO stipulates that a minimum data set with these data elements be maintained in the health workforce registry in order to manage the health workforce information system.

Q11. This question asks whether the country has an electronic HRIS. An updated and accurate HRIS can provide a continuous record of changes in the health workforce and serves as the timeliest source of information.

Q12. This question seeks information on who owns and manages the HRIS and at what level.

Q13. This question asks about the type of electronic system in which the HRIS is managed. An HRIS can be created and maintained using an array of digital tools (e.g., spreadsheets, databases, HMIS software). Some of the tools are better tailored to data management and exchange than others. Indicate the software tool used in managing HRIS in the country.

Q14. This question asks whether the HRIS has semantic interoperability with any other data systems. An HRIS should be designed to exchange data with other HIS, including the MFL. For the HRIS to effectively exchange data electronically with other information systems, it must have semantic interoperability with those systems. Semantic interoperability is the ability of computer systems to exchange data with consistent "content and coding" (Ritz, Althauser, & Wilson, 2014).

Q15. This question asks about the data exchange standards used. Standards provide a common language that enables interoperability between systems and devices. A wide range of standards exist to drive interoperability of electronic health information. Among the standards for data exchange are ADX, FHIR, IHE, DICOM, and HL7.

Q16. This is a filter to check Module 2 for the presence of a facility registry or MFL.

Q17. This question asks whether the HRIS is linked electronically with the MFL.

Q18. This question asks about the lowest level in the healthcare system where HRIS data can be accessed.

Q19. This is a filter to check for the presence of an electronic HRIS.

Q20. This question asks whether the health workforce data are entered and managed in the HRIS.

Q21. This question seeks to determine the percentage of facilities in the public sector that provide health workforce registry data.

Q22. This question seeks to determine the percentage of facilities in the private sector that provide health workforce registry data.

Q23. This question seeks to determine the best estimate number of professional health workers in the public sector registered in the health workforce registry.

Q24. This question seeks to determine the best estimate number of professional health workers in the private sector registered in the health workforce registry.

Q25. This question asks about the last time in years or months (if less than 11 months) when the health workforce registry data in the HRIS were updated.

Q26. This question asks about the frequency in which the health workforce registry data are updated.

Module 3 References

Greenwell, F., & Salentine, S. (2018). *Health information system strengthening: Standards and best practices for data sources.* Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina. Retrieved from https://www.measureevaluation.org/resources/publications/tr-17-225

Ritz, D., Althauser, C., & Wilson, K. (2014). *Connecting health information systems for better health: Leveraging interoperability standards to link patient, provider, payor, and policymaker data.* Seattle, WA, USA: PATH and Joint

Learning Network for Universal Health Coverage. Retrieved from http://www.jointlearningnetwork.org/resources/connecting-health-information-systems-for-better-health

World Health Organization (WHO). (2016). *Global strategy on human resources for health: Workforce 2030*. Geneva, Switzerland: WHO. Retrieved from http://who.int/hrh/resources/globstrathrh-2030/en/

World Health Organization. (n.d.). Classifying health workers: Mapping occupations to the international standard classification. Adapted from International Labour Organization, International standard classification of occupations: International Standard Classification of Occupations 2008. Retrieved from http://www.who.int/hrh/statistics/Health_workers_classification.pdf?ua=1

World Health Organization. (2015). *Minimum data set for health workforce registry, human resources for health information system*. Geneva, Switzerland: WHO. Retrieved from http://www.who.int/hrh/statistics/minimun_data_set/en/

MODULE 4

Logistics Management Information System

Module 4 Introduction

The primary purpose of the LMIS is to manage the logistics of ensuring a smooth supply chain, so that the data it generates are also relevant for monitoring key indicators of health system performance, namely essential medicines (Greenwell & Salentine, 2018). Module 4 contains questions that asses a country's LMIS.

Excerpt from Module 4 Questionnaire

Module 4 Questionnaire: Logistical Management Information System			
No.	QUESTION	RESPONSE	SKIPS
1	The World Health Organization (WHO) recommends that countries adopt and implement a national medicine policy (NMP) as a "commitment to a goal and a guide for action" to define a framework for setting and monitoring medium- to long-term objectives in the pharmaceutical sector. Does [COUNTRY] have an NMP, or if no NMP, any official or unofficial documents that set monitoring objectives in the pharmaceutical sector?	YES, NMP 1 YES, OTHER OFFICIAL DOCUMENT(S) 2 YES, UNOFFICIAL DOCUMENTS 3 NO 4	SKIP TO Q4
2	Does the NMP or other official instrument address core topics that include the following: (a) Equitable availability of essential medicines (b) Affordability of essential medicines	YES NO 1 2 1 2	
3	In which year was the NMP or the unofficial document published or last updated, whichever is most recent? RECORD YEAR	YEAR ☐☐☐☐	
4	A national essential medicines list (NEML) is a government-approved selected list of medicines. Does [COUNTRY] have a defined list of essential medicines, an NEML?	YES, PART OF THE NMP 1 YES, SEPARATE OFFICIAL DOCUMENT 2 YES, AN UNOFFICIAL LIST 3 NO 4	SKIP TO Q7
5	In what year was the NEML last updated? RECORD A ROUND NUMBER	YEAR ☐☐☐☐	

The complete questionnaire can be accessed at the following link: https://www.measureevaluation.org/resources/tools/dart/. The next section provides instructions for completing the questionnaire.

Module 4 Questionnaire Instructions and Background

Q1. This questions asks whether the country has established a national medicine policy (NMP) or any documents that set monitoring objectives in the pharmaceutical sector. The NMP defines a framework for setting and monitoring medium-to long-term objectives in the public and private pharmaceutical sectors. The NMP should encompass objectives that ensure equitable access to effective medicines of assured quality and their rational use by prescribers and consumers. (WHO, 2006, p. xiii).

A national medicine policy may also be called a national drug policy or national pharmaceutical policy. The country may have another official or unofficial document, such as a strategic plan, that contains objectives and strategies (Management Sciences for Health [MSH], 2012, p 4.19).

Q2. This question lists two of the core objectives that a medicine policy should set out to address and accomplish, which provide the basis for monitoring access to medicines (MSH, 2012, p 4.4)

Q3. This questions asks when the NMP was last updated. An NMP should be periodically updated to respond to changes related to the pharmaceutical sector (MSH, 2012, p 4.19).

Q4. This question asks whether the country has a national essential medicines list (NEML). Essential medicines satisfy the priority healthcare needs of the population. The selection may be based on the WHO Model List, and medicines are selected with regard to disease prevalence, evidence on efficacy and safety, and comparative cost-effectiveness. Essential medicines are intended to be available in the context of functioning health systems at all times in adequate amounts, in the appropriate dosage forms, with assured quality, and at a price that the individual and the community can afford.

The total number of medicines on the NEML typically range from around 200 to 450. The NMP or other official document should contain a national list of essential medicines.

Q5. This question asks when the NEML was last updated. WHO regularly updates the global list of essential medicines, with the last update in March 2017 (WHO, 2017). National lists should also be updated regularly to reflect changing priorities in healthcare needs and a strategic procurement selection. The WHO Technical Cooperation for Essential Drugs and Traditional Medicines monitors countries with NEMLs updated within the last five years (WHO, 2006, Figure 14).

Q6. The categories in this question are required for standardizing medicines for monitoring availability, price, quality and safety, and rational use (WHO, 2011):

(a) Name of medicine or drug. This is the nonproprietary or generic name given by an official body for the unambiguous identification of a pharmaceutical substance. The WHO 2017 list of essential medicines, for example, contains 433 medicines (WHO, 2017). (Note that the brand name, proprietary name, originator brand, or trade name is chosen by the manufacturer. For example, the generic medicine acetaminophen has the brand name Tylenol, and the generic medicine diazepam has the brand name Valium.)

(b) Form and dosage. Principal dosage forms include oral administration, injection, and other forms (WHO, 2017). Doses are various strengths of the medicine, such as 10mg, 20mg, 30 mg. Each medicine comes in various doses, which are determined by the manufacturer or pharmaceutical company.

(c) Therapeutic group. Also referred to as indication or reason for use (see MSH, 2015, p. 381, for WHO therapeutic categories).

(d) Core or complementary medicine. Core medicines are defined as efficacious, safe, and cost-effective medicines for priority conditions, based on current and future public health relevance and potential for safe and effective treatment; complementary medicines are essential medicines for priority diseases, for which specialized diagnostics, medical care, or training is needed (WHO, 2017).

(e) Public sector procurement price. The price paid by a public sector purchaser, such as the government, to procure medicines. Different prices may be paid for the same product by the health ministry, the

medicine outlet that supplies the medicine to the patient, and the individual who purchases the medicine (WHO & Health Action International [HAI], 2008, p. 234).

Q7. This question asks about monitoring medicine availability and affordability. Availability means that the essential medicine is in a designated facility or outlet at all times, in adequate quantity, in appropriate dosage forms, with assured quality and affordable price. Affordability is defined as the cost of treatment in relation to income, typically that of the lowest paid unskilled worker compared to the cost of a defined course of treatment for a specific condition.

Q8. A selection of specific medicines should be monitored. Common ones would be HIV, TB and malaria medicines that international development organizations monitor, but the list may include medicines for other conditions. This question asks about distinguishing the total number of medicines by those that are originator brand medicines and those that are generic equivalent medicines (see WHO & HAI, 2008, pp. 231–232, for glossary terms, "brand name" and "generic medicine").

Q9–10. These questions inquire about monitoring availability and affordability.

Q11–12. This is a filter for the presence of an essential medicine list and whether tracer medicines are on the list.

Q13. This question asks whether the country uses an eLMIS to track the supply of medicines. A well-designed, well-operated supply chain is critical to the success of any health system. It ensures that essential health commodities are available to the right clients when they need them. An eLMIS enables logisticians to quickly collect the data needed to make informed decisions, which ultimately improves customer service by minimizing losses and stock imbalances while moving public health commodities more efficiently to where they are needed most.

Note: "Medicine outlet" is a term used to describe a shop that is not owned or run by a pharmacist and that has a limited license. Medicine outlet can also be used more broadly to identify any place in which medicines are sold, such as private retail pharmacies, public outpatient pharmacies and dispensaries, and nongovernmental organization health facilities (WHO & HAI, 2008, p. 233). Types of medicine outlets include licensed pharmacies, private not for profit clinics, and public health facilities. Some countries may also include all outlets in the private sector or across all sectors in which a specific class of medicines may be stocked.

Q14. This question asks whether the eLMIS is linked to a central medical store. A central medical store is typically responsible for the supply chain of medicines and commodities in the public sector. Medicine outlets may be connected to enable seamless ordering of medicines.

Q15. This question determines the main entity responsible for overseeing the day-to-day running of the eLMIS.

Q16. This question asks for the software in which logistics data are managed.

Q17. This question asks whether the eLMIS has semantic interoperability with other data systems. The LMIS should be designed to exchange data with other HIS, including the MFL. For LMIS to effectively exchange data electronically with other information systems, it must have semantic interoperability with those systems. Semantic interoperability is the ability of computer systems to exchange data with consist "content and coding" (Ritz, Althauser, & Wilson, 2014).

Q18. This questions asks about the data exchange standards used. Standards provide a common language that enables interoperability between systems and devices. A wide range of standards exists to drive interoperability of electronic health information. Standards for data exchange include ADX, FHIR, IHE, DICOM, and HL7.

Q19. This question asks whether LMIS data can be linked to health service delivery data at the facility level. For the eLMIS to maximize its usefulness, it should be linked with patient or client consumption data, either at the aggregate level or by linking with patient-based information systems such as EMRs.

Q20–21. These questions verify whether the country has a facility registry or MFL and whether the eLMIS is linked to it.

An MFL is a foundational tool that enable linkages between the eLMIS, individual facilities, and eventually with individual patients in these facilities. In both the eLMIS and health facility data, the facility name and facility code is a common field, which makes data exchange between these two systems possible.

Q22–23. These questions verify whether the country has an NEML and whether essential medicines are harmonized with those in LMIS.

Q24-Q26. These questions ask about the level at which data in the eLMIS can be accessed and updated. The most timely and accurate information on availability and affordability of essential medicines will be that recorded at the place of consumption, or closest to the place of consumption and closest to the time of consumption.

Q27–Q28. These questions address the timeliness and completeness of medicine outlets reporting to the LMIS.

Q29–30. These questions ask about a national survey of medicine prices and availability. WHO and HAI have published a survey method to ascertain medicine availability and affordability (WHO & HAI, 2008). This method can be used to as a way to calibrate or validate information derived from the eLMIS, or in the absence of an eLMIS, as an alternative source of this information.

Module 4 References

Greenwell, F., & Salentine, S. (2018). *Health information system strengthening: Standards and best practices for data sources.* Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina. Retrieved from https://www.measureevaluation.org/resources/publications/tr-17-225

Management Sciences for Health (MSH). (2012). Chapter 4: National medicine policy. In *MDS-3: Managing access to medicines and health technologies*. Arlington, VA, USA: MSH. Retrieved from http://apps.who.int/medicinedocs/documents/s19581en/s19581en.pdf

Management Sciences for Health (MSH). (2015). *International drug price indicator guide*. 2014 edition. Medford, MA, USA: MSH. Retrieved from http://apps.who.int/medicinedocs/documents/s21982en/s21982en.pdf

Ritz, D., Althauser, C., & Wilson, K. (2014). *Connecting health information systems for better health: Leveraging interoperability standards to link patient, provider, payor, and policymaker data*. Seattle, WA, USA: PATH and Joint Learning Network for Universal Health Coverage. Retrieved from http://www.jointlearningnetwork.org/resources/connecting-health-information-systems-for-better-health

World Health Organization (WHO). (2006). *Using indicators to measure country pharmaceutical situations, fact book on WHO level I and level II monitoring indicators*. Geneva, Switzerland: WHO. Retrieved from http://www.who.int/medicines/publications/WHOTCM2006.2A.pdf

World Health Organization (WHO). (2011). *The world medicine situation report 2011, 3rd edition*. Geneva, Switzerland: WHO. Retrieved from http://apps.who.int/medicinedocs/documents/s20054en/s20054en.pdf?ua=1

World Health Organization (WHO). (2017). *WHO model list of essential medicines, 20th list (amended August 2017)*. Geneva, Switzerland: WHO. Retrieved from http://www.who.int/medicines/publications/essentialmedicines/20th_EML2017_FINAL_amendedAug2017.pdf?ua=1

World Health Organization (WHO) & Health Action International (HAI). (2008). *Measuring medicine prices, availability, affordability and price components*. Second edition. Geneva, Switzerland: WHO & HAI. Retrieved from http://www.haiweb.org/medicineprices/manual/documents.html

MODULE 5

5

Financial Management Information System

Module 5 Introduction

A financial management information system (FMIS) integrates and automates government budgeting and accounting processes, including for the health sector. This allows health authorities to execute a budget and track health-related budget disbursements, revenues, and expenditures. An FMIS is the basis for financing universal health coverage, by managing efficient and equitable healthcare delivery (Greenwell & Salentine, 2018). Module 5 contains questions to assess a country's FMIS.

Excerpt from Module 5 Questionnaire

Module 5 Questionnaire: Financial Management Information System

No.	QUESTION	RESPONSE		SKIPS
1	Does [COUNTRY] have an integrated financial management information system (IFMIS)?	YES NO	1 2	 SKIP TO END
2	Is the IFMIS underpinned by a legal framework governing public finances, including: (a) Managing, controlling, and monitoring budget execution (b) Authorization, commitment, and release of funds (c) Basis of accounting (cash or accrual) (d) Reporting requirements (e) Asset management, public investment, and borrowing	YES 1 1 1 1 1	NO 2 2 2 2 2	
3	Where is the FMIS housed?	MINISTRY OF FINANCE TREASURY DEPARTMENT ACCOUNTANT GENERAL DEPT. OTHER GOVERNMENT AGENCY NON-GOVERNMENTAL AGENCY OTHER	1 2 3 4 5 6	
4	Does the FMIS support the ministry of health in budget allocations or accounting functions?	YES NO	1 2	 SKIP TO END
5	Does the FMIS allocate funds budgeted for health by cost center?	YES NO	1 2	

The complete questionnaire can be accessed at the following link: https://www.measureevaluation.org/resources/tools/dart/. The next section provides instructions for completing the questionnaire.

Module 5 Questionnaire Instructions and Background

Q1. This question determines the existence of an FMIS.

Q2. This questions asks about the legal framework underpinning the FMIS. An FMIS needs firm political commitment and clear legal guidance on the roles and responsibilities of all institutions (USAID, 2008). The main components of a legal framework should address the four areas listed in the questionnaire.

Q3. This questions asks where the FMIS is housed. An FMIS is usually owned and managed by a central level government institution such as the ministry of finance or the treasury department.

Q4. This question asks whether the FMIS supports the health ministry in budget allocations or accounting functions. The FMIS should harmonize budgeting and accounting systems across government departments and ministries, including the health ministry.

Q5. This question asks whether the FMIS allocates funds budgeted for health by cost center. A cost center is a department in which budgets are allocated and costs may be charged, but it does not contribute revenue. For example, in the health sector, service units include general services, ancillary services, inpatient services, outpatient services, etc.

Q6. This question asks whether the FMIS allocates funds budgeted for health by program or subprogram. Programs and subprograms may include specific services, or essential health packages, such as HIV/AIDS prevention, treatment, and care services; mental health services; and maternal, newborn, and child health interventions.

Q7. This question asks about health sector accounting modules and systems available in the FMIS. An FMIS consists of several elements with different functions (Diamond & Khemani, 2011). These elements include the following:

- General ledger—tracks revenues and expenditures needed to prepare financial statements
- Budgetary accounting—compares the planned amounts and the actual amounts spent, to inform how much of the planned amount remains
- Accounts payable—the amount *owed* because of purchased goods or services on credit
- Accounts receivable—the amount to be *collected* because of sold goods and services on credit

Q8–Q10. These question aim to ascertain whether there is a harmonized public accounting system for the FMIS (including common budget classifications and types of accounts) between central units and with subnational levels.

Unified budget specifications and charts of accounts are required in all administrative units at national, regional, and local governments and municipalities. Common codes and classifications must be adopted and aligned with standard classifications and with accounting frameworks, such as such as the International Monetary Fund's Government Finance Statistics and the International Public Sector Accounting Standards (USAID, 2008).

Aggregating budget disbursements at the district level, by program or subprogram and by cost center, provides crucial information for moving toward providing universal health coverage. It also provides detailed financial inputs for the health accounts exercise (see Module 12: Health Accounts).

Q11. This question asks about the software that the FMIS uses. Custom-developed applications may be an effective interim solution when transitioning from manual to computerized recordkeeping. They also may be sufficient if the functionality of the system and the number of users is limited.

Commercial off-the-shelf (COTS) packages have standardized core FMIS functions and are designed to avoid the most common problems faced in custom development. The detailed checks and balances built into COTS systems help build and maintain trust and transparency. There is great value in implementing a COTS system

that has been used successfully in other environments and has been certified by an internationally recognized accounting group (Dener, 2011).

Q12–Q13. This question asks about audits of the FMIS. Regular internal and external audits are necessary for quality control assurance. Internal audits are useful to evaluate the extent to which the FMIS processes comply with the national accounting standards. An internal audit should be performed on a quarterly basis or twice yearly (Salomon, 2016).

Q14. This question asks about health-related indicators that can be produced from a well-functioning FMIS.

Module 5 References

Dener, C. (2011). *Public financial management training program. Financial management information systems.* Washington, DC, USA: World Bank. Retrieved from web.worldbank.org/archive/website01531/WEB/IMAGES/PFM_TR-3.DOC

Diamond, J., & Khemani, P. (2005). *Introducing financial management information systems in developing countries.* IMF Working Paper WP/05/196. Washington, DC, USA: International Monetary Fund. Retrieved from https://www.imf.org/external/pubs/ft/wp/2005/wp05196.pdf

Greenwell, F., & Salentine, S. (2018). *Health information system strengthening: Standards and best practices for data sources.* Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina. Retrieved from https://www.measureevaluation.org/resources/publications/tr-17-225

Salomon, S. (2016, March 11). How often are internal audits needed for your organization? [Blog post]. Retrieved from https://www.ispartnersllc.com/blog/how-often-internal-audits-needed-organization/

United States Agency for International Development (USAID). (2008). *Best practices in fiscal reform and economic governance: Introducing integrated financial management information systems.* Washington, DC, USA: USAID. Retrieved from http://blog-pfm.imf.org/pfmblog/files/ifmis_bpn_web1.pdf

MODULE 6

6

Health Facility Assessment

Module 6 Introduction

A health facility assessment (HFA) collects data periodically from a country's network of health facilities to monitor inputs into the health system regarding infrastructure, personnel, medicine, and equipment; and to monitor outputs of the health system regarding the range of services provided and quality of services.

The purposes of an HFA are to (1) enhance the scope of information on health system inputs and outputs (beyond data that are routinely collected), (2) periodically validate comparable data in the routine HIS, and (3) provide subjective information on staff and patient satisfaction and on the patient consultation processes (Greenwell & Salentine, 2018). Module 6 contains questions to assess a country's use of the HFA.

Excerpt from Module 6 Questionnaire

Module 6 Questionnaire: Health Facility Assessment

No.	QUESTION	RESPONSE	SKIPS
1	A health facility assessment (HFA) entails interviews and observations at selected health facilities. Has [COUNTRY] ever conducted an HFA, using either a health facility census methodology or a health facility survey methodology?	YES, CENSUS 1 YES, SURVEY 2 NO 3	 SKIP TO END
2	When was the most recent HFA conducted, at the national or subnational level?	YEAR 1 [2][0][ ][ ] BEFORE 2000 2	 SKIP TO END
3	For the most recent HFA, did [COUNTRY] use or adapt standard questionnaire instruments for collecting data? CIRCLE THE MAIN TYPE OF INSTRUMENT THAT WAS USED OR ADAPTED.	YES, SERVICE PROVISION ASSESSMENT (SPA) 1 YES, SERVICE AVAILABILITY AND READINESS ASSESSMENT (SARA) 2 YES, SERVICE AVAILABILITY MAPPING (SAM) 3 OTHER STANDARD INSTRUMENT 4 NO STANDARD INSTRUMENT 5	
4	Did the most recent HFA measure: (a) Service availability (b) General service readiness (c) Service-specific readiness	YES NO 1 2 1 2 1 2	
5	CHECK MODULE 4 (LMIS), Q4: IF MODULE 4, Q4 = 1, 2, OR 3, GO TO Q6 IF MODULE 4, Q4 = 4, GO TO Q7		

The complete questionnaire can be accessed at the following link: https://www.measureevaluation.org/resources/tools/dart/. The next section provides instructions for completing the questionnaire.

Module 6 Questionnaire Instructions and Background

Q1. This question determines whether a country ever implemented an HFA. A health facility census is an enumeration of all facilities; a health facility survey is an enumeration of a sample of facilities.

Q2. This question determines when the most recent HFA was conducted. WHO recommends that a health facility census be conducted approximately every five years and that a health facility survey to assess service availability and readiness be conducted annually, or biennially, to allow for the results to feed into the health sector review process (WHO, 2013).

Q3. This question asks whether the country used or adapted standard questionnaire instruments to collect data. Standard instruments to assess health service delivery include the Service Provision Assessment tool developed by ICF, the Service Availability Mapping tool developed by WHO, and the Service Availability and Readiness Assessment developed by WHO that takes into account the Service Availability Mapping and Service Provision Assessment approaches as well as drawing on experiences of the International Health Facility Assessment Network.

Q4. This question asks about areas measured by the HFA. An HFA usually has three focus areas: (1) service availability (health infrastructure, core health personnel, and aspects of service utilization); (2) general service readiness (overall capacity of health facilities to provide general health services); and 3) service-specific readiness (capacity of the health facilities to offer a specific service, including the related trained staff, guidelines, equipment, diagnostic capacity, and essential medicines).

Q5. This is a filter to check Module 4 to see whether the country has an NEML.

Q6. This question asks about whether the HFA used the NEML to adapt the questions on availability of medicines and commodities. Ideally, countries have adopted a standard list of essential medicines and commodities in the NEML. If the NEML exists, then the HFA questionnaires should be adapted to medicines in this list.

Q7. In the absence of an NEML, this question asks whether the HFA has been adapted to other national guidance concerning medicines.

Q8. This is a filter to check Module 3 for national definitions of health workers.

Q9. This question asks whether the HFA adapted questions on staffing based on nationally defined health occupations. Ideally, countries have adopted standard definitions of health workers. If these exist, then the HFA questionnaires should be adapted to these national health worker definitions.

Q10. In the absence of national health worker definitions, this question asks whether the HFA has been adapted to existing health occupations.

Q11. This question determines whether certain types or levels of facilities are designated to provide specific services. Examples of service packages are HIV/AIDS prevention, treatment, and care services; mental health services; and maternal, newborn, and child health interventions.

The HFA measures service-specific readiness by collecting information on availability of basic components (e.g., human resources, drugs, equipment) to adequately provide the services.

This question is included, because sometimes a facility will offer a service that it is not officially designated to provide. In such a case, the service-specific readiness score will likely be low, and a country will need to revisit whether to officially designate the facility to provide the service, and better capacitate it, or whether to require the facility to cease further provision of that service.

Q12. The question aims to determine whether the HFA results can be generalized nationally (or subnationally, as applicable). For HFA results to be representative, they may require sampling weights.

Q13. This is a filter to check whether the HFA method was a census or survey.

Q14. This question asks whether the health facility census established or updated a facility registry or MFL. One of the main reasons to conduct a health facility census is to establish or update the list of facilities in a facility register or MFL.

Q15. This is a filter to check Module 2 for the presence of a facility registry or MFL.

Q16. If there is a facility registry or MFL, this question asks whether the sample of facilities was selected from this list.

Q17. This question asks about the percentage of targeted facilities enumerated. The level of completeness of enumeration (the number of facilities enumerated divided by the target number of facilities to enumerate) is a dimension of data quality.

Module 6 References

Greenwell, F., & Salentine, S. (2018). *Health information system strengthening: Standards and best practices for data sources.* Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina. Retrieved from https://www.measureevaluation.org/resources/publications/tr-17-225

World Health Organization (WHO). (2013). *Service Availability and Readiness Assessment (SARA): An annual monitoring system for service delivery.* Reference Manual. Version 2.1. Geneva, Switzerland: WHO. Retrieved from http://www.who.int/healthinfo/systems/SARA_Reference_Manual_Full.pdf

MODULE 7

7

Population Census

Module 7 Introduction

Census results are necessary for effective public administration; for example, population counts are needed for efficient allocations of government funds for health services, and sociodemographic information across small administrative areas informs equity issues. Population estimates based on the census are used to compute many routine health indicators, and the census database constitutes a sampling frame for conducting representative surveys (Greenwell & Salentine, 2018). Module 7 contains questions about the country's national census.

Excerpt from Module 7 Questionnaire

Module 7 Questionnaire: Population Census

No.	QUESTION	RESPONSE		SKIPS
1	A population census is the total process of collecting, compiling, evaluating, analyzing, and disseminating demographic and socioeconomic data pertaining to all persons in a precisely delimited administrative unit, at a fixed point in time.			
	In which year was the most recent national census conducted?	YEAR		
		NEVER TAKEN A CENSUS	2	SKIP TO END
2	Does [COUNTRY] have national legislation that provides for taking a periodic census?	YES	1	
		NO	2	
3	Does [COUNTRY] have national laws or policies governing the confidentiality of information obtained in the census?	YES	1	
		NO	2	
4	Did the census include these standard questions to estimate fertility and mortality:	YES	NO	
	(a) Children ever born alive	1	2	
	(b) Children living	1	2	
	(c) Date of birth of last child born alive	1	2	
	(d) Age of mother at birth of first child born alive	1	2	
	(e) Household deaths in the past 12 months (or other recent period)	1	2	
	(f) Maternal or paternal orphanhood	1	2	
5	Population estimates and projections serve to update the base population count and should be revised regularly to help ensure that the most accurate possible population figures are available for target-setting and for monitoring and evaluation of a range of health-related indicators.			
	[COUNTRY] uses the census base population to produce annual population estimates and projections by age and sex.	YES	1	
		NO	2	SKIP TO Q10

The complete questionnaire can be accessed at the following link: https://www.measureevaluation.org/resources/tools/dart/. The next section provides instructions for completing the questionnaire.

Module 7 Questionnaire Instructions and Background

Q1. The question asks about the most recent national census. The United Nations (UN) recommends that a country conduct a census at least every 10 years, assuming national conditions are favorable.

Q2. This question asks whether the country has national legislation that provides for taking a periodic census. The essential features of a census are as follows: (1) every individual is recorded separately (individual enumeration); (2) a precise territory is defined in which all people are enumerated (universality within a defined territory), (3) the enumeration occurs within a well-defined point of time, for a well-defined reference

period (simultaneity); and (4) the census is conducted at regular intervals so that a comparable series of information is available (defined periodicity) (UN, 2008, paras. 1.8–1.13).

Q3. This question asks whether the country has laws or policies governing the confidentiality of the information obtained in the census. Census legislation should clearly establish and guarantee the confidentiality of individual information so the public is confident in providing complete and accurate information (UN, 2008, para. 1.83)

Q4. This question asks whether the census includes standard questions to estimate fertility and mortality. These are recommended to include in the census, especially in cases in which the civil registration vital statistics are weak, such as registration coverage of less than 90 percent. The census provides an opportunity to collect data for estimating fertility and mortality at national and subnational levels in a cost-effective manner. Nevertheless, if countries desire timely and detailed estimates of fertility and mortality, they must maintain civil registration systems with universal coverage (UN, 2008, paras. 2.168–2.201).

Q5. This question asks whether the country uses the census base population to produce annual population estimates and projections by age and sex. Population estimates and projections are among the most important analytical outputs from the census and are used in computing many health-related indicators. The two main approaches for producing population projections are as follows: (1) fitting a mathematical model to past trends of population size and extrapolating the fitted curve; and (2) using the cohort component method, in which separate projections, usually for five years, are made for births, deaths, and migration for sex- and age-specific groups, and the numbers are added to or subtracted from the base population (International Union for the Scientific Study of Population, n.d.).

Q6. This is a filter to establish how recently a census was conducted. If it was conducted within the last year, or the last calendar year, then population projections and estimates may not be applicable yet.

Q7. This question asks whether population estimates or projections are available for the current year. Population projections are not necessary for the year the census was taken, which is the base year on which the projections are usually based. It may, however, be necessary to correct for under- or over-counting and then ensure that trends are smooth from the previous projections to the forward projections.

Q8. This question asks when population estimates were last produced or updated. Projections are usually done in 5- or 10-year stages. As new information on fertility, mortality, and migration levels becomes available, such as through a national survey or good quality administrative records, the projections may be updated to improve their accuracy.

Q9. This question asks about the smallest administrative area for which population estimates were produced. Population projections are usually done at national level and at the next largest administrative level (e.g., province, region). At smaller administrative levels they may not be accurate unless reliable information on fertility, mortality, and migration is available for small administrative areas.

Q10. This question asks whether the country has digital maps of the current or most recent census enumeration areas. Census area identification maps, or base maps, locate and show the boundaries of all administrative areas for which data are reported in census publications. The official boundaries are useful for

organizing other data collection efforts and linking results across sectors. The provision of a unique, consistent, spatial reference system for the entire country is an essential prerequisite for facilitating the use of demographic data in the health sector and other sectors (UN, 2008, para. 1354).

Q11–12. These questions ask whether a postenumeration survey (PES) was conducted and about the net undercount rate. A PES is a complete re-enumeration of a sample of enumeration areas. The purpose is to assess the degree of coverage error in certain areas or among certain groups, and to assess errors in content for specific questionnaire items.

The basic results from a PES would include estimation of coverage error at the national level (UN, 2008, paras. 1.393–398). A net undercount (or overcount) rate is the percentage of the PES estimate for a given population.

Q13. This question asks about the percentage different of the national population estimate compared to the most recent international annual estimate. Internationally produced population estimates can serve to validate national estimates, and vice versa. If there is a significant discrepancy between the nationally produced and internationally produced estimates, then the national focal point should contact the respective lead agency to explore the reason for the discrepancy and whether an adjustment should be made to either source.

To answer this question, obtain the international projected number from the UN Population Division (United Nations, Department of Economic and Social Affairs, Population Division, 2017) and the U.S. Census Bureau (U.S. Census Bureau, 2017).

Module 7 References

Greenwell, F., & Salentine, S. (2018). *Health information system strengthening: Standards and best practices for data sources.* Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina. Retrieved from https://www.measureevaluation.org/resources/publications/tr-17-225

International Union for the Scientific Study of Population. (n.d.). Population projections: Concepts and methods. Introduction. Retrieved from http://papp.iussp.org/sessions/papp101_s10/PAPP101_s10_020_010.html

United Nations (UN). (2008). *Principles and Recommendations for population and housing censuses, revision 2*. Statistical papers, Series M No.67/Rev.2. New York, NY, USA: UN. Retrieved from https://unstats.un.org/unsd/demographic-social/Standards-and-Methods/files/Principles_and_Recommendations/Population-and-Housing-Censuses/Series_M67Rev2-E.pdf

United Nations, Department of Economic and Social Affairs, Population Division. (2017). World population prospects: The 2017 revision, DVD edition. Retrieved from https://esa.un.org/unpd/wpp/Download/Standard/ASCII/

United States Census Bureau. (2017). International Data Base. Retrieved from https://www.census.gov/data-tools/demo/idb/informationGateway.php

MODULE 8

Population-Based Survey

Module 8 Introduction

Surveys are often the most appropriate data source for monitoring health trends in the population, including non-medical determinants of health such as exposure to chronic disease risk factors, knowledge about disease transmission and treatment, self-reported health and prevalence of symptoms, and coverage of services (Greenwell & Salentine, 2018). Module 8 contains questions on a country's use of population-based surveys.

Excerpt from Module 8 Questionnaire

Module 8 Questionnaire: Population-Based Survey

No.	QUESTION	RESPONSE	SKIPS
1	A population-based health survey is typically a cross-sectional study using interviews to collect data from a sample of individuals. Has [COUNTRY] ever conducted a national population-based survey designed to collect information on risk factors, service coverage, or health outcomes?	YES 1 NO 2	 SKIP TO END
2	When was the most recent survey conducted?	YEAR 1 2 0 _ _ BEFORE 2000 2	 SKIP TO END
3	Does [COUNTRY] have a national law, act, or other legal order that mandates the systematic collection of public health statistics as part of the national health monitoring system?	YES 1 NO 2	
4	Does [COUNTRY] have national laws or policies governing the confidentiality of information obtained in the census?	YES 1 NO 2	
5	For the most recent survey, did [COUNTRY] use or adapt standard questionnaire instruments for collecting data? CIRCLE THE MAIN TYPE OF STANDARD QUESTIONNAIRE INSTRUMENT THAT WAS USED OR ADAPTED	DEMOGRAPHIC and HEALTH SURVEY 1 MULTIPLE INDICATOR CLUSTER SURVE 2 WORLD HEALTH ORGANIZATION WOR 3 EUROPEAN HEALTH INTERVIEW SURVE 4 U.S. NATIONAL HEALTH INTERVIEW SU 5 OTHER STANDARD INSTRUMENT 6 NO STANDARD INSTRUMENT 7	

The complete questionnaire can be accessed at the following link: https://www.measureevaluation.org/resources/tools/dart/. The next section provides instructions for completing the questionnaire.

Module 8 Questionnaire Instructions and Background

Q1. This question asks whether a country ever implemented a population-based health survey.

Q2. This question asks when the most recent population-based health survey was conducted. Large-scale survey programs, such as the Demographic and Health Survey (DHS) and the European Health Interview Survey (EHIS), recommend conducting the cross-sectional surveys every five years.

Q3. This question asks whether the country has a national law or legal order that mandates the collection of public health statistics as part of the national health monitoring system. In the United States, for example, the National Health Survey Act of 1956 mandates that the National Health Interview Survey be conducted regularly since 1957 to collect information on the health of the noninstitutionalized population in the United States (United States Centers for Disease Control and Prevention, 2016).

The EHIS is conducted every five years in the European Union member countries, according to the 2008 European Commission Legislation on Community Statistics on Public Health and Health and Safety at Work (European Commission, 2008).

Q4. This question asks whether the country has national laws or policies governing the confidentiality of information obtained in the census. Principle 6 of the UN Fundamental Principles of Official Statistics requires that individual data collected by statistical agencies for statistical compilation, whether they refer to natural or legal persons, are to be strictly confidential and used exclusively for statistical purposes (UN, 2015).

Q5. This question asks whether the country used or adapted standard questionnaire instruments for collecting data. Standard instruments include those from a global or regional survey programs, such as DHS, the Multiple Indicator Cluster Survey, the WHO World Health Survey, and EHIS. Others include instruments used over and over again in a country, such as the U.S. Health Interview Survey.

Q6. This question asks whether the survey collected data on basic sociodemographic items, health status, healthcare access and utilization, health-related determinants, and health insurance. Basic sociodemographic data include such items as sex, age, education, and marital status. Health status data include such items as perceived health, chronic conditions, functional limitations in daily activities, and disease-specific morbidity. Healthcare access data include such items as hospitalizations, consultations, and preventive care. Health determinants data include such items as risky and healthy behaviors related to smoking, diet, and exercise. Health insurance data include such items as compulsory and voluntary, and social security or insurance company.

Q7. This question asks whether the survey provided representative results. Representative results are derived from probabilistic samples and are designed to statistically reflect members of the target population.

Q8. This question asks about the primary sampling unit (PSU) for the last survey. PSU refers to sampling units that are selected in the first (primary) stage of a multi-stage sample ultimately aimed at selecting individuals. For example, in the two-stage DHS sample, the PSU is typically the census enumeration area, using a census sample frame. In some countries, the sample of individuals may be selected directly from a universal list of the target population, such as from a population register.

Q9. This question asks whether a household listing activity was conducted before data collection. Sample frames are not always up to date; for example, the household census sample frame might be based on a census that was conducted many years ago. A household listing operation may be conducted prior to the main data collection to update occupied households and thus ensure that interviewers who are required to interview only pre-selected households will not encounter households that are no longer occupied since the census (ICF International, 2012).

Q10. This question asks whether the sample was proportionally allocated across subnational populations. Proportionally allocated samples are rarely used, because countries desire to obtain survey estimates at the subnational level for comparison purposes and to identify health-related disparities.

Q11. This question asks whether sample weights were calculated. For disproportionate allocation of sampling units, sampling weights act as inflation factors, which are the frequency that the sampled unit represents in the target population.

Q12. This question asks whether the data capture application supported a list of desired attributes of data capture software.

Q13. This question asks about the application in which the survey data were captured and contains a list of data capture software applications that are used for surveys.

Q14. This question asks whether data were captured through paper-and-pencil interviewing or computer-assisted personal interviewing. Interviewers may record responses using paper-and-pencil interviewing (PAPI) or capture them electronically through computer-assisted personal interviewing (CAPI).

Q15. This question asks about the percentage of sampled households that were interviewed. This is the household response rate, a common indicator of completeness that may affect the quality of results.

Module 8 References

European Commission. (2008). Regulation (EC) No 1338/2008 of the European Parliament and of the Council of 16 December 2008 on community statistics on public health and health and safety at work. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2008.354.01.0070.01.ENG

Greenwell, F., & Salentine, S. (2018). *Health information system strengthening: Standards and best practices for data sources.* Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina. Retrieved from https://www.measureevaluation.org/resources/publications/tr-17-225

ICF International. (2012). Demographic and Health Survey sampling and household listing manual. MEASURE DHS. Calverton, MD, USA: ICF International. Retrieved from https://dhsprogram.com/pubs/pdf/DHSM4/DHS6_Sampling_Manual_Sept2012_DHSM4.pdf

United Nations (UN). (2015). *UN fundamental principles of official statistics: Implementation guidelines.* New York, NY, USA: UN. Retrieved from https://unstats.un.org/unsd/dnss/gp/Implementation_Guidelines_FINAL_without_edit.pdf

United States Centers for Disease Control and Prevention. (2016). 2018 National Health Interview survey questionnaire redesign. *Federal Register, Daily Journal of the United States Government.* Retrieved from https://www.federalregister.gov/documents/2016/10/07/2016-24348/2018-national-health-interview-survey-questionnaire-redesign

MODULE 9

9

Civil Registration and Vital Statistics System

Module 9 Introduction

The civil registration and vital statistics system has two functions, one legal and the other statistical. The legal function is to record, archive, and retrieve information on vital events; the statistical function is to compile data from civil registration records to produce a continuous source of vital statistics. In a well-functioning civil registration system, these records constitute the timeliest and most accurate source of birth and death statistics in a country. Complete and comparable information on causes of death is also an important part of a fully functioning civil registration and vital statistics system (Greenwell & Salentine, 2018). Module 9, which consists of Modules 9A and 9B, contains questions to assess a country's civil registration and vital statistics system.

Module 9A: Registration of Births and Deaths

Excerpt from Module 9A Questionnaire

Module 9a Instructions: Civil Registration and Vital Statistics System—Registration of Events			
No.	**QUESTION**	**RESPONSE**	**SKIPS**
1	Virtually all countries have in place a national civil registration system whose legal and statistical functions are governed by a legal framework. The legal function is to record, archive, and retrieve information on vital events; the statistical function is to compile data from civil registration records to produce a continuous source of vital statistics. [COUNTRY] has legislation that authorizes the creation of a civil registration system.	YES 1 NO 2	 SKIP TO END
2	In what year was the legislation last updated?	YEAR ☐☐☐☐	
3	The United Nations (UN) recommends that national regulation designate 'informants' or 'declarants' as persons required to notify the local civil registrar of the occurrence of a vital event, and its main characteristics, so that the event can be registered. Do civil registration regulations or subsidiary laws designate legal informants or declarants to notify the local civil registrar of:	YES NO	
	(a) Births that occurred in his or her jurisdiction	1 2	
	(b) Deaths that occurred in his or her jurisdiction	1 2	
	(c) Fetal deaths that occurred in his or her jurisdiction	1 2	
4	For vital events to be accurately counted, classified, and compared, the definition of each vital event in a national civil registration and vital statistics system should be aligned with the definitions prepared for statistical purposes by the UN. Does the civil registration legislation or regulations define 'live birth'?	YES 1 NO 2	 SKIP TO Q6
5	Is the definition of 'live birth' aligned with the UN definition?	YES 1 PARTIALLY 2 NO 3	

The complete questionnaire can be accessed at the following link: https://www.measureevaluation.org/resources/tools/dart/. The next section provides instructions for completing the questionnaire.

Module 9A Questionnaire Instructions and Background

Q1. This question establishes the legal presence of a national civil registration system. Nearly all countries have in place a national civil registration system whose legal and statistical functions are governed by a legal framework.

Q2. This question determines the year in which the legislation was last updated. The year gives an indication of how current the legislation might be.

Q3. This question asks whether civil registration regulations or subsidiary laws designate legal informants or declarants. The informant or declarant should be legally bound to supply accurate information on births, deaths, and stillbirths for the legal purposes of registration, as well as to ensure accurate data for statistical purposes of registration.

Typically, the law or other regulation stipulates that the medical personnel who was present at the birth is obligated to issue a certificate attesting to its occurrence and characteristics, to serve as proof to the local registrar that the event took place. In a case in which there was no medical assistance, there may be other documentation required, such as a health record or a letter from a local authority. Documentary evidence is preferable to that of a witness, and the latter should be accepted only in the absence of documentation. For a death, a burial permit or letter from a local authority may be among the required documentation for notifying the event.

Q4–5. These questions ask about the definition of a live birth. The UN definition of a live birth is the same as the WHO definition (WHO, 2011; UN, 2014):

Live birth: The complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered live born (all live-born infants should be registered and counted as such, irrespective of gestational age or whether alive or dead at the time of registration, and if they die at any time following birth, they should also be registered and counted as deaths).

Q6–7. These questions ask about the definition of a death. The UN definition of a death is the same as the WHO definition:

Death: The permanent disappearance of all evidence of life at any time after live birth has taken place (postnatal cessation of vital functions without capability of resuscitation) (WHO, 2011; UN, 2014). (This definition excludes fetal deaths, which are defined separately below.)

Q8–9. The UN definition of a fetal death is the same as the WHO definition (WHO, 2011; UN, 2014):

Fetal death: Death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy; the death is indicated by the fact that after such separation the fetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical

cord or definite movement of voluntary muscles (note that this definition broadly includes all terminations of pregnancy other than live births, as defined above).

The legal requirements for the registration of fetal deaths vary from country to country. It is recommended that dead fetuses weighing 500 grams or more at birth (or those fetal deaths of 22 completed weeks of gestation or crown-heel body length of 25 centimeters or more if weight is not known) be registered. In addition, for statistical purposes, it is recommended that such terminology as "abortion," "early fetal death," and "late fetal death" be replaced through the use of weight-specific measures (e.g., the fetal death rate for fetuses of 1,000 or more grams or the fetal death rate for fetuses weighing between 500 and 1,000 grams).

Q10–14. These questions cover data collection forms for births and deaths. Basic data collection forms should be used in all civil registration centers, and they should contain the minimal set of standard data elements. The UN has recommended data elements on core topics to be collected through the civil registration system for vital statistics purposes (UN, 2014, Section III.B).

Q15–16. These questions capture the total number of reporting sites for births and deaths. This information can be used to calculate a crude measure of the density of civil registration services, namely, the number of sites per 10,000 population.

Q17. This question establishes whether the country has an electronic system to capture birth and death registration data. Electronic records offer timely use of data compared to paper-based records that are often transferred physically to central level, at infrequent intervals, for archiving purposes.

Q18. This question identifies the managing entity of the electronic system to capture birth and death registration data and the location of the system. The electronic system for routine summary data on reportable conditions, if available, is housed and managed by an agency or a number of agencies. For example, it could be at the national registration authority, the ministry of information communication and technology, or the central statistical office. They system may be decentralized; for example, in the United States, each state has a system to manage vital events data.

Q19. The question asks about the format of the electronic system. There are different formats of databases for managing data, and one or several may be used, especially if the system is being rolled out or modernized.

Q20. This question refers to interoperability between the civil registration system and the health sector that notifies events. Semantic interoperability is the ability of computer systems to exchange data with consist "content and coding" (Ritz, Althauser, & Wilson, 2014).

Q21. This question asks about the data exchange standards used in the system. Standards provide a common language that enable interoperability between systems and devices. A wide range of standards exist to drive interoperability of electronic health information. Standards for data exchange include ADX, FHIR, IHE, DICOM, and HL7.

Q22–25. These questions provide information on the format, transmission mechanism, and frequency of birth registration data received at central level.

Q26–29. These questions provide information on the format, transmission mechanism, and frequency of death registration data received at central level.

Q30–31. These questions ask about the birth and death registration coverage for the most year available. National registration authorities should keep track of registration coverage to ensure that civil registration is a continuous and universal service.

Module 9B: Cause of Death

Excerpt from Module 9B Questionnaire

Module 9b Instructions: Civil Registration and Vital Statistics System—Cause of death				
No.	QUESTION	RESPONSE		SKIPS
32	Has [COUNTRY] authorized a person by law to certify the cause of death?	YES NO	1 2	 SKIP TO Q33
33	Who is legally authorized to medically certify the cause of death? CIRCLE ALL THAT APPLY	PHYSICIAN OR SURGEON WHO ATTENDED THE DECEASED MEDICAL PRACTITIONER WHO EXAMINED THE BODY CORONER OR MEDICAL-LEGAL OFFICER NURSE/MIDWIFE OTHER MEDICAL TRAINED PERSON LAYPERSON	A B C D E F	
34	Has [COUNTRY] adopted the International Form for the Medical Certificate of Cause of Death (IMCCD)?	YES, ALIGNED WITH CURRENT INTERNATIONAL PRESCRIBED FORMAT (WHO 2016) YES, ALIGNED WITH AN OLD INTERNATIONAL PRESCRIBED FORMAT NO	1 2 3	 SKIP TO Q4
35	Does the IMCCD form capture whether a woman was pregnant, or had recently been pregnant, at the time of death?	YES NO	1 2	
36	Are all causes of death on the IMCCD form coded with International Classification of Diseases (ICD)?	YES, CONSISTENTLY YES, SOMETIMES NO MULTIPLE CAUSES NOT RECORDED	1 2 3 4	

The complete questionnaire can be accessed at the following link: https://www.measureevaluation.org/resources/tools/dart/. The next section provides instructions for completing the questionnaire.

Module 9B Questionnaire Instructions and Background

Q32. This question asks whether the country has authorized a person to certify cause of death. A certifier of cause of death is authorized by law to certify the circumstances (accident, suicide, homicide, natural causes) and the specific disease, injury, or other causes of death (UN, 2014, para. 195).

Q33. This questions asks about who is authorized to medically certify the cause of death. Medical certification of the cause of death is usually the responsibility of the physician or surgeon who attended the deceased in his or her last illness. For medically unattended deaths, or deaths believed to have been due to violence (accident, suicide, homicide), a medical-legal officer (coroner or medical examiner) is often designated to certify the causes of death (UN, 2014, para. 196).

Q34. This questions asks whether the country has adopted the International Medical Certificate of Cause of Death (IMCCD) form. If the causes of death are determined by a medically qualified individual or a medical-

legal officer, the diseases or injuries should be reported and recorded in the format and detail contained in the most current version of the IMCCD form (UN, 2014, para. 496; WHO, 2010, section 4.1.3)

Q35. This question asks whether the IMCCD form captures whether a woman was pregnant or had recently been pregnant at time of death. To improve the quality of maternal mortality data and provide alternative methods of collecting data on deaths during pregnancy or related to it, as well as to encourage the recording of deaths from obstetric causes occurring more than 42 days following termination of pregnancy, the Forty-third World Health Assembly in 1990 adopted the recommendation that countries consider the inclusion on death certificates of questions regarding current pregnancy and pregnancy within one year preceding death.

Q36. This question asks all causes of death on the IMCCD form are coded using ICD. To provide a comprehensive and comparable tool for identifying causes of death and diseases in general, WHO developed the ICD, currently in its eleventh revision, although most countries use ICD-10. The ICD is designed to translate diagnoses of diseases and other health problems from words into an alphanumeric code, which permits easy storage, retrieval, and analysis of data.

Q37. This question asks whether the underlying cause of death is clearly identified on the IMCCD form. The immediate and antecedent causes of death can be used to assess the relative contributions of different diseases and conditions to mortality. The underlying cause of death, however, provides the most useful information for public health purposes, because it is the disease or condition that could be prevented or cured, thus breaking the chain of events leading to death. The underlying cause of death is defined as "(a) the disease or injury which initiated the train of morbid events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury" (WHO, 2010, section 4.1.2).

Q38. This question asks about the agency responsible for coding causes of death. In some countries, coding of causes on the IMCCD is centralized at national level by trained coders in the health ministry, central statistical office, national registrar, or other agency. In other countries, coding may be decentralized by coders in one of these agencies. If there are multiple locations and agencies where deaths are coded, the main one should be recorded in the questionnaire.

Q39. This question asks for the source list of the ICD cause of death codes. The full ICD-10 has more than 14,400 codes, of which about 10,000 are possible causes of death when coded with 4 alphanumeric characters, and about 1,600 possible causes of death when coded with 3 alphanumeric characters. The ICD-10 Startup Mortality List (SMoL) has about 100 possible causes of death, with potential for expansion by countries.

The ICD-10 special tabulation lists for mortality and morbidity include mortality tabulation list 1, condensed list of 130 causes, and mortality tabulation list 2, selected list of 80 causes. These are tabulation lists for tabulating the full list of causes and should not be used for primary coding purposes.

Verbal autopsy results can be mapped to about 65 ICD-10 codes (WHO, 2016b).

Q40. This question asks whether the country routinely compiles medically certified cause of death data at the central level. Data must be compiled at central level for authorities to be apprised of patterns of deaths across

the country and to produce national cause of death indicators. If answered affirmatively, this question starts a series of questions about compilation at the national level.

Q41. This question asks about the agency responsible for compiling official cause of death data. Sometimes the collection, coding, and compilation of cause of death information is not harmonized. For example, it may be captured by the health sector on the IMCCD and by the local registrar on the death registration form, and coded by neither or independently by both.

Q42–Q44. These questions provide information on the format, transmission mechanism, and frequency of cause of data received at the central level.

Q45. This is a filter to identify the reporting format of cause of death data.

Q46. This question asks about the format of individual-level cause of death data. Data are readily analyzed if causes of death have ICD codes.

Q47. This questions asks about which causes are used to produce official cause of death statistics. Underlying cause of death is the single most important cause for public health purposes, but multiple causes in addition to the underlying cause are also informative in research. The immediate cause of death should not be used for public health purposes.

Q48. This question asks whether the individual ICD codes are linked to data in the death registration record. Much richer analyses of cause of death data are possible when the data are linked to data in the death registration record.

Q49–53. These questions ask about verbal autopsy. Many countries have difficulty in medically certifying all deaths, especially those in the community, and choose to implement the verbal autopsy method for deaths that are not medically certified. The probable cause of death assigned following review of the verbal autopsy information could be used to investigate causes of non-medically certified deaths at the population level. The method for assigning cause of death for verbal autopsy differs from ICD rules and instructions, so the verbal autopsy results should not be mixed indistinguishably with medically certified causes of death (WHO, 2016b).

Q54. This question asks about the percentage of registered deaths that have a medically certified cause of death. Ideally, all registered deaths should have a medically certified cause of death. They often do not, however, for various reasons, including lack of medically qualified persons to certify causes of death and lack of processes in place to ensure that causes of death are certified.

Q55. This question asks about the percentage of coded deaths that are coded as ill-defined underlying cause of death. There are two types of ill-defined causes of death: (1) symptoms, signs, and abnormal clinical findings not defined elsewhere (ICD-10, Chapter XVIII, R codes); and (2) vague or unspecific diagnoses that can be found throughout most of the other ICD-10 chapters. The percentage of ill-defined causes among all causes may indicate the quality of cause of death statistics.

Module 9 References

Greenwell, F., & Salentine, S. (2018). *Health information system strengthening: Standards and best practices for data sources.* Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina. Retrieved from https://www.measureevaluation.org/resources/publications/tr-17-225

Ritz, D., Althauser, C., & Wilson, K. (2014). *Connecting health information systems for better health: Leveraging interoperability standards to link patient, provider, payor, and policymaker data.* Seattle, WA, USA: PATH and Joint Learning Network for Universal Health Coverage. Retrieved from http://www.jointlearningnetwork.org/resources/connecting-health-information-systems-for-better-health

United Nations (UN). (2014). *Principles and recommendations for a vital statistics system.* Statistical Papers, Series M, No. 19/Rev.3. New York, NY, USA: (UN). Retrieved from http://unstats.un.org/unsd/Demographic/standmeth/principles/M19Rev3en.pdf

World Health Organization (WHO). (2011). *International statistical classification of diseases and related health problems, 10th revision. Volume 2: Instruction manual.* Geneva, Switzerland: WHO. Retrieved from http://www.who.int/classifications/icd/ICD10Volume2_en_2010.pdf

World Health Organization (WHO). (2016a). *International statistical classification of diseases and related health problems, 10th revision. Volume 1: Tabular list, fifth edition.* Geneva, Switzerland: WHO. Retrieved from apps.who.int/iris/bitstream/10665/246208/1/9789241549165-V1-eng.pdf

World Health Organization. (2016b). WHO verbal autopsy instrument. Retrieved from http://www.who.int/healthinfo/statistics/verbalautopsystandards/en/

MODULE 10

10

Public Health Surveillance System

Module 10 Introduction

A public health surveillance system is the continuous systematic collection, compilation, analysis, and dissemination of data on reportable diseases and other events that present a potential threat to public health security. Indicator-based surveillance monitors the frequency, origin, and distribution of reportable national and international diseases. The data are typically structured according to case definitions, and they enter the health system through a patient encounter at an outpatient consultation or inpatient admission, or a patient encounter with a health worker in the community (Greenwell & Salentine, 2018). Module 10 contains questions to assess a country's public health surveillance system.

Excerpt from Module 10 Questionnaire

Module 10 Questionnaire: Public Health Surveillance System			
No.	QUESTION	RESPONSE	SKIPS
1	The International Health Regulations (2005) define public health surveillance as, "the systematic on-going collection, collation and analysis of data for public health purposes and the timely dissemination of public health information for assessment and public health response as necessary." [COUNTRY] has legislation, policy, or other official instruments in place for the national implementation of IHR (2005).	YES 1 NO 2	SKIP TO Q3
2	Does the legislation or other official instruments: (a) Designate a national IHR focal point which is the national center for IHR implementation (b) Address the coordination and integration of relevant sectors in the implementation of the IHR	YES NO 1 2 1 2	
3	Reportable (or notifiable) conditions include diseases, injuries, and hazardous events that are required to be reported to government authorities following clinical or laboratory diagnosis. [COUNTRY] has a national list of reportable conditions that are identified as potential public health risks.	YES 1 NO 2	SKIP TO Q11
4	In what year was the list of reportable conditions last updated?	YEAR ☐☐☐☐	
5	What is the total number of reportable conditions, including immediate, case-based reporting and routine summary reporting?	TOTAL ☐☐☐	

The complete questionnaire can be accessed at the following link: https://www.measureevaluation.org/resources/tools/dart/. The next section provides instructions for completing the questionnaire.

Module 10 Questionnaire Instructions and Background

Q1. This question to ascertains whether the country has adopted appropriate legislation or government instruments for national implementation of the International Health Regulations (IHR) (2005), namely, the effective detection, assessment, notification, and reporting of public health events in accordance with the IHR (2005). The IHR (2005) constitute a legally binding instrument designed to "to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks without interfering with international traffic and trade" (WHO, 2005).

Q2. This question asks whether the country's legislation or official instruments designate a national IHR focal point and address the coordination and integration of relevant sectors in the implementation of the IHR. One hundred ninety-four countries agreed to have IHR (2005) implemented by June 2012. A national IHR focal point and multisectoral coordination are necessary to implement IHR. The two parts of this question are as follows:

(a) National IHR focal point is the national center for communications and should be accessible at all times to communicate with the WHO IHR regional contact point.
(b) Relevant sectors for public health surveillance include the health and sanitation, environment, law enforcement, border control, customs, agriculture, animal surveillance, etc.

Q3. This question asks whether the country has a national list of reportable conditions that are identified as potential public health risks. Reportable (or notifiable) conditions are causes of illness and death in the population that can cause epidemics, that can be controlled and prevented, and that can be identified using standard or community case definitions. Each country should identify and maintain a list of reportable priority conditions to be included in the public health surveillance system.

Q4. The selection of priority conditions for surveillance, and their periodic review can be achieved through a prioritization exercise conducted at approximately 5-yearly intervals (refer to the WHO Guideline on prioritization of diseases for surveillance) (WHO, 2006).

Q5. This question asks about the total number of reportable conditions on the national list. The number should include both immediate case-based reporting, which is for epidemic-prone diseases that are required to be reported to designated government authorities within 24-hours—by phone, e-mail, or other electronic means; and routine summary reporting, which is reporting on the number of cases and deaths associated with reportable conditions, within a defined period, to monitor levels and identify outbreaks (Government of Ghana, Ministry of Health, National Surveillance Unit, 2002).

Q6–8. These questions ask about the distribution of reportable conditions by required reporting intervals.

Q9. This question asks how many of the reportable conditions on the national list have corresponding case definitions. A case definition can be a standard case definition, which is a definition applied by health professionals at health centers and hospitals to classify a case as confirmed or suspected. These definitions are based on clinical criteria, laboratory criteria, or a combination of the two. A case definition may also be a community case definition, which is a simplified standard definition for community health workers to identify suspected cases (Ethiopia Federal Ministry of Health and The Open University, n.d.). If a condition has both types of case definition, only the standard case definition should be counted.

Q10. This question asks about whether conditions are reported to WHO. The country must notify WHO of the first category that includes four conditions, regardless of circumstances (WHO, 2005, Annex 2).

The second category includes conditions that have potentially serious public health impact. The IHR Decision Instrument should be applied to determine whether the country should notify WHO.

Q11–17. These questions gauge completeness of reporting and the capacity to monitor reportable conditions.

Q18. This question asks whether the country performs core laboratory tests to confirm indicator pathogens. Laboratory diagnostic capacity can help in detecting emerging or reemerging pathogens in a timely manner and can support syndromic surveillance systems by adding specificity. Countries should be able to perform core diagnostic tests (either through their own or through network capacity) quickly and reliably to confirm indicator pathogens.

The six core laboratory tests in the IHR (2005) are as follows: two from the IHR immediately notifiable list, three from the WHO Top Ten Causes of Death in low-income countries, and one from the WHO Global Foodborne Infections Network. In addition, four country-specific pathogens should be selected on the basis of national public health concerns (these are not included on the list in Q18) (Ijaz, et al., 2012).

Q19–21. These questions establish whether the country has an existing electronic system that captures epidemiological data, and whether it captures the reportable conditions, and if so, how many of them.

Q22. This question identifies the managing entity for the electronic system and the level of health system where it is located. The electronic system for routine summary data on reportable conditions, if available, is housed and managed by an office or a number of offices and officers.

Q23. This question asks about the type of electronic system in which the routine summary data are managed. There are different formats of databases for managing surveillance data, and one or several may be used for data on reportable conditions.

Q24. This question asks whether the electronic system has semantic interoperability with other data systems. Semantic interoperability is the ability of computer systems to exchange data with consist "content and coding" (Ritz, Althauser, & Wilson, 2014).

Q25. This question asks about the data standards used. Standards provide a common language that enables interoperability between systems and devices. A wide range of standards exist to drive interoperability of electronic health information. Standards for data exchange include ADX, FHIR, IHE, DICOM, and HL7.

Q26–27. These questions ask whether the electronic system is linked to the facilities or the MFL. The facility register, or MFL, enables linkages between the public health surveillance system and updated information on facilities. The use of common facility codes is necessary for data exchange and linking with other types of data that also use the same facility codes, for example, individual records (e.g., EMR), eLMIS, and human resources for health.

Q28–29. These questions ask whether the electronic system is linked to a laboratory system.

Q30. This question asks whether the electronic system also captures immediate, case-based reports. An effective electronic public health surveillance system should ideally be configured to generate immediate, case-based reports.

Module 10 References

Ethiopia Federal Ministry of Health & The Open University. (n.d.). Communicable diseases module. Study session 41. Integrated disease surveillance and response. Retrieved from http://www.open.edu/openlearncreate/mod/oucontent/view.php?id=127&printable=1

Government of Ghana, Ministry of Health, National Surveillance Unit. (2002). *Technical guidelines for integrated disease surveillance and response in Ghana.* Accra, Ghana: Government of Ghana, Ministry of Health. Retrieved from http://www.moh.gov.gh/wp-content/uploads/2016/02/Integrated-Disease-Surveillance-and-Response-Ghana-Guidelines.pdf

Greenwell, F., & Salentine, S. (2018). *Health information system strengthening: Standards and best practices for data sources.* Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina. Retrieved from https://www.measureevaluation.org/resources/publications/tr-17-225

Ijaz, K., Kasowski, E., Arthur, R., Anglo, F., & Dowell, S. (2012). International Health Regulations—What gets measured gets done. *Emerging Infectious Diseases, 18*(7). Retrieved from https://wwwnc.cdc.gov/eid/article/18/7/12-0487-t2

Ritz, D., Althauser, C., & Wilson, K. (2014). *Connecting health information systems for better health: Leveraging interoperability standards to link patient, provider, payor, and policymaker data.* Seattle, WA, USA: PATH and Joint Learning Network for Universal Health Coverage. Retrieved from http://www.jointlearningnetwork.org/resources/connecting-health-information-systems-for-better-health

World Health Organization (WHO). (2005). *International health regulations (2005).* Second edition. Geneva, Switzerland: WHO. Retrieved from http://apps.who.int/iris/bitstream/10665/43883/1/9789241580410_eng.pdf

World Health Organization (WHO). (2006). *Communicable disease surveillance and response systems: Guide to monitoring and evaluating.* Geneva, Switzerland: WHO. Retrieved from http://www.who.int/csr/resources/publications/surveillance/WHO_CDS_EPR_LYO_2006_2.pdf

MODULE 11

Collective Interventions

11

Module 11 Introduction

Collective interventions are diverse services or programs at the community level whose purpose is to improve or maintain the overall health and safety of the target population. They include health prevention and promotion services that aim to (1) avoid disease and risk factors in the general population; (2) detect disease as early as possible through population screening, for more timely, less costly, less invasive, and more successful intervention outcomes; and (3) improve the health system's effectiveness, efficiency, and equity for the benefit of all users (Greenwell & Salentine, 2018).

Collective interventions are healthcare activities that have financial allocations and expenditures related to them, and they have an impact on public health. For this reason, they are important for the government to monitor, even though by definition the community-level activity or program is not tied to a specific individual or health facility. The data source for such activities is less likely to be a standardized, routinely maintained, central database, although such a database would help monitor implementation and related costs.

Module 11 is aligned with the two collective intervention categories defined in the international classification for health accounts (ICHA) used in the System of Health Accounts (SHA) 2011, namely, preventive care (HC.6) (Organisation for Economic Co-operation and Development [OECD], Eurostat, & WHO, 2011, pp. 100–104) and governance and health system and financing administration (HC.7) (OECD, Eurostat, & WHO, 2011, p. 106).

Excerpt from Module 11 Questionnaire

Module 11 Questionnaire: Collective Interventions				
No.	QUESTION	RESPONSE		SKIPS
1	Does [COUNTRY] monitor any information, education, and counseling (IEC) programs to enable individuals in the community to protect and improve their health and safety (HC.6.1)? For example, mass media campaigns to: - Reduce substance abuse and overconsumption of alcohol - Provide information on healthy behavior related to diet, exercise, and sedentary lifestyles - Promote self-protection to avoid injuries due to road accidents	YES NO	1 2	 SKIP TO Q4
2	Name one IEC program that is currently monitored: _____			
3	For this IEC program, is information readily available on the: (a) Reference period for delivery or implementation (b) Geographical areas targeted (c) Populations targeted within the area (general population or specific age, sex, or other groups) (d) Entity responsible to deliver or implement the intervention	YES 1 1 1 1	NO 2 2 2 2	
4	Does [COUNTRY] monitor any immunization programs that help to prevent vaccine-preventable diseases (HC.6.2)? For example, vaccine campaigns or continuous immunization operations to reduce or eliminate diseases such as: -Diphtheria -Hepatitis -Herpes zoster -HPV -Influenza -Measles -Meningococcal infections -Mumps -Pertussis (whooping cough) -Pneumococcal infections -Polio -Rabies	YES NO	1 2	 SKIP TO Q7

The complete questionnaire can be accessed at the following link: https://www.measureevaluation.org/resources/tools/dart/. The next section provides instructions for completing the questionnaire.

Module 11 Questionnaire Instructions and Background

Q1–Q3. These questions aim to identify collective intervention activities that fall into the preventive care activity of "Information, education and counseling programs" (HC.6.1) (OECD, Eurostat, & WHO, 2011, p. 103).

Q4–Q6. These questions aim to identify collective intervention activities that fall into the preventive care activity of "Immunization programs" (HC.6.2) (OECD, Eurostat, & WHO, 2011, p. 103).

Q7–Q9. These questions aim to identify collective intervention activities that fall into the preventive care activity of "Early detection programs" (HC.6.3) (OECD, Eurostat, & WHO, 2011, pp. 103–104).

Q11–Q12. These questions aim to identify collective intervention activities that fall into the preventive care activity of "Health condition monitoring programs" (HC.6.4) (OECD, Eurostat, & WHO, 2011, p. 104).

Q13–Q15. These questions aim to identify collective intervention activities that fall into the preventive care activity of "Epidemiological surveillance and risk and disease programs" (HC.6.5) (OECD, Eurostat, & WHO, 2011, p. 104).

Q16–Q18. These questions aim to identify collective intervention activities that fall into the preventive care activity of "Preparing for disaster and emergency response programs" (HC.6.6) (OECD, Eurostat, & WHO, 2011, p. 106).

Q19–Q21. These questions aim to identify collective intervention activities that fall into the preventive care activity of "Governance, and health system and financing administration" (HC.7.1) (OECD, Eurostat, & WHO, 2011, pp. 106–107).

Q22–Q24. These questions aim to identify collective intervention activities that fall into the preventive care activity of "Administration of health financing" (HC.7.2) (OECD, Eurostat, & WHO, 2011, p. 107).

Module 11 References

Greenwell, F., & Salentine, S. (2018). *Health information system strengthening: Standards and best practices for data sources.* Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina. Retrieved from https://www.measureevaluation.org/resources/publications/tr-17-225

Organisation for Economic Co-operation and Development (OECD), Eurostat, & WHO. (2011). *A system of health accounts.* Paris, France: OECD. Retrieved from http://www.who.int/health-accounts/methodology/sha2011.pdf?ua=1

MODULE 12

Health Accounts

12

Module 12 Introduction

Health accounts measure healthcare spending and track funds that flow through the health system from their origin, to agencies that pool and distribute the money, to providers who engage in healthcare activities, and finally to beneficiaries of the activities. The SHA provides a standard framework for recording, classifying, and summarizing health consumption expenditures for the whole set of health system transactions within a defined functional healthcare boundary (Greenwell & Salentine, 2018). Module 12 contains questions to assess a country's health accounts.

Excerpt from Module 12 Questionnaire

Module 12 Questionnaire: Health Accounts

No.	QUESTION	RESPONSE			SKIPS
1	Health accounts (HA) provide a systematic description of the financial flows related to the consumption of healthcare goods and services. They describe a health system from an expenditure perspective.				
	[COUNRY] has produced health accounts that summarize healthcare consumption by type of healthcare activity, provider, and financing source.	YES NO		1 2	 SKIP TO END
2	In which year were the most recent HA conducted?	YEAR			
3	Has [COUNTRY] produced a time series of HA, that is, health accounts for at least one other time period?	YES NO		1 2	 SKIP TO Q5
4	In which year were the previous HA, prior to the most recent HA?	YEAR			
5	How does [COUNTRY'S] healthcare boundaries compare with the groups of activities comprising the common, international healthcare boundary, as defined in the System of Health Accounts? The national boundaries include consumption (expenditures) of:	YES	PARTIALLY	NO	
	(a) Health promotion and prevention activities	1	2	3	
	(b) Diagnosis, treatment, cure, and rehabilitation of illness	1	2	3	
	(c) Caring for persons affected by chronic illness	1	2	3	
	(d) Caring for persons with health-related impairment and disability	1	2	3	
	(e) Palliative care	1	2	3	
	(f) Community health programs	1	2	3	
	(g) Governance and administration of the health system	1	2	3	

The complete questionnaire can be accessed at the following link: https://www.measureevaluation.org/resources/tools/dart/. The next section provides instructions for completing the questionnaire.

Module 12 Questionnaire Instructions and Background

Q1–Q4. These questions help determine whether there is a system in place to regularly conduct health accounts. From a value-for-money perspective, there are many advantages to planning for a regular production of health accounts, perhaps annually or every two years. This will provide trend information as well as snapshots of the health system (OECD, Eurostat, & WHO, 2011).

Q5. This question asks about the country's healthcare boundaries. To compare health expenditures over time, or with other countries, countries must define their national healthcare boundaries, that is, a clear description of what is in and out of national healthcare services for the purposes of health accounts.

Questions 6–11 are organized around the SHA three core classifications of healthcare expenditures that enable comparison over time and between different areas: (1) function, (2) provider, and (3) health financing scheme. Standard categories within these three classifications are defined in the ICHA: ICHA healthcare functions (ICHA-HC), ICHA healthcare providers (ICHA-HP), and ICHA financing schemes (ICHA-HF).

Q6–Q7. These questions ascertain whether there is a national list of healthcare functions (i.e., healthcare goods and services), and whether the functions can be mapped to the ICHA-HC categories (OECD, Eurostat, & WHO, 2011, Table 5.1).

Q8–Q9. These questions ascertain whether there is a national list of healthcare providers, and whether the providers can be mapped to the ICHA-HC categories (OECD, Eurostat, & WHO, 2011, Table 6.2).

Q10–Q11. These questions ascertain whether there is a national list of healthcare financing schemes, and whether the schemes can be mapped to the ICHA-HF categories (OECD, Eurostat, & WHO, 2011, Table 7.2).

Q12. This question asks whether the country has combined with most recent SHA results with System of National Accounts (SNA) macroeconomic data to produce expenditure indicators. SNA, as distinct from the SHA, serves to classify activities of the whole national economy, including the production and consumption of the healthcare sector. Measures derived from the SNA, such as gross domestic product (GDP), may be used together with SHA results to produce common health expenditure indicators such as current health expenditure (from SHA) as a percentage of GDP (from SNA), showing the consumption of healthcare by the resident population relative to national income (i.e., the burden of healthcare expenditures on total government funds).

Q13. This question asks whether the country has produced health subaccounts. Country-level analyses have focused on disease-specific subaccounts, such as HIV/AIDS, providing information on overall allocations, distribution of spending between preventive and curative care, and patterns of international financing (Izazola-Licea, et al., 2002). The reporting of expenditure on HIV/AIDS is now a global effort and is part of the United Nations General Assembly Special Session (UNGASS) on HIV/AIDS annual report.

Expenditure by disease and condition analyses should be produced regularly, such as every three to five years if possible (Beratungsgesellschaft für angewandte Systemforschung [BASYS], Centre for European Policy Studies [CEPS], & Inspection Générale de la Sécurité Sociale [IGSS], 2006).

Q14. This question asks about the subaccounts produced. The list includes some disease and condition-specific health accounts.

Q15. This question asks whether the country has produced health accounts by subnational geographic region. Health accounts analyses by subnational region may lead to more effective allocations of healthcare resources and provide insights into inequalities in healthcare provision.

Q16. This questions asks whether routine quality checks are performed. OECD, Eurostat, & WHO (2011, p. 351) provides further details on these quality checks:

- In the tri-axial approach, the total expenditures should be the same for healthcare functions, providers, and financing. Quality checks include ensuring that the totals reported agree with the sums of the constituent parts.
- Identical items with identical classifications that appear in different tables should have the same value.
- Another set of quality checks should look into the plausibility of the indicators in relation to the totals, in relation to the population (per capita data), in relation to GDP, and in relation to historical values (percentage change from year to year, growth rates). Although the percentage shares and growth rates considered reasonable vary across countries, the relative changes should be within predetermined ranges of acceptability.

Module 12 References

Beratungsgesellschaft für angewandte Systemforschung (BASYS), Centre for European Policy Studies (CEPS), & Inspection Générale de la Sécurité Sociale (IGSS). (2006). *Feasibility study of health expenditures by patient characteristics.* Augsburg, Germany: BASYS. Retrieved from https://circabc.europa.eu/webdav/CircaBC/ESTAT/health/Library/reports/caresgroup/sha/characteristics/shapatientcharacteristics_final_11august2006.pdf

Greenwell, F., & Salentine, S. (2018). *Health information system strengthening: Standards and best practices for data sources.* Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina. Retrieved from https://www.measureevaluation.org/resources/publications/tr-17-225

Izazola-Licea, J.A., Avila-Figueroa, C., Arán, D., Piola, S., Perdomo, R., Hernández, P., Saavedra-López, J.A., & Valladares-Cardona, R. (2002). Country response to HIV/AIDS: National health accounts on HIV/AIDS in Brazil, Guatemala, Honduras, México and Uruguay. *AIDS, 16,* Suppl. 3, 566–575. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/12685927

Organisation for Economic Co-operation and Development (OECD), Eurostat, & WHO. (2011). *A system of health accounts.* Paris, France: OECD. Retrieved from http://www.oecd.org/publications/a-system-of-health-accounts-2011-9789264270985-en.htm

MEASURE Evaluation
University of North Carolina at Chapel Hill
123 West Franklin Street, Suite 330
Chapel Hill, NC 27517 USA
Phone: +1 919-445-9350
measure@unc.edu
www.measureevaluation.org

This publication was produced with the support of the United States Agency for International Development (USAID) under the terms of the MEASURE Evaluation cooperative agreement AID-OAA-L-14-00004. MEASURE Evaluation is implemented by the Carolina Population Center, University of North Carolina at Chapel Hill in partnership with ICF International; John Snow, Inc.; Management Sciences for Health; Palladium; and Tulane University. Views expressed are not necessarily those of USAID or the United States government. TL-18-14

ISBN: 978-1-64232-059-6

USAID
FROM THE AMERICAN PEOPLE

MEASURE
Evaluation