ETHIOPIAN SIMPLIFIED VERSION OF ICD11 (ESV-ICD11)

Implementation Guide

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POLICY, PLAN, MONITORING AND EVALUATION DIRECTORATE
MOH

Forward

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Acronyms

CRVS	Civil Registration and Vital Statistics
DHIS2	District Health Information Software Version 2
ESV	Ethiopian Simplified Version
ICD 11	International Classification of Disease Version Eleven
GBD	Global Burden of Disease
HEW	Health Extension Worker
HIT	Health Information Technicians
HMIS	Health Management Information System
ICD	International Classification of Disease
ICU	Intensive Care Unit
IPD	Inpatient Department
M&E	Monitoring and Evaluation
MoH	Ministry of Health
NCoD	National Classification of Disease
NICU	Neonatal Intensive Care Unit
NTF	National Task Force
OPD	Outpatient Department
PMT	Performance Review Meeting Team
SNOMED	Systematized Nomenclature of Medicine
SOP	Standard Operating Procedures
TOT	Training of Trainers
UHC	Universal Health Coverage

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Chapter 1: Introduction

1.1 Disease Recording & Reporting in Ethiopia: An Overview

Understanding why people get sick and die in specific geographical areas is critical to plan and execute appropriate promotional, preventive, and therapeutic health interventions to reduce the magnitude of morbidity and mortality in the population. This effort requires a well-functioning health information system (HIS) that produces quality disease and injury data from health facilities. In Ethiopia, disease recording and reporting are one of the four technical areas of the National Health Management Information System (HMIS).

Prior to the HMIS reform in 2008/2009, the International Classification Disease Version Six (ICD-6) was widely used in the Ethiopian health care delivery system to record and report causes of morbidity and mortality. However since ICD-6 was released and endorsed by the World Health Organization in 1948, it did not incorporate diseases and conditions that have emerged since then, such as Human Immuno-deficient Virus infection (HIV).

Following the HMIS reform, which was executed based on the high- arching principles of standardization, simplicity, integration, and institutionalization; the Ministry of Health (MOH) defined a new HMIS disease list and coding system with over 126 diseases and conditions. A serial number was used as a code for each disease entity in the list; and was fully mapped on the ICD-10 chapters. It was implemented in Ethiopian health facilities from 2009/10 to 2016.

In general, the reform brought significant changes in the country's routine health information system (RHIS) data quality and use by implementing a well-defined set of service indicators, data elements, and diagnosis codes; standardizing recording and reporting tools; and institutionalizing data use practices, using performance review meetings as a platform.

However, facility users reported several complaints on the HMIS disease code. For facilities with better diagnostic capabilities, the list was too general , and yet it was too specific for those facilities with limited diagnostic capabilities. To respond to such drawbacks, and with the advent of new initiatives such as the

Information Revolution (IR), the MOH developed a new classification of diseases in 2017, widely known as NCoD (National Classification of Disease).

On the other hand, the Ethiopian e-health architecture (e-HA) shared service component, Terminology Management Service (TMS)/ National Health Data Dictionary (NHDD), defined the NCoD as one domain area of the service whereby semantic level interoperability could be achieved during health data exchange (diagnosis) among electronic health recording systems. The development process of NCoD passed through several steps including conducting a survey to assess the most commonly diagnosed illness or conditions and injuries in the Ethiopian hospitals (data collected from patient charts), and had consultative workshops with relevant stakeholders.

At the final stage, NCoD was piloted in certain settings before it was categorized into four editions and rolled out to health facilities across the country. The 'extended' edition was the largest diagnosis set with 2,054 diagnoses and was intended to serve tertiary level hospitals. The 'compact' edition had 1,849 diagnoses and was meant for secondary level (general) hospitals. The 'mini' edition with 617 diagnoses was for primary hospitals and health centers. The health post edition with 45 diagnoses was for health posts. Though there were notable changes in disease recording and reporting as causes of morbidity or mortality on a monthly basis using both paper and electronic systems (DHIS2), the quality of data did not show a substantial improvement for numerous reasons. This warranted the need for the revision of the NCoD-based morbidity and mortality reporting of Ethiopia.

1.2 NCoD Gap Assessment

Before commencing the revision work, the MOH conducted a rapid gap assessment in April 2021. The major findings or challenges observed during the study could be classified into two main categories: Implementation & Design/ Content- related issues.

Common design and content-related issues identified included: erroneous use of ICD conventions, redundant diagnoses, missing common diagnoses such as tetanus and hemorrhoids, and NCoD code variations for the same diagnosis among the different editions. In regards to implementation, study findings indicated a lack of standardized implementation guides and operational procedures; inadequate training for clinicians, nurse assistants, health information technicians (HITs), and other care providers; lack of disease data use integration with the Performance Monitoring Team (PMT); and absence of a NCoD implementation monitoring mechanism. Since then the MOH formulated actionable items and moved to revising all aspects of disease recording and reporting system in the country.

1.3 Interventions

Cognizant of the prevailing disease data quality issues that mainly emanated from the design and implementation of the NCoD, MOH developed a new Ethiopian Simplified Version of ICD-11 (ESV-ICD-

11) as an optimal solution. Different techniques were deployed to select diseases and injuries with higher public health importance and frequency of occurrence, with due consideration of health facilities diagnostic capabilities. In addition, the disease list revision process has employed several consultative workshops and meetings with senior clinicians and other key stakeholders.

However, having a concise and complete list of diseases and injuries alone is insufficient to creating a robust disease recording and reporting system that generates quality data to inform public health decision-making processes. Ensuring the availability of updated and standardized disease recording and reporting tools; building capacity through adequate training, mentorship, and supportive supervision; integrating ESV-ICD-11 data use with the PMT platform; supporting the facility level implementation by making available an implementation guide, standard operating procedures, and job aids; defining roles and responsibilities of various actors; and installing robust M&E mechanisms are very critical activities to be implemented by all responsible bodies. The MOH believed these holistic interventions could bring significant change in the quality of disease data, generated from the RHIS.

1.4 Organization of the guide

This implementation guide contains essential information that can help HIS implementers, clinicians, nurse assistants, HITs, HMIS officers, and data analysts to plan, implement, and maintain ESV-ICD-11 in health facilities. The document is organized into seven chapters. Next to the introductory chapter 1, a brief introduction to ESV-ICD-11 and its content is explained in chapter 2. The third chapter provides definitions and explanations of terms or concepts that are common but vague in disease recording and reporting practices. The fourth chapter describes the workflow, key steps, and tools used in disease recording and reporting based on ESV-ICD-11. The fifth chapter is about the roles and responsibilities of different actors involving the recording and reporting of causes of morbidity and mortality at facility and administrative levels. The sixth chapter contains information about the steps required to successfully implement ESV-ICD-11 at the health facility level. The seventh chapter explores common indicators and analysis techniques for morbidity and mortality data. The eighth chapter describes the M&E plan and tools for ESV-ICD-11 implementation.

Chapter 2: ESV- ICD-11

The ESV-ICD-11 is a recently revised list of diseases and injuries with the corresponding codes, categories, super-categories, blocks, and chapters. This revised version has a different name from NCoD as there is no new disease classification technique applied to produce it, but simple reduction of less common diagnoses that have little or no public health significance, rare in occurrence and require sophisticated investigations. Thus, to reflect its source, design, content, and hierarchical relationships, MOH renamed the revised disease and injury list as ESV-ICD-11. The main purpose of revising and deploying ESV-ICD-11 in the Ethiopian health system is to allow a systematic recording, analysis, interpretation, and comparison of morbidity and mortality data collected from different health facilities in all the regions at different times. It also helps to measure the burden of diseases and monitor the effectiveness of health intervention programs and planning.

Using reference terminology standards such as ICD is also essential to achieve sub-national, national, and international comparability of disease data. Establishing standardized disease recording and reporting systems can also support the strengthening of other systems such as civil registration and vital statistics (CRVS) and health care insurance systems such as a community based health insurance scheme. When such a system starts to produce reliable evidence on the causes of morbidity and mortality, the country and regional states can efficiently allocate their limited resources fairly and equitably to achieve universal health coverage (UHC) and utilization. The resources can be a skilled health workforce, medical technologies, pharmaceuticals, and laboratory reagents.

Systematized Nomenclature Medical Clinical Terminology (SNOMED-CT) and ICD are the two well-known reference terminology standards widely used for disease classification and coding. The former classification standard has coded more than 300,000 clinical terms including diagnoses, procedures, medications, and investigations. However, the purpose of the SNOMED classification is mainly for clinical data exchange using electronic health recording systems. Moreover, the concept relationship is fairly complex and not a simple hierarchy, and thus difficult to produce summary reports for national and international comparisons. In addition, though it is free for low-income countries, the International Health Terminology Standards Development Organization (IHTSDO) is a proprietary organization established in 2007. Whereas the ICD is owned by the World Health Organization which recommends member states to use it for recording and reporting morbidity and mortality data. It has evolved over the past 150 years from an International List of Causes of Death to a comprehensive classification system for use in mortality, morbidity, quality measurement, and patient safety.

Main users of the ICD are physicians, health officers, nurses, health information technology professionals, and data analysts. These professionals have different levels of expertise that influence their diagnostic capability and deal with disease mapping and data analysis. Since every problem or reason for a health facility visit cannot be categorized as a disease or as an injury, ICD includes a wide variety of signs, symptoms, and abnormal findings. Therefore, it is not strange if one finds symptoms or signs or abnormal findings in the simplified Ethiopian version of the ICD-11 list. Under this chapter, the development process, structure, different editions, and general rules on how to use ESV-ICD-11 are described with adequate examples provided.

2.1 ESV-ICD 11 Development

The driving force to come up with a shorter list of ICD-11 that is going to be used for the coming five years, at minimum, in the Ethiopian health system is the determination of the MOH to improve the quality of disease data collected from health facilities using NCoD (previous disease classification and coding system). Establishing the national task force, engaging key stakeholders, studying existing disease recording and reporting drawbacks, developing revision guide with principles, conducting a series of consultative workshops for rating using the Delphi technique, and inclusion of program-specific and Global Burden of Disease (GBD) diagnoses as mandatory

for inclusion were major activities executed to produce the first version of ESV-ICD-11. An evaluative workshop with some health professionals who had been involved in the rating was conducted as a final step in the process. The list for the health post level was drafted from the program packages and evaluated by experts from the Health Extension Program.

a. Establishing the National Task Force

As a response to the mounting concern of poor disease data quality from different directorates, regions, and other data users, MOH established a national task force (NTF) consisting of different directorates, agencies, and partners to identify major gaps and respond with different interventions. The mandate was given to the NTF to take all the necessary steps towards the improvement of the quality of disease data.

b. Engaging Key Stakeholders

The process of developing ESV-ICD required continual engagement of key stakeholders for their technical and financial support. The key stakeholders were:

- Health workforce ranging from senior sub-specialists, specialists to general practitioners, and from health officers and nurses to program experts.
- MOH directorates and agencies, such as clinical service, emergency directorate, disease prevention and controls, EPHI, and regional health bureaus.
- Partners such as WHO, Vital Strategies, Ethiopian Data Use Partnership, and professional associations.

c. Studying Disease Recording & Reporting Drawbacks

One of the activities accomplished earlier in the process of ESV-ICD-11 development by the NTF was an NCoD gap assessment. The major findings were explained in the introductory part of this guide.

d. Developing a Revision Guide

The NTF developed an ESV-ICD-11 revision guide that outlined major activities, specific tasks, deliverables, timeline, responsible bodies, and guiding principles to be used during and after the revision period. These guiding principles are:

- ***Focusing on the purpose***: During each step of the revision and implementation process, it is essential to consider the main purpose of having a reliable and quality disease data recording and reporting system.

- ***Engaging relevant stakeholders***: To meet the objectives of having a reliable and robust disease recording and reporting system as causes of morbidity and mortality, and attain the necessary buy-in in the health system, the revision process should allow engagement of all the stakeholders and end-users at different levels.
- ***Understanding the context:*** The process of revising and implementing national disease recording and reporting tools across the country is resource-intensive. Thus, it is important to leverage available resources and keep in mind the existing human resource, diagnostic capabilities, and ICT infrastructure in health facilities.
- ***Single underlying disease or condition reporting***: Though multiple conditions reporting provides an opportunity to better information and analysis of the burden of diseases, due to limited resources (recording tools) and lack of international experience on how to implement, we should follow the existing practice of single condition reporting during the design of recording tools and implementation process of the new simplified version of ESV-ICD11. However, death notifications from all causes of death (immediate, intermediate, and underlying) including other conditions that contribute to death should be recorded.
- ***Reporting new and repeat episodes of illness:*** Patients may visit health facilities with new episodes of illness or as follow up or due to complications for already known illness (as a recurrent case). Identifying and reporting an episode of illness as a new case of an illness is important to compute different measurements of disease burden in a specific period.
- ***Keeping Hierarchy:*** To produce a summary of disease data at national or subnational levels, it is important to keep the parent-child relationship defined in ICD-11. Though the list includes four to five digits code of ICD-11 with the possibility of expanding to a specific level, its hierarchical relationship should be maintained; and disease grouping in DHIS2 shall be based on this information.
- ***Validation rules:*** To improve the quality of data reported from health facilities, it is critical to define validation rules related to disease outcomes, age, and sex in consultation with clinicians.
- ***Addition of Synonyms:*** Since some disease and injury naming may not be convenient to clinicians who usually prefer to use diagnostic names from textbooks. Thus, it makes the

disease list user-friendly, synonymous with ICD-11 and can be used as an alternative to represent the disease or injury with the same code.

N.B: Attention while recording on the Abstract registry, only the main diagnosis name and code should be registered on the ESV-ICD-11.

e. Conducting a series of consultative workshops

To start with, the NTF proposed three scenarios. The first one was to collect diagnostic data from patient charts. However, from the previous experience, this approach was believed to be time intensive. Further, it may not be easy to clean and summarize the data as most hospitals do not use the standard to record diagnoses on patient charts. The second scenario was to use an extended edition of the NCoD list as initial point for the revision. This list also had its limitations in terms of its design and content. The last option was to consider ICD-11 as the starting point for disease selection based on expert judgment through consecutive workshops.

Since ICD-11 is a very recent version with 28 chapters including newly added chapters such as developmental anomalies, sleep-wake disorders, and conditions related to sexual health with an exhaustive list of diagnoses and distinct codes (17,180), the NTF adopted all the chapters (26) of ICD-11 except for the supplementary chapter for traditional medicine (chapter 26) and extension codes (chapter X) as the initial dataset. However, a few codes from the extension codes chapter were taken to supplement the injury and poisoning chapter.

Several consultative workshops were conducted to rate each disease/injury. A total of 294 participants (sub-specialists, specialists, general practitioners, health officers, and nurses) from a referral, general, primary hospitals, and health centers (160 directly, 134 via email) were engaged in the process. The Delphi technique was employed to identify diseases or injuries with a higher frequency of occurrence or public health importance, and with due consideration of the diagnostic capabilities of health facilities at different levels. Each disease or injury was rated separately by five or more clinicians coming either from referral, general, primary hospitals, or health centers. The highest of the average score given by each level for a particular diagnosis or injury was taken and put on a separate column, signifying that a particular disease that got the maximum average score by at least one facility-level had a greater chance to be included in the national disease list.

In general, three was a cut-off point (with level/depth variation from chapter to chapter) and applied to the column that contains the highest average score to prepare the draft list for each chapter. Those diagnoses or injuries with higher public health importance and frequency of occurrence but could not be included because their average score was below the cut-off point, were included in the draft list.

Through face-to-face and virtual meetings, the draft list was evaluated by selected workshop participants to determine the final list of ESV-ICD-11. Similarly, to refine the selection process of diseases of neoplasms (chapter 2), a senior pathologist was engaged in the process. In addition, a significant number of pediatricians reviewed and commented on the entire disease list before it was considered as the final list. To revise the disease list of the health post edition, a list was drafted from the program's roadmap. Some diagnoses were included in the list from the health extension program packages in consultation with the program experts to come up with the final edition for HEW.

f. Inclusion of program-specific diagnoses

Since there are several initiatives interested in national disease classification, it is always essential to consult different health intervention programs in the preparation of such a list. In this process, most of those diagnoses used in the national Primary Healthcare Treatment Guideline (PHTG), public health emergency management (PHEM) immediately and weekly reportable diseases, and the majority of the global burden of diseases (used to study the global burden of disease 1990-2019) were included in the final list of ESV-ICD-11 after consulting the relevant stakeholders.

2.2 ESV-ICD -11 Structure

The ICD has categories for diseases, syndromes, signs, symptoms, findings, injuries, external causes of morbidity and mortality, factors influencing health status or contact with health services, and traditional medicine. However, two chapters are not included in the ESV-ICD-11 as these chapters are not relevant to our context and purpose of disease data collection aside from a few extension codes that were combined with poisoning. The excluded chapters are 'traditional medicine' and 'extension code'. Otherwise, ESV-ICD-11 contains all categories in 26 chapters including chapters of codes for 'special purposes' and 'supplementary section for functioning assessment'. These chapters are considered for reporting on COVID-19 conditions, and an impairment functioning assessment in rehabilitation centers respectively.

In general, the ESV-ICD-11 chapters are categorized into two groups: body systems chapters and special group chapters. The body system chapters are primarily arranged with the diseases and injuries by the anatomic site. The special groups arranged those conditions that could be inconveniently scattered if arranged based on anatomic site. Infectious and parasitic disorders, neoplasm, diseases of blood or blood-forming organs, diseases of the immune system, pregnancy, childbirth or puerperium, conditions originating in the perinatal period, developmental anomalies, and injury, poisoning, and other conditions due to external causes are chapters of the special group category. In ICD-11 there is also a concept known as multiple parenting where a condition can be classified either based on etiology or anatomic site. For example, esophageal cancer can be classified in chapter 2 (neoplasm) or in chapter 13 as a condition of the digestive system. This implies that during searching for a disease or a condition from the editions, one needs to consider both chapters that may relate to its origin of the anatomical site and its etiology before reporting it as a missing diagnosis/condition.

In ESV-ICD-11, each chapter is further classified by blocks. Many of the chapters have one to five levels of blocks, keeping the hierarchy (we took only two levels of blocks in the adoption process). This structure would help us to produce a summary disease report by grouping many conditions to the parent block using a parent-child relationship. A total of +2,490 distinct diagnoses or conditions are included in the ESV- ICD-11 in the complete edition.

Table 2.1: ESV-ICD 11 Diagnosis List by Chapter

SN	Chapter	Total Distinct DX	# Selected Disease/Injury
1	Certain infectious or parasitic diseases	986	218
2	Neoplasms	1244	184
3	Diseases of the blood or blood-forming organs	256	49
4	Diseases of the immune system	252	28
5	Endocrine, nutritional or metabolic diseases	637	117
6	Mental, behavioral or neurodevelopmental disorders	860	117
7	Sleep-wake disorders	79	9
8	Diseases of the nervous system	844	151
9	Diseases of the visual system	709	107
10	Diseases of the ear or mastoid process	150	50
11	Diseases of the circulatory system	585	109
12	Diseases of the respiratory system	350	76
13	Diseases of the digestive system	958	142
14	Diseases of the skin	734	166
15	Diseases of the musculoskeletal system or connective tissue	428	76
16	Diseases of the genitourinary system	528	160
17	Conditions related to sexual health	67	6
18	Pregnancy, childbirth or the puerperium	508	70
19	Certain conditions originating in the perinatal period	614	114
20	Developmental anomalies	1306	152
21	Symptoms, signs or clinical findings, not elsewhere classified	1238	99
22	Injury, poisoning or certain other consequences of external causes	1965	95
23	External causes of morbidity or mortality	904	111
24	Factors influencing health status or contact with health services	837	9
25	Codes for special purposes	838	3
V	Supplementary section for functioning assessment	20	25
X	Extension Codes	120	45
	Grand Total	18,017	2,490

Under each block, there are categories or sub-categories of disease and conditions with one to three levels of depth (in our context). The parent-child relationship is defined either as 'is a kind of' or 'is part of' or 'cause and effect'. This structure is essential to map the condition or disease diagnosed by the clinician onto the simplified list. For instance, amebic lung abscess may not be in the simplified list; however, it is clear that amebic lung abscess is a kind of amoebiasis and thus the responsible person can map this diagnosis on its parent category that is available in the simplified version.

Since keeping the hierarchical structure and sub-divisions is critical to attain different levels of detail during analysis and the capturing of disease data, all categories equivalent to the top level blocks of each chapter are included in the ESV-ICD-11 list. It can also serve as a parent category option for mapping a disease or a condition that is diagnosed by a treating clinician but not included on the list. For instance, there are about 22 level 1 blocks for chapter 1 that represents certain infectious and parasitic disorders. See below.

Code	**Block Name**
BlockL1-1A0	- Gastroenteritis or colitis of infectious origin
BlockL1-1A6	- Predominantly sexually transmitted infections
BlockL1-1B1	- Mycobacterial diseases
BlockL1-1B4	- Certain staphylococcal or streptococcal diseases
BlockL1-1B7	- Pyogenic bacterial infections of the skin or subcutaneous tissues
BlockL1-1B9	- Certain zoonotic bacterial diseases
BlockL1-1C1	- Other bacterial diseases
BlockL1-1C6	- Human immunodeficiency virus disease
BlockL1-1C8	- Viral infections of the central nervous system
BlockL1-1D0	- Non-viral and unspecified infections of the central nervous system
BlockL1-1D2	- Dengue
BlockL1-1D4	- Certain arthropod-borne viral fevers
BlockL1-1D6	- Certain zoonotic viral diseases
BlockL1-1D8	- Certain other viral diseases
BlockL1-1E3	- Influenza
BlockL1-1E5	- Viral hepatitis
BlockL1-1E7	- Viral infections characterized by skin or mucous membrane lesions
BlockL1-1F2	- Mycoses
BlockL1-1F4	- Parasitic diseases
BlockL1-1G4	- Sepsis

BlockL1-1G8	- Sequelae of infectious diseases

For most block levels, there are categories of disease or injuries that have the block name and end with "……, Unspecified". e.g.: Syphilis….Block level 2 has corresponding category level one as "Syphilis, Unspecified'.

In addition, the ESV-ICD-11 has diagnoses or conditions that start with "Other specified…." signifying a diagnosis that is specified by a care provider at a health facility but not included in the simplified version of ICD-11. This category of disease or injury can be used as a parent category to map the clinician's diagnosis onto ESV-ICD-11.

2.3 ESV- ICD-11 Rules

Proper understanding of rules of morbidity and mortality recording and use of ICD conventions is essential to collect quality data that can serve the intended purpose. The following rules should be followed during the mapping and recording of ESV-ICD-11 diseases and conditions as causes of morbidity and mortality in the Ethiopian context.

General Rules: These rules are applied to recording and mapping of diagnosis or conditions set by a clinician to the ESV- ICD-11.

Rule 1:

A disease or a condition recorded as a cause of morbidity or mortality on the patient chart at the final stage of the episode of care by the treating clinician shall be considered as the main diagnosis of the patient.

Rule 2:

A disease or a condition shall be labeled as either "New" or "Repeat" episode of illness by the treating clinician.

Rule 3:

The name and code of a specific diagnosis or condition shall be written on the chart and abstract register (all service units where diagnosis is made) at the end of the episode of care.

Rule 4:

Only a single condition or diagnosis shall be recorded and reported as cause of morbidity or mortality on the abstract register for an individual diagnosed to have one or more diagnoses or conditions at the end of the episode of care.

Rule 5:

The name of a disease or a condition *shall not be written in abbreviated form* on the abstract register. On the patient chart

Rule 7:

Only an ESV-ICD-11 diagnosis or condition is allowed to be written on the abstract register as the cause of morbidity or mortality by the treating clinician or the nurse assistant with a transcription/mapping role.

form on the patient chart to avoid errors of interpretation during mapping onto ESV-ICD-11

Rule 8:

If the main diagnosis or condition to be mapped onto ESV-ICD -11 cannot be found on the list, search for its parent category in the hierarchy to write its name and code on the register. If you cannot get the immediate parent category, consider the next higher level category.

Rule 9. Use the 'Other Specified….' category of the same parent if available on the list. In general, there should not be a main diagnosis that cannot be mapped to either under a certain chapter or block. For example, if the clinician diagnosis rheumatic mitral valve stenosis and cannot locate it on the list, look for a diagnosis named as mitral valve stenosis and its code to record the above disease entity.

Rule 10:

During a diagnosis or a condition mapping, if you cannot get it in the edition recommended to the level of the health facility you are working for, use editions intended for a higher level before you look for the parent category. Example: A clinician who is working in a primary hospital can make a diagnosis of a Meniere disease and could not get this diagnosis in the edition prepared for the primary hospital level. Before looking for the parent category of this disease, the clinician should look in the edition prepared for general hospital or even the complete edition.

Rule 11:

The ICD has historically used body systems as an organizing principle. Traditional divisions of body systems facilitate the creation of meaningful subsets for coding and analysis. If you cannot get the corresponding diagnosis or condition in the chapter categorized based on anatomic site, try to search for it in the relevant special group chapters before you opt to the parent category. Example: Tuberculosis is a condition that mainly attacks the respiratory system and is expected to be categorized under Chapter 12: Diseases of the respiratory system. However, Tuberculosis can also affect almost all parts of the body and may complicate the hierarchy if the classification is based on anatomic site. Thus, it is categorized in special group chapters which is Chapter 1: Certain infectious or parasitic diseases.

Rule 12:

A working diagnosis or condition that can be ruled out or under question should not be recorded or reported as a cause of morbidity or mortality if the treating clinician could not reach a definitive (final) diagnosis at the end of the episode of care. Rather, record and report the clinical finding or investigation result for which you have been treating the patient as the main diagnosis or condition.

Example: The diagnosis of Systemic Lupus Erythematosus (SLE) is made through medical history and physical examination supported by clinical criteria, skin/kidney biopsy and blood and urine tests for Antinuclear Antibody (ANA). In the Ethiopian context, tertiary facilities do not provide laboratory tests for ANA and the majority of facilities do not perform skin/kidney biopsies. Thus, the tentative diagnosis is made and the treatment is provided for patients based on the clinical criteria supported by history and physical findings. In such scenarios, the prominent clinical finding/investigation should be recorded and reported as such, generalized edema related to renal disorder, low hemoglobin related to neurologic disorder, etc.

Rule 13:

ESV-ICD-11 contains some services for which clients may visit a health facility for reasons other than diseases or injuries. During the analysis of morbidity and mortality data, such as producing top n causes of morbidity or mortality, one should exclude from the list before analysis.

Example: When individuals visit health facilities for the purpose of acquiring a medical certificate, examination for driving license, or others; chapter 24 details such lists.

Morbidity Rules: These rules are applied for recording and reporting causes of morbidity using ESV-ICD-11. One should remember that Ethiopia is a single condition reporting country.

Rule 1:

Only the treating clinician can determine the 'main condition' or 'primary diagnoses' of the episode of care on the patient's card to be transcribed.

Rule 2:

If there are more than one diagnoses or conditions that can be considered as a main diagnosis, the *one that takes more of the facility's* ***resources*** *will be recorded and reported as 'main diagnosis'.* To determine the resources consumed during the care of the patient, the clinician can consider the severity of the illness, services provided such as investigations conducted and procedures performed, length of hospital stay, and other resources that directly affect the management.

Example 1: A patient diagnosed to have severe hypertension (HTN) and complicated benign prostatic hyperplasia (BPH) underwent surgery five days after admission and the HTN was controlled. The patient was discharged ten days after the surgery and took IV antibiotic for the possibility of Septicemia. In this case, the patient had three diagnoses: HTN, BPH, and Septicemia. Since the surgery and prolonged admission costs were associated with BPH, the main diagnosis to be recorded and on the register and then reported as cause of mortality should be BPH.

Example 2: The chief/main complaints of a patient admitted to a hospital was supposedly related to heart failure secondary to hypertrophic cardiomyopathy (HCM); and type I diabetes mellitus (DM) with diabetic ketoacidosis (DKA). The clinician diagnosed both heart failure and DKA as complications of HCM and DM respectively and started to treat the conditions accordingly. The patient was in the ICU for the first two days, mainly to treat the DKA, and then moved to the cardiac ward to manage his cardiac condition. The patient stayed for an additional 15 days and many investigations and procedures were performed to help the patient recover from the cardiac condition. Meanwhile his DM was controlled by taking his regular insulin. After a total of 17 days of hospital stay, the patient was discharged and a follow up appointment was given to the referral chronic care clinic. Since both conditions were primary causes for the patient to visit the facility, we must choose the condition that takes the most resources of the hospital. The treating clinician should indicate the HCM as a 'main diagnosis.'

Rule 3:

The type of episode of an illness as 'new' or 'repeat' can only be determined by the treating clinician who is expected to mark the main diagnosis or condition as 'new' or 'repeat' on the patient chart. See below the operational definitions of new and repeat cases.

Example 1: In case of chronic illness, when a patient visits a facility for a new complication, such as a known diabetes mellitus patient with diabetic ketoacidosis (DKA). The case can be recorded and reported as new episode of DKA case (main diagnosis: diabetic ketoacidosis- new). However, all chronic or recurrent cases who visit a facility for follow-up, should be recorded and reported as repeat cases. Those cases, where the patient developed an illness following a new exposure or occurrence of a chronic condition for the first time, the main diagnosis should be labeled as 'repeat'. However, verifying this heavily relies on the treating clinicians.

Example 2. When a patient presents with a recurrent diagnosis, i.e when the patient presents with the same diagnosis after a full recovery of the initial episode (recurrence is defined clinically for each condition), the condition must be registered as "new."

Rule 4:

For an **admitted** or a **referred** case, the patient's main condition shall not be written on the outpatient abstract register. Instead, the 'Admitted' or 'Referred" will be filled as status (according to HMIS recording and reporting standards). However, the diagnosis of cases who are referred to other facilities shall be written on the Liaison Referral in and Out Register.

N.B: For internal linkages made with in the same health facility in to other OPDs than the first visit, The diagnosis made at all OPDs should be recorded on the registry independently.

Mortality Rules: Mortality data is widely used for medical research, evaluating health interventions, and planning. Analysis of mortality data typically involves comparison of datasets. Unless the data is produced in a uniform way using the same standards, such comparison may yield misleading results. Therefore, it is important to apply WHO-ICD rules for recording and reporting causes of death.

Rule 1:

The clinician who is well informed about the medical history of the patient and who has carefully carried out the examination of the deceased shall write the causes of death (immediate, intermediate, and underlying) on the medical certificate (death notification form) and the underlying causes of death on the discharge diagnosis column of the IPD abstract register. However, if death occurs upon arrival to the health facility, the available clinician should indicate the probable cause of mortality on the death notification form. It will not be recorded on the register and will not be reported at the end of the reporting month. However, it should be registered/transcribed as "Death on Arrival" on the OPD abstract register. Do not include Death on Arrival during tally and analysis

Rule 2:

The clinician should write immediate, intervening (intermediate), and underlying cause of death on the patient chart and on the death notification form. The treating clinician must indicate or mark the 'underlying' cause of death so that it will be recorded on the IPD register under the column labeled as 'Discharge Diagnosis.'

Rule 3:

In case of death due to injury or poisoning, the external cause of the injury such as 'road traffic accident' instead of the injury sustained should be reported as the underlying cause of death. However, if the treatment outcome is not death, the actual body damage or injury shall be reported as cause of morbidity. Example: A patient admitted with history of road traffic accident and diagnosed to have a fracture of base of skull. If the patient dies, 'road traffic accident' will be recorded and reported as the main diagnosis or condition for mortality. Otherwise, 'fracture of base of skull' will be the main diagnosis to be recorded and reported as a cause of morbidity.

Rule 4:

The mode of death, such as **cardiac arrest** or **respiratory failure,** should not be reported as immediate cause of death.

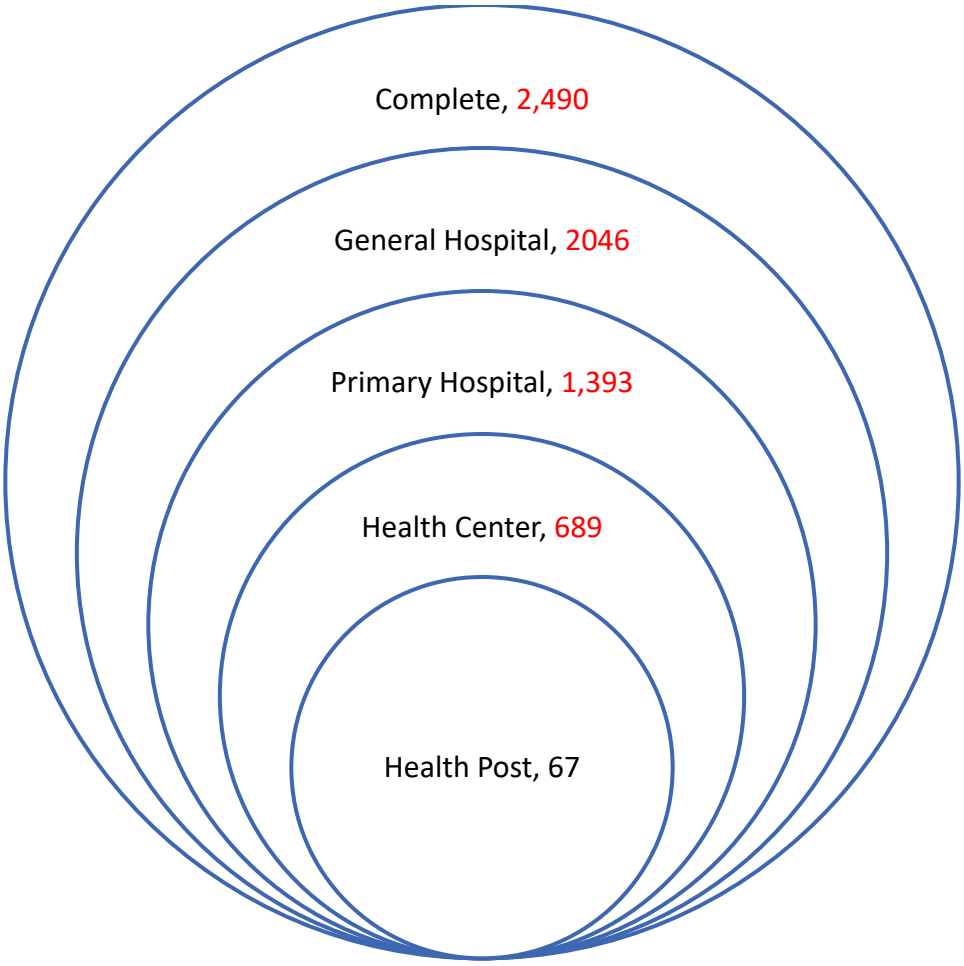
N.B When filling the **death notification** form, all three causes of death (immediate, intermediate, and underlying) should be recorded.

2.4 ESV- ICD-11 Editions

To provide an appropriate list of diseases and conditions to the different levels of health facilities, MOH has prepared five different editions of ESV-ICD-11(including a health post version) and has recommended them to different levels of the health service delivery points with due consideration of each level's diagnostic capabilities. Each list is prepared mainly based on the judgments of care providers from the respective level of health facilities using Delphi techniques during the selection process. These editions are:

- Complete Edition: The most comprehensive list with 2,490 distinct diagnoses and codes is primarily intended to serve tertiary level health facilities with greater diagnostic capabilities.
- General Hospital Edition: The second type is prepared for users in the secondary level of health service delivery points, general hospitals. This edition is a subset of the complete edition. It has 2,046 diseases, injuries, and services.
- Primary Hospital Edition: The third is to be used by health care providers working at primary hospitals. It has about 1,393 distinct diagnoses.
- Health Center Edition: The fourth edition is meant for Health centers and has 689 distinct diagnoses.
- Health Post Edition: This version is for health extension workers, with 67 distinct diagnoses.

However, professionals working at a lower level can use any edition recommended to a higher level if they find it relevant to their context.


Complete, 2,490
General Hospital, 2046
Primary Hospital, 1,393
Health Center, 689
Health Post, 67

Chapter 3: Terms, Concepts, and Operational Definitions

Apart from adopting ICD-11 to a simplified version, it is also essential to define concepts in the Ethiopian context for uniform understanding, implementation, and practice of disease data collection by health workers in health facilities at all levels. Thus, this implementation guide provides operational definitions and descriptions for some of the common terms that are used in the practice of recording and reporting disease or injury data.

Main Diagnosis/Condition

The condition to be used for single-condition morbidity analysis is the main diagnosis treated or investigated during the relevant episode of health care. The main condition is defined as the condition, diagnosed at the end of the episode of health care, primarily responsible for the patient's need for treatment or investigation. If there is more than one such condition, the one held most responsible for the greatest use of resources should be selected. If no diagnosis was made, the main symptom, abnormal finding or problem should be selected as the main condition. In cases where only one condition is treated during an episode of care, clinicians and coders will have no trouble in choosing a main condition. However, many cases are not that simple.

Example: Ato Kebede is admitted to Tikur Anbessa Hospital to remove a lipoma from his right arm. His past medical history includes asthma, hypertension, and a previous cholecystectomy. Kebede undergoes surgery without any complications. During his episode of care he requires Ventolin via a nebulizer due to an acute episode of his asthma. He is discharged with no further problems and will see his local doctor for removal of the sutures in ten days. The main diagnosis of Kebede at the end of the episode of care is *lipoma*.

Final Diagnosis/Condition

A final diagnosis should reflect how difficult the case was, meaning the complexity of all the medical decision-making, including laboratory tests, EKGs, x-rays, CTs, and treatment that was

medically necessary. The final diagnosis should always be as specific as possible. However, if at the end of an encounter, no clear diagnosis can be established, it is acceptable to code sign(s) and/or symptom(s) instead of a diagnosis.

Other Conditions

In addition to the main condition, the record should, whenever possible, also list separately other conditions or problems dealt with during the episode of health care on the patient card or form. Other conditions are defined as those conditions that coexist or develop during the episode of health care and affect the management of the patient. Conditions related to an earlier episode that have no bearing on the current episode should not be recorded.

With the above example, Ato Kebede has asthma that required treatment during the episode of care. Therefore, asthma is the 'other condition' of the patient. Diseases or conditions like the hypertension and cholecystectomy are preexisting conditions and no treatment was required during the episode of care. Therefore, these conditions should neither be recorded as 'other' nor 'main' diagnoses during the episode of care.

Episode of Health Care

According to the ICD, an episode of health care is a period of care that varies between one in-health facility stay or encounter with a health care provider up to the inclusion of all stays and encounters necessary for observation and /or treatment (including inpatient stay). The healthcare provider should wait to record the diagnosis on the OPD/IPD register until the end of an encounter. Coding or mapping of the main condition or diagnosis is expected to be performed on each episode of health care in a health facility.

Single Condition Reporting

In clinical practice, a patient may visit a care provider having multiple conditions that may be diagnosed and treated. Single condition reporting is when one diagnosis or condition is singled out for recording and reporting on the OPD/IPD register and reporting tools. In this situation, the treating clinician has to choose the main condition among other diagnoses recorded on the patient chart. This way of recording and reporting disease data has its own advantages and limitations. Simplicity and consuming little resources for recording and reporting are its advantages, whereas loss of information is its main disadvantage. One should remember that a clinician should record all the conditions on the patient's chart at the end of the episode of care.

Example: Most countries including Ethiopia has been reporting a single condition of an individual who has been treated for more than one main diagnoses. This tradition will continue well into the future for two main reasons. The first one is that most countries are practicing the single condition reporting approach. Thus, making international comparisons of disease data as causes of morbidity and mortality can only be possible if our way of reporting is similar to other countries. The second reason is its effect to the cost of recording materials needed would offset the benefits received from quality data. In our case, a lot work has be done to improve the quality of data and enjoy its benefits.

Multiple Conditions Reporting

This is a practice of recording and reporting all distinct diagnoses made during an episode of care. In this case, we do not need to identify main diagnosis and as a result, it consumes several rows on the register to record those identified diagnoses, new or recurrent. This kind of recording and reporting modality may avoid loss of information and lead to richer data analysis. However, this practice needs more resources for recording and reporting. In addition, there is no international rule that has been established to assist a multiple conditions recording and reporting practice.

'Not Elsewhere Classified'

In ICD, this phrase serves as a warning that certain specified variants of the clinical concept may appear in other parts of classification.

'Other Specified….'

With ICD, some of the categories or sub-categories ends with 'unspecified', implying that the source documentation (disease list) used for classifying did not provide more detail beyond the term, unable to further classify the disease. Therefore, the one who made a specific diagnosis in the practice can use this category to map the diagnosis. This is the same as when we use the 'other' category in a survey questionnaire. Example: Dr. Kebede made a diagnosis of streptococcal pneumonia and this specific diagnosis is not on the national disease list. Therefore, Dr. Kebede can categorize the disease as 'Other specified bacterial pneumonia' during mapping.

'……Unspecified'

In ICD-11, this phrase implies that the source document /disease list/ is able to provide further detail; however, the clinician was not able to specify the diagnosis any further. Therefore, the clinician can use categories like '……, unspecified' to map the disease with the same name in the phrase. Example: Health officer Tedla was able to diagnose a leprosy case but could not differentiate it as pauci-bacillary or multi-bacillary leprosy. In this case, he can use the category 'leprosy, unspecified' to map the main diagnosis on ESV-ICD-11.

Admitted Case

In the Ethiopian health service delivery setting, a patient should go through OPD units for admission. An admitted case is a patient who is receiving care from an inpatient department, staying in the facility for more than 24 hours. Thus, for all admitted cases from OPD units, the main diagnosis will not be written on the abstract register. Instead, the clinician should write 'admitted' on the column labeled for NCoD diagnosis.

Underlying Cause of Death

This is a disease or a condition that has initiated the series of illnesses leading directly to death, or the circumstances connected with an accident or an act of violence that caused the injury or poisoning leading to death. The concept of the 'Underlying Cause of Death' (UCOD) is central to mortality recording and reporting.

Immediate Cause of Death

It refers to the disease or the condition whose symptoms cause the person to die.

Intermediate Cause of Death

It refers to the condition which leads from the underlying cause of death to the immediate cause of death. The intermediate cause of death is recorded in the death notification/medical certificate and saved in the statistical data files, but it is not used in the compilation of annual statistics.

Episode of Illness as New

When an individual visits a health facility for an illness due to new exposure, the episode of illness can be labeled as a 'new' case. Since it is the treating clinician who is able to differentiate (record on the patient chart) the true onset of a disease from follow up visits (usually for continuing care or disease recurrence), he / she is expected to indicate if the main diagnosis is new.

Episode of Illness as Repeat

The individual can also visit a health facility for illness of the same exposure for follow-up or recurrence of the disease as recurrent or old cases. In this case, the episode of the illness can be labeled as 'repeat'. This type of episode of an illness shall only be determined by the treating clinician.

Death Notification (Medical certificate of death/causes of death)

This is a piece of paper issued by a doctor who attends the death of a person. It details the cause of death and other information which is required to register the death. It is a key input to vital registration systems and for the compilation of annual causes of death statistics.

Synonyms

In ESV-ICD-11 synonyms are alternative names for the same underlying concepts. Some synonyms in our disease and injury list are:

SN	Code	Category	Synonyms
1	1A00	Cholera	Cholera
2	1A02	Intestinal infections due to Shigella	Shigellosis
3	1A08	Paratyphoid fever	Paratyphoid fever
4	1A31	Giardiasis	Lambliasis
5	1A36	Amoebiasis	Amebiasis
6	1A90	Chancroid	Chancroid
7	1B13	Miliary tuberculosis	Disseminated Tuberculosis
8	1B20.Z	Leprosy, unspecified	Hansen Disease
9	1B75.0	Furuncle	Boil
10	1C12	Whooping cough	Pertussis
11	1C13	Tetanus	Lock- Jaw
12	1E91	Zoster	Shingles
13	1F28	Dermatophytosis	Ringworm
14	1F28.0	Dermatophytosis of scalp	Tinea capitis
15	1F28.1	Dermatophytosis of nail	Tinea unguium
16	1F28.2	Dermatophytosis of foot	Tinea pedis
17	1F28.3	Genitocrural dermatophytosis	Tinea cruris
18	1F64	Dracunculiasis	Guinea Worm
19	1F65	Enterobiasis	Pinworm
20	1F66.3	Lymphatic filariasis	Tropical elehpantiasis
21	1F76.Z	Taeniasis, unspecified	Tapeworm
22	1F86	Schistosomiasis	Bilharziasis
23	1G02	External hirudiniasis	Leech infestation
24	1G03	Pthiriasis	Pediculosis pubis

Chapter 4: Disease Recording and Reporting: Workflow and Tools

Understanding how a patient's diagnosis is made and identifying important tools used to record and report health conditions at the end of the episode of care at the health facility level is critical to monitor and improve the quality of disease data at its source. In the implementation guide, the workflow, recording, reporting tools, and other relevant documents are explained in brief.

4.1 Clinical Workflow

A patient or a client can visit a health facility for different reasons. The workflow, in general is described below:

- The starting point is the registration unit where the patient or the client is registered as a new visit if it is his or her first time in the health facility. Otherwise, the older medical card will be retrieved and assigned to one of the outpatient service units, depending on the information collected from the triage unit.
- Using basic techniques to elicit information from the patient, the treating clinician writes the chief compliment/s, present illness, system review, physical examination findings, investigations, diagnosis/conditions, treatment plan, and medications on the patient's chart.
- If the treating clinician decides to treat the case as an ambulatory case, s/he will write the final diagnosis as the main diagnosis and mark it as new or repeat on the patient chart. If the patient fulfills the health facility's admission criteria, the treating clinician should mark this on the patient chart and register them as "admitted.' However, if the final decision is to refer the patient for better care in another facility, a referral will be written by the treating clinician using a standard referral form and recorded as 'referred' in the registers.
- At the end of the day before the patient charts are returned to the medical record unit, the assigned clinician or nurse assistant records abstract information of the patient on the outpatient register. Name, age, sex, main diagnosis with its status as a new/repeat status

are the main data elements to be abstracted from the chart and shall be filled on the register.

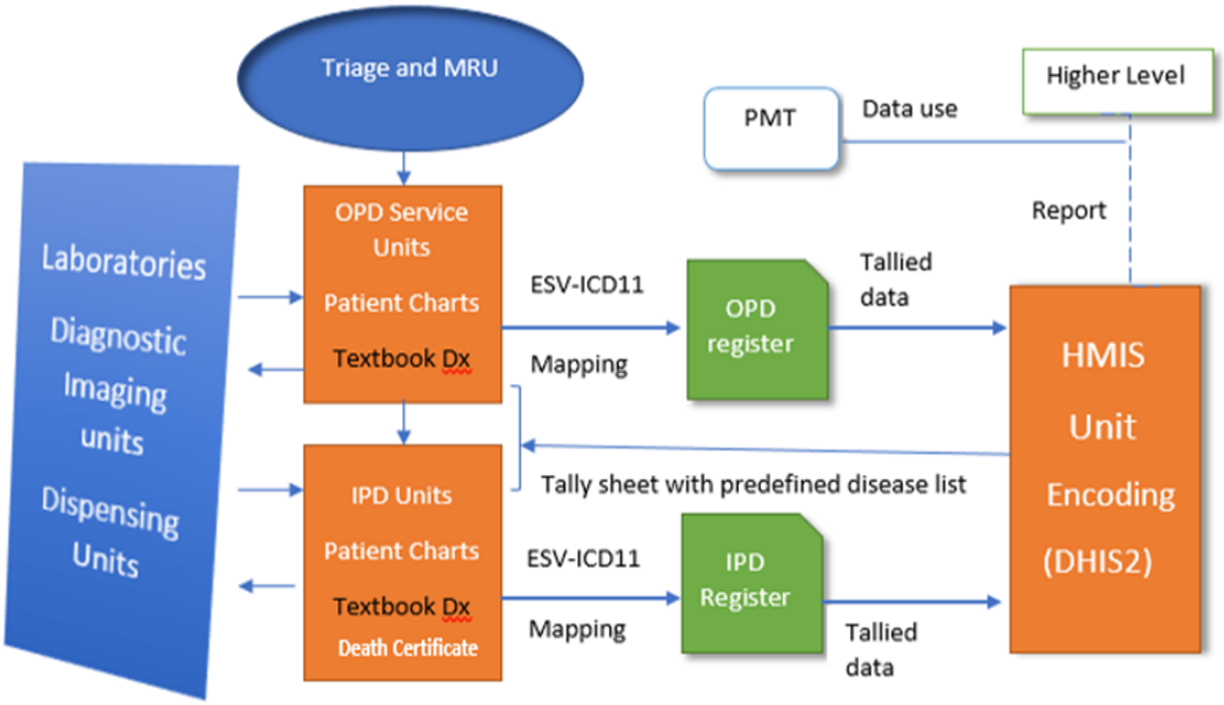
- At this stage, if the treating clinician writes the main diagnosis based on ESV-ICD-11, there is no need to map, and s/he can directly write the diagnosis, its code, and new/repeat status on the OPD register.
- If the treating clinician writes the main diagnosis using textbook diagnosis as a free text, the clinician or the assigned nurse assistant must map the indicated main diagnosis onto the ESV-ICD-11 and record the corresponding diagnosis or condition exactly as it is written on the standard disease/injury list.
- During OPD visits, if the treating clinician cannot reach a certain diagnosis at the end of the day (due to ongoing investigations), the working diagnosis should not be recorded on OPD register; rather, the clinician or the nurse assistant must wait until the next day when the final stage of episode of care is reached. Otherwise, use the rules described above. Meanwhile, the patient chart can be handled based on HMIS recording and reporting procedures. Example: If the clinician is requesting a diagnostic test for Tuberculosis (Gene X-pert) and the result will not be available on the same day, the clinician or the nurse assistant should not record the working diagnosis on the OPD register, and they must wait for the end of episode of care.
- For inpatient cases, the discharge diagnosis of the patient is recorded on the IPD/ICU/NICU registers when the patient is discharged.

N.B: The *Discharge diagnosis should record the final diagnosis made at the end of the episode of care up on discharging of the patient, not the diagnosis made up on admission.*

- If the discharge outcome of the patient is death, the underlying illness or diagnosis should be indicated by the treating clinician before writing the discharge diagnosis on the IPD abstract register with other important data, such as age, sex, and name of the individual case. In addition, all the causes of death (immediate, intermediate, and underlying) and other information should be filled out on the death notification form.
- The clinician, both at OPD or IPD units, must not write abbreviations or textbook diagnosis as a main diagnosis on the abstract register. These recordings of causes of morbidity and mortality at inpatient and outpatient units on the abstract registers are expected to happen every day after the final episode of care for ambulatory and discharged

cases. During this process, both clinicians and nurse assistants can use the electronic version of ESV-ICD-11 and other job aids to facilitate their task.

- Based on the HMIS Calendar/Standard - monthly reporting period, the HIT should provide the disease tally sheet (with pre-defined diseases-for previously reported diagnoses with free space) for each inpatient and outpatient units.
- The assigned individual is expected to complete tallying the morbidity and mortality causes as disease and injury. For each month, the records to be considered for tallying are the cases seen or discharged from the 21st of the last month to the 20th day of the reporting month.
- Each disease or injury should be disaggregated by age group, sex, and new/repeat (for morbidity only). If the disease or condition is reported for the first time in that facility, the one who is responsible for tallying the disease data shall write the name and corresponding code of the condition to complete the tallying process.
- Within one to two days of completion of the reporting period, each service unit should submit the completed tally sheets to the HMIS unit for electronic data entry in the DHIS2 software by the responsible HIT. Once disease data encoding is completed, the HIT is responsible to check for quality of data using validation rules and LQAS technique per the national integrated data quality and use guide.
- The HIT, nurse assistant, and responsible clinician must collaborate to resolve any data quality-related issues if identified from service units where disease or injury data is recorded and reported. The HMIS unit is also expected to include the monthly top causes of morbidity and mortality data for discussions during the PRM (performance review meeting) along with the health service data.



4.2 Disease/Injury Recording and Reporting tools

Availability and utilization of updated morbidity and mortality data recording and reporting tools is essential to have better quality of disease data. In the previous NCoD implementation period, inadequacy of updated tools to each OPD and IPD unit was one of the major issues identified during the gap assessment. Therefore, each health facility has to ensure the availability and proper utilization of the following tools:

Patient Form/Card: This recording tool has different forms that contain the patient's history, investigations, physical findings, problem list, diagnoses, treatment plan, progress note, vital signs, etc. Health facilities may have different types of forms. However, any hospital's patient form must contain a format to record those basic information items and a place to write the main diagnosis.

OPD Abstract Register: As part of the HMIS indicator revision, MOH has updated the OPD register to accommodate the recording of data for some data elements necessary to compute the added or modified indicators. The health facility has to avail and monitor the continuous supply and utilization of updated OPD abstract registers to each unit.

IMNCI Register (0-2 months): Integrated management of newborn and childhood illness (IMNCI) register is a serial register that is used to record clinical signs and symptoms, assessment (diagnosis based on ESV-ICD-11), treatment given, and/or referral status of sick children, ages 0-2 months.

IMNCI Register (2 months–5 years): Integrated management of newborn and childhood illness (IMNCI) register is a serial register that is used to record information about health care services given to children of ages two months to five years old. It captures data on the signs and symptoms, assessment (diagnosis based on ESV-ICD-11), treatment given, and/or referral status.

Emergency Register: The register is a serial register and its main purpose is to record data from patients who visited the emergency department in the facility. It captures data on mode of arrival, patient handover, source of referral, and diagnosis on arrival, based on ESV-ICD-11.

IPD Abstract Register: Similar to the OPD register, the hospital needs to ensure availability and use of this register in each ward.

N.B: The *Discharge diagnosis should record the final diagnosis made at the end of the episode of care up on discharging of the patient, not the diagnosis made up on admission.*

Intensive Care Unit (ICU) Register: The register is a serial register and the main purpose is to record information about the Intensive Care Unit (ICU) services that include diagnosis at admission based on ESV-ICD-11, HIV test status, intensive mechanical ventilation, discharge information, death information (if occurred), and others.

Neonatal Intensive Care Unit (NICU) Register: The purpose of the NICU register is to record information about neonates who have been treated in the NICU, a unit where a health care provider provides treatment and care for babies who have severe problems, such as prematurity. The register captures data that is related to the type of treatment provided and causes of death based on ESV-ICD-11.

Health Card: this card is part of the family folder used by health extension workers to record health information of the individual patient who is diagnosed and referred and/or treated at the health post level.

Disease Tally Sheet: The disease tally sheet should support disaggregation for a range of age groups (compatible with the GBD), sex, and outcome. For morbidity, the type of episode of the illness must be included as "new' or 'repeat." Since it is not manageable to prepare the tally sheet with all diseases or injuries listed in the ESV-ICD-11, HITs are expected to print the tally sheets every month containing a predefined list of diseases with free space for newly identified diagnosis in the reporting period.

N.B: *Any Health service delivery point where a diagnosis is made by a clinician, the service register should support the recording of the main diagnosis, similar to the OPD/IPD registers. Otherwise the patient chart should be sent to the relevant IPD/ OPD register at the end of episode of care to record the main diagnosis on the register.*

Death Notification Form: To record death-related data, including cause of death based on ESV-ICD-11(immediate/direct, intermediate, and underlying), for communication to the nearby civil status or vital registration office as part of implementation of civil registration and vital statistics (CRVS). If the case is maternal or neonatal death, other additional variables need to be recorded on the death notification form. When recording the causes of death, immediate causes of death need to be recorded first followed by intermediate and underlying causes of death respectively.

Notification serial number_____

Place of death	Hospital ☐	Health center ☐	Health post ☐	Clinic ☐	Other ☐
Facility ownership					
Government ☐	Private for non-profit ☐	Private for profit ☐	other government ☐		

Facility address

Facility name_____	Region/ City Adm._____
Zone _____	Town /Sub-city_____
Woreda/S.Woreda_____	kebele _____
House number _____	Telephone number_____

Section 1: Diseased Information

Full Name _____	Sex Male ☐ Female ☐
Title _____	Date of Death ☐☐ ☐☐ ☐☐☐☐ Day ☐
Age _____	Date Month Year Night ☐

Section 2: causes of death

		Causes of death	Time interval from onset of death
Disease condition directly leading to death **immediate causes of death.**	↩		
Chain of events **intermediate causes of death**	↩		
Underlying causes of death	↩		
Other significant conditions **contributing to death**			

For women was the diseased pregnant	Yes ☐	No	Unknown
Pregnant at the time of Death		Pregnant within 42 days before the death	
Pregnant between 43 days and 1 year before the death		Unknown	

Did the pregnancy contributr to death	Yes	No	Unknown
Fetal or infant death	Yes	No	
Multiple pregnancy	Yes	No	Unknown
still birth	Yes	No	Unknown
If the death within 24 hr specify the number of hour survived		Birth weight (In grams)	
Number of completed wee of pregnancy		Age of the mother (Years)	
Maternal Condition affected the fetus, newborn			

Person who declare death

Full name _____ Qualification _____

Date_____ Signature _____

Notification form issued by

Full name_____ Date _____ Signature _____

ESV-ICD-11 Edition: Depending on the health facility's service provision level, an appropriate edition of ESV-ICD-11 should be available as a hardcopy in both IPD and OPD departments. In addition, all clinicians and nurse assistants should be advised to download the mobile application of ESV-ICD-11 (NHDD-pocket mobile app.) from the Google Play store and install on their smartphones for quick reference. The softcopy of different editions of ESV-ICD-11 in PDF or excel formats can be used as an alternative tool of reference.

ESV-ICD-11 Implementation Guide and SOP: This implementation guide and the disease recording and reporting SOP, annexed with this document, must be kept in the HMIS unit as both a hardcopy and softcopy to bring uniformity to the disease recording and reporting practice across health facilities in Ethiopia. The NTF also prepared a one page job aid that briefly describes the workflow, key steps, and responsible bodies in the disease recording and reporting process and is expected to be available in every unit where diagnoses are made.

Chapter 5: ESV-ICD11 Implementation Steps and Modalities

A successful implementation of an information system depends on several factors that can be categorized as organizational, technical, and behavioral. Building the capacity of individuals involved in disease recording and reporting activities and providing clear implementation steps to follow at the facility and administrative levels are paramount. In this chapter the recommended training modalities and key implementation steps of ESV-ICD-11 at sub-national and facility levels are described.

5.1 Training Modality

To reach to the grassroots level, MOH employs different types of training modalities. Cascading training of trainers (TOT) at national and regional levels and offering basic training to end users are the most common and recommended types of training that should be applied to train on ESV-ICD-11.

5.1.1 Master TOT

The purpose of Master TOT provision is to produce an expert pool for the next cascading round of training on ESV-ICD-11.

A master TOT will be provided for clinicians, regional clinical directorate focal persons, national and regional M&E focal persons, related program experts, and clinicians involved in the ESV-ICD-11 development process from across the country. The training will be conducted for three days in two rounds (30 participants per round). The content for the training will be focused on the ESV-ICD-11, its structure and content, implementation guide, SOPs, and job aids. The training content will be guided by standard training materials prepared by PPMED. The master TOT will be provided face-to-face to allow for interactivity with participants.

5.1.2 Regional TOT

The purpose of regional TOT provision is to cascade the training to the facility level and support the overall implementation of activities.

The regional TOT will be provided for regional clinical directorate experts, regional M&E experts, related program experts, and clinicians involved in the ESV-ICD-11 development process from the respective region. The training will be conducted in three days in one to three rounds, depending on the regional context (30 participants per round). The content for the training will be focused on ESV-ICD-11, its structure and contents, implementation guide, SOPs, and job aids. The training content will be guided by standard training materials prepared by PPMED. The regional TOT will be provided face-to-face to allow for interactivity with participants.

5.1.3 Basic Training

The basic training will be provided to all health care providers HIT, HMIS focal persons, and health extension workers. The training will be provided by individuals who received the TOT of ESV-ICD-11 and using standard training materials prepared for basic training. The training will be conducted on the premises of the health facility (onsite) for eight hours, and in a way that will not affect the routine activities of the health facility.

5.2 Regional Level Implementation Steps

Step 1: Awareness Creation

Awareness creation about the need to improve quality of disease/injury data by implementing ESV-ICD 11 in the region among different stakeholders working in the region including RHB directorates, Hospital Chief Executive officers (EOs), CRVS and Non-governmental organizations is essential to smoothly implement the simplified ICD 11 in the region's health facilities. A day-long awareness creation workshop in collaboration with the MoH can be organized by the Regional plan, budget, monitoring & Evaluation directorate with disease prevention and control case team/directorate.

Step 2: Mobilizing Resources

Adequate financial resources are critical to provide cascaded TOT and basic training in mass coverage, print and distribute all the tools required to implement ESV-ICD 11 in the region's health facilities. Allocated adequate budget for mentorship and supportive supervision is also essential. Therefore, the RHBs are expected to estimate an adequate budget for ESV-ICD 11 implementation ahead of time by mobilizing all available resources in collaboration with MoH and other NGOs.

Step 3: Printing and distribution of tools

Availability and continuous supply of OPD/IPD registers, ESV-ICD 11 editions as hard copies, implementation guide, SOP and other job aids in implementing health facilities is one of key implementation activities of disease recording and reporting systems. Before ordering print for any ESV-ICD 11 recording and reporting tools, A RHB must ensure to get the updated versions for each tool from MoH. Ensuring adequate and timely distribution of the tools is the prime responsibility of RHB.

Step 4: Capacity building

Once awareness is created among the leadership, adequate resources are mobilized and relevant ESVD-ICD 11 recording and reporting tools and other supportive documents are printed and distributed, The RHB should immediately plan and execute TOT on ESV-ICD 11 to the appropriate target audiences in one or more rounds. The training should be given based on training materials prepared by MoH, and adequate time should be allotted for each session.

Step 5: Mentorship

For the first eight to twelve weeks of the go-live time of health facilities, the RHB should plan and provide mentorship to support health-care providers & HITs who received the basic training and started to implement disease recording, tallying and reporting based on ESV-ICD 11 disease list. Individuals who received TOT can serve as Mentor for disease recording and reporting system implementation.

Step 6: Region level disease data quality checks

To ensure continuous improvement in the quality of disease data collected from the region's health facilities, RHB must perform disease data quality checks using techniques embedded with DHIS2 such as outlier analysis, completeness for IPD and OPD disease data for hospitals, health centers and health posts. Feedback to specific zone health departments should be given whenever data quality issues are identified in health facilities under.

Step 7: Integration of disease data analysis with regional level PMT

To improve the level of disease data use and its quality at region level, the RHB needs to integrate the practice of morbidity/mortality data analysis and use with the regional data use platform (PMT).

Step 8: Monitoring Implementation Status

Frequent and regular monitoring of disease/injury recording and reporting system implementation status using M&E tool recommended by MoH. The RHB should monitor the coverage and utilization level of ESV-ICD by health facility type aiming at 100% implementation success.

Step 9: Supportive Supervision and Feedbacks

To have a stable and well-functioning disease recording and reporting system in the region, the regional plan, Budget, M&E directorate should conduct supportive supervision twice a year in selected health facilities representing the three tiers of service delivery points. The Supportive supervision team should consist of M&E, HIS, Disease prevention and control case teams. The team shall use a checklist produced by MoH during field visit to achieve regional comparability of the assessment data.

5.3 Facility Level Implementation Steps

The ESV-ICD-11 implementation steps at the facility level require rigorous work, as it is a place where during routine activities, some challenges may arise that require proper and immediate interventions.

Step 1: Awareness Creation

Creating awareness among health workers and the leadership on the benefits of implementing ESV-ICD-11 in a health facility is an initial step. The individual who received TOT training at national or regional level can provide a half-day orientation, discussing the roles and responsibilities of the relevant staff in the routine practice of disease/injury recording and reporting.

Step 2: Acquisition of Tools

A facility should identify ESVD- ICD-11 tools and estimate the number of hardcopies it requires for its annual, at minimum, consumption. These materials need to be in place before the facility launches the ESV-ICD-11 to go live in the OPD/IPD units. The role of HITs and the heads of the facility is key in this process.

Step 3: Providing Basic Training

A health facility must provide either on-site or off-site ESV-ICD-11 basic training to all staff working in IPD/OPD and HMIS units. This training should be based on MOH's standard training materials and adequate time should be allocated for each session. All the recording and reporting tools, including the electronic formats, should be demonstrated to the trainees.

Step 4: Mentoring

Training staff on ESV-ICD-11 tools is not sufficient for a successful implementation. The facility also needs to assign mentors to IPD/OPD and HIT units for the initial phase (four to eight weeks) of the implementation, following the go-live time. Staff who received the TOT could be potential mentors to their facility and surrounding sites.

Step 5: Disease Data Quality Checks

The HMIS unit of the health facility is responsible to conduct outlier analysis for disease data using DHIS2 on a monthly basis, together with checking the completeness of IPD and OPD disease data. The HIT is expected to give feedback to the respective OPD/IPD units if data quality issues are identified. LQAS should be carried out for selected IPD and OPD diseases, per the HMIS standard.

Step 6: Integrating Morbidity/Mortality Data Analysis with PMT

One way of improving the quality of data is to increase the use of data at the level where it is produced. Thus, an implementing health facility should integrate the use of disease/injury data with existing data use platforms, such as PMT. Representative clinicians should also participate in the analysis and interpretations of morbidity and mortality data during the monthly performance review meeting. Top n causes of morbidity and mortality, deaths attributable to certain common diseases or injuries should be incorporated in the facility's information products such as its annual bulletin.

Chapter 6: Roles and Responsibilities for Disease Recording & Reporting

This section of the guide describes the roles and responsibilities of the different actors involved in the process of disease recording, reporting, quality checks, analysis, and use of disease data at all levels of the health system.

6.1 Roles & Responsibilities of Clinician, Nurse Assistant, HIT, and Facility Head

As with health care delivery, the recording and reporting of morbidity and mortality data is based on task sharing among health care providers. Different professionals who have a share of tasks in disease recording and reporting processes at clinical and administrative levels have distinct roles and responsibilities.

6.1.1 Clinician/Diagnosing Health Professionals

Clinicians are the first point of contact for all types of patients and are the critical starting point within the chain of data flow. With other care providers, clinicians are mainly responsible for positively influencing the quality and use of disease data from the facility level all the way to higher level public health decision makers and policy designers. In the process of recording and reporting causes of morbidity and mortality, a clinician has the following roles and responsibilities.

Roles & Responsibilities

- Make a diagnosis for a patient or client for whom she/he is in charge of taking patient history, conducting physical examination, ordering investigation/workup, and preparing treatment plan.
- Write patient's diagnosis/diagnoses along with the code on his/her chart with legible handwriting and avoiding the use of abbreviations.
- Mark the patient's 'main diagnosis' by writing with capital, or uppercase, letters or underlining it at the final stage of the episode of care. In case a definitive diagnosis cannot

be reached at the end of the episode of care, apply rule ten to mark the main condition/diagnosis.

- Mark the main diagnosis or condition as 'new' or 'repeat' by writing '-N' or '-R' as a suffix next to the main diagnosis/condition. This mark is important to determine whether the occurrence of the case is new or recurrent.
- Transcribe or map the 'main diagnosis' onto the ESV-ICD-11 list and write the corresponding disease/injury name and its ICD code on the abstract register. In health facilities where there is an assigned nurse assistant working with the clinician, this role shall be given to the nurse assistant.
- Identify underlying, intermediate, and immediate causes of death for deceased patients to whom he/she was providing treatment/care and write them on the death notification form.
- Support and guide a nurse assistant in case the following situations occur:
    - Illegible handwriting
    - Unindicated main diagnosis
    - Main diagnosis not marked as new (N) or repeat(R)
    - Main diagnosis written in abbreviated form
    - Difficulties to map the main diagnosis on the ESV-ICD-11
- Support HIT or HMIS focal person in analysis and interpretation of disease data as cause of morbidity and mortality.

- A clinician is responsible for the quality of disease data recorded and responsible in his/her specific unit or ward assigned to work.

- A clinician who received TOT on ESV-ICD-11 is responsible to mentor other staff and monitor the disease recording and reporting process in his or her assigned unit or ward.

- A clinician is responsible for writing a discharge summary and death certification of a deceased patient.

- The clinician who is working in a unit where the available service register does not allow the recording of a main diagnosis is also responsible to ensure that the main diagnosis is recorded on any nearby OPD register (arranged by the facility head) on a daily basis.

6.1.2 Nurse Assistant

In a significant number of Ethiopian health facilities, nurse assistants are assigned to different health care delivery units to work with clinicians to provide adequate and coordinated care to patients. In the disease recording and reporting process, nurse assistants play crucial roles, linking clinicians to the HMIS Unit. If this link fails to function properly, the quality of disease data can be severely affected. A nurse assistant has the following roles and responsibilities:

Roles & Responsibilities

- Register the main diagnosis accurately with clear handwriting.
- Communicate with the clinician before the end of a shift if there is any issue/concern.
- Communicate with the head nurse/supervisor if the clinician is not following the set rules.
- Regarding patients who are waiting for their final diagnosis after undergoing a variety of diagnostic modality, ensure the recording of the main diagnosis on both patient card/form and the register at the end of the episode of care, based on the HMIS recording and reporting procedure.
- Cross-check the daily card numbers with the total number of registrations in order to minimize unregistered patient files.
- Make sure that all patient cards are registered unless waiting for a definitive diagnosis.
- The nurse assistant working in other units where the available service register does not allow for the recording of the main diagnosis is also responsible for the main diagnosis to be recorded on any nearby OPD register (arranged by the facility head) on a daily basis.

6.1.3 Nurse Head

A nurse head is responsible for all activities within a specific unit whether inpatient or outpatient. Among the activities, data management and quality assurance are and must be primary activities of the nurse head. A nurse head is responsible for the following activities:

Roles & Responsibilities

- Supervise the registration process; a minimum of weekly supervision is mandatory.

- Assess data quality periodically.
- Perform data quality assurance.
- Disseminate assessment findings to all stakeholders— clinicians, nurse assistants, and management teams.
- Conduct periodic corrective measures based on the assessment findings and update the staff on such actions.
- Orient the nursing and midwifery team to the implementation guidelines.
- Prepare a clear disease tally sheet periodically.
- Report the weekly registration to the HMIS team or focal person to minimize inaccuracies and ease registration load.

6.1.4 HMIS Focal/HIT

The HMIS focal/ HIT professional is at the end of the data chain within the health facility, and is responsible for generating data that represents the particular institution. The professional must always understand and take to heart that data is not merely compiled for the purpose of generation, but rather, for the generation of information that can be utilized at all levels of the health system (institutional, woreda, zonal, regional, and national).

Roles & Responsibilities

- Verify collected tally sheet.
- Communicate frequently with department heads if there is any discrepancy or concern.
- Responsible for the coding of the disease list.
- Frequently compile data, conduct analysis, and share with all stakeholders.
- Provide short-term disease recording and reporting on-the-job trainings for nurse heads, nurses, and clinicians.

6.1.5 Quality Head/Hospital Administration

The administration of a health facility is responsible for all activities within the facility. The effective and efficient delivery of services is the main goal of any health facility and the administration is responsible for the accomplishment of this goal. To do so, reliable data must be generated to enforce changes within the facility and to responsibly communicate with higher

officials, partners, and other stakeholders. The quality department relies on the data generated to design QI projects and engage in activities to boost the quality of services delivered within a facility. Thus, both entities must collaborate to ensure the generation of quality data from the facility.

- Take the initiative to regularly discuss with professionals in the process map regarding disease recording and reporting.
- Ensure all of the health facility's units where diagnoses are made are recording and reporting causes of morbidity and mortality.
- Include data quality and use/disease recording and reporting within the regular management meetings.
- Launch QI Projects to improve data quality.
- Organize frequent on-the- job and off-site trainings.

N.B. In certain scenarios, such as health centers where nurse assistants are not available or assigned, the roles and responsibilities indicated for nurse assistant should be performed by the clinician.

6.2 Digital Disease Recording and Reporting

This section applies to facilities where EMR or digital disease recording and reporting is applicable.

- The workflow within this system is initiated by the clinician or the treating health care worker and the loop is completed by the same health care worker.
- Taking that into consideration, the EMR solution should provide capabilities for the clinician to select a primary/main diagnosis from national recommended reference standard for diagnosis.
- The system should not allow the entry of the main diagnosis by the clinician as a free text (see below for an example case of what happened in a hospital using an EMR system when the clinicians were allowed for writing diagnoses in free text form.
- The system should generate the monthly morbidity and mortality report in the same way it is produced using a paper system.

- The system should map this internally to the corresponding ESV-ICD- 11 diagnosis.
- Frequent data quality assurance should be conducted by the nurse assistant for each department.

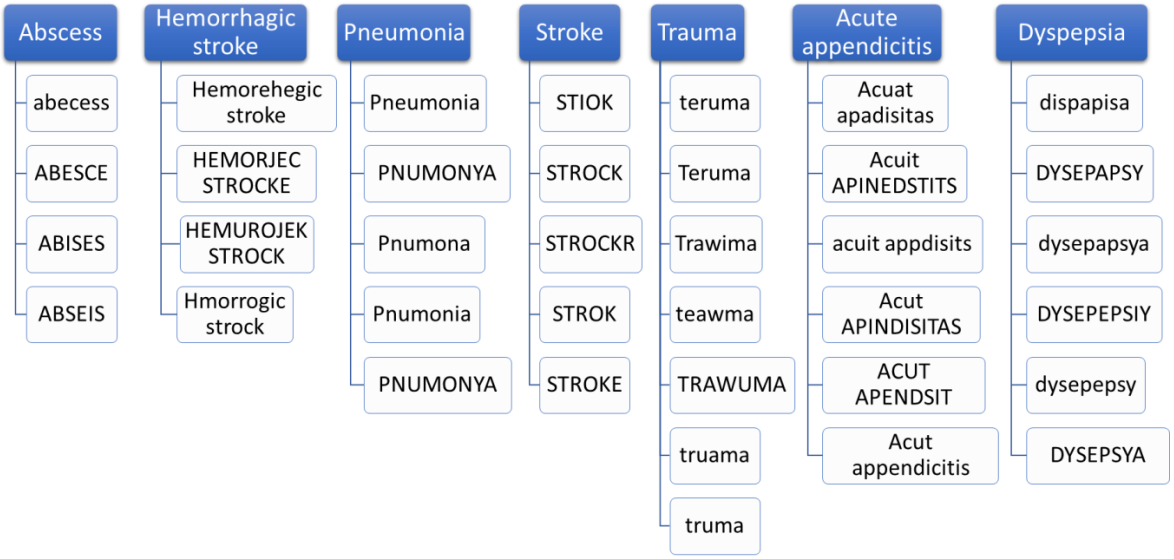


Fig 6.1. Some consequences of allowing clinicians to enter diagnosis as free text using EMR.

6.3 Roles and Responsibilities at the Administrative Level

For a successful implementation of a disease recording and reporting system and improvement in disease data quality and use, administrative level offices should maintain their own roles and responsibilities.

6.3.1 Woreda/Zone

- Assign professionals that are solely responsible for all facilities under the woreda health bureau in regards to disease recording and reporting.
- Assign professionals that are solely responsible for all woredas under the zonal health bureau.
- The assigned professionals are responsible for frequently communicating with facilities/woredas to discuss the quality of data, the top ten morbidity and mortality disease lists, and the way forward.
- Report findings to woreda/zonal health bureau heads and other stakeholders within the health bureau.
- Heads must frequently report to their regional counterpart and other stakeholders.

- Organizing experience sharing platforms for woredas.
- Ensure ESV-ICD-11 -related capacity building within their jurisdiction: cascading of training, mentorship, and supervision.
- Coordinate partners for better quality data of causes of morbidity and mortality.
- Ensure adequate availability of ESV-ICD-11- related tools for health facilities within their catchment.

6.3.2 Regional

- Assign and incorporate the data management team within the HealthCare Quality Department.
- Organize trainings and experience sharing platforms.
- Cascade instructions, training, guides, or any developments that originate from the federal level.
- Secure partners that can support the implementation.
- Ensure ESV-ICD-11 -related capacity building within their jurisdiction: cascading of training, mentorship, and supervision.
- Coordinate partners for better quality disease data.
- Ensure adequate availability of ESV-ICD-11- related tools for health facilities within their catchment.

6.3.3 National

- Coordinate and financially support national TOTs for ESV-ICD-11.
- Ensure development and availability of the required ESV-ICD tools at regional and national levels.
- Mobilize resources for effective implementation of a disease recording and reporting system across the regions.
- Coordinate stakeholders, such as partners, to financially and technically support ESV-ICD implementation.
- Plan and execute national-level integrated supportive supervision periodically.
- Monitor and evaluate the implementation status of ESV-ICD-11 in the regions.

Process Map

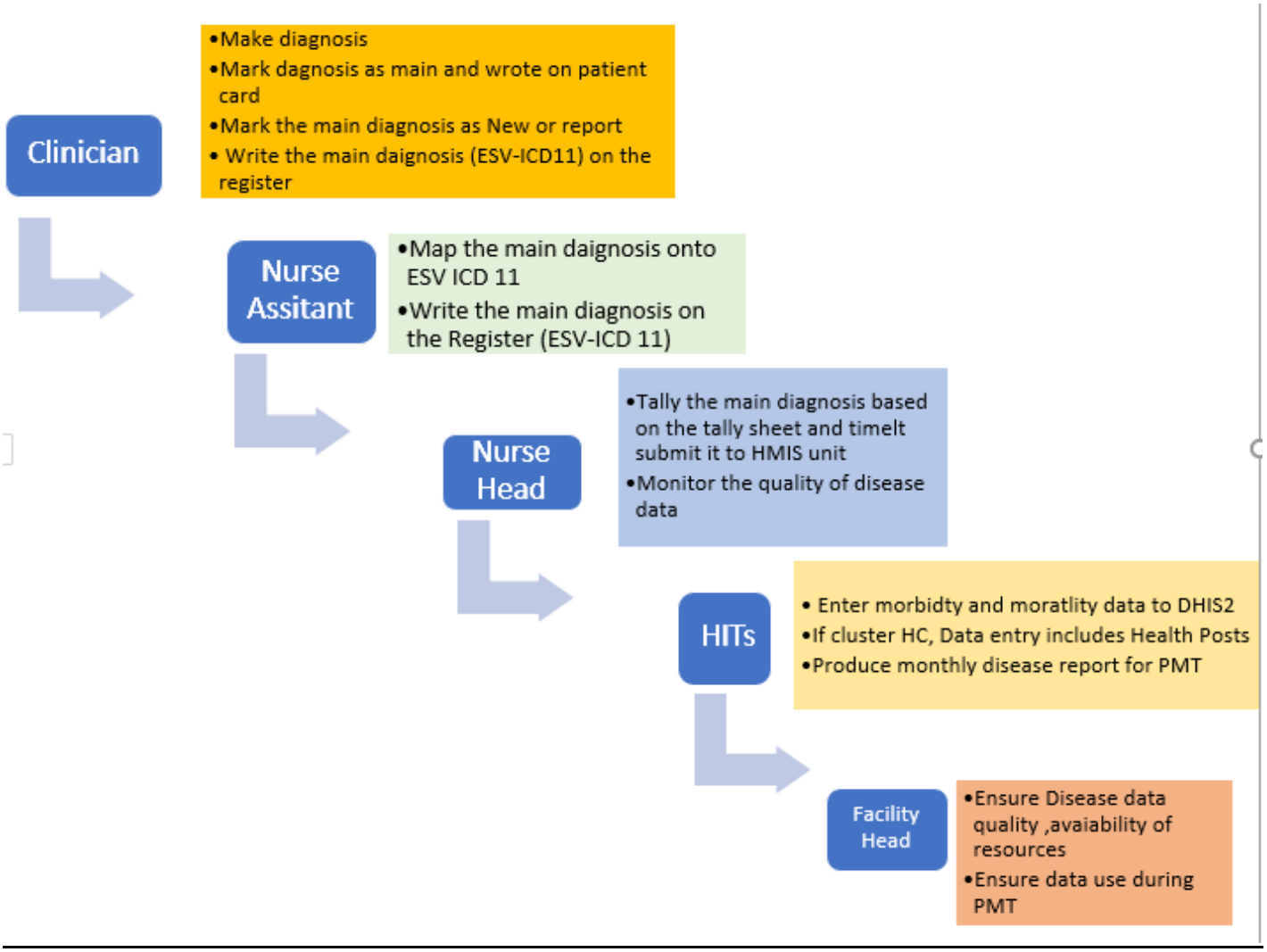


Fig. 6.2. Default Process Map for Health Facilities for Paper- Based Disease Recording & Reporting

Chapter 7: Morbidity and Mortality Data Analysis

Reliable mortality and morbidity statistics are instrumental in guiding global, national, sub-national, and facility level policies and priorities for health and development. Knowledge of cause-specific mortality and morbidity patterns in a population, with disaggregation by age, sex, and geographic location, is essential for policy-making, planning, and adjusting interventions to population needs. For example, by using a framework that links a disease control intervention to impact measures (e.g. morbidity and mortality), programs can assess the effectiveness of their interventions and refine their targeting or policies to optimize impact.

7.1 About the Data

As part of other HMIS data, capturing disease related data goes beyond the purpose of reporting to the next level. It should be analyzed and used for different purposes at all levels. One of the major data use platforms in the health sector at all levels is the Performance Monitoring Team (PMT) meetings. Assessments show that analysis and use of disease data at PMTs at most levels is a neglected area. This trend must be changed, and appropriate use of disease data, such as top ten causes of morbidity and mortality, need to be part of PMT meetings of all levels. This has substantial implications in the improvement of disease data.

Assessing the data quality: Morbidity and mortality data are assessed according to the main data quality dimensions. The dimensions include report completeness and timeliness and data consistency (internal and external).

7.2 Data Quality Dimensions

The quality of disease data can be measured in terms of its dimensions. In our case, the main dimensions considered for data quality assessment are:

- Reporting completeness and timeliness
- Internal consistency of reported data
- External consistency with other data sources, and
- External comparison of population data

7.2.1 Dimension 1: Reporting completeness and timeliness

Completeness is expressed as the percentage of expected reports submitted to a higher level of the reporting system. Completeness is assessed at each reporting level (e.g., completeness of facility reports submitted to woreda, zone, region, and national levels).

- Assess OPD and IPD reports for completeness.

For calculation of reporting completeness for OPD and IPD, the numerator is the number of OPD or IPD reports received and the denominator is the number of facilities expected to submit each form.

- Assess completeness of reporting for key data elements (main diagnosis for morbidity and mortality) - content completeness.

This step assesses the completeness of specific data elements pre-defined (main diagnosis recorded and reported into DHIS2 system) within a reporting form.

- Consider completeness of reporting based on facility type (hospital, health center, clinic, and health post) and facility ownership (public and private).

7.2.2 Dimension 2: Internal consistency of reported data

Internal consistency relates to the coherence between different data elements that have an expected relationship with each other. Assessment of internal consistency examines whether data values follow expected patterns over time and in relation to each other.

Data entry error is an important cause of inconsistency. Errors may occur, for example, when data are added up or transcribed from a tally sheet or register to a monthly report or transcribed or entered from a monthly paper report into an electronic database. Key steps for assessing internal consistency include:

- Assess coherence between the same data items at different points in time. Outliers are values that are unusually high or low in comparison with historical trends.

- Major data entry errors can be identified by screening for outliers; tables or charts showing trends over time can be used to quickly identify outlier values.

In general, values of more than three standard deviations (SD) higher or lower than expected may be considered data errors, unless there is evidence that the value is correct. For highly consistent data, narrower limits than three SD can be used to identify outliers. Seasonal data, such as the number of malaria cases, do not show the same month-to-month consistency. However, to identify outliers, the seasonal trend for the last 12 months can be compared with the seasonal trend for 12 to 23 months previously, 24 to 35 months previously, etc.

- Assess consistency between reported data and source documents.

This is the only dimension of the data quality assessment that requires additional collection of primary data. It is a comparison of reported data with the same data in the source documents in health facilities. Source documents may include registers, tally sheets, or individual patient records. This assessment ("verification exercise") may provide evidence of over-reporting or under-reporting or it may reveal problems related to the aggregation of data.

- Assess other potential consistency issues.

An unusual degree of uniformity in the data or the existence of certain patterns may also point to quality issues. Datasets (reporting forms) should be reviewed for double entry of data for time periods (e.g. duplication of entries for two consecutive months) or reporting units (e.g. duplication of entries for different facilities). Data with very many reported values that are multiples of five or ten may point to guesses rather than reporting of true values. The data should also be checked for unlikely or impossible entries, e.g. only for female diagnosis recorded as males.

7.2.3 Dimension 3: External consistency with other data sources

This dimension examines the level of agreement between two data sources that measure the same health indicator. Indicators derived from HMIS data may be compared with indicators obtained through:

- Estimates from population-based surveys.

- Parallel data systems (e.g. vertical, program-specific systems).
- Sentinel site data, and
- Statistics that have been officially reported to WHO. The most important data sources for comparison with facility data are population-based surveys.

7.3 Data Quality Assurance Mechanisms

Routine, regular assessment: Routine assessment of disease data quality can identify problems in close to real-time, enabling correction of errors as they occur. This involves regular quality checks at the facility level and at each subsequent reporting level. Such checks should be part of the SOPs and may include:

- Checking and approval of monthly reports by facility PMT before report submission.
- Automated quality checks (e.g. pre-set minimum and maximum values; validation rules) that are built into the DHIS2 to provide alerts at the time of data entry.
- Simple visual scanning of data displayed in tables or trend charts to identify obvious problems such as missing values, unusual fluctuations, and mathematical errors.
- Automated data quality dashboards that display data quality metrics along with the related routinely reported data, and
- Routine and regular use of WHO Data Quality Tool in DHIS2 for inconsistencies check.
- Conducting LQAS for OPD and IPD reports by facility every month.

7.4 Core Indicators for Morbidity and Mortality

	Indicator	Definitions	Disaggregation
1	Top N causes of morbidity	The list of diseases or injuries that attributes for the most frequent causes of illness in a specified period	Age group, sex
2	Top N cause of Mortality	The list of diseases or injuries that attributes for the most frequent causes of death in a specified period	Age group, sex
3	District Crude death (institutional)	The sum of number of deaths from health facilities in a district/woreda	Sex, Age group

4	Deaths attributable to NCD	Total number of deaths due to asthma, DM, HTN, cardiac illness, and cancer	Age group, sex
5	Deaths attributable to HIV (institutional)	Number of deaths due to HIV infection as underlying cause	Age group, sex
6	Deaths attributable to TB (institutional)	Number of deaths due to TB infection as underlying cause	Age group, sex
7	Number of NCD cases	The total sum of all cases of asthma, DM, HTN, cardiac illness and cancer	Age group, sex
8	Deaths attributable to injury/trauma	Number of deaths due to injury/trauma as underlying cause	Age, sex, type of mechanism of injury/trauma (RTA, Poisoning, burn, interpersonal violence, fall, workplace injuries)
9	Top 10 causes of ICU Mortality	The list of diseases or injuries that attributes for the most frequent causes of death in a specified period in the ICU	Age group, sex, ICU type (NICU, adult ICU)

7.5 Data Analysis (Morbidity and Mortality Dashboards)

- Each health facility and institution should monitor and track the most frequent causes of death and morbidity.
- Prior to performing analysis of disease data, its quality should be checked using the recommended techniques. If there is any outlier, try to trace the source and correct the data before you proceed to the analysis task.
- Those data related to services should be removed from the list before analysis.

8. Monitoring and Evaluation

To track and monitor the extent of implementation coverage and utilization of ESV-ICD-11, the following M&E framework has been developed by MOH.

SN	Objective	Activities	Indicator definition	Indicator formula	Target	Frequency of reporting	Data Source
1	Improve ESV-ICD11 Capacity building	Provide ESV- ICD 11 TOT training	Number of Health care providers who received master TOT and TOT on ESV- ICD 11 and working at health facility		=2* 400 =800	Quarterly	Report
		Provide ESV-ICD 11 basic training	Proportion of IPD/OPD clinicians, nurse assistants, and HITs who received basic ESV-ICD -11 training		>80%	Quarterly	Report
2	Increase availability of ESV-ICD 11 tools	Print and distribute ESV-ICD 11 Editions	Proportion of health facilities with at least one edition of ESV-ICD- 11 in hardcopy		>90%	Quarterly	Rapid assessment
		Print and distribute Implementation guide, and SOP and	Proportion of health facilities with hardcopies of implementation guide and SOPs		>90%	Quarterly	Report
		Avail Mobile App. of ESV ICD 11	Number of care providers using ESV-ICD -11 mobile app.			Monthly	Report
3	Improve ESV-ICD 11 Implementation Coverage	Implement ESV-ICD 11 in health facilities	Proportion health facilities ESV-ICD -11 is implemented		>90%	Monthly	Assessment
4	Improve Disease data quality	Increase completeness of disease data	Disease report completeness of public health facilities (HIS Strategic plan indicator)		>95%	Monthly	DHIS 2
		Increase IPD/OPD disease data LQAS score	LQAS score for IPD disease date LQAS score for OPD disease data		>90%	Monthly	Report
		Increase disease reporting timeliness	Disease report timeliness		90%	Monthly	Report
5	Increase disease data use	Integrate Disease data analysis and use with PMT	Number of facilities where disease data analytics work and quality discussed during PMT at the end of the reporting period (PMT)		1 per facility per month	Monthly	Rapid assessments or PRISM assessment
		Increase disease data information products	Number of information product produced on causes of morbidity and mortality		1 per quarter per facility	quarterly	rapid assessments

Annex: Summary of Standard Operating Procedures for Disease Recording and Reporting

Standard Operating Procedures for Disease Recording and Reporting using the Ethiopian Simplified Version-ICD 11 (ESV-ICD11)

Improving the quality of morbidity and mortality data is the main objective of the national taskforce for the revision of the disease recording and reporting system. Apart from revising the national disease list, developing the implementation guide and standard operating procedures for proper disease recording for causes of morbidity and mortality in the Ethiopian health facilities are key interventional tools. This SOP is summarized and annexed to this implementation guide to increase its accessibility and ease of use by the end users during disease data recording, tallying, quality checks, reporting, analyzing, and use for different purposes.

1. Recording Diagnosis on Patient chart/ Health Card

Diagnosing a patient can happen at all levels where health service is provided, starting from the health post to tertiary level hospitals.

a. Outpatient disease recording on patient form

- After the clinician applied all the techniques to elicit information about the illness of the individual and conducted the necessary investigations, s/he should write the final diagnosis of the patient. The clinician can also write other concomitant diagnoses or conditions, if any.
- To record the patient's diagnosis or the clinician's impression about the illness of the patient, s/he can write it as a free text (based on textbook or individual experience). The clinician has no obligation to use national (ESV-ICD-11) or reference standards such as and SNOMED-CT to write the main diagnosis on the patient card/form.
- If the clinician is not certain about the diagnosis, s/he can write the working diagnosis with other differential diagnoses or the major findings or conditions for which s/he is treating the patient until

the during the episode of care. At this stage of care, the practice of recording the diagnosis is not different from the usual practice. However, at the end of episode of care, the clinician must write or indicate the main diagnosis.

- The clinician should wait until the end of the episode of care (final stage of the care) if certain investigations results are not yet available to write the final diagnosis. Until then, the clinician may need to keep the patient card in his/her office for a while (based on the time defined in HMIS guideline).
- The clinician should also mark the 'main diagnosis' using upper case (CAPITAL) letters or underlining it if the patient has more than one diagnoses. Identifying the main diagnosis should be based on the ESV-ICD-11 guidelines.
- The treating clinician is expected to write the diagnosis or the condition in a legible manner and no abbreviation should be used.
- Once the clinician diagnosed the case, s/he should indicate whether the diagnosis is a new occurrence or recurrent (repeat) case by writing 'N' or 'R' next to the main diagnosis respectively.
- If there are two or more 'main diagnoses', mark only one main diagnosis using capital letters or by underlining it, as we are single condition reporting country.
- These steps shall be done for each individual who is seen at any of the outpatient units (ambulatory case) such as regular OPD, referral OPD, emergency, special clinics, and IMNCI units.
- For 'death on arrival' cases, the clinician should not write the possible cause of death on the patient card/form, rather a verbal autopsy needs to be conducted using the appropriate form.
- If death occurs in the emergency outpatient department, the clinician should mark the underlying cause of death as 'main diagnosis.' For instance, if a patient dies due to respiratory failure as a result of lung metastasis of breast cancer, 'BREAST CANCER' will be marked as 'main diagnosis' on the patient form.

b. Inpatient disease recording on patient form

- Similar to the outpatient unit, the clinician can write a diagnosis or many diagnoses on a patient form during the episode of care. The diagnosis can be confirmed or a working diagnosis or differential diagnoses or conditions for which the patient is being treated for.
- The clinician can also write the diagnosis or the condition as free text. There is no need to use the terminology standard on the patient card.
- At the end of the episode of care, the clinician should write the discharge diagnosis or condition and indicate the main diagnose by writing it in upper case letters or by underling it.

- Since the patient card stay in the ward until the patient is discharged from the health facility, the clinician can have ample time to reach a final diagnosis before recording it on the IPD register.
- The clinician should write the main diagnosis with legible hand writing (especially for a paper system) and note, **abbreviation is not allowed**.
- The clinician should clearly write –N or –R after the main diagnosis indicating either a new or a repeat case.
- If the outcome of the care is death, the treating clinician should mark the underlying cause of death as 'main diagnosis'. The immediate and intermediate causes of death should not be marked as main diagnoses.
- When recording the causes of death on the patient card, the clinician should ensure that the cause of death is ***a valid condition that can lead to death***.
- The recording of the causes of morbidity or mortality on the patient form in all inpatient units, such as ICU units, by treating clinician should be similar.

c. ***Disease recording using health card***

- At the health post, the health extension worker should write the condition or diagnosis of a patient using the health card.
- Since the number of diagnoses or conditions in the revised health post edition is conducive to searching and is sourced primarily from training modules, a health extension worker should write the diagnosis, based on the national standard on the health card.
- The handwriting should also be legible and s/he needs to avoid abbreviations.

2. Transcribing Main Diagnosis and Recording on a Register

The occurrence of diseases or injuries in a certain locality do not necessarily follow all of the time the pattern observed by clinicians who participated in the disease selection process. As a result, there might be no exact match for our main diagnosis in the national list (ESV-ICD-11). However, since the list has all the chapters and related categories, there is always a way out to find at least a diagnosis that has a defined relationship with the main diagnosis made by a particular clinician. Therefore, the one who is responsible for transcribing the main diagnosis onto the register (clinician or nurse assistant) should follow the following procedure during the transcription process.

- The clinician or the nurse assistant should receive adequate training and mentoring on ESV-ICD-11 by an individual who received the TOT.
- The clinician or nurse assistant (if assigned) should do the transcription of the main diagnosis to the corresponding ESV-ICD-11 and recording on the register on a daily basis (for both outpatient and inpatient cases).
- The clinician or nurse assistant (if assigned) should ***use*** the appropriate edition of ESV-ICD-11 to search and transcribe the main diagnosis to the corresponding ESV-ICD-11 diagnosis. The edition can be in hard or softcopy (NHDD-pocket mobile app or excel/pdf formats).
- To find the corresponding ESV-ICD-11 diagnosis, the responsible person should start the search from the appropriate chapter, drilling down to the blocks then to the super category, and lastly to the category.
- If the main diagnosis is not in the category list of the chapter you are looking for, move to the other chapter known as special groups such as neoplasm and certain infectious and parasitic disorders (mentioned in the implementation guide) and a higher level edition before taking the parent category into consideration.
- If the main diagnosis written by the clinician is not the appropriate edition for that level, move to the next higher level edition.
- Once you are able to identify the corresponding diagnosis from ESV-ICV-11, record the name of the diagnosis with its code on the register. It could be cause of morbidity or mortality, depending on the outcome of the treatment.
- The clinician or nurse assistant should also record the type of episode of illness (main diagnosis) as new or repeat on the register from patient form/card.
- It is also important the responsible person to record the sex and age of the individual to whom the main diagnosis is recorded on the register.
- If the case is an admission or a referral, you do not need to search for the corresponding ESV-ICD-11 diagnosis. Simply write 'admitted 'or 'referred' on the register accordingly.
- The transcription and recording of the main diagnosis (based on ESV-ICD- 11) should be done in the same way in all outpatient and inpatient units.
- In a service unit where a diagnosis is made (where there is no space in the register to record the diagnosis), the nurse assistant/clinician should bring the patient card from their unit to the related OPD unit in order to transcribe and record the case in the IPD/OPD register on a daily basis. The HIT should monitor the inclusion of such cases in the abstract registers. This happens until the existing service register is modified to enable the clinician/nurse assistant to record the main diagnosis on it.

3. Tallying causes of morbidity and mortality

- Since reporting the causes of morbidity and mortality requires aggregation of data, the tallying of each main diagnosis based on the national format is a critical step for quality data production.
- The disease tally sheet format should be the same as the morbidity and mortality dataset defined in DHIS2.
- The tally sheet for both morbidity and mortality should have sex and age group disaggregation. The age groups should match with the international disease age categories (GBD).
- The periodicity of tallying OPD and IPD disease data should be based on a nationally defined time (daily- from start date to the end of the HMIS reporting date).
- The HIT should produce the disease tally sheets with predefined disease list from the ESV-ICD-11 disease list which have been reported in the previous time with some free space. The HIT is responsible for printing and distributing the tally sheet to each disease reporting unit. The free space would be used to tally newly diagnosed diseases for the month (diagnoses for which no data was reported in the previous reporting months).
- The clinician or nurse assistant should write the main diagnosis based on ESV-ICD-11 on the tally sheet and continue with tallying if the main diagnosis is not included in the printed tally sheet.
- The assigned nurse assistant or clinician or nurse head should perform tallying the main diagnoses from the OPD/IPD register on the tally sheet (see the role section of this document).
- During the tallying process, the individual with this role should tally an individual's main diagnosis only once to a specific sex, age, episode type (N or R), outcome type (morbidity or mortality) for the same episode of care.
- Once the tallying task is completed for a specific month 'y' (Month x, 21 to Month y 20), the clinician or the nurse assistant or the head nurse should submit the disease tally sheet(s) to the HIT/HMIS officer within the first one to two days after the completion of the reporting period.
- The tally sheet should be labeled based on the code given by the HIT so that data entry to DHIS2 will be based on a specific unit. This can help the HIT to trace back if any data entry error occurs.

4. Disease Data Entry using DHIS2

Almost in all health facilities except health posts, the aggregate disease data is collected using DHIS2. For health facilities with no electricity or computers and health posts, the disease data is entered to DHIS2 at the woreda/district health office or cluster health center respectively. Therefore, HITs who are responsible for DHIS2 data entry should follow the following procedures to complete and timely submit the disease report.

- Depending on the local context, HIT should generate the morbidity and mortality tally sheets from DHIS2 with a pre-populated disease list (previously ever reported) with some space to allow tallying of diseases that are not included in the pre-defined list.
- The HIT who is responsible for the disease data entry to DHIS2 should collect or make sure that the collection of the disease tally sheets from all OPD and IPD units occur.
- The HIT should label OPD and IPD units with a number/code based on what is configured on the DHIS2-disease data entry. This is helpful to trace back the source of the data in case of quality issues (OPD1, OPD2… IPD1, IPD2…).
- After collecting the tally sheets, the HIT should enter the data for each unit. In case of violation of the validation rules, the HIT should go to the respective OPD/IPD unit and resolve the issue with the clinician or nurse assistant or nurse head who is responsible for tallying the disease data (this depends on the validation rules incorporated with DHIS2).
- The HIT should complete the data entry for its facility (including health posts, in case of cluster health centers) on behalf of them before the national due date.

5. Disease Data quality checks and producing reports

Performing LQAS on selected IPD and OPD disease data on a monthly basis; checking for the facility level completeness of data, outlier values, and timely submission of the tally sheets from IPD/OPD units; and data entry to DHIS2 should be performed routinely. Thus, HIT should:

- Perform monthly LQAS for both IPD and OPD disease data by taking randomly selected diseases.
- If the LQAS score is below the national standard (90%), the HIT should repeat it, and both first and last score should be reported.
- HIT should print out the morbidity and mortality data for each OPD or IPD unit and verify the data by the relevant clinician or nurse assistant or head nurse before marking the data entry as ‘completed’ on DHIS2.

- HIT should see the data for any possible outlier or invalid data entry such as data entered for Benign Prostatic Hyperplasia on a female.
- If DHIS2 is deployed offline, the HIT should export the report data of the specific month and send to the next level via email or portable media to import the data to an online version of DHIS2.

6. Use of Disease Data during PMT

As part of the other HMIS data, capturing disease data is beyond the purpose of reporting to the next level. It should be analyzed and used for different purposes at all levels. One of the major data use platforms in the health sector is the Performance Monitoring Team (PMT) meetings. Thus, the following activities should be done every month.

- The HIT should produce at least top ten causes of morbidity and mortality data of the month and avail the data as hard and soft copies (if possible) during the meeting.
- The PMT should discuss morbidity and mortality data and agree on the most common causes of diseases or injuries that the catchment population is getting sick or dying from.
- The PMT team should follow the quality of the data to be always in the acceptable range in terms of accuracy, completeness, and timeliness.
- Root cause analysis also should be done to the top causes of death and illness in the area with possible suggestions of appropriate interventions.

7. Documenting and reporting any challenges related to disease recording and reporting

Since recording and reporting causes of morbidity and mortality at the facility has some anticipated challenges that may relate to diagnostic capabilities, lack of adequate training or mentorship on the ESV-ICD- 11, shortage of availability of tools, or the quality and use of the disease data, there should be a way to document and communicate the issue to the next level for immediate help or possible amendment. Therefore, the responsible body (HIT and head of the facility) should do the following activities:

- Whenever an issue is encountered that relates to disease recording and reporting, reproduce the issue and confirm it.
- Write the issue on a logbook prepared for this purpose with a full description.
- Notify the issue (can be via email) to the higher level.
- Follow the issue until it is resolved.