



Pacific CRVS
supported by Brisbane Accord Group

CURRICULUM FOR CODING OF CAUSES OF DEATH

FOR PACIFIC ISLAND COUNTRIES AND TERRITORIES



SDD

Statistics for Development Division

CURRICULUM FOR CODING OF CAUSES OF DEATH

FOR PACIFIC ISLAND COUNTRIES AND TERRITORIES

**Pacific Community, Queensland University of Technology, Australian Bureau of Statistics, New Zealand
Ministry of Health, Fiji National University, Vital Strategies and World Health Organization**



Pacific
Community

Communauté
du Pacifique

Noumea Cedex, New Caledonia

2021

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Australian Bureau of Statistics, New Zealand Ministry of Health, Fiji National University, Vital Strategies
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Abbreviations

BAG	Brisbane Accord Group
COD	cause of death
ICD	International Statistical Classification of Diseases and Related Health Problems
MCCD	Medical Certificate of Cause of Death
MMDS	Medical Mortality Data System
SP	starting point
SPC	Pacific Community
TSP	tentative starting point
TUCOD	Tentative Underlying Cause of Death
UCOD	underlying cause of death
WHO	World Health Organization

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About this curriculum

The material in this generic curriculum document is aimed at providing guidance for coding of causes of death and establishing mechanisms for its inclusion within a formal academic training programme in the Pacific region.

This curriculum is intended to be delivered as a module with 10 learning areas and 75 hours of student contact time. Each learning area includes an assessment to evaluate the students' learning. Regional academic training programmes are authorised to customise the learning areas to suit the needs of the trainees; therefore, the programme could be delivered in a shorter or longer period of time.

Country Medical Certificate of Cause of Death

This curriculum assumes that the country where the participating students are located already uses the International form of Medical Certificate of Cause of Death (MCCD) (or a similar version of the standard certificate with Part 1, Part 2, and a column for reporting time interval). The latest MCCD recommended by the World Health Organization is shown in figure 1 on page 14.

Learning areas and objectives

This curriculum consists of 10 learning areas. Depending on the objective of a particular academic training programme, some or all of the learning areas could be selected and adopted.

Learning areas		Learning objectives
		At the successful completion of the module, students should be able to carry out the following:
1.	Principles of classification and history of International Classification of Diseases (ICD).	Describe the definition of clinical coding, list the purposes of clinical coding and the uses of disease classification systems, and outline the history of ICD.
2.	Introduction to the <i>International statistical classification of diseases, 10th revision</i> (ICD-10) structure and coding conventions.	Describe the structure of ICD-10 codes, explain the use of the <i>ICD-10, Volume 1: Tabular list (WHO 2016a)</i> and demonstrate the ability to correctly use coding conventions related to this list, explain the use of the <i>ICD-10, Volume 2: Instruction manual (WHO 2016b)</i> , and explain the use of the <i>ICD-10, Volume 3: Alphabetical index (2016c)</i> and demonstrate the ability to correctly use coding conventions related to this index.
3.	Understanding basic coding guidelines.	Demonstrate an understanding of the basic coding guidelines.
4.	Chapter specific coding.	Conduct chapter specific coding in accordance with the chapters listed in the tabular list.
5.	Sources of mortality data.	Describe the main sources of mortality data.
6.	Concept of Underlying Cause of Death (UCOD).	Define the concept of UCOD and demonstrate an understanding of the structure of the international form of MCCD.
7.	Basic concepts in mortality coding.	Describe the basic concepts in mortality coding.
8.	Mortality coding rules/instructions for selecting the UCOD.	Correctly use the mortality coding rules/instructions for selecting the UCOD, and understand the causal relationships reported on the MCCD.

Learning areas		Learning objectives
9.	Understanding causal relationships using the Medical Mortality Data System (MMDS) decision tables.	Demonstrate and understanding of the causal relationships reported on the MCCD using MMDS decision tables and correctly answer the mortality coding practice exercises.
10.	Mortality coding rules/instructions for perinatal deaths (this area applies only to the countries who are still using a separate perinatal MCCD to certify perinatal deaths).	Describe mortality coding rules for perinatal deaths.

Teaching and learning methods

The teaching and learning methods of this curriculum are as follows:

- Interactive lecture discussions with question-and-answer sessions (held during the theory component of the guidelines).
- Small group discussions.
- Individual student work using examples in accordance with the chapters listed in the tabular list (chapter specific coding) and cause(s) of death (for mortality coding):
 - Chapter specific coding practice exercises from ICD-10 coding workbook
 - Mortality coding practice exercises from ICD-10 coding workbook.

Student evaluation

This curriculum contains student assessments for learning areas during the training. Those who are responsible for conducting academic training programmes have the freedom to decide to use all or some of the assessments, based on their country requirements.

Course duration

The course duration would consist of 75 hours student contact time and assessments.

	Learning area	Time* (hours)	Teaching methodology
1.	Principles of classification and history of ICD.	1.00	Interactive presentation.
2.	Introduction to the <i>International statistical classification of diseases and related health problems, 10th revision</i> (ICD-10) structure and coding conventions.	5.50	Interactive presentation, use of <i>ICD-10, Volume 1: Tabular list</i> and <i>ICD-10, Volume 3: Alphabetical index</i> , and practice exercises using ICD-10 work and answer books.
3.	Understanding basic coding guidelines.	0.50	Interactive presentation.
4.	Chapter specific coding.	38.0	Interactive presentation, practice exercises using ICD-10 work and answer books.
5.	Sources of mortality data.	0.25	Interactive presentation, <i>ICD-10, Volume 2: Instruction manual</i> .
6.	The concept of Underlying Cause of Death (UCOD).	0.75	Interactive presentation, <i>ICD-10, Volume 2: Instruction manual</i> .
7.	Basic concepts in mortality coding.	5.00	Interactive presentation; <i>ICD-10 Volume 1: Tabular list</i> , <i>ICD-10 Volume 2: Instruction manual</i> , <i>ICD-10 Volume 3: Alphabetical index</i> , online version of the classification, and ICD-10 work and answer books.

Learning area		Time* (hours)	Teaching methodology
8.	Mortality coding rules/instructions for selecting the UCOD.	7.00	Interactive presentation, <i>ICD-10 Volume 1: Tabular list</i> , <i>ICD-10 Volume 2: Instruction manual</i> , <i>ICD-10, Volume 3: Alphabetical index</i> , and ICD-10 work and answer books.
9.	Understanding causal relationships using the Medical Mortality Data System (MMDS) decision tables.	15.00	Interactive presentation, <i>ICD-10 Volume 1: Tabular list</i> , <i>ICD-10 Volume 2: Instruction manual</i> , <i>ICD-10, Volume 3: Alphabetical index</i> , MMDS decision tables, and ICD-10 work and answer books.
10.	Mortality coding rules/instructions for perinatal deaths (this area applies only to the countries who are still using a separate perinatal MCCD to certify perinatal deaths).	2.00	Interactive presentation, <i>ICD-10 Volume 1: Tabular list</i> , <i>ICD-10 Volume 2: Instruction manual</i> , <i>ICD-10, Volume 3: Alphabetical index</i> , and ICD-10 work and answer books.
Total time in hours: 75.00			

**The time durations could be adjusted based on curriculum requirements of the regional academic training programmes and time durations given should be used as a guide only.*

Learning areas

1. Principles of classification and history of ICD

- Objectives:**
1. To learn the definition of clinical coding
 2. To list purposes of clinical coding
 3. To list the uses of disease classification systems
 4. To learn the history of ICD

A brief introduction to describe the four main areas:

1. Definition of clinical coding
2. Purposes of clinical coding
3. Uses of disease classification systems
4. History of ICD

Lesson plan

Time allocation: 60 minutes

Teaching/learning method: Interactive presentation

Resources: PowerPoint presentation, ICD-10 volumes 1, 2 and 3

Topic	Expected outcome	Content
Clinical coding	Students understand the definition of clinical coding and understand its importance	<p>Clinical coding is the translation of diseases, health related problems and procedural concepts from text to alphanumeric codes for storage, retrieval and analysis.</p> <p>Few examples of ICD-10 coded data are as follows:</p> <ul style="list-style-type: none"> • Acute myocardial infarction - I21.9 • Dengue haemorrhagic fever - A91 • Acute appendicitis with peritoneal abscess - K35.1 • Bell's palsy - G51.0
Purposes of clinical coding	Students understand how to list the purposes of clinical coding	<p>Purposes of coding includes the following:</p> <ul style="list-style-type: none"> • Clinical research and epidemiological analysis • Funding and resource allocation • Education/quality assurance • Health services planning and evaluation • Utilisation reviews
Uses of disease classification systems	Students understand the uses of disease classification systems	<p>Uses of disease classifications</p> <ul style="list-style-type: none"> • To permit easy storage, retrieval and analysis of data • To allow comparisons of data between individual wards, hospitals, districts, provinces, states or countries
History of ICD	Students learn the history of ICD	<p>History of ICD along a timeline (WHO 2016b)</p> <p>Sir George Knibbs, an eminent Australian statistician, credited Francois Bossier de Lacroix (1706–1777) with the first attempt to systematically classify diseases.</p> <p>The classification of disease by William Cullen (1710–1790), of Edinburgh, was published in 1785 under the title <i>Synopsis nosologiae methodicae</i>, and was in use at the beginning of the nineteenth century.</p>

Topic	Expected outcome	Content
History of ICD (cont'd)	Students learn the history of ICD (cont'd)	<p>William Farr (1807–1883), who was a medical statistician, worked strenuously to secure better classifications and international uniformity in their use.</p> <p>A committee chaired by Jacques Bertillon (1851–1922), who was a chief of statistical services of the city of Paris, was entrusted with the preparation of a classification of cause(s) of death during a meeting of the International Statistical Institute in Vienna in 1891. The Bertillon classification of causes of death received general approval and was adopted by several countries. It was suggested that classification should be revised every 10 years. Revisions were done under Bertillon's leadership in 1900, 1910 and 1920.</p> <p>After Bertillon's fourth revision was done in 1929, the fifth revision was carried out in 1938 in Paris.</p> <p>An international health conference was held in New York in 1946. The World Health Organization (WHO) was given the responsibility of the next revision of the international list of causes of death and the establishment of international lists of causes of morbidity. The sixth revision was done in 1948.</p> <p>Prior to sixth revision, ICD was used only for mortality coding and from the sixth revision, ICD started to code morbidity too. The seventh revision was done in 1955, while the eighth revision was done in 1965. The ninth revision was done in Geneva in 1975.</p> <p>Work on the tenth revision (ICD-10) began in 1983, and it became endorsed by the Forty-third World Health Assembly in 1990, and was first used by member states in 1994. ICD-11 will start being implemented internationally from 2022.</p>

Evaluation:

1. Importance of clinical coding.
2. Purposes of clinical coding.
3. Uses of disease classification systems.
4. History of ICD along a timeline.

2. Introduction to the ICD-10 structure and coding conventions

- Objectives:**
1. To describe the structure of ICD-10 codes
 2. To familiarise students with the ICD-10 Volume 1: Tabular list and to learn coding conventions related to this list
 3. To introduce the ICD-10 Volume 2: Instruction manual
 4. To familiarise students with the ICD-10 Volume 3: Alphabetical index and to learn coding conventions related to ICD-10 in this index

Lesson plan

Time allocation: 330 minutes

Teaching/learning method: Interactive presentation

Resources: PowerPoint presentation, ICD-10 volumes 1, 2 and 3, ICD-10 work and answer books

Topic	Expected outcome	Content
Describe the structure of ICD-10 codes	Students understand the structure of ICD-10 codes	<p>Structure of ICD-10 codes</p> <p>There are three main fundamentals to the structure of the ICD-10 and they include the following:</p> <ul style="list-style-type: none"> • Three volumes of ICD-10 (Volume 1: Tabular list, Volume 2: Instruction manual, and Volume 3: Alphabetical index) • A total of 22 chapters • The alphanumeric code structure <p>In an ICD-10 code the first character is an alpha character (a letter), followed by two numeric characters (numbers) sometimes followed by a decimal point. Finally, following the decimal point another digit or two completes the code.</p> <div style="text-align: center;"> <p>K35.1</p> <p>First character A to Z Followed by 2 digits Then a decimal point Finally, another digit or two</p> </div>
Introduction to ICD-10 Volume 1: Tabular list	Students familiarise themselves with the ICD-10 Volume 1: Tabular list	<p>ICD-10 Volume 1: Tabular list</p> <ul style="list-style-type: none"> • It comprises 22 chapters • These chapters are associated with particular body systems, special diseases or external factors. One chapter is assigned for "Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified" and one for "Codes for special purposes". • Chapters are associated with one letter (14 chapters) or more than one letter (four chapters) and the remaining chapters share one letter since they have a smaller range. • Chapters in <i>ICD-10 Volume 1: Tabular list</i> are further divided into; <ul style="list-style-type: none"> - Blocks - Three-character categories - Four-character subcategories (and certain fifth character categories in limited places) • British spelling is used throughout <i>ICD-10 Volume 1: Tabular list</i>.

Topic	Expected outcome	Content
Introduction to ICD-10 Volume 1: Tabular list (cont'd)	Students learn coding conventions related to <i>ICD-10 Volume 1/ Tabular list</i>	<p>Coding conventions related to ICD-10 Volume 1: Tabular list</p> <p>Note: For more detailed instructions, refer to section 3.1 of ICD-10 Volume 2: Instruction manual (WHO 2016b).</p> <ul style="list-style-type: none"> • Inclusion terms • Exclusion terms • Dual coding Dagger and asterisk system • Parentheses () • Square brackets [] • Colon : • Brace } • NOS (Not Otherwise Specified) • NEC (Not Elsewhere Classified) • "And" in titles • Point dash .-
Introduction to ICD-10 Volume 2: Instruction manual	Students familiarise themselves with the <i>ICD-10 Volume 2: Instruction manual</i>	<p>ICD-10 Volume 2: Instruction manual</p> <ul style="list-style-type: none"> • It provides a basic description of the ICD-10, together with practical instructions for mortality (and morbidity) coders, and guidelines for the presentation and interpretation of data. • It is presented as a separate volume for ease of handling when reference needs to be made at the same time as the classification and the instructions for its use.
Introduction to ICD-10 Volume 3: Alphabetical index	Students familiarise themselves with the <i>ICD-10 Volume 3: Alphabetical index</i>	<p>ICD-10 Volume 3: Alphabetical index</p> <ul style="list-style-type: none"> • It is an alphabetical index to the tabular listing of Volume 1. • It includes the following: <ul style="list-style-type: none"> - An introduction, which explains the general arrangement and conventions used in the index. - Section I, which is an alphabetical index to diseases and nature of injur. - Section II, which is an alphabetical listing of external causes of injury. - Section III, which is an alphabetically arranged table of drugs and chemicals. • Index entries contain the following: <ul style="list-style-type: none"> - Lead terms to the extreme left of each column, in bold, that refer mainly to the names of diseases or conditions. - Modifiers at different levels of indentation to the right. They usually refer to variations of sites or situations that affect coding. • American spelling is used throughout <i>ICD-10 Volume 3: Alphabetical index</i>.
	Students learn coding conventions related to <i>ICD-10 Volume 3: Alphabetical index</i>	<p>Coding conventions related to ICD-10 Volume 3: Alphabetical index</p> <ul style="list-style-type: none"> • Parentheses () • NEC (Not Elsewhere Classified) • Cross-references

Evaluation:

1. Structure of ICD-10 codes.
2. Use of *ICD-10 Volumes 1: Tabular list and Volume 3: Alphabetical index*.
3. Meanings of coding conventions and their applications.

Student evaluation is also based on practice exercises from the following:

1. ICD-10 work and answer books.

3. Understanding basic coding guidelines

Objective: To enhance student knowledge in understanding the basic coding guidelines

Lesson plan

Time allocation: 30 minutes

Teaching/learning method: Interactive presentation

Resources: PowerPoint presentation, ICD-10 volumes 1, 2 and 3, ICD-10 work and answer books

Topic	Expected outcome	Content
Describe the basic coding guidelines	Students understand basic coding guidelines	<p>Basic coding guidelines</p> <ul style="list-style-type: none"> • It is mandatory to use both <i>Volume 3: Alphabetical index as well as Volume 1: Tabular list</i> in order to assign a particular code. • At the onset, identify the type of statement to be coded and refer to the appropriate section of the alphabetical index. For example, if the statement is a disease or injury classifiable to chapters I-XIX or XXI-XXII, refer to section I of the alphabetical index. If the statement is an external cause of an injury or other event classifiable to chapter XX, refer to section II of the index. Similarly, if the statement refers to a drug or chemical, refer to section III of the index. • Identify the lead term and locate it in the correct section of the alphabetical index. • Pay attention to any note that appears under the lead term and be guided accordingly. • Carefully read the terms (if any) enclosed in parentheses after the lead term, as well as any terms indented under the lead term, until all the words in the diagnostic term are covered. • Go through any cross-references ("see" and "see also"), which can be found in alphabetical index. • Refer to the tabular list to verify the appropriateness of the selected code. • Pay attention to the inclusion or exclusion terms under the selected code or under the chapter, block or category heading and act appropriately. • Assign the appropriate code.

Evaluation:

1. The application of basic coding guidelines.

4. Chapter specific coding

Objective: To describe chapter specific coding in accordance with the chapters listed on tabular list

Lesson plan

Time allocation: 2 280 minutes

Teaching/learning method: Interactive presentation

Resources: PowerPoint presentation, ICD-10 volumes 1, 2 and 3, ICD-10 work and answer books

Topic	Expected outcome	Content
Describe chapter specific coding in accordance with the chapters listed on the tabular list	Students learn chapter specific coding in accordance with the chapters listed on the tabular list	One coding example from each chapter is provided in order to demonstrate the process of chapter specific coding.
	Chapter I: Certain infectious and parasitic diseases (90 minutes)	Categories in this chapter range from A00 to B99. Coding example for chapter I: Chronic viral hepatitis C Search Hepatitis (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i> , section I Hepatitis - viral -- chronic --- type ---- C → B18.2 Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.
	Chapter II: Neoplasms (180 minutes)	Categories in this chapter range from C00 to D48. Coding example for chapter II: Acute myelomonocytic leukaemia Search Leukemia (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i> , section I Leukemia - myelomonocytic -- acute (M9867/3) → C92.5 Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.
	Chapter III: Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (90 minutes)	Categories in this chapter range from D50 to D89. Coding example for chapter III: Drug induced enzyme deficiency anaemia Search Anemia (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i> , section I Anemia - deficiency -- enzyme --- drug-induced (hemolytic) → D59.2 Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.
	Chapter IV: Endocrine, nutritional and metabolic diseases (120 minutes)	Categories in this chapter range from E00 to E90. Coding example for chapter IV: Sick euthyroid syndrome Search Syndrome (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i> , section I Syndrome - sick euthyroid → E07.8 Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.

Topic	Expected outcome	Content
Describe chapter specific coding in accordance with the chapters listed on the tabular list (cont'd)	Chapter V: Mental and behavioural disorders (120 minutes)	<p>Categories in this chapter range from F00 to F99.</p> <p>Coding example for chapter V: Acute stress reaction</p> <p>Search Reaction (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i>, section I</p> <p>Reaction</p> <ul style="list-style-type: none"> - stress -- acute → F43.0 <p>Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.</p>
	Chapter VI: Diseases of the nervous system (120 minutes)	<p>Categories in this chapter range from G00 to G99.</p> <p>Coding example for chapter VI: Transient ischemic attack</p> <p>Search Attack (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i>, section I</p> <p>Attack</p> <ul style="list-style-type: none"> - transient ischemic (TIA) → G45.9 <p>Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.</p>
	Chapter VII: Diseases of the eye and adnexa (60 minutes)	<p>Categories in this chapter range from H00 to H59.</p> <p>Coding example for chapter VII: Chronic simple glaucoma</p> <p>Search Glaucoma (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i>, section I</p> <p>Glaucoma</p> <ul style="list-style-type: none"> - chronic -- simple → H40.1 <p>Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.</p>
	Chapter VIII: Diseases of the ear and mastoid process (60 minutes)	<p>Categories in this chapter range from H60 to H95.</p> <p>Coding example for chapter VIII: Acute purulent otitis media</p> <p>Search Otitis (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i>, section I</p> <p>Otitis</p> <ul style="list-style-type: none"> - media -- acute or subacute --- purulent → H66.0 <p>Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.</p>
	Chapter IX: Diseases of the circulatory system (120 minutes)	<p>Categories in this chapter range from I00 to I99.</p> <p>Coding example for chapter IX: Right ventricular failure</p> <p>Search Failure (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i>, section I</p> <p>Failure</p> <ul style="list-style-type: none"> - ventricular -- right → I50.0 <p>Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.</p>
	Chapter X: Diseases of the respiratory system (120 minutes)	<p>Categories in this chapter range from J00 to J99.</p> <p>Coding example for chapter X: Acute maxillary sinusitis</p> <p>Search Sinusitis (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i>, section I</p> <p>Sinusitis</p> <ul style="list-style-type: none"> - maxillary -- acute → J01.0 <p>Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.</p>

Topic	Expected outcome	Content
Describe chapter specific coding in accordance with the chapters listed on the tabular list (cont'd)	Chapter XI: Diseases of the digestive system (120 minutes)	<p>Categories in this chapter range from K00 to K93.</p> <p>Coding example for chapter XI: Obstructed left inguinal hernia</p> <p>Search Hernia (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i>, section I</p> <p>Hernia</p> <ul style="list-style-type: none"> - inguinal -- unilateral --- with ---- obstruction → K40.3 <p>Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.</p>
	Chapter XII: Diseases of the skin and subcutaneous tissue (90 minutes)	<p>Categories in this chapter range from L00 to L99.</p> <p>Coding example for chapter XII: Pilonidal sinus with abscess</p> <p>Search Sinus (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i>, section I</p> <p>Sinus</p> <ul style="list-style-type: none"> - pilonidal -- with abscess → L05.0 <p>Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.</p>
	Chapter XIII: Diseases of the musculoskeletal system and connective tissue (120 minutes)	<p>Categories in this chapter range from M00 to M99.</p> <p>Coding example for chapter XIII: Bursitis of shoulder</p> <p>Search Bursitis (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i>, section I</p> <p>Bursitis</p> <ul style="list-style-type: none"> - shoulder → M75.5 <p>Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.</p>
	Chapter XIV: Diseases of the genitourinary system (120 minutes)	<p>Categories in this chapter range from N00 to N99.</p> <p>Coding example for chapter XIV: End stage renal failure</p> <p>Search Failure (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i>, section I</p> <p>Failure</p> <ul style="list-style-type: none"> - renal -- end stage → N18.0 <p>Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.</p>
	Chapter XV: Pregnancy, childbirth and the puerperium (90 minutes)	<p>Categories in this chapter range from O00 to O99.</p> <p>Coding example for chapter XV: Hyperemesis gravidarum</p> <p>Search Hyperemesis (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i>, section I</p> <p>Hyperemesis</p> <ul style="list-style-type: none"> - gravidarum → O21.0 <p>Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.</p>
	Chapter XVI: Certain conditions originating in the perinatal period (90 minutes)	<p>Categories in this chapter range from P00 to P96.</p> <p>Coding example for chapter XVI: Hyaline membrane disease of newborn</p> <p>Search Disease (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i>, section I</p> <p>Disease</p> <ul style="list-style-type: none"> - hyaline -- membrane (newborn) → P22.0 <p>Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.</p>

Topic	Expected outcome	Content
Describe chapter specific coding in accordance with the chapters listed on the tabular list (cont'd)	Chapter XVII: Congenital malformations, deformations and chromosomal abnormalities (60 minutes)	Categories in this chapter range from Q00 to Q99. Coding example for chapter XVII: Cervical spina bifida with hydrocephalus Search Spina bifida (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i> , section I Spina bifida - cervical -- with hydrocephalus → Q05.0 Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.
	Chapter XVIII: Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (60 minutes)	Categories in this chapter range from R00 to R99. Coding example for chapter XVIII: Hyperglycaemia Search Hyperglycemia (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i> , section I Hyperglycemia, hyperglycemic → R73.9 Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.
	Chapter XIX: Injury, poisoning and certain other consequences of external causes (180 minutes) and Chapter XX: External causes of morbidity and mortality (180 minutes)	Categories in chapter XIX range from S00 to T98 while categories in chapter XX range from V01 to Y98. Note: <i>When allocating codes from chapter XIX, the coders must also allocate a chapter XX in order to complete the coding process. Accordingly, the coding example below covers both chapters XIX and XX.</i> Coding example for chapter XIX and XX: Cerebral contusion due to fall from bed onto floor, while sleeping, at home Search Contusion (lead term for injury) in the <i>ICD-10 Volume 3: Alphabetical index</i> , section I Contusion - cerebral → S06.20 Next, search Fall (lead term for external cause) in the <i>ICD-10 Volume 3: Alphabetical index</i> , section II Fall - bed → W06.04 Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.
	Chapter XXI: Factors influencing health status and contact with health services (60 minutes)	Categories in this chapter range from Z00 to Z99. Note: <i>This chapter is not used for mortality coding.</i> Coding example for chapter XXI: Incidental pregnancy Search Pregnancy (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i> , section I Pregnancy - incidental finding → Z33 Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.
	Chapter XXII: Codes for special purposes (30 minutes)	Categories in this chapter range from U00 to U99. Coding example for chapter XXII: COVID-19, virus identified Search COVID-19 (lead term) in the <i>ICD-10 Volume 3: Alphabetical index</i> , section I COVID-19 - virus identified → U07.1 Refer to <i>ICD-10 Volume 1: Tabular list</i> to confirm the code.

Evaluation:

1. Individual work – Practice exercises using the ICD-10 work and answer books.

5. Sources of mortality data

Objective: To describe the main source of mortality data

Lesson plan

Time allocation: 15 minutes

Teaching/learning method: Interactive presentation

Resources: PowerPoint presentation, ICD-10 volume 2

Topic	Expected outcome	Content
Main source of mortality data	Students identify the main source of mortality data	<p>Medical Certificate of Cause of Death is the main source of mortality data. Information on MCCD is usually provided by a medical practitioner. However, in some jurisdictions – in the case of deaths due to accidents or violence – the MCCD may be completed by a coroner or other legal official.</p> <p>The person certifying the cause of death (COD) must enter the sequence of events on the MCCD that led to the death.</p>

Evaluation:

1. The source and information providers of mortality data.

6. The concept of Underlying Cause of Death (UCOD)

- Objectives:**
1. To describe the international form of MCCD
 2. To define the concept of UCOD

Lesson plan

Time allocation: 45 minutes

Teaching/learning method: Interactive presentation

Resources: PowerPoint presentation, ICD-10 volumes 1, 2 and 3, ICD-10 work and answer books

Topic	Expected outcome	Content																																																																																																																												
International form of MCCD	Students familiarise themselves with the international form of the MCCD	<p>The World Health Organization recommends the use of the international form of MCCD (see Figure 1 below) for certification of deaths in all countries.</p> <table border="1"> <tr> <td>Sex</td> <td><input type="checkbox"/> Female</td> <td><input type="checkbox"/> Male</td> <td><input type="checkbox"/> Unknown</td> </tr> <tr> <td>Date of birth</td> <td>D D M M Y Y Y Y</td> <td>Date of death</td> <td>D D M M Y Y Y Y</td> </tr> </table> <p>Frame A: ► Medical data: Part 1 and 2</p> <table border="1"> <thead> <tr> <th rowspan="5"> 1. Report disease or condition directly leading to death on line a Report chain of events in due order (if applicable) State the underlying cause on the lowest used line </th> <th colspan="2">► Cause of death</th> <th>► Time interval from onset to death</th> </tr> </thead> <tbody> <tr> <td>a</td> <td></td> <td></td> </tr> <tr> <td>b</td> <td>Due to:</td> <td></td> </tr> <tr> <td>c</td> <td>Due to:</td> <td></td> </tr> <tr> <td>d</td> <td>Due to:</td> <td></td> </tr> </tbody> </table> <p>2. Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</p> <p>Frame B: ► Other medical data</p> <table border="1"> <tr> <td>Was surgery performed within the last 4 weeks?</td> <td><input type="checkbox"/> Yes</td> <td><input type="checkbox"/> No</td> <td><input type="checkbox"/> Unknown</td> </tr> <tr> <td>If yes please specify date of surgery</td> <td colspan="3">D D M M Y Y Y Y</td> </tr> <tr> <td>If yes please specify reason for surgery (disease or condition)</td> <td colspan="3"></td> </tr> <tr> <td>Was an autopsy requested?</td> <td><input type="checkbox"/> Yes</td> <td><input type="checkbox"/> No</td> <td><input type="checkbox"/> Unknown</td> </tr> <tr> <td>If yes were the findings used in the certification?</td> <td><input type="checkbox"/> Yes</td> <td><input type="checkbox"/> No</td> <td><input type="checkbox"/> Unknown</td> </tr> <tr> <td colspan="4">► Manner of death:</td> </tr> <tr> <td><input type="checkbox"/> Disease</td> <td><input type="checkbox"/> Assault</td> <td colspan="2"><input type="checkbox"/> Could not be determined</td> </tr> <tr> <td><input type="checkbox"/> Accident</td> <td><input type="checkbox"/> Legal intervention</td> <td colspan="2"><input type="checkbox"/> Pending investigation</td> </tr> <tr> <td><input type="checkbox"/> Intentional self harm</td> <td><input type="checkbox"/> War</td> <td colspan="2"><input type="checkbox"/> Unknown</td> </tr> <tr> <td>If external cause or poisoning:</td> <td>Date of injury</td> <td colspan="2">D D M M Y Y Y Y</td> </tr> <tr> <td colspan="4">Please describe how external cause occurred (If poisoning please specify poisoning agent)</td> </tr> <tr> <td colspan="4">► Place of occurrence of the external cause:</td> </tr> <tr> <td><input type="checkbox"/> At home</td> <td><input type="checkbox"/> Residential institution</td> <td><input type="checkbox"/> School, other institution, public administrative area</td> <td><input type="checkbox"/> Sports and athletics area</td> </tr> <tr> <td><input type="checkbox"/> Street and highway</td> <td><input type="checkbox"/> Trade and service area</td> <td><input type="checkbox"/> Industrial and construction area</td> <td><input type="checkbox"/> Farm</td> </tr> <tr> <td colspan="3"><input type="checkbox"/> Other place (please specify):</td> <td><input type="checkbox"/> Unknown</td> </tr> <tr> <td colspan="4">► Fetal or infant Death</td> </tr> <tr> <td>Multiple pregnancy?</td> <td><input type="checkbox"/> Yes</td> <td><input type="checkbox"/> No</td> <td><input type="checkbox"/> Unknown</td> </tr> <tr> <td>Stillborn?</td> <td><input type="checkbox"/> Yes</td> <td><input type="checkbox"/> No</td> <td><input type="checkbox"/> Unknown</td> </tr> <tr> <td>If death within 24h specify number of hours survived</td> <td colspan="3">Birth weight (in grams)</td> </tr> <tr> <td>Number of completed weeks of pregnancy</td> <td colspan="3">Age of mother (years)</td> </tr> <tr> <td colspan="4">If death was perinatal, please state conditions of mother that affected the fetus and newborn</td> </tr> <tr> <td colspan="4">► For women, was the deceased pregnant?</td> </tr> <tr> <td><input type="checkbox"/> At time of death</td> <td><input type="checkbox"/> Yes</td> <td><input type="checkbox"/> No</td> <td><input type="checkbox"/> Unknown</td> </tr> <tr> <td><input type="checkbox"/> Between 43 days up to 1 year before death</td> <td><input type="checkbox"/> Yes</td> <td><input type="checkbox"/> No</td> <td><input type="checkbox"/> Unknown</td> </tr> <tr> <td>Did the pregnancy contribute to the death?</td> <td><input type="checkbox"/> Yes</td> <td><input type="checkbox"/> No</td> <td><input type="checkbox"/> Unknown</td> </tr> </table>	Sex	<input type="checkbox"/> Female	<input type="checkbox"/> Male	<input type="checkbox"/> Unknown	Date of birth	D D M M Y Y Y Y	Date of death	D D M M Y Y Y Y	1. 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Figure 1: International form of Medical Certificate of Cause of Death (WHO 2016b)

Topic	Expected outcome	Content
International form of MCCD (cont'd)	Students familiarise themselves with the international form of the MCCD (cont'd)	<p>The international form of MCCD is divided into three main sections as follows:</p> <ul style="list-style-type: none"> • Section to document basic demographic information: Details in this section may differ from country to country. However, details such as full name, age/date of birth, date and place of death, sex, place of residence, and race/ethnicity of the deceased are frequently included. • Frame A, Medical data: This section of the MCCD is further divided into Parts 1 and 2, and a section to record the approximate interval between onset of the condition and death. • Frame B: This section includes other important information such as other medical data, manner of death, place of occurrence of the external cause, whether foetal or infant death, and details on pregnancy at the time of death (pregnancy check box).
Concept of UCOD	Students learn to define the concept of UCOD	<p>Many MCCDs have only a single COD documented on line 1a of the certificate and this single cause becomes the UCOD. Such cases are simple and straight forward.</p> <p>However, in many other cases, two or more conditions contribute to death. These must all be recorded on the MCCD in a sequence. The underlying cause must be recorded on the lowest used line of Part I, and other conditions due to the underlying cause are documented above it in a sequence. To further understand the sequence of events leading to death – how it started, how it ended and intervening causes – an example is shown below.</p> <p>A 53-year-old male was admitted to the hospital vomiting blood and was diagnosed as having bleeding oesophageal varices. Investigations revealed portal hypertension. He had a history of hepatitis B infection.</p> <p>Figure 2 outlines the sequence of events that led to his death. It begins with a hepatitis B infection (UCOD, the starting point), which led to cirrhosis of liver (intervening cause 1), followed by portal hypertension (intervening cause 2), then bleeding oesophageal varices (immediate COD, the end point), which finally led to death.</p> <pre> graph BT A[Hepatitis B] --> B[Cirrhosis of liver] B --> C[Portal hypertension] C --> D[Bleeding oesophageal varices] </pre> <p><i>Figure 2: An example of a sequence of events leading to death</i></p> <p>In cases where more than one cause is reported, it is the practice to select one of the causes for coding and reporting purposes. The selected single cause becomes the UCOD. This concept of the UCOD is fundamental to mortality coding.</p> <p>WHO (1948) has defined the UCOD as:</p> <ul style="list-style-type: none"> • the disease or injury which initiated the train of morbid events leading directly to death; or • the circumstances of the accident or violence which produced the fatal injury. <p>Thus, the UCOD is the condition, event or circumstance without which the patient would not have died. For example, a patient died following an acute myocardial infarction due to coronary atherosclerosis. Here, the immediate COD is acute myocardial infarction and the UCOD is coronary atherosclerosis.</p>

Topic	Expected outcome	Content
Concept of UCOD (cont'd)	Students learn to define the concept of UCOD (cont'd)	Before the MCCD reaches the mortality coder, the certifying doctor must report the: <ul style="list-style-type: none">• diseases or conditions related to the sequence of events leading directly to the death in Part 1 of Frame A; and• unrelated conditions that had no direct connection with the events leading to death, but may have contributed to death in Part 2 of Frame A

Evaluation:

1. The arrangement of the international form MCCD and its parts.
2. The concept of UCOD.

7. Basic concepts in mortality coding

Objective: To describe the basic concepts in mortality coding

Lesson plan

Time allocation: 300 minutes

Teaching/learning method: Interactive presentation

Resources: PowerPoint presentation, ICD-10 volumes 1, 2 and 3, ICD-10 work and answer books

Topic	Expected outcome	Content
Basic concepts in mortality coding	Students learn to describe the basic concepts in mortality coding (cont'd)	<p>Mortality coders must be familiar with the basic concepts in mortality coding presented below.</p> <p>Note: For more detailed instructions, refer to section 4.1.3 (basic concepts) of ICD-10 Volume 2: Information manual (WHO 2016b).</p> <ul style="list-style-type: none"> • Sequence The term "sequence" refers to a chain or series of medical events in which each step is a complication of, or is caused by, the previous step. • Causal relationship A "causal relationship" exists if a condition mentioned on the MCCD can be caused by another condition that is also mentioned on the MCCD. • Duration The "duration" refers to the time period between the onset of the disease or condition and the time of death: therefore, on a MCCD, each reported condition should also include information about the duration. • Terminal cause of death (COD) The "terminal COD" is the condition entered first on the first line of Part 1 of the MCCD. • Starting point The "starting point" is the condition or event that started the sequence of acceptable causal relationships ending with the terminal COD. In a correctly completed MCCD, the condition reported on the lowest used line in Part 1 is the starting point of the sequence. • Tentative starting point As mentioned above, in a correctly completed MCCD, the condition reported on the lowest used line in Part 1 is the starting point, but if the MCCD is not correctly filled out, the starting point may be reported somewhere else. The "tentative starting point" may change several times as the instructions are applied to the MCCD. • Obvious cause Several coding instructions will instruct to check whether the tentative starting point is itself obviously caused by another condition mentioned on the same line or below on the MCCD. If so, this "obvious cause" condition becomes the new tentative starting point. • First-mentioned sequence An MCCD may contain several sequences, and the coding instructions will guide the coder to find the starting point of the "first-mentioned sequence".

Topic	Expected outcome	Content
Basic concepts in mortality coding (cont'd)	Students learn to describe the basic concepts in mortality coding (cont'd)	<ul style="list-style-type: none"> • Underlying cause of death (UCOD) Usually, mortality statistics show a single COD for each individual, regardless of how many conditions are reported on the MCCD. The "underlying cause of death" is the condition selected for such single-cause tabulation. In most cases, the UCOD is the same as the starting point. However, sometimes a condition other than the starting point is selected as UCOD for use in statistics. • Modification Special coding instructions on specific sequences and ICD categories may have the effect that a condition other than the starting point is selected as the UCOD for use in statistics. In such cases, the code for underlying cause often expresses a combination of the starting point with another reported condition, or a complication or consequence of the starting point that is of particular importance to public health. The procedure by which the ICD code for the starting point is replaced by another code is called "modification". • Tentative underlying cause of death (TUCOD) Several special instructions on modification may apply to the same MCCD. If so, apply the instructions step by step. The code selected as the outcome of each step in the process is called the "tentative underlying cause of death".

Evaluation:

1. Answering questions on basic concepts in mortality coding.
2. Group/Individual work using the examples given in ICD-10 work and answer books.

8. Mortality coding rules/instructions for selecting the UCOD

- Objectives:**
1. To describe the mortality coding rules/instructions for selecting the UCOD
 2. To understand the causal relationships reported on the MCCD

Lesson plan

Time allocation: 420 minutes

Teaching/learning method: Interactive presentation

Resources: PowerPoint presentation, ICD-10 volumes 1, 2 and 3, ICD-10 work and answer books

Topic	Expected outcome	Content
Mortality coding rules/instructions for selecting the UCOD	Students learn to apply mortality coding "starting point" rules in selecting the UCOD (ont'd)	<p>Before attempting to find the UCOD, first assign ICD codes to all the conditions mentioned on the MCCD. The reason for this is that many mortality coding instructions are based on specific ICD codes. Therefore, to determine whether any of the instructions apply, the ICD codes for all the conditions on the MCCD must be known. Following this procedure, the next step is to select a UCOD to be included in the mortality statistics.</p> <p>Selecting the UCOD involves two separate steps.</p> <ul style="list-style-type: none"> • First, <i>identify the starting point (SP)</i>; i.e., the disease or event that started the chain of events leading to death. • Next, check whether any <i>special instructions</i> apply to the identified starting point. If so, the next step is to modify the identified starting point in the first step. <p>Note: For more detailed instructions, refer to section 4.2 of ICD-10 Volume 2: Instruction manual (WHO 2016b).</p> <p>Identifying the starting point (Steps SP1 to SP8)</p> <p>To identify the starting point, follow the eight steps specified below. The steps are named SP1 to SP8 (starting point rule 1 to starting point rule 8). Each step contains one selection rule. At each step, there is a description of the selection rule itself and an instruction on what to do thereafter.</p> <ul style="list-style-type: none"> • Step SP1 – Single cause on the MCCD If there is only one condition reported on the MCCD, in either Part 1 or Part 2, this is the <i>starting point</i> and it is also the UCOD. Next, go to step M4. <p>If there are two or more conditions on the certificate, go to step SP2.</p> <ul style="list-style-type: none"> • Step SP2 – Only one line used in Part 1 of the MCCD If the certifier has used only one line in Part 1. But entered two or more conditions on this line, then the first-mentioned condition is the <i>tentative starting point</i>. Next, go to step SP6. <p>Also, if there is only one condition reported in Part 1. But one or more conditions in Part 2, then the single condition in Part 1 is the <i>tentative starting point</i>. Next, go to step SP6.</p> <p>If the certifier has used more than one line in Part 1, go to step SP3.</p> <ul style="list-style-type: none"> • Step SP3 – More than one line used in Part 1, first cause on lowest line explains all entries above If there are conditions reported on more than one line in Part 1, check whether all of the conditions reported on the line(s) above the lowest used line in Part 1 can be caused by the first condition on the lowest used line.

Topic	Expected outcome	Content
Mortality coding rules/instructions for selecting the UCOD (cont'd)	Students learn to apply mortality coding "starting point" rules in selecting the UCOD (cont'd)	<p>If all conditions on the line(s) above the lowest used line in Part 1 can be caused by the first condition on the lowest used line, then this condition is the <i>tentative starting point</i>. Next, go to step SP6.</p> <p>If all conditions on the line(s) above the lowest used line in Part 1 cannot be caused by the first condition on the lowest used line, try to get clarification from the certifying doctor. If it fails and no further information is available, go to step SP4.</p> <ul style="list-style-type: none"> • Step SP4 – First cause on lowest used line does not explain all entries above, but a sequence ends with the terminal condition <p>If there is only one sequence ending with the terminal condition, find the starting point of this sequence. This is the <i>new tentative starting point</i>. Next, go to step SP6.</p> <p>If there are two or more sequences of conditions/events ending with the terminal condition, identify the first-mentioned sequence and find the starting point of this first-mentioned sequence. Next, go to step SP6. For further elaboration, refer to section 4.1.3 of <i>ICD-10 Volume 2: Instruction manual (WHO 2016b)</i>.</p> <p>If there is no sequence ending with the terminal condition, go to step SP5.</p> <ul style="list-style-type: none"> • Step SP5 – No sequence in Part 1 <p>If there is no sequence ending with the terminal condition, then the <i>terminal condition</i> is also the <i>tentative starting point</i>. Next, go to step SP6.</p> <ul style="list-style-type: none"> • Step SP6 – Obvious cause <p>Check whether the selected tentative starting point in steps SP1 to SP5 was <i>obviously caused by another condition</i> on the MCCD. If the tentative starting point is in Part 1, then this other condition must be either on the same line, further down in Part 1, or in Part 2. If the tentative starting point is in Part 2, this other condition must also be in Part 2.</p> <p>Next, check whether there is another condition mentioned on the same line or further down on the MCCD as the new tentative starting point identified that <i>obviously caused</i> this new tentative starting point. Continue looking for a new tentative starting point until a starting point that is not obviously caused by a condition reported on the same line or further down on the MCCD is found. Then go to step SP7.</p> <p>Furthermore, if there is no condition mentioned on the MCCD that <i>obviously caused</i> the tentative starting point selected in steps SP1 to SP5, go to step SP7.</p> <p>Note: Remember the points given below also apply during step SP6 (<i>Obvious cause consideration</i>)</p> <ul style="list-style-type: none"> - If the tentative starting point is in Part 1, look for an obvious cause of the tentative starting point first on the same line in Part 1, next on lower lines in Part 1, and finally in Part 2. Do not look for obvious causes on the lines above the tentative starting point. - If the tentative starting point is in Part 2, look for an obvious cause in Part 2. Do not look for obvious causes in Part 1. - If a "condition A" has a longer duration than a "condition B", then "condition B" cannot be the obvious cause of "condition A". - If there are several conditions that could be obvious causes of the tentative starting point, select the first-mentioned condition.

Topic	Expected outcome	Content
Mortality coding rules/ instructions for selecting the UCOD (cont'd)	Students learn to apply mortality coding "starting point" rules in selecting the UCOD (cont'd)	<ul style="list-style-type: none"> - "Obvious cause" means that there must be no doubt that the tentative starting point was caused by the other condition that is mentioned on the MCCD. It is not sufficient that the sequence would have been accepted if the tentative starting point had been reported as due to the other condition. • Step SP7 – Ill-defined conditions Check whether the tentative starting point is <i>listed in the table of ill-defined conditions</i> (refer to Annex 7.3 of <i>ICD-10 Volume 2: Instruction manual</i> (WHO 2016b): List of ill-defined conditions). If listed, the tentative starting point is considered ill-defined. If so: <ul style="list-style-type: none"> - Check whether there are other conditions reported on the MCCD. Check whether they are all ill-defined. If all other conditions are ill-defined, go to step M1. - Check if there is at least one condition that is not ill-defined, then disregard the ill-defined condition(s). Go to step SP1 and select another starting point, as if the ill-defined condition(s) had not been mentioned on the MCCD. - If the tentative starting point is not ill-defined, go to step SP8. • Step SP8 – Conditions unlikely to cause death Check whether the tentative starting point is <i>listed in the table of conditions unlikely to cause death</i> (refer to Annex 7.3 of <i>ICD-10 Volume 2: Instruction manual</i> (WHO 2016b): List of ill-defined conditions). If so: <ul style="list-style-type: none"> - Check if there are other conditions reported on the certificate and <i>check whether they are all ill-defined or unlikely to cause death</i>. If they are all ill-defined or unlikely to cause death, go to step M1. - Check if there are other conditions reported that are not ill-defined or unlikely to cause death. First check whether the death was caused by a reaction to treatment of the condition that is unlikely to cause death that was selected as the tentative starting point. If it was, then <i>select the reaction to treatment as the starting point</i>. Next, go to step M1. - If the death was not caused by a reaction to treatment of the condition that is unlikely to cause death, check whether the condition was the cause of another condition that is not on the list of conditions that are unlikely to cause death and that it is not ill-defined. If so, then the <i>condition unlikely to cause death</i> is still the <i>tentative starting point</i>. Next, go to step M1. - If there was no reaction to treatment and no complication of the condition unlikely to cause death, then <i>disregard the condition unlikely to cause death</i>. Go to step SP1 and select another starting point, as if the condition unlikely to cause death had not been mentioned on the MCCD. <p>If the starting point is not a condition unlikely to cause death, then go to step M1.</p>
	Students learn to apply mortality coding Modification rules in selecting the UCOD	Modifications to the starting point (Steps M1 to M4) The starting point that was identified when using steps SP1 to SP8 is now considered the tentative underlying cause of death (TUCOD). There may be special coding instructions on this TUCOD, or other reasons to modify the TUCOD. Check whether the TUCOD should be modified by applying the modification rules described in steps M1 to M3 (modification rule 1 to modification rule 3).

Topic	Expected outcome	Content
Mortality coding rules/ instructions for selecting the UCOD (cont'd)	Students learn to apply mortality coding Modification rules in selecting the UCOD (cont'd)	<ul style="list-style-type: none"> • Step M1 – Special instructions <p>Check whether special coding instructions apply to the TUCOD. If a special coding instruction applies, assign a new TUCOD according to the instruction.</p> <p>Next, check whether any special instructions apply to this new TUCOD. That is, re-apply step M1. Repeat until a TUCOD that is not affected by any further special coding instruction is found. Next, go to Step M2.</p> <p>Note: For more detailed instructions, refer to section 4.2.5 of ICD-10 Volume 2: Instruction manual (WHO 2016b), which provides special instructions on linkages and other provisions (step M1) and detailed instructions on specific tentative underlying causes.</p> <ul style="list-style-type: none"> • Step M2 – Specificity <p>If the TUCOD describes a condition in general terms and a term that provides more precise information about the site or nature of this condition is reported on the MCCD, this more informative term is the new TUCOD.</p> <p>Next, check whether this new TUCOD can be specified even further by other terms on the MCCD. That is, re-apply step M2. Repeat until a TUCOD that cannot be specified further is found.</p> <ul style="list-style-type: none"> • Step M3 – Recheck steps SP6, M1 and M2 <p>At this point, if the TUCOD is not the same as the starting point that was selected using steps SP1 to SP8, then go back to step SP6. Repeat the procedures described in steps SP6, M1 and M2.</p> <ul style="list-style-type: none"> - Do not go back to step SP6 if the cause selected in step M1 or M2 is correctly reported as being due to another condition, except when this condition is ill-defined. - Do not go back to step SP6 if the TUCOD is a reaction to treatment of a condition unlikely to cause death, as selected in step SP8. <ul style="list-style-type: none"> • Step M4 – Instructions on medical procedures, poisoning, main injury and maternal deaths <p>Note: For more detailed instructions, refer to the relevant sections of ICD-10 Volume 2: Instruction manual (WHO 2016b).</p> <p>At this final stage, apply the following instructions to the selected TUCOD:</p> <ul style="list-style-type: none"> - If the TUCOD arrived at by applying steps SP1 to SP8 and steps M1 to M3 is surgery or another type of medical procedure, apply the instructions in section 4.2.9 (Special instructions on surgery and other medical procedures step M4). - If the TUCOD arrived at by applying the selection and modification rules in steps SP1 to SP8 and steps M1 to M3 is an injury or poisoning (a code in S00–T98), code the external cause of the injury or poisoning as the UCOD. - If the TUCOD is in Chapter XX (External causes of morbidity and mortality) also select a main injury. See the instructions in section 4.2.6 (Special instructions on main injury in deaths from external causes – step M4). - If the starting point selected by applying steps SP1 to SP8 and steps M1 to M3 is poisoning, and more than one toxic substance is reported on the certificate, apply the instructions in Section 4.2.7 (Special instructions on poisoning by drugs, medicaments and biological substances – step M4), to identify the most important drug involved.

Topic	Expected outcome	Content
Mortality coding rules/ instructions for selecting the UCOD (cont'd)	Students learn to apply mortality coding Modification rules in selecting the UCOD (cont'd)	<ul style="list-style-type: none"> - If the decedent is a woman, and pregnancy, childbirth or puerperium is reported on the certificate, determine whether to code the underlying cause to Chapter XV (Pregnancy, childbirth and the puerperium), according to the instructions in section 4.2.8 (Special instructions on maternal mortality – step M4). <p>When a cause of death that is not further changed in either step SP6 or steps M1 to M3 is found, this is the UCOD.</p> <p>Note: <i>Although the COD identified is not further changed in step SP6 or steps M1 to M3, other restrictions may apply. For example, if the cause is limited to one of the sexes or to a specific age range, or the COD is improbable, considering the geographical setting. Hence, always check whether any such restrictions apply to the TUCOD that was selected.</i></p>

Evaluation:

1. Group/Individual work using the examples given in ICD-10 work and answer books.

9. Understanding causal relationships using the MMDS decision tables

- Objectives:** 1. To understand the causal relationships reported on the MCCD using MMDS decision tables
2. To answer the mortality coding practice exercises

Lesson plan

Time allocation: 900 minutes

Teaching/learning method: Interactive presentation

Resources: PowerPoint presentation, ICD-10 volumes 1, 2 and 3, MMDS decision tables, ICD-10 work and answer books

Topic	Expected outcome	Content
Understanding causal relationships using MMDS decision tables	Students understand the causal relationships reported on the MCCD using MMDS decision tables	<p>Interpreting the causal relationships using the Medical Mortality Data System (MMDS) decision tables</p> <p>Note: Under the previous section the tentative starting point, UCOD, was selected by applying mortality coding rules (steps SP1 to SP8 and M1 to M4) and the resultant tentative starting point, UCOD, was determined by clinically based causal relationships. The MMDS decision tables could be used to determine the causal relationships even by a person who does not have clinical knowledge on causal relationships.</p> <p>To interpret causal relationships more easily, the Iris Institutes <i>MMDS Decision Tables for Classifying Underlying Causes of Death</i> (2021) is used. The MMDS decision tables within it are used by many countries to automatically code the majority of MCCD.</p> <p>The MMDS decision tables could be downloaded by personnel of countries that do not use automated coding software. The use of the MMDS decision tables ensures consistent application of the selection and modification rules across jurisdictions and assists with the provision of comparable COD data nationally and internationally.</p> <p>Using MMDS decision tables to select the UCOD</p> <p>The decision tables are a collection of lists that provide guidance and direction in the application of the selection and modification rules published in <i>ICD-10 Volume 2: Instruction manual</i> (WHO 2016b). The document contains eight tables (A to H).</p> <p>Note: Details concerning the use of each table are outlined below:</p> <ol style="list-style-type: none"> Table A: Lists each ICD-10 code that is valid for use in <i>both</i> multiple and underlying cause coding. Table B: Lists codes valid for use in multiple cause coding but <i>not</i> underlying cause coding. Table C: Lists all ICD-10 codes that are invalid for <i>both</i> multiple and underlying cause coding. Table D: Is used to <i>determine</i> the causal relationships of conditions listed on the MCCD. The "address code" is displayed at the top of lists of codes. The code ranges or "subaddresses" that have a valid causal relationship are listed below the address code. The address code is the code listed on the <i>upper</i> line of Part I. The subaddress codes identify conditions that can give rise to, or cause, that condition. Conditions for which codes are not listed cannot cause the condition specified by the address code, meaning they are non-acceptable sequences. This table is used to determine the causal relationships when applying the SP3, SP4 and SP5. <p>Note: <i>Table D ambivalent causal relationships.</i> There are some ICD-10 code subaddresses that have an <i>ambivalent causal relationship</i> to the condition listed in the address code. This means, they may or may not have an acceptable causal relationship. This applies to all subaddresses marked with the letter "M".</p> <ol style="list-style-type: none"> Table E: Is the <i>modification table</i> and is used for the application of step SP6 (obvious cause), step SP7 (ill-defined conditions), step M1 (special instructions) and step M2 (specificity). <p>Note: <i>The address code in Table E is the tentative underlying cause code.</i> This means the code selected after the application of the step SP3, SP4 and SP5. This code may be modified a number of time</p>

Topic	Expected outcome	Content
Understanding causal relationships using MMDS decision tables (cont'd)	Students understand the causal relationships reported on the MCCD using MMDS decision tables (cont'd)	<p>before determination of the final underlying cause. The ICD-10 subaddress codes identify conditions that will either combine with the tentative starting point code or direct the coder to use a preferred code. In either case, the new code becomes the address code. This process may be repeated several times before assignment of the final starting point code.</p> <p>Furthermore, the use of Table E requires the understanding of a number of <i>symbols and acronyms</i> that alert coders to special conditions and circumstances that must be met before assigning individual subaddress. These are listed below:</p> <p>Table E Symbols</p> <p>The symbol “M”, as for Table D, denotes an ambivalent relationship and is treated in the same way as it is in Table D.</p> <p>The symbol “#” denotes special considerations in the application of step M1 (special instructions).</p> <p>Where a condition listed in ICD-10 categories C000 to D489 Neoplasms is marked with the # symbol, the address may be reported in Part 1 and the subaddress may be reported in Part 2 or vice versa. Normally, to apply step M1 to neoplasm codes, both conditions must be reported together in Part 1, or together in Part 2.</p> <p>To apply step M1 to categories F03, F09 and F29, certain subaddresses must be reported on the same line as the address code in order to be selected by step M1. These subaddresses are flagged with the # symbol in Table E.</p> <p>Table E Acronyms</p> <p>DS (Direct, Sequel): For step SP6</p> <p>When the tentative starting point is considered obviously caused by (a direct sequence of) another condition on the MCCD in Part 1 – because it is reported on the same or a lower line as the tentative starting point, or if it is reported in Part 2 – the code for that <i>other condition is preferred</i> over the code for the tentative starting point.</p> <p>DSC (Direct, Sequel, Combined): For step SP6</p> <p>When the tentative starting point is considered obviously caused by (a direct sequel of) another condition on the MCCD in Part 1 (must be on the same or lower line as tentative starting point) or in Part 2, and the codes for the tentative starting point and the <i>other condition combine</i> into a third code.</p> <p>IDDC (Ill defined, Due to, Combined): for step SP7</p> <p>When the tentative starting point is an ill-defined condition in the <i>due to</i> position to another condition, and the codes for the tentative starting point and the <i>other condition combine</i> into a third code.</p> <p>SENMC (Senility, Mention, Combined): For step SP7</p> <p>When the tentative starting point is senility (R54) and this condition is reported <i>with mention of</i> another condition on the MCCD, and the codes for the tentative starting point and the <i>other condition combine</i> into a third code.</p> <p>SENDC (Senility, Due to, Combined): For step SP7</p> <p>When the tentative starting point is senility (R54) and is reported in a <i>due to</i> position to another condition, and the codes for the tentative starting point and the <i>other condition combine</i> into a third code.</p> <p>LMP (Linkage, Mention, Preferred): For step M1</p> <p>When the TUCOD is reported <i>with mention of</i> another condition in Part 1 or Part 2 of the MCCD, and the code for the <i>other condition is preferred</i> over the code for the TUCOD.</p> <p>LMC (Linkage, Mention, Combined): For step M1</p> <p>When the TUCOD is reported <i>with mention of</i> another condition in Part 1 or Part 2 of the MCCD, and the codes for the TUCOD and the <i>other condition combine</i> into a third code.</p>

Topic	Expected outcome	Content																													
Understanding causal relationships using MMDS decision tables (cont'd)	Students understand the causal relationships reported on the MCCD using MMDS decision tables (cont'd)	<p>LDP (Due to, Preferred): For step M1</p> <p>When the TUCOD is reported in the <i>due to</i> position to another condition, and the code for the <i>other condition is preferred</i> over the code for the TUCOD.</p> <p>LDC (Linkage, Due to, Combined): For step M1</p> <p>When the TUCOD is reported in the <i>due to</i> position to another condition, and the codes for the TUCOD and the <i>other condition combine</i> into a third code.</p> <p>SMP (Specificity, Mention, Preferred): For step M2</p> <p>When the TUCOD describes a condition in general terms and a condition that provides more precise information about the site or nature of this condition is reported anywhere on the MCCD, the code for the more <i>precise condition is preferred</i> over the code for the TUCOD.</p> <p>SMC (Specificity, Mention, Combined): For step M2</p> <p>When the TUCOD describes a condition in general terms, and a condition which provides more precise information about the site or nature of this condition is reported anywhere on the MCCD, and the codes for the TUCOD and the <i>other condition combine</i> into a third code.</p> <p>SDC (Specificity, Due to, Combined): For step M2</p> <p>When the TUCOD is reported in the <i>due to</i> position to another condition, and can be regarded as an adjective modifying this condition, and the codes for the TUCOD and the <i>other condition combine</i> into a third code.</p> <p>6. Table F: Explains most <i>ambivalent ("M") entries</i> found in Tables D and E. Table F provides further guidance in selection of the most appropriate UCOD. If the conditions laid out in Table F can be met, the code or combination code is selected as the UCOD. This code may be further modified by additional application of rules.</p> <p>7. Table G: Is the list of codes <i>created</i> to assist the MMDS software to distinguish between certain conditions that are coded to the same category. The table contains conversions to change the <i>created ICD-10 categories</i> back to the <i>original ICD-10 codes</i>.</p> <p>8. Table H: Contains the list of codes considered to be trivial when assigning the UCOD. If a selected UCOD is on the list, step SP8 is applied to establish the appropriate course of action. This may involve selecting a non-trivial condition as the UCOD.</p> <p>Note: <i>The process of using the decision tables goes hand in hand with the application of selection and modification rules. Remember that the process of selection of TUCOD may need to be repeated a number of times before a final underlying cause of death is determined.</i></p>																													
	Mortality coding practice exercises	<p>Selecting final UCOD using MMDS decision tables</p> <p>A few examples on selecting final UCOD using the MMDS decision tables are given below.</p> <p>Example 1</p> <table border="1" data-bbox="496 1621 1477 2004"> <thead> <tr> <th colspan="4" data-bbox="496 1621 1477 1659">Frame A:</th> </tr> <tr> <th colspan="4" data-bbox="496 1659 1477 1688">▶ Medical data: Part 1 and 2</th> </tr> <tr> <th data-bbox="496 1688 759 1749"></th> <th data-bbox="759 1688 815 1749"></th> <th data-bbox="815 1688 1273 1749">▶ Cause of death</th> <th data-bbox="1273 1688 1477 1749">▶ Time interval from onset to death</th> </tr> </thead> <tbody> <tr> <td data-bbox="496 1749 759 1928" rowspan="4"> 1. Report disease or condition directly leading to death on line "a" Report chain of events in due to order (if applicable) State the underlying cause on the lowest used line </td> <td data-bbox="759 1749 815 1809">a</td> <td data-bbox="815 1749 1273 1809">Intermediate small cell carcinoma unknown primary</td> <td data-bbox="1273 1749 1477 1809">13 months</td> </tr> <tr> <td data-bbox="759 1809 815 1845">b</td> <td data-bbox="815 1809 1273 1845">Due to:</td> <td data-bbox="1273 1809 1477 1845"></td> </tr> <tr> <td data-bbox="759 1845 815 1881">c</td> <td data-bbox="815 1845 1273 1881">Due to:</td> <td data-bbox="1273 1845 1477 1881"></td> </tr> <tr> <td data-bbox="759 1881 815 1928">d</td> <td data-bbox="815 1881 1273 1928">Due to:</td> <td data-bbox="1273 1881 1477 1928"></td> </tr> <tr> <td data-bbox="496 1928 759 2004"> 2. Other significant conditions contributing to death (time intervals can be included in brackets after the condition) </td> <td data-bbox="759 1928 815 2004"></td> <td data-bbox="815 1928 1273 2004"></td> <td data-bbox="1273 1928 1477 2004"></td> </tr> </tbody> </table>	Frame A:				▶ Medical data: Part 1 and 2						▶ Cause of death	▶ Time interval from onset to death	1. Report disease or condition directly leading to death on line "a" Report chain of events in due to order (if applicable) State the underlying cause on the lowest used line	a	Intermediate small cell carcinoma unknown primary	13 months	b	Due to:		c	Due to:		d	Due to:		2. Other significant conditions contributing to death (time intervals can be included in brackets after the condition)			
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<p>Understanding causal relationships using MMDS decision tables (cont'd)</p>	<p>Mortality coding practice exercises (cont'd)</p>	<p>Answer to example 1</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 5%;"></th> <th style="width: 15%;">ICD-10 Code(s)</th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> <th style="width: 10%;">TUCOD</th> <th style="width: 10%;">Rule</th> <th style="width: 10%;">Table E Acronym</th> </tr> </thead> <tbody> <tr> <td rowspan="4">Part 1a</td> <td>1a</td> <td>C34.9</td> <td>_____</td> <td>_____</td> <td>C34.9</td> <td>SP1</td> <td></td> </tr> <tr> <td>b</td> <td>_____</td> <td>_____</td> <td>_____</td> <td></td> <td></td> <td></td> </tr> <tr> <td>c</td> <td>_____</td> <td>_____</td> <td>_____</td> <td></td> <td></td> <td></td> </tr> <tr> <td>d</td> <td>_____</td> <td>_____</td> <td>_____</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Part 2</td> <td></td> <td>_____</td> <td>_____</td> <td>_____</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Final UCOD: C34.9 Malignant neoplasm bronchus or lung, unspecified</p> <p>Steps in arriving at the final UCOD for example 1</p> <ul style="list-style-type: none"> Find the code for "Intermediate small cell carcinoma" using the alphabetical index and the tabular list. They direct the coder to the code C34.9. Intermediate small cell carcinomas of "Unspecified site" are considered to be located in the lung or bronchus and thus the code C34.9. Apply the appropriate mortality coding rule – SP1 for this case. Look up Table A; C34.9 is listed as a valid UCOD code. <p>Example 2</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #d3d3d3;"> <th colspan="5">Frame A:</th> </tr> <tr style="background-color: #d3d3d3;"> <th colspan="5">► Medical data: Part 1 and 2</th> </tr> <tr> <th style="width: 45%;"></th> <th style="width: 5%;"></th> <th colspan="2" style="background-color: #d3d3d3;">► Cause of death</th> <th style="background-color: #d3d3d3;">► Time interval from onset to death</th> </tr> </thead> <tbody> <tr> <td rowspan="4" style="vertical-align: top;"> 1. 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Other significant conditions contributing to death (time intervals can be included in brackets after the condition) </td> <td colspan="3">Renal transplant, NIDDM</td> </tr> </tbody> </table> <p>Answer to example 2</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 5%;"></th> <th style="width: 15%;">ICD-10 Code(s)</th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> <th style="width: 10%;">TUCOD</th> <th style="width: 10%;">Rule</th> <th style="width: 10%;">Table E Acronym</th> </tr> </thead> <tbody> <tr> <td rowspan="4">Part 1a</td> <td>1a</td> <td>A41.9</td> <td>_____</td> <td>_____</td> <td>G00.3</td> <td>SP3</td> <td></td> </tr> <tr> <td>b</td> <td>A41.0</td> <td>_____</td> <td>_____</td> <td></td> <td></td> <td></td> </tr> <tr> <td>c</td> <td>G00.3</td> <td>_____</td> <td>_____</td> <td></td> <td></td> <td></td> </tr> <tr> <td>d</td> <td>_____</td> <td>_____</td> <td>_____</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Part 2</td> <td></td> <td>N28.9</td> <td>E11.9</td> <td>_____</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Final UCOD: G00.3 Staphylococcal meningitis</p> <p>Steps in arriving at the final UCOD for example 2</p> <ul style="list-style-type: none"> Find codes for all the causes listed in the MCCD using the alphabetical index and the tabular list. Apply the appropriate mortality coding rule – SP3 for this case. G00.3 is selected as the <i>tentative starting point</i> (TSP) using SP3: How? Follow the steps below to understand the logical sequence. Look up Table D address: <table style="margin-left: 20px;"> <tr> <td>--- A41.9 ---</td> <td>(--- A400-A699 ---)</td> </tr> <tr> <td>G00.3</td> <td>(A000 – R002) → is listed</td> </tr> </table> Look up Table D address: <table style="margin-left: 20px;"> <tr> <td>--- A41.0 ---</td> <td>(--- A400-A699 ---)</td> </tr> <tr> <td>G00.3</td> <td>(A000 – R002) → is listed</td> </tr> </table> Accordingly, the selected G00.3 as TSP using SP3 (the condition listed <i>alone</i>, on the <i>lowest used</i> line of Part 1) can cause all the conditions listed above it and we select G00.3 Staphylococcal meningitis as TSP using the SP3. 			ICD-10 Code(s)			TUCOD	Rule	Table E Acronym	Part 1a	1a	C34.9	_____	_____	C34.9	SP1		b	_____	_____	_____				c	_____	_____	_____				d	_____	_____	_____				Part 2		_____	_____	_____				Frame A:					► Medical data: Part 1 and 2							► Cause of death		► Time interval from onset to death	1. Report disease or condition directly leading to death on line "a" Report chain of events in due to order (if applicable) State the underlying cause on the lowest used line	↻	a	Septicaemia	Hours	↻	b	Due to: Staphylococcus aureus sepsis	Days	↻	c	Due to: Staphylococcus aureus meningitis	Days		d	Due to:		2. Other significant conditions contributing to death (time intervals can be included in brackets after the condition)		Renal transplant, NIDDM					ICD-10 Code(s)			TUCOD	Rule	Table E Acronym	Part 1a	1a	A41.9	_____	_____	G00.3	SP3		b	A41.0	_____	_____				c	G00.3	_____	_____				d	_____	_____	_____				Part 2		N28.9	E11.9	_____				--- A41.9 ---	(--- A400-A699 ---)	G00.3	(A000 – R002) → is listed	--- A41.0 ---	(--- A400-A699 ---)	G00.3	(A000 – R002) → is listed
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<p>Understanding causal relationships using MMDS decision tables (cont'd)</p>	<p>Mortality coding practice exercises (cont'd)</p>	<ul style="list-style-type: none"> Check whether G00.3 is further modified by Table E. Look up Table E address: --- G00.3 --- (--- G000-G008 ---) A41.9 → is not listed A41.0 → is not listed N28.9 → is not listed E11.9 → is not listed No modification required. Look up Table A; G00.3 is listed as a valid UCOD code. <p>Example 3</p> <div style="border: 1px solid black; padding: 5px;"> <p><i>Frame A:</i></p> <p>► Medical data: Part 1 and 2</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;"></th> <th style="width: 10%;"></th> <th style="width: 40%;">► Cause of death</th> <th style="width: 10%;">► Time interval from onset to death</th> </tr> </thead> <tbody> <tr> <td rowspan="4" style="vertical-align: top;"> 1. Report disease or condition directly leading to death on line "a" Report chain of events in due to order (if applicable) State the underlying cause on the lowest used line </td> <td style="text-align: center;">↻</td> <td>a Acute on chronic renal failure</td> <td>2 weeks</td> </tr> <tr> <td style="text-align: center;">↻</td> <td>b Due to: Glomerulonephritis</td> <td>1 year</td> </tr> <tr> <td style="text-align: center;">↻</td> <td>c Due to: Diabetic nephropathy</td> <td>5 years</td> </tr> <tr> <td></td> <td>d Due to: Diabetes, Type II</td> <td>10 years</td> </tr> <tr> <td colspan="2" style="vertical-align: top;"> 2. Other significant conditions contributing to death (time intervals can be included in brackets after the condition) </td> <td colspan="2">Femoral neck fracture, Femoral fracture repair, Post-operative haematoma</td> </tr> </tbody> </table> </div> <p>Answer to example 3</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th colspan="3">ICD-10 Code(s)</th> <th>TUCOD</th> <th>Rule</th> <th>Table E Acronym</th> </tr> </thead> <tbody> <tr> <td>Part 1a</td> <td>N17.9</td> <td>N18.9</td> <td>_____</td> <td>E11.9</td> <td>SP3</td> <td></td> </tr> <tr> <td>b</td> <td>N05.9</td> <td>_____</td> <td>_____</td> <td>E11.2</td> <td>Rule M1</td> <td>LMC</td> </tr> <tr> <td>c</td> <td>E14.2†</td> <td>(N08.3*)</td> <td>_____</td> <td>N05.9</td> <td>Rule M1</td> <td>LMC</td> </tr> <tr> <td>d</td> <td>E11.9</td> <td>_____</td> <td>_____</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Part 2</td> <td>S72.00 (X59.0)</td> <td>Y83.1</td> <td>T81.0</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Final UCOD: E11.2 Non-insulin dependent diabetes mellitus with renal complications</p> <p>Steps in arriving at the final UCOD for example 3</p> <ul style="list-style-type: none"> Find codes for all the causes listed in the MCCD using the alphabetical index and the tabular list. Apply the appropriate mortality coding rule – SP3 for this case. E11.9 is selected as TSP using SP3: How? Follow the steps below to understand the logical sequence. Look up Table D address: --- N17.9 --- E11.9 → is listed Look up Table D address: --- N18.9 --- (--- N181-N189 ---) E11.9 → is listed Look up Table D address: --- E14.2 --- (--- E140-E149 ---) E11.9 → is listed Look up Table D address: --- N083 --- → No N083 Address? Why? Look up N08 in the tabular List – all N08 codes are Asterisk (*) codes. Asterisk (*) codes are not used for mortality coding. Therefore E11.9 (the condition listed <i>alone</i>, on the <i>lowest used</i> line of Part 1) can cause all the conditions listed above it and we select E11.9 Non-insulin dependent diabetes mellitus as TSP using the SP3. Look up Table E address: --- E11.9 --- N17.9 → is not listed LMC N18.9 → is listed E11.2 <p>Note: N18.9 is listed with table E Acronym LMC Rule M1 Linkage with Mention of the other condition, Combination code) E11.2</p>			► Cause of death	► Time interval from onset to death	1. Report disease or condition directly leading to death on line "a" Report chain of events in due to order (if applicable) State the underlying cause on the lowest used line	↻	a Acute on chronic renal failure	2 weeks	↻	b Due to: Glomerulonephritis	1 year	↻	c Due to: Diabetic nephropathy	5 years		d Due to: Diabetes, Type II	10 years	2. Other significant conditions contributing to death (time intervals can be included in brackets after the condition)		Femoral neck fracture, Femoral fracture repair, Post-operative haematoma			ICD-10 Code(s)			TUCOD	Rule	Table E Acronym	Part 1a	N17.9	N18.9	_____	E11.9	SP3		b	N05.9	_____	_____	E11.2	Rule M1	LMC	c	E14.2†	(N08.3*)	_____	N05.9	Rule M1	LMC	d	E11.9	_____	_____				Part 2	S72.00 (X59.0)	Y83.1	T81.0			
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<p>Understanding causal relationships using MMDS decision tables (cont'd)</p>	<p>Mortality coding practice exercises (cont'd)</p>	<ul style="list-style-type: none"> Look up Table D address: --- M84.4 --- H54.7 → is not listed Therefore, no sequence terminating in the first-mentioned condition "Pathological femoral fracture" (M84.45) and SP4 too does not apply. Apply SP5; select the <i>first-mentioned condition</i> M84.45 as the TSP. Look up Table E address: --- M84.4 --- H54.7 → is not listed R53 → is not listed F03.9 → is not listed Therefore, SP6 does not apply. <p>Note: However, M81.9(9) is listed with table E Acronym LMC Rule M1 Linkage with Mention of the other condition, Combination code M80.9(5)</p> <p style="text-align: center;">LMC M81.9(9) → is listed M80.9(5)</p> <ul style="list-style-type: none"> Therefore, M84.4(5) and M81.9(9) <i>combine</i> to provide a <i>new TSP code</i> M80.9(5), Unspecified osteoporosis with pathological fracture of femur. Rule M1 Look up Table E address: --- M80.9(5) --- I95.1 → is not listed No further modification is required and step M3 does not apply. Look up Table A; M80.9(5) is listed as a valid UCOD code. <p>Example 5</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #d9d9d9;"> <th colspan="4">Frame A:</th> </tr> <tr style="background-color: #d9d9d9;"> <th colspan="4">► Medical data: Part 1 and 2</th> </tr> <tr> <th rowspan="5" style="width: 40%; vertical-align: top;"> 1. Report disease or condition directly leading to death on line "a" Report chain of events in due to order (if applicable) State the underlying cause on the lowest used line </th> <th rowspan="5" style="width: 5%; text-align: center;"> </th> <th colspan="2" style="background-color: #d9d9d9;">► Cause of death</th> <th style="background-color: #d9d9d9;">► Time interval from onset to death</th> </tr> </thead> <tbody> <tr> <td style="width: 5%;">a</td> <td style="width: 30%;">Obstetric shock</td> <td style="width: 20%;"></td> <td style="width: 40%;">2 hours</td> </tr> <tr> <td>b</td> <td>Due to: Obstructed delivery</td> <td></td> <td>Hours</td> </tr> <tr> <td>c</td> <td>Due to: Breech presentation</td> <td></td> <td>Months</td> </tr> <tr> <td>d</td> <td>Due to:</td> <td></td> <td></td> </tr> </tbody> </table> <p>2. Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</p>	Frame A:				► Medical data: Part 1 and 2				1. Report disease or condition directly leading to death on line "a" Report chain of events in due to order (if applicable) State the underlying cause on the lowest used line		► Cause of death		► Time interval from onset to death	a	Obstetric shock		2 hours	b	Due to: Obstructed delivery		Hours	c	Due to: Breech presentation		Months	d	Due to:									
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		ICD-10 Code(s)	TUCOD	Rule	Table E Acronym																																	
Part 1a		O75.1 ___ ___	O32.1	SP3																																		
b		O66.9 ___ ___	O64.1	Rule M1	LDC																																	
c		O32.1 ___ ___																																				
d		___ ___ ___																																				
Part 2		___ ___ ___																																				
<p>Steps in arriving at the final UCOD for example 5</p> <ul style="list-style-type: none"> Find codes for all the causes listed in the MCCD using the alphabetical index and the tabular list. Apply the appropriate mortality coding rule – SP3 for this case. Follow the steps below to understand the logical sequence. Look up Table D address: --- 075.1 --- (--- 0750-0759 ---) 032.1 (010.0 – 071.9) → is listed Look up Table D address: --- 066.9 --- 032.1 (032.0 – 034.9) → is listed 032.1 selected as TSP using SP3 																																						

Topic	Expected outcome	Content
Understanding causal relationships using MMDS decision tables (cont'd)	Mortality coding practice exercises (cont'd)	<ul style="list-style-type: none"> Look up Table E address: --- 032.1 --- 075.1 → is not listed LDC 066.9 → is listed 064.1 <p>Note: 066.9 is listed with the table E Acronym LDC (Rule M1: Linkage Due to, Combination) and combination code 064.1</p> <ul style="list-style-type: none"> Look up Table E address: --- 064.1 --- (--- 0640-0648 ---) No further modification required Look up Table A; 064.1 is listed as a valid UCOD code.

Evaluation:

1. Group/Individual work using the examples given in ICD-10 work and answer books.

10. Mortality coding rules/instructions for perinatal deaths

Objective: To describe mortality coding rules for perinatal deaths

Note: With the update of the international form of MCCD in 2016, it is recommended to use only one MCCD for all deaths including perinatal deaths. The previously recommended perinatal death certificate should be replaced by the international form of MCCD. However, because of legal or other constraints, if the implementation of the international form of MCCD for perinatal deaths is delayed, the following perinatal mortality rules could be applied.

Lesson plan

Time allocation: 120 minutes

Teaching/learning method: Interactive presentation

Resources: PowerPoint presentation, ICD-10 volumes 1, 2 and 3

Topic	Expected outcome	Content
Mortality coding rules for perinatal deaths	Students learn to apply mortality coding rules for perinatal deaths	<p>Certification of perinatal deaths</p> <p>If a separate certificate of cause of perinatal death is to be completed, the causes are to be set out as follows:</p> <ul style="list-style-type: none"> (a) Main disease or condition in fetus or infant (b) Other diseases or conditions in fetus or infant (c) Main maternal disease or condition affecting fetus or infant (d) Other maternal diseases or conditions affecting fetus or infant (e) Other relevant circumstances <p>Coding of causes of perinatal death</p> <p>The perinatal death certificate has five sections for the entry of causes of perinatal deaths, labelled (a) to (e), as shown above</p> <p>Each condition entered in sections (a), (b), (c) and (d) should be coded separately.</p> <p>Maternal conditions affecting the infant or fetus, entered in sections (c) and (d), should be coded to categories P00–P04, and these codes should not be used for sections (a) and (b).</p> <p>Conditions in the infant or fetus, entered in section (a), can be coded to any categories other than P00–P04, but will most often be coded to categories P05–P96 (perinatal conditions) or Q00–Q99 (congenital anomalies).</p> <p>Only one code should be entered for sections (a) and (c), but for sections (b) and (d) as many codes as needed could be entered.</p> <p>Section (e) is for review of individual perinatal deaths and will not normally need to be coded.</p> <p>Coding rules</p> <p>Note: The selection rules for general mortality do not apply to the perinatal death certificate. For more detailed instructions, refer to section 4.4.5, of ICD-10 Volume 2: Instruction manual (WHO 2016b).</p> <p>Rule P1 – Mode of death or prematurity entered in section (a)</p> <p>If heart or cardiac failure, asphyxia or anoxia (any condition in P20.-, P21.-) or prematurity (any condition in P07.-) is entered in section (a), and other conditions of the infant or fetus are entered in either section (a) or section (b), code the first-mentioned of these other conditions as if it had been entered alone in section (a), and code the condition actually entered in section (a) as if it had been entered in section (b).</p>

Topic	Expected outcome	Content
Mortality coding rules for perinatal deaths (cont'd)	Students learn to apply mortality coding rules for perinatal deaths (cont'd)	<ul style="list-style-type: none"> • Rule P2 – Two or more conditions entered in sections (a) or (c) If two or more conditions are entered in section (a) or section (c), code the first-mentioned of these as if it had been entered alone in section (a) or section (c) and code the others as if they had been entered in sections (b) or (d). • Rule P3 – No entry in sections (a) or (c) If there is no entry in section (a), but there are conditions of the infant or fetus entered in section (b), code the first-mentioned of these as if it had been entered in section (a); if there are no entries in either section (a) or section (b), either code P95, fetal death of unspecified cause, for stillbirths, or code P96.9, condition originating in the perinatal period, unspecified, for early neonatal deaths, should be used for section (a). Similarly, if there is no entry in section (c) but there are maternal conditions entered in section (d), code the first-mentioned of these as if it had been entered in section (c); if there are no entries in either section (c) or section (d), use an artificial code (e.g., xxx.x) for section (c) to indicate that no maternal condition was reported. • Rule P4 – Conditions entered in wrong section If a maternal condition (i.e., conditions in P00–P04) is entered in section (a) or section (b), or if a condition of the infant or fetus is entered in section (c) or section (d), code the conditions as if they had been entered in the respective correct section. If a condition that is classifiable as a condition of the infant or fetus, or as a maternal condition is mistakenly entered in section (e), code it as an additional fetal or maternal condition in section (b) or (d), respectively.

Evaluation:

1. Group/Individual work using the examples given in ICD-10 work and answer books.

References

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