ICD-11 Reference Guide

Draft

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# Purpose and Multiple Uses of ICD

The International Classification of Diseases (ICD) is a tool for reporting and grouping conditions and factors that influence health. It contains categories for diseases, health related conditions, and external causes of illness or death. The purpose of the ICD is to allow the systematic recording, analysis, interpretation and comparison of mortality and morbidity data collected in different countries or areas and at different times. The ICD is used to translate diagnoses of diseases and other health problems into an alphanumeric code, which allows storage, retrieval and analysis of the data. The ICD has become the international standard diagnostic classification for all general epidemiological and many health management purposes. These include analysis of general health situations of population groups, monitoring of incidence and prevalence of diseases, and other health problems in relation to other variables, such as the characteristics and circumstances of the affected individuals. ICD is also suitable for studies of financial aspects, such as billing or resource allocation. The ICD 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, casemix, quality and patient safety. It can be used in primary care, secondary care and research. The ICD is used to allocate the majority of the global health resources. Users of the ICD include physicians, nurses, other health care providers, researchers, health information management professionals, coders, health information technology workers, analysts, policymakers, insurers, patient organizations and many more.

The ICD is used in various settings with different levels of resolution ranging from a set of 100 codes to more than 10,000 codes. It therefore includes an information framework that contains a fully specified set of health concepts and their characteristics and relationships. The ICD–11 ensures consistency with traditional use cases of earlier ICD versions, because it has been built with the past revisions in mind. Past data analyses based on older versions of ICD can be linked to analyses of data based on ICD–11.

All World Health Organization (WHO) Member States are expected to use the most current version of the ICD for reporting death and illness (according to an international treaty, the ‘WHO Nomenclature Regulations’, adopted by the World Health Assembly in 1967). By 2015, many Member States of the WHO had started using the ICD. ICD–10 has been translated into 43 languages, and ICD–11 has been available in all 6 official languages since its publication. Most countries (115 in 2017) use the system to report mortality data, a primary indicator of health status.

The ICD is primarily designed for the classification of diseases and injuries. However, not every problem or reason for coming into contact with health services can be categorized in this way. Consequently, the ICD includes a wide variety of signs, symptoms, abnormal findings, complaints and social factors that represent the content from health-related records (see section on morbidity). The ICD can therefore be used to classify data recorded under headings such as ‘Diagnosis’, ‘Reason for admission’, ‘Conditions treated’ and ‘Reason for consultation’, which appear on a wide variety of health records from which statistics are derived, for treatment, prevention or patient safety.
1.1 Intended Use

The ICD has been designed to address the needs of a broad range of use cases: - Mortality - Morbidity - Epidemiology - Casemix - Quality and safety - Primary care Detailed information on the intended use is available in the sections 5 (mortality) and 6 (morbidity). A situation may arise, which anticipates using the ICD-11 for a purpose for which it has not been designed. In this situation, the categorization used within the ICD-11 and its additional features may not be able to address such a new use case. In such cases, it is recommended to consult with the WHO in order to ensure that the information collected is appropriate to the intended new use.

1.2 Classification

A classification is ‘an exhaustive set of mutually exclusive categories to aggregate data at a pre-prescribed level of specialization for a specific purpose’ (ISO 17115). Classification involves the categorization of relevant concepts for the purposes of systematic recording or analysis. The categorization is based on one or more logical rules. The purpose of a health classification varies: for example, it may be used in the analysis of cause of death (mortality), morbidity, activity limitation, or participation restriction. Low frequency concepts tend to be grouped but rare concepts may also be separately classified if necessary. Coding rules must be incorporated in the classification to achieve consistency of coding and comparability of coded data over time and space. Classifications are complementary to terminologies, since they are designed to be used for standardized coding of information for statistical purposes.

1.3 ICD in the Context of WHO Family of International Classifications (WHO-FIC)

The WHO Family of International Classifications (WHO-FIC) comprises classifications that have been endorsed by the WHO to describe various aspects of health and the health system in a consistent manner. The WHO-FIC provides standardized building blocks for health information systems and consists of 3 broad groups: Reference classifications, Derived classifications and Related classifications. The reference classifications are international reference standards, from which the derived ones have been developed to accommodate a particular detail in specific areas of health. Related classifications cover health domains beyond mere mortality and morbidity (e.g. medicaments classification). Figure 1 illustrates the types of classifications in the WHO-FIC.
Figure 1: WHO Family of Classifications

The purpose of the WHO-FIC is to assist the development of reliable statistical systems at local, national, and international levels, with the aim of improving health status and health care. The classifications are the property of the WHO or other groups. Health related information might sometimes require additional detail to that contained in the ICD. A group or ‘family’ of health relevant classifications covers these needs both by classification of domains different from those of the ICD and provision of more detail for specific uses, e.g. cancer registration. The WHO-FIC designates a suite of integrated classification products that share similar features and can be used singularly or jointly to provide information on different aspects of health and on health care systems. For example, the ICD as a reference classification is mainly used to capture mortality and morbidity. Functioning is classified in the International Classification of Functioning, Disability and Health (ICF) and health interventions in the International Classification of Health Interventions (ICHI).

In general, the WHO-FIC aims to provide a conceptual framework of information dimensions which are related to health and health management. In this way, it provides a common language that improves communication and permits comparisons of data within countries, across countries, health care disciplines, services, and time. The WHO and the WHO-FIC Network strive to build the family of classifications based on sound scientific and taxonomic principles, ensuring it is culturally appropriate and internationally applicable, and focusing on the multi-dimensional aspects of health in order to meet the needs of its different users.
1.4 WHO-FIC: Reference Classifications

Reference classifications cover the main parameters of the health system, such as death and disease (ICD), disability, functioning, and health (ICF) and health interventions (ICHI). WHO-FIC reference classifications are a product of international agreements. They have achieved broad acceptance and official agreement for use and are approved and recommended as guidelines for international reporting on health. They may be used as models for the development or revision of other classifications. The three Reference classifications are:

1. International Classification of Diseases (ICD)
2. International Classification of Functioning, Disability & Health (ICF)
3. International Classification Health Intervention (ICHI)

1.4.1 Disability and Functioning – ICF

The ICF is the WHO’s framework for measuring health and functioning/disability at both the individual and population levels. While the ICD classifies diseases and causes of death, the ICF classifies health domains. ICD and ICF together provide tools to capture the full picture of health. The ICF classifies health and health-related states in two parts. Part one addresses functioning and disability, described from the perspectives of the body, the individual, and society, and is composed of two components:

1. Body Functions and Structures
2. Activities and Participation life areas

Part two covers contextual factors and has two components: Environmental Factors and Personal Factors (currently not classified in ICF), since an individual's functioning occurs in a context. Functioning is a generic term for body functions (e.g. memory), body structures (e.g. occipital lobe), and activities and participation life areas (e.g. walking, engaging in paid work). It denotes the neutral aspects of the interaction between an individual (related to the individual’s health) and that individual's contextual factors (environmental and personal factors). Disability is an umbrella term for impairments, activity limitations and participation restrictions. It denotes the negative aspects of the interaction between an individual (with a health condition) and that individual's contextual factors (environmental and personal factors). Disabilities are envisioned as a continuum and therefore the ICF and the codes within it do not confer an international binary status of disabled/not disabled. Levels of disability can be used descriptively in clinical settings when formulating a case. Program and policy decision-makers can apply the ICF and specify their own standards for the level of disability as eligibility criteria that are relevant for specific purposes. ICF includes the following other definitions:

- Body functions are the physiological functions of body systems (including psychological functions).
- Body structures are anatomical parts of the body such as organs, limbs and their components.
- Impairments are problems in body function or structure such as a significant deviation or loss.
- Activity is the execution of a task or action by an individual.
- Activity limitations are difficulties an individual may have in executing activities.
• Participation is involvement in a life situation.
• Participation restrictions are problems an individual may experience in involvement in life situations.
• Environmental factors make up the physical, social and attitudinal environment in which people live and conduct their lives.

ICF includes codes for Body Functions (b), Body Structures (s), Activities and Participation (d), and Environmental Factors (e). ICF codes are only complete with the presence of a qualifier, which denotes the level of health (i.e. severity of the problem from ‘no problem’ to ‘complete problem’). Without qualifiers, codes have no inherent meaning. The ICF acknowledges that every human being can experience a decrement in health and thereby experience some disability. Disabilities can be temporary and may be brief (such as staying home from work for a few days with the flu); they can also be chronic or permanent and may fluctuate in severity over time.

1.4.2 Interventions – ICHI

Intervention classifications are designed to include all kinds of health interventions for treatment, diagnosis or prevention. ICHI includes interventions across all functional sectors of the health system, covering acute care, primary care, rehabilitation, assistance with functioning, prevention, public health, and ancillary services. Interventions provided by all types of providers have been included. The importance of describing and classifying health interventions has long been understood. An International Classification of Procedures in Medicine (ICPM) was published by WHO in 1978, but was not maintained. ICHI is much broader than the former ICPM because it includes the full range of health interventions. Development of ICHI began in 2007, as a joint effort of the WHO-FIC Network and WHO. Its structure has been completed, an alpha version published in 2012 and a beta version in 2015. Finalisation is planned for 2017.

<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>The Target axis</td>
<td>The Action is defined as a deed which is done by an actor to a target during a health care intervention. Actions include:</td>
<td>The Means axis contains the entities describing the processes and methods by which the action is carried out. Means include:</td>
</tr>
<tr>
<td>Anatomy</td>
<td>Investigation</td>
<td>Approach: the process by which the target of the action is accessed, e.g. open, endoscopic</td>
</tr>
<tr>
<td>Human function</td>
<td>Treating</td>
<td>Technique used as part of the action, e.g. radiation, magnetic resonance</td>
</tr>
<tr>
<td>Person or client</td>
<td>Managing</td>
<td>Method: describing how the action is undertaken, e.g. law enforcement, method of transport.</td>
</tr>
<tr>
<td>Group or population</td>
<td>Informing</td>
<td></td>
</tr>
</tbody>
</table>
Other attributes of interventions are included as means in the ICHI Content Model. The content of the axes has been restricted to attributes that are common to a wide range of interventions. In particular:

- Devices have not been included as an axis because the majority of interventions do not involve a device and devices change rapidly
- Drugs or other substances administered through an intervention are classified elsewhere (ICD, ATC/DDD, INN).

The coding system comprises a 7-character category structure for the three axes:

- Three letters for the Target
- Two letters for the Action
- Two letters for the Means

ICHI is a flat file comprising valid 7 letter combinations of the three axes. For each intervention included in ICHI, the appropriate 7 letter combination is identified. Not every possible combination of the three axes represents a valid ICHI domain.

1.5 WHO-FIC: Derived Classifications

Derived classifications are often tailored for use at the national or international level or for use in a particular specialty. Derived classifications are based upon reference classifications. Derived classifications may be prepared by:

- adopting the reference classification structure and classes
- providing additional detail beyond that provided by the reference classification, or through rearrangement or by aggregation of items from one or more reference classifications.

1.6 Related Classifications

Related classifications are included in WHO-FIC to describe important aspects of health or the health system not covered by reference or derived classifications. Related classifications are:

1. International Classification of Primary Care (ICPC)
2. International Classification of External Causes of Injury (ICECI)
3. Technical aids for persons with disabilities (ISO9999)
4. The Anatomical Therapeutic Chemical Classification with Defined Daily Doses (ATC/DDD)
5. The International Classification for Nursing Practice (ICNP)

1.7 Use in Health Information Systems

Health information systems include a range of different components for collection, analysis and use of the data. Information sources could for example be population-based, health
facility-based or focus on particular diseases. The main population-based sources of health information are census data, household surveys, and (sample) vital registration systems.

Health facility-related data sources include public health surveillance, health services data (that may be referred to as health management information systems or routine health information systems), and health system monitoring data (e.g. human resources, health infrastructure, financing).

National health accounts are designed to provide a comprehensive picture of health financing.

Coding enables the recording of health information in a language independent way. Standardization of coding enables both intra- and international data comparison. For example, ICD coded data can be compared across different sectors of the health system – if the same coding rules are applied.

The health information systems are increasingly based on digital (electronic) reporting and coding. ICD–11 is designed to be used in such environments. In many places information collection is based on paper reporting in a traditional analog way. ICD–11 can be produced in a printed version for use in paper based systems.

1.7.1 Use of ICD–11 in a Digital Setting and Web Services

The ICD–11 is used in an electronic version for coding of electronically reported diagnoses, in electronic health records or electronic death certificates, or in other places. Specific tools facilitate the coding, allowing access to the specific ICD–11 code using any of the several dimensions that define an ICD–11 entity or category. Additional detail can be added using multiple codes for one condition. Relevant rules and instructions to guide the coder are shown in the context of individual categories. Data analysis draws on the framework of the ICD–11 with its multiple dimensions to create previously agreed upon groupings to answer epidemiological or clinical questions. Retaining the unique identifier of the coded ICD–11 entity, allows the same information to be reused across different versions of the ICD, between different translations, and to report conditions at a finer granular level than what is possible with individual ICD–11 codes. Current health information system are based on numerous software systems, from mobile apps to sophisticated electronic health record systems, that make use of the ICD. Timely availability of the classifications to these systems in an IT friendly manner is a crucial component, as much as the possibility to use coding mechanisms that are embedded in the electronic ICD. The way the classification is provided to software systems is essentially very different from the way the classification is provided to people. For this reason, WHO has developed the ICD web services; special software that is accessed via the web, designed to support interoperable machine-to-machine interaction.

1.7.2 Use of ICD–11 in an Analog Paper Based Setting

The ICD–11 is used in analog printed versions in many countries. Information is reported on paper and then coded with the ICD–11. In order to start coding with ICD–11 and to do initial reporting of mortality and morbidity statistics this may be one way to become acquainted with ICD–11 and health information. Paper based recording however requires manual transcription of the information into electronic systems and should be substituted by electronic reporting as early as possible in the information chain. Further problems with
paper based recording include readability and timeliness. ICD-11 supports many ways of computer assisted coding including sanctioning of code combinations and other possible plausibility checks. Therefore, the long term goal for all users should be coding of ICD-11 in an electronic environment, even though the preceding steps and the following steps in the processing of health information may still be carried out on paper. The electronic coding support facilitates coding and improves consistency and reliability of the coding.

2 Links with other Classifications and Terminologies

ICD coded entities or categories can be used in conjunction with other health relevant classifications or terminologies to fully document an episode of care, or a case for research.

2.1 Integrated use with Terminologies

Classification involves grouping information according to logical rules. The grouping is driven by a specific purpose. Terminology allows the reporting of information at any desired level of detail: for example, body parts, findings, or other elements that constitute a disease. Terminologies have no mechanism to report new information that has not previously been added to the terminology. In contrast, a classification has residual classes ('other specified') that ensures that all cases can always be classified. In a terminology, as much as in a modern disease classification, a disease can be defined, for example establishing linkages between its elements, such as anatomy or findings. Terminologies are able to retain the information without emphasizing any aspect of the recorded information. In contrast, classification allows identification of ‘relevant parts’ of the content, for example for public health. International agreement about these relevant parts makes sure that the aggregated information is internationally comparable. The standardized use of the aggregation logic of a classification and the standardized use of the detailed information of a terminology aim at the same result: comparability. International agreement processes are necessary in both cases – and must be the same as soon as the same question has to be answered by the aggregation/classification. Terminologies and classifications should be considered complementary. As an example for a linked terminology within ICD-11 the Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT) can be referenced to, and information coded with the aid of SNOMED CT could be categorized with ICD. Links to additional terminologies, and nomenclatures include for example ICD-O, INN or ICECI. The two standards used together allow better support of data collection, more efficient reporting, and meaningful exchange of data in health information systems.

2.2 Joint Use With ICF

Historically, the ICD has used certain disability concepts as common disease or disorder entities, such as: Blindness, Deafness, Mental Retardation, Learning Disability, or Paraplegia, as well as certain disability concepts for other purposes, such as ‘disability as a sequela of injury’, and ‘limitation of activities due to disability’. The ICF was developed after the publication of ICD–10. The ICD–11 has been created both to share concepts and be used jointly with, the ICF. This partnership may assist with the following tasks:

- evaluation for general medical practice (e.g. fitness for work)
- evaluation for social benefits (e.g. disability, pension)
- payment or reimbursement purposes
• needs assessment (e.g. for rehabilitation, occupational assistance, long term care.)
• outcome evaluation of interventions

Signs and symptoms in the ICD were aligned with body functions in the ICF, and ‘factors influencing health status’ in the ICD with contextual factors in the ICF.

Additional selected ICF categories (see sections 1.2 and 1.4.1) are drawn from the component *activities and participation* (A&P) and help to describe the functional limitations commonly associated with the specific health condition in a functioning pattern. The impact of the disease or disorder in daily activities of a person may vary depending on the severity of the condition as well as the contextual factors (e.g. environmental factors) and possible co-morbidities. The ICD takes an approach that identifies severity as a property of the disease/disorder and describes the impact of the health condition on the daily life of a person as functioning pattern (FP). Details about implementing FPs are described in Section 3.2.5. Instructions on how to code FPs are described in Section 6.4.

### 3 Structure and Taxonomy of the ICD Classification System

The chapter and block structure of the ICD has evolved in 11 iterations over 100 years. The authoring of ICD follows a set of rules that ensure the functional and structural integrity of the classification. The evolution of ICD carefully balances the need for categories that match current knowledge while allowing statistical comparability over space and time.

The chapter structure of ICD reflects major aspects of diseases. Chapters are not intended to delimit areas of medical expertise or domains of specialties. The ICD has categories for diseases, disorders, syndromes, signs, symptoms, findings, injuries, external causes of morbidity and mortality, factors influencing health status, reasons for encounter of the health system and traditional medicine. ICD-11 complements these categories with additional detail such as anatomy, substances, infectious agents, or place of injury. ICD-11 also comes with a set of rules and explanations for its use, required reporting formats, and necessary metadata.

The most widespread use of ICD over time and geographically, is for cause of death statistics. The second important use is classification of clinical documentation to provide standardized, language independent information for morbidity use, as resource allocation, case mix, patient safety and quality of care as well as primary care and research. ICD and its definitions are also used as a framework in legislation.

A statistical classification of diseases must be confined to a limited number of mutually exclusive categories able to encompass the complete range of diseases or morbid conditions. The categories are chosen to facilitate the statistical study of disease phenomena. A specific disease entity that is of particular public health importance, or that occurs frequently, should have its own category. Otherwise, categories are assigned to groups of separate but related conditions. Every morbid condition must have a well-defined place in the list of categories. Consequently, throughout the classification, there will be residual categories for other and miscellaneous conditions that cannot be allocated to the more specific categories. The following measures are used to determine whether an entity qualifies to become a unique category:

1. Epidemiological evidence: frequency analyses of coded mortality and morbidity data
2. Clinical evidence: disease evidence provided by the medical specialties
3. Granularity: minimum detail reported and useful in mortality (mortality data) or primary care
4. Continuity: preserve the level of detail pre-existing in ICD
5. Parsimony: the need to limit the number of categories for international mandatory reporting.

The concepts of classification, nomenclature and terminology are closely related. It is the element of grouping that distinguishes a statistical classification from a nomenclature or terminology, which must have separate titles for each known morbid condition. However, nomenclatures or terminologies are also often arranged systematically. A statistical classification can make allowances for different levels of detail if it has a hierarchical structure and subdivisions.

A statistical classification of diseases should retain the ability to identify specific disease entities while allowing statistical presentation of data of broader groups to enable the generation of useful and understandable information. The same general principles apply to the classification of other health problems, and reasons for contact with health-care services, which are also incorporated in the ICD. The ICD has developed as a practical, rather than a purely theoretical classification, in which there are a number of compromises between classification based on aetiology, anatomical site, circumstances of onset, or other criteria.

ICD-11 draws extensively on the method of combining several codes to describe a morbid entity to the desired level of detail. Its electronic architecture allows assignment of unique identifiers to any condition listed - independently whether the condition is grouped in a statistical class or whether it represents a class of its own. The two approaches together allow the option of keeping coding simple where required diagnostic detail is limited; and the alternative to add detail where diagnostic reporting requires a high level of sophistication.

3.1 Taxonomy

The authoring of ICD follows a set of guiding principles that ensure the functional and structural integrity of the classification. The international standardized, and most widespread use of ICD over time and geographically, is cause of death statistics. The second important use is classification of clinical documentation to provide pertinent information for resource allocation, case mix, patient safety and quality of care as well as primary care and other kinds of statistics. A statistical classification of diseases must be confined to a limited number of mutually exclusive categories able to encompass the complete range of morbid conditions. The categories are chosen to facilitate the statistical study of disease phenomena. A specific disease entity that is of particular public health importance, or that occurs frequently, should have its own category. Otherwise, categories are assigned to groups of separate but related conditions. Every disease or morbid condition must have a well-defined place in the list of categories. Consequently, throughout the classification, there will be residual categories for other and miscellaneous conditions that cannot be allocated to the more specific categories. The following measures apply in determining whether an entity qualifies to become a unique category:

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### 3.2 Chapter Structure

The ICD is a variable-axis classification. The structure has developed out of that proposed by William Farr in the early days of international discussions on classification structure: - epidemic diseases - constitutional or general diseases - local diseases arranged by site - developmental diseases - injuries

These groups remain in the chapters of ICD–11. The structure has stood the test of time and, though in some ways arbitrary, is still regarded as more useful for general epidemiological purposes than any of the alternatives tested. The conservation of the structure acknowledges the need for stability while allowing incorporation of additional sections. The special groups bring together conditions that would be inconveniently arranged for epidemiological study were they to be scattered, for instance in a classification arranged primarily by anatomical site. These conditions formulate the “special groups” chapters:

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 1</td>
<td>Certain infectious or parasitic diseases</td>
</tr>
<tr>
<td>Chapter 2</td>
<td>Neoplasms</td>
</tr>
<tr>
<td>Chapter 3</td>
<td>Diseases of the blood or blood-forming organs</td>
</tr>
<tr>
<td>Chapter 4</td>
<td>Diseases of the immune system</td>
</tr>
<tr>
<td>Chapter 18</td>
<td>Pregnancy, childbirth or the puerperium</td>
</tr>
</tbody>
</table>
Chapter 19  Certain conditions originating in the perinatal or neonatal period
Chapter 20  Developmental anomalies
Chapter 22  Injury, poisoning or certain other consequences of external cause

The distinction between the ‘special groups’ chapters and the ‘body systems’ chapters has practical implications for understanding the structure of the classification, for coding to it, and for interpreting statistics based on it. It has to be remembered that, in general, conditions are primarily classified to one of the ‘special groups’ chapters.

Where there is any doubt as to where a condition should be positioned, the ‘special groups’ chapters should take priority. This principle is enforced in the excludes notes at the beginning of each chapter in the ICD. For example, cervical dysplasia grade 1 is coded to the chapter 2 ‘Neoplasms’ because distinction between dysplasia and neoplasia and clinical management are subject to a set of recommended criteria that may change over time.

3.3 Revision major steps

The revision of ICD-11 has taken place in several phases.

First, a list of issues that were known from the use of ICD-10 and that could not be solved in its classification structure was compiled and possible solutions were formulated.

Second, input was received from many scientific groups in the key subject areas with a focus on the clinical perspective.

Finally, centralised editing occurred, aimed to adjust imbalances in content generated by multiple independently operating expert groups in the previous phase of the revision, and to ensure the overall structure is consistent and practicable for users in mortality and morbidity statistics. The 'guiding principles' were an essential tool particularly in the last phase. The content, terminology and suggestions for specific groupings by the scientific groups has been preserved, though the proposed structure and location of the entities in the classification has undergone changes necessary to the main uses of ICD. The multiple parenting preserved the visibility of the conditions in the preferred location of the scientific groups. The final version also received input from field testing, Member State comments, and ongoing submission and processing of proposals.

3.4 Guiding Principles

Allocation of entities in the classification follows a set of rules that serve to maintain the structural and functional integrity of the classification. The core set of rules listed here is complemented by additional rules that address special cases or serve to ensure consistent user guidance (see annex). They are listed in order of priority.

1. No changes to the classification, including movement of categories or groups between chapters, without rationale and documented change in aetiology or prevention method. (e.g. Diseases of the immune system was added as a new chapter as there was sufficient scientific evidence to support this move. Alternatively, while it was suggested to move 'wounds of skin' to Disease of the skin, the wound of the skin, being an injury, remains grouped with injuries. Prevention will focus on the cause of the wound.

2. Conditions are classified predominantly by their aetiology.
a. Local manifestations of important ‘aetiologies’ are located in the aetiology chapter (e.g. Viral hepatitis is in Certain infectious or parasitic disease).

b. Where one condition can be due to multiple different aetiologies, and it is more relevant to retain the affected body system, it is usually classified with the body system, (e.g. some gastric ulcers are caused by bacteria, but they remain in the Digestive system chapter).

c. Where the aetiology of the condition is unknown, it is allocated to the most relevant organ system (e.g. Costen syndrome is in the Digestive chapter).

d. Systemic ‘aetiologies’ are primarily in their relevant aetiology chapter (e.g. Idiopathic inflammatory myopathy is in Diseases of the immune system).

3. Conditions that could arguably be in two or more places of the classification remain in their legacy location.

a. For example, injuries of the eye are equally important for the eye and their prevention. Despite the suggestion of including them in the eye chapter, they remained where they were, in the injury chapter.

b. Where aetiology and body system are equally important, the legacy location remains unchanged (ocular motor nerve palsies).

4. Keeping a group of subtypes together in one location may override anatomical or aetiological considerations (e.g. human prion diseases, some have a genetic component, others a transmissible component).

3.5 Guiding principles for special concepts

1. Clinical findings are located in the chapter ‘Symptoms, signs or clinical findings, not elsewhere classified’. (e.g. Abnormal serum enzyme levels or Results of function studies of the circulatory system)

2. Manifestations of diseases and a relevant point for a health intervention are ‘clinical manifestations’ and are located in the body system chapter where they manifest. The underlying condition has to be coded as well. (e.g. myocarditis)

3. Syndromes, where the aetiology is unknown, are allocated with the most relevant organ system. (e.g. Costen syndrome is in the Digestive chapter)

4. The number of categories with ‘due to’ in the title are restricted to certain exceptions. (e.g. Sepsis due to certain bacteria)

5. Chronic, specific postprocedural conditions are grouped at the end of the organ system chapter where they manifest. (e.g. lymphoedema due to surgery or radiotherapy). Residual categories do not exist for these groups.

6. Acute postprocedural complications are identified by combinations of codes from body system, injury and external causes chapters. (e.g. an accidental puncture during an intervention is classified with a code for the injured organ, a code identifying the accidental puncture as the mode of injury and a code describing what surgery occurred as the mechanism of injury)

7. Categories with mention of ‘multiple’ are restricted to exceptions and require coding of the different multiple conditions individually. (e.g. multiple injuries are to be coded individually)
8. Categories with mention of ‘sequelae’ are, if there are any at all, restricted to exceptions. The specific condition resulting as a sequela needs to be coded along with the underlying cause. In some instances, they will continue to exist with the label ‘late effects of...’ (e.g. late effects of cerebrovascular disease or late syphilis)
9. Categories with mention of ‘history of’ are limited to exceptions. (e.g. personal history of malignant neoplasms lists only the more frequent anatomical sites)
10. High level groupings need to be meaningful.
11. Residual categories exist only where they are meaningful. (e.g. where conditions are either congenital or acquired, there is no ‘other’ residual, but there will be an ‘unspecified’ option)

### 3.6 Improving user guidance

The following rules serve to provide user guidance. Users may expect to find conditions in certain places when browsing the tree structure. User groups may need to group data or create subsets for other reasons. The multiple parenting in the foundation serves to address that issue.

1. Where a condition could be in two or more places, identify these other places and add them as secondary parents, e.g. malignant neoplasm of the colon is coded to the neoplasm chapter, but is also shown in the chapter of diseases of the digestive system. In case a set of conditions needs to be shown in more than one place and there is no grouping matching that set, create a window (no primary children, no terms, no residual categories) in the appropriate place.
2. Where a condition could be confused with another condition bearing a similar name, add an exclusion note. (e.g. ‘Influenza due to seasonal influenza virus’ has a note ‘Exclusion: Haemophilus influenzae [H. influenzae] meningitis’).
3. Where alternative ways of tabulating data are required, create a special tabulation list as a second parent. (e.g. infectious diseases by agent.). The coding scheme of the individual entries will remain the one used for the full international classification.
4. Where diseases of certain body systems are spread across different chapters, allow for a specialty tabulation of the pertinent diseases. The coding scheme of the individual entries will remain the one used for the full international classification. Currently there are specialty tabulations for primary care, dermatology, neurology, ophthalmology and the special cases ICD-O and ICECI.

### 3.7 General features of ICD–11

The main structural innovation of ICD–11 is that it is built on a foundation component from which the tabular list can be derived. The international reference Tabular list is the statistical classification for morbidity and mortality. Due to the addition of a Foundation component, and the electronic design of ICD-11, some new terminology had to be introduced that had not been used in prior versions of ICD. The table below provides examples of this new terminology. You will find more detail about individual aspects in other parts of this guide.

<table>
<thead>
<tr>
<th>ICD–11 Term</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation</td>
<td>Underlying data base content that holds all necessary information to generate print versions of the tabular list and the alphabetical index as well as additional information that is needed to generate specialty</td>
</tr>
</tbody>
</table>
versions of ICD-11 and country specific modifications.

Stem code
Stem codes are codes that can be used alone. They are found in the tabular list of ICD-11 for Mortality and Morbidity Statistics. Stem codes may be entities or groupings of high relevance, or clinical conditions that should always be described as one single category. The design of stem codes makes sure that in use cases that require only one code per case, a meaningful minimum of information is collected.

Extension code
Some users and settings are interested in reporting more detail than is included in a stem code. This additional detail can be coded using an Extension code. Extension codes can never be used without a stem code, but are used together with the stem codes to define the full detail of a reported disease.

Cluster coding
Stem codes can be postcoordinated, or jointly used together, with extension codes or with other stem codes to fully describe one diagnosis. In this case, the postcoordinated codes will be grouped to show which ones belong together to describe the diagnosis. This mechanism is called “cluster coding”.

Primary and secondary parents
The hierarchy of ICD-11 is defined the same as it was in previous versions of ICD. The possibility to connect specific diseases and concepts within the classification to another parent code was introduced to enable specific extracts of the Tabular list for medical specialities or for specific use cases. For example, a code for a malignant neoplasm of the skin is located in the chapter for malignant neoplasms. The primary parent for this code is a code or a block from this chapter. However, a medical doctor treating only skin diseases might want to see only codes from the classification that are relevant for his or her specific clinical purpose. Therefore, a secondary parent was defined in the skin chapter which will only show the code in this chapter if the specific extract of code for his or her use case is selected.

Details of the differences between ICD–10 and ICD–11 in individual chapters are explained in the annex.

Coding scheme:

- The chapter numbering is in Arabic numbers and not Roman numerals.
- The coding scheme for categories now has 4 characters, and there are 2 levels of subcategories.
- The coding scheme always has a letter in the second position to differentiate from the codes of ICD–10.
- In ICD–11, the first character of the code always relates to the chapter number. It may be a number or a letter. The code range of a single chapter always has the same character in the first position.
- In order to describe a causal relationship between conditions in a code title the preferred term is ‘due to’.
- In order to indicate the concurrence of two conditions in a code title the preferred term is ‘associated with’.
Extension codes and additional subclassifications

ICD–11 allows adding specific detail to coded entities by the following mechanisms:

1. The extension codes comprised of groups of codes e.g. anatomy, agent, histopathology and other aspects that may be used to add detail to a code. Extension codes are not to be used alone but have to be added to a stem code. Not all extension codes are allowed to be used with every stem code. As well there might be places where only a subgroup of an extension code can be used together with a specific stem code. This will be indicated in the tabular list by showing the valid extension codes for each stem code. Sometimes an extension code might be valid for a group of stem codes. This will be indicated in the tabular list by displaying such extension code at the highest level within the hierarchy.

2. ‘Code also’ instructions inform about additional aetiological information which needs to be coded in conjunction with certain categories, because that additional information is relevant for primary tabulation. The ‘code also’ statement marks the categories that should be used only in conjunction with the indicated second code(s). In some instances, they may be a reason for treatment in their own right, where aetiology is unknown.

3. ICD–11 has an explicit way of marking codes that are postcoordinated to describe one condition, called cluster coding. This is a notable new feature in ICD-11 that creates an ability to link core diagnostic concepts (i.e. stem code concepts) when desired, and/or to add clinical concepts captured in extension codes to primary stem code concepts. Either way, it should be emphasized that the clustering ability inherent to ICD-11 is one of the significant changes relative to ICD-10.

Other general features:

ICD–11 categories have a short description and a long definition labelled ‘additional information’. The description is a short characterisation (maximum of 100 words) of the entity that states things that are always true about a disease or condition and necessary to understand the scope of the rubric. It appears in the tabular list of the classification. The long ‘additional information’ is the full definition, without length restriction, including detailed information that appears in the foundation component only.

- Special tabulation lists continue to exist in ICD-11, but there are three additional ones—the Startup Mortality List (SMoL), the list for verbal autopsy and infectious diseases by agent. Additional special tabulations can be derived from the new multiple parenting technique, e.g. all WHO notifiable diseases, listing all conditions that are assigned to the relevant section of the infectious diseases chapter. Specialty tabulations allow the representation of content from the angle of a specialty, such as dermatology or neurology, creating subsets, and allowing the precoordinatation of more detail, if desired.

- For morbidity, the definition of main diagnosis has changed to be the reason for admission after assessment at the end of the stay. This definition is less prone to interpretation, and countries that had switched from the 'biggest resources' definition to the 'reason for admission at the end of the stay' using ICD-10, noticed only small changes in their activity statistics.
3.8 Foundation Component and Tabular Lists of ICD–11

The Foundation Component is a multidimensional collection of all ICD entities. Entities can be diseases, disorders, injuries, external causes, signs and symptoms. Some entities may be very broad, for example ‘injury of the arm’, while others are more detailed, for example ‘laceration of the skin of the thumb’. The Foundation Component also has the necessary information to use the entities to build a tabular list (a mono hierarchy in the style of a traditional statistical classification). The foundation includes information on where and how a certain entity is represented in a tabular list, whether it becomes a grouping, a category with a stem code, or whether it is mentioned as an inclusion term in a particular category.

Several different tabular lists can be built from the foundation component. Drawing on the same foundation, a set of tabular lists that builds on the same hierarchical tree can be created – a set of so called congruent tabular lists. Data that is collected with any tabular list of such a congruent set can always be aggregated to the smallest common denominator (provided the same rules for reporting, coding and selection have been applied). The foundation component includes instructions on how to combine certain codes in a tabular list to achieve more detail in coding. These rules help coders and computer systems to visualize the permitted code combinations when they are using a tabular list.

In a tabular list, entities of the foundation become categories. The categories are mutually exclusive and jointly exhaustive, and linked to a mono hierarchical tree (they have only one parent). The information related to an entity that has become a category and has multiple parents is still available from the foundation. This information can be used to visualize that category in more than one place in the tabular list, e.g. showing them in black in its place for reference tabulation and in grey in any other place for browsing or alternative tabulations. Multiple parenting is explained in a separate section (see Basic coding guidelines). ICD–11 has multiple congruent tabular lists with varying levels of detail.

Core tabular lists for international use are:

- Mortality and Morbidity Statistics (MMS)
- Primary care low resources settings (PCL)
- Primary care intermediate resources setting (PCM)
- Verbal Autopsy (VA)
- Simple Mortality List (SMoL)

The full name of such a tabular list will always include ‘ICD–11’, e.g. ICD–11–MMS.

3.8.1 Stem Codes and Extension Codes

For instructions for use of stem codes and extension codes see later sections ‘Extension codes’ and ‘Basic Coding Guidelines’

3.8.2 Pre- and Postcoordination, Cluster

A health condition may be described to any level of detail, by applying more than one code, or by ‘postcoordinating’ (i.e.combining)

- two or more stem codes, (i.e., code1/code2)
stem codes with one or more extension codes. (i.e. stem code & extension code1 & extension code2)

In this manner, the classification can address a big number of items with a limited range of categories. Stem codes contain all pertinent information in a pre-combined fashion. This is referred to as 'precoordination'. When additional detail that pertains to a single condition is described by combining multiple codes, this is referred to as 'postcoordination'. The mechanism of showing which codes are postcoordinated is called cluster coding in ICD-11. Below, two examples are presented to show first a precoordinated diagnostic concept, then one that benefits from postcoordination.

Example: Single code (precoordination)

Single code: ‘squamous cell carcinoma of lung’

In precoordination, both site and pathology are combined in a single precoordinated diagnostic code

Example: Cluster coding (postcoordination)

Stem code: other specified neoplasm of lung
Extension code: large cell carcinoma

In postcoordination, the condition 'large cell carcinoma of bronchus and lung' is expressed through a combination of two linked or clustered codes.

3.8.3 Multiple Parenting

An entity may be correctly classified in two different places, e.g. by site or by aetiology. For a disease like oesophageal cancer this would mean that it could be classified to cancers (malignant neoplasms) or to conditions of the digestive system. In the same way, cerebral ischaemic conditions could be classified to the vascular system – where the problem arises - or to the nervous system – where the ischaemia impacts and manifests with symptoms.

In the foundation component 'includes' notes for these examples will have both mentioned possible parents (multiple parents). However, for the tabulation of statistical outputs from any tabular list, there can be only one parent for primary tabulation. When there are such multiple parents, in the foundation view both parents will be displayed the same way. However, in a tabular list, the primary parent place will show the entity and its parents in black, and possibly the secondary parent place (e.g. for oesophageal cancer primary parent malignant neoplasm will appear in black and the digestive system for the oesophageal cancer) in grey. Similar to the online version, the print version (i.e. the hard copy) in grey, if needed for the specific use the tabular list was generated for.

Every time an entity is parented elsewhere, it will continue to show the code from the primary parent. The primary parent is sometimes referred to as the ‘Tabular list parent’.

3.8.4 The Content Model

ICD-11 holds all its content in the foundation component. Here, every entity is specified by a definition, machine readable properties that have values, and one or more parent-child relationship. Additional links provide information for postcoordination. All this multi-
dimensional information is then projected on one line with mutually exclusive categories, as the tabular lists. The foundation includes information on where and how a certain entity is represented in a tabular list. An entity might become a grouping, a category, or just a term that is, for example, listed in the index. The Content Model is a structured framework that defines each entity found in the ICD in a standard way. The purpose of the Content Model is to present the background knowledge that provides the basis for the definition of each ICD entity in a systematic way to allow for computerization. Each ICD entity can be seen from different dimensions. The Content Model represents each one of these dimensions as a ‘property’. For example, there are currently 13 defined main properties in the content model to describe an entity in the ICD.

A disease is usually defined using addressing a set of relevant aspects drawn from the pattern below. A disease is a set of dysfunctions in any body system defined by:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Symptomatology or manifestations:</td>
<td>known pattern of signs, symptoms, and related findings</td>
</tr>
<tr>
<td>2. Aetiology:</td>
<td>an underlying explanatory mechanism</td>
</tr>
<tr>
<td>3. Course and outcome:</td>
<td>a distinct pattern of development over time</td>
</tr>
<tr>
<td>4. Treatment response:</td>
<td>a known pattern of response to interventions</td>
</tr>
<tr>
<td>5. Linkage to genetic factors:</td>
<td>e.g., genotypes, patterns of gene expression, etc.</td>
</tr>
<tr>
<td>6. Linkage to environmental factors</td>
<td></td>
</tr>
</tbody>
</table>

The key components of the definition of disease are included as different properties within the Content Model. The thirteen main properties of the Content Model are:

1. ICD Entity Title
2. Classification Properties
3. Textual Definitions
4. Terms
5. Body System/Body Part
6. Temporal Properties
7. Severity of Subtypes Properties
8. Manifestation Properties (Signs, Symptoms or Investigation Findings)
9. Causal Properties
10. Functioning Properties
11. Specific Condition Properties
12. Treatment Properties
13. Diagnostic Criteria

For each ICD entity, various properties can be given if necessary to reach the correct coding result. At the time of initial release of ICD-11 only absolutely necessary properties will be defined in order to avoid the necessity of frequent updates and to reduce the resources.
needed in implementing countries to update the classification within a short timeframe. Additions of property values on international level can be managed through the regular update cycle whenever coding problems indicate the necessity to do so. For example:

ICD entity: invasive ductal carcinoma of breast

<table>
<thead>
<tr>
<th>Properties</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomy</td>
<td>breast</td>
</tr>
<tr>
<td>Morphology</td>
<td>invasive ductal carcinoma</td>
</tr>
</tbody>
</table>

The full range of different values for a given property is predefined using standard terminologies and ontologies. This range of values is called a "Value set".

3.8.4.1 Definitions

Descriptions of ICD–11 concepts inform analysts and translators about the meaning of an entity and its descriptive characteristics. There are two different types of descriptions: a short description (maximum of 100 words) that is available in both the content model and the tabular list, and a detailed description with comprehensive detail at the level required for each entity. The detailed description appears only in the content model and possibly in electronic versions online.

Coders are cautioned not to use the descriptions to establish a diagnosis. Coders must assign codes based on the diagnosis(es) documented by the clinician.

The descriptor information that is included for the individual entities of the ICD-11 provides users of the ICD clear insight regarding the intended meaning and scope of rubrics or terms in the tabular list and the Foundation component. The descriptors guide translators, coders and users of coded data. The goal is to enhance the comparability, consistency, and interpretation of coded information for everyone, everywhere. There are four levels of descriptor information in the ICD–11 content model.

3.8.4.1.1 Fully Specified Term

This is an unambiguous title that does not assume context. For example, “systemic illness with predominant gastrointestinal diarrheal symptoms attributable to vibrio cholera” as opposed to “cholera” or “other” (where the meaning of other would have been clear from the hierarchical context.)

3.8.4.1.2 Description

The description is a short characterization (maximum of 100 words) of the entity that states things that are always true about a disease or condition and necessary to understand the scope of the rubric. Descriptions do not contain elements intended for in level 3 (common epidemiology) or things that may be true for level 4 (clinical criteria). Descriptions were formerly called ‘short definitions’.

3.8.4.1.3 Additional Information

This is a text field that is not mandatory, but that may contain any additional information about, or characteristics of, the diseases or conditions included in the entity. This text field provides more context for the entity. For example, the most common epidemiologic
circumstances, putative or highly suspected aetiologic agents, or other information that may not always be true but may be common, typical, or expected. Additional information was formally called ‘long definition’.

3.8.4.2 Clinical or Diagnostic Criteria

This element is presently unpopulated within the Foundation content model. It is intended to contain one or more scenarios of clinical criteria and characteristics that would be sufficient to diagnose the condition(s) or syndrome(s) of the given class or concept. Such scenarios should contain multiple variations, or embedded logic to accommodate “x out of n” variations, that are necessary or useful to make the diagnosis. For example, a myocardial infarction in high-resource diagnostic settings would typically include a longitudinal pattern of cardiac enzymes, specific EKG changes, and stereotypical symptoms. However, only two out of these three need be present as there are such things as “silent MIs (without symptoms) and similar variations. It is expected that these scenarios will be divided over technology capabilities. For example, diagnosing a myocardial infarction in the high-resource diagnostic settings would likely involve different technology and criteria than in low-resource settings. ICD diagnostic criteria draw on various WHO guidelines that have identified diagnostic rules (e.g. guidelines, criteria). Extensions to the ICD, as specialty tabular lists, may use such diagnostic rules. The ICD-11 architecture, and the future evolution of this component of information, could eventually serve decision algorithms based on these criteria. Assignment of diagnoses and conditions could automatically be proposed from data arising in electronic medical records. Populating the clinical criteria is a future project that requires further planning. If necessary, diagnostic criteria describe diagnostic methodology that determines how health providers diagnose cases that are classified to an entity. It contains the core diagnostic information necessary and sufficient to describe a category, and enables the digital representation of the diagnostic algorithms using standardized terminology and other elements as appropriate. There may be different sets of diagnostic criteria for different settings. Diagnostic Criteria draw on content of other attributes. ICD diagnostic criteria draw on various WHO guidelines that have identified diagnostic rules (e.g. guidelines, criteria). Extensions to the ICD, as specialty tabular lists, may use such diagnostic rules.

3.8.4.3 Functioning properties

In order to describe the impact of morbidity on the life of a person it is not only necessary to mention the diseases a patient suffers but the impact of these diseases on functioning, activity and participation of a person needs to be described, too. This is possible with the embedded functioning properties. A detailed description on how to use the functioning properties is given in a separate section below. Note: Functioning embedded in ICD allows a first documentation of functioning of an individual. Using selected subsets for the assessment of functioning has proven a useful method that is also used in the WHO Disability Assessment Scale (WHODAS). Where possible, the full ICF should be used for a complete reporting of functioning.

3.9 Language independent ICD Concepts

ICD-11 concepts are language independent. All concepts have unique identifier (URI), and have a specific place in a hierarchy of groups, categories and narrower terms. The maintenance of the ICD-11 on an international level is handled in the English language but
the content model of the ICD–11 is language independent and allows binding of any desired language to the elements of its foundation. In this way, an international translation base facilitates translations or multilingual browsing. The unique identifier (implemented as an URI) remains valid independently whether an ICD concept is still valid or has been retired. The hierarchical structure of groups, categories, subcategories, and inclusions (parents, children and narrower terms) serves also as a language independent backbone for translations of ICD. This structure that is one component of the foundation is essential when building an index in a local language. It helps (in conjunction with the ICD translation platform) to identify the things that need to be translated in order to be able to address ICD categories with terms reported in the local language.

3.10 Organization of a Congruent System

Many countries use a single coding system (tabular list) for all use cases. Congruent, telescopically expandable and collapsible purpose-independent subsets for morbidity coding in different settings (comparable to Verbal Autopsy, or initial implementation lists for mortality) allow gathering of information at different levels of detail and still allow for comparison of the collected information at the level of the common description.

3.11 ICD–11 conventions

ICD–11 has standard ways of presenting its content. Conventions describe textual content and also apply to the coding structure.

3.11.1 Code Structure

The codes of the ICD–11 are alphanumeric and cover the range from 1A00.00 to ZZ9Z.ZZ. Codes starting with ‘X’ indicate an extension code (see Extension codes). The inclusion of a forced number at the 3rd character position prevents spelling ‘undesirable words’. A letter in the 2nd character position allows for clear distinction between a code from ICD–11 and one from ICD–10. The letters ‘O’ and ‘I’ are omitted to prevent confusion with the numbers ‘0’ and ‘1’. Technically, the coding scheme would be described as below:

```
EDEE.EE
```

- E corresponds to a 'base 34 number' (0-9 and A-Z; excluding O, I);
- D corresponds to 'base 24 number' (A-Z; excluding O, I); and
- 1 corresponds to the 'base 10 integers' (0-9)
- The first E starts with ‘1’ and is allocated for the chapter. (i.e. 1 is for the first chapter, 2: chapter 2, ... A chapter 10, etc.)

The terminal letter Y is reserved for the residual category ‘other specified’ and the terminal letter ‘Z’ is reserved for the residual category ‘unspecified’. For the chapters that have more than 240 blocks, ‘F’ (‘other specified’) and ‘G’ (‘unspecified’) are also used to indicate residual categories (due to problems with the coding space).

Chapters are indicated by the first character. For example, 1A00 is a code in chapter 1, and BA00 is a code in chapter 11.
Groups are not coded within this code structure. However, hierarchical relations are retained in the 4-digit codes. There is unused coding space allocated in all blocks to allow for later updates and to keep the codes stable.

3.11.2 Inclusions

Within the coded categories there are typically other optional diagnostic terms. These are known as ‘inclusion terms’ and are given, in addition to the title, as examples of the diagnostic statements to be classified to that category. They may refer to different conditions or be synonyms. They are not a sub-classification of the category. Inclusion terms are listed primarily as a guide to the content of the category, in addition to the definition. Many of the items listed relate to important or common terms belonging to the category. Others are borderline conditions or sites listed to distinguish the boundary between one subcategory and another. The lists of inclusion terms are by no means exhaustive. Alternative names of diagnostic entities (synonyms) are included and shown in the electronic coding tool and the Alphabetical Index, which should be referred to first when coding a given diagnostic statement. It is sometimes necessary to read inclusion terms in conjunction with titles. This usually occurs when the inclusion terms describe lists of sites or pharmaceutical products, where appropriate words from the title (e.g. ‘malignant neoplasm of ...’, ‘injury to ...’, ‘toxic effects of ...’) need to be understood. General diagnostic descriptions common to a range of categories, or to all the subcategories in a four-character category, are to be found in the notes heading ‘Inclusions’, immediately following a chapter, group, or category title.

3.11.3 Exclusions

Certain categories contain lists of conditions preceded by the word ‘Exclusions’. These are terms which are classified elsewhere. An example of this is 6A40 Hyperfunction of pituitary gland which excludes Cushing syndrome (6A50)

Exclusions serve as a cross reference in ICD and help to delimitate the boundaries of a category.

General exclusions for a range of categories or for all subcategories are found in the notes heading ‘Excludes’, immediately following a chapter, group or category title. Some exclusions may be language dependent. The meaning of ICD entities is designed to be the same in all languages but different languages have different sets of synonyms. As a result, a language specific term can have a language specific homonym in a different part of the classification, while such homonym does not exist in English. In such instances, a language specific exclusion note would inform the user and will have a cross-reference.

Multiple parenting in ICD-11 shows categories in the context of siblings that are placed elsewhere in the classification. This is also an indication of an exclusion and means ‘some sibling is coded elsewhere’. In the print and the coder version this information is displayed as an exclusion as well.

3.11.4 Code also - Use additional code, if desired

Code also instructions inform the user about mandatory additional information which has to be coded in conjunction with certain categories because that additional information is relevant for primary tabulation. The ‘code also’ statement marks the categories that should be used in conjunction with the indicated second code(s). However, in some instances they
may be a reason for treatment in their own right, where aetiology is unknown, and the code is reported alone.

**Use additional code, if desired** instructions inform the user about optional additional detail that can be added for a particular diagnosis.

### 3.11.5 ‘NEC’ and ‘NOS’

**‘NEC’**

The words ‘not elsewhere classified’, when used in a category title, serve as a warning that certain specified variants of the listed conditions may appear in other parts of the classification.

**‘NOS’**

The letters NOS are an abbreviation for ‘not otherwise specified’, implying that the documentation that is used for classifying does not provide more detail than just that term (implying ‘unspecified’, ‘incompletely specified’ or ‘unqualified’). Sometimes an unqualified term is nevertheless classified to a rubric for a more specific type of the condition. This is because, in medical terminology, the most common form of a condition is often known by the name of the condition itself and only the less common types are qualified. For example, ‘pharyngitis’ is commonly used to mean ‘acute pharyngitis’. These inbuilt assumptions have to be taken into account in order to avoid incorrect classification. Careful inspection of inclusion terms will reveal where an assumption of cause has to be accounted for; coders should be careful not to code a term as unqualified unless it is quite clear that no information is available that would permit a more specific assignment elsewhere. Similarly, in interpreting statistics based on the ICD, some conditions assigned to an apparently specified category will not have been so specified on the record that was coded. When comparing trends over time and interpreting statistics, it is important to be aware that assumptions may change from one revision of the ICD to another. For example, before the Eighth Revision, an unqualified aortic aneurysm was assumed to be due to syphilis (this is no longer the case since ICD-10). In ICD-11 in most instances the ‘NOS’ point to unspecified categories, so that the later data analysis can take care of assumptions or not regarding the linguistic meaning.

### 3.11.6 ‘Certain’

The term ‘certain’ informs that some entities that could be grouped here are grouped somewhere else outside the current chapter or block.

### 3.11.7 Residual categories – ‘Other’ and ‘Unspecified’

ICD-11 coding should always be completed to include the highest level of detail possible with the use of one code or multiple codes as described above. There are, however, circumstances when that is not possible and for that reason the ICD-11 includes categories titled ‘other’ and ‘unspecified’. In some instances, necessary information to select a specific category may not be available in the source documentation. When this is the case, the residual category ‘unspecified’ is selected. Conversely, there are instances where the information in the source documentation is very specific, but the tabular list does not
include a specific category. In this case, users identify the closest category match, and code to the residual category titled ‘other’.

3.11.8 Use of ‘And’ and ‘Or’

The words ‘and’ and ‘or’ in ICD–11 are used in their meaning in formal logic. A term that includes a statement of the kind 'A and B' means that both, A and B, have to be present in order to use that category. A term that includes a statement of the kind ‘A or B’ means that either A or B, or both, have to be present in order to use the category. Because A or B can mean either A or B or both, ‘or’ now meaning "and/or". (The term ‘and’ meaning ‘and/or’ found in ICD–10 has not been carried over into ICD–11.)

3.11.9 ‘Due to’ and ‘With’

‘Due to’ is the preferred term for categories where two conditions are mentioned and a causal sequence exists. Other terms, such as ‘caused by’ or ‘attributed to’ may be allowed synonyms. The phrase ‘secondary to’ is equivalent and may also be included as a synonym. ‘Associated with’ is the preferred term for categories where two conditions are mentioned and there is no causal sequence implied.

3.11.10 Spelling, parentheses, grammar and other conventions

Spelling and grammar of ICD-11 follow the British rules with exceptions and amendments conforming with WHO spelling rules. The detailed conventions are listed below. The alphabetical index uses the following conventions:

- Terms will be listed in their singular form
- Apostrophes have been removed For example: ‘Hodgkin lymphoma’ (instead of ‘Hodgkin’s lymphoma’)
- Entities are described using natural language For example: ‘myocardial infarction’ (instead of ‘infarction, myocardial’)
- Abbreviations will be printed using upper case letters, and followed by the complete title in full. For example: ‘MI – myocardial infarction’

Parentheses are used in the tabular list to enclose the code to which an exclusion term refers. For example:

1M7L Infectious blepharitis
Exclusions: blepharoconjunctivitis (AD56)

3.12 Stem codes

ICD–11 stem codes are codes in a particular tabular list that can be used alone. Stem codes may be entities or groupings of high relevance, or clinical entities that should always be described as one entity. The design of stem codes makes sure that in use cases that require only one code per case a meaningful minimum of information is collected.

The stem codes of the ICD-11 are organized in 24 chapters that follow the traditional pattern of ICD, relating to aetiology, relevant organ system, maternal status, perinatal status, external causes, and factors influencing the health status.
3.13 Extension codes

The Extension codes have been designed to standardize the way additional information is added to stem codes. Also, the adoption of multi-dimensional coding results in a substantially reduced amount of stem codes.

The Extension codes should never be used alone and must always be linked to a stem code. One or more extension codes can be linked when coding a specific condition. Extension codes are provided for use as supplementary or additional codes when it is desired to identify more detail in entities classified elsewhere.

There are two main types of Extension codes.

Type 1 extension codes allow the user to add detail to a stem code. The category refers to the same diagnosis with or without the Type I extension code. These extension codes provide important additional information, such as whether a condition is acute or old - and where it is located.

Type 2 extension codes describe the kind of diagnosis; they identify different types of use of the same ICD code in health and other records or for administrative detail. The same ICD code may be used as a main condition, or to specify whether that condition was present on admission, or alternatively, if it arose after admission (see also section ‘Morbidity rules’ for the international definition of main condition). The meaning of the code refers to the same condition, but the extension code alters its interpretation. For example:

In both examples above, ‘Other specified benign neoplasms’ refers to the same ICD code, and the Type 1 extension codes refer to the same diagnostic situation for the patient, but the use of the Type 2 extension code provides additional detail informing that the diagnosis of the lipoma was the reason for admission.

<table>
<thead>
<tr>
<th>Type 1</th>
<th>Type 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severity</td>
<td>Main Condition Reason for encounter</td>
</tr>
<tr>
<td></td>
<td>Reason for admission Main Resource</td>
</tr>
<tr>
<td></td>
<td>Condition</td>
</tr>
<tr>
<td>Temporality (course of the condition)</td>
<td>Present on Admission Developed after admission</td>
</tr>
<tr>
<td></td>
<td>Developed after admission Uncertain timing relative to admission</td>
</tr>
<tr>
<td>Temporality (Time in life)</td>
<td>Provisional diagnosis</td>
</tr>
<tr>
<td>Aetiology</td>
<td>Diagnosis confirmed by... - lab - serology - histology - genetics - imaging - unspecified means</td>
</tr>
<tr>
<td>Anatomic detail</td>
<td>Differential Diagnosis</td>
</tr>
<tr>
<td>Topology Anatomic location</td>
<td></td>
</tr>
<tr>
<td>Histopathology</td>
<td></td>
</tr>
</tbody>
</table>

Table: Overview of the Extension codes
Biological Indicators

Consciousness

External Causes detail

Injury Specific detail

3.13.1 Using extension codes and cluster coding

Extension codes and codes from other parts of ICD can be linked together to describe a diagnosis in detail. They have to be grouped together in order to not lose the information conveyed by the joint group of codes for one condition in data transmission and evaluation. Such a group of codes is called a cluster. For coding, the following conventions for clustering should be followed:

1. If only one stem code is coded no clustering mechanisms need to be observed.
   Example: stem code

2. If one stem code is postcoordinated with extension codes, such a cluster has to be identified and grouped together using an unambiguous markup that will be chosen based on a specific use of the ICD-11 in a specific setting. In data submission for international reporting, this specific markup has to comply with the following rules: The stem code is to be reported first followed by a ‘&’ followed by the extension codes separated as well by ‘&’.
   Example: stem code & extension code & extension code

3. If two stem codes are postcoordinated to provide additional detail to a single condition, it is important to follow the order according to the use case. For international reporting the first stem code will be separated from the second stem code by a slash (in data analysis for public health prevention, priority will be given to the code that describes the aetiology of a condition, if only one code can be retained).
   Example: stem code / stem code

4. If a stem code is postcoordinated with extension codes and another stem code with some more extension codes, the specific markup should be designed to make a clear distinction of which extension codes in the cluster belong to which stem codes. For international reporting, the following markup has to be followed: The first stem code is reported, followed by a ‘&’ followed by one or more extension codes, each of them separated by ‘&’. Then a slash separates this first section of the cluster from the next stem code which is followed by a ‘&’ and the extension codes for this specific stem code, each again separated by ‘&’.
   Example: stem_code & extension_code / stem_code & extension_code & extension_code

Postcoordination is only to be used to combine codes to describe a single diagnosis or event. If a patient suffers from two independent diagnoses they are not to be reported as clusters. However, clusters can be used to link an injury with an external cause code, or an infection with a code for an antimicrobial resistant organism.

Permissible combinations of stem codes and extension codes are described by sanctioning rules that are embedded in the foundation of ICD-11. They will prevent impossible
combinations, and the creation of combinations that already exist in precoordination in the tabular list in question.

### 3.13.2 Special extension codes

The inclusion of the new Extension codes in ICD–11 provides capacity for coding qualifying information of linked stem codes.

#### 3.13.2.1 “History of” and “Family history of”

Chapter 24 of the classification includes a number of codes that describe both a personal history of various conditions, and a family history of various conditions. If a coder is in a situation of wanting to use ICD-11 to capture such coded information, they have the option of either using the available codes in chapter 24 in isolation, or of using the ‘history of’ (and ‘family history of’) codes, postcoordinated and clustered with more specific diagnoses existing elsewhere in the classification or with extension codes.

**Example 1:** A patient has a personal history of colon cancer that was curatively resected, and a coder wishes to capture this concept.

- **Option 1:** ‘code for personal history of malignant neoplasm of digestive organs’ (coded alone)
- **Option 2:** ‘code for personal history of malignant neoplasm of digestive organs’/‘code for colon cancer’

  Option 1 simply captures the notion that the patient has a personal history of cancer of the digestive organs. In the coding depicted in option 2, the clustering mechanism has allowed the coder to increase the specificity of information for the history of neoplasm, specifying the exact site of neoplasm.

**Example 2:** A patient with a family history of macular degeneration, and a coder wishes to capture this concept.

- **Option 1:** ‘code for family history of eye disorder’ (coded alone)
- **Option 2:** ‘code for family history of eye disorder’/‘code for macular degeneration’

Note that a forward slash is used when the postcoordinated codes are both stem codes.

#### 3.13.2.2 “Present on Admission”

The inclusion of the new Extension codes in ICD–11 provides capacity for coding qualifying information of linked stem codes. Among the new qualifying features is the particularly important status display feature that allows for distinction of diagnoses present at admission from diagnoses arising after hospital stay began.

The latter distinction is particularly important, because it allows for the targeted identification of a number of in-hospital diagnoses that may represent adverse events associated with health care. A majority of coded concepts in a hospital record are present at admission. Recognizing this, the most common operational desire in ICD–11 will be to flag a diagnosis that developed after admission.

**Example 1:**
A patient with long-standing type 1 diabetes, admitted to hospital because of a myocardial infarction.

Main condition: Myocardial infarction
Other condition: Diabetes mellitus, type 1

In this instance, both conditions are present at admission, but one of them (myocardial infarction) does not need to be coded as being ‘present on admission’ because it is the main condition, designated in this example as being the “reason for admission after assessment at the end of the stay”. The appropriate coding of this scenario therefore includes a combination of two clustered coding entities, each of which involves a stem code linked to an accompanying extension code i.e.:

• ‘Code for myocardial infarction’ & ‘code for reason for admission assessed at end of stay’
• ‘Code for diabetes mellitus type 1’ & ‘code for present on admission’

Note that for both of these coded entities in the above example, an ampersand is used. In the first cluster, the stem code for myocardial infarction is linked to an extension code for main condition diagnosis type. In the second cluster, the stem code for diabetes mellitus type 1 is linked to an extension code for present on admission.

Example 2:

A patient with long-standing type 1 diabetes, admitted to hospital because of myocardial infarction. The patient develops deep vein thrombosis as an in-hospital complication of care.

Main condition: Myocardial infarction
Other condition: Diabetes mellitus, type 1
Deep vein thrombosis (arising after hospital stay began)

In this example, an extension code for ‘developed after admission’ is linked by cluster coding to a stem code for ‘deep vein thrombosis’. The first two diagnostic concepts, meanwhile, are coded exactly as per the preceding example. i.e.,

• ‘Code for myocardial infarction’ & ‘code for reason for admission assessed at end of stay’
• ‘Code for diabetes mellitus type 1’ & ‘code for present on admission’
• ‘Code for deep vein thrombosis’ & ‘code for developed after admission’
Again, each of the three cluster entities uses a ‘&’ because the second code in the cluster is an extension code.

4 ICD Print and Electronic version

The ICD provides a standard for reporting, coding, selecting, and tabulating conditions for different use cases. It provides guidance on finding the right code from a reported condition.

In the electronic version of the ICD, most information is interlinked and visible in the relevant context. Only the content of the Reference Guide should be consulted additionally when coding with ICD-11.

In the print version, the information is divided into 3 volumes, the tabular list, the reference guide, and the index. All three are needed to use the ICD correctly.

4.1 Volume 1: Tabular List, Special Tabulation Lists, Qualifiers, and Modifiers

Volume 1 contains the Tabular list, which is an alphanumeric listing of diseases and disease groups, inclusion and exclusion notes, and some coding rules. The ICD has 25 chapters, and approximately 15 000 entities at the 4, 5 or 6-character level.

In addition, there is a section on extension codes and one on traditional medicine. At the end of Volume 1 the special tabulation lists are presented. These are not designed for coding, but are for tabulation only.

4.2 Volume 2: Reference Guide

The Reference Guide contains an introduction to the context, components, and intended use of the ICD. It describes the diverse components of ICD–11, provides guidelines for certification, recording, rules for mortality coding (i.e. causes of death) and morbidity coding (e.g. hospital statistics) and lists for tabulation of statistical data.

4.3 Volume 3: Index

The Alphabetical Index is a list of approximately 120 000 clinical terms (including synonyms or phrases). The Index is used to find the relevant ICD codes or code combinations for terms.

4.4 Electronic core: The Foundation Component

The Foundation Component is a data source for production and maintenance of Volume 1 and 3, in parts, for Volume 2 as well. It also includes additional content (see ‘content model’) that goes beyond the traditional paper based use of a classification. Depending on the setting within a country it can be decided to use the full Foundation component or to focus on the parts that are essential to production and maintenance of the Index and the Tabular list.

The foundation serves to align the different tabular lists in content and to define the categories. As such it allows standardised use of the ICD-11, independent of the setting in which it is used. The foundation component includes for example links to other
classifications or terminologies that can be expanded in the future. Only if relevant for a country this information, or subsets of it, can be used in the application of ICD-11.

4.5 Online Tools

The WHO provides the ICD–11 browser for browsing the ICD in multiple languages. This tool allows the user to retrieve concepts by searching terms, anatomy or any other element of the content model. With this browser, users can also contribute to the updating and continuous improvement of ICD with comments and solutions. Such input is reviewed for consideration for inclusion on an annual basis.

ICD–11 can also be accessed using web services with user specific software. The IT guide to the ICD provides more details on compatibility requirements. Both, the web services and the online browser allow access to all Tabular lists of the ICD, for mortality and morbidity statistics, primary care, or for a specialty adaptation for certain specialized domains.

5 Basic Coding and Reporting Guidelines

Coding is the assignment of one or more codes in order to represent the meaning of a condition in as much detail as required. Before attempting to code, the coder should be acquainted with the principles of classification and coding. In some instances, using one code will provide sufficient detail. In other instances, it may be necessary to use several codes together in order to express the level of detail required by the use case, setting, or laws. For coding, users may use a print version of ICD, an online version, or local software.

5.1 Finding a stem code

An ICD entity may be:

- A category
- A group
- A chapter

A category (which is the most common reference to an ICD class within a tabular list) may be a disease, disorder or syndrome, a sign or symptom, other health problems such as injuries, or a combination of the above. In addition, the ICD also classifies ‘external causes’ or ‘other reasons for encounter’. A group refers to a set of categories with at least one common property, while a chapter is the highest level of aggregation within the ICD.

5.2 Coding step by step – clinical term

The table below compares the coding steps in a paper and an electronic environment. The essential component of coding is finding a match to the reported clinical term – having a good dictionary in the relevant language, and verifying the resulting code against additional rules. In an electronic environment a sanctioning mechanism can verify compliance with the coding rules.

<table>
<thead>
<tr>
<th>Electronic</th>
<th>Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enter the statement or term in the search window of your user interface</td>
<td>Look up the lead term in the Alphabetical Index and applicable secondary terms.</td>
</tr>
</tbody>
</table>
Select the matching term, or one closest to what you are looking for, among the displayed options

Verify the result in the tabular list browser view for exclusions, inclusions and notes given at the level of that category, its grouping levels and at the chapter level.

WHO has made available a coding tool online for the ICD-11: [click here](http://example.com). The WHO online browser is available [here](http://example.com). You can also access browser and coding tool through the WHO website: [www.who.int/classifications/ICD](http://www.who.int/classifications/ICD)

### 5.3 Adding Detail – postcoordination and cluster coding with multiple stem codes and extension codes

All cases should be coded in a way to inform about aetiology and the manifestation of the condition of interest. In some instances, the ICD category refers to both, in other instances more than one code needs to be used in order to express the relevant detail. Postcoordination as described in 3.5.1 will be used in these cases. It is necessary to search for the relevant stem codes individually in order to find the correct code. If using only one stem code, search using the full name of the condition in the search field (or the paper index). This name may point to an entity in the foundation that already contains the information regarding what stem code and what Extension code(s) are to be combined in order to code that condition. In the case when there is no such entry, it is necessary to look up the stem code and the Extension code separately. Postcoordination must never be used to replicate the meaning of a condition with an existing stem code. For example: Because there is a code for fracture of ulna, it is not allowed to build a cluster with the two codes

1. Other specified fracture of forearm and ulna.

There may be less obvious cases across the ICD. Sanctioning rules will help to avoid this kind of mistake, in an electronic environment. For reporting purposes, the correlated codes are linked, using a separator between codes (see ‘3.7.1’). In both cases the first code will be the one for the more specific condition prompting the health care contact (i.e. neither the external cause, nor a chronic underlying condition).

If a case has several conditions, it can be coded with one or more codes. Every condition could be postcoordinated in its own right and reported in a separate data field or section.

There will also be instances where multiple conditions may be postcoordinated and clustered. Cluster coding may be used for example to link multiple injuries to an external cause, or to link an infection with the code for an organism found to be antimicrobial resistant.

**Example**

A patient was admitted with a fracture of the shaft of the right radius and contusion
scapul after falling off a ladder.

Main condition: Fracture of shaft of radius & right/contusion of scalp/fall on or from ladder

Special cases ‘multiple’

Some categories refer to multiple parts of the body being affected by one condition, e.g. ‘multiple fractures of…’, or ‘multiple valve disease’. In such cases report first the code with ‘multiple’ and then list in the same cluster all the specific conditions. For example:

Multiple fractures of pelvis/fracture of os pubis/fracture of os sacrum/fracture of os ilium

Special case ‘prosthetic’

Some categories refer to ‘disease of prosthetic…’. In such cases a local coding hint will inform what conditions need to be also coded to be specific about the disease occurring in the context of the prosthesis. For example:

Prosthetic valve disease/Nonrheumatic valve stenosis

5.4 Electronic reporting

Electronic documentation will follow the principle of lossless collection of information at the source. Best practice includes: 1. A text field that captures the clinical term or cause of death with the exact wording reported by the health provider 2. A data field that retains the identifier (URI) of the most exact matching chosen term of ICD-11 (index, code title or other element). 3. A data field for the relevant ICD-11 code. In this way, the quality of the coding can be verified at any point in time. Also, specific conditions can be identified and analyzed, independently of them being linked to an individual ICD code or lumped together in a code with other conditions.

6 Main Uses of the ICD: Mortality

This section concerns the rules and guidelines adopted by the World Health Assembly regarding the selection of a single cause or condition for routine tabulation from death certificates. Guidelines are also provided for the application of the rules and for coding of the condition selected for tabulation. Implementation of the ICD for mortality requires setting up an infrastructure for reporting and storing information, designing information flows, quality assurance and feedback, and training for classification users working with the input or output of data.

6.1 Mortality statistics

Mortality statistics are widely used for medical research, monitoring of public health, evaluating health interventions and planning and follow-up of health care. Analysis of mortality data typically involves comparisons of data sets, for example those representing different regions or different points in time. Unless the data have been produced by the same methods and according to the same standards, such comparisons will yield misleading results. To standardize production of mortality data, WHO issues international instructions
on data collection, coding and classification, and statistical presentation of causes of death. It is of utmost importance that production of mortality data follows the procedures detailed next, since any deviation from the international instructions will impair international comparability. The definition of a single underlying cause of death, and selected approaches to multiple causes of death enables the identification of trends in health for a given population. Analysis of mortality data typically involves comparisons of data sets, for example those representing different regions or different points in time. Unless the data has been produced by the same methods according to the same standards, such comparisons will yield misleading results. The following section contains information on coding causes of death for mortality statistics. It explains the basic concepts, how to code multiple causes, and how to select the underlying cause of death.

The aim of these instructions is to optimize the mortality statistics from a public health point of view. Some of the instructions may appear wrong or questionable from a purely medical perspective. They should still not be set aside, since they may be motivated by well-founded epidemiological and public health principles. If an apparent error is found, it should be reported to WHO. WHO will either explain the rationale or take steps to correct the error at the international level. Individual countries should not correct what is assumed to be an error, since changes at the national level will lead to data that are less comparable to data from other countries, and thus less useful for analysis.

6.1.1 Coding instructions for mortality: underlying cause of death

It was agreed by the Sixth Decennial International Revision Conference that the cause of death for primary tabulation should be designated the underlying cause of death. From the standpoint of prevention of death, it is necessary to break the chain of events or to effect a cure at some point. The most effective public health objective is to prevent the precipitating cause from operating. For this purpose, the underlying cause has been defined as ‘(a) the disease or injury which initiated the train of morbid events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury’. However, for some diseases or injuries special rules apply.

Sections 6.1–6.3 contain instructions on coding causes of death for mortality statistics. The first section, 6.1, explains the basic concepts, section 6.2 explains how to identify the underlying cause of death, and section 6.3 gives further details on how to code multiple causes of death.

6.1.2 The international death certificate

The international mortality coding instructions presuppose that data have been collected with a death certificate conforming to the International form of medical certificate of cause of death (see Annex 14.1). Otherwise, the causes of death cannot be coded according to the international standard and the data will not be internationally comparable. For example, some coding instructions apply to conditions reported as caused by certain other conditions, and in such cases it is important to have a clear distinction between causes reported in Part 1 and in Part 2 of the certificate. Further, information reported elsewhere on the certificate, such as manner of death or whether pregnancy contributed to the death, is essential when assigning multiple cause codes to the conditions stated on the certificate.
It is the responsibility of the medical practitioner or other qualified certifier signing the death certificate to indicate which morbid conditions led directly to death and to state any antecedent conditions giving rise to this cause. The certifier should use his or her clinical judgement in completing the medical certificate of cause of death. Automated systems must not include lists or other prompts to guide the certifier, as these necessarily limit the range of diagnoses and therefore have an adverse effect on the accuracy and usefulness of the report.

The medical part of the form is split into two parts: Part 1 is for diseases related to the train of events leading directly to death, and Part 2 is for unrelated but contributory conditions. On the certificate, all additional data that are necessary to code the correct underlying cause should be recorded, and the form (see Annex 14.1) indicates which other information should be collected. In order to align the way this information is collected internationally, the form should be followed as closely as possible. The information can then be used for manual or electronic coding of the underlying and multiple causes of death.

6.1.3 Basic concepts

Mortality coders must be familiar with the basic concepts introduced in this section.

6.1.3.1 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.

Example 1

1 (a) Myocardial infarction
due to
(b) Coronary thrombosis
due to
(c) Coronary atherosclerosis

2

The myocardial infarction is caused by the coronary thrombosis, which, in its turn, is a complication of coronary atherosclerosis. Consequently, the sequence is myocardial infarction caused by coronary thrombosis caused by coronary atherosclerosis.

Example 2:

1 (a) Extensive haemorrhage
due to
(b) Traumatic amputation of right leg
due to
(c) Run over by street car
The haemorrhage is a complication of the traumatic amputation, which, in its turn, is caused by the street car accident. Consequently, the sequence is extensive haemorrhage caused by traumatic amputation of the right leg caused by being run over by a street car.

### 6.1.3.2 Causal relationship

A causal relationship exists if a condition mentioned on the certificate can be caused by another condition also mentioned on the certificate. However, whether a causal relationship is considered acceptable or not for mortality coding is founded not only on a medical assessment but also on epidemiological and public health considerations. Therefore, a medically acceptable relationship might be listed as unacceptable in the coding instructions, because a later step in the sequence is more important from a public health point of view.

Therefore, to decide whether a stated causal relationship is acceptable or not, first check the instructions in Section 6.2.3, Special instructions on accepted and rejected sequences. Stated relationships that are not listed in Section 6.2.3 should be accepted as far as possible, because the certifier’s opinion about the causes leading to death should not be disregarded lightly. If a stated relationship seems highly improbable, refer to internationally recognized decision tables for mortality coding. A reported sequence that appears improbable should be accepted if one or more intervening steps would explain the causal relationship. For example, if haematemesis is stated as due to cirrhosis of the liver, assume that the haematemesis was caused by ruptured oesophageal varices, the varices were caused by portal hypertension, and the portal hypertension by liver cirrhosis. Such assumed intervening causes must not be used to modify the coding. Note that a condition A can never be caused by a condition B if condition A has a longer duration or earlier onset than condition B.

### 6.1.3.3 Duration

On death certificates, each reported condition should also include information about duration. The duration refers to the time period between the onset of the disease or condition and the time of death. Note that it is not always the same as the time of diagnosis of the condition, which may be at the same time as, or after, the onset of symptoms.

### 6.1.3.4 Terminal cause of death

The terminal cause of death is the condition entered first on the first line of Part 1 of the death certificate.

**Example 3**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 1 | (a) Myocardial infarction and pulmonary oedema  
  |   | *due to*  
  |   | (b) Coronary atherosclerosis  
| 2 |   |

Myocardial infarction is the terminal cause of death, since it is entered first on the first line of the certificate.
6.1.3.5 Starting point

The starting point is the condition or event that started the sequence of acceptable causal relationships ending with the terminal cause of death. In a correctly completed certificate, the condition reported on the lowest used line in Part 1 is the starting point of the sequence.

Example 4:

1 (a) Myocardial infarction and pulmonary oedema

due to

(b) Coronary atherosclerosis

2

Example 5:

1 (a) Pneumonia

due to

(b) Hip fracture

due to

(c) Tripped on carpet

2

Tripped on carpet is the starting point, since it started the sequence of events leading to death.

6.1.3.6 Tentative starting point

In a correctly completed certificate, the condition reported on the lowest line in Part 1 is the starting point, but if the certificate is not correctly filled out, the starting point may be reported somewhere else. The instructions on how to identify the starting point in such cases are complex. Sometimes, several instructions apply to the same death certificate, and it is important to apply the instructions step by step as described in Section 6.2.1, ‘Find the starting point’. In each step where a tentative starting point is identified, a condition that is provisionally considered as the starting point but that, in later steps, might turn out to be caused by something else. The tentative starting point may change several times as the instructions are applied to the certificate.

Also, take additional information on causal relationships that the certifier has provided into account. This applies also if the information appears in the ‘wrong’ place of the certificate. For example, if the sequence in Part 1 starts with a disease A, and information elsewhere on the certificate states that this disease A was due to a disease B, then consider B as the tentative starting point.

6.1.3.7 Obvious cause

Several coding instructions will instruct you to check whether the tentative starting point is itself obviously caused by another condition mentioned on the same line or below on the
certificate. The word ‘obviously’ is important, and there must be no doubt about the relationship between the conditions. Further instructions are given in Section 6.2.1, Step SP6 – Obvious cause, and in Section 6.2.4, Special instructions on obvious cause (Step SP6).

Example 6:

1. (a) Sepsis
   
   due to

2. (b) Peritonitis

Appendicitis with rupture

Peritonitis started the sequence of events reported in Part 1, so it is the tentative starting point. However, appendicitis with rupture is an obvious cause of peritonitis. Therefore, the sequence of events starts with appendicitis, which consequently is the starting point of the sequence of events ending with sepsis, the terminal cause of death.

6.1.3.8 First-mentioned sequence

A death certificate may contain several sequences, and the coding instructions will tell you to find the starting point of the first-mentioned sequence. To identify the starting point of the first-mentioned sequence, begin with the terminal cause of death (the first-mentioned condition on the uppermost line in Part 1). Establish whether the first condition listed on the next line in Part 1 can cause the terminal cause of death. If it cannot, and if there are more conditions on the line, establish whether the second condition listed on this line can cause the terminal cause of death. Continue until you have found a condition that could cause the terminal cause of death. This is the tentative starting point of the sequence.

If no condition on the next line can cause the terminal cause of death, there is no sequence ending with the terminal cause of death.

If you found a tentative starting point but there are conditions reported on lower lines in Part 1, repeat the procedure for the next line. Start with the tentative starting point you identified in the previous step. Establish whether the first condition listed on the next lower line in Part 1 can cause the tentative starting point. If it cannot, and if there are more conditions on the line, check whether the second condition listed on that line can cause the tentative starting point. Continue until you have found a condition that could cause the tentative starting point. This is the new tentative starting point.

If there are still conditions reported on lower lines in Part 1, repeat the procedure for as long as a new tentative starting point can be identified. When no condition can be found that could cause the tentative starting point, the last identified tentative starting point is also the starting point of the first-mentioned sequence. The figure illustrates examples of certificates with several sequences. The starting point of the first-mentioned sequence is in grey, with a bold black circle.
Example 7:

1. (a) Pneumonia  
   due to  
   (b) Hip fracture and heart failure  
   due to  
   (c) Tripped on carpet, coronary atherosclerosis

Pneumonia can be due to hip fracture, and therefore hip fracture is the tentative starting point. Hip fracture can be due to tripping, which is the new tentative starting point. Since there are no causes reported below line 1(c), tripping on carpet is the starting point of the first-mentioned sequence.

Example 8:

1. (a) Pneumonia  
   due to  
   (b) Heart failure and hip fracture  
   due to  
   (c) Coronary atherosclerosis and tripped on carpet

Pneumonia can be due to heart failure, and therefore heart failure is the tentative starting point. Heart failure can be due to coronary atherosclerosis, which is the new tentative starting point. Since there are no causes reported below line 1(c), coronary atherosclerosis is the starting point of the first-mentioned sequence.

Example 9:

1. (a) Pneumonia  
   due to  
   (b) Hip fracture and heart failure
due to

(c) Coronary atherosclerosis and tripped on carpet

Pneumonia can be due to hip fracture, and therefore hip fracture is the tentative starting point. However, hip fracture cannot be due to coronary atherosclerosis but hip fracture can be due to tripping, which is the new tentative starting point. Since there are no causes reported below line 1(c), tripped on carpet is the starting point of the first-mentioned sequence.

6.1.3.9 First-mentioned condition

Some coding instructions refer to the ‘first-mentioned’ condition. When identifying the first-mentioned condition, start from the top line of Part 1 downwards, and from left to right. [Note for translators: If the local language is not written from left to right and from top to bottom, adapt the instruction so that it agrees with the direction of writing.]

6.1.3.10 Underlying cause of death

Most, but not all, mortality statistics show a single cause of death for each individual, regardless of how many conditions are reported on the certificate. The underlying cause of death is the condition selected for such single-cause tabulation. In most cases, the underlying cause of death is the same as the starting point. However, sometimes a condition other than the starting point is selected as underlying cause of death for use in the statistics. See also ‘Modification’, next.

Example 10:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(a)</td>
</tr>
<tr>
<td></td>
<td>Bronchopneumonia</td>
</tr>
</tbody>
</table>

due to

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(b)</td>
<td>Hemiplegia</td>
</tr>
</tbody>
</table>

due to

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(c)</td>
<td>Cerebral infarction</td>
</tr>
</tbody>
</table>

Cerebral infarction started the sequence of events leading to death, so it is the starting point. In this case, it is also the underlying cause of death.

6.1.3.11 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 underlying cause of death for use in the 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.

Example 11:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(a)</td>
</tr>
<tr>
<td></td>
<td>Heart disease</td>
</tr>
</tbody>
</table>
Generalized atherosclerosis started the sequence of events leading to death, so it is the starting point. However, according to a special instruction on generalized atherosclerosis, generalized or unspecified atherosclerosis leading to heart disease is assigned to atherosclerotic heart disease in mortality statistics. Because of this modification, atherosclerotic heart disease is the underlying cause of death.

6.1.3.12 Tentative underlying cause of death

Several special instructions on modification may apply to the same death certificate. 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.

Example 12:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(a) Myocardial infarction</td>
</tr>
<tr>
<td></td>
<td><em>due to</em></td>
</tr>
<tr>
<td></td>
<td>(b) Coronary atherosclerosis</td>
</tr>
<tr>
<td></td>
<td><em>due to</em></td>
</tr>
<tr>
<td></td>
<td>(c) Generalized atherosclerosis</td>
</tr>
</tbody>
</table>

Generalized atherosclerosis started the sequence of events leading to death, so it is the starting point. There are special modification instructions relating to atherosclerosis and coronary heart disease in the ICD, and, in the next step, coronary atherosclerosis is selected as the tentative underlying cause of death. But there are further instructions on coronary atherosclerosis and myocardial infarction, and in the final step, myocardial infarction is selected as the underlying cause.

6.2 Coding instructions for mortality: selecting the underlying cause of death

When coding and classifying causes of death, you must first assign ICD codes to all the conditions mentioned on the death certificate. Many coding instructions are based on specific ICD codes and, to determine whether any of the instructions apply, you need to know the ICD codes for all conditions on the certificate. This is called multiple-cause coding (see section 6.3, Coding instructions for mortality: multiple causes). Next, you select an underlying cause of death to be used in the mortality statistics. This is called classification of the underlying cause of death.

For most death certificates, selecting the underlying cause of death is a fairly uncomplicated procedure. There are, however, many cases where the underlying cause is not immediately obvious. To ensure that both straightforward and complex cases are coded according to international regulations, it is important to follow the coding instructions carefully, step by step. Otherwise, the resulting mortality statistics will not be internationally comparable, which seriously reduces the value of the data for public health purposes.
Selecting the underlying cause of death involves two separate steps. First, you identify the starting point – the disease or event that started the chain of events leading to death. Next, you check whether any special instructions apply to the starting point you identified. If so, the next step is to modify the starting point you identified in the first step.

Note that the purpose of the selection procedure is to produce the most useful mortality statistics possible. Thus, the following instructions may reflect importance for public health rather than what is correct from a purely medical point of view. The following instructions always apply, whether they might be considered medically correct or not.

In the coding examples that follow, the ‘due to’ statement between the lines in Part 1 is no longer included. Still, it is important to bear in mind that anything reported on an upper line in Part 1 is meant to be due to what is reported on the line below.

### 6.2.1 Find the starting point (Steps SP1 to SP8)

To identify the starting point, follow the eight steps specified in this section. 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 next. For some of the rules, there are also bullet points with more detailed instructions.

#### 6.2.1.1 Step SP1 – Single cause on certificate

If there is only one condition reported on the certificate, in either Part 1 or Part 2, this is the starting point and it is also the underlying cause. Next, go to Step M4. If there are two or more conditions on the certificate, go to Step SP2.

#### 6.2.1.2 Step SP2 – Only one line used in Part 1

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 tentative starting point. Next, go to Step SP6. 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 tentative starting point. Next, go to Step SP6.

If the certifier has used more than one line in Part 1, go to Step SP3.

Example 1:

1. (a) Myocardial infarction and diabetes mellitus
   (b)
   (c)
   (d)

Example 2:
Myocardial infarction is mentioned first on the certificate and is the tentative starting point. Next, go to Step SP6, to check whether further selection and modification rules apply.

6.2.1.3 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. 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 – tentatively – the starting point. Next, go to Step SP6. 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 certifier. If no further information is available, go to Step SP4. At Step SP3, it is not necessary to assess the causal relationships between conditions reported on the lines above the lowest used line. It is sufficient that each one of the conditions on the lines above the lowest used line can be due to the condition reported first on the lowest used line. At Step SP3, there is no requirement that the conditions entered above the lowest used line have successively longer durations from the top line downwards. The condition mentioned first on the lowest used line may still have caused all conditions reported on the lines above, as long as none of them has a duration that is longer than that of the condition mentioned first on the lowest used line. - Note that whether a causal relationship is listed as correct or not may reflect importance for public health rather than what is acceptable from a purely medical point of view. Therefore, check the instructions in Section 6.2.3, Special instructions on accepted and rejected sequences, first. Always follow the instructions in Section 6.2.3, whether they appear to be medically correct or not. - Stated relationships that are not listed as rejected in Section 6.2.3 should be accepted, as far as possible. They reflect the certifier’s opinion about the causes leading to death and should not be disregarded lightly. - If a stated relationship appears highly improbable, refer to internationally recognized decision tables for mortality coding.

Example 3:

1  (a) Bronchopneumonia
(b) Hemiplegia
(c) Cerebral infarction
(d)

2  Diabetes mellitus
Both bronchopneumonia and hemiplegia can be caused by cerebral infarction. This means that cerebral infarction is the tentative starting point.

Example 4:

1. (a) Kaposi sarcoma 1 year
   (b) HIV 3 years
   (c) Blood transfusion 5 years
   (d) Haemophilia since birth

2.

Kaposi sarcoma, HIV and blood transfusion can all be caused by haemophilia, which is the first (and also only) condition mentioned on the lowest used line in Part 1. This means that haemophilia is the tentative starting point.

Example 5:

1. (a) Pneumocystosis 6 months
   (b) HIV 5 years
   (c) Ruptured spleen 7 years
   (d) Assault – fist fight 7 years

2.

Assault by fist fight is the only condition mentioned on the lowest used line in Part 1. It can cause everything on the lines above, assuming a blood transfusion as treatment for the ruptured spleen. See also Section 6.1.3, Basic concepts, where assumption of intervening cause is described in the section on causal relationship.

Example 6:

1. (a) Liver metastases 2 months
   (b) Bronchopneumonia 4 days
   (c) Stomach cancer 6 months
   (d)

2.

Both liver metastases and bronchopneumonia can be caused by stomach cancer. This means that stomach cancer is the tentative starting point, even though bronchopneumonia cannot cause liver metastases and the bronchopneumonia has a shorter duration than the liver metastases.

Example 7:

1. (a) Liver metastases and pulmonary oedema
   (b) Bronchopneumonia
Liver metastases, pulmonary oedema and bronchopneumonia can all be caused by stomach cancer. This means that stomach cancer is the tentative starting point, even though bronchopneumonia cannot cause liver metastases.

Example 8:

1  (a) Liver metastases 2 months
(b) Bronchopneumonia 4 days
(c) Stomach cancer and cerebral infarction 6 months

Both liver metastases and bronchopneumonia can be caused by stomach cancer, which is the first condition mentioned on the lowest used line in Part 1. This means that stomach cancer is the tentative starting point, even though bronchopneumonia cannot cause liver metastases, and bronchopneumonia has a shorter duration than the liver metastases.

Example 9:

1  (a) Liver metastases
(b) Bronchopneumonia and stomach cancer

Liver metastases cannot be due to bronchopneumonia. This means that no tentative starting point can be identified at Step SP3. Therefore, go to Step SP4.

6.2.1.4 Step SP4 – First cause on lowest used line does not explain all entries above, but a sequence ends with the terminal condition

If there is only one sequence ending with the terminal condition, find the starting point of this sequence. This is the new tentative starting point. Next, go to Step SP6. If there are two or more sequences of conditions or events ending with the terminal condition, identify the first-mentioned sequence as described in Section 6.1.3, and find the starting point of this first-mentioned sequence. Next, go to Step SP6. If there is no sequence ending with the terminal condition, go to Step SP5.

• As mentioned under Step SP3, always follow the instructions in Section 6.2.3, whether they appear to be medically correct or not.
• Stated relationships that are not listed as rejected in Section 6.2.3 should be accepted as far as possible. They reflect the certifier’s opinion about the causes leading to death and should not be disregarded lightly.
• If a stated relationship appears highly improbable, refer to internationally recognized decision tables for mortality coding.
• When evaluating a sequence, also remember that, according to Section 6.2.3, Special instructions on accepted and rejected sequences, a condition A can never be caused by a condition B if condition A has a longer duration than condition B.

Example 10:
1 (a) Liver metastases 2 months
(b) Cerebral infarction and stomach cancer 6 months

Cerebral infarction cannot cause liver metastases, but liver metastases can be due to stomach cancer. Stomach cancer is the tentative starting point.

Example 11:

1 (a) Bronchopneumonia 2 months
(b) Cerebral infarction and liver metastases 6 months
(c) Atherosclerosis and stomach cancer

Atherosclerosis cannot cause liver metastases. However, there are three acceptable sequences on the certificate: (1) bronchopneumonia caused by cerebral infarction, in its turn caused by atherosclerosis; (2) bronchopneumonia caused by cerebral infarction, in its turn caused by stomach cancer; and (3) bronchopneumonia caused by liver metastases, in its turn caused by stomach cancer. But the first-mentioned sequence is bronchopneumonia caused by cerebral infarction, in its turn caused by atherosclerosis. Consequently, atherosclerosis is the tentative starting point.

6.2.1.5 Step SP5 – No sequence in Part 1

If there is no sequence ending with the terminal condition, then the terminal condition is also the tentative starting point. Next, go to Step SP6.

Example 12:

1 (a) Liver metastases
(b) Cerebral infarction
(c) Atherosclerosis
2 Stomach cancer

Atherosclerosis cannot cause liver metastases. Also, there is no sequence in Part 1 that ends with the terminal condition, because cerebral infarction cannot cause liver metastases. Because there is no sequence ending with the terminal condition, the terminal condition itself – liver metastases – is the tentative starting point.

6.2.1.6 Step SP6 – Obvious cause

Now check whether the tentative starting point you selected in Steps SP1 to SP5 obviously was caused by another condition on the certificate. 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.

Next, check whether there is another condition mentioned on the same line or further down on the certificate as the new tentative starting point you just identified that obviously caused this new tentative starting point. Continue looking for a new tentative starting point until you find a starting point that is not obviously caused by a condition reported on the same line or further down on the certificate. Then go to Step SP7. If there is no condition
mentioned on the certificate that obviously caused the tentative starting point you selected in Steps SP1 to SP5, go to Step SP7.

- 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 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.
- ‘Obvious cause’ means that there must be no doubt that the tentative starting point was caused by the other condition mentioned on the certificate. 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.
- Refer to Section 6.2.4, Special instructions on obvious cause (Step SP6), for further instructions. Note that whether a condition B is considered an obvious cause of a condition A may reflect importance for public health rather than what is motivated from a purely medical point of view. Therefore, always follow the instructions in Section 6.2.4, whether they appear to be medically correct or not.

**Example 13:**

1  (a) Liver metastases  
   (b) Cerebral infarction  
2  Stomach cancer

Cerebral infarction cannot cause liver metastases, and liver metastases is the tentative starting point. But stomach cancer is an obvious cause of liver metastases, and stomach cancer is the new tentative starting point.

**Example 14:**

1  (a) Sepsis  
   (b) Peritonitis  
2  Necrosis of intestine, mesenteric infarction

**2 Necrosis of intestine, mesenteric infarction**

Sepsis can be caused by peritonitis, and peritonitis is the tentative starting point. But necrosis of intestine is an obvious cause of peritonitis, so necrosis of intestine is the new tentative starting point. Next, mesenteric infarction is an obvious cause of necrosis of intestine, and mesenteric infarction is the final starting point.

**Example 15:**

1  (a) Sepsis
(b) Peritonitis

2 Mesenteric embolism, ruptured appendicitis

Sepsis can be caused by peritonitis, and peritonitis is the tentative starting point. Next, both mesenteric embolism and ruptured appendicitis are obvious causes of peritonitis. Because mesenteric embolism is mentioned first, it is the new tentative starting point.

6.2.1.7 Step SP7 – Ill-defined conditions

Now check whether the tentative starting point is listed in the table of ill-defined conditions (see Annex 14.3, List of ill-defined conditions). If it is, the tentative starting point is considered ill-defined. Then do as follows:

- If there are other conditions reported on the certificate, check whether they are all ill-defined. If all other conditions are ill-defined, go to Step M1.
- If there is at least one condition that is not ill-defined, then disregard the ill-defined condition. Go to Step SP1 and select another starting point, as if the ill-defined condition had not been mentioned on the certificate.
- If the tentative starting point is not ill-defined, go to Step SP8.

Note that Septic shock, Systemic inflammatory response syndrome of infectious origin without organ failure, Systemic inflammatory response syndrome of infectious origin with organ failure and Sudden infant death syndrome are not considered ill-defined. In some cases, the ill-defined condition may have an impact on how other conditions on the certificate are coded. If so, disregard the ill-defined condition when selecting the starting point, but take it into consideration when coding the other conditions on the certificate.

Example 16:

1 (a) Respiratory failure
2 Mesenteric embolism

Respiratory failure is the only condition mentioned in Part 1 and it is the tentative starting point according to Steps SP2 and SP6. But respiratory failure is in the table of ill-defined conditions, so disregard respiratory failure and restart the selection procedure from Step SP1. Mesenteric embolism is the new starting point according to Step SP1.

Example 17:

1 (a) Anaemia
(b) Splenomegaly

Splenomegaly, the tentative starting point according to Step SP3, is in the table of ill-defined conditions. Disregard splenomegaly and restart the selection procedure from Step SP1. Now, anaemia is the new starting point according to Step SP2. However, splenomegaly modifies the coding of anaemia (see the Alphabetical index). Code to ‘splenomegalic anaemia’.

6.2.1.8 Step SP8 – Conditions unlikely to cause death

Next, check whether the tentative starting point is listed in the table of conditions unlikely to cause death (see Annex 14.4, List of conditions unlikely to cause death). If it is, do as follows:
• If there are other conditions reported on the certificate, check whether they are all ill-defined or unlikely to cause death. If they are all ill-defined or unlikely to cause death, go to Step M1.
• 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 unlikely to cause death that you selected as the tentative starting point. If it was, then select the reaction to treatment as the starting point. Next, go to Step M1.
• If the death was not caused by a reaction to treatment of the condition unlikely to cause death, check whether the condition was the cause of another condition that is not on the list of conditions unlikely to cause death and that is not ill-defined. If it was, then the condition unlikely to cause death is still the tentative starting point. Next, go to Step M1.
• If there was no reaction to treatment and no complication of the condition unlikely to cause death, then disregard the condition unlikely to cause death. Go to Step SP1 and select another starting point, as if the condition unlikely to cause death had not been mentioned on the certificate.
• If the certificate mentions several treatments for the condition unlikely to cause death, select the initial treatment.
• ‘Complication’ means a condition that can be due to the condition unlikely to cause death, or due to the treatment of the condition unlikely to cause death.
• If the starting point is not a condition unlikely to cause death, then go to Step M1.

Example 18:

1 (a) Hearing loss
2 Ischaemic heart disease

Hearing loss is the tentative starting point according to Step SP2, but hearing loss is in the table of conditions considered unlikely to cause death. There is another condition on the certificate, ischaemic heart disease, which is not in the table of conditions considered unlikely to cause death. Disregard hearing loss and restart the selection procedure from Step SP1. Ischaemic heart disease is the new starting point according to Step SP1.

Example 19:

1 (a) Liver failure
   (b) Excessive use of paracetamol
   (c) Migraine type headache

Migraine type headache is the tentative starting point according to Step SP3. It is in the table of conditions considered unlikely to cause death. The condition was treated with paracetamol and there was a reaction to the treatment, liver failure. Disregard the condition unlikely to cause death and select the reaction to the treatment, liver failure, as the starting point.

Example 20:

1 (a) Sepsis
   (b) Submandibular abscess
(c) Caries

Caries is the tentative starting point according to Step SP3. It is in the table of conditions considered unlikely to cause death, but in this case it caused complications that are not considered unlikely to cause death. Because of that, select caries as the starting point.

Example 21:

1.
   (a) Headache
   (b) Caries

2. Ischaemic heart disease

Caries is the tentative starting point according to Step SP3. It is in the table of conditions considered unlikely to cause death. A complication is reported, headache, but it is in the table of ill-defined conditions. Disregard both caries and headache and restart the selection procedure from Step SP1. Ischaemic heart disease is the new starting point according to Step SP1.

6.2.2 Check for modifications of the starting point (Steps M1 to M4)

The starting point you identified using Steps SP1 to SP8 is now considered the tentative underlying cause. There may be special coding instructions on this tentative underlying cause, or other reasons to modify the tentative underlying cause. Check whether the tentative underlying cause should be modified by applying the modification rules described in steps M1 to M3 (Modification rule 1 to Modification rule 3). Each step contains one modification rule. At each step, there is a description of the modification rule itself and what to do next. There are also bullet points with more detailed instructions and explanations.

6.2.2.1 Step M1 – Special instructions

Check whether special coding instructions apply to the tentative underlying cause. If a special coding instruction applies, assign a new tentative underlying cause according to the instruction.

Next, check whether any special instructions apply to this new tentative underlying cause. That is, reapply Step M1. Repeat until you have found a tentative underlying cause that is not affected by any further special coding instruction. Next, go to Step M2.

- Refer to Section 6.2.5, Special instructions on linkages and other provisions (Step M1), for detailed instructions on specific tentative underlying causes.
- According to some of these special instructions, the tentative underlying cause combines with another cause of death reported on the death certificate, into a new tentative underlying cause. If there are several such combinations that would apply to the tentative underlying cause, then apply the combination with the first-mentioned of these other conditions (the first-mentioned linkage).
- Note that some special instructions only apply under specific circumstances, for example where a condition A is reported as the cause of a condition B, or to deaths at a specific age.
- Sometimes Volume 1 or the Alphabetical index indicates a code for a combination of the tentative underlying cause with another cause mentioned on the certificate. Use the combination code only if the code title clearly indicates the aetiology of the
condition. If no special coding instruction applies, then the starting point you found using Steps SP1 to SP8 is the tentative underlying cause. Next, go to Step M2.

Example 1:

1  (a)  Myocardial infarction  
     (b)  Ischaemic heart disease

Ischaemic heart disease is the tentative starting point according to Step SP3. There is a special instruction on ischaemic heart disease reported with myocardial infarction, and, according to this instruction, myocardial infarction is the new tentative underlying cause.

Example 2:

1  (a)  Ischaemic heart disease  
     (b)  Atherosclerosis  
     2  Myocardial infarction

Atherosclerosis is the tentative starting point according to Step SP3. There is a special instruction on atherosclerosis reported with ischaemic heart disease, and another one on atherosclerosis reported with myocardial infarction. Ischaemic heart disease is reported first on the certificate, so apply the instruction on atherosclerosis reported with ischaemic heart disease and select ischaemic heart disease as the new starting point. Next, there is a special instruction on ischaemic heart disease reported with myocardial infarction. Apply this instruction and select myocardial infarction as the new tentative underlying cause.

Example 3:

1  (a)  Ischaemic heart disease  
     (b)  Atherosclerosis  
     2  Cerebral infarction

Atherosclerosis is the tentative starting point according to Step SP3. There is a special instruction on atherosclerosis reported with ischaemic heart disease, and another one on atherosclerosis reported with cerebral infarction. Ischaemic heart disease is reported first on the certificate, so apply the instruction on atherosclerosis reported with ischaemic heart disease and select ischaemic heart disease as the new tentative underlying cause.

Example 4:

1  (a)  Cerebrovascular infarction  
     (b)  Atherosclerosis  
     (c)  Hypertension  
     2  Myocardial infarction

Hypertension is the tentative starting point according to Step SP3. There are special instructions on hypertension reported with cerebrovascular infarction and with myocardial infarction. Cerebrovascular infarction is reported first on the certificate, so apply the instruction on
hypertension reported with cerebrovascular infarction and select cerebrovascular infarction as the new tentative underlying cause.

Example 5:

1. (a) Dementia

(b) Atherosclerosis

Atherosclerosis is the tentative starting point according to Step SP3. There is a special instruction on atherosclerosis reported as the cause of dementia. Apply this instruction and select atherosclerotic dementia as the new tentative underlying cause.

Example 6:

1. (a) Atherosclerosis

2. Dementia

Atherosclerosis is the tentative starting point according to Step SP2. Although there is a special instruction on dementia reported as caused by atherosclerosis, this instruction does not apply here because dementia is reported in Part 2 and not as caused by atherosclerosis. In this case, atherosclerosis remains the tentative starting point.

Example 7:

1. (a) Epilepsy

(b) Alcoholism

Alcoholism is the tentative starting point according to Step SP3. In Volume 1, a list of inclusion terms at G40.5, Special epileptic syndromes, mentions ‘epileptic seizures related to alcohol’. However, the code title for Special epileptic syndromes, does not mention alcohol. Therefore, keep alcoholism as the tentative starting point.

6.2.2.2 Step M2 – Specificity

If the tentative underlying cause 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 certificate, this more informative term is the new tentative underlying cause. Next, check whether this new tentative underlying cause can be specified even further by other terms on the death certificate. That is, reapply Step M2. Repeat until you have found a tentative underlying cause that cannot be specified further.

- The more specific description must refer to the same condition as the tentative underlying cause. Do not disregard a generalized condition such as atherosclerosis because a more specific but unrelated condition is reported on the certificate (see also Example 9).

- Note that the new tentative underlying cause itself is sometimes specified further by the general term (see Example 10).

- If several other expressions on the certificate provide more precise information on the tentative underlying cause, start with the first-mentioned of these other conditions.

- Note that some instructions on specificity only apply under specific circumstances, for example where a condition A is reported as the cause of a condition B.
Example 8:

1 (a) Cerebrovascular accident  
(b) Atherosclerosis  
2 Arterial embolism to brain stem  

Atherosclerosis is the tentative starting point according to Step SP3. There is a special instruction on atherosclerosis reported with cerebrovascular accident; apply this instruction and select cerebrovascular accident as the new starting point according to Step M1. The type of cerebrovascular accident is described more precisely in Part 2 as an arterial embolism to brain stem. This is the new tentative underlying cause.

Example 9:

1 (a) Cerebrovascular accident  
(b) Atherosclerosis  
2 Oat cell cancer originating in upper right lobe  

Atherosclerosis is the tentative starting point according to Step SP3. There is a special instruction on atherosclerosis reported with cerebrovascular accident; apply this instruction and select cerebrovascular accident as the new tentative underlying cause. There is no more specific description of the type of cerebrovascular accident on the certificate, and cerebrovascular accident remains the tentative underlying cause.

Example 10:

1 (a) Meningitis  
(b) Tuberculosis  

Tuberculosis is the tentative starting point according to Step SP3. The manifestation is described as meningitis, and the two terms combine into tuberculous meningitis, which is the tentative underlying cause.

6.2.2.3 Step M3 – Recheck Steps SP6, M1 and M2

If, at this point, the tentative underlying cause is not the same as the starting point you selected using Steps SP1 to SP8, then go back to Step SP6. Repeat the procedures described in Steps SP6, M1 and M2. - Do not go back to Step SP6 if the cause selected in Step M1 or M2 is correctly reported as due to another condition, except when this condition is ill-defined. - Also, do not go back to Step SP6 if the tentative underlying cause is a reaction to treatment of a condition unlikely to cause death, as selected in Step SP8.

Example 11:

1 (a) Sepsis  
(b) Arterial disease, arterial embolism of left leg  
2 Colon cancer
Arterial disease is the tentative starting point according to Step SP3. Arterial embolism of left leg, reported as the second condition on line 1(b), is a specific type of arterial disease. Therefore, select arterial embolism of left leg as the tentative underlying cause in Step M2. Reapply Step SP6, because the tentative starting point is not the same as the one selected in Steps SP1 to SP8. But colon cancer is an obvious cause of arterial embolism, and colon cancer is the new starting point. No further modifications apply. Code colon cancer (Malignant neoplasm of colon, unspecified) as the underlying cause of death.

Example 12:

1 (a) Sepsis
   (b) Arterial disease, arterial embolism of left leg
   (c) Atherosclerosis
2 Colon cancer

Atherosclerosis is the tentative starting point according to Step SP3. There is a special instruction on atherosclerosis reported as the cause of arterial disease, and, according to this instruction, arterial disease is the new starting point according to Step M1. Arterial embolism of left leg, reported as the second condition on line 1(b), is a more specific description of the type of arterial disease and is selected as the tentative starting point in Step M2. Do not reapply Step SP6, because arterial embolism of left leg is reported as due to atherosclerosis, and this is a correct causal relationship. No further modifications apply. Code arterial embolism of left leg, Embolism and thrombosis of arteries of lower extremities) as the underlying cause of death.

6.2.2.4 Step M4 – Instructions on medical procedures, poisoning, main injury and maternal deaths

Finally, apply the following instructions to the underlying cause you have arrived at:

- If the underlying cause you 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 6.2.9, Special instructions on surgery and other medical procedures (Step M4).
- If the underlying cause you 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 underlying cause of death.
- If the underlying cause is in Chapter 23, External causes of morbidity and mortality, also select a main injury. See the instructions in Section 6.2.6, Special instructions on main injury in deaths from external causes (Step M4).
- If the starting point you 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 6.2.7, Special instructions on poisoning by drugs, medicaments and biological substances (Step M4), to identify the most important drug involved.
- 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 18, Pregnancy, childbirth and the puerperium, according to the instructions in Section 6.2.8, Special instructions on maternal mortality (Step M4). When you have found a cause of death that is not further changed in either Step SP6 or Steps M1 to M3, you have arrived at the underlying cause of death. Although the cause of death you identified is not further changed in Step SP6 or Steps M1 to M3, other restrictions may apply, for example that the cause is limited to one of the sexes or to a specific age range, or that the cause of
death is improbable, considering the geographical setting. Therefore, always check whether any such restrictions apply to the underlying cause you selected.

6.2.3 Special instructions on accepted and rejected sequences (Steps SP3 and SP4)

This section lists sequences of causes of death that should be accepted or rejected when selecting the underlying cause of death. The purpose is to produce the most useful mortality statistics possible. Thus, whether a sequence is listed as ‘rejected’ or ‘accepted’ may reflect interests of importance for public health rather than what is acceptable from a purely medical point of view. Therefore, always apply these instructions, whether they can be considered medically correct or not. Individual countries should not correct what is assumed to be an error, since changes at the national level will lead to data that are less comparable to data from other countries, and thus less useful for analysis.

A. Accepted sequences

When applying Steps SP3 and SP4, accept the relationships listed below.

(a) Infectious diseases due to other conditions

Accept infectious diseases caused by other conditions, except for the infectious diseases listed in Section 6.2.3B, Rejected sequences, subsection (a), Infectious diseases due to other conditions.

(b) HIV reported as due to other conditions

Accept HIV as due to: - conditions necessitating blood transfusion, such as haemophilia, anaemia and major injuries - invasive procedures, such as surgery - drug abuse. Examples of such conditions are given in the Annex 14.5, Causes of HIV. Note that the list in Annex 14.5 is not complete.

(c) Infectious diseases due to HIV

Accept the following infectious diseases as due to HIV disease, malignant neoplasms and conditions impairing the immune system: 1. Typhoid and paratyphoid fevers, Other Salmonella infections, Shigellosis; Tuberculosis Sequelae of tuberculosis

(d) Malignancies and HIV

Accept the following malignant neoplasms as due to Human immunodeficiency virus [HIV] disease: - Malignant neoplasm of oropharynx - Malignant neoplasm of anus and anal canal - Kaposi sarcoma - Malignant neoplasm of vulva - Malignant neoplasm of vagina - Malignant neoplasm of cervix uteri, if specified as invasive - Malignant neoplasm of penis - Hodgkin lymphoma, if specified as primary in brain - Follicular lymphoma, if specified as primary in brain - Non-follicular lymphoma, if specified as primary in brain - Diffuse large B-cell lymphoma, if specified as immunoblastic - Burkitt lymphoma - Mature T/NK-cell lymphoma, if specified as primary in brain - Other and unspecified types of non-Hodgkin lymphoma, if specified as primary in brain - Other specified types of T/NK-cell lymphoma, if specified as primary in brain

(e) Diabetes due to other conditions
Accept Type 1 diabetes mellitus as due to conditions that cause autoimmune destruction of β-cells.

Accept Type 2 diabetes mellitus as due to conditions that cause insulin resistance.

Accept Other specified and unspecified diabetes mellitus as due to conditions that cause damage to the pancreas.

See Annex 14.6 for a list of conditions that can cause diabetes.

**(f) Rheumatic fever due to other conditions**

Accept Acute rheumatic fever and Chronic rheumatic heart diseases as due to: 1. Scarlet fever Sepsis due to *Streptococcus*, group A Streptococcal sore throat Streptococcal tonsillitis

**(g) Hypertension due to other conditions**

Accept a hypertensive condition as due to: 1. endocrine neoplasms renal neoplasms carcinoid tumours.

**(h) Cerebrovascular diseases due to other conditions**

Accept Intracerebral haemorrhage as due to Diseases of liver.

Accept cerebrovascular embolism, thrombosis and unspecified stroke as due to endocarditis.

**(i) Congenital anomalies due to other conditions**

Accept a congenital anomaly as due to a chromosome abnormality or a congenital malformation syndrome.

Accept pulmonary hypoplasia as due to a congenital anomaly.

**(j) Accidents due to other conditions**

Accept a Fall as due to a Disorder of bone density and structure or as due to a (pathological) fracture caused by a Disorder of bone density and structure.

Accept asphyxia and aspiration (W78–W80) caused by other causes.

**(k) Acute or terminal circulatory diseases due to other conditions**

Accept the following acute or terminal circulatory diseases as due to malignant neoplasm, diabetes or asthma:

<list to be edited after finalization of the ICD-11 MMS>

**B. Rejected sequences**

When applying Steps SP3 and SP4, reject the relationships listed below.

**(a) Infectious diseases due to other conditions**

Do not accept the following infectious and parasitic diseases as due to any other causes, not even HIV/AIDS, malignant neoplasms or conditions impairing the immune system:

<list to be edited after finalization of the ICD-11 MMS>
Do not accept the following infectious diseases as due to other causes, except HIV disease, malignant neoplasms and conditions impairing the immune system:

1. Typhoid and paratyphoid fevers, Other *Salmonella* infections, Shigellosis Tuberculosis Sequelae of tuberculosis.

(b) Malignant neoplasms due to other conditions

Do not accept a malignant neoplasm as due to any other cause, except the following malignant neoplasms as due to HIV:

- Malignant neoplasm of oropharynx
- Malignant neoplasm of anus and anal canal
- Kaposi sarcoma
- Malignant neoplasm of vulva
- Malignant neoplasm of vagina
- Malignant neoplasm of cervix uteri, *if specified as invasive*
- Malignant neoplasm of penis
- Hodgkin lymphoma, *if specified as primary in brain*
- Follicular lymphoma, *if specified as primary in brain*
- Non-follicular lymphoma, *if specified as primary in brain*
- Diffuse large B-cell lymphoma, *if specified as immunoblastic*
- Burkitt lymphoma
- Mature T/NK-cell lymphoma, *if specified as primary in brain*
- Other and unspecified types of non-Hodgkin lymphoma, *if specified as primary in brain*
- Other specified types of T/NK-cell lymphoma, *if specified as primary in brain*.

(c) Haemophilia due to other conditions

Do not accept haemophilia as due to any other cause.

(d) Diabetes due to other conditions

Do not accept Type 1 diabetes mellitus as due to any other cause except conditions causing autoimmune destruction of β-cells.

Do not accept Type 2 diabetes mellitus as due to any other cause except conditions causing insulin resistance.

Do not accept Other and Unspecified diabetes mellitus as due to any other cause except conditions causing damage to the pancreas.

See Annex 14.6 for a list of the conditions that can cause diabetes.

(e) Rheumatic fever due to other conditions


(f) Hypertension due to other conditions
Do not accept hypertensive conditions as due to a neoplasm, except: 1. endocrine neoplasms 2. renal neoplasms 3. carcinoid tumours.

**(g) Chronic ischaemic heart disease due to other conditions**

Do not accept Chronic ischaemic heart disease as due to a neoplasm.

**(h) Atherosclerosis due to other conditions**

Do not accept an atherosclerotic condition as due to a neoplasm.

**(i) Influenza due to other conditions**

Do not accept Influenza as due to any other cause.

**(j) Congenital anomalies due to other conditions**

Do not accept a congenital anomaly as due to any other cause, including immaturity, except: 1. congenital anomaly due to a chromosome abnormality or a congenital malformation syndrome 2. Pulmonary Hypoplasia due to a congenital anomaly.

**(k) Conflicting durations**

Do not accept a condition with a stated duration as due to a condition with a shorter duration (see Examples 6 and 8 in Section 6.2.1, Step SP3, for exceptions).

**(l) Accidents due to other conditions**

Do not accept accidents as due to causes coded in other chapters, except: 1. Fall as due to a Disorder of bone density and structure 2. Fall as due to a (pathological) fracture caused by a Disorder of bone density and structure 3. Asphyxia and aspiration as due to other causes.

**(m) Suicide due to other conditions**

Do not accept suicide as due to any other cause.

### 6.2.4 Special instructions on obvious cause (Step SP6)

This section lists conditions that should be considered an obvious cause of conditions selected as tentative starting point in Steps SP1 to SP5.

**A. Complications of HIV**

**(a) Infectious diseases and HIV**

Consider [HIV] disease stage 2–4 as an obvious cause of infectious diseases, except those listed in Section 6.2.3, Special instructions on accepted and rejected sequences, Section B, Rejected sequences, subsection (a), Infectious diseases due to other conditions.

Also consider HIV disease but not HIV-positive status as an obvious cause of Typhoid and paratyphoid fevers, Other Salmonella infections and Shigellosis, these are listed in the second part of Section 6.2.3 B, subsection (a).

Consider both HIV disease and HIV-positive status as an obvious cause of the following infectious diseases:

- Salmonella sepsis
- Cryptosporidiosis
- Isosporiasis
- Tuberculosis
- Infection due to other mycobacteria
- Progressive multifocal leukencephalopathy
- Herpes simplex infections specified as chronic ulcers, bronchitis, pneumonia, or oesophagitis
- Cytomegalovirus infections, except for liver, spleen, lymph nodes
- Candidiasis of other sites, specified as of lung or oesophagus
- Coccidioidomycosis
- Histoplasmosis
- Cryptococcosis
- Pneumocystosis
- Sequelae of tuberculosis

**b) Malignant neoplasms and HIV**

Consider both HIV disease as the obvious cause of the following malignant neoplasms:

1. Kaposi sarcoma
2. Cervix carcinoma, specified as invasive in Malignant neoplasm of cervix uteri
3. Lymphoma, specified as primary cerebral
4. Diffuse large B-cell lymphoma, specified as immunoblastic
5. Burkitt lymphoma

**c) Immune deficiency and HIV**

Consider HIV disease as the obvious cause of immune deficiency.

**d) Pneumonia and HIV**

Consider HIV disease stage 2-4 as an obvious cause of pneumonia.

**e) Wasting syndrome and HIV**

Consider both HIV disease as an obvious cause of wasting syndrome.

**B. Enterocolitis due to Clostridium difficile**

Consider enterocolitis due to *Clostridium difficile* as an obvious consequence of antibiotic therapy.

**C. Sepsis and systemic inflammatory response syndrome**

Consider conditions that impair the immune system, wasting diseases (such as malignant neoplasms and malnutrition), diseases causing paralysis (such as cerebral haemorrhage and thrombosis), serious respiratory conditions and serious injuries (grade 1–4 according to the injury priority list in the Annex 14.7) as obvious causes of sepsis, and of Systemic inflammatory response syndrome [SIRS].

**D. Complications of diabetes**

Consider Diabetes mellitus (E10–E14) as the obvious cause of the following conditions:
E. Dehydration

Consider any intestinal infectious disease as an obvious cause of dehydration.

F. Dementia

Consider conditions that typically involve irreversible brain damage as obvious causes of dementia, if no other cause of the dementia is stated.

Consider Down syndrome as an obvious cause of Unspecified dementia and Alzheimer disease.

G. Mental retardation (F70–F79)

Consider the following conditions as obvious causes of mental retardation:

H. Heart failure and unspecified heart disease

Consider other heart conditions as the obvious cause of Heart failure and unspecified Heart disease.

I. Embolism

Consider venous thrombosis, phlebitis or thrombophlebitis, valvular heart disease, childbirth or any operation as the obvious cause of diseases described as ‘embolic’. However, there must be a clear route from the place where the thrombus formed and the place of the embolism.

J. Oesophageal varices

Consider cirrhotic liver diseases as the obvious cause of Oesophageal varices.

K. Pneumonia

Consider Dependence syndrome due to use of alcohol as the obvious cause of Lobar pneumonia, unspecified.

Consider conditions that impair the immune system, wasting diseases (such as malignant neoplasms and malnutrition), diseases causing paralysis (such as cerebral haemorrhage and thrombosis), serious respiratory conditions, communicable diseases, conditions that affect the process of swallowing, other diseases that limit the ability to care for oneself, including dementia and degenerative diseases of the nervous system, poisoning and serious injuries (grade 1–4 according to the injury priority list in the Annex 14.7) as obvious causes of any pneumonia.

L. Pulmonary oedema

Consider the following conditions as obvious causes of Pulmonary oedema:

1. heart disease (including pulmonary heart disease)
2. conditions affecting the lung parenchyma, such as:
   - lung infections
• aspiration and inhalation
• respiratory distress syndrome
• high altitude
• circulating toxins
• conditions causing fluid overload, such as:
• renal failure
• hypoalbuminaemia
• congenital anomalies affecting the pulmonary circulation, such as:
• congenital stenosis of pulmonary veins.

M. Nephritic syndrome
Consider any streptococcal infection (scarlet fever, streptococcal sore throat, etc.) as the obvious cause of Nephritic syndrome and Nephrotic syndrome.

N. Pyelonephritis
Consider any urinary obstruction from conditions such as hyperplasia of prostate or ureteral stenosis as the obvious cause of pyelonephritis.

O. Acute renal failure
Consider a urinary tract infection as the obvious cause of Acute renal failure, provided that there is no indication that the renal failure was present before the urinary tract infection developed.

P. Primary atelectasis of newborn
Consider congenital kidney conditions, premature rupture of membranes and oligohydramnios as obvious causes of Primary atelectasis of newborn.

Q. Premature rupture of membranes and oligohydramnios
Consider congenital kidney conditions as obvious causes of Fetus and newborn affected by premature rupture of membranes or oligohydramnios.

R. Haemorrhage
Consider anticoagulant poisoning or overdose as the obvious cause of haemorrhage. However, do not consider anticoagulant therapy, without mention of poisoning or overdose, as the obvious cause of haemorrhage. Further, consider treatment with steroid, aspirin, and nonsteroidal anti-inflammatory drugs (NSAIDs) as obvious causes of gastric haemorrhage.

Consider gastrointestinal haemorrhage as the obvious cause of secondary or unspecified anaemia.

S. Aspiration and inhalation
Consider conditions listed under Section 6.2.4 K, Pneumonia, as obvious causes of aspiration and inhalation.

T. Operations and other medical procedures
Consider surgery as the obvious cause of conditions that are considered common postprocedural complications, see Annex 14.2, List of conditions to be considered direct consequences of medical procedures.

Consider any surgical condition (such as malignant tumour or injury), reported anywhere on the certificate, as the obvious cause of an operation or other medical procedure performed on the same organ.

**U. Common secondary conditions**

Consider wasting diseases (such as malignant neoplasms and malnutrition), diseases causing paralysis (such as cerebral haemorrhage or thrombosis), communicable diseases, other disease that limits the ability to care for oneself, including dementia and degenerative diseases of the nervous system, and serious injuries as the obvious cause of the common secondary conditions listed in the Table 1. However, such secondary conditions should not be considered an obvious consequence of respiratory conditions.

Conditions in categories flagged with an ‘M’ (Maybe) should be considered obvious consequences of wasting and paralysing conditions only if they meet the prerequisite for code assignment noted in the final column of the table.

**Table: Common secondary conditions**

<list to be edited after finalization of the ICD-11 MMS>

6.2.5 **Special instructions on linkages and other provisions (Step M1)**

Use the list in this section in Step M1.

The tentative underlying cause is listed in the left-hand column. If the conditions specified in the right-hand column apply, then use the code in bold as the new tentative underlying cause.

There are two types of combination:

`with mention of` means that the other condition may appear anywhere on the certificate;

`when reported as the cause of` means that the other condition must appear in a correct causal relationship or be otherwise indicated as being due to the tentative underlying cause.

For some conditions, there are further requirements, for example that a specific term has been used either for the tentative underlying cause or for the condition that may change the underlying cause code.

6.2.5.1 **Summary of codes not to be used in underlying-cause mortality coding**

<lists to be edited after finalization of the ICD-11 MMS>

*In addition to Extension codes*

**Codes not to be used for underlying-cause mortality coding** (code to item in parentheses; if no code is indicated, code to other and unspecified causes of death)**

(code to yyyy.y)
6.2.5.2 Codes not to be used if the underlying cause is known

<list to be edited after finalization of the ICD-11 MMS>

6.2.6 Special instructions on main injury in deaths from external causes (Step M4)

If the underlying cause you arrived at by applying the selection and modification rules in Steps SP1 to SP8 and M1 to M3 is an external cause, code the external cause of the injury as the underlying cause of death. In addition to the underlying cause from Chapter 23, External causes of morbidity and mortality, also code a main injury. This applies to both body injuries and poisoning. For special instructions on how to identify the main injury in poisoning deaths, see Section 6.2.7. If more than one injury is reported on the death certificate, apply the following instructions:

(a) When the injuries reported include superficial and trivial injuries (as listed in the Annex 14.4, List of conditions unlikely to cause death), whether in Part 1 or Part 2, select the main injury as if the superficial or trivial injury had not been reported.

Example 1:

1  (a)  Contusion of arm and fracture of skull

    (b)  Fall from scaffolding

    Fall from scaffolding is the underlying cause of death. Code underlying cause to W12, Fall on and from scaffolding. As main injury, code fracture of skull (Fracture of skull and facial bones, part unspecified). Disregard contusion of arm (Superficial injury of upper limb, level unspecified), as it is in the Annex 14.4, List of conditions unlikely to cause death.

(b) When serious (non-superficial and non-trivial) injuries are reported in both Part 1 and Part 2, select the main injury from Part 1. This applies even when the injuries mentioned in Part 2 have a higher rank in Annex 14.7, Priority ranking of ICD–11 nature-of-injury codes, than the injuries mentioned in Part 1.

Example 2:

1  (a)  Multiple intrathoracic injuries

    (b)  Car driver, collision with bus

2  Brain injuries

    Code to car driver injured in collision with bus as underlying cause of death Car occupant injured in collision with heavy transport vehicle or bus, driver injured in traffic accident. As main injury, code ‘Multiple injuries of thorax’. Unspecified brain injury has a higher rank in Annex 14.7 than multiple injuries of thorax, but multiple injuries of thorax are mentioned in Part 1 and take precedence over the injuries mentioned in Part 2.

When serious injuries are reported only in Part 2, select a main injury from Part 2.

(c) When more than one serious injury is reported in the relevant part of the certificate, select the main injury according to Annex 14.7, Priority ranking of ICD–11 nature-of-injury codes). Note that 1 is the highest priority rank and that 6 is the lowest.
Example 3:

1. **(a)** Multiple intrathoracic injuries and brain injuries

2. **(b)** Car driver, collision with bus

Code to car driver injured in collision with bus as underlying cause of death. Car occupant injured in collision with heavy transport vehicle or bus, driver injured in traffic accident. As main injury, code brain injury Intracranial injury, unspecified, which has a higher rank on the priority list than Multiple injuries of thorax.

(d) When more than one of the serious injuries reported in the relevant part of the certificate have the same and highest rank, select the first mentioned of these injuries. However, prefer a specific injury over an injury from the group Injuries involving multiple body regions, with the same priority rank.

Example 4:

1. **(a)** Multiple injuries with rupture of aorta

2. **(b)** Car driver, collision with bus

Code to car driver injured in collision with bus as underlying cause of death. Car occupant injured in collision with heavy transport vehicle or bus, driver injured in traffic accident. As main injury, code rupture of aorta Injury of thoracic aorta. Multiple injuries and rupture of aorta have the same rank on the priority list, but a specific injury takes precedence over injury from the group Injuries involving multiple body regions.

6.2.7 Special instructions on poisoning by drugs, medicaments and biological substances (Step M4)

A. Underlying cause

If the underlying cause you selected by applying Steps SP1 to SP8 and M1 to M3 is poisoning, there is more than one drug reported on the certificate and the drugs do not have the same external cause code, select a code for the underlying cause as follows:

(a) If one of the drugs is specified as the most important substance in bringing about the death, code the external cause code for that drug as the underlying cause of death.

Example 5:

1. **(a)** Accidental heroin overdose

2. **(b)** Diazepam and amitriptyline present

By placing heroin overdose in Part 1 and reporting the other substances as contributing causes of death in Part 2, the certifier has identified heroin as the most important substance in bringing about the death. Select accidental poisoning by heroin as underlying cause Accidental poisoning by and exposure to narcotics and psychodysleptics [hallucinogens], not elsewhere classified.

Example 6:

1. **(a)** Poisoning by amphetamine

2. **(b)** Toxic levels of heroin and flunitrazepam
By placing amphetamine poisoning alone in Part 1 and reporting the other substances as contributing causes of death in Part 2, the certifier has identified amphetamine as the most important substance in bringing about the death. Select accidental poisoning by amphetamine as underlying cause Accidental poisoning by and exposure to antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified.

Example 7:

1 (a) Poisoning by alcohol
2 Toxic levels of heroin and flunitrazepam

By placing alcohol poisoning alone in Part 1 and reporting the other substances as contributing causes of death in Part 2, the certifier has identified alcohol as the most important substance in bringing about the death. Select accidental poisoning by alcohol as underlying cause.

(b) If none of the drugs is specified as the most important substance in bringing about the death, first try to get further information from the certifier. If no clarification can be obtained, code:
1. combinations of alcohol with a drug to the drug;
2. other multidrug deaths to the appropriate category for ‘Other’.

Example 8:

1 (a) Toxic levels of heroin and amphetamine

Neither heroin nor amphetamine is identified as the most important substance in bringing about the death. Code to Accidental poisoning by and exposure to other and unspecified drugs, medicaments and biological substances.

Example 9:

1 (a) Accidental poisoning by alcohol, heroin and diazepam

Neither of the substances is identified as the most important substance in bringing about the death. Poisoning by combinations of alcohol and drugs are coded to the drugs. Code to Accidental poisoning by and exposure to other and unspecified drugs, medicaments and biological substances.

Proceed by identifying the most dangerous drug and code it as the main injury.

B. Main injury

If the underlying cause is poisoning, use the code for poisoning in the Chapter 22, Injury, poisoning and certain other consequences of external causes chapter as main injury. If only one toxic substance is reported, code that substance as main injury. If several toxic substances are reported, identify the most dangerous substance and code it as main injury. To identify the most dangerous substance, apply the instructions that follow. (a) If one toxic substance is specified as the cause of death, code to that component substance.

Example 10:

1 (a) Accidental overdose by heroin
2 Diazepam and amitriptyline present
By placing heroin overdose alone in Part 1 and reporting the other substances as contributing causes of death in Part 2, the certifier has identified heroin as the most important substance in bringing about the death. Select accidental poisoning by heroin as underlying cause Accidental poisoning by and exposure to narcotics and psychodysleptics [hallucinogens], not elsewhere classified. As main injury, code poisoning by heroin Poisoning by narcotics and psychodysleptics [hallucinogens], heroin.

Example 11:

1. (a) Alcohol poisoning
2. Diazepam and amitriptyline present

By placing alcohol poisoning alone in Part 1 and reporting the other substances as contributing causes of death in Part 2, the certifier has identified alcohol as the most important substance in bringing about the death. Select accidental poisoning by alcohol as underlying cause Accidental poisoning by and exposure to alcohol. Code poisoning by alcohol as main injury Toxic effect of alcohol, unspecified.

(b) If no single toxic substance is indicated as the cause of death, code combinations of alcohol with a drug to the drug.

Example 12:

1. (a) Toxic levels of alcohol and flunitrazepam
2. Diazepam and amitriptyline present

By placing toxic levels of alcohol and flunitrazepam in Part 1 and reporting the other substances as contributing causes of death in Part 2, the certifier has identified alcohol and flunitrazepam as the most important substances in bringing about the death. Of these two, select poisoning by flunitrazepam because combinations of alcohol with a drug are coded to the drug. Select accidental poisoning by flunitrazepam as underlying cause, Accidental poisoning by and exposure to antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified). Code poisoning by flunitrazepam as main injury Poisoning by antiepileptic, sedative-hypnotic and antiparkinsonism drugs, benzodiazepines).

(c) If no appropriate combination category is available, select the main nature of injury code, in the following order of priority:

1. Opioid agonists and partial agonists and other and unspecified narcotics. Deaths that include multiple opioids classifiable should be prioritized as:
   1a. Heroin
   1b. Methadone
   1c. Opium
   1d. Other opioids
   1e. Other synthetic narcotics
   1f. Other and unspecified narcotics

2. Inhaled and intravenous anaesthetic agents
   Includes: Propofol

3. Tricyclic and tetracyclic antidepressants

4. Barbiturates

5. 4-Aminophenoldervatives
6. Antipsychotics and neuroleptics
   Includes:
   Phenothiazine antipsychotics and neuroleptics
   Butyrophenone and thioxanthene neuroleptics
   Other and unspecified antipsychotics and neuroleptics

7. Antiepileptic drugs, antiparkinsonism drugs and unspecified sedatives

8. Cocaine

9. Psychostimulants with abuse potential
   Includes:
   Amphetamines and derivatives

10. Monoamine oxidase inhibitor (MAO) antidepressants and other and unspecified antidepressants
    Includes: Selective serotonin reuptake inhibitors (SSRIs), venlafaxine

11. Benzodiazepines

12. Drugs and substances not listed above

If there is more than one drug in the same priority group, code to the first mentioned. Note that for poisonings, the selected underlying cause does not always match the code for main injury. For example, the underlying cause may express a combination of toxic substances, but the main injury code identifies the most dangerous component.

Example 13:
1 (a) Toxic levels of cocaine, heroin, diazepam and amitriptyline

Neither of the substances is identified as the most important substance in bringing about the death, and there is no specific code category for the combination of these substances. Code to Accidental poisoning by and exposure to other and unspecified drugs, medicaments and biological substances, as the underlying cause of death. As main injury, code to poisoning of heroin. On the priority list above, cocaine is in group 8, heroin is in group 1a, diazepam is in group 11 and amitriptyline is in group 10. Select heroin, the substance with the highest priority, Poisoning by narcotics and psychodysleptics [hallucinogens], heroin. Add the codes for the other substances to the cluster.

Example 14:
1 (a) Heroin, cocaine, diazepam and amitriptyline overdose

Neither of the substances is identified as the most important substance in bringing about the death, and there is no specific code category for the combination of these substances. Code to Accidental poisoning by and exposure to other and unspecified drugs, medicaments and biological substances, as the underlying cause of death. Add the codes for the individual substances to the cluster, if desired. Next, code poisoning by heroin as main injury. On the priority list above, heroin is in group 1a, cocaine is in group 8, diazepam is in group 11 and amitriptyline is in group 10. Select heroin, the substance with the highest priority, Poisoning by narcotics and psychodysleptics [hallucinogens], heroin. Add the codes for the other substances to the cluster.
Example 15:

1. (a) Accidental poisoning by alcohol, heroin and diazepam

Poisoning by combinations of alcohol and drug(s) is coded to the drug(s), see instruction in Section 6.2.7 B, subsection (b), above. Neither of the drugs reported in Part 1 is identified as the most important substance in bringing about the death, and there is no specific code category for the combination of these substances. Code to Accidental poisoning by and exposure to other and unspecified drugs, medicaments and biological substances, as the underlying cause of death.

Next, code poisoning by heroin as main injury. On the priority list above, heroin is in group 1a and diazepam is in group 11. Select heroin, the substance with the highest priority Poisoning by narcotics and psychodysleptics (hallucinogens), heroin) and add codes for the other substances to the cluster.

6.2.8 Special instructions on maternal mortality (Step M4)

If pregnancy, childbirth, or puerperium is mentioned anywhere on the certificate, in most cases the underlying cause is coded to Chapter 18, Pregnancy, childbirth and the puerperium. This is either because the underlying cause you selected by applying Steps SP1 to SP8 and M1 to M4 is classified to Chapter 18 according to the Alphabetical index, or because there is a special code in Chapter 18 for the condition if it appears during pregnancy, childbirth and the puerperium.

Apply the following instructions to determine whether an underlying cause that is indexed to other parts of the ICD should be classified to Chapter 18. Note that these instructions do not apply to conditions that are indexed to Chapter 18 in the Alphabetical index.

If pregnancy, childbirth or puerperium is reported anywhere on the certificate but it is not clearly stated that pregnancy, childbirth or puerperium contributed to the death, first contact the certifier and ask for additional information.

- If the certifier states that the death was a complication of pregnancy, childbirth or puerperium, code the underlying cause to Chapter 18, Pregnancy, childbirth and the puerperium.
- If the certifier states that the death was not a complication of pregnancy, childbirth or puerperium, do not code the underlying cause to Chapter 18.
- If you cannot obtain any additional information, but pregnancy, childbirth or puerperium is mentioned in Part 1 or Part 2 of the certificate, code the underlying cause to Chapter 18.

If the underlying cause you selected is classifiable to Maternal infectious and parasitic diseases classifiable elsewhere but complicating pregnancy, childbirth and the puerperium and Other maternal diseases classifiable elsewhere but complicating pregnancy, childbirth and the puerperium, then add to the cluster the corresponding code from Chapter 01-19 as a multiple cause of death. This is important because otherwise relevant information on the death will not be retrievable. Note that some conditions are not coded to Chapter 18, even if they occurred during pregnancy, childbirth or puerperium, see the 'Excludes' note at the beginning of Chapter 18.

Example 1:
1 (a) Amniotic fluid embolism

The underlying cause, Amniotic fluid embolism, is indexed to Chapter 18.

Example 2:

1 (a) Pulmonary oedema
(b) Mitral regurgitation, pregnancy

The underlying cause, mitral regurgitation, is coded to Chapter 18 because pregnancy is mentioned in Part 1. Code the underlying cause to Diseases of the circulatory system complicating pregnancy, childbirth and the puerperium. Also add the code for Mitral regurgitation to the cluster as a contributing cause of death.

Example 3:

1 (a) Haemorrhage
(b) Cervical cancer

2 Treatment delayed because of pregnancy

The underlying cause, cervical cancer, is coded to Chapter 18 because pregnancy is mentioned in Part 2. Code the underlying cause to Other specified diseases and conditions complicating pregnancy, childbirth and the puerperium. Also add the code for cervical cancer as a contributing cause of death.

Example 4:

1 (a) Hepatic failure
(b) Dengue haemorrhagic fever

5 days

2 Additional information: 40 days postpartum

Code the underlying cause to Other viral diseases complicating pregnancy, childbirth and the puerperium. Also add to the cluster the code for Dengue as a contributing cause of death.

6.2.9 Special instructions on surgery and other medical procedures (Step M4)

A. Reason for the surgery or procedure stated

If the tentative starting point you arrived at by applying Steps SP1 to SP7 and M1 to M4 is surgery or other medical procedure and the certificate states the reason for which the operation or procedure was performed, then select the reason for the operation or other procedure as the new starting point. Next, apply the instructions in Steps SP7 and M1 to M4 as already described.

B. Reason for the surgery or procedure not stated, complication reported

If the reason for the surgery or procedure is not stated and a complication is reported, proceed as described next. First check whether the Alphabetical index gives a default code for the reason of the surgery or procedure. If it does, this is the new starting point. Next,
apply the instructions in Steps SP7 and M1 to M4 as already described. If the coding tool does not give a default code for the reason of the surgery or procedure, determine whether the type of surgery or procedure indicates a specific organ or site. If it does, then use the code for the residual category for the organ or site operated on as the new starting point. Next, apply the instructions in Steps SP7 and M1 to M4 as already described.

If the coding tool does not give a default code for the reason of the surgery or procedure, and the type of surgery or procedure does not indicate an organ or site, check whether the certificate mentions a misadventure at the time of the procedure. If it does, use the appropriate code from Complications during labour and delivery or Surgical and other medical procedures associated with injury or harm in therapeutic use and also Mode of injury or harm associated with a surgical or other medical procedure as underlying cause of death.

If the coding tool does not give a default code, the type of surgery or procedure does not indicate an organ or site and there is no mention of a misadventure at the time of the procedure, use the appropriate code from Complications during labour and delivery or Surgical and other medical procedures associated with injury or harm in therapeutic use as underlying cause of death.

C. Reason for the surgery or procedure not stated, no complication reported

If the reason for the surgery or procedure is not stated and no complication is reported, proceed as described next. First check whether the Alphabetical index gives a default code for the reason of the surgery or procedure. If it does, this is the new starting point. Next, apply the instructions in Steps SP7 and M1 to M4 as described earlier.

If the Alphabetical index does not give a default code for the reason of the surgery or procedure, determine whether the type of surgery or procedure indicates a specific organ or site. If it does, then use the code for the residual category for the organ or site operated on as the new starting point. Next, apply the instructions in Steps SP7 and M1 to M4 as described earlier.

If the Alphabetical index does not give a default code and the type of surgery or procedure does not indicate an organ or site, code to Other ill-defined and unspecified causes of mortality.

Example 1:

1 (a) Pulmonary embolism
(b) Appendectomy

The certificate does not specify the reason for the surgery, but the term appendectomy indicates appendix as the organ operated on. Code Disease of appendix, unspecified, as the underlying cause of death.

Example 2:

1 (a) Accidental puncture of aorta
(b) Laparotomy
The certificate does not specify the reason for the surgery and the term laparotomy does not indicate a specific organ. However, there is a mention of a misadventure at the time of the surgery. Code the misadventure, accidental puncture during laparotomy, as the underlying cause of death, Unintentional cut, puncture, perforation or haemorrhage during surgical and medical care, during surgical operation.

Example 3:

1 (a) Postoperative haemorrhage
(b) Caesarean section
(c) Prolonged labour

The certificate states the reason why the surgery was performed. Code the reason for the surgery, prolonged labour, as the underlying cause of death, Long labour, unspecified.

Example 4:

1 (a) Laparotomy

The certificate does not specify why the surgery was performed and the term laparotomy does not indicate a specific organ. There is no mention of a complication. Other ill-defined and unspecified causes of mortality, as the underlying cause of death.

D. Medical devices associated with adverse incidents due to external causes

If a death is caused by an incident involving a medical device, but the incident is due to an external cause and not to any breakdown or malfunctioning of the device itself, code the external cause as the underlying cause of death.

Example 5:

1 (a) Inhalation pneumonia
(b) Haemorrhage of trachea
(c) Fell from bed while attached to respirator
2 Respirator treatment following liver transplant

There is no mention of breakdown or malfunctioning of the respirator or the tracheal tube. Code Fall involving bed, the accident that caused the haemorrhage, as the underlying cause of death.

Example 6:

1 (a) Pulmonary oedema
(b) Intra-aortic balloon pump stopped
(c) Power cut due to hurricane
(d) Recent myocardial infarction with mitral insufficiency

The balloon pump stopped working, not because of any malfunctioning or breakdown, but because of a power cut. Code the reason of the power cut, cataclysmic storm, as the underlying cause of death, Victim of cataclysmic storm.
If the external cause of the incident is not specifically classified, code to Exposure to unspecified factor causing other and unspecified injury.

Example 7:

1 (a) Cardiac and respiratory failure
(b) Stopped administration of inotropic drugs
(c) Accidental removal of subclavian line

2 Surgery for acute rupture of gallbladder

There is no mention of malfunctioning or breakdown of equipment. Since the accident that caused the removal of the subclavian line is not described, code to, Exposure to unspecified factor causing other and unspecified injury.

6.3 Coding instructions for mortality: multiple causes

Multiple-cause coding permits in-depth analysis of causes of death, for example of serious but avoidable complications of certain underlying causes, and the impact of coexisting conditions on the outcome of a disease process. Therefore, in mortality coding, both underlying cause and multiple causes should be recorded. Also, complete multiple-cause coding is essential for a correct application of the ICD instructions for selection and modification of the underlying cause of death (see Section 6.2). All possible detail should be retained in the multiple-cause coding, since records containing all multiple-cause conditions permit more thorough analysis than records with only a selection of the conditions reported on the certificate. In particular: - the position of the individual codes in the data record should reflect where on the certificate the corresponding diagnostic expressions were entered by the certifier, because some analyses may focus on the terminal cause of death, or on conditions reported in Part 2; - codes for common conditions, or for conditions regarded as symptomatic or less informative, should not be deleted or left out, since they may be of special interest in analysis of avoidable complications and may serve as markers of the seriousness of other conditions reported on the certificate; - multiple-cause data should be stored in two formats: one format that shows as clearly as possible which term the certifier used on the certificate and where on the certificate each term was reported; and one format that takes the stated or implied relationships between the reported conditions into consideration, and where the codes have been harmonized according to the instructions in the ICD volumes.

6.3.1 Uncertain diagnosis

Ignore expressions indicating doubt as to the certainty of the diagnosis, for example ‘apparently’, ‘presumably’, ‘probably’ or ‘possibly’. A tentative diagnosis, although uncertain, is of better use to mortality statistics than no diagnosis at all.

6.3.2 Either ... or

The certifier might report alternative diagnoses, ‘either diagnosis A or diagnosis B’. In such cases, proceed as follows.

A. One condition, either one site or another
(a) If the sites are in the same anatomical system, code to the residual category for the group or anatomical system in which the reported sites are classified.

Example 1:

1 (a) Cancer of kidney or bladder

Code as Malignant neoplasm, urinary organ, unspecified.

(b) If the reported sites are in different anatomical systems, or if there is no residual category for the group or anatomical system, code to the residual category for the disease or condition specified.

Example 2:

1 (a) Cancer of adrenal gland or kidney

Code as Malignant neoplasm, primary site unspecified, since adrenal gland and kidney are in different anatomical systems.

B. One site or system, either one condition or another condition

(a) If the reported conditions are classifiable to different four-character subcategories of the same three-character category, code to the four-character subcategory for ‘unspecified’.

Example 3:

1 (a) Arteriosclerotic heart disease or coronary aneurysm

Code as Chronic ischaemic heart disease, unspecified.

(b) If the reported conditions are classifiable to different three-character categories but ICD–11 provides a residual category for the disease in general, code to the residual category.

Example 4:

1 (a) Myocardial infarction or coronary aneurysm

Code as the residual category for ischaemic heart disease.

(c) If the reported conditions are classifiable to different three-character categories and there is no residual category for the disease in general, code to the residual category relating to the disease of the anatomical site/system.

Example 5:

1 (a) Tuberculosis or cancer of lung

Code as Other disorders of lung. Both conditions involve the lung.

Example 6:

1 (a) Stroke or heart attack

Code as Other and unspecified disorders of circulatory system. Both conditions are in the circulatory system.
C. Either one condition or another, different anatomical systems

When different diseases of different anatomical systems are reported as ‘either ... or’, code to Other specified general symptoms and signs.

Example 7:

1 (a) Gallbladder colic or coronary thrombosis

Code as Other specified general symptoms and signs.

D. Either disease or injury

When death is reported as due to either a disease or an injury, code to Other ill-defined and unspecified causes of mortality.

Example 8:

1 (a) Coronary occlusion or war injuries

Code as Other ill-defined and unspecified causes of mortality.

6.3.3 Effect of connecting terms

When the certifier uses a connecting term, the codes assigned must be arranged to reflect the certifier intention. There are two types of connecting terms: those implying a causal relationship and those not implying a causal relationship between reported causes of death.

A. Connecting terms implying a causal relationship

A causal relationship can be expressed in two ways: ‘due to’ written or implied by a similar term; or ‘resulting in’ written or implied by a similar term.

(a) ‘Due to’ written or implied by a similar term

When one cause is certified with a connecting term implying it is due to another cause, enter the code for the first cause on the line where reported and the code for the other cause on the next lower line. Code any causes reported on the remaining lines in Part 1 on the next lower lines.

Example 1:

1 (a) Heart failure due to ischaemic heart disease

(b) Diabetes

Heart failure is the first cause on line (a), and code it to line (a). It is reported as due to ischaemic heart disease, so code ischaemic heart disease to line (b). Move diabetes, which is written on line (b), to line (c).

Example 2:

1 (a) Heart failure because of hepatocellular carcinoma

(b) Ischaemic heart disease

(c) Diabetes
Heart failure is the first cause on line (a), and code it to line (a). It is reported as due to hepatocellular carcinoma, so code hepatocellular carcinoma to line (b). Move ischaemic heart disease, which is reported on line (b), to line (c). Also move diabetes, which is reported on line (c), to line (d). This applies to other connecting terms or signs that indicate a ‘due to’ relationship, such as ‘caused by’, ‘because of’, or similar.

(b) ‘Resulting in’ written or implied by a similar term

When one cause is certified with a connecting term implying it resulted in another cause, enter the code for the cause following the connecting term on the line where reported, and the code for the cause preceding the connecting term on the next lower line. Code any causes reported on the remaining lines in Part 1 on the next lower lines.

Example 3:

1 (a) Ischaemic heart disease resulting in heart failure
(b) Diabetes

Code heart failure, which follows the connecting term ‘resulting in’, on line (a). Code ischaemic heart disease, which is reported before the connecting term, on line (b). Move diabetes, reported on line (b), one line down and code it on line (c).

Example 4:

1 (a) Hepatocellular carcinoma causing heart failure
(b) Ischaemic heart disease
(c) Diabetes

Code heart failure, reported after the connecting term ‘causing’, on line (a). Code hepatocellular carcinoma, which is reported before the connecting term, on line (b). Move ischaemic heart disease, reported on line (b), to line (c), and move diabetes, which is reported on line (c), to line (d). This applies to other connecting terms or signs that indicate a ‘resulting in’ relationship, such as ‘causing’, ‘leading to’, ‘developing into’, and similar.

B. Connecting terms not implying a causal relationship

(a) ‘And’ written or implied by a similar term first or last on a line

The connecting term ‘and’ does not imply a causal relationship, but it indicates that the terms before and after it both belong to an enumeration. Therefore, when a line ends with ‘and’, code the cause or causes on the next lower line last on the upper line, so that the coding reflects the enumeration implied by the connecting term. Similarly, when a line starts with ‘and’, consider this as a continuation of an enumeration starting on the line above, and code the cause or causes on that line last on the line above. Code any causes reported on the remaining lines in Part 1 where reported. This applies to other connecting terms or signs that indicate an enumeration but do not imply a causal relationship, such as ‘also’, ‘plus’, ‘besides’, ‘in addition’, ‘+’ or comma.

Example 5:

1 (a) Heart failure and
(b) Ischaemic heart disease

(c) Diabetes

Line 1(a) ends with ‘and’, so consider ‘ischaemic heart disease’, reported on line (b) as a part of the enumeration ‘heart failure and ischaemic heart disease’. Code accordingly, and place the codes for both heart failure and ischaemic heart disease on line 1(a). Code diabetes where it is reported, on line (c).

Example 6:

1  (a) Heart failure
   (b) Ischaemic heart disease
   (c) and diabetes

Line 1(c) starts with ‘and’. Consider diabetes, reported on line (c), as a part of the enumeration ‘ischaemic heart disease and diabetes’. Code accordingly, and place the codes for both ischaemic heart disease and diabetes on line 1(b).

(b) ‘And’ written or implied by a similar term but not first or last on a line

If a connecting term that does not imply a causal relationship is written on a line but not first or last, then treat it as a comma. Do not reformat the text and do not move any part of the causes to another line.

C. Diagnostic terms that do not stop at the end of the line

If a diagnostic term starts on one line in Part 1 and continues on the next line, code as if the entire diagnostic term had been written on the line where the diagnostic term starts. Code any causes reported on the remaining lines in Part 1 where reported.

Example 7:

1  (a) Ischaemic
   (b) Heart disease
   (c) Diabetes type 2

‘Ischaemic heart disease’ is a diagnostic term reported on two lines. Code as if the complete term had been written on line (a). Code diabetes where it is reported, on line (c).

Example 8:

1  (a) Pneumonia
   (b) Chronic kidney
   (c) disease, diabetes type 2

‘Chronic kidney disease’ is a diagnostic term reported on two lines. Reformat the certificate and code the complete term ‘chronic kidney disease’ on line (b). Also code diabetes on line (b), since it continues the line where ‘chronic kidney’ has been written.
6.3.4 Malignant neoplasms

To assign the correct multiple-cause code for a neoplasm, you must first determine behaviour (malignant, in situ, benign, uncertain or unknown) for each of the neoplasms reported on the death certificate. For malignant neoplasms, you must also determine whether to code them as primary or secondary. To that end, apply the instructions outlined in Sections 6.4 A and 6.4 B that follow.

A. Behaviour: malignant, in situ, benign or unknown/uncertain behaviour?

The four major types of behaviour are:

• malignant: the neoplasm invades surrounding tissue or disseminates from its point of origin and begins to grow at another site;
• in situ: the neoplasm is malignant but still fully confined to the tissue in which it originated;
• benign: the neoplasm grows in the place of origin without the potential for spread;
• uncertain or unknown behaviour: it is undetermined or unknown whether the neoplasm is benign or malignant.

Determine which code group to use as follows:

(a) The term itself indicates behaviour

Look in the ICD coding tool for the term used on the certificate to describe the neoplasm. If both morphology and location are stated, then look up the morphology term first. For specific morphologies, the coding tool gives either the ICD code to use, or directs you to the proper part of the list at ‘Neoplasm’ in the coding tool. If the morphology is not stated, go to the ‘Neoplasm’ list in the coding tool and code by site and behaviour.

(b) Other information on the certificate indicates behaviour

If the term used on the certificate does not indicate a specific behaviour, then look for other information indicating behaviour.

Code a neoplasm of unspecified behaviour, or described as ‘in situ’, as malignant if it is reported as the cause of, or together with, metastases or infiltration. See also Section 6.4 B, ‘Malignant neoplasms: primary or secondary?’, subsection (c), Other indication of primary malignant neoplasm.

Example 1

1 (a) Colon tumour with liver metastases

The colon tumour is reported with liver metastases and is considered malignant. Code the colon tumour as primary.

This also applies to other types of growths that are not indexed to Chapter 02, for example, certain polyps. If they are reported as the cause of metastases or secondary tumours, they should be considered malignant and coded as malignant neoplasms.

Also consider a neoplasm of unspecified behaviour as malignant if it is reported as due to a malignant neoplasm. To decide whether it is primary or secondary, see the instructions in
section 6.4 B, Malignant neoplasms: primary or secondary?, subsection (c), Other indication of primary malignant neoplasm.

If a tumour is indexed to the Chapter 02 section for benign neoplasm but is reported as the cause of metastases or infiltration, check in the Alphabetical index and in Volume 1 whether there is a code for a malignant variety. If so, code it as malignant. If there is no code for a malignant variety, first try to obtain clarification from the certifier. If no further information is available, then accept the statement on the certificate and use the code for benign tumour.

If there is no indication of malignancy, code as uncertain or unknown behaviour.

B. Malignant neoplasms: primary or secondary?

If the neoplasm is coded to malignant neoplasms, next decide whether it is primary or secondary.

The primary site is the anatomical location where the malignant neoplasm originated. A malignant neoplasm may spread to other parts of the body, and these sites are referred to as secondary or metastases. It is most important to determine the primary site. When the death certificate is ambiguous as to the primary site, every effort should be made to obtain clarification from the certifier. The instructions that follow should be applied only when clarification cannot be obtained. The ICD provides the following blocks for primary malignant neoplasms:

- Malignant neoplasms, stated or presumed to be primary, of specified anatomical site. This group does not include lymphoid, haematopoietic and related tissues and does not include Neoplasms of brain and central nervous system
- Malignant neoplasms of ill-defined sites
- Malignant neoplasm, without specification of site
- Neoplasms of haematopoietic and lymphoid tissues – includes malignant neoplasms
- Neoplasms of brain and central nervous system – includes malignant neoplasms

For secondary malignant neoplasms, the ICD provides the block:

- Secondary and unspecified malignant neoplasms, stated or presumed to be metastatic spread from another site

For malignant neoplasms of unspecified site not stated or presumed to be primary or secondary, the ICD provides a code for, Malignant neoplasm, primary site unspecified.

(a) Common sites of metastases

When choosing between codes for primary and secondary malignant neoplasms, refer to the following list of common sites of metastases:

- bone
- mediastinum
- brain
- meninges
- diaphragm
- peritoneum
ill-defined site  pleura
liver  retroperitoneum
lung  spinal cord
lymph nodes

See below for further instructions on how to use this list.

(b) Malignant neoplasm reported as primary

If the certifier describes a malignant neoplasm as ‘primary’, ‘primary in’, ‘originating in’, or with similar terms, then use a code for primary malignant neoplasm.

If the morphology has been stated, always look up the morphology in Volume 3 first, because for some morphologies there are specific ICD codes that are different from the code given in the ‘Neoplasm’ table by site and behaviour.

(c) Other indication of primary malignant neoplasm

Also code a malignant neoplasm as primary, although not described as primary by the certifier, if:

- all other malignant neoplasms on the certificate are described as secondary or as metastases;
- it is in the code range ‘Neoplasms of haematopoietic and lymphoid tissues’:
- A primary neoplasm of haematopoietic and lymphoid tissues may occur simultaneously together with another primary neoplasm in the same range. Code all malignant neoplasms classifiable to Neoplasms of haematopoietic and lymphoid tissues as primary, unless the certifier specifies them as secondary;
- the site is not on the list of common sites of metastases.

If the site is on the list of common sites of metastases, code the malignant neoplasm as primary if:

- the morphology indicates that it is primary of the reported site;
- it is described as caused by a known risk factor for malignant neoplasms of the stated site;
- it is the only malignant neoplasm mentioned on the death certificate, and it is not described as ‘metastatic’:
  exception: code malignant neoplasm of lymph nodes as secondary, even if it is the only reported neoplasm on the certificate, unless it is stated that the lymph node neoplasm is primary;
  note: if the only malignant neoplasm reported on the certificate is malignant neoplasm of liver, and it is not specified as either primary or secondary, then use the code, Malignant neoplasm of liver, unspecified;
- it is malignant neoplasm of lung, and all other malignant neoplasms mentioned on the certificate are on the list of common sites of metastases: code lung as secondary only if another malignant neoplasm is reported in the same part of the certificate (Part 1 or Part 2 of frame A) and this other malignant neoplasm is coded as a primary malignant neoplasm.
Always code lung as primary if the malignant neoplasm is described as bronchogenic or of bronchus.

Code a neoplasm that is not indexed as malignant, for example meningioma, as primary malignant if it is reported as causing secondary or metastatic spread and a code for a malignant variety of the neoplasm is available. See also above, Section 6.4 A, Behaviour: malignant, in situ, benign or unknown/uncertain, subsection (b), Other information on the certificate indicates behaviour.

Exceptions are listed next.

- If durations are stated, the secondary neoplasms must not have a longer duration than the presumed primary malignant neoplasm.
- If morphologies are stated, the secondary and presumed primary malignant neoplasms must have the same morphology.
- If a neoplasm that would not be coded as malignant is reported as the cause of another neoplasm that would not be coded as malignant, then code both neoplasms according to the Alphabetical index. Do not assume malignancy or metastatic spread.

Example 2:

| 1 | (a) Brain metastasis |
|   | (b) Lung tumour |

The lung tumour has caused metastatic spread and is considered malignant. It is also considered primary, since the other site mentioned (brain) is a metastasis. Code the lung tumour as primary of lung.

Example 3:

| 1 | (a) Cancer of pancreas |
|   | (b) Cancer of stomach |

Pancreas and stomach are not on the list of common sites of metastases. Code both cancers as primary.

Example 4:

| 1 | (a) Cancer of liver and lung |
|   | (b) Chronic hepatitis |

Chronic hepatitis increases the risk of primary liver cancer. Therefore, consider the liver cancer primary and code to malignant neoplasm of liver, unspecified. Do not use the code for Secondary malignant of liver. Code the lung cancer as Secondary, because the only other malignant neoplasm on the certificate is primary.

Example 5:

| 1 | (a) Kidney cancer and lung cancer |
Code the kidney cancer as primary, since it is not on the list of common sites of metastases. Code lung cancer as secondary, since it is reported in the same part of the certificate as the kidney cancer and the kidney cancer is considered primary.

Example 6:

1 (a) Lung cancer
2 Kidney cancer

Code the lung cancer as Primary. There is no other primary malignant neoplasm in the same part of the certificate as where lung cancer is reported, and the code for lung cancer is not influenced by neoplasms mentioned in another part of the certificate. Code the kidney cancer as Primary, since it is not on the list of common sites of metastases.

Example 7:

1 (a) Brain tumour
2 Lung tumour, probably secondary

Consider both tumours as malignant, since the certifier described one of the two as secondary, which is evidence of malignant behaviour. See Section 6.4 A, Behaviour: malignant, in situ, benign or unknown/uncertain, subsection (b), Other information on the certificate indicates behaviour. Code the brain tumour as primary, since the other malignant neoplasm on the certificate is described as secondary. The qualification ‘probably’ is ignored; see Section 6.3.2, Uncertain diagnosis.

Example 8:

1 (a) Metastatic involvement of chest wall
   (b) Carcinoma in situ of breast

Code the carcinoma in situ of breast as primary Malignant neoplasm of breast. Since the breast tumour has spread to the chest wall it is no longer in situ.

Example 9:

1 (a) Secondary malignant neoplasm of lung and brain
   (b) Polyp of stomach

Code the polyp as primary malignant neoplasm of stomach. Since the polyp is reported as the cause of secondary spread, it is considered malignant.

Example 10:

1 (a) Brain cancer

Brain is on the list of common sites of metastases, but in this case it is the only malignant neoplasm mentioned on the certificate. Use the code for primary Malignant neoplasm of brain.

Example 11:

1 (a) Cancer of cervical lymph nodes
Code the cancer of cervical lymph nodes as secondary. It is considered secondary to an unspecified primary malignant neoplasm.

Example 12:

1 (a) Bladder cancer
(b) Primary in prostate

The prostate cancer is described as primary. Code it to the group of primary malignant neoplasms. Code bladder cancer as secondary, since the certificate states that the cancer was primary in another site. See also Section 6.4 B, Malignant neoplasms: primary or secondary, subsection (e), Other indication of secondary malignant neoplasm.

Example 13:

1 (a) Bladder tumour
(b) Lung tumour

None of the tumours is specified as malignant or benign. Therefore, do not assume malignancy or metastatic spread. Use codes from the group of Neoplasms of uncertain or unknown behaviour, bladder and lung.

(d) Malignant neoplasm reported as secondary

If the certifier describes a neoplasm as secondary, then code to the appropriate subcategory in Malignant neoplasms of ill-defined, secondary and unspecified sites.

(e) Other indication of secondary malignant neoplasm

If a malignant neoplasm is not described as primary or secondary but the morphology is stated, first look up the morphology in the Alphabetical index. If the morphology is incompatible with the stated site of the neoplasm (i.e. the neoplasm cannot be primary of the stated site according to textbooks and other reference literature), then assign a code for a malignant neoplasm of unspecified site for the morphology indicated.

Code a malignant neoplasm as secondary if the neoplasm is:

- specified as secondary by the certifier;
- unspecified whether primary or secondary, and the site is on the list of common sites of metastases:
  
  *exception: if there is only one malignant neoplasm mentioned and the site is on the list of common sites of metastases, then code the neoplasm as primary although it is on the list of common sites of metastases. This does not apply to lymph nodes, which are always coded as secondary. See also section 6.4 B, Malignant neoplasms: primary or secondary?, subsection (b), Other indication of primary malignant neoplasm;*
  
  *exception: code lung as primary, if all other sites in the same part of the certificate (Part 1 or Part 2) are on the list of common sites of metastases;*

- unspecified whether primary or secondary, and the certifier states that the cancer is primary in another site. This applies whether the site is on the list of common sites of metastases or not:
• regardless of site, do not code a neoplasm as secondary if it is of a different morphology from another neoplasm stated to be primary. See also Section 6.3.5C, More than one primary malignant neoplasm;

• unspecified whether malignant, in situ or benign, and it is reported as due to a malignant neoplasm:

  exception: if durations are stated, do not code the unspecified neoplasm as secondary if it has a duration that is longer than the durations of the malignant neoplasm reported as the cause of the unspecified neoplasm; - the morphology indicates that the neoplasm cannot be primary of the stated site.

Do not use order of entry to determine whether a neoplasm specified as malignant is primary or secondary. Code a malignant neoplasm reported as due to another malignant neoplasm as secondary only if it is described as secondary, metastatic spread or similar, or if it is on the list of common sites of metastases.

Do not confuse ‘primary’ with ‘primary in’. Whereas ‘primary in’ identifies one of several malignant tumours as the primary tumour, ‘primary’ simply means that the malignant neoplasm was not secondary. It does not necessarily mean that all other malignant neoplasms mentioned on the certificate were secondary.

Example 14:

1 (a) Carcinoma of adrenal glands

2 Primary in kidney

The malignant neoplasm of adrenal glands is considered secondary, since the certificate states that the cancer was primary in kidney. Code the adrenal carcinoma as Secondary and the primary in kidney as Malignant Primary neoplasm of kidney.

Example 15:

1 (a) Prostate cancers

(b) Primary site unknown

The primary site is described as unknown. Code to Malignant neoplasm of unknown primary site. Code prostate cancer as Secondary, since the primary malignant neoplasm clearly was in another site.

Example 16:

1 (a) Brain tumour

(b) Lung cancer

The brain tumour is considered malignant, since it is reported as due to lung cancer. Also, it is considered secondary, since it is on the list of common sites of metastases and reported together with lung cancer. Code the brain tumour as Secondary malignant. Code the lung cancer as primary, since the only other reported neoplasm is on the list of common sites of metastases.

Example 17:
1 (a) Cancer growth in liver and lymph nodes

2 Malignant neoplasm of stomach

The cancer growth in liver and lymph nodes is considered secondary, since they are both on the list of common sites of metastases. Code as Secondary malignant neoplasm of liver and lymph node, and as Malignant primary neoplasm of stomach.

Example 18:

1 (a) Cancer of lung, pleura and chest wall

Code the cancer of lung as primary, since the other sites mentioned on the certificate, pleura and chest wall, are on the list of common sites of metastases. Code cancer of pleura and chest wall as secondary.

Example 19:

1 (a) Mesothelioma of pleura and lymph nodes

Mesothelioma of pleura is in the code range for primary malignant neoplasms. The malignant neoplasm of lymph nodes is considered secondary, since lymph nodes is on the list of common sites of metastases.

Example 20:

1 (a) Lung cancer

2 Stomach cancer

Code both lung cancer and stomach cancer as primary. Although lung is on the list of common sites of metastases, it is the only malignant neoplasm mentioned in Part 1 of the certificate, and the coding of lung cancer is not influenced by neoplasms mentioned in another part of the certificate.

Example 21:

1 (a) Cancer of bladder

(b) Cancer of kidney

Code both cancer of bladder and cancer of kidney as primary, since neither is on the list of common sites of metastases, and neither is described as primary.

Example 22:

1 (a) Osteosarcoma of sacrum

(b) Clear cell cancer of kidney

Code both malignant neoplasms as primary. Bone is on the list of common sites of metastases, but osteosarcoma is indexed as a primary cancer of bone. Also, it is of different morphology than clear cell cancer of kidney.

Example 23:

1 (a) Osteosarcoma of lung
The morphology indicates a primary neoplasm of bone, and the reported site (lung) is incompatible with the morphology. Code to osteosarcoma of unspecified site, also add a code for secondary malignant neoplasm of lung.

If all sites are on the list of common sites of metastases, then code all sites as secondary. It is recommended that you also add a code for unknown primary. Code ‘primary malignant neoplasm of unspecified site’, if no morphology is stated. If the morphology is stated, then code to the ‘unspecified site’ code for the morphology involved.

C. More than one primary malignant neoplasm

More than one primary malignant neoplasm may be reported on the same certificate. Code each primary malignant neoplasm. Indications of several primary malignant neoplasms are:

- different morphologies;
- a site-specific morphology reported with a malignant neoplasm of another site that is not on the list of common sites of metastases;
- the sites are not on the list of common sites of metastases:
  - if one morphology term is less specific and covers a more specific term that is also used on the certificate, then consider the two as referring to the same neoplasm;
  - do not consider ‘cancer’ or ‘carcinoma’ as morphologic terms, but as synonyms to ‘malignant neoplasm’.

Example 24:

1. (a) Transitional cell carcinoma of bladder
2. Osteosarcoma, primary in knee

Bladder on 1(a) is not on the list of common sites of metastases. The malignant neoplasm reported in Part 2 is specified as primary. Further, the two neoplasms are of different morphology and both are considered primary. Code as Malignant neoplasm of bladder and primary osteosarcoma of knee.

Example 25:

1. (a) Hepatoma
   (b) Cancer of breast

The morphology ‘hepatoma’ indicates a primary malignant neoplasm of liver. The breast cancer is also considered primary, since breast is not on the list of common sites of metastases. Code as Hepatoma and primary malignant neoplasm of breast.

Example 26:

1. (a) Oat cell carcinoma
   (b) Cancer of breast

The morphology ‘oat cell carcinoma’ indicates a primary malignant neoplasm of lung. The breast cancer is also considered primary, since breast is not on the list of common sites of metastases. Code as primary, although lung is on the list of common sites of metastases, and primary Malignant neoplasm of breast.
D. Site not clearly indicated

If a malignant neoplasm is described as in the ‘area’ or ‘region’ of a site, or if the site is prefixed by ‘peri’, ‘para’, ‘pre’, ‘supra’, ‘infra’ or similar expressions, then first check whether this compound term is included in the Alphabetical index.

If the compound term is not in the Alphabetical index, then code morphologies classifiable to one of the categories: - Malignant melanoma of skin - Other malignant neoplasms of skin - Mesothelioma, - Kaposi sarcoma - Peripheral nerves and autonomic nervous system - Connective and soft tissue - Meninges - Brain - Other parts of central nervous system to the appropriate subdivision of that category. If the compound term is not in the Alphabetical index and the morphology is not classifiable to the categories above, or the morphology is not stated, then code to the appropriate subdivision of Neoplasm of other and ill-defined sites.

Example 27:

1 (a) Fibrosarcoma in the region of the pancreas

Code as Malignant neoplasm of connective and soft tissue of abdomen.

Example 28:

1 (a) Carcinoma in the lung area

Code as Malignant neoplasm of other and ill-defined sites, within the thorax. When the site of a primary malignant neoplasm is not specified, do not make any assumption of the primary site from the location of other reported conditions such as perforation, obstruction or haemorrhage. These conditions may arise in sites unrelated to the neoplasm. For example, intestinal obstruction may be caused by the spread of a malignant neoplasm of ovary.

Example 29:

1 (a) Obstruction of intestinea
   
   (b) Carcinoma

Code the carcinoma as Malignant neoplasm, without specification of site.

E. Primary site unknown

If the certificate states that the primary site is unknown and does not mention a possible primary site, code to the category for unspecified site for the morphological type involved. For example, code adenocarcinoma to ‘primary site unknown’.

Example 30:

1 (a) Secondary carcinoma of live
   
   (b) Primary site unknown

The certificate states that the primary site is unknown. For line 1(b), use the code for primary carcinoma without specification of site.
Example 31:

1 (a) Generalized metastases

(b) Melanoma

(c) Primary site unknown

The certificate states that the primary site is unknown. Code as primary malignant melanoma of unspecified site.

However, if the certificate mentions a probable or possible primary site, disregard the expression indicating doubt and code to that site. See also Section 6.3.2, (Uncertain diagnosis).

Example 32:

1 (a) Secondary carcinoma of liver

(b) Primary site unknown, possibly stomach

The certificate states that the primary site is unknown, but it also mentions stomach as a possible primary site. Ignore ‘possibly’ and code line 1(b) as Primary malignant neoplasm of stomach.

If the certificate mentions several possible primary sites, select a code according to the instructions in Section 6.3.3 A, (One condition, either one site or another) above.

Example 33:

1 (a) Secondary carcinoma of liver

(b) Primary site unknown, probably stomach or colon.

The certificate states that the primary site is unknown, but it also mentions stomach or colon as a possible primary site. Code line 1(b) as primary Malignant neoplasm of ill-defined sites within the digestive system.

F. Overlapping sites

The introduction to Chapter 02 describes the contents and the intended use of subcategory .8 for malignant neoplasms of overlapping sites. In mortality coding, however, the codes for malignant neoplasms of overlapping sites should be used only if the lesion has been expressly described as overlapping, or if the anatomical term used on the death certificate indicates an overlapping site. Do not use the codes for overlapping lesions if a malignant neoplasm has spread from one part of an organ or organ system to another part of the same organ or organ system.

Example 34:

1 (a) Overlapping malignant neoplasm of tongue and floor of mouth

Code as Overlapping lesion of lip, oral cavity and pharynx. The neoplasm is described as overlapping.

Example 35:
1 (a) Malignant neoplasm of rectosigmoid colon

Code as Malignant neoplasm of rectosigmoid junction. The term ‘rectosigmoid’ indicates an overlapping site. It is not sufficient that the certificate enumerates contiguous sites. In that case, code the sites one by one according to the instructions given above.

Example 36:

1 (a) Malignant neoplasm of colon and gallbladder

There is no statement that ‘colon and gallbladder’ refers to an overlapping neoplasm. None of the sites is on the list of common sites of metastases, and consequently they are considered as two independent primary sites. Code as primary Malignant neoplasm of colon, and primary Malignant neoplasm of gallbladder.

G. ‘Metastatic’ cancer

Note: The expression ‘metastatic’ is a problem mainly in the English language. Other countries should translate only as much as needed of Section 6.3.5 G. Neoplasms qualified as metastatic are always malignant, either primary or secondary. However, the adjective ‘metastatic’ is used in two ways, sometimes meaning a secondary from a primary elsewhere and sometimes denoting a primary that has given rise to metastases.

(a) Malignant neoplasm ‘metastatic from’ a specified site

If a malignant neoplasm is described as ‘metastatic from’ a specified site, or if a ‘due to’ relationship implies a spread from a specified site, that site should be considered primary. This also applies to sites on the list of common sites of metastases.

(b) Malignant neoplasm ‘metastatic to’ a specified site

If a malignant neoplasm is described as ‘metastatic to’ a specified site, or if a ‘due to’ relationship implies a spread to a specified site, that site should be considered secondary, whether the site is on the list of common sites of metastases or not. However, if a morphology classifiable to categories primarily subdivided by histopathology is reported, code to the ‘unspecified site’ subcategory of that morphological type.

(c) Malignant neoplasm metastatic of site A to site B

A malignant neoplasm described as metastatic of site A to site B should be interpreted as primary of site A and secondary of site B.

(d) ‘Metastatic’ malignant neoplasm on the list of common sites of metastases

Except for lung, code a ‘metastatic’ neoplasm of a site on the list of common sites of metastases as secondary, even if no other neoplasm is mentioned on the certificate. For ‘metastatic’ neoplasm of lung, see Section 6.3.5 G, Metastatic cancer, subsection (f), ‘Metastatic’ cancer of lung.

Exception: code a neoplasm of a site on the list of common sites of metastases as primary when it is reported as due to a condition that increases the risk of a malignant neoplasm of that site or tissue.

Exception: code a neoplasm of a site on the list of common sites of metastases as primary if it is the only malignant neoplasm mentioned on the certificate.
(e) ‘Metastatic’ malignant neoplasm not on the list of common sites of metastases

If the only malignant neoplasm is specified as ‘metastatic’ and the site is not on the list of common sites of metastases, then code as primary malignant neoplasm of that particular site.

If one or more neoplasms specified as ‘metastatic’ are reported on the certificate and there is also another malignant neoplasm that is not specified as ‘metastatic’, then code the neoplasm not specified as ‘metastatic’ as primary and the ones specified as ‘metastatic’ as secondary. This applies also to neoplasms not on the list of common sites of metastases, if specified as metastatic.

Example 37:

1 (a) Bladder cancer

(b) Metastatic prostate cancer

Code as Secondary prostate cancer and primary bladder cancer. The order of entry does not impact on the coding.

(f) ‘Metastatic’ cancer of lung

If the only malignant neoplasm mentioned is ‘metastatic’ neoplasm of lung, code to primary Malignant neoplasm of lung. Also code a ‘metastatic’ neoplasm of lung as Primary malignant neoplasm of lung, if all other neoplasm sites reported on the death certificate are on the list of common sites of metastases. If another malignant neoplasm is mentioned that is not on the list of common sites of metastases, then code a ‘metastatic’ malignant neoplasm of lung as Secondary malignant neoplasm of lung.

(g) ‘Metastatic’ neoplasm of a specific morphology

If the certificate reports a malignant neoplasm specified as ‘metastatic’ of a morphological type classifiable to a cancer category that mentions a specific histopathology only, and the site reported is consistent with the morphological type, then code to a primary malignant neoplasm of the specified morphological type. Use the appropriate site subcategory for the specified morphological type or site.

If the ‘metastatic’ cancer reported on the certificate and the site is not consistent with the morphological type, then code to a secondary malignant neoplasm of the specified site. Also add a code for a primary malignant neoplasm of unspecified site for the stated morphological type.

Example 38:

1 (a) Osteosarcoma of sacrum, metastatic

The site sacrum is consistent with a primary cancer of bone. Code as primary osteosarcoma of sacrum.

Example 39:

1 (a) Osteosarcoma of kidney, metastatic
Code osteosarcoma of kidney as a Secondary malignant neoplasm, because the specified site (kidney) is not consistent with osteosarcoma, which is primary in bone. Also code in the cluster, Osteosarcoma of unspecified site.

6.3.5 Sequelae

A. Sequelae of tuberculosis

Sequelae of tuberculosis include conditions specified as such or as arrested, cured, healed, inactive, old or quiescent, unless there is evidence of active tuberculosis. It does not include chronic tuberculosis, which should be coded as active infectious disease.

B. Sequelae of trachoma

Sequelae of trachoma include residuals of trachoma specified as healed or inactive and certain specified sequelae, such as blindness, cicatricial entropion and conjunctival scars, unless there is evidence of active infection. It does not include chronic trachoma, which should be coded as active infectious disease.

C. Sequelae of viral encephalitis

Sequelae of viral encephalitis include conditions specified as such, and late effects present one year or more after onset of the causal condition. It does not include chronic viral encephalitis, which should be coded as active infectious disease.

D. Sequelae of other infectious and parasitic diseases

Sequelae of other infectious and parasitic diseases include conditions specified as such or as arrested, cured, healed, inactive, old or quiescent. Sequelae also include conditions present one year or more after onset of conditions classifiable to categories, unless there is evidence of active disease. It does not include chronic infectious and parasitic diseases, which should be coded as active infectious and parasitic disease.

E. Sequelae of rickets

Sequelae of rickets include conditions stated to be a sequela or late effect of rickets, or previous rickets as the cause of conditions present one year or more after onset of rickets. It does not include chronic malnutrition or nutritional deficiency, which should be coded to current malnutrition or nutritional deficiency.

6.3.6 Consistency between sex of patient and diagnosis

Most categories of ICD–11 apply to persons of both sexes. However, some diseases are more likely to occur in one sex than in the other. A list of those conditions is given in the Annex.

If there is an apparent inconsistency between the sex of the deceased and the code selected for a cause of death reported on the certificate, then the coder should check the information and make sure that no reporting error occurred.

Follow any additional information provided by the certifier. If it turns out that the code is in fact correct, in spite of the apparent inconsistency, then the code should be kept. In such cases, it might be useful to add a note to the statistics that the reported cause of death has been verified and is correctly reported and coded. If no additional information can be obtained and the reported cause of death is fully incompatible with the sex of the deceased
and there is no indication of sex-change treatment, then code, Other ill-defined and unspecified causes of mortality. In such cases, a note can be added to the statistical publication, specifying the number of cases recoded to that category because of sex and cause inconsistencies that could not be verified.

6.3.7 Specific instructions on other ICD categories

A. Rheumatic fever with heart involvement

If there is no statement that the rheumatic process was active at the time of death, assume activity if the heart condition (other than terminal conditions and bacterial endocarditis) that is specified as rheumatic, or stated to be due to rheumatic fever, is described as acute or subacute. In the absence of such description, the terms ‘carditis’, ‘endocarditis’, ‘heart disease’, ‘myocarditis’ and ‘pancarditis’ can be regarded as acute if either the interval from onset is less than one year or, if no interval is stated, at ages under 15 years. ‘Pericarditis’ can be regarded as acute at any age.

B. Pneumonia and immobility

Code pneumonia, organism unspecified reported with immobility or reduced mobility to Hypostatic pneumonia, unspecified.

C. Obstetric death of unspecified cause, Obstetric deaths 42 days 1 year after delivery, sequelae of direct obstetric causes

These categories classify obstetric deaths according to the time elapsed between the obstetric event and the death of the woman. These categories should be complemented in the cluster by a code indicating the specific cause of death with a code from the appropriate chapter of ICD.

D. Perinatal deaths

Use a code from Chapter 19, Certain conditions originating in the perinatal period, if:

1. the condition is indexed to a code in Chapter 19;
2. there is an index entry for the specified condition as congenital/perinatal/newborn, and the duration of the condition indicates that the condition developed in the neonatal or perinatal period. This applies even if the condition is not specified as neonatal or perinatal on the certificate.

For some conditions diagnosed below a specific age, it is assumed that the condition was congenital, see the following section, Congenital malformations, deformations and chromosomal abnormalities.

Further, for children less than 28 days old, assume that a reported condition developed in the perinatal period, unless the duration is stated and the onset was after the first completed week of life.

Note that some types of conditions are excluded from Chapter 19, such as:

- Tetanus neonatorum
- Congenital gonococcal infection
- Congenital syphilis
• HIV disease
• Infectious diseases acquired after birth
• Intestinal infectious diseases
• Neoplasms
• Hereditary haemolytic anaemia
• Transient hypogammaglobulinaemia of infancy
• Endocrine, nutritional and metabolic diseases
• Certain congenital diseases of the nervous system
• Congenital cardiomyopathy
• Intestinal obstruction or paralytic ileus
• Pemphigus neonatorum and Staphylococcal scalded skin syndrome (L00)
• Cradle cap
• Diaper [napkin] dermatitis
• Developmental anomalies
• Injury, poisoning and certain other consequences of external causes

E. Developmental anomalies

Conditions classified as Developmental anomalies should be coded as such if the duration of the condition indicates that it existed from birth, even if the condition is not specified as congenital on the certificate. Further, the following conditions should be coded congenital at the ages stated, provided there is no indication that they were acquired after birth. 1. Under 1 year: aneurysm, aortic stenosis, atresia, atrophy of brain, cyst of brain, deformity, displacement of organ, ectopia, hypoplasia of organ, malformation, pulmonary stenosis, valvular heart disease. Under 4 weeks: heart disease NOS, hydrocephalus NOS.

F. Complications of surgical and medical care

Whenever a complication of a procedure is not indexed or is not a synonym of an inclusion or indexed term, code early complications and mechanical complications to the appropriate section in chapter 20, ‘Injury or harm arising from surgical and medical care, not elsewhere classified’. Code late complications and longstanding complications of organ function to the appropriate system chapter.

6.4 Routine use and special cases

6.4.1 Routine cause of death

In routine cause of death reporting systems, every individual death is certified by a qualified medical doctor who carries out an accurate post mortem examination, collects history from relatives, and has access to all pre-existing medical information about the defunct. The medical certification of the cause of death is usually the responsibility of the attending physician, and should be in line with international recommendations. Administrative procedures should ensure confidentiality of data from death certificates or other medical records.

In the case of deaths certified by coroners or other legal authorities, the medical evidence supplied to the certifier should be stated on the certificate in addition to any legal findings.
Routine cause of death reporting is usually embedded in the certification of death process. Death certificates are a legal requirement for burial and for inheritance.

### 6.4.2 Verbal autopsy

Verbal autopsy (VA) is a method used to ascertain the cause of a death based on an interview with next of kin or other caregivers. This is done using a standardized questionnaire that elicits information on signs, symptoms, medical history, and circumstances preceding death. The cause of death, or the sequence of causes that led to death, are assigned based on the data collected by the questionnaire and other available information. Rules and guidelines, algorithms or computer programs, may assist in evaluating the information to determine the cause of death (11). The main objective of the VA is to describe the causes of death at the community or population level in areas, where civil registration and death certification systems are weak and where most people die at home without having had contact with the health system. A standard VA instrument comprises a VA questionnaire, cause of death or mortality classification system, and diagnostic criteria (either expert or data derived algorithms) for deriving causes of death. The VA process consists of interviews, data recording, and identification of the cause of death from the reports. At any step, factors can influence the cause-specific mortality fractions estimated throughout the process. Besides research, VA is a viable method for causes of death identification in settings where no physician can evaluate the deceased.

### 6.4.3 Maternal mortality

A maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. Maternal deaths are subdivided into two groups.

- **Direct obstetric deaths**: those resulting from obstetric complications of the pregnant state (pregnancy, labour, and puerperium), and from interventions, omissions, incorrect treatment, or from a chain of events resulting from any of the above.
- **Indirect obstetric deaths**: those resulting from previous existing disease or disease that developed during pregnancy and not due to direct obstetric causes, but were aggravated by the physiologic effects of pregnancy.

In order to improve the quality of maternal mortality data and provide alternative methods of collecting data on deaths during pregnancy or anything related to pregnancy, as well as to encourage the recording of deaths from obstetric causes occurring more than 42 days following termination of pregnancy, the Forty-third World Health Assembly in 1990 adopted the recommendation that countries consider including questions regarding current pregnancy and pregnancy within one year preceding death on death certificates.

Maternal mortality is part of the Millennium Development Goals (MDGs), and of the Sustainable Development Goals (SDG) that serve to monitor the impact of the joint work of the international community in this field.

If pregnancy, childbirth, or puerperium is mentioned anywhere on the certificate, in most cases the underlying cause is coded to Chapter 18 (Pregnancy, childbirth and the puerperium). This is either because the underlying cause selected by applying Step SP1–M4 is classified to Chapter 18 according to the Alphabetical index, or because there is a special
code in Chapter 18 for the condition if it appears during pregnancy, childbirth and the puerperium. Apply the following instructions to determine if an underlying cause which is indexed to other parts of the ICD should be classified to Chapter 26, Extension codes. Note that these instructions do not apply to conditions that are indexed to Chapter 18 in the Alphabetical index.

- If pregnancy, childbirth or puerperium is reported anywhere on the certificate but it is not clearly stated that pregnancy, childbirth or puerperium contributed to the death, first contact the certifier and ask for additional information.
- If the certifier states that the death was a complication of pregnancy, childbirth or puerperium, code the underlying cause to Chapter 18, Pregnancy, childbirth and the puerperium.
- If the certifier states that the death was not a complication of pregnancy, childbirth or puerperium, do not code the underlying cause to Chapter 18, Pregnancy, childbirth and the puerperium.
- If you cannot obtain any additional information, but pregnancy, childbirth or puerperium is mentioned in Part 1 or Part 2 of the certificate, code the underlying cause to Chapter 18, Pregnancy, childbirth and the puerperium.
- If the underlying cause you selected is classifiable to ‘Maternal infectious and parasitic diseases classifiable elsewhere but complicating pregnancy, childbirth and the puerperium’ and ‘Other maternal diseases classifiable elsewhere but complicating pregnancy, childbirth and the puerperium’, then add to the cluster the corresponding code from Chapter 1-18 as a multiple cause of death. This is important because otherwise crucial information on the death will not be retrievable.

Note that some conditions are not coded to Chapter 18, Pregnancy, childbirth and the puerperium, even if they occurred during pregnancy, childbirth or puerperium, see the Excludes note at the beginning of Chapter 18, Pregnancy, childbirth and the puerperium.

**Example 1:**

1. (a) **Amniotic fluid embolism**

   The underlying cause, amniotic fluid embolism, is indexed to Chapter 18.

**Example 2:**

1. (a) **Pulmonary oedema**

   caused by

   (b) **Mitral regurgitation, pregnancy**

   The underlying cause, mitral regurgitation, is coded to Chapter 18 because pregnancy is mentioned in Part 1. Code the underlying cause to diseases of the circulatory system complicating pregnancy, childbirth and the puerperium. Also add to the cluster the code for mitral regurgitation as a contributing cause of death.

**Example 3:**

1. (a) **Haemorrhage**

   caused by
(b) Cervical cancer Treatment delayed because of pregnancy

The underlying cause, cervical cancer, is coded to Chapter 18 because pregnancy is mentioned in Part 2. Code the underlying cause to other specified diseases and conditions complicating pregnancy, childbirth and the puerperium. Also add to the cluster the code for cervical cancer as a contributing cause of death.

Example 4:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(a) Hepatic failure caused by</td>
</tr>
<tr>
<td></td>
<td>(b) Dengue haemorrhagic fever 5 days</td>
</tr>
<tr>
<td></td>
<td>Additional information: 40 days postpartum</td>
</tr>
</tbody>
</table>

Code the underlying cause to other viral diseases complicating pregnancy, childbirth and the puerperium. Also add to the cluster the code for dengue haemorrhagic fever as a contributing cause of death.

6.4.4 Infant mortality

Infant mortality refers to death of children under the age of 1 year and older than 28 days. It is an indicator for quality of life and health infrastructure.

6.4.5 Child and infant mortality

Child mortality (Under-5 mortality rate – probability of dying by age of 5 years, and infant mortality rate – probability of dying by age of 1 year) is a leading indicator of the level of child health, quality of life, health infrastructure, and overall development in countries. It is also the MDG indicator number 4.

6.4.6 Perinatal mortality

The legal requirements for the registration of fetal deaths and live births vary from country to country and between countries. If possible, all fetuses and infants weighing at least 500 g at birth, whether alive or dead, should be included in the statistics. When information on birth weight is unavailable, the corresponding criteria for gestational age (22 completed weeks) or body length (25 cm crown-heel) should be used. The criteria for deciding whether an event has taken place within the perinatal period should be applied in the order:

1. birth weight,
2. gestational age,
3. crown-heel length.

The inclusion of fetuses and infants weighing between 500 g and 1000 g as stated in national statistics is recommended both because of its inherent value and because it improves the coverage of reporting at 1000 g and over. For perinatal mortality statistics, full-scale multiple-cause analysis of all conditions reported will be of the greatest value. Whenever possible, a separate certificate of cause of perinatal death should be completed, in which the causes are to be set out as follows:

(a) main disease or condition in foetus or infant
(b) other diseases or conditions in foetus or infant
(c) main maternal disease or condition affecting foetus or infant
(d) other maternal diseases or conditions affecting foetus or infant
(e) other relevant circumstances.

The reliability of the neonatal mortality estimates depends on accuracy and completeness of reporting and recording of births and deaths. Under-reporting and misclassification are common, especially for deaths occurring in newborns.

6.5 Perinatal mortality: guidelines for certification

With the update of the *International form of medical certificate of cause of death* in 2016, just one certificate is used for all cases (see Annex 14.1). Care needs to be taken to correctly fill in the specific section for perinatal deaths on the certificate. The previously recommended perinatal death certificate should be replaced by the form in Annex.

7 Main Uses of the ICD: Morbidity

Morbidity data are used for statistical reporting mostly on national or local levels. While some of this statistical reporting is conducted within an academic research context, it is commonly conducted in applied settings to inform health system and public health agency decision-making. ICD coded data also form the basis of different casemix systems such as different varieties of Diagnosis Related Groups (DRGs). Coded morbidity data can also be used to inform a variety of clinical guidelines through provision of foundational information on burden of disease.

7.1 What is coded: Conditions of patient

The health care practitioner responsible for the patient’s treatment is also responsible for documenting the patient’s health conditions. This information should be organized systematically by using standard recording methods. A properly completed record is essential for good patient management. It is also an essential prerequisite to the creation of a valid coded record of patient diagnoses, derived through a coding process from written information describing a patient’s medical condition. When a sound written record of patient conditions is available, successful coding of this information in ICD and associated classifications produces a valuable source of epidemiological and other statistical data on morbidity and other health care problems. The person transforming the information on the stated condition to codes (the ‘coder’) may be the health care practitioner or a clinical coder who is not responsible for the patient’s treatment. In the latter situation, which is quite common among member countries, the coder depends on the adequacy of clinical documentation of patient condition by health care practitioners in the medical record. The primary importance of clinical documentation by health care practitioners as the starting point for coded health data cannot be overstated, and needs to be underlined as being a matter of key importance within countries and internationally – with implications for health information and clinical documentation teaching within health care practitioner training programs.
7.2 Documentation principles related to morbidity coding

Morbidity data are increasingly being used in the formulation of health policies and programs, and in their management, monitoring and evaluation, in epidemiology, in identification of risk populations, and in clinical research (including studies of disease occurrence in different socioeconomic groups). Record as the main condition the condition that is determined to be the reason for admission, established at the end of the episode of health care. That definition of main condition is to be applied for both, inpatients and outpatients. (Importantly, and as mentioned earlier, this is a change in the WHO’s main condition definition that existed in ICD–10.) 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. Other conditions are defined as those conditions that coexist or develop during the episode of health care and affect the management of the patient. It is recommended, where practicable, to carry out multiple-condition coding and analysis to supplement the routine data.

7.2.1 Guidelines for recording diagnostic information for morbidity data analysis

The health-care practitioner responsible for the patient’s treatment should select the main condition to be recorded, as well as any other conditions, for each episode of health care. The term episode is used for all settings, including hospital admissions. It is acknowledged that the definition may be different in each country, though it is most often considered to be a contiguous hospital care period, which begins on the first day of a person’s admission to a care facility and ends on the day upon which they are discharged from that facility. (Some countries consider sequential care periods on different wards within the same hospital to be distinct episodes of care.)

In the context of these morbidity coding rules, the term practitioner is used throughout the morbidity rules to mean physician or any qualified health care practitioner who is legally accountable for establishing the patient’s diagnosis. This information should be organized systematically by using standard recording methods. A properly completed record is essential for good patient management and is a valuable source of epidemiological and other statistical data on morbidity and other health-care problems.

Specificity and detail

Each diagnostic statement should be as informative as possible in order to classify the condition to the most specific ICD category. Examples of such diagnostic statements include:
- transitional cell carcinoma of trigone of bladder
- acute appendicitis with localized peritonitis
- meningococcal pericarditis
- pregnancy-induced hypertension
- diplopia due to reaction to antihistamine taken as prescribed
- osteoarthritis of hip due to an old hip fracture
- fracture of neck of femur following a fall at home
- full thickness burn of palm of left hand due to grilling accident

Unconfirmed diagnoses

If no definite diagnosis has been established by the end of an episode of healthcare, then the information that permits the greatest degree of specificity and knowledge about the condition that necessitated care or investigation should be recorded. This should be done by stating a symptom, abnormal finding or problem, and also reporting the unconfirmed
diagnosis qualifying it as 'provisional diagnosis', when it has been considered but not established. In case the unconfirmed diagnosis has resulted in treatment, it should be mentioned first – together with the extension code 'provisional'. In case the unconfirmed diagnosis has in monitoring only, it should be mentioned second – together with the extension code 'rule out'.

**Contact with health services for reasons other than illness**

Episodes of health care or contact with health services are not restricted to identification, treatment or investigation of current illness or injury. Episodes may also occur when someone who may not currently be sick requires or receives limited care or services; the details of the relevant circumstances should be recorded as the ‘main condition’. Examples include: - monitoring of previously treated conditions - immunization - contraceptive management, antenatal and postpartum care - surveillance of persons at risk because of personal or family history - examinations of healthy persons, e.g. for insurance or occupational reasons - seeking of health-related advice - requests for advice by persons with social problems - consultation on behalf of a third party. Chapter 24 (Factors influencing health status and contact with health services) provides a broad range of categories (QA00–QF9Z) for classifying these circumstances; reference to this chapter will give an indication of the detail required to permit classification to the most relevant category.

**Conditions due to external causes**

When a condition such as an injury, poisoning or other effect of external causes is recorded, it is important to document fully both the nature of the condition and the circumstances that gave rise to it. For example: ‘fracture of neck of femur caused by fall due to slipping on pavement’; ‘cerebral contusion caused when patient lost control of car, which hit a tree’; ‘accidental poisoning—patient drank disinfectant in mistake for soft drink’; or ‘severe hypothermia—patient fell in her garden in cold weather’.

**Documentation of sequelae**

Where an episode of care is for the treatment or investigation of a residual condition (sequela) of a disease that is no longer present, the sequela should be fully described and its origin stated, together with a clear indication that the original disease is no longer present. For example: ‘deflected nasal septum—fracture of nose in childhood’, ‘contracture of Achilles tendon – late effect of injury to tendon’, or ‘infertility due to tubal occlusion from old tuberculosis’. Where multiple sequelae are present and treatment or investigation is not directed predominantly at one of them, a statement such as ‘sequelae of cerebrovascular accident’ or ‘sequelae of multiple fractures’ is acceptable.

### 7.2.2 Guidelines for selecting ‘main condition’ and ‘other conditions’ for coding purposes

The main condition is the condition that is determined to be the reason for admission, established at the end of the episode of health care by the practitioner. If more than one condition is recorded as the main condition, see coding rule MB1 in the section below on reselection of a main condition when the original selection is incorrect. Whenever possible, a record with an obviously inconsistent or incorrectly recorded main condition should be returned for clarification.
Where an episode of health care concerns a number of related conditions present at admission and contributing to the need for admission (e.g. multiple injuries, multiple sequelae of a previous illness or injury, or multiple conditions occurring in human immunodeficiency virus [HIV] disease), the one that is mentioned first should be recorded as the ‘main condition’ and the others as ‘other conditions’.

The ‘main condition’ and ‘other conditions’ relevant to an episode of health care should have been recorded by the responsible health-care practitioner. If clarification of potential erroneous documentation is not possible, Rules MB1 to MB3 (Section on morbidity rules below) will help the coder to deal with some of the more common causes of incorrect recording. The guidelines given below are for use when the coder may be unclear as to which code should be used.

For clinical and resource allocation purposes, in many instances, the manifestation of a disease (kind and severity e.g. ulcer stage 3) may be more relevant during a specific treatment episode than the underlying disease (e.g. Diabetes mellitus). For prevention programs at national levels, knowledge about the underlying aetiology may be more important. Quality and safety will require reporting additional detail related to the stay. For comprehensive analysis and use of morbidity data, it is crucial to have a dataset with multiple fields covering all the aspects above.

Type 2 extension codes (a new section of codes in ICD–11) will provide a number of distinct codes that serve as concept modifying flags for marking how the diagnosis is to be used and/or interpreted. These extension code modifiers include:

- Reason for admission
- Most resource intensive condition
- Tentative (provisional) diagnosis
- Differential diagnosis
- Present on admission
- Arising after admission during hospital stay

For more detail about the use of extension codes, which identify additional characteristics about the diagnoses, see section 4.2.7.

**Example 1:**

A patient is admitted with a myocardial infarction, for which he stays in hospital for 5 days without any notable complications.

Myocardial infarction & ‘reason for admission as determined after the stay’

(Note that the above cluster uses an ‘&’ to postcoordinate the myocardial infarction stem code with the extension code for ‘reason for admission determined after the stay’.)

**Example 2:**

A patient is admitted to hospital with myocardial infarction and then develops a stroke that leads to a one month hospitalization.

Myocardial infarction is the main condition because it was the reason for admission. Stroke is then postcoordinated with a diagnosis-type extension code flag indicating that the diagnosis arose after admission. i.e.

‘Myocardial infarction’ & ‘reason for admission as determined after the stay’
‘Stroke’ & ‘developed after admission’

**Example 3:**

A patient is admitted to the hospital with pneumonia and congestive heart failure. The final diagnosis recorded by the responsible health care practitioner is:

- Pneumonia
- Congestive Heart Failure

There are two possible main conditions. Pneumonia is selected as the main condition because it was mentioned first. As mentioned earlier, a coder must attempt to judge which of the two candidate conditions is most severe or consuming a greater amount of resources, based on the provider’s documentation, to thus be selected as the main condition. If presence at admission, severity or resource use are difficult to discern between possible main conditions, the first one is selected.

Such a system with diagnosis flags meets the objectives of countries that want a reason-for-admission coding rule, while also meeting the objectives of countries that want to be able to make inferences regarding complications of care and resource consumption (of relevance to casemix systems).

As mentioned earlier, there are some health care episodes that are not related to the treatment of or investigation of current illness of injury (e.g., monitoring of previously-treated conditions, immunization visits, seeking of health-related advice). In such situations, a code for the main condition can potentially be found in ICD–11 Chapter 24 (Factors influencing health status and contact with health services).

It has been recommended that ‘other conditions’, in relation to an episode of care, should be recorded in addition to the main condition, even for single-cause analysis, since this information may assist in choosing the correct ICD code for the main condition.

**7.2.2.1 Coding of conditions with cluster coding**

A significant new feature in ICD–11 is an embedded functionality for the clustering (or linking) of related diagnostic concepts to better capture the clinical narrative surrounding an episode of care. This so-called postcoordination of diagnostic concepts is now possible in ICD–11. The postcoordinated coding of conditions is shown as an example here. For additional detail see also section 5.

Case is reported with:

- Condition 1. diabetes mellitus type 2
- Condition 2. diabetic retinopathy
- Condition 3. arterial hypertension.

Cluster the Codes for condition 1 as follows: 6A11 Type 2 diabetes mellitus / ME90.Z Diabetic retinopathy, unspecified

Code condition 2 as follows: CA10 Essential hypertension
7.2.2.2 Coding of suspected conditions, symptoms, abnormal findings and non-illness situations

If the period of health care was for an inpatient, the coder should be cautious about classifying the main condition to Chapters 21 and 24. If a more specific diagnosis has not been made by the end of the inpatient stay, or if there was truly no codable current illness or injury, then codes from the above chapters are permissible (see also Rules MB3 and MB5, Section 8.2.2.9). The categories can be used in the normal way for other episodes of contact with health services.

If, after an episode of health care, the main condition is still recorded as ‘suspected’, ‘questionable’, etc., and there is no further information or clarification, the suspected diagnosis must be coded as if established.

The Category for ‘Medical observation and evaluation for suspected diseases and conditions’ applies to suspected diagnoses that were ruled out after investigation.

Example 4:

Main condition: Suspected acute cholecystitis
Other conditions: -

Code to acute cholecystitis as ‘main condition’.

Example 5:

Main condition: Severe epistaxis
Other conditions: -

Patient in hospital one day. No procedures or investigations reported.

Code to epistaxis. This is acceptable since the patient was obviously admitted to deal with the immediate emergency only.

7.2.2.3 Coding of multiple conditions

Where multiple conditions are recorded in the documentation as ‘Multiple …’, and no single condition predominates, the code for the ‘Multiple …’ category should be used as the preferred code, where data system can retain one code only. Additional codes are added to the cluster for individual conditions listed where the data system can handle the postcoordination. Ideally all the multiple conditions are coded in a cluster (see cluster coding). Such coding applies mainly to conditions associated with HIV disease, to injuries and sequelae.

7.2.2.4 Coding of combination categories

The ICD provides certain categories where two conditions or a condition and an associated secondary process can be represented by a single code. Such combination categories should be used as the main condition where appropriate information is recorded. Two or more conditions recorded under ‘main condition’ may be linked if one of them may be regarded as an adjectival modifier of the other.
Example 6:

Main condition: Renal failure

Other conditions: Hypertensive renal disease

Code to hypertensive renal disease with renal failure and add to the cluster a code for chronic renal failure, stage unspecified.

Example 7:

Main condition: Glaucoma secondary to eye inflammation

Other conditions: -

Code to glaucoma due to eye infection.

Example 8:

Main condition: Intestinal obstruction

Other conditions: Left inguinal hernia

Code to unilateral or unspecified inguinal hernia and add to the cluster a code for intestinal obstruction.

Example 9:

Main condition: Diabetic cataract. Type 1 diabetes mellitus

Other conditions: Hypertension

Specialty: Ophthalmology

Code the Type 1 diabetes mellitus and add to the cluster a code for ‘diabetic cataract’.

Example 10:

Main condition: Type 2 diabetes mellitus

Other conditions: Hypertension

Rheumatoid arthritis

Cataract

Specialty: General medicine

Code to type 2 diabetes mellitus as ‘main condition’. Note that in this example the linkage of cataract with diabetes must not be made since they are not both recorded under ‘main condition’.

7.2.2.5 Coding of external causes of morbidity

For injuries and other conditions due to external causes, both the nature of the condition and the circumstances of the external cause should be coded. The preferred ‘main condition’ code should be that describing the nature of the condition. This will often, but not always,
be classifiable to Chapter 22. The code from Chapter 23 indicating the external cause is used as an additional code.

**Example 11:**

<table>
<thead>
<tr>
<th>Main condition:</th>
<th>Fracture of neck of femur caused by fall due to tripping on uneven pavement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other conditions:</td>
<td>Contusions to elbow and upper arm</td>
</tr>
</tbody>
</table>

Code to fracture of neck of femur as ‘main condition’. The external cause code for fall on same level from slipping, tripping or stumbling on street or highway (place of occurrence) may be used as an optional additional code linked to the fracture code through clustering in a string code representation.

**Example 12:**

<table>
<thead>
<tr>
<th>Main condition:</th>
<th>Severe hypothermia- patient fell in her garden in cold weather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other conditions:</td>
<td>Senility</td>
</tr>
</tbody>
</table>

Code to hypothermia as ‘main condition’ and add to the cluster the external cause code for exposure to excessive natural cold and for site ‘at home’.

**Example 13:**

<table>
<thead>
<tr>
<th>Main condition:</th>
<th>Diplopia due to reaction to antihistamine taken as prescribed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other conditions:</td>
<td>-</td>
</tr>
</tbody>
</table>

Code to diplopia as the ‘main condition’ and add to the cluster the external cause code for antiallergic and antiemetic drugs causing adverse effects in therapeutic use and the code for mode of harm ‘medication taken as prescribed at correct dose’.

**Example 14:**

<table>
<thead>
<tr>
<th>Main condition:</th>
<th>Haemoglobinuria caused by training for marathon run (training on outdoor track at stadium)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other conditions:</td>
<td>-</td>
</tr>
</tbody>
</table>

Code to haemoglobinuria due to haemolysis from other external causes as ‘main condition’ and add to the cluster the external cause code for overexertion and strenuous, repetitive movements at sports and athletics area.

### 7.2.2.6 Coding of acute and chronic conditions

Where the condition is recorded as being both acute (or subacute) and chronic, and the ICD provides separate categories or subcategories for each, but not for the combination, the category for the acute condition should be sequenced first, followed by the chronic
condition. When an appropriate combination code is provided for both the acute and chronic condition, assign only the combination code.

**Example 15:** Main condition: Acute and chronic cholecystitis

Other conditions:

Code to acute cholecystitis as the ‘main condition’. The code for chronic cholecystitis is added to the cluster.

**Example 16:** Main condition: Acute exacerbation of chronic obstructive bronchitis

Other conditions:

Code to chronic obstructive pulmonary disease with acute exacerbation as the ‘main condition’ since the ICD provides an appropriate single precoordinated code for the combination.

### 7.2.2.7 Coding of postprocedural conditions and complications

For certain acute complications of surgical and other procedures Chapter 21 provides categories, for example surgical wound infections, mechanical complications of implanted devices, or shock. Most body-system chapters also contain categories for permanent conditions that occur either as a consequence of specific procedures and techniques or as a result of the removal of an organ, e.g. postmastectomy lymphoedema syndrome, post-irradiation hypothyroidism. Some conditions (e.g. pneumonia, pulmonary embolism) that may arise in the postprocedural period are not considered unique entities and are, therefore, coded in the usual way, but an optional additional code from PC70-PD5Z may be added to identify the relationship to a procedure, and an extension code indicating the timing of onset of a condition diagnosed during a hospital stay (e.g. ‘diagnosis arose after admission’). When postprocedural conditions and complications are recorded as the main condition, reference to modifiers or qualifiers in the Alphabetical Index is essential for choosing the correct code.

**Example 17:** Main condition: Hypothyroidism since thyroidectomy 1 year ago

Other conditions: -

Specialty: General medicine

Code to postsurgical hypothyroidism as the ‘main condition’ and add a code for ‘endocrine procedure as the cause of injury’ to the cluster. (Note: A third mode/mechanism code associated with surgical procedure as a cause of injury can also be included in the cluster, if a discrete mode of injury is apparent in the medical record. Mode/mechanism codes associated with health care interventions are discussed in detail below in section 8.4.3.)

**Example 18:** Main condition: Excessive haemorrhage after tooth extraction

Other conditions: Pain

Specialty: Dentistry

Code to haemorrhage resulting from a procedure as the ‘main condition’. And add to the cluster a code for ‘Dental procedure as the cause of injury’. (A third mode/mechanism code associated with surgical procedure as the cause of injury can also be included, if a specific mode is apparent.)
Example 19: Main condition: Postoperative psychosis after plastic surgery

Other conditions: 

Specialty: Psychiatry

Code to psychosis as the ‘main condition’ and add a code for other specified surgical procedures [as the cause of abnormal reaction of the patient]] to the cluster to indicate the postprocedural relationship. The related diagnoses can then be linked through the available clustering mechanism.

7.2.2.8 Rules for reselection when the main condition is incorrectly recorded

The responsible health-care practitioner indicates the ‘main condition’ to be coded, and this should normally be accepted for coding subject to the guidelines above and in the chapter-specific notes. However, certain circumstances or the availability of other information may indicate that the health-care practitioner has not followed the correct procedure. In this instance, clarification of the main condition should be obtained from the responsible health-care practitioner. If it is not possible to obtain clarification from the health-care practitioner, one of the following rules may be applied and the ‘main condition’ reselected.

Rules for reselection of main condition

Rule MB1. Several conditions recorded as ‘main condition’

If several different conditions (they cannot be classified to a single stem code) are recorded as the ‘main condition’, and other details on the record point to one of them as the ‘main condition’ for which the patient received care, select that condition. If there is the ability to record more than one main condition (for example, in addition to the ‘reason for admission’ reporting also ‘main resource condition’), a code(s) from Chapter 26, Extension codes, should be assigned to indicate the different types of main condition that are reported. If the "main condition" cannot be determined based on documentation, query the provider. If the setting does not allow for provider query, then select the condition first mentioned.

Example 20:

Main condition: Cataract. Staphylococcal meningitis. Ischaemic heart disease

Other conditions: 

Specialty: Neurology

Patient in hospital for five weeks.

Code staphylococcal meningitis as the 'main condition'.

Example 21:

Main condition: Chronic obstructive bronchitis. Hypertrophy of prostate. Psoriasis vulgaris
Other conditions: -
Specialty: Outpatient in the care of a dermatologist

Code psoriasis vulgaris as the 'main condition'.

Example 22:

Main condition: Mitral stenosis. Acute bronchitis. Rheumatoid arthritis
Other conditions: -
Specialty: General medicine

No information about therapy.

Code mitral stenosis, the first mentioned condition, as the 'main condition'.

Example 23:

Main condition: Chronic gastritis. Secondary malignancy in axillary lymph nodes. Carcinoma of breast
Other conditions: -
Procedure: Mastectomy

Code malignant neoplasm of breast as the 'main condition'.

Example 24:

Main condition: Premature rupture of membranes. Breech presentation. Anaemia
Other conditions: -
Procedure: Spontaneous delivery

Code premature rupture of membranes unspecified, the first mentioned condition, as the 'main condition'.

Rule MB2. Condition recorded as ‘main condition’ is presenting symptom of diagnosed, treated condition If a symptom or sign (usually classifiable to Chapter 21), or a problem classifiable to Chapter 24, is recorded as the ‘main condition’ and this is obviously the presenting sign, symptom or problem of a diagnosed condition recorded elsewhere and care was given for the latter, reselect the diagnosed condition as the ‘main condition’.

Example 25: Main condition: Haematuria
Other conditions: Varicose veins of legs
Papillomata of posterior wall of bladder

Treatment: Diathermy excision of papillomata

Specialty: Urology

The haematuria is caused by the papillomata of the bladder, which is the focus of treatment by excision. Re-select papillomata of posterior wall of bladder as the ‘main condition’ and code accordingly.

Example 26: Main condition: Coma

Other conditions: Ischaemic heart disease

Otosclerosis

Type I diabetes mellitus

Specialty: Endocrinology

Care: Establishment of correct dose of insulin

Re-select type 1 diabetes mellitus as the ‘main condition’ and add a code for diabetic coma as the first entry in the cluster. The information provided indicates that the coma was due to diabetes mellitus and coma is taken into account as it modifies the coding.

Example 27: Main condition: Abdominal pain

Other conditions: Acute appendicitis

Procedure: Appendectomy

Re-select acute appendicitis as the ‘main condition’ and code accordingly.

Example 28: Main condition: Febrile convulsions

Other conditions: Anaemia

Procedure: No information about therapy

Code febrile convulsions as the ‘main condition’. Rule MB2 does not apply since the ‘main condition’ as reported is not a presenting symptom of the other reported condition.

Rule MB3. Signs and symptoms Where a symptom or sign is recorded as the ‘main condition’ with documentation that it may be due to either one condition or another, select the symptom as the ‘main condition’. Where two or more conditions are recorded as diagnostic options for the ‘main condition’, select the first condition recorded.

See also 'Coding of multiple conditions and coding of combination categories.'

Example 29: Main condition: Headache due to either stress and tension or acute sinusitis

Other conditions:

Select headache as the ‘main condition’ and code accordingly.
Unlikely main condition

Where a condition, or an incidental problem, is recorded as the ‘main condition’, and a more life threatening or contagious condition, relevant to the treatment given and/or the specialty that cared for the patient, is recorded as an ‘other condition’, query the provider and if the reason for admission was reported incorrectly, you will need to reselect the latter as the ‘main condition’.

Example 30:

<table>
<thead>
<tr>
<th>Main condition:</th>
<th>Acute sinusitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other conditions:</td>
<td>Carcinoma of endocervix</td>
</tr>
<tr>
<td></td>
<td>Hypertension</td>
</tr>
<tr>
<td>Patient in hospital for three weeks</td>
<td></td>
</tr>
<tr>
<td>Procedure:</td>
<td>Total hysterectomy</td>
</tr>
<tr>
<td>Admission:</td>
<td>Acute sinusitis, carcinoma of cervix accidentally discovered during stay</td>
</tr>
<tr>
<td>Admission specialty:</td>
<td>Ear, nose and throat</td>
</tr>
<tr>
<td>Treating specialty:</td>
<td>Gynaecology</td>
</tr>
</tbody>
</table>

Keep Acute sinusitis as the ‘main condition’. The case has been reported correctly, in view of timing of diagnosis. Even though the carcinoma of the cervix is a more life threatening condition and was treated during this episode, the main condition remains as acute sinusitis as that was the reason for admission. The notes indicate the carcinoma of the cervix was discovered accidentally during the stay.

Example 31:

<table>
<thead>
<tr>
<th>Main condition:</th>
<th>Rheumatoid arthritis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other conditions:</td>
<td>Diabetes mellitus</td>
</tr>
<tr>
<td></td>
<td>Strangulated femoral hernia</td>
</tr>
<tr>
<td></td>
<td>Generalized arteriosclerosis</td>
</tr>
<tr>
<td>Patient in hospital for two weeks.</td>
<td></td>
</tr>
<tr>
<td>Procedure:</td>
<td>Herniorrhaphy</td>
</tr>
<tr>
<td>Specialty:</td>
<td>Surgery - no other specialty involved.</td>
</tr>
</tbody>
</table>

Clarify if the reason for admission is definitely the rheumatoid arthritis, and if so, code rheumatoid arthritis as the main condition and cluster code the strangulated femoral hernia with a code from the extension code chapter to identify it as a condition arising during the stay. However, in this example, if the likely reason for admission was the hernia, then reselect strangulated femoral hernia as the ‘main condition’.

Example 32:

<table>
<thead>
<tr>
<th>Main condition:</th>
<th>Epilepsy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other conditions:</td>
<td>Otomycosis</td>
</tr>
</tbody>
</table>
Specialty: Ear, nose and throat

Reselect otomycosis as the ‘main condition’. The case has been reported incorrectly, in view of the treating specialty and the documented procedure.

**Example 33:**

<table>
<thead>
<tr>
<th>Main condition: Congestive heart failure</th>
<th>Other conditions: Fracture neck of femur due to fall during hospitalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient in hospital for four weeks</td>
<td>Internal fixation of fracture</td>
</tr>
<tr>
<td>Procedure:</td>
<td>Internal medicine for 1 week then</td>
</tr>
<tr>
<td>Specialty:</td>
<td>transfer to orthopaedic surgery for treatment of fracture</td>
</tr>
</tbody>
</table>

Keep the congestive heart failure as the main condition (reason for admission) and postcoordinate the code for fractured neck of femur with a code from the extension code chapter to identify it as a condition arising during the stay. Additional coding may be necessary to identify all dimensions of this case for the purposes of patient safety analysis.

**Example 34:**

<table>
<thead>
<tr>
<th>Main condition: Cerebrovascular accident</th>
<th>Other conditions: Diabetes mellitus, Hypertension, Cerebral haemorrhage</th>
</tr>
</thead>
</table>

Reselect cerebral haemorrhage as the ‘main condition’.

**Example 35:**

<table>
<thead>
<tr>
<th>Main condition: Congenital heart disease</th>
<th>Other conditions: Ventricular septal defect</th>
</tr>
</thead>
</table>

Reselect ventricular septal defect as the ‘main condition’ and add a code for congenital heart disease to the cluster.

**Example 36:**

<table>
<thead>
<tr>
<th>Main condition: Enteritis</th>
<th>Other conditions: Crohn disease of ileum</th>
</tr>
</thead>
</table>

Reselect Crohn disease of ileum as the ‘main condition’.

**Example 37:**

<table>
<thead>
<tr>
<th>Main condition: Dystocia</th>
<th>Other conditions: Hydrocephalic foetus, Fetal distress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedure: Caesarean section</td>
<td></td>
</tr>
</tbody>
</table>

Reselect obstructed labour due to other abnormalities of foetus.
7.2.3 Chapter-specific notes

Guidance is given below for specific chapters where problems may be encountered in selecting preferred ‘main condition’ codes. The preceding general guidelines and rules apply to all chapters unless a specific chapter note states otherwise.

7.2.3.1 Chapter 1: Infectious and parasitic diseases

Human immunodeficiency virus [HIV] disease

A patient with a compromised immune system due to HIV disease may sometimes require treatment during the same episode of care for more than one disease, for example mycobacterial and cytomegalovirus infections. Only subcategories for stage, tuberculosis and malaria are provided in this block for HIV disease. Code the appropriate subcategory as selected by the health-care practitioner, and add a code for the HIV caused disease to the cluster.

Example 1: Main condition: HIV disease and Kaposi sarcoma
Other conditions: -

Code to HIV disease, stage unspecified and add a code for the Kaposi sarcoma to the cluster.

Example 2: Main condition: Toxoplasmosis and cryptococcosis in HIV patient
Other conditions: -

Code to HIV disease, stage unspecified and add the codes for toxoplasmosis and cryptococcosis to the cluster.

Example 3: Main condition: HIV disease Stage 4 with Pneumocystis carinii pneumonia, Burkitt lymphoma and oral candidiasis
Other conditions: -

Code to HIV disease clinical stage 4. Additional codes for Pneumocystis carinii pneumonia, Burkitt lymphoma and oral candidiasis may be added to the cluster, if desired.

7.2.3.2 Chapter 2: Neoplasms

When coding neoplasms, refer to the instructions at the level of the individual categories regarding code assignment and the use of additional morphological or site descriptions from the extension codes.

A neoplasm, whether primary or metastatic, that is the focus of care during a relevant episode of health care, should be recorded and coded first in the cluster. When the ‘main condition’ as recorded by the health-care practitioner is a primary neoplasm that is no longer present (having been removed during a previous episode of care), code first the neoplasm of the secondary site, the current complication, or the appropriate circumstance codable to Chapter 24, Factors influencing health status or contact with health services for reasons other than illness that was the focus of the treatment or investigation during the current episode of care, add an appropriate code from Chapter 24 for personal history of neoplasm and the code for the removed primary neoplasm at the end of the cluster.
Example 1:  Main condition: Carcinoma of prostate  
Other conditions: Chronic bronchitis  
Procedure: Prostatectomy  
Code to malignant neoplasm of prostate as the ‘main condition’. Code Chronic bronchitis in a separate cluster.

Example 2:  Main condition: Carcinoma of breast resected two years ago  
Other conditions: Secondary carcinoma in lung  
Procedure: Bronchoscopy with biopsy  
Code to Malignant neoplasm metastasis in lung and add to the same cluster the code for Personal history of malignant neoplasm of breast in conjunction with the code for Carcinoma of the breast.

Example 3:  Main condition: Previously excised bladder cancer. Admitted for follow-up examination by cystoscopy  
Other conditions: -  
Procedure: Cystoscopy  
Code to Follow-up examination after surgery for malignant neoplasm. The code for Personal history of malignant neoplasm of urinary tract is added to the cluster as an additional code and a code for the Bladder cancer.

Metastatic malignant neoplasms, except of lymphoid, haematopoietic, central nervous system or related tissues, unspecified  
The code should be used alone for coding only when the malignancy is described as 'disseminated metastases' or 'metastatic carcinoma' (or other similar terms as described in the inclusion list of the code) and the specific sites are not documented.

Unspecified malignant neoplasms of ill-defined or unspecified sites  
This code should be used only when the health care practitioner has clearly recorded the neoplasm as an unknown primary site or as an unspecified malignancy, assumed primary.

Malignant neoplasms of independent, primary multiple sites  
Malignant neoplasms of independent (primary) multiple sites should be coded separately when the health-care practitioner records as the main condition two or more independent primary malignant neoplasms, none of which predominates. Additional codes to identify the individual neoplasms are added to the cluster to identify the individual malignant neoplasms listed. Codes from the extension codes may be added to the cluster to identify additional detail of the histopathology and the site.

Example 4:  Main condition: Carcinomatosis  
Other conditions: -  
Code to Metastatic malignant neoplasms, except of lymphoid, haematopoietic, central nervous system or related tissues, unspecified and add a code for Unspecified malignant neoplasms of ill-
defined or unspecified sites in the same cluster. An appropriate code from Chapter 24 for personal history of neoplasm should be used for a primary neoplasm that is no longer present.

Example 5:

Main condition: Multiple myeloma and primary adenocarcinoma of prostate

Code to Malignant neoplasms of independent, primary multiple sites and add the codes for Plasma cell myeloma and Malignant neoplasm of prostate. A code from the extension codes to identify the multiple myeloma may be added as optional additional code to the cluster in conjunction with the Plasma cell myeloma.

7.2.3.3 Chapter 3: Diseases of the blood or blood-forming organs

Certain conditions classifiable to this chapter may result from drugs or other external causes. Codes from Chapter 20 may be used as optional additional codes.

Example 1:

Main condition: Trimethoprim-induced folate deficiency anaemia

Other conditions: none

Code Drug-induced folate deficiency anaemia and add a code for ‘Drugs medicaments and biological substances associated with injury or harm in therapeutic use, Other systemic anti-infectives and antiparasitics, Antimalarials and drugs acting on other blood protozoa’ in the same cluster together with a code for ‘Drugs medicaments and biological substances associated with injury or harm in therapeutic use, Other systemic anti-infectives and antiparasitics’. A code to identify trimethoprim may be used as an optional additional code from the extension codes in the same cluster.

7.2.3.4 Chapter 5: Endocrine, nutritional or metabolic diseases

Certain conditions classifiable to this chapter may result from drugs or other external causes. Codes from Chapter 23 may be used as optional additional codes.

Diabetes mellitus

In coding the selection of an appropriate additional category that describes the complication should be based on the ‘main condition’ as recorded by the health-care practitioner. Code all reported complications individually in the same cluster.

Example 1:

Main condition: Kidney failure due to diabetic glomerulonephrosis

Other conditions: -

Code to Unspecified diabetes mellitus and add a code for the Kidney failure, unspecified in the same cluster.

Example 2:

Main condition: Type 1 diabetic with nephropathy, gangrene and diabetic cataract

Other conditions: -

Code to Type 1 diabetes mellitus and add codes for the Kidney failure unspecified, Gangrene and Diabetic cataract in the same cluster.
Carcinoid syndrome

This code is not to be used alone if a carcinoid tumour is recorded, unless the episode of care was directed predominantly at the endocrine syndrome itself and the tumor is not reported.

7.2.3.5 Chapter 6: Mental, behavioural or neurodevelopmental disorders

In some categories there is provision for optional additional codes. Dementias always have to be coded in combination with the underlying etiology.

7.2.3.6 Chapter 8: Diseases of the nervous system

Certain conditions classifiable to this chapter may result from the effects of drugs or other external causes. Codes from Chapter 23 may be used as optional additional codes.

Late effect of cerebrovascular disease

These codes are not to be used as the preferred code for the ‘main condition’ if the nature of the residual condition is recorded.

Paralytic symptoms

These codes are not to be used alone if a current cause is recorded, unless the episode of care was mainly for the paralysis itself and the cause is not recorded.

Example 1: Main condition: Cerebrovascular accident with hemiplegia

Other conditions:

Specialty: Neurology

Code Stroke not known if ischaemic or haemorrhagic and add the code for (Hemiplegia, unspecified) may be used as an optional additional code.

Example 2: Main condition: Cerebral infarction three years ago

Other conditions: Paralysis of left leg

Patient receiving physical therapy

Code Monoplegia of lower extremity, unspecified as ‘main condition’. Late effect of cerebral ischaemic stroke may be used as an optional additional code.

7.2.3.7 Chapter 9: Diseases of the visual system

Visual impairment) These codes are not to be used alone if the cause is recorded, unless the episode of care was mainly for the blindness itself and the cause of blindness is not recorded.

7.2.3.8 Chapter 10: Diseases of the ear or mastoid process

Acquired hearing impairment

These codes are not to be used alone if the cause is recorded, unless the episode of care was mainly for the hearing loss itself and the cause was not recorded.
7.2.3.9 Chapter 11: Diseases of the circulatory system

Secondary hypertension

This code is not to be used alone if the cause is recorded. When coding to the cause, secondary hypertension is used as additional code to indicate that this manifestation has been relevant in the context of a treatment.

7.2.3.10 Chapter 15: Diseases of the musculoskeletal system or connective tissue

Many musculoskeletal conditions are treated without knowing the underlying disease. In such cases only the musculoskeletal condition is coded. Wherever the underlying condition is known, it is coded at the second place in the coding cluster.

7.2.3.11 Chapter 18: Pregnancy, childbirth or the puerperium

Complications following abortion and ectopic and molar pregnancy

These codes are not to be used alone, except where a new episode of care is solely for treatment of a complication, e.g. a current complication of a previous abortion. It may be used as an optional additional code to identify associated complications and to give fuller details of the complication.

Example 1: Main condition: Ruptured tubal pregnancy with shock

Specialty: Gynaecology

Code ruptured tubal pregnancy and in the same cluster the shock following abortion and ectopic and molar pregnancy.

Example 2: Main condition: Incomplete abortion with perforation of uterus

Specialty: Gynaecology

Code Unspecified abortion with Other specified complications following abortion, ectopic or molar pregnancy and add in the same cluster codes indicating complication of medical care and the resulting injury, the perforation of the uterus.

Example 3: Main condition: Disseminated intravascular coagulation following abortion performed two days ago at another facility

Specialty: Gynaecology

Code Delayed or excessive haemorrhage following abortion, ectopic or molar pregnancy. No other code is required since the abortion was performed during a previous episode of care.

Delivery

Use of these codes to describe the ‘main condition’ should be limited to cases where the only information recorded is a statement of delivery or the method of delivery. These codes may be used as additional codes to indicate a method or type of delivery where no separate data item or procedural classification is being used for this purpose.

Example 4: Main condition: Pregnancy

Other conditions:
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<table>
<thead>
<tr>
<th>Procedure:</th>
<th>Low forceps delivery</th>
</tr>
</thead>
</table>

Code Single delivery by forceps or vacuum extraction as ‘main condition’ since no other information is provided.

**Example 5:**

<table>
<thead>
<tr>
<th>Main condition:</th>
<th>Pregnancy delivered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other conditions:</td>
<td>Failed trial of labour</td>
</tr>
<tr>
<td>Procedure:</td>
<td>Caesarean section</td>
</tr>
</tbody>
</table>

Code Failed trial of labour, unspecified as the ‘main condition’. The code for Single delivery by caesarean section, unspecified, is used as an additional code in the same cluster.

**Example 6:**

<table>
<thead>
<tr>
<th>Main condition:</th>
<th>Twin pregnancy delivered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other conditions:</td>
<td></td>
</tr>
<tr>
<td>Procedure:</td>
<td>Spontaneous delivery</td>
</tr>
</tbody>
</table>

Code Twin pregnancy as the ‘main condition’. Multiple delivery, all spontaneous may be added as an optional additional code.

**Example 7:**

<table>
<thead>
<tr>
<th>Main condition:</th>
<th>Term pregnancy delivered of dead foetus, 2800 g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other conditions:</td>
<td>-</td>
</tr>
<tr>
<td>Procedure:</td>
<td>Spontaneous delivery</td>
</tr>
</tbody>
</table>

For the mother, code to Maternal care for intrauterine death if no specific reason for the fetal death can be determined.

**Certain maternal diseases classifiable elsewhere but complicating pregnancy, childbirth or the puerperium**

The subcategories provided should be used as ‘main condition’ codes in preference to categories outside Chapter 18 when the conditions being classified have been indicated by the health-care practitioner to have complicated the pregnant state, to have been aggravated by the pregnancy, or to have been the reason for obstetric care. The pertinent codes from other chapters may be used as optional additional codes to allow specification of the condition.

**Example 8:**

<table>
<thead>
<tr>
<th>Main condition:</th>
<th>Toxoplasmosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other conditions:</td>
<td>Pregnancy undelivered</td>
</tr>
<tr>
<td>Specialty:</td>
<td>High-risk antenatal clinic</td>
</tr>
</tbody>
</table>

Code Protozoal diseases complicating pregnancy, childbirth or the puerperium as the main condition. A code for Toxoplasmosis, unspecified is used as an additional code in the cluster to identify the specific organism.

**7.2.3.12 Chapter 21: Symptoms, signs or clinical findings, not elsewhere classified**

Categories from this chapter should not be used as ‘main condition’ codes unless the symptom, sign or clinical finding was clearly the main condition treated or investigated during an episode of care and was unrelated to other conditions recorded by the health-care
practitioner. See also Rule MB3 and the introduction to Chapter 21 in Volume 1 for further information.

**7.2.3.13 Chapter 22: Injury, poisoning or certain other consequences of external causes**

Where multiple injuries are recorded and no one of these has been selected as the ‘main condition’, code to one of the categories provided for statements of multiple injuries of:

- same type to the same body region;
- different types to the same body region; and
- same type to different body regions

and code in the same cluster, after the code for ‘multiple’ the individual injuries separately

Note the following special cases:

- for internal injuries recorded with superficial injuries and/or open wounds only, code to internal injuries first in the cluster that has all the injuries;
- for fractures of skull and facial bones with associated intracranial injury, code to the intracranial injury first in the cluster that has all the injuries;
- for intracranial haemorrhage recorded with other injuries to the head only, code to intracranial haemorrhage first in the cluster that has all the injuries; and
- for fractures recorded with open wounds of the same location only, code to fracture first in the cluster that has all the injuries.

When the multiple injury categories are used, codes for any individual injuries listed are used as additional codes in the same cluster.

**Example 1:** Injury of bladder and urethra

*Other conditions:* -

Code to Injury of multiple pelvic organs and add codes for Injury of bladder and Injury of urethra in the same cluster.

**Example 2:** Open intracranial wound with cerebellar haemorrhage

*Other conditions:* -

Code to Traumatic intracerebellar haemorrhage and add the code for Open wound of head, unspecified

Categories are provided in Chapter 22 for Injury or harm arising from surgical or medical care, not elsewhere classified, e.g. surgical wound infections, complications of implanted devices, shock, etc. Most body-system chapters also contain categories for conditions that occur either as a consequence of specific procedures and techniques or as a result of the removal of an organ, e.g. postmastectomy lymphoedema syndrome, post-irradiation hypothyroidism. Some conditions (e.g. pneumonia, pulmonary embolism) that may arise in the postprocedural period are not considered unique post procedural entities and, therefore, are not found with the codes for postprocedural disorders. An optional additional code from the block Causes of healthcare related harm or injury may be added to identify the relationship to a procedure.
7.2.3.14 Chapter 23: External causes of morbidity or mortality

These codes are not to be used as ‘main condition’ codes. They are intended for use as optional additional codes to identify the external cause of conditions classified in Chapter 22, and may also be used as optional additional codes with conditions classified in any other chapter but having an external cause.

7.3 Special cases

The morbidity special tabulation list is intended as a basis for national lists and for inter-country comparison. National lists can be constructed by either condensing or expanding the core classification as appropriate. The list is suitable for data on inpatient care and, with suitable adaptation – notable aggregation of some items and expansion of items relating to Chapter 21 (Symptoms, signs or clinical findings, not elsewhere classified) and Chapter 24 (Factors influencing health status and contact with health services) -- for information from other sources, such as ambulatory care and surveys. When a local list is constructed, the key to the condensed categories should contain the three (or four) character codes of the core classification. The list has been designed for international comparisons of hospital morbidity statistics. This concise list allows for comparison of hospital activity, independent of health systems, and based on the version of the ICD in use. The conditions have been selected in a way that they can always be treated in an admission of at least 24 hours. If, after examination of the frequencies of the ICD four-character rubrics, it is necessary to expand the list, some of the items within ICD categories can be subdivided according to the core classification or even to the five-character level. If the recommended list is too detailed or if a shorter list is required, selection can be made based on national or local health concerns. Depending on a country’s ‘epidemiological profile’, categories may be combined to shorten the list.

7.3.1 Morbidity for clinical care

Clinical care comprises different levels of treatment, all of which mean a level of diagnostic capacity that is higher than in primary care. The ICD addresses this level of detail primarily through multidimensional coding. Secondary care refers to the health care services provided by medical specialists and other health professionals who generally do not have first contact with patients, for example, cardiologists, urologists, or dermatologists. It includes acute care, necessary treatment for a short period of time for a brief but serious illness, injury or other health condition, such as in a hospital emergency department. It also includes skilled attendants during childbirth, intensive care, and medical imaging services. ‘Secondary care’ is sometimes used synonymously with ‘hospital care’. However, many secondary care providers do not necessarily work in hospitals, such as psychiatrists, clinical psychologists, or physiotherapists, and some primary care services are delivered within hospitals. Depending on the organization and policies of the national health system, patients may be required to see a primary care provider for a referral before they can access secondary care. Tertiary care refers to specialized consultative health care, usually for inpatients and following a referral from a primary or secondary health professional, in a facility that has personnel and facilities for advanced medical investigation and treatment, such as a tertiary referral hospital.
7.3.2 Morbidity for epidemiology

Epidemiology is the study of the distribution and determinants of health-related states or events (including disease) and the application of this study to the control of diseases and other health problems. Various methods can be used to carry out epidemiological investigations: surveillance and descriptive studies are used to study distribution and analytical studies are used to study determinants. ICD coded data, either from morbidity and mortality sources, contribute to the understanding of the health of a population.

7.3.3 Morbidity for quality and patient safety

Coded health information is used to measure and report on various aspects of quality of care and patient safety (e.g. reporting on in-hospital mortality or adverse event rates for various conditions, or reporting on patient safety indicators). Users of this kind of health information are health system payers (e.g. ministries of health, or in privately-funded health care systems, health insurance companies) and other stakeholders, such as health quality councils, hospital administrators, clinical leaders/groups, or public advocacy organizations.

7.3.3.1 The quality and safety use case for ICD–11

The quality and safety use case of the ICD is based on the availability of large numbers of methodological tools that are originally based on ICD–10. Specific examples include the Charlson and Elixhauser co-morbidity indices, AHRQ Patient Safety (Agency for Healthcare Research and Quality) Indicators, the Hospital Standardized Mortality Ratio, and various other administrative data quality indicators. Most of these tools were actually first developed as ICD-9 or ICD-9-CM coding algorithm methodologies, and have only recently been translated, through rigorous research, to ICD–10. ICD–11 development involved restructuring to coding logic or structure (relative to ICD–10), and pre-existing tools for quality or patient safety reporting need to undergo similar translation work so that they can be applied in ICD–11. WHO recommendations on coding rules for hospital separation episodes improve comparability of records across hospitals and jurisdictions. Specific examples of coding rules include: a) rules for specifying the most responsible diagnosis, b) numbers of codes per record, c) code clustering mechanisms, and d) use of a status display system that distinguishes diagnoses arising during a hospital stay from those present at admission. Quality and patient safety reporting is often focused not only on diagnostic information available in the International Classification of Diseases, but also on procedure information, that is currently coded in various country-specific procedure coding systems. The harmonization of ontological concepts in international procedure coding systems will be important going forward. The available medical complication codes of ICD–11 are in line with current knowledge in the domain of safety and adverse events.

7.3.3.2 Reporting on indicators of quality of care and patient safety

This use case relates to the use of coded health information to measure and report on various aspects of quality of care and patient safety. (e.g., reporting on in-hospital mortality or adverse event rates for various conditions, or reporting on patient safety indicators). The initiating actor may be a health quality council, hospital administrators, clinical leaders/groups, a health system payer (e.g., ministries of health, or in privately-funded health care systems, health insurance companies) or a public advocacy ‘watch-dog’ organizations. The participating actors are hospital administrators, clinicians, health system
decision makers, public representatives, patients and their families, and sometimes even the media. Preconditions are: - Availability of person-level data on episodes of health care delivery (e.g., hospitalizations, physician visits) - Identifiers that permit attribution of the health care delivery episode to a provider, provider group, or a given health facility/hospital. - Clinical information on diagnoses present and procedures performed during a health care delivery episode. - Clinical information on relevant outcomes such as mortality, length of stay, and specific adverse events. - Analytical expertise among initiating actors so that attention is paid to data validity considerations, knowledge of ‘best’ indicators (e.g., the most valid patient safety indicators), risk adjustment methodology, etc. The outputs are reports containing information on dimensions of system quality. These can either provide global information on system performance, or comparative information stratified by provider unit (e.g. physician-level, hospital-level, or regional reporting).

1 Functionality:

An ideal course of events for such use would include:

- The initiating actor communicates desire to conduct quality/safety measurement and reporting to relevant stakeholders.
- Appropriate applications are made to secure access to the data needed to conduct the planned reporting.
- Appropriate methodological and clinical expertise is enlisted to ensure that best methodological practices are incorporated into the planned reporting, and that clinical face validity and acceptability are considered.
- Data analysis and reporting are undertaken.
- Broad dissemination and knowledge translation to stakeholders is undertaken. A continuous quality improvement process is undertaken in response to reports (with consideration given to quality improvement interventions, and repeat measurement after intervention). Exceptions: Quality/safety reporting that does not follow the sequence of steps described above can be compromised. Indeed, there are many historical instances of failed or suboptimal quality/safety reporting from administrative data because of skipped steps. (e.g., 1. quality reporting without valid indicators, or appropriate methodologies for risk adjustment, 2. quality reporting without good clinical face validity, 3. quality reporting without a Continuous Quality Improvement(CQI) mindset, etc.). Examples of sub-use cases (addressing the quality dimensions of effectiveness, efficiency, safety, access)
  - reporting on global mortality by facility (e.g., the hospital standardized mortality ratio - HSMR)
  - reporting on condition-specific mortality
  - reporting on patient safety indicators
  - reporting on global or condition-specific length of stay
  - reporting on readmission rates after hospitalization
  - reporting on global or condition-specific costs of care (e.g., cost per hospitalization)
  - reporting on waiting times
  - reporting on small area variability in utilization

2 Additional information:
Requirements: See ‘Preconditions’ section above. There needs to be ongoing development and refinement of quality reporting methodologies (in essence, ongoing research around the development of new administrative data quality indicators and new methodologies for risk adjustment in outcome/quality reporting). Assumptions: An underlying assumption in quality or patient safety reporting from administrative data is uniformity of data format and data validity across comparator units (i.e., across providers, hospitals, or jurisdictions). Uniformity in data format and validity is not always present, and has been a common reason for criticism of quality or patient safety reports derived from administrative data. In this regard, all ongoing WHO efforts towards achieving directive coding rules help to facilitate comparative reporting by reducing data variability across comparator units (e.g., rules on factors such as the definition of the ‘most responsible diagnosis’, numbers of possible codes per record, and the implementation of diagnosis-timing codes). See also the separate use case description for international comparative reporting.

7.3.3.3 Conceptual model for quality and patient safety

Exposure to health care events sometimes has unintended and undesired consequences. Health care, the people to whom it is provided and the complications that can arise in the course of care are highly diverse and complex. Representing them comprehensively in an information system is challenging, and is presently beyond the bounds of practicality for routine administrative information systems of the types that are intended to make use of the ICD. The conceptual model has three components: - harm to the patient: With what main consequence for the patient’s health? - cause or source of harm: What caused the harm? - mode or mechanism: In what way? How did the source of harm actually produce harm?

7.3.3.4 Overview of code-set in ICD–11 for quality and patient safety

A key feature of the Quality and patient safety code-set in ICD–11 is that a cluster of codes is required to represent a case. Provision for cluster-coding has been an aspect of the ICD since the 6th Revision, which introduced separate chapters for coding injuries and their external causes. It has also been prominent in ICD-9 and ICD–10 clinical modifications, often as a requirement to ‘code also’ a second concept to provide additional relevant information on a case. Use of the term ‘cluster’ is novel in ICD–11 and so is the extent and formalisation of the requirement for postcoordination. The cluster required to code a Quality and safety case has three codes, one for each of the three components of the model given above. The first component, Quality and patient safety Harm, is usually represented by a standard ICD–11 diagnosis code, from [almost] any chapter of the classification. Some forms of harm that can result from Quality and safety events are not adequately represented by a standard ICD–11 diagnosis code. A special set of categories to represent these forms of harm are provided in the injury chapter of ICD–11, under the heading Complications of Surgical and Medical Care, not elsewhere classified. Quality and patient Safety causes and sources of harm fall into four types of causes at the top level that capture events caused by:

1. substances (drugs and medicaments, etc.),
2. procedures,
3. devices, and
4. a mixed bag of other types of causes (e.g. problems associated with transfusions, or problems associated with diagnosis, including missed diagnosis, incorrect diagnosis, etc.).
The full Quality and safety cause code-lists are part of the Chapter 23, External causes.

Quality and safety Mode or Mechanism (‘Mode’ is used here) refers to the main way in which the Quality and safety Cause leads to the harm represented in the third concept, Quality and safety Harm. Quality and safety Modes are specific to the types of Quality and safety Cause. Examples are:

<table>
<thead>
<tr>
<th>Cause or Source of Harm</th>
<th>Mode or Mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substance</td>
<td>Overdose, under-dose, wrong substance.</td>
</tr>
<tr>
<td>Procedure</td>
<td>Accidental perforation of an organ during a procedure.</td>
</tr>
<tr>
<td>Device</td>
<td>Dislodgement. Malfunction.</td>
</tr>
<tr>
<td>Other cause</td>
<td>Mismatched blood. Patient dropped during transfer from OR table.</td>
</tr>
</tbody>
</table>

The third component, Quality and safety Harm, is usually represented by a standard ICD–11 diagnosis code, from [almost] any chapter of the classification. Some forms of harm that can result from Quality and safety events are not adequately represented by a standard ICD–11 diagnosis code. A special set of categories to represent these forms of harm are provided in the injury chapter of ICD–11, under the heading Complications of Surgical and Medical Care, not elsewhere classified.

7.3.3.5 Examples for the ICD–11 Quality and safety coding model

The ICD–11 Quality and safety coding model is demonstrated by the examples in the following table.

<table>
<thead>
<tr>
<th>Example</th>
<th>Case</th>
<th>Harm</th>
<th>Mode or Mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A woman has been admitted to hospital for stabilization of diabetes. She is erroneously prescribed three times the usual dose of a medication. The abnormally high dose is given and the patient has a hypoglycaemic episode.</td>
<td>Diabetes mellitus with hypoglycaemia</td>
<td>Overdose of substance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exposure to a drug, medicament or biological substance - Insulin and oral hypoglycaemic [anti-diabetic] drugs</td>
<td>Cause</td>
</tr>
<tr>
<td>2</td>
<td>A man attends a primary care physician for removal of a skin lump, mainly to exclude the possibility of malignancy. The lesion is excised and the wound is sutured. It later becomes known that the physician had Hepatitis C, and the patient has now contracted this disease.</td>
<td>Acute hepatitis C</td>
<td>Failure of sterile precautions</td>
</tr>
</tbody>
</table>
Cause: Procedures associated with injury or harm therapeutic use - Biopsy procedure

**Example 3** Case: An elderly woman is admitted due to a fractured neck of femur. Surgical fixation is undertaken. The operative site bleeds heavily the day after surgery, requiring return to theatre.

Harm: Haemorrhage

Mode or Mechanism: Mode of injury or harm associated with surgical procedure - unspecified

Cause: Medical or surgical procedure - Orthopaedic surgical procedure

**Example 4** Case: A 63 year old man had a knee-replacement less than a year ago, because of arthritis. The implanted device has come loose, resulting in pain and reduced function.

Harm: Loosening of internal joint prosthesis

Mode or Mechanism: Device failure

Cause: Orthopaedic devices associated with adverse incidents prosthetic and other implants, materials and accessory devices

**Example 5** Case: A man has bowel cancer. Abdominal surgery was done several days ago to resect the affected part of the colon and re-join the preserved part of the colon. The anastomosis has leaked, and required surgical revision.

Harm: Leaking anastomosis

Mode or Mechanism: Other specified mode. *Because none of the more specific types appears to provide for failure of anastomosis*..

Cause: Medical or surgical procedure - Gastrointestinal surgical procedure

Note that in each of these examples, a mode/mechanism of harm is coded alongside the cause of harm code for all cases. This is true, even when a mode of harm is not apparent. In the latter situations, a code for ‘mode or mechanism of injury unspecified’ should be selected, for any of substance-related harm, procedure-related harm, or device-related harm. The ‘other aspects of care’ category of causes of healthcare related harm is the exception to this, where there is typically only a need to code the ‘other aspects of care codes’ from Chapter 23 along with the actual harm or injury code from anywhere in the classification.

### 7.3.3.6 Recommendations for data capture and organization

Information systems must be capable of: - capturing the three components - marking the three codes as belonging to the same cluster (see also instructions for postcoordination and cluster coding)
7.3.3.7 Recommendations for use and interpretation of coded data

These recommendations apply to the use of records in which data were captured and organised as recommended in the previous section. - Select records involving a quality or patient safety event: these are all records with any quality or patient safety harm code. - Summarise types of quality or patient safety harm represented in a set of records: select records with any quality or patient safety harm code. Summarise the distribution of quality or patient safety Harm codes present in the selected set. - Summarise quality or patient safety causes of harm in a set of records. - Summarise quality or patient safety mechanisms in a set of records. - Summarise quality or patient safety harm in a set of records.

7.3.4 Morbidity for research purposes

The morbidity use case for ICD–11 includes a number of situations where the primary goal is to work in an academic research paradigm to extract information from ICD–11 coded data to study burden of disease, clusters of disease, geographic distribution of diseases, and health impacts associated with various diseases. The research paradigm is of course most relevant when it has translational relevance to either health system policy or public health policy, in which case the research paradigm, labelled as such, becomes indistinguishable from applied morbidity analyses conducted for the purpose of health planning. Nevertheless, explicit mention is made here of the widespread use of ICD–11 coded data in a research paradigm, recognizing that this is one of the significant drivers for developing a clinically rich and detailed classification system, with novel features and coding rules that enhance the classification's potential as a research tool.

7.3.5 Morbidity in primary care

Primary care has been defined as essential front line health care based on practical, scientifically sound, and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and the country can afford to maintain. Of relevance to primary care, ICD–11 includes many diagnostic and disease entities that are common reasons for searching contact with the health system at the first level of health services. ICD–11 has various primary-care tabular lists depending on the resource level. A primary care tabular list for low resource-settings enables simple reporting of broader concepts. A high and middle resource-setting tabular list is used when more sophisticated diagnoses and treatments are available. An International Classification of Disease for Primary Care (ICD-PCI) has been developed by the World Organization of National Colleges, Academies and Academic Associations of General Practitioners/Family Physicians (WONCA), through its WONCA International Classification Committee (WICC). WONCA and the WHO have collaborated in the updates of their classifications, and for ICD–11 have collaborated in filling previous gaps in the ICD for primary care use. As a result, new versions of WONCA's International Classification of Primary Care and ICD–11 share a common subset of categories. Both classifications are now fully derived classifications of the ICD and allow cross sectoral comparability, such as between primary care and hospital activity.

The ICD–11 has versions shaped for different primary care settings:

- Low resources setting - a simplified version.
- Middle resource setting.
High resource setting, the tabular list for mortality and morbidity statistics contains elements relevant to primary care and is thus able to be used in high resource environments for primary care, as well as for secondary and tertiary care. The middle resource version shares all concepts with ICPC, which allows the ICD or ICPC to be used interchangeably for primary care medicine settings.

7.3.6 Casemix groupings

In casemix grouping systems such as the Diagnosis Related Group (DRG) system, ICD based data are used for reimbursement or resource allocation. Such systems are used in systematic fashion (nationwide) in over 22 countries for reimbursement or resource allocation. The assignment of patient cases to groups is based on an algorithm using, in addition to coded diagnosis information, coded procedures and a number of other variables. The scientific basis of the casemix systems is grounded in healthcare economics and in the theory of medicine. Since casemix systems are an essential part of administration in countries that use them, smooth transfer to the new revision of the ICD in these systems is essential for the approval and implementation of the new revision. ICD–11 has been developed to accommodate the different levels of detail that are required in diagnosis-related casemix groupings, in close collaboration with the custodians of the diverse casemix systems. Joint use in a specific casemix system is driven by the relevant grouper algorithms, and partly also by national legislation. For matters of international comparability of hospital activity, it is recommended that countries adopt the new WHO definition of main diagnosis and that country implementations of ICD–11 apply the new extension codes for the type of diagnosis that are provided with ICD–11. For international tabulations, the resulting diagnoses are listed with the aid of the International Shortlist for Hospital Morbidity Tabulation.

7.4 Use of functioning in ICD-11n

Functioning embedded in ICD serves to allow a first documentation of functioning of an individual. Using selected subsets for the assessment of functioning has proven a useful method that is also used in the WHO Disability Assessment Scale (WHODAS), the Measurement of Disability Survey (MDS) and the generic core set. Where possible, the full ICF should be used for a complete reporting of functioning.

7.4.1 Description of functioning in ICD-11

Functioning refers to aspects of functioning that are potentially related one or more health condition. Fuctioning includes predefined ICF categories from the activities and participation (A&P) component of the ICF likely to be most relevant in the context of health. This does not preclude that a person may also experience problems in other aspects of functioning. In the ICD, these ICF categories are grouped into the following domains:

<table>
<thead>
<tr>
<th>Domains</th>
<th>Description of domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding Impact</td>
<td>Cognitive, mental or psychological processes involved in comprehending, thinking and making interpretations.</td>
</tr>
<tr>
<td>Communication Impact</td>
<td>Verbal or non-verbal processes including transmission or sharing of information between two or more people.</td>
</tr>
<tr>
<td>Life Management</td>
<td>Activities involving everyday actions, tasks and routines in different contexts such as home, school and work place</td>
</tr>
<tr>
<td>Activities Impact</td>
<td></td>
</tr>
</tbody>
</table>
Mobility Impact | An ability to move easily and freely by changing body position or from one location to another
Self-Care Impact | Activities necessary to care for oneself to maintain health and hygiene
Household Activities Impact | Activities involving everyday domestically-related activities such as cleaning the living area, washing and drying clothes, or shopping
Interpersonal Relations Impact | Interactions between people (e.g. family members, friends, relatives, strangers) in socially appropriate manners.
School Activities Impact | Activities related to and involvement in school activities
Work Activities Impact | Activities related to and involvement in work life
Social Participation Impact | Engagement and involvement in social and political life
Children and Youth Impact | Aspects of functioning that consider specific developmental characteristics of children and youth

The inclusion of functioning domains in the ICD-11 are designed to assist health professionals and professionals in related fields - to comprehensively describe aspects of functioning that are related to a person’s health condition. - in their daily decision-making, e.g. making a diagnosis, in treatment planning, monitoring outcomes and treatment response over time and along the continuum of care. - in examining eligibility for disability pension and other social welfare benefits or specific health services and programs. The use of Functioning by stakeholders in the health system who are responsible for program planning and resource allocation is intended to enable the systematic collection of information about the health and health-related problems and needs of persons living with a specific health condition. This data could be used to - plan programs and interventions - inform resource allocation - provide data for risk adjustment to inform optimal care planning. For all stakeholders in the health system, including researchers, functioning is a relevant outcome variable in the comparison of different treatment modalities. Functioning points to the use of ICF in the context of ICD. It is only in this context that a preselected set of ICF categories is to be coded within the context of ICD. The use of ICF in this context does not override the conceptual model underpinning the ICF which recognizes the multiple interactions among the domains of functioning and health.

7.4.2 Implementation of functioning patterns

In the ICD-11 contains a predefined functioning pattern for generic use that can be complemented by usecase specific patterns, as for rehabilitation of hand injuries, or aging. The setting will need to specify beforehand whether the generic pattern is used alone or in conjunction with a usecase specific pattern.

Option 1 is the default for any health condition. Option 2 applies for 100 rehabilitation-relevant health conditions, such as rheumatoid arthritis, obesity, or depression. Option 3 constitutes an extension of Option 1 and 2.

Option1: Default for any health condition:

The default set for any health condition is a set of 4 ICF categories. These four ICF categories are a selection of a minimal generic set to best describe variations in functioning across...
people with various health conditions\(^1\). The (G) after the category title always indicates that these are the 4 ICF categories from the A&P component derived from the minimal generic set, so-called ‘generic set’.

### Life Management Activities Impact

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>d230</td>
<td>Carrying out daily routine (G)</td>
</tr>
<tr>
<td></td>
<td>Described as carrying out simple or complex and</td>
</tr>
<tr>
<td></td>
<td>coordinated actions in order to plan, manage</td>
</tr>
<tr>
<td></td>
<td>and complete the requirements of day-to-day</td>
</tr>
<tr>
<td></td>
<td>procedures or duties, such as budgeting time</td>
</tr>
<tr>
<td></td>
<td>and making plans for separate activities</td>
</tr>
<tr>
<td></td>
<td>throughout the day.</td>
</tr>
<tr>
<td>d410</td>
<td>Changing basic body position</td>
</tr>
<tr>
<td></td>
<td>Changing basic body position</td>
</tr>
<tr>
<td>d415</td>
<td>Maintaining a body position</td>
</tr>
<tr>
<td>d420</td>
<td>Transferring oneself</td>
</tr>
<tr>
<td>d450</td>
<td>Walking (G)</td>
</tr>
<tr>
<td></td>
<td>Described as moving along a surface on foot,</td>
</tr>
<tr>
<td></td>
<td>step by step, so that one foot is always on</td>
</tr>
<tr>
<td></td>
<td>the ground, such as when strolling, sauntering,</td>
</tr>
<tr>
<td></td>
<td>walking forward, backwards, or sideways.</td>
</tr>
<tr>
<td>d455</td>
<td>Moving around (G)</td>
</tr>
<tr>
<td></td>
<td>Described as moving the whole body from one</td>
</tr>
<tr>
<td></td>
<td>place to another by means</td>
</tr>
</tbody>
</table>

To best describe varying levels of functioning across health conditions and along the continuum of care, ICD-11 users can decide to code an additional 13 ICF categories beyond the generic set categories.

---

\(^1\) (Cieza, Oberhauser, Bickenbach, Chatterji, & Stucki, 2014)
d465 Moving around using equipment

d470 Using transportation

**Self-Care Impact**

d510 Washing oneself

d520 Caring for body parts

d530 Toileting

d540 Dressing

d550 Eating

d570 Looking after one's health

**Household Impact**

d640 Doing housework

d660 Assisting others

**Interpersonal Relations Impact**

d710 Basic interpersonal interactions

d770 Intimate relationships

**Work Activities Impact**

d850 Remunerative employment (G)

**Social Participation Impact**

d920 Recreation and leisure

### 7.4.3 Coding functioning patterns

Once a user selects an ICD code, the functioning pattern opens up. Two coding rules are available for FPs. Each setting would have to specify beforehand which coding rule should be applied.

#### 7.4.3.1 ICF qualifier rule for coding

The ICF qualifier coding implies that the user is directed outside the ICD-11 to the ICF. The user would follow the coding instructions outlined in the ICF (WHO, 2001). A generic scale from 0 'no problem' to 4 'complete problem' is used in this context for coding the extent of functional impairments and restrictions. As with coding rule a) the coding of the FPs are documented in a distinct data field. Note: For certain purposes, such as predicting mortality, re-admission rates, length of stay, or monitoring disease activity and functioning over time, a single score on people’s functioning may be important. The creation of such a score would need to satisfy distinct attributes of measurement, such as uni-dimensionality and invariance across groups. More research is needed to establish such scores. It can be expected that in the future an impact score can be created by integrating information already collected in routine practice based on relevant psychometrical methods. Once such systems for score transformation are available, they can be integrated into the electronic format of the ICD-11.
7.4.3.2 Examples

In the following section, the coding instructions for use of Functioning are illustrated with four case examples. For each example both coding rules, including the extension for the binary coding rule, are outlined. The cases apply different options for specifying FPs: Example 1 deploys option 1; Example 2 constitutes a rehabilitation-relevant health condition and draws upon option 2 for the specification of FPs; Example 3 refers to option 3, and Example 4 illustrates how FPs can be specified in the case of a multi-morbid patient.

*  

Example 1: Influenza

Six days ago Mr. Mburu, 35 year old small shop owner, started experiencing extreme fatigue, 38 degree fever, severe headache and joint pain. These symptoms increasingly got worse as the days past, and in addition coughing, hot flashes and chills also appeared. Despite feeling very ill, he continued to work since his livelihood depends on keeping the shop open. However, at the end of the second day Mr. Mburu had major difficulties taking care of daily activities and moving around was extremely strenuous. He thought that he acquired malaria again, since these symptoms were similar to a bout of malaria he had experienced a few years before. The local doctor gave him Chloroquine, an anti-malarial medication, with an initial dose of 10 mg/kg followed by 5 mg/kg the following 2 days. However, the symptoms did not subside, and he started experiencing pneumonia-like symptoms - chest pains and difficulty breathing. His wife decided to bring him to the hospital. He was almost unable to walk into the clinic from the parking lot. The clinic doctor diagnosed his symptoms as influenza with pneumonia, and recommended inpatient treatment. However, due to lack of health insurance and limited finances for inpatient care, Mr. Mburu decided to go home with a prescription for Cloxacillin 500 mg orally every 6 hours that the clinic doctor gave him. Since it was too late to treat the influenza virus itself, the doctor did not prescribe any antiviral medication.

Specification of FPs

Mr. Mburu has been diagnosed with Influenza. Option 1, the default for any health condition has been used to specify the FPs.

Binary rule for coding

In the example of Mr. Mburu, the FPs have been coded as follows:

<table>
<thead>
<tr>
<th>Life Management Activities Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrying out daily routine (G)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mobility Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking (G)</td>
</tr>
<tr>
<td>Moving around (G)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work Activities Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remunerative employment (G)</td>
</tr>
</tbody>
</table>
The codes listed in the far right column are then documented in the distinct data field for FPs in the ICD-11.

### 7.4.3.3 ICF qualifier rule for coding

#### Life Management Activities Impact

<table>
<thead>
<tr>
<th>Activity</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrying out daily routine (G)</td>
<td>0 1 2 3 4 d230.3</td>
</tr>
</tbody>
</table>

#### Mobility Impact

<table>
<thead>
<tr>
<th>Activity</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking (G)</td>
<td>0 1 2 3 4 d450.2</td>
</tr>
<tr>
<td>Moving around (G)</td>
<td>0 1 2 3 4 d455.3</td>
</tr>
</tbody>
</table>

#### Work Activities Impact

<table>
<thead>
<tr>
<th>Activity</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remunerative employment (G)</td>
<td>0 1 2 3 4 d850.3</td>
</tr>
</tbody>
</table>

The codes listed in the far right column are then documented in the distinct data field for FPs in the ICD-11.

**Example 2: Recurrent Depressive Disorder**

Ms. Dupont, 70 year-old former bookkeeper, has been living on and off with depression since her late teenage years. Unrecognized as clinical depression and feeling misunderstood by her doctor at the time, she did not return to see him, leaving her depression untreated. When she became pregnant her partner was supportive, but a few months later they separated. Not able to work, financial worries and inability to handle the stress exacerbated Ms. Dupont’s existing sleep problems. Despite seeing various health professionals her underlying depression continued to be undertreated. After the birth of her son she tried unsuccessfully to contain the symptoms, thinking that her emotional problems were a result of her situation rather than due to an illness. She often had difficulties in making decisions and juggling her daily routine, especially with a newborn. When her son started school, her depression subsided. However, after a few years, her depression returned. She regularly experienced migraines and back pain, increasingly took time off from work. Facing reproach from her colleagues, Ms. Dupont felt so alone. While her general practitioner found no organic cause for her health problems, another doctor diagnosed her with depression and prescribed medication (Prozac). Despite some improvement, she lost her job. Afterward she discontinued Prozac, she started having suicidal thoughts. Consequently Ms. Dupont’s family arranged for therapy with a psychologist in a combined practice with a psychiatrist. The psychiatrist prescribed amitriptyline 60 mg/day. Pharmacological therapy with psychological counselling, Ms. Dupont has been able to control her depression for many years. Stabilized on medication, she ended psychological counselling 10 years ago. Her son is now grown and has moved away, but they still have regular phone contact – a weekly highlight. Like many elderly people, she spends much of her time alone. She sometimes struggles to carry out her daily routine, including self-care, and decision-making is often difficult. Her psychiatrist suggested increasing her dosage of amitriptyline from 60 mg to 75 mg/day. However, there was concern that the daytime drowsiness and periodic dizziness that she had been experiencing for years will consequently increase. Due to these symptoms Ms. Dupont recently fell down a short flight of stairs. Additionally, she has been getting more and more constipated, almost every other day.

**Specification of FPs**
Ms. Dupont has been diagnosed with recurrent depressive disorder. Depression has been identified as one of the 100 rehabilitation-relevant health conditions and an evidence-based specification of the FPs is available in the ICD-11. This set consists of 16 FPs, including the 4 FPs specified in Option 1.

**Binary rule for coding**

In the example of Ms. Dupont, the FPs have been coded as follows:

<table>
<thead>
<tr>
<th>Understanding Impact</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Solving problems</td>
<td>d175.0</td>
</tr>
<tr>
<td>Making decisions</td>
<td>d177.8</td>
</tr>
<tr>
<td>Thinking</td>
<td>d163.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Life Management Impact</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrying out daily routine (G)</td>
<td>d230.8</td>
</tr>
<tr>
<td>Managing daily routine</td>
<td>d2301.8</td>
</tr>
<tr>
<td>Managing one’s own activity level</td>
<td>d2303.8</td>
</tr>
<tr>
<td>Handling stress and other psychological demands</td>
<td>d240.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Communication Impact</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Conversation</td>
<td>d350.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mobility Impact</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking (G)</td>
<td>d450.0</td>
</tr>
<tr>
<td>Moving around (G)</td>
<td>d455.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Self-Care Impact</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Washing oneself</td>
<td>d510.0</td>
</tr>
<tr>
<td>Looking after one's health</td>
<td>d570.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interpersonal Relations Impact</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Family relationships</td>
<td>d760.0</td>
</tr>
<tr>
<td>Intimate relationships</td>
<td>d770.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work Activities Impact</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquiring, keeping and terminating a job</td>
<td>d845.0</td>
</tr>
<tr>
<td>Remunerative employment (G)</td>
<td>d850.0</td>
</tr>
</tbody>
</table>

The codes listed in the far right column are then documented in the distinct data field for FPs in the ICD-11.

**7.4.3.4 ICF qualifier rule for coding**

<table>
<thead>
<tr>
<th>Understanding Impact</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Solving problems</td>
<td>d175.0</td>
</tr>
<tr>
<td>Making decisions</td>
<td>d177.8</td>
</tr>
</tbody>
</table>
Thinking  

**Life Management Impact**

- Carrying out daily routine (G)  
- Managing daily routine  
- Managing one's own activity level  
- Handling stress and other psychological demands  

**Communication Impact**

- Conversation  

**Mobility Impact**

- Walking (G)  
- Moving around (G)  

**Self-Care Impact**

- Washing oneself  
- Looking after one's health  

**Interpersonal Relations Impact**

- Family relationships  
- Intimate relationships  

**Work Activities Impact**

- Acquiring, keeping and terminating a job  
- Remunerative employment (G)  

The codes listed in the far right column are then documented in the distinct data field for FPs in the ICD-11.

**Example 2: Rheumatoid Arthritis**

Mrs. Baker, a 42 year-old woman, has been suffering from rheumatoid arthritis (Rheumatoid factor seropositive, erythrocyte sedimentation rate (ESR) 25 mm/h, haemoglobin 10g/dl) for about 10 years. Both hands, her right shoulder and right knee are affected by the disease (Subluxation MCP joints 2 and 3 right, commencing ulnar drift of right hand; degenerative changes of proximal and distal interphalangeal joints right hand, dig. 2 and 3). The physical examination revealed an ulnar drift, swan-neck deformity of the little finger and Boutonnière deformity of the index finger of her right hand and her right knee was moderately swollen. The range of motion (ROM) in her right should (140°/0/30°), hand joints (volar flexion/dorsiflexion right 30°/0/0° and left 35°/0/10°; radial flexion/ulnar flexion right 0°/5/20° and left 0°/0/20°) and knee (flexion/extension right 95°/10/0° and left 120°/0/0°) were reduced. Additionally, Mrs. Baker experiences pain with every movement especially in the morning. The restricted movement due to the swelling and pain, especially in her fingers and shoulder, make dressing by herself difficult and complicates other self-care activities. Additionally, carrying out daily routine such as cleaning and cooking is problematic due to Mrs. Baker’s right shoulder and hands. Besides difficulties experienced in activities of daily living, Mrs. Baker had to give up her job as a secretary, since major job tasks such as typing...
was extremely difficult due to the swelling and deformation of her fingers and pain that ensued while typing. Treatment and interventions included medication and physical therapy once a week to mobilize the joints. During a hospital visit, the occupational therapist recommended using an electric opener for opening up cans and a special grip for knives to facilitate cooking, and provided Mrs. Baker with a wrist splint for joint protection and to help quiet inflammation. Mrs. Baker was still unable to work.

**Specification of FPs**

Mrs. Baker has been diagnosed with rheumatoid arthritis for which also an evidence-based set of FPs is available in the ICD-11. This set consists of 7 FPs, including the 4 FPs specified in option 1. In this example, the setting in which the coding occurs, decided to deploy option 3 for the specification of FPs. The following table illustrates how the set of FPs was put together:

<table>
<thead>
<tr>
<th>Default for any health condition</th>
<th>Specification specifically for Rheumatoid Arthritis</th>
<th>Extended specification relevant across health conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Life Management Activities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Impact</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d230</td>
<td>Carrying out daily routine (G)</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>d240</td>
<td>Handling stress and other psychological demands</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mobility Impact</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d410</td>
<td>Changing basic body position</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>d415</td>
<td>Maintaining a body position</td>
<td>x</td>
</tr>
<tr>
<td>d420</td>
<td>Transferring oneself</td>
<td>x</td>
</tr>
<tr>
<td>d440</td>
<td>Fine hand use</td>
<td>x</td>
</tr>
<tr>
<td>d445</td>
<td>Hand and arm use</td>
<td>x</td>
</tr>
</tbody>
</table>
| d450                            | Walking (G)                                       | x                                                      | x                                                      | x
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>d455</td>
<td>Moving around (G)</td>
<td>x</td>
</tr>
<tr>
<td>d465</td>
<td>Moving around using equipment</td>
<td>x</td>
</tr>
<tr>
<td>d470</td>
<td>Using transportation</td>
<td>x</td>
</tr>
</tbody>
</table>

**Self-Care Impact**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>d510</td>
<td>Washing oneself</td>
<td>x</td>
</tr>
<tr>
<td>d520</td>
<td>Caring for body parts</td>
<td>x</td>
</tr>
<tr>
<td>d530</td>
<td>Toileting</td>
<td>x</td>
</tr>
<tr>
<td>d540</td>
<td>Dressing</td>
<td>x</td>
</tr>
<tr>
<td>d550</td>
<td>Eating</td>
<td>x</td>
</tr>
<tr>
<td>d570</td>
<td>Looking after one's health</td>
<td>x</td>
</tr>
</tbody>
</table>

**Household Impact**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>d640</td>
<td>Doing housework</td>
<td>x</td>
</tr>
<tr>
<td>d660</td>
<td>Assisting others</td>
<td>x</td>
</tr>
</tbody>
</table>

**Interpersonal Relations Impact**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>d710</td>
<td>Basic interpersonal interactions</td>
<td>x</td>
</tr>
<tr>
<td>d770</td>
<td>Intimate relationships</td>
<td>x</td>
</tr>
</tbody>
</table>

**Work Activities Impact**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>d850</td>
<td>Remunerative employment (G)</td>
<td>x</td>
</tr>
</tbody>
</table>

**Social Participation Impact**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>d920</td>
<td>Recreation</td>
<td>x</td>
</tr>
</tbody>
</table>
and leisure

Binary rule for coding

Based on the binary rule for coding, the FPs have been coded for Mrs. Baker as follows:

<table>
<thead>
<tr>
<th>Life Management Activities Impact</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrying out daily routine (G)</td>
<td>d230.8</td>
</tr>
<tr>
<td>Handling stress and other psychological demands</td>
<td>d240.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mobility Impact</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Changing basic body position</td>
<td>d410.0</td>
</tr>
<tr>
<td>Maintaining a body position</td>
<td>d415.0</td>
</tr>
<tr>
<td>Transferring oneself</td>
<td>d420.0</td>
</tr>
<tr>
<td>Fine hand use</td>
<td>d440.8</td>
</tr>
<tr>
<td>Hand and arm use</td>
<td>d445.8</td>
</tr>
<tr>
<td>Walking (G)</td>
<td>d450.0</td>
</tr>
<tr>
<td>Moving around (G)</td>
<td>d455.0</td>
</tr>
<tr>
<td>Moving around using equipment</td>
<td>d465.0</td>
</tr>
<tr>
<td>Using transportation</td>
<td>d470.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Self-Care Impact</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Washing oneself</td>
<td>d510.8</td>
</tr>
<tr>
<td>Caring for body parts</td>
<td>d520.8</td>
</tr>
<tr>
<td>Toileting</td>
<td>d530.0</td>
</tr>
<tr>
<td>Dressing</td>
<td>d540.8</td>
</tr>
<tr>
<td>Eating</td>
<td>d550.0</td>
</tr>
<tr>
<td>Looking after one's health</td>
<td>d570.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Household Impact</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Doing housework</td>
<td>d640.8</td>
</tr>
<tr>
<td>Assisting others</td>
<td>d660.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interpersonal Relations Impact</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic interpersonal interactions</td>
<td>d710.0</td>
</tr>
<tr>
<td>Intimate relationships</td>
<td>d770.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work Activities Impact</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Remunerative employment (G)</td>
<td>d850.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social Participation Impact</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Recreation and leisure</td>
<td>d920.8</td>
</tr>
</tbody>
</table>

The codes listed in the far right column are then documented in the distinct data field for FPs in the ICD-11.
## ICF qualifier rule for coding

<table>
<thead>
<tr>
<th>Life Management Activities</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrying out daily routine (G)</td>
<td>0 1 2 3 4 d230.3</td>
</tr>
<tr>
<td>Handling stress and other psychological demands</td>
<td>0 1 2 3 4 d240.1</td>
</tr>
</tbody>
</table>

### Mobility Impact

<table>
<thead>
<tr>
<th>Activity</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changing basic body position</td>
<td>0 1 2 3 4 d410.0</td>
</tr>
<tr>
<td>Maintaining a body position</td>
<td>0 1 2 3 4 d415.0</td>
</tr>
<tr>
<td>Transferring oneself</td>
<td>0 1 2 3 4 d420.0</td>
</tr>
<tr>
<td>Fine hand use</td>
<td>0 1 2 3 4 d440.2</td>
</tr>
<tr>
<td>Hand and arm use</td>
<td>0 1 2 3 4 d445.3</td>
</tr>
<tr>
<td>Walking (G)</td>
<td>0 1 2 3 4 d450.0</td>
</tr>
<tr>
<td>Moving around (G)</td>
<td>0 1 2 3 4 d455.0</td>
</tr>
<tr>
<td>Moving around using equipment</td>
<td>0 1 2 3 4 d465.0</td>
</tr>
<tr>
<td>Using transportation</td>
<td>0 1 2 3 4 d470.0</td>
</tr>
</tbody>
</table>

### Self-Care Impact

<table>
<thead>
<tr>
<th>Activity</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washing oneself</td>
<td>0 1 2 3 4 d510.1</td>
</tr>
<tr>
<td>Caring for body parts</td>
<td>0 1 2 3 4 d520.1</td>
</tr>
<tr>
<td>Toileting</td>
<td>0 1 2 3 4 d530.0</td>
</tr>
<tr>
<td>Dressing</td>
<td>0 1 2 3 4 d540.2</td>
</tr>
<tr>
<td>Eating</td>
<td>0 1 2 3 4 d550.0</td>
</tr>
<tr>
<td>Looking after one's health</td>
<td>0 1 2 3 4 d570.0</td>
</tr>
</tbody>
</table>

### Household Impact

<table>
<thead>
<tr>
<th>Activity</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doing housework</td>
<td>0 1 2 3 4 d640.1</td>
</tr>
<tr>
<td>Assisting others</td>
<td>0 1 2 3 4 d660.0</td>
</tr>
</tbody>
</table>

### Interpersonal Relations Impact

<table>
<thead>
<tr>
<th>Activity</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic interpersonal interactions</td>
<td>0 1 2 3 4 d710.0</td>
</tr>
<tr>
<td>Intimate relationships</td>
<td>0 1 2 3 4 d770.1</td>
</tr>
</tbody>
</table>

### Work Activities Impact

<table>
<thead>
<tr>
<th>Activity</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remunerative employment (G)</td>
<td>0 1 2 3 4 d850.4</td>
</tr>
</tbody>
</table>

### Social Participation Impact

<table>
<thead>
<tr>
<th>Activity</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recreation and leisure</td>
<td>0 1 2 3 4 d920.1</td>
</tr>
</tbody>
</table>

The codes listed in the far right column are then documented in the distinct data field for FPs in the ICD-11.
Example 4: Morbid obesity and comorbidity with type 2 diabetes and essential hypertension

Mr. Chen, 36 year-old male computer engineer, has a history of bilateral knee pain, hypertension, hyperglycaemia. At the start of treatment at the weight loss clinic, Mr. Chen was obese, weighing 135 kg (297.6 lbs.), a body mass index (BMI) of 45.1 kg/m2 (99.4 lbs/m2) and 43.6% body fat. His waist circumference was measured at 125.98 cm (49.6 inches) and his hip circumference at 124.46 cm (49 inches). Mr. Chen was diagnosed with type 2 diabetes that was being controlled with oral medication (Acarbose 300 mg, Glimepiride 4 mg, and Metformin HCl 1000 mg per day) and insulin injections (Insulin glargine 35 unit, HS). His blood pressure was high at 156/91 mmHg, his glycated haemoglobin HbA1C (or blood sugar level) was poor at 8.2%, triglycerides high at 285 mg/dL, and his total cholesterol and LDL-C (so-called ‘bad cholesterol’) were both borderline high at 235 mg/dL and 140 mg/dL respectively. He had been receiving Amlodipine 5 mg/day for hypertension and Lipitor 10 mg/day for hyperlipidaemia. Despite trying several methods for losing weight, Mr. Chen has continued to gain weight – mostly due to continued intake of sweet and high-fat foods and irregular meals. Due to knee pain he seldom exercised and limited walking up stairs. Another work-related problem is related to Mr. Chen’s colleagues, who disliked talking or working with him due to bad body odour as a result of problems washing himself. His obesity also causes issues with his boss.

Specification of FPs

Given the multi-morbidity of Mr. Chen, a combination of different predefined FPs sets was applied to best reflect the impact of these health conditions on his daily life. As shown in the following table, there is some overlap across the ICF categories specified to be most relevant in these three health conditions.

<table>
<thead>
<tr>
<th>FPs Set Obesity</th>
<th>FPs Set Diabetes Mellitus</th>
<th>FPs Set Ischaemic Heart Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life Management Impact</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d230</td>
<td>Carrying out daily routine (G)</td>
<td>X</td>
</tr>
<tr>
<td>d240</td>
<td>Handling stress and other psychological demands</td>
<td>X</td>
</tr>
<tr>
<td>Mobility Impact</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d450</td>
<td>Walking (G)</td>
<td>X</td>
</tr>
<tr>
<td>d455</td>
<td>Moving around (G)</td>
<td>X</td>
</tr>
<tr>
<td>Self-Care Impact</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d520</td>
<td>Caring for body parts</td>
<td>X</td>
</tr>
<tr>
<td>d570</td>
<td>Looking after one’s</td>
<td>X</td>
</tr>
</tbody>
</table>
Binary rule for coding

All of these ICF categories will serve as the foundation for the set of predefined FPs for Mr. Chen. These 10 FPs are then coded as follows:

**Life Management Impact**

- Carrying out daily routine d230.8
- Handling stress and other psychological demands d240.8

**Mobility Impact**

- Walking d450.8
- Moving around d455.8

**Self-Care Impact**

- Caring for body parts d520.8
- Looking after one's health d570.8

**Household Activities Impact**

- Acquisition of goods and services d620.8

**Interpersonal Relations Impact**

- Family relationships d760.0
- Intimate relationships d770.0

**Work Activities Impact**

- Remunerative employment d850.8

The codes listed in the far right column are then documented in the distinct data field for FPs in the ICD-11.

ICF qualifier rule for coding
### Life Management Impact

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>d230</td>
<td>Carrying out daily routine</td>
<td>0-4</td>
</tr>
<tr>
<td>d240</td>
<td>Handling stress and other psychological demands</td>
<td>0-4</td>
</tr>
</tbody>
</table>

### Mobility Impact

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>d450</td>
<td>Walking</td>
<td>0-4</td>
</tr>
<tr>
<td>d455</td>
<td>Moving around</td>
<td>0-4</td>
</tr>
</tbody>
</table>

### Self-Care Impact

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>d520</td>
<td>Caring for body parts</td>
<td>0-4</td>
</tr>
<tr>
<td>d570</td>
<td>Looking after one's health</td>
<td>0-4</td>
</tr>
</tbody>
</table>

### Household Activities Impact

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>d620</td>
<td>Acquisition of goods and services</td>
<td>0-4</td>
</tr>
</tbody>
</table>

### Interpersonal Relations Impact

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>d760</td>
<td>Family relationships</td>
<td>0-4</td>
</tr>
<tr>
<td>d770</td>
<td>Intimate relationships</td>
<td>0-4</td>
</tr>
</tbody>
</table>

### Work Activities Impact

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>d850</td>
<td>Remunerative employment</td>
<td>0-4</td>
</tr>
</tbody>
</table>

The codes listed in the far right column are then documented in the distinct data field for FPs in the ICD-11.

## 8 Traditional Medicine

Traditional medicine is a relevant part of health services provided in many countries. International standardization regarding traditional medicine within the ICD allows for comparison and monitoring over time. ICD–11’s chapter on traditional medicine disease is designed to be used alone, or for dual coding cases in conjunction with the Western medicine concepts of ICD chapters 1 to 25. For international reporting and comparison between traditional medicine and western medicine, dual coding should be applied.

### 8.1 Using ICD-11 in traditional medicine

**Reporting at regional, national and international levels:**

1. Counting episodes of care for traditional medicine disorders and/or patterns (see also description of chapter 27) in the same way as western medicine diseases for morbidity data reporting purposes
2. Counting episodes of care by traditional medicine practitioners who may use a combination of western medicine and traditional medicine terminology
3. Describing and quantifying utilization of traditional medicine services and reasons for encounter
4. Monitoring use of resources for traditional medicine services

**Research:**

- On safety and efficacy of traditional medicine interventions – evidence based research
- Clinical research within TM framework and between WM and TM
- On interrelationships between WM diseases, TM disorders and patterns
- To study treatment patterns and outcomes for specific disorders and patterns using ICD–11 in conjunction with country specific procedure classifications and the TM component of the intended International Classification of Health Interventions (ICHI).

**Casemix reimbursement and insurance:**

- There are precedents in China, Japan and Korea for use of existing TM classifications (with or without WM concepts) for reimbursement of hospitals and for insurance claims.
- Incorporating TM as a chapter of ICD–11 will allow much greater scope for describing patient condition (diseases, disorders and patterns across the WM and TM chapters) as well as complications and co-morbidities.

**Quality and safety of care:**

- Standardising use of codes reflecting quality and safety of care between WM diseases and TM disorders will allow TM practitioners to interpret data from ICD–11 on quality, safety and efficacy of care.

**Education:**

- Educating TM practitioners in regard to standardisation of diagnosis
- Educating TM clinicians and coders in application and interpretation of ICD–11 data.

**Standardising terminology for use in electronic health records:**

- To enable more efficient recording and extraction of data
- To allow computer assisted coding of disorders and patterns

**8.2 Traditional medicine section of ICD–11 update and maintenance**

- Through user feedback, use of TM and WM codes and need for coding guidelines will be monitored. This will bring Traditional Medicine practitioners and users into the WHO-FIC mechanisms to update the ICD and ensure its clinical and technological currency.
- Different filters, constraints and formats can be applied to allow data to be collected once and used often.
- Using a standard classification will allow data creators and users to participate in ongoing discussions regarding development of the classification
- There will be a need for user involvement in discussions to reconcile and accommodate different country practices and requirements so that the classification continues to fulfil all its purposes.
8.3 Coding instructions for Traditional Medicine

8.4 Data sources, reporting and quality

Data Sources for inpatient, outpatient and primary care settings

• Patient records including history, physical examination, investigations, treatments and final diagnoses
• Discharge summaries

Data Quality - Education of clinicians, coders, and data users is paramount in ensuring data quality. This involves an understanding of how ICD–11 is applied, including definition of main condition, rules relating index terms to the tabular list, use of inclusion notes, exclusion notes and, code also notes within the classification, as well as application of standard coding rules. - Specific tools exist to edit and audit ICD data. These include the recognition of incompatible codes and rare disorders, comparison of ICD data with other sources (e.g. infection control, laboratory data), and sample code-recode studies to identify coding reliability and validity and compliance with coding rules and definitions. - Technical coding tools can be employed to measure inter-rater reliability of code decision as well as application of coding rules and guidelines.

8.4.1 General principles & rules for coding traditional medicine

Codes from the traditional medicine chapter can be used across settings (hospital inpatient or ambulatory care in hospital or community) but should not be used for reporting cause of death. When coding in primary care, disorders and patterns may not be fully developed so that it may be more feasible to identify reason for encounter rather than main condition and associated conditions. General principles for coding traditional medicine:

- code relevant information i.e. information relevant to this episode of care. Coding should relate to reasons for treatment during this episode and need not describe the patient’s previous history unless a past condition affects current care.
- code explicit information - code specific information - use TM diagnostic test results in coding - codes should represent aetiology and manifestations of TM condition - code acute and chronic conditions - code threatened TM conditions

Traditional medicine practitioners or clinical coders may use the codes in the TM chapter in two ways: either as a stand-alone chapter choosing codes from within the TM Chapter, or in conjunction with other chapters of ICD–11.

8.4.2 Using the TM chapter as a stand-alone chapter choosing codes from within the TM Chapter

In this case, codes may be applied for disorder or disorders from the TM chapter plus a pattern or patterns from the TM chapter. However, there may also be circumstances where a pattern code may be applied alone or where a disorder (™) code may be applied alone.

Coding

• Read the patient summary or medical record
• Select disorder(s) (™) and/or pattern(s) (™) to be coded
Consult Alphabetic Index for TM (Section 3) arranged usually according to disease process rather than site and choose appropriate entry and code (take note of lead terms and modifiers plus ‘see’ and ‘see also’ references)

Go to tabular list for that code. Take note of inclusion and exclusion notes and textual definitions

Assign appropriate code and follow any specific guidelines for that code.

**Sequencing**

In the first place, a ‘main condition’ code is selected. It is important to code all current disorders or patterns documented in the patient record to ensure that they reflect a complete picture of the patient’s condition for the episode of care. It may be necessary to code pattern (™) alone, disorder (™) alone, or combined pattern (™) and disorder (™). However, when combined pattern (™) and disorder (™) are coded, choose disorder (™) as main condition. The most usual scenario is to have both disorder and pattern, with codes listed in that order. If it is not possible to code a disorder (™), pattern (™) may be sequenced as main condition.

**How to code for traditional medicine**

Code first: Disorder(s) (™) Code second: Pattern(s) (™)

**National versus international rules**

There may be some variation between countries in the way in which sections of the TM chapter are used or in the use of WM diseases together with disorders (™) and patterns (™).

**Examples**

- Disorder Pattern
- Post coordination examples 2 codes for one disorder 2 codes for one pattern
- Disorder or Pattern alone

**8.5 Using the TM chapter with other chapters of ICD–11**

This option takes into account the practice variations of using a code for WM disease or TM disorder and/or a traditional medicine pattern code for a given clinical picture. In this case, codes should be applied for WM diseases and/or disorder (™) from Chapters 01-25 plus a pattern or patterns from Chapter 27.

**Coding rules**

This may be either for choice of disorder (™) or WM diseases as main condition and/or for associated disorders (™) or WM diseases. In this scenario, codes may be chosen for disease or diseases from Chapters 01-25 of ICD–11 plus disorder (™) or disorders (™) from Chapter 27. In either case, a pattern (™) or patterns (™) from Chapter 27 should be used in association with the codes for disease or disorder (™). To code from Chapters 01-25, consult the Alphabetic Index for Western Medicine chapters to assign a code and follow the steps outlined in Section 6. This use of all ICD–11 chapters (01-26) for traditional medicine may be especially relevant for neoplasms and injury (use Section 1 of the Index), chronic and complicated conditions, external cause of injury and adverse reaction.
**Sequencing** If there are both western medicine diseases and traditional medicine disorders, use either as main condition, depending on which meets the definition for ‘main condition’ as outlined in the ICD–11. Pattern (™) or patterns (™) may follow either the western medicine disease or disorder (™).

**National and international coding** Traditional Medicine practitioners can work with colleagues in other countries and with Western Medicine practitioners in their own country to make ICD–11 a positive tool in understanding their own practice and contributing to information not currently available about Traditional Medicine utilization and outcomes.

**Examples**

Injuries using Chapters 01-25

**Main condition:** from Chapter 27. QA 80.5 Lumbar impediment disorder (™) or from the injury chapter (Chapter 22) should be used together with

- codes from the External Cause chapter (Chapter 23)
- a pattern code, if appropriate.

Disorders such as migraine can be coded (using Chapters 01-25) as: > **Main condition** from Chapter (09) Migraine in conjunction with a - disorder (™) from Chapter 27 (QA51.1 Headache disorder (™)) and/or Pattern (™) such as Dual deficiency of yin and yang pattern (™) or QE 71 Small Yin type Yang Depletion pattern (™)

Diseases such as diabetes mellitus can be coded using Chapters 01-25 as:

**Main condition** from Chapter (06) Diabetes or Metabolic Syndrome plus

- Wasting thirst disorder (™) (QB00)
- Yin deficiency with dryness heat (QE63 Large Yin type Dryness Heat pattern (™))

or from Chapter 27 alone as:

**Main condition** from Chapter 27 Wasting thirst disorder (™) plus - Yin deficiency with dryness heat (QE63 Large Yin type Dryness Heat pattern (™))

9 **General statistical recommendations**

9.1 **Data quality**

To ensure high quality of data, processes for monitoring the data quality need to be implemented. This is referred to as Quality Assurance. On the following pages you will find some suggestions on how to apply Quality Assurance for mortality and morbidity statistics. As a basic principle, those responsible for the collection and analysis of data should be involved in the development of the protocol for processing and coding diagnostic data, and other items to be cross-tabulated with them. Collecting quality data requires a clearly designed workflow (from reporting to coding to analysis), and adequate training of all involved parties. In particular, all parties need to understand the process and their part in it. The basic stages of the process include:

1. Reporting – This is where the information starts. Identifying a condition and reporting it on a death certificate or on other medical forms needs to be carried out with accuracy
and using the best possible evidence. For this reason, this part should always be carried out by a well-trained and experienced physician. Beware- garbage in = garbage out.

2. Verification or reports – Feedback loops and queries to the reporters help to further specify unclear information and illogic statements. Grouping and analysis – Both serve to aggregate data in ways that are determined by the diverse use cases. Rules and constraints should be clearly understood and communicated when carrying out the task and presenting this task.

9.2 Specificity versus ill-defined codes

Reported information should be coded to the highest level of detail possible. In some instances, not much information or only trivial information is available. Though the ICD also provides categories for these cases, such information does neither really allow treatment nor prevention of disease.

9.3 Problems of a small population

Population size is one of the factors that need to be considered when the health status of a population is assessed by means of mortality or morbidity data. In countries with small populations, the annual numbers of events in many categories will be very small, and may fluctuate from year to year. For example, especially when separated for age and sex. The problems can be alleviated through one or more of the following measures:

• use or presentation of broad groupings of ICD rubrics, such as chapters
• aggregation of data over a longer period, e.g. to take the preceding two years of data together with those for the current year and produce a ‘moving average’ figure
• using the broadest possible age groupings is recommended

The recommendations that apply for small national populations also hold true, in general, for subnational segments of larger populations. Investigations of health issues in population subgroups have to take into consideration the effect of the size of each of the subgroups on the type of analysis used. This need is generally recognized when dealing with sample surveys, but often overlooked when the investigation concerns the health problems of special groups in a national population.

9.3.1 ‘Empty cells’ and cells with low frequencies

Regardless of the list of causes being used, it may be found that no cases for one or more listed cause occur in certain cells of a statistical table. Where there are many empty lines in a table, it is worth considering the omission of such lines from a published table or from a computer printout. When only the occasional case of a disease occurs in a country, the line can be regularly omitted from the published statistical table and a footnote added to indicate either that there were no cases or, when sporadic cases do occur, in which cell the case would have appeared. For cells with very low frequencies, especially those relating to diseases that would not be expected to occur, it is important to establish that the cases existed and did not result from a coding or processing error. This should be carried out as part of the general quality control of the data.
9.4 Precautions needed when tabulation lists include subtotals

It may not always be apparent to those processing the data that some of the items in the tabulation lists are in fact subtotals. These items may include titles of blocks and titles of three-character categories (in the four-character list of ICD–11) or the items for chapter titles (in the condensed versions of the mortality tabulation lists). These entries should be ignored when totals are calculated, otherwise cases may be counted more than once.

9.5 Ethical Aspects

Confidentiality refers to the obligation of not disclosing information (data) about information delivered in confidence to third parties. This duty was codified in the Hippocratic Oath in the 4th century BC, and is still one of the core principles of medical ethics.

Any information that might allow the identification of a specific person should only be viewed by people who are authorised to do so. Authorisation means that a person is legally permitted to look at the information. E.g. medical staff, coroners, and coders are all people who can be authorised to see sensitive information.

Generally, the only way for confidential information to become publicly accessible is through legislation, statutes, and regulations. Sometimes confidential information can become public record after a certain period of time. For instance, in some regions of the world only the passage of time can render death certificates as a matter of public record and, therefore, no longer remain confidential.

The authorised supplier of confidential information must verify that the requesting person is an authorised user and determine their level of authorisation. The supplier must be aware of the level of information that can be made available to the authorised user and take appropriate steps to guard against unauthorised disclosure. The authorised user must not attempt to gain access to information which they are not authorised to view. Additionally, the user must also guard against unauthorised access to the information. This means that users must secure the confidential information and any recordings of that information in a way that prevents unauthorised viewing. They must only use the information for appropriate purposes and they must return the information as required. National legal frameworks, state and local regulations, and institutional guidelines provide specific rules and information regarding how to maintain confidentiality.

9.5.1 Avoidance of Potential Harm

Direct and serious harm can result from a breach of confidentiality. For example, the disclosure of sensitive information can potentially lead to stigma and discrimination against an individual. Conversely, greater harm can result from maintaining confidentiality than from not doing so. Some circumstances may require a judgement that involves balancing the harms to, against the interests of, the patient, deceased person and other relevant parties. A person may suffer ‘harm’ physically, socially, or psychologically as a result of a breach of confidentiality. A confidential diagnosis that is breached makes the patient lose faith or trust in the clinician, and the patient may then suffer abuse from another person or suffer the stigma associated with certain conditions. In other circumstances the nondisclosure of one person’s confidential information may result in another individual or a community being at risk of developing a harmful condition or being exposed to a harmful situation.
This is a difficult concept and one that must be approached in a thoughtful way. As previously mentioned, there are times when it is justifiable to give others confidential information, such as when reporting communicable disease incidence. In such cases the reporting of confidential information is usually. This is an example of where the nondisclosure of a disease could result in major harm to others.

If it is necessary to disclose information, it is preferable to speak with the relevant person and let them know about the need to do so. In some cases, this may not be possible or appropriate, and users should be guided by legal and institutional guidelines. We must seriously consider the harms that can be caused by disclosure of certain information. Some information that can be particularly sensitive includes tests for genetic disorders and diseases, incidence of communicable diseases, and HIV test results. Sometimes there are special requests for confidentiality that may require increased levels of confidentiality assurances. These special requests cannot supersede legal requirements for disclosure, but should be respected when possible.

9.5.2 Security of Privacy – Confidentiality

Privacy relates to protecting an individual’s control over what personal information and decisions may or may not be shared with others. For instance, when a physician examines or speaks with a patient it is usually done in a non-public area so that the information given to the physician by the patient cannot be heard by anyone else. It also enables the physician to give a patient their diagnosis in private. Data are forwarded with consent by the patient. Security of privacy and confidentiality of health (and other) data are usually addressed by national laws and regulations.

9.6 International morbidity reporting

International morbidity reporting and comparison of data among different countries requires internationally agreed definitions of: - inpatient, recoding of day-patients, outpatient - hospital - treatment episode - reason for encounter used instead of diagnosis

9.6.1 Minimum data set and markup for cluster coding

A minimum data set suitable for international comparison would include age, sex, main diagnosis, (reason for admission after assessment at the end of the stay), and health sector (hospital, practitioner, other), and is ideally accompanied by the definitions in place for the variables mentioned above. The markup for international reporting of postcoordinated codes in clusters will follow the specifications below; a slash ‘/’ separates 2 stem codes; an ‘&’ links stem codes with extension codes. A cluster may consist of a single code. > One condition with additional detail in one cluster: - stem code&extension code&extension code

Two unrelated conditions will have two clusters: - stem code - stem code
Two clusters with multiple codes: - stem code&extension code/stem code&extension code&extension code

Example1: Diabetes mellitus / Diabetic retinopathy
Example2: Multiple fractures of forearm / fracture of shaft of ulna & compound fracture / fracture of shaft of radius & compound fracture /external cause code
9.7 International mortality statistics

Recommendations standardize the presentation of the data which allows international comparison of the different countries or regions.

9.7.1 The recommended special tabulation lists for mortality

There are standard ways of listing causes coded according to the ICD, and there are formal recommendations concerning lists for tabulation that allow for international comparison. In other tabulations, the hierarchical structure of the ICD allows considerable flexibility for possible groupings. For mortality the ICD includes special tabulation lists in Volume I which are intended for circumstances in which the three-character list is too detailed, and are designed so that international comparison of significant diseases and groups of diseases is not compromised by different groupings having been used in different countries.

The special tabulation lists are:

- List 1 General mortality condensed list (103 causes)
- List 2 General mortality selected list (80 causes)
- List 3 Infant and child mortality condensed list (67 causes)
- List 4 Infant and child mortality selected list (51 causes)
- List 5 General morbidity (298 causes)
- List 6 International Shortlist for Hospital Morbidity Tabulation (ISHMT) (148 groups)
- List 7 Infectious diseases by agent condensed list
- List 8 Traffic accidents
- List 9 SDG
- List 10 WHO Verbal autopsy list

9.7.2 Use of prefixes to identify the mortality lists

Use of the numerical prefixes prevents confusion between the special tabulation lists, as the ICD four-character codes have a letter in the first position. Where an adapted list is used for national or sub-national purposes, an alternative identifying prefix should be used.

9.7.3 The condensed lists for mortality

The two condensed lists, List 1 and List 3, provide items for each ICD chapter and also, within most chapters, identify the items of the selected lists together with residual items entitled ‘Remainder of...’. Together, these lists complete the coverage of the respective chapter. They condense the full range of ICD three-character codes into a manageable number of items for numerous publication purposes.

9.7.4 The selected lists for mortality

The two selected lists, List 2 and List 4, contain items within most ICD chapters, for conditions and external causes significant for the monitoring and analysis of population health status and mortality-related health concerns at both national and international levels. Chapter totals are not provided and only a few chapters have residual rubrics that enable such totals to be obtained.
9.7.5 Locally designed lists for mortality

For most countries, the four special tabulation lists provide enough information on the most important diseases and external causes of death. They also facilitate comparison over time and observation of shifts in the relative frequencies as health programmes take effect, of e.g. infectious diseases and degenerative diseases. They permit comparison between sub-national areas and population sub-groups. In addition, they make meaningful international comparisons of causes of death possible. When there is no need for international comparison, lists similar to the special tabulation lists can be designed for local use. The ICD rubrics in such lists can be selected and grouped in any way. Special lists would be needed, for example, for monitoring progress, in terms of morbidity and mortality, of many local health programmes. When adapting the special tabulation lists to national requirements, or when a tabulation list is being devised for a new or special project, a trial run is helpful by counting the number of cases for each four-character category. In such way, it can be determined which conditions are appropriate for broad grouping, and where subcategories would be necessary.

Where a local list is constructed, the key to the condensed categories should contain the same three- (or four-) character codes of the core classification.

10 Recommendations in relation to statistical tables for international comparison

10.1 Statistical tables

The degree of detail in cross-classification by cause, sex, age, and geographical area will depend both on the purpose and range of the statistics and on the practical limits to their tabulation. The following patterns, which are designed to promote international compatibility, present standard ways of expressing various characteristics. Where a different classification is used in published tables (e.g. in age-grouping), it should be reducible to one of the recommended groupings.

(a) Analysis by the International Classification of Diseases should, as appropriate, be in accordance with:
• the detailed list of three-character categories, with or without four-character subcategories;
• one of the special tabulation lists for mortality;
• the special tabulation list for morbidity.

(b) Age classification for general purposes:
• under 1 year, single years to 4 years, 5-year groups from 5 to 84 years, 85 years and over;
• under 1 year, 1-4 years, 5-14 years, 15-24 years, 25-34 years, 35-44 years, 45-54 years, 55-64 years, 65-74 years, 75 years and over.
• under 1 year, 1-14 years, 15-44 years, 45-64 years, 65 years and over.

(c) Classification by area should, as appropriate, be in accordance with:
• each major civil division;
• each town or conurbation of 1,000,000 population and over, otherwise the largest town with a population of at least 100,000;
• a national aggregate of urban areas of 100,000 population and over;
• a national aggregate of urban areas of less than 100,000 population; - a national aggregate of rural areas.

Note 1. Statistics relating to (c) should include the definitions used of urban and rural. Note 2. In countries where medical certification of the cause of death is incomplete or limited to certain areas, figures for deaths not medically certified should be published separately.

10.1.1 Tabulation of causes of death

Statistics of causes of death for a defined area should be in accordance with recommendation ‘Statistical tables’ (a)(1) above, or, if this is not possible, with recommendation ‘Statistical tables’ (a)(2). Deaths should preferably be classified by sex and age group as in recommendation ‘Statistical tables’ (b)(3). Statistics of causes of deaths for the areas in recommendation ‘Statistical tables’ (c) should comply with recommendation ‘Statistical tables’ (a)(2), or if this is not possible, with recommendation ‘Statistical tables’ (a)(3). They should preferably be tabulated by sex and age group as in recommendation ‘Statistical tables’ (b)(2).

10.1.2 Maternal mortality statistics

Published maternal mortality rates should always specify the numerator, which can be given as: the number of recorded direct obstetric deaths, or the number of recorded obstetric deaths (direct plus indirect). For the purpose of international reporting of maternal mortality, only those maternal deaths occurring before the end of the 42-day reference period should be included in the calculation of the various ratios and rates, although the recording of later deaths is useful for national analytical purposes.

10.1.3 Injury mortality

Injury mortality traditionally distinguishes between injuries that are caused by:
- Interpersonal violence and sexual abuse
- Collective violence including wars, civil insurrections and riots
- Traffic collisions
- Incidents at home, at work and while participating in sports and other recreational activities

In the context of mortality, the WHO recommends the retention of that injury and external causes. In places where this is not feasible, the external cause code is the single underlying cause of death code, and the ICD–11 external cause code incorporates the intent, mechanism, and object of the deceased in a single code. Pace of occurrence and activity are coded separately.

10.2 Definitions for mortality statistics

10.2.1 Perinatal mortality definition for international comparison

Live birth is the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered liveborn.
Fetal death is death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy; the death is indicated by the fact that after such separation the foetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles. The first weight of the foetus or newborn obtained after birth. For live births, birth weight should preferably be measured within the first hour of life before significant postnatal weight loss has occurred. While statistical tabulations include 500 g groupings for birth weight, weights should not be recorded in those groupings. The actual weight should be recorded to the degree of accuracy to which it is measured. The definitions of ‘low’, ‘very low’, and ‘extremely low’ birth weight do not constitute mutually exclusive categories. Below the set limits they are all inclusive and therefore overlap (i.e. ‘low’ includes ‘very low’ and ‘extremely low’, while ‘very low’ includes ‘extremely low’).

- **Low birth weight**: Less than 2500 g (up to and including 2499 g).
- **Very low birth weight**: Less than 1500 g (up to and including 1499 g).
- **Extremely low birth weight**: Less than 1000 g (up to and including 999 g).

The duration of gestation is measured from the first day of the last normal menstrual period. Gestational age is expressed in completed days or completed weeks (e.g. events occurring 280 to 286 completed days after the onset of the last normal menstrual period are considered to have occurred at 40 weeks of gestation). Gestational age is frequently a source of confusion, when calculations are based on menstrual dates. For the purposes of calculation of gestational age from the date of the first day of the last normal menstrual period to the date of delivery, it should be borne in mind that the first day is day zero and not day one; days 0-6 therefore correspond to ‘completed week zero’; days 7-13 to ‘completed week one’; and the 40th week of actual gestation is synonymous with ‘completed week 39’. Where the date of the last normal menstrual period is not available, gestational age should be based on the best clinical estimate. In order to avoid misunderstanding, tabulations should indicate both weeks and days.

- **Pre-term**: Less than 37 completed weeks (less than 259 days) of gestation.
- **Term**: From 37 completed weeks to less than 42 completed weeks (259 to 293 days) of gestation.
- **Post-term**: 42 completed weeks or more (294 days or more) of gestation.
- **Perinatal period**: The perinatal period commences at 22 completed weeks (154 days) of gestation (the time when birth weight is normally 500 g), and ends seven completed days after birth.
- **Neonatal period**: The neonatal period commences at birth and ends 28 completed days after birth. Neonatal deaths (deaths among live births during the first 28 completed days of life) may be subdivided into early neonatal deaths, occurring during the first seven days of life, and late neonatal deaths, occurring after the seventh day but before 28 completed days of life.

Age at death during the first day of life (day zero) should be recorded in units of completed minutes or hours of life. For the second (day 1), third (day 2) and through 27 completed days of life, age at death should be recorded in days. In statistics for international comparison, inclusion of the extremely low birth weight group disrupts the validity of comparisons and is not recommended. Countries should arrange registration and reporting procedures so that the events and the criteria for their inclusion in the statistics can be easily identified. Less
mature fetuses and infants not corresponding to these criteria (i.e. weighing less than 1000 g) should be excluded from perinatal statistics unless there are legal or other valid reasons to the contrary, in which case their inclusion must be explicitly stated. Where birth weight, gestational age and crown heel length are not known, the event should be included in, rather than excluded from, mortality statistics of the perinatal period. Countries should also present statistics in which both the numerator and the denominator of all ratios and rates are restricted to fetuses and infants weighing 1000 g or more (weight-specific ratios and rates); where information on birth weight is not available, the corresponding gestational age (28 completed weeks) or body length (35 cm crown heel) should be used. In reporting fetal, perinatal, neonatal and infant mortality statistics the number of deaths due to malformations should whenever possible be identified for live births and fetal deaths and in relation to birth weights of 500 999 g and 1000 g or more. Neonatal deaths due to malformations should be subdivided into early and late neonatal deaths. This information enables perinatal and neonatal mortality statistics to be reported with or without the deaths from malformations.

10.2.1.1 Ratios and rates

Published ratios and rates should always specify the denominator, i.e. live births or total births (live births plus fetal deaths). Countries are encouraged to provide the ratios and rates listed below, or as many of them as their data collection systems permit. For example: - Fetal death ratio - Fetal death rate - Fetal death rate, weight-specific - Early neonatal mortality rate - Early neonatal mortality rate, weight-specific - Perinatal mortality ratio - Perinatal mortality rate The perinatal mortality rate is the number of deaths of fetuses weighing at least 500 grams (or, when birth weight is unavailable, after 22 completed weeks of gestation or with a crown-heel length of 25 centimetres or more), plus the number of early neonatal deaths, per 1000 total births. Because of the different denominators in each component, this is not necessarily equal to the sum of the fetal death rate and the early neonatal mortality rate. - Perinatal mortality rate, weight-specific - Neonatal mortality rate - Neonatal mortality rate, weight-specific - Infant mortality rate - Infant mortality rate, weight-specific

10.2.1.2 Perinatal mortality age classifications

Age classification for special statistics of infant mortality

1. By single days for the first week of life (under 24 hours, 1, 2, 3, 4, 5, 6 days), 7-13 days, 14-20 days, 21-27 days, 28 days and up to 2 months, by single months of life from 2 months to 1 year (2, 3, 4 ... -11 months).
2. Under 24 hours, 1-6 days, 7-27 days, 28 days up to, but not including, 3 months, 3-5 months, 6 months but under 1 year.
3. Under 7 days, 7-27 days, 28 days but under 1 year.

Age classification for early neonatal deaths 1. Under 1 hour, 1-11 hours, 12-23 hours, 24-47 hours, 48-71 hours, 72-167 hours. 2. Under 1 hour, 1-23 hours, 24-167 hours.

Birth weight classification for perinatal mortality statistics

By weight intervals of 500 grams, i.e. 1000-1499 grams, etc.

Gestational age classification for perinatal mortality statistics
10.2.2 Maternal mortality definitions

10.2.2.1 Maternal death

A maternal death is defined as: the death of a woman while pregnant or within 42 days following termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.

10.2.2.2 Late Maternal death

A late maternal death is defined as: the death of a woman from direct or indirect obstetric causes, more than 42 days but less than one year after termination of pregnancy.

10.2.2.3 Comprehensive maternal death

A grouping that combines early maternal death (maternal death) and late maternal death.

10.2.2.4 Death occurring during pregnancy, childbirth and puerperium

A death occurring during pregnancy, childbirth, and puerperium is defined as: the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of death (obstetric and non-obstetric).

10.2.2.5 Published maternal mortality rates

Published maternal mortality rates should always specify the numerator (number of recorded maternal deaths), which can be given as: - the number of recorded direct obstetric deaths, or - the number of recorded obstetric deaths (direct plus indirect) When calculating maternal mortality rates, cases not coded to Chapter 18 (J codes) should be included. These include those categories presented in the ‘Exclusion Note’ at the beginning of Chapter 18, provided that they have been aggravated by pregnancy or conversely aggravated the pregnancy.

10.2.2.6 Denominators for maternal mortality

The denominator used for calculating maternal mortality should be specified as either the number of live births or the number of total births (live births plus fetal deaths). Where both denominators are available, a calculation should be published for each.

10.2.2.7 Ratios and rates in maternal mortality

Results should be expressed as a ratio of the numerator over the denominator, multiplied by k (where k may be 1000, 10 000 or 100 000, as preferred and indicated by the country). Maternal mortality ratios and rates can thus be expressed as follows: 1. Maternal mortality rate 2. Direct obstetric mortality ratio 3. Ratio for death occurring during pregnancy, childbirth and puerperium.
10.2.3 Injury Mortality Definitions

The WHO definition of an ‘injury’ is: ‘Injuries are caused by acute exposure to physical agents such as mechanical energy, heat, electricity, chemicals, and ionizing radiation interacting with the body in amounts or at rates that exceed the threshold of human tolerance. In some cases, (for example, drowning and frostbite), injuries result from the sudden lack of essential agents such as oxygen or heat’. Injuries may be categorized in a number of ways. However, for most analytical purposes and for identifying intervention opportunities, it is especially useful to categorize injuries according to whether or not they were deliberately inflicted and by whom. Commonly used categories are: - unintentional (i.e. accidental) - intentional (i.e. deliberate): - interpersonal (e.g. assault and homicide) - self-harm (e.g. abuse of drugs and alcohol, self-mutilation, suicide) - legal intervention (e.g. action by police or other law enforcement personnel) - war, civil insurrection and disturbances (e.g. demonstrations and riots) - undetermined intent Regarding the collection of events that cause injuries, a set of definitions apply. See section ‘Definition related to transport accidents.’.

10.2.3.1 Definitions related to transport accidents

(a) A ‘transport accident’ is any accident involving a device designed primarily for, or being used at the time primarily for, conveying persons or goods from one place to another.

(b) A public highway [trafficway] or street is the entire width between property lines (or other boundary lines). It includes the space of open public land used for purposes of moving persons or property from one place to another. A roadway is that part of the public highway designed, improved and customarily used for vehicular traffic.

(c) A traffic accident is any vehicle accident occurring on the public highway [i.e. originating on, terminating on, or involving a vehicle partially on the highway]. A vehicle accident is assumed to have occurred on the public highway unless another place is specified, except in the case of accidents involving only off-road motor vehicles, which are classified as non-traffic accidents unless the contrary is stated. A special tabulation list provides the set of relevant codes.

(d) A non-traffic accident is any vehicle accident that occurs entirely in any place other than a public highway. A special tabulation list provides the set of relevant codes.

(e) A pedestrian is any person involved in an accident who was not at the time of the accident riding in or on a motor vehicle, railway train, streetcar or animal-drawn or other vehicle, or on a pedal cycle or animal.

Pedestrians include: - changing tire of vehicle - making adjustment to motor of vehicle - on foot Items which assist with pedestrian conveyance include: - baby carriage - ice-skates - perambulator - push-chair - roller-skates - scooter - skateboard - skis - sled - wheelchair (powered)

(f) A driver is an occupant of a transport vehicle who is operating or intending to operate it.

(g) A passenger is any occupant of a transport vehicle other than the driver.

Excludes: person travelling on outside of vehicle - see definition (h)
(h) A person ‘travelling on’ a transport vehicle includes any person being transported by a
vehicle but not occupying the space normally reserved for the driver or passengers, or
the space intended for the transport of property.

‘Travelling on’ includes: - bodywork - bumper [fender] - hanging on outside - roof (rack) -
running-board - step

(i) A pedal cycle is any land transport vehicle operated solely by pedals.
Includes: bicycle tricycle
Excludes: motorized bicycle - see definition (k)

(j) A pedal cyclist is any person riding on a pedal cycle or in a sidecar or trailer attached to
such a vehicle.

(k) A motorcycle is a two-wheeled motor vehicle with one or two riding saddles and
sometimes with a third wheel for the support of a sidecar. The sidecar is considered
part of the motorcycle.
Includes: moped motor scooter motorcycle: - NOS - combination - with sidecar - motorized
bicycle - speed-limited motor-driven cycle
Excludes: motor-driven tricycle - see definition (m)

(l) A motorcycle rider is any person riding on a motorcycle or in a sidecar or trailer
attached to such a vehicle.

(m) A three-wheeled motor vehicle is a motorized tricycle designed primarily for on-road
use.
Includes: - motor-driven tricycle - motorized rickshaw - three-wheeled motor car
Excludes: - motorcycle with sidecar - see definition (k) - special all-terrain vehicle - see
definition (x)

(n) A car [automobile] is a four-wheeled motor vehicle designed primarily for carrying up to
10 persons. A trailer or caravan being towed by a car is considered a part of the car.
Includes: minibus

(o) A motor vehicle or vehicle may refer to various transport vehicles. The local usage of
the terms should be established to determine the appropriate code. If the terms are
used ambiguously, use the code for "unspecified". A trailer or caravan being towed by a
vehicle is considered a part of the vehicle.

(p) A pick-up truck or van is a four- or six-wheeled motor vehicle designed primarily for
carrying property, weighing less than the local limit for classification as a heavy goods
vehicle, and not requiring a special driver’s licence. A trailer or caravan being towed by
a pick-up truck or van is considered a part of the vehicle.

(q) A heavy transport vehicle is a motor vehicle designed primarily for carrying property,
meeting local criteria for classification as a heavy goods vehicle in terms of kerbside
weight (usually above 3500 kilograms), and requiring a special driver's licence to operate.

(r) A bus is a motor vehicle designed or adapted primarily for carrying more than 10 persons, and requiring a special driver's licence to operate.

(s) A railway train or railway vehicle is any device, with or without cars coupled to it, designed for traffic on a railway.

Includes: interurban: - electric car - street car (operated chiefly on its own right-of-way, not open to other traffic) railway train, any power [diesel] [electric] [steam]: - funicular - monorail or two-rail - subterranean or elevated other vehicle designed to run on a railway track

Excludes: interurban electric cars [streetcars] specified to be operating on a right-of-way that forms part of the public street or highway - see definition (t)

(t) A streetcar is a vehicle designed and used primarily for transporting persons within a municipality, running on rails, usually subject to normal traffic control signals, and operated principally on a right-of-way that forms part of the roadway. A trailer being towed by a streetcar is considered a part of the streetcar.

Includes: - interurban electric car or streetcar, when specified to be operating on a street or public highway - tram (car) - trolley (car)

(u) A special vehicle mainly used on industrial premises is a motor vehicle designed primarily for use within the buildings and premises of industrial or commercial establishments.

Includes: - battery-powered: - airport passenger vehicle - (baggage)(mail) - coal-car in mine - forklift (truck) - logging car - self-propelled truck, industrial - station baggage truck (powered) - tram, truck or tub (powered) in mine or quarry

(v) A special vehicle mainly used in agriculture is a motor vehicle designed specifically for use in farming and agriculture (horticulture), for example to work the land, tend and harvest crops and transport materials on the farm.

Includes: - combine harvester - self-propelled farm machinery - tractor (and trailer)

(w) A special construction vehicle is a motor vehicle designed specifically for use in the construction (and demolition) of roads, buildings and other structures.

Includes: - bulldozer - digger - dumper truck - earth-leveller - mechanical shovel - road-roller

(x) A special all-terrain vehicle is a motor vehicle of special design to enable it to negotiate rough or soft terrain or snow. Examples of special design are high construction, special wheels and tyres, tracks, and support on a cushion of air.

Includes: - hovercraft on land or swamp - snowmobile

Excludes: hovercraft on open water - see definition (y)

(y) A watercraft is any device for transporting passengers or goods on water.

Includes: hovercraft NOS
An aircraft is any device for transporting passengers or goods in the air.

10.2.3.2 Classification and coding instructions for transport accidents

Transport accidents are counted for official statistics where they are unintentional. A special tabulation list provides the set of categories for traffic accident reporting.

1. If an event is unspecified as to whether it was a traffic or a non-traffic-accident, the following classifications will help to decipher: a) Classify as: A traffic accident occurs when the event is classifiable to the traffic accident categories.

b) Classify as: A non-traffic accident occurs when the event is classifiable to non-traffic categories. For these categories the victim is either a pedestrian, or an occupant of a vehicle designed primarily for off-road use.

2. When accidents involving more than one kind of transport are reported, the following order of precedence should be used:
   - aircraft and spacecraft
   - watercraft
   - other modes of transport

3. Where transport accident descriptions do not specify the victim as being a vehicle occupant and the victim is described as:
   - crushed - dragged - hit - injured - killed - knocked down - run over - by any vehicle including:
     - animal being ridden
     - animal-drawn vehicle
     - bicycle
     - bulldozer
     - bus
     - car
     - motorcycle
     - motorized tricycle
     - pick-up (truck)
     - recreational vehicle
     - streetcar
     - tractor
     - train
     - tram
     - truck
     - van
     Classify the victim as a pedestrian

4. Where transport accident descriptions do not indicate the victim's role, classify the victim as an occupant or rider of the vehicle if there is mention of vehicles such as:
   - airplane
   - bicycle
   - boat
   - bulldozer
   - bus
• car
• motorcycle
• motorized tricycle
• pick-up (truck)
• recreational vehicle
• spacecraft
• tractor
• train
• tram
• truck
• van
• watercraft
• accident
• collision
• crash
• wreck -NOS >Classify the victim as an occupant or rider of the vehicle mentioned.

If more than one vehicle is mentioned, do not make any assumption as to which vehicle was occupied by the victim unless the vehicles are the same. Instead, code to the appropriate categories, taking into account the order of precedence given in note 2 above.

5. Where a transport accident, such as:
• vehicle (motor) (non-motor):
• going out of control (due to):
• burst tyre [blowout]
• driver falling asleep
• driver inattention
• excessive speed
• failure of mechanical part > resulted in a subsequent collision, classify the accident as a collision. If an accident other than a collision resulted, classify it as a non-collision accident according to the vehicle type involved.

6. Where a transport accident involving a vehicle in motion, such as:
• accidental poisoning from exhaust gas generated by
• breakage of any part of
• explosion of any part of
• fall, jump or being accidentally pushed from
• fire starting in
• hit by object thrown into or onto
• injured by being thrown against some part of, or object in
• injury from moving part of
• object falling in or on
• vehicle in motion
• resulted in a subsequent collision, classify the accident as a collision. If an accident other than a collision resulted, classify it as a non-collision accident according to the vehicle type involved. >Land transport accidents described as:
• collision (due to loss of control)(on highway) between vehicle and:
• abutment (bridge)(overpass)
• fallen stone
• guard rail or boundary fence
• inter-highway divider
• landslide (not moving)
• object thrown in front of motor vehicle
• safety island
• tree
• traffic sign or marker (temporary)
• utility pole
• wall of cut made for road
• other object, fixed, movable or moving
• overturning (without collision)
• collision with animal (herded)(unattended)
• collision with animal-drawn vehicle or animal being ridden are included.

11 ICD maintenance and application

The ICD maintenance process allows the continuous adaptation of the ICD following the evolution in the understanding of diseases, treatments, and prevention. A proposal and review mechanism on an online platform makes the process transparent. Workflows ensure that proposed changes are considered both from a medical and scientific perspective and from their value and place in a particular use case. As a result, the foundation component and the related tabular list(s) will be released in updated versions.

11.1 ICD–11 Update Process

Official releases of the ICD-11 MMS classification are produced annually for international use in mortality and morbidity. The ICD-11 foundation is continuously updated. A standardized process has been established to ensure that the proposed updates are collected, routed, reviewed, and duly considered before being implemented. The updating is carried out at different levels with different frequencies. That will keep stability for mortality and allow quicker updates for morbidity use. Updates that impact on the 4 and 5 digit structure will be published every 5 years. Updates at a more detailed level can be published at annual rates, and pending the needs of clinical modifications also twice a year. Additions to the index can be done on an ongoing basis. Mortality and morbidity rules will be updated in long term cycle.

11.1.1 Proposals and Review Mechanisms and workflow

Any individual can submit a proposal for an update to the ICD. Such updates can refer to one or more entities of the ICD. They may address the position of entities in a tabular list, in the foundation, and any element of the content model. Suggestions shall be provided in the format of a short (approximately 500-word) explanation with references to underpinning literature and evidence. The proposal shall also visualize the changes in the position and address potential impact on entities outside the proposal. The proposals will be reviewed by scientific experts and classification experts. Decision on taking into account a particular
A proposal will be based on the recommendations by these experts. A workflow between a mortality and a morbidity reference group, a medical scientific advisory group and a classification and statistics advisory group will ensure that all aspects concerning a proposal are taken into account. Reviews of the synthesis by classification experts ensure suitability of the proposed changes to the diverse use cases of the ICD. The process has 2 rounds of mutual editing between content and classification experts to achieve consensus about a proposed change. All rounds of editing will be handled through electronic platforms. Where consensus cannot be achieved, the proposal can either be deferred to subsequent cycles of editing pending arbitration by the WHO or be solved in a face to face meeting of classification and content experts. In all other cases, a consensus recommendation is given to the WHO for final decision.

11.1.2 Official releases

The ICD-11 will be released in 5-yearly ‘stable’ versions for international use (updates that impact on the 4 and 5 digit structure), unless urgent public health needs require otherwise. The releases are supplemented with version identifiers that are used for reporting in conjunction with the codes. Transition tables and materials showing the differences are provided with every version. Updates at a more detailed level than 4 and 5 digits can be published at annual rates. Additions to the index can be done on an ongoing basis. Mortality and morbidity rules will be updated in long term cycle. All countries that have implemented the ICD-11 are encouraged to adopt the updates in order to ensure greatest possible standardization of coding results. If a country for whatever reason cannot implement a certain year of updates it shall ensure that at least the reported data is in line with the most recent version of ICD-11. Small error corrections that serve to clarify meaning, indexing or errors, may be communicated at a yearly rate. The WHO has taken all reasonable precautions to verify the information contained in the ICD and its different versions and editions. However, the ICD is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of ICD lies with the user. In no event shall the WHO be liable for damages arising from its use. The publisher of ICD-coded information is liable to ensure proper use of the ICD and present clearly the methodology for data collection and mechanisms that were used to modify the original data in order to indicate the comparability of the presented outcomes. For mortality data, no deviation from the methodology indicated in the ICD is permitted.

11.1.3 Update platform

All proposals are entered on an online update platform, for verification of completeness, discussion and editing. The platform provides the infrastructure for routing proposals to reviewers and experts, and for providing feedback to the original authors. The update platform also shows the final outcome of the proposal that has been entered in the authoring platform and become part of the ICD.

11.2 Applicability and Intellectual Property

The ICD is an international reference standard which is free of charge. Changes to the ICD are not permitted unless they are approved through the updating mechanism. The ICD provides a set of core tabular lists with categories that are mandatory for international reporting. The ICD is distributed free of royalties for personal, research, governmental and other non-commercial uses of WHO Member States. Commercial users of the ICD are subject
to royalties payable to the WHO. Users may access and use the ICD from the Internet for personal use. Users will register and agree to the end user license agreement prior to accessing the ICD files for download. A print version can be bought at the WHO bookshop. Web services for ICD coding and browsing are available subject to signature of relevant contracts. The ICD may be translated into any language. For translation, interested parties are requested to contact the WHO and comply with the relevant regulations in a signed contract. The translator will use the WHO translation platform thus allowing the WHO to verify correctness and completeness of the translation. All versions of ICD–11 belong to the WHO, including non-official languages. In view of the multilingual tooling for ICD–11, quality control will be ensured for all versions. The ICD must be used as is. No changes are permitted, unless a dedicated contractual arrangement with WHO has been made. Requests for production of special version will be subject to requests for funding of the related work. Such versions will be produced from the WHO production platform by WHO. No publicity may be displayed in the ICD print versions. No publicity may be displayed in the coding or browsing page. In case of online use, a link to the ICD homepage at the WHO has to be included. Ideally users will access the ICD through the WHO web services. This will ensure proper joint use of index, content model and tabular lists and facilitate updates, where applicable. For international reporting, the most up to date version of the ICD is used, as stipulated in the Nomenclature Regulations (1967). In some instances, users may feel the need to change parts of the ICD. Changes impact on the meaning of categories of the classification. Changes also may reflect specific needs that are useful to other users. Requests for changes to ICD have to be submitted on the WHO-ICD update platform (for details see section on updating the ICD.)

The ICD is designed to be used as such, or to be usable together with SNOMED-CT. A legal framework regulates the joint use of SNOMED-CT and the ICD. The relevant regulations are made available upon request. Links of the ICD to other terminologies or nomenclatures are subject to individual legal and technical arrangements between the WHO and the interested parties.

Any input to ICD–11 and its components requires proper mention of sources and permission by the owner of the copyright. ICD–11 has standard ways of presenting its content. Conventions describe textual content and also apply to the coding structure.

11.3 National Modifications for morbidity coding

The use of ICD in the specific context of the health care system of a country may require the development of modifications to the ICD-11, for example due to specific settings or due to reimbursement system requirements. Such changes will be subject to the same international process as are all other proposals for changes to ICD, then become part of the foundation and eventually of the MMS, prior to their implementation in the requesting country. A situation may arise, where high level interventions of a national government or an equally important national body requests a modification to be implemented immediately. In such exceptional circumstances, conflicts with the current foundation must be avoided, and the relevant changes will be subject to the international updating process during or immediately after the date of their of national implementation. All countries planning to produce national modifications have to make the relevant contractual arrangements with WHO. This includes regulations on distribution within the respective country and the resources necessary.

For developing a national modification of ICD-11 the following rules must be followed:
1. Modifications will be agreed by the ICD-11 maintenance bodies before they are implemented nationally.

2. Modifications can only be added below the level of coding depth that is specified in the Tabular List for Morbidity and Mortality Statistics, and should not conflict with the foundation.

   Example: “Diabetes Type 1” in WHO Version of ICD-11 is 5A10. In a national modification there might be the need for additional detail which can be added in the routine notation of ICD-11 codes: “Diabetes Type 1, uncontrolled” can be coded in that national modification to 6A10.0; Diabetes Type 1, uncontrolled” to 6A10.1. However, the mechanisms for postcoordination via cluster coding would allow to code that detail without additional precoordination.

11.4 Mortality Rules – Knowledgebase

The Mortality Knowledge Database is a collection of rules that are used for determining the underlying Cause of Death from the death certificates. These rules are based upon the Mortality coding guidelines of the ICD. The rules cover permitted sequences, such as disease ‘a’ due to disease ‘b’, and cases where the selected cause may be modified to provide more relevant information for public health. Short summaries describe the scope of a rule, and code tables specify explicitly and independent of language the use of the rule with the codes of the mortality tabular list. ‘Code sets’ of the code table group ICD codes that often occur together in the knowledge base or are handled similarly by the selection and modification rules, for example as causes or consequences of diseases with some common characteristic. The information on the rules is maintained in a database, so that the data in the rules code table can be easily validated against changes in the classification, and vice versa.

The code tables can be used for manual coding and selection of the underlying cause of death, or for programming of software that assists in this task. In the past such Rule bases have been developed by users of ICD-10 mortality coding in an international approach, relying for decision to change relationship in the tables on decisions of internationally accredited groups such as the Mortality Reference Group of the Family of Classifications Network. For ICD-11 the maintenance of such tables might be continued by the users in a joined endeavour or might be transferred to WHO if resources at WHO permit such maintenance.

11.5 Automated coding tools for mortality

Automated coding tools for mortality are interactive computer-based systems for coding multiple causes of death and for selecting the underlying cause of death. Systems require a dictionary that matches the language that is used for reporting causes of death. Use of the software requires training. Specialist coders need to assist in cases that can not be coded by the software. This is the case in (10-20%) of cases, depending on language and dictionary. Currently (2017) IRIS is the only actively maintained automated coding software. It has been developed through a longstanding collaboration between several countries including France, Germany, Hungary, Italy, Spain, Sweden, and the United States. IRIS is a language-independent software system which can be operated from a PC. The main objective of IRIS is
to increase the quality of mortality data and its comparability at the international level. The data reported on a death certificate can be entered in coded format or in plain text. The system comes with dictionaries in English, French, and other languages. The software was originally based on the ACME software and the USA decision tables. IRIS is now maintained by an international community of national offices that use this system and it uses the Mortality Knowledge Database, developed by the NCHS and developed further by the Iris Core Group. The IRIS collaboration is hosted by the DIMDI.

12 History of the development of the ICD

12.1 Early history

Sir George Knibbs, the eminent Australian statistician, credited François Bossier de Lacroix (1706–1777), better known as Sauvages, with the first attempt to classify diseases systematically (10). Sauvages’ comprehensive treatise was published under the title Nosologia methodica. A contemporary of Sauvages was the great methodologist Linnaeus (1707–1778), author of Genera morborum, a catalogue of diseases. More recently, Moriyama et al (11) have referred to 16th century and 17th predecessors Fernel and Sydenham. At the beginning of the 19th century, the classification of disease in most general use was one by William Cullen (1710–1790), of Edinburgh, which was published in 1785 under the title Synopsis nosologiae methodicae.

For all practical purposes, however, the statistical study of disease began a century earlier with the work of John Graunt on the London Bills of Mortality published in 1662. The kind of classification envisaged by this pioneer is exemplified by his attempt to estimate the proportion of liveborn children who died before reaching the age of six years, no records of age at death being available. He took all deaths classed as thrush, convulsions, rickets, teeth and worms, abortives, chrysomes, infants, livergrown, and overlaid and added to them half the deaths classed as smallpox, swinepox, measles, and worms without convulsions. Despite the crudity of this classification, his estimate of 36% mortality before the age of six years appears from later evidence to have been a good one. While three centuries have contributed something to the scientific accuracy of disease classification, there are many who doubt the usefulness of attempts to compile statistics of disease, or even causes of death, because of the difficulties of classification. To these, one can quote Major Greenwood: ‘The scientific purist, who will wait for medical statistics until they are nosologically exact, is no wiser than Horace’s rustic waiting for the river to flow away’ (12).

Fortunately for the progress of preventive medicine, the General Register Office of England and Wales, at its inception in 1837, found in William Farr (1807–1883) – its first medical statistician – a man who not only made the best possible use of the imperfect classifications of disease available at the time, but laboured to secure better classifications and international uniformity in their use.

Farr found Cullen’s classification in use in the public services. It had not been revised to embody the advances of medical science, nor was it deemed by him to be satisfactory for statistical purposes. Farr realised that small numbers that would result from a detailed classification would not permit statistical inferences to be made (11). In the first Annual Report of the Registrar General (13), therefore, he discussed the principles that should
The advantages of a uniform statistical nomenclature, however imperfect, are so obvious, that it is surprising no attention has been paid to its enforcement in Bills of Mortality. Each disease has, in many instances, been denoted by three or four terms, and each term has been applied to as many different diseases: vague, inconvenient names have been employed, or complications have been registered instead of primary diseases. The nomenclature is of as much importance in this department of inquiry as weights and measures in the physical sciences, and should be settled without delay.

Both nomenclature and statistical classification received constant study and consideration by Farr in his annual ‘Letters’ to the Registrar General published in the Annual Reports of the Registrar General. Farr did much to promote his classification but could not find general acceptance (11). The utility of a uniform classification of causes of death was so strongly recognized at the first International Statistical Congress, held in Brussels in 1853, that the Congress requested William Farr and Genevan Marc d’Espine, to prepare an internationally applicable, uniform classification of causes of death.

At the next Congress, in Paris in 1855, Farr and d’Espine submitted two separate lists which were based on very different principles. Farr’s classification was arranged under five groups: epidemic diseases, constitutional (general) diseases, local diseases arranged according to anatomical site, developmental diseases, and diseases that are the direct result of violence. D’Espine classified diseases according to their nature (gouty, herpetic, haematic, etc.). The Congress adopted a compromise list of 139 rubrics. In 1864, this classification was revised in Paris on the basis of Farr’s model and was subsequently further revised in 1874, 1880, and 1886. Although this classification was never universally accepted, the general arrangement proposed by Farr, including the principle of classifying diseases by aetiology followed by anatomical site, survived as the basis of the International List of Causes of Death.

Importantly, the 1855 Congress also recommended that each country should ask for information on causes of death from the doctor who had been attending the deceased, and that each country should take measures to ensure that all deaths were verified by doctors (11).

12.2 Adoption of the International List of Causes of Death

The International Statistical Institute, the successor to the International Statistical Congress, at its meeting in Vienna in 1891, charged a committee, chaired by Jacques Bertillon (1851-1922), Chief of Statistical Services of the City of Paris, with the preparation of a classification of causes of death. The report of this committee was presented by Bertillon at the meeting of the International Statistical Institute in Chicago in 1893 and adopted by it.

Bertillon adopted for main headings the anatomical site rather than the nature of disease, according to Farr’s plan. Bertillon’s list included defined diseases most worthy of study by reason of their transmissible nature or their frequency of occurrence. In accordance with the instructions of the Vienna Congress, Bertillon included three classifications: the first, an abridged classification of 44 titles; the second, a classification of 99 titles; and the third, a classification of 161 titles. Bertillon also prepared some rules or guidelines on the resolution of problems; for example, how statistical clerks should classify what is written without imputing what the doctor might have meant (11).
The ‘Bertillon Classification of Causes of Death’, as it was first called, received general approval and was adopted by several countries, as well as by many cities. The classification was first used in North America by Jesus E. Monjaras for the statistics of San Luis de Potosi, Mexico (14). In 1898, the American Public Health Association, at its meeting in Ottawa, Canada, recommended the adoption of the Bertillon Classification by registrars of Canada, Mexico, and the United States of America. The Association further suggested that the classification should be revised every ten years.

At the meeting of the International Statistical Institute at Christiania in 1899, Bertillon presented a report on the progress of the classification, including the recommendations of the American Public Health Association for decennial revisions. The International Statistical Institute then adopted the following resolution (15): The International Statistical Institute, convinced of the necessity of using in the different countries comparable nomenclatures:

- Learns with pleasure of the adoption by all the statistical offices of North America, by some of those of South America, and by some in Europe, of the system of cause of death nomenclature presented in 1893;
- Insists vigorously that this system of nomenclature be adopted in principle and without revision, by all the statistical institutions of Europe;
- Approves, at least in its general lines, the system of decennial revision proposed by the American Public Health Association at its Ottawa session (1898);
- Urges the statistical offices who have not yet adhered, to do so without delay, and to contribute to the comparability of the cause of death nomenclature.

The French Government therefore convoked in Paris, in August 1900, the first International Conference for the Revision of the Bertillon or International List of Causes of Death. Delegates from 26 countries attended this Conference. A detailed classification of causes of death consisting of 179 groups and an abridged classification of 35 groups were adopted on 21 August 1900. The desirability of decennial revisions was recognized, and the French Government was requested to call the next meeting in 1910. In fact, the next conference was held in 1909, and the Government of France called succeeding conferences in 1920, 1929, and 1938. Bertillon continued to be the guiding force in the promotion of the International List of Causes of Death, and the revisions of 1900, 1910, and 1920 were carried out under his leadership. As Secretary-General of the International Conference, he sent out the provisional revision for 1920 to more than 500 people, asking for comments. His death in 1922 left the International Conference without a guiding hand.

At the 1923 session of the International Statistical Institute, Michel Huber, Bertillon’s successor in France, recognized this lack of leadership and introduced a resolution for the International Statistical Institute to renew its stand of 1893 in regard to the International Classification of Causes of Death and to cooperate with other international organizations in preparation for subsequent revisions. The Health Organization of the League of Nations had also taken an active interest in vital statistics and appointed a Commission of Statistical Experts to study the classification of diseases and causes of death, as well as other problems in the field of medical statistics. E. Roesle, Chief of the Medical Statistical Service of the German Health Bureau and a member of the Commission of Expert Statisticians, prepared a monograph that listed the expansion in the rubrics of the 1920 International List of Causes of Death that would be required if the classification were to be used in the tabulation of statistics of morbidity. This careful study was published by the Health Organization of the League of Nations in 1928 (16). In order to coordinate the work of both agencies, an international commission, known as the ‘Mixed Commission’, was created with an equal number of representatives from the International Statistical Institute and the Health
Organization of the League of Nations. This Commission drafted the proposals for the Fourth (1929) and the Fifth (1938) revisions of the International List of Causes of Death.

12.3 The Fifth Decennial Revision Conference

The Fifth International Conference for the Revision of the International List of Causes of Death, like the preceding conferences, was convened by the Government of France and was held in Paris in October 1938. The Conference approved three lists: a detailed list of 200 titles, an intermediate list of 87 titles and an abridged list of 44 titles. Apart from bringing the lists up to date in accordance with the progress of science, particularly in the chapter on infectious and parasitic diseases, and changes in the chapters on puerperal conditions and on accidents, the Conference made as few changes as possible in the contents, number, and even in the numbering of the items. A list of causes of stillbirth was also drawn up and approved by the Conference.

As regards classification of diseases for morbidity statistics, the Conference recognized the growing need for a corresponding list of diseases to meet the statistical requirements of widely differing organizations, such as health insurance organizations, hospitals, military medical services, health administrations, and similar bodies. The following resolution, therefore, was adopted (15):

12.4 International Lists of Diseases.

In view of the importance of the compilation of international lists of diseases corresponding to the international lists of causes of death: The Conference recommends that the Joint Committee appointed by the International Institute of Statistics and the Health Organization of the League of Nations undertake, as in 1929, the preparation of international lists of diseases, in conjunction with experts and representatives of the organizations specially concerned. Pending the compilation of international lists of diseases, the Conference recommends that the various national lists in use should, as far as possible, be brought into line with the detailed International List of Causes of Death (the numbers of the chapters, headings and subheadings in the said List being given in brackets). The Conference further recommended that the United States Government continue its studies of the statistical treatment of joint causes of death in the following resolution (17):

Death Certificate and Selection of Causes of Death where more than One Cause is given (Joint Causes) The Conference,

• Whereas, in 1929, the United States Government was good enough to undertake the study of the means of unifying the methods of selection of the main cause of death to be tabulated in those cases where two or more causes are mentioned on the death certificate,
• And whereas, the numerous surveys completed or in the course of preparation in several countries reveal the importance of this problem, which has not yet been solved,
• And whereas, according to these surveys, the international comparability of death rates from the various diseases requires, not only the solution of the problem of the selection of the main tabulated cause of death, but also the solution of a number of other questions;
1. Warmly thanks the United States Government for the work it has accomplished or promoted in this connection;
2. Requests the United States Government to continue its investigations during the next ten years, in cooperation with other countries and organizations, on a slightly wider basis, and

3. Suggests that, for these future investigations, the United States Government should set up a subcommittee comprising representatives of countries and organizations participating in the investigations undertaken in this connection.

12.5 Previous classifications of diseases for morbidity statistics

In the discussion so far, classification of disease has been presented almost wholly in relation to cause of death statistics. Farr, however, recognized that it was desirable.

12.6 United States Committee on Joint Causes of Death

In compliance with the resolution of the Fifth International Conference, the American Secretary of State in 1945 appointed the United States Committee on Joint Causes of Death under the chairmanship of Lowell J. Reed, Professor of Biostatistics at Johns Hopkins University. Members and consultants of this committee included representatives of the Governments of Canada and the United Kingdom and the Health Section of the League of Nations. The committee recognized the general trend of thought with regard to lists of morbidity and mortality statistics, and decided that, before taking up the matter of joint causes, it would be advantageous to consider classifications from the point of view of morbidity and mortality, since the problem of joint causes pertained to both types of statistics.

The committee also took into account that part of the resolution on International Lists of Diseases of the previous International Conference recommending that the ‘various national lists in use should, as far as possible, be brought into line with the detailed International List of Causes of Death’. It recognized that the classification of sickness and injury is closely linked with the classification of causes of death. The view that such lists are fundamentally different arises from the erroneous belief that the International List is a classification of terminal causes, whereas it is in fact based upon the morbid condition that initiated the train of events ultimately resulting in death. The committee believed that, in order to utilize fully both morbidity and mortality statistics, not only should the classification of diseases for both purposes be comparable, but if possible there should be a single list.

Furthermore, an increasing number of statistical organizations were using medical records involving both sickness and death. Even in organizations that compile only morbidity statistics, fatal as well as non-fatal cases must be coded. A single list, therefore, greatly facilitates their coding operations. It also provides a common base for comparison of morbidity and mortality statistics.

A subcommittee was therefore appointed, which prepared a draft of a Proposed Statistical Classification of Diseases, Injuries and Causes of Death. A final draft was adopted by the committee after it had been modified on the basis of trials undertaken by various agencies in Canada, the United Kingdom and the United States of America.
12.7 Sixth Revision of the International Lists

The International Health Conference held in New York City in June and July 1946 (20) entrusted the Interim Commission of the World Health Organization with the responsibility of:

reviewing the existing machinery and of undertaking such preparatory work as may be necessary in connection with: (i) the next decennial revision of ‘The International Lists of Causes of Death’ (including the lists adopted under the International Agreement of 1934, relating to Statistics of Causes of Death); and

(ii) the establishment of International Lists of Causes of Morbidity

To meet this responsibility, the Interim Commission appointed the Expert Committee for the Preparation of the Sixth Decennial Revision of the International Lists of Diseases and Causes of Death. This Committee, taking full account of prevailing opinion concerning morbidity and mortality classification, reviewed and revised the above mentioned proposed classification which had been prepared by the United States Committee on Joint Causes of Death.

The resulting classification was circulated to national governments preparing morbidity and mortality statistics for comments and suggestions under the title, International Classification of Diseases, Injuries, and Causes of Death. The Expert Committee considered the replies and prepared a revised version incorporating such changes as appeared to improve the utility and acceptability of the classification. The Committee also compiled a list of diagnostic terms to appear under each title of the classification. Furthermore, a subcommittee was appointed to prepare a comprehensive alphabetical index of diagnostic statements classified to the appropriate category of the classification. The Committee also considered the structure and uses of special lists of causes for tabulation and publication of morbidity and mortality statistics and studied other problems related to the international comparability of mortality statistics, such as form of medical certificate and rules for classification. The International Conference for the Sixth Revision of the International Lists of Diseases and Causes of Death was convened in Paris from 26 to 30 April 1948 by the Government of France under the terms of the agreement signed at the close of the Fifth Revision Conference in 1938. Its secretariat was entrusted jointly to the competent French authorities and to the World Health Organization, which had carried out the preparatory work under the terms of the arrangement concluded by the governments represented at the International Health Conference in 1946 (20).

The Conference adopted the classification prepared by the Expert Committee as the Sixth Revision of the International Lists (21). It also considered other proposals of the Expert Committee concerning the compilation, tabulation and publication of morbidity and mortality statistics. The Conference approved the International Form of Medical Certificate of Cause of Death, accepted the underlying cause of death as the main cause to be tabulated, and endorsed the rules for selecting the underlying cause of death as well as the special lists for tabulation of morbidity and mortality data. It further recommended that the World Health Assembly should adopt regulations under Article 21(b) of the WHO Constitution to guide Member States in compiling morbidity and mortality statistics in accordance with the International Statistical Classification. In 1948, the First World Health Assembly endorsed the report of the Sixth Revision Conference and adopted World Health Organization Regulations No. 1, prepared on the basis of the recommendations of the
Conference. The International Classification, including the Tabular List of Inclusions defining the content of the categories, was incorporated, together with the form of the medical certificate of cause of death, the rules for classification and the special lists for tabulation, into the Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death (22). The Manual consisted of two volumes, Volume 2 being an alphabetical index of diagnostic terms coded to the appropriate categories. In the Sixth Revision, morbid conditions resulting from injuries, poisonings and other external causes were classified according to both the external circumstances giving rise to the injury and to the kind of injury. The adoption of this dual classification was regarded at the time as a bold step to deal with the simultaneous interest in more than one aspect of injury. The Sixth Decennial Revision Conference marked the beginning of a new era in international vital and health statistics. Apart from approving a comprehensive list for both mortality and morbidity and agreeing on international rules for selecting the underlying cause of death, it recommended the adoption of a comprehensive programme of international cooperation in the field of vital and health statistics. An important item in this programme was the recommendation that governments establish national committees on vital and health statistics to coordinate the statistical activities in the country, and to serve as a link between the national statistical institutions and the World Health Organization. It was further envisaged that such national committees would, either singly or in cooperation with other national committees, study statistical problems of public health importance and make the results of their investigations available to the WHO.

12.8 The Seventh and Eighth Revisions

The International Conference for the Seventh Revision of the International Classification of Diseases was held in Paris under the auspices of the WHO in February 1955 (23). In accordance with a recommendation of the WHO Expert Committee on Health Statistics, this revision was limited to essential changes and amendments of errors and inconsistencies (24). The Eighth Revision Conference convened by the WHO met in Geneva, from 6 to 12 July 1965 (25). This revision was more radical than the Seventh but left unchanged the basic structure of the Classification and the general philosophy of classifying diseases, whenever possible, according to their aetiology rather than a particular manifestation. During the years that the Seventh and Eighth Revisions of the ICD were in force, the use of the ICD for indexing hospital medical records increased rapidly and some countries prepared national adaptations which provided the additional detail needed for this application of the ICD.

12.9 The Ninth Revision

The International Conference for the Ninth Revision of the International Classification of Diseases, convened by the WHO, met in Geneva from 30 September to 6 October 1975 (26). In the discussions leading up to the conference, it had originally been intended that there should be little change other than updating of the classification. This was mainly because of the expense of adapting data processing systems each time the classification was revised. There had been an enormous growth of interest in the ICD and ways had to be found of responding to this, partly by modifying the classification itself and partly by introducing special coding provisions. A number of representations were made by specialist bodies which had become interested in using the ICD for their own statistics. Some subject areas in the classification were regarded as inappropriately arranged and there was considerable pressure for more detail and for adaptation of the classification to make it more relevant for
the evaluation of medical care, by classifying conditions to the chapters concerned with the
part of the body affected rather than to those dealing with the underlying generalized
disease. At the other end of the scale, there were representations from countries and areas
where a detailed and sophisticated classification was irrelevant, but which nevertheless
needed a classification based on the ICD in order to assess their progress in health care and
in the control of disease. The final proposals presented to and accepted by the Conference
retained the basic structure of the ICD, although with much additional detail at the level of
the four digit subcategories, and some optional five digit subdivisions. For the benefit of
users not requiring such detail, care was taken to ensure that the categories at the three
digit level were appropriate. For the benefit of users wishing to produce statistics and
indexes oriented towards medical care, the Ninth Revision included an optional alternative
method of classifying diagnostic statements, including information about both an underlying
general disease and a manifestation in a particular organ or site. This system became known
as the dagger and asterisk system. The Twenty Ninth World Health Assembly, noting the
recommendations of the International Conference for the Ninth Revision of the International
Classification of Diseases, approved the publication, for trial purposes, of supplementary
classifications of Impairments and Handicaps and of Procedures in Medicine as supplements
to, but not as integral parts of, the International Classification of Diseases.

12.10 The Tenth Revision

Even before the Conference for the Ninth Revision, the WHO had been preparing for the
Tenth Revision. It recognised that the great expansion in the use of the ICD necessitated a
thorough rethinking of its structure and an effort to devise a stable and flexible classification,
which should not require fundamental revision for many years to come. The WHO
Collaborating Centres for Classification of Diseases (see www.who.int/classification) were
consequently called upon to experiment with models of alternative structures for ICD–10. It
had also become clear that the established ten year interval between revisions was too
short. Work on the revision process had to start before the current version of the ICD had
been in use long enough to be thoroughly evaluated, mainly because the necessity to consult
so many countries and organizations made the process a very lengthy one. The Director
General of the WHO therefore wrote to the Member States and obtained their agreement to
postpone until 1989 the Tenth Revision Conference, which was originally scheduled for 1985
and to delay the introduction of the Tenth Revision which would have been due in 1989. In
addition to permitting experimentation with alternative models for the structure of the ICD,
this allowed time for the evaluation of ICD 9, for example through meetings organized by
some of the WHO Regional Offices and through a survey organized at headquarters. The
International Conference for the Tenth Revision of the International Classification of
Diseases, attended by delegates from 43 Member States, was convened by the World Health
Organization in Geneva from 26 September to 2 October 1989. The United Nations, the
International Labour Organisation and the WHO Regional Offices sent representatives to
participate in the Conference, as did the Council for International Organizations of Medical
Sciences, and twelve other non-governmental organizations concerned with cancer
registration, the deaf, epidemiology, family medicine, gynaecology and obstetrics,
hypertension, health records, preventive and social medicine, neurology, psychiatry,
rehabilitation and sexually transmitted diseases. Extensive preparatory activity had been
devoted to a radical review of the suitability of the structure of the ICD, essentially a
statistical classification of diseases and other health problems, to serve a wide variety of
needs for mortality and health-care data. Ways of stabilizing the coding system to minimize
disruption at successive revisions had been investigated, as had the possibility of providing a better balance between the content of the different chapters of the ICD. Even with a new structure, it was plain that one classification could not cope with the extremes of the requirements. The concept had therefore been developed of a ‘family’ of classifications, which would include the ICD for traditional mortality and morbidity statistics, while needs for more detailed, less detailed or different classifications and associated matters would be dealt with by other members of the family. The potential for different members of the ‘family’ in the medico-social and multi-dimensional assessment in relation not only to health but also to activities of daily living as well as the social and physical environment was recognised. It was demonstrated that effective information could be obtained through use of the ICD and the International Classification of Impairments, Disabilities, and Handicaps (ICIDH) (27), and through use of the codes from the XXI of the Tenth Revision. The main innovation in the Tenth Revision was the use of an alphanumeric coding scheme of one letter followed by three numbers at the four-character level. This had the effect of more than doubling the size of the coding frame in comparison with the Ninth Revision and enabled the vast majority of chapters to be assigned a unique letter or group of letters, each capable of providing 100 three-character categories. Of the 26 available letters, 25 had been used, the letter U being left vacant for future additions and changes and for possible interim classifications to solve difficulties arising at the national and international level between revisions. An important innovation was the creation towards the end of certain chapters of categories for postprocedural disorders. These identified important conditions that constituted a medical care problem in their own right. Postprocedural conditions that were not specific to a particular body system continued to be classified in the chapter on ‘Injury, poisoning and certain other consequences of external causes’. The Revision included definitions, standards and reporting requirements related to maternal mortality and to fetal, perinatal, neonatal and infant mortality. It was published in three volumes: one containing the Tabular List, a second containing all related definitions, standards, rules and instructions, and a third containing the Alphabetical Index.

The Tenth Revision Conference discussed the difficulties experienced during the extended period of use of the Ninth Revision, related to the emergence of new diseases and the lack of an updating mechanism to accommodate them. It recognized that it would not be feasible to hold revision conferences more frequently than every 10 years. It also recognized that any changes introduced during the lifetime of the Tenth Revision would need to be considered carefully in relation to their impact on analyses and trends.

12.11 The WHO Family of International Classifications

Although the ICD is suitable for many different applications, it does not serve all the needs of its various users. It does not provide sufficient detail for some specialties and sometimes information on different attributes of health conditions may be needed. Also, the ICD is not useful to describe functioning and disability as aspects of health, and does not include a full array of health interventions or reasons for encounter. Foundations laid by the International Conference on ICD–10 in 1989 provided the basis for the development of a ‘family’ of health classifications. This was given added momentum during the 1990s by the development of the International Classification of Functioning, Disability and Health (ICF) (28), approved by the World Health Assembly in 2001.
In 2001, the WHO Family of International Classifications (WHO-FIC) was created. At the core of the Family are its reference classifications, currently the ICD and the ICF; the International Classification of Health Interventions (ICHI), now under development, is the third reference classification. The WHO-FIC also includes derived classifications, which provide additional detail to core classifications or are rearrangements or aggregations of terms in core classifications; the WHO has licensed several countries to develop national modifications of the ICD as derived classifications. As well, the WHO-FIC includes related classifications to cover health functions which are not (or are only partially) covered by other WHO-FIC members. The WHO-FIC is supported by a network of Collaborating Centres, based on the former Collaborating Centres for the ICD and the ICF, but continuously expanded by the addition of new centres.

12.12 Updating of ICD between revisions

As foreshadowed at the Tenth Revision conference, updating of the tenth revision of ICD commenced in 2000. Updating proposals came from, and were carefully considered by, the WHO and Collaborating Centres, including the impact on trends. The updating process has allowed an extended life for the Tenth Revision while maintaining its clinical and scientific currency.

12.13 Preparations for the Eleventh Revision

By 2003, it was becoming clear to the WHO and the Collaborating Centres that a further revision of the ICD could not be long delayed. The extent to which ICD updating could encapsulate emerging developments was limited by the structure of ICD–10, and some issues needed extended development and discussion with expert groups. A special meeting of Collaborating Centres in Helsinki in 2004 discussed the need for a revision and issues to be addressed as part of the revision process. The 2004 WHO-FIC meeting subsequently adopted a revision process work-plan which was progressively developed at ensuing meetings.

In 2007, the WHO formally launched the revision process. Oversight has been provided through a broad based Revision Steering Group. Technical work has been undertaken by a series of Technical Advisory Groups, with cross-cutting groups examining mortality, morbidity and quality and safety issues. For the first time, a chapter on description of diseases and patterns of diseases from a Traditional medicine standpoint has been included.

A Content Model, including a range of components for each ICD entity has been developed, giving a rich Foundation for the ICD. Other classifications and terminologies are linked or included where possible to ensure ICD is aligned with them, and items used in other members of the WHO Family of Classifications have been aligned wherever possible. The more traditional statistical classification for mortality and morbidity is obtained from the Foundation component of ICD–11 as a tabular list. Extension codes are used to limit content volume but still allow detailed classification of disease entities.

12.14 History of the development of the ICD - References

8. International Nomenclature of Diseases. Geneva, Council for International Organizations of Medical Sciences and World Health Organization; for details of individual volumes, see text.
13 Annexes

13.1 International form of medical certificate of cause of death

Additional data that might be necessary for the reporting system of countries can be added to the certificate. The form has a Frame A that serves to report the cause of death, the sequence of causes, the duration of diseases until death, and other conditions contributing to death. Obvious information, like ‘cardiac arrest’ or ‘respiratory arrest’. Causes of death should be reported with the best available detail. For example, ‘birth depression’ for a newborn child that died, should be complemented by the reason for birth depression, as intrapartal asphyxia, or prepartal hypoxaemia.

The Frame B helps to report detail that is relevant to coding and epidemiology analyses for deaths due to external causes, maternal deaths, perinatal deaths, and deaths due to postprocedural conditions. It complements the information of Frame A.

The complete reporting of the causes of death is based on an accurate examination of the dead body, the assessment of local circumstances and insight in available health records. Correct establishment of a cause of death and filling in the death certificate requires training that should start at the medical school and is refreshed in continuous education programmes. The necessary practical experience that is gained under the supervision of more experienced colleagues. It is noted that medical certifiers that establish the cause of death may not always be available. Replacement by non-physicians may result in a changed pattern of the reported causes of death.

Where the dead body is no longer available for examination, for example due to low coverage with medical staff or traditional rapid burial procedures, a verbal autopsy may provide some limited information on the cause of death. In such case, a sequence of causes that led to death will rarely be identified, and causes identified with verbal autopsy should
be reported separately.

<table>
<thead>
<tr>
<th>Frame 1: Medical data: Part I and II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Report disease or condition directly leading to death on line a</td>
</tr>
<tr>
<td>Cause of death</td>
</tr>
<tr>
<td>a Due to:</td>
</tr>
<tr>
<td>b Due to:</td>
</tr>
<tr>
<td>c Due to:</td>
</tr>
<tr>
<td>d Due to:</td>
</tr>
<tr>
<td>Report chain of events in due to order (if applicable)</td>
</tr>
<tr>
<td>State the underlying cause on the lowest used line</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frame 2: Other medical data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Was surgery performed within the last 4 weeks?</td>
</tr>
<tr>
<td>□ Yes □ No □ Unknown</td>
</tr>
<tr>
<td>If yes please specify date of surgery</td>
</tr>
<tr>
<td>□ D □ M □ M □ Y □ Y □ Y □ Y</td>
</tr>
<tr>
<td>If yes please specify reason for surgery (disease or condition)</td>
</tr>
<tr>
<td>□ Disease □ Assault □ Could not be determined</td>
</tr>
<tr>
<td>□ Accident □ Legal intervention □ Pending investigation</td>
</tr>
<tr>
<td>□ Intentional self harm □ War □ Unknown</td>
</tr>
<tr>
<td>Was an autopsy requested?</td>
</tr>
<tr>
<td>□ Yes □ No □ Unknown</td>
</tr>
<tr>
<td>If yes were the findings used in the certification?</td>
</tr>
<tr>
<td>□ Yes □ No □ Unknown</td>
</tr>
<tr>
<td>Manner of death:</td>
</tr>
<tr>
<td>□ Disease □ Assault □ Could not be determined</td>
</tr>
<tr>
<td>□ Accident □ Legal intervention □ Pending investigation</td>
</tr>
<tr>
<td>□ Intentional self harm □ War □ Unknown</td>
</tr>
<tr>
<td>If External cause or poisoning:</td>
</tr>
<tr>
<td>Date of injury</td>
</tr>
<tr>
<td>□ D □ M □ M □ Y □ Y □ Y □ Y</td>
</tr>
<tr>
<td>Please describe how external cause occurred (If poisoning please specify poisoning agent)</td>
</tr>
<tr>
<td>Place of occurrence of the external cause:</td>
</tr>
<tr>
<td>□ At home □ Residential institution □ School, other institution, public administrative area</td>
</tr>
<tr>
<td>□ Street and highway □ Trade and service area □ Industrial and construction area</td>
</tr>
<tr>
<td>□ Farm □ Other place (please specify):</td>
</tr>
<tr>
<td>□ Unknown</td>
</tr>
<tr>
<td>Fetal or infant Death</td>
</tr>
<tr>
<td>Multiple pregnancy</td>
</tr>
<tr>
<td>□ Yes □ No □ Unknown</td>
</tr>
<tr>
<td>Stillborn?</td>
</tr>
<tr>
<td>□ Yes □ No □ Unknown</td>
</tr>
<tr>
<td>If death within 24h specify number of hours survived</td>
</tr>
<tr>
<td>Birth weight (in grams)</td>
</tr>
<tr>
<td>Number of completed weeks of pregnancy</td>
</tr>
<tr>
<td>Age of mother (years)</td>
</tr>
<tr>
<td>If death was perinatal, please state conditions of mother that affected the fetus and newborn</td>
</tr>
<tr>
<td>□ Yes □ No □ Unknown</td>
</tr>
<tr>
<td>For women, was the deceased pregnant?</td>
</tr>
<tr>
<td>□ Yes □ No □ Unknown</td>
</tr>
<tr>
<td>□ At time of death □ Within 42 days before the death</td>
</tr>
<tr>
<td>□ Between 43 days up to 1 year before death □ Unknown</td>
</tr>
<tr>
<td>Did the pregnancy contribute to the death?</td>
</tr>
<tr>
<td>□ Yes □ No □ Unknown</td>
</tr>
</tbody>
</table>
13.1.1 Cause of Death on the Death Certificate in line with ICD–11 – Quick reference guide
Cause of Death on the Death Certificate In line with ICD-11

-Quick reference guide-

Cause of death information serves
-epidemiology and prevention
-managing health care
-comparing health in different populations

Certification of death is one of the first steps in getting an overview of the health of people.

The diseases or conditions recorded on a death certificate represent the best medical opinion.

A properly completed cause-of-death certificate provides a description of the order, type and association of events that have resulted in the death.

The diagnoses reported on the certificate are coded with the International Classification of Diseases, 11th edition. This coded data is analyzed and used both nationally and internationally no matter what language was used to complete the certification.
Cause of Death on the certificate - how to fill in?

Frame A: Death certificates may look different in most countries. But the section on the cause of death is identical worldwide. This is also referred to as ‘Frame A’. It has two parts, called Part 1 and Part 2, and a section to record the time interval between the onset of each condition and the date of death.

Part 1 - is used for diseases or conditions that form part of the sequence of events leading directly to death.

The immediate (direct) cause of death is entered on the first line, I(a).
There must always be an entry on line I(a).
The entry on line Ia may be the only condition reported in Part I of the certificate.
Where there are two or more conditions that form part of the sequence of events leading directly to death. Each event in the sequence should be recorded on a separate line.

In any case you must record the disease, injury or external cause that resulted in the death. Do no record the mode of dying, such as cardiac arrest, respiratory failure or heart failure. Try to be as specific as you can.

“Unknown” cause of death should be recorded in cases where thorough testing or autopsy examination cannot determine a cause of death. “Unknown” is better than any speculation on the possible cause of death. Always fully spell out all terms. Abbreviations can be interpreted in different ways. Terms such as “suspected” or “possible” are ignored in evaluation of the entries. For example “suspected Diabetes” will be interpreted as “Diabetes”.

The four lines may not provide enough space for the chain of events. Do not waste space with unnecessary words. Some clinical terms are very vague. For example, “tumour” does not specify behaviour (see also last page of this flyer).

Duration - is the time interval between the onset of each condition that is entered on the certificate (not the time of diagnosis of the condition), and the date of death. The duration information is useful in coding certain diseases and also provides a useful check on the order of the reported sequence of conditions.

Part 2 - is used for conditions that do not belong in part 1 but whose presence contributed to death.

Frame B: Some detail is frequently forgotten in part 1 and 2 (frame A). Separate detailed questions ask for detail like previous surgery, mode of death or place of occurrence. Frame B is not shown in this information sheet.
**Cause of Death on the certificate - step by step**

**Start** at line 1(a), with the immediate (direct) cause, then go back in time to preceding conditions until you get to the one that started the sequence of events. You will get very close to the time the patient was healthy.

**Now,** you should have reported the underlying or originating cause on the lowest used line and a sequence of events leads from the underlying cause up to the immediate (direct) cause in the first line 1(a).

**Finally,** record the time interval between the onset of each condition entered on the certificate and the date of death. Where the time or date of onset is not known you should record a best estimate. Enter the unit of time (minutes, hours, days, weeks, months, years).

**Example**

<table>
<thead>
<tr>
<th></th>
<th>Cause of death</th>
<th>Time interval between onset and death</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Direct cause of death</strong></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Cerebral haemorrhage</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td><strong>Due to</strong></td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>Metastasis of the brain</td>
<td>4 months</td>
</tr>
<tr>
<td></td>
<td><strong>Due to</strong></td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>Breast cancer</td>
<td>5 years</td>
</tr>
<tr>
<td></td>
<td><strong>Due to</strong></td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>Arterial hypertension (3 years); Diabetes mellitus (10 years)</td>
<td></td>
</tr>
</tbody>
</table>

*This does not mean the mode of dying, e.g. heart failure, respiratory failure.
It means the disease, injury, or complication that caused death.

- **Write clearly and do not use abbreviations.**
- **Be sure the information is complete.**
- **Do not speculate on the cause of death.**
- **Do not fill in laboratory results or statements like “found by partner”.** (there may be separate fields on the form for this kind of information)
- **One condition per line should be sufficient.**
### Frequently used ill-defined terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Specification</th>
</tr>
</thead>
</table>
| Accident                  | Specify **circumstances**  
Specify **intent**, as ‘car accident’, suicidal, or assault;  
Specify **place** of occurrence |
| Alcohol, drugs            | Specify **use**: long term or single, addiction                             |
| Complication of surgery   | Specify **disease**: disease that caused surgery                             |
| Dementia                  | Specify **cause**: Alzheimer, infarction, old age, other                     |
| Hepatitis                 | Specify **course**, **etiology**: acute or chronic, alcoholic  
**If viral**: specify Type (A, B, C, …) |
| Infarction                | Specify **site**: heart, brain, …  
Specify **cause**: arteriosclerotic, thrombotic, embolic … |
| Infection                 | Specify **primary or secondary** **organism**  
**If primary**: specify bacterial or viral  
**If secondary**: specify the primary infection |
| Leukaemia                 | Specify **acute**, subacute, chronic lymphatic, myeloid, monocytic           |
| Pneumonia                 | Specify **primary**, aspiration, **cause**, causative organism  
**If due to immobility**: specify the cause of the immobility |
| Pulmonary embolism        | Specify **cause**: cause of embolism  
**If post-surgical or immobility**: specify **disease** that caused surgery or immobility |
| Renal failure             | Specify **acute**, chronic or terminal, underlying **cause** of insufficiency, like arteriosclerosis, or infection  
**If due to immobility**: specify the cause of the immobility |
| Thrombosis                | Specify **arterial or venous**  
Specify **the blood vessel**  
**If post-surgical or immobility**: specify disease that caused surgery or immobility |
| Tumour                    | Specify **behaviour**, location, metastases                                |
| Urinary tract infection   | Specify **site** in the urinary tract, causative **organism**, underlying **cause** of infection  
**If due to immobility**: specify the cause of the immobility |
13.1.2 Suggested additional detail of perinatal deaths (stillbirths and liveborn infants dying within 168 hours [1 week] from birth)

<table>
<thead>
<tr>
<th>Identifying particulars</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Child was born live on</td>
<td>D D M M Y Y at hh:mm hours</td>
</tr>
<tr>
<td>This child was stillborn on</td>
<td>D D M M Y Y at hh:mm hours</td>
</tr>
<tr>
<td>□ died before labour</td>
<td>□ during labour</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mother</th>
<th>Date of birth</th>
<th>D D M M Y Y</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of previous pregnancies</th>
<th>Date of last pregnancy</th>
<th>Outcome of last previous pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livebirths</td>
<td></td>
<td>□ Live birth</td>
</tr>
<tr>
<td>Stillbirths</td>
<td></td>
<td>□ Stillbirth</td>
</tr>
<tr>
<td>Abortions</td>
<td></td>
<td>□ Abortion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1st day of last menstrual period</th>
<th>D D M M Y Y</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Delivery:</th>
<th>Antenatal care, two or more visits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Normal spontaneous vertex</td>
<td>□ Yes</td>
</tr>
<tr>
<td>□ Other (specify)</td>
<td>□ No</td>
</tr>
<tr>
<td></td>
<td>□ Not known</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attendant at birth</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Physician</td>
<td>□ Trained midwife</td>
</tr>
<tr>
<td>□ Other trained person</td>
<td>□ Other</td>
</tr>
<tr>
<td>Specify</td>
<td>Specify</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Child</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Single birth</td>
<td>□ First twin</td>
</tr>
<tr>
<td>□ Second twin</td>
<td>□ Other multiple</td>
</tr>
<tr>
<td>(specify)</td>
<td></td>
</tr>
</tbody>
</table>

**figure 10: additional detail for perinatal deaths**

13.2 List of conditions to be considered direct consequences of medical procedures

1. A condition on the list should be considered a direct consequence of a medical procedure if the procedure was carried out within four weeks before death. No condition on the list should be considered a direct consequence of a procedure if there is evidence that the condition was present before the procedure was carried out. A condition flagged with ‘OCPR’ (Other Cause of Procedure Required) should be considered an obvious consequence of a procedure only if another reason for performing the procedure is indicated on the certificate.

   A condition flagged with ‘DSAP’ (Duration Stated, developed After Procedure) should be considered an obvious consequence of a medical procedure only if there is clear evidence that the condition developed after the procedure.
Adhesions should be considered an obvious consequence of a procedure in the same site or region, even after more than four weeks. If the procedure was performed more than one year before death, use the codes for sequelae of medical care.

### Infections

<table>
<thead>
<tr>
<th>Infections</th>
<th>Flag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abscess</td>
<td>OCPR</td>
</tr>
<tr>
<td>Bacteraemia</td>
<td></td>
</tr>
<tr>
<td>Fistula</td>
<td>OCPR, and for a procedure of the same site or region only</td>
</tr>
<tr>
<td>Gas gangrene</td>
<td></td>
</tr>
<tr>
<td>Infection, haemolytic</td>
<td></td>
</tr>
<tr>
<td>Infection NOS</td>
<td>DSAP</td>
</tr>
<tr>
<td>Infection in surgical wound</td>
<td></td>
</tr>
<tr>
<td>Sepsis</td>
<td></td>
</tr>
<tr>
<td>Septic</td>
<td></td>
</tr>
</tbody>
</table>

### Haemorrhage, haemolysis

<table>
<thead>
<tr>
<th>Haemorrhage, gastrointestinal</th>
<th>OCPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemorrhage, intra-abdominal</td>
<td>OCPR</td>
</tr>
<tr>
<td>Haemorrhage, rectal</td>
<td>OCPR</td>
</tr>
<tr>
<td>Haemorrhage, surgical wound</td>
<td></td>
</tr>
<tr>
<td>haemorrhage, specified site</td>
<td>For a procedure of the same site or region only</td>
</tr>
<tr>
<td>Haematemesis</td>
<td>OCPR</td>
</tr>
<tr>
<td>Haematoma</td>
<td>OCPR</td>
</tr>
<tr>
<td>Haemothorax</td>
<td>OCPR</td>
</tr>
<tr>
<td>Haemolysis</td>
<td></td>
</tr>
<tr>
<td>Melaena</td>
<td>OCPR</td>
</tr>
</tbody>
</table>

### Cardiac complications

<table>
<thead>
<tr>
<th>Cardiac complications</th>
<th>Flag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrest, cardiac</td>
<td></td>
</tr>
<tr>
<td>Arrhythmia NOS</td>
<td>DSAP</td>
</tr>
<tr>
<td>Asystole</td>
<td></td>
</tr>
<tr>
<td>Group, cardiac</td>
<td>DSAP</td>
</tr>
</tbody>
</table>
Failure/insufficiency, cardiac

Fibrillation, atrial
Fibrillation, ventricular
Infarction (myocardial)
Ischaemia, myocardial (acute)
Rupture, myocardial

**Cerebrovascular and other cerebral complications**

Apoplexy
Damage, brain (anoxic)
Embolism, cerebral
Haemorrhage, cerebral/intracranial
Infarction, cerebral
Ischaemia, cerebral/cerebrovascular
Lesion, cerebral/cerebrovascular
Meningitis
Oedema, cerebral
Stroke
Thrombosis, cerebral

**Other vascular complications**

Arrest, circulatory
Embolism (arterial)
Embolism, fat/air
Embolism, pulmonary
Embolism, venous
Failure/insufficiency, circulatory
Hypotension
Infarction, pulmonary
Infarction (any site)
Occlusion (any site)
Phlebitis (any site)
Phlebothrombosis (any site)
Thrombophlebitis (any site)
Thrombosis, arterial
Thrombosis, venous
Thrombosis NOS (any site)

**Respiratory complications**

*Flag*

Adult respiratory distress syndrome (ARDS)
Alkalosis and acidosis, respiratory
Arrest, respiratory
Aspiration
Atelectasis

Bronchitis

Effusion, pleura

Empyema

Fistula, bronchopleural or oesophageal

Failure/insufficiency, pulmonary

Failure/insufficiency, respiratory

Mediastinitis

Obstruction, upper airway

Oedema, laryngeal

Oedema/hypostasis, pulmonary

Pneumonia

Pneumothorax

**Gastrointestinal complications**

*Flag*

Abscess, intra-abdominal

Constipation

Dilatation, gastric

Disorder, circulatory, gastrointestinal

Embolism, mesenterial

Failure, hepatic

Fistula, biliary/ bowel/rectovaginal

Ileus

Ischaemia, intestinal

Necrosis, gastrointestinal

Obstruction, bowel (mechanical)
Peritonitis  OCPR
Ulcer, gastrointestinal (stress)  OCPR
Volvulus  OCPR
**Renal and urinary complications**  Flag
  Anuria
Failure/insufficiency, renal
  Fistula, urinary  OCPR
Infection, urinary
Pyelonephritis  DSAP
Retention, urine
Stricture, urethra  OCPR
Uraemia
Urosepsis

**Other complications**  Flag
Adhesions
  For a procedure of the same site or region only
Compartment syndrome  OCPR
Complication(s) NOS
Crisis, thyrotoxic  DSAP
Displacement, prosthesis
Failure, (multi)organ
Gangrene
Insufficiency, anastomosis  OCPR
Necrosis, fat/wound  OCPR
Seizures (epileptic)  DSAP
Shock NOS
Shock, anaphylactic
Ulcer, decubitus

**13.3 List of ill-defined conditions**

Use this table in Step SP7. Conditions in this table are considered ill-defined. *<To be added later>*

**13.4 List of conditions unlikely to cause death**

*<To be added later>*
13.5 Causes of HIV

Use this list in Steps SP3 and SP4. *<To be added later>*

13.6 List of conditions that can cause diabetes

Acceptable sequences for diabetes ‘due to’ other diseases *<To be added later>*

13.7 Priority ranking of ICD–10 nature-of-injury codes

(1 = Highest priority rank) *<To be added later>* 1. List of code categories limited to, or more likely to occur in, just one sex 2. List of categories limited to, or more likely to occur in, female persons *<To be added later>*

13.7.1 List of categories limited to, or more likely to occur in, male persons

*<To be added later>*

13.7.2 List of rehabilitation-relevant health conditions for which a tailored set of functioning properties is available

Acute myocardial infarction
Alzheimer and other dementias
Amputation (traumatic amputations involving multiple body regions)
Amyotrophic diseases (amyotrophic lateral sclerosis)
Ankylosing spondylitis and other spondylopathies
Asthma
Benign prostatic hypertrophy
Bipolar affective disorder
Birth asphyxia and birth trauma
Bladder cancer
Brain injury (traumatic brain injury or acquired brain injury)
Breast cancer
Cerebral palsy
Cerebrovascular disease incl. stroke
Cervix uteri cancer
Chagas disease
Chronic obstructive pulmonary disease
Cleft lip
Cleft palate
Colon and rectum cancers
Complex regional pain syndrome
Congenital heart anomalies
Corpus uteri cancer
Depression
Diabetes mellitus
Down syndrome
Drug use disorders
Endocrine disorders
Epilepsy
Fracture of femur
Fracture of lower leg, including ankle
Fracture of lumbar spine and pelvis
Gout
Haemophilia
Hand conditions
Hearing loss, adult onset
Heart failure
HIV/AIDS
Hypertensive heart disease
Impingement syndrome
Inflammatory Bowel Disease
Ischaemic heart diseases
Japanese Encephalitis
Leishmaniasis
Leprosy and sequelae of leprosy
Leukaemia
Liver cancer
Low back pain (dorsalgia)
Low birth weight
Lower limbs fractures
Lower respiratory infections
Lymphatic filariasis
Lymphomas and multiple myeloma
Macular degeneration and other sense disorders
Malaria
Melanoma and other skin cancers
Meningitis
Mental and behavioural disorders due to use of alcohol
Mild mental retardation attributable to lead exposure (unspecified mental retardation)
Mouth and oropharynx cancers
Movement disorders (e.g. ataxia, , hemiplegia, dysdiadochokinesia)
Multiple sclerosis
Muscle dystrophy
Musculoskeletal pain syndrome (fibromyalgia, entrapment/mononeuropathies)
Myopathies
Nephritis and nephrosis
Neuropathies
Obesity
Oesophageal atresia
Oesophagus cancer
Onchocerciasis
Osteoarthritis
Osteoporosis
Other joint disorder, not elsewhere classified
Other neurotic conditions
Ovary cancer
Pancreas cancer
Parkinson disease
Poliomyelitis and sequelae of poliomyelitis
Post-traumatic stress disorder
Prostate cancer
Protein-energy malnutrition
Pulmonary hypertension
Renal failure
Rheumatic heart disease
Rheumatoid arthritis
Schizophrenia
Scleroderma, dermatomyositis
Skin diseases e.g. psoriasis, decubitus ulcer and pressure area, other disorders of skin & subcutaneous tissue not elsewhere classified
Sleep disorders (obstructive sleep apnoea, narcolepsy, insomnia, circadian rhythm sleep-wake disorder, restless legs)
Spina bifida
Spinal cord injury
Stomach cancer
Syphilis
Tetanus
Trachea, bronchus and lung cancers
Tuberculosis and sequelae of tuberculosis
Upper limbs fractures
Vertebral fractures
Vertigo

13.8 Annex Differences between ICD-10 and ICD-11

This annex outlines major changes from ICD-10 to ICD-11 and gives, at least to some extent, a rationale for why these changes have been performed.

Coding scheme:

<table>
<thead>
<tr>
<th>ICD-10</th>
<th>ICD-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter numbering is roman numerals</td>
<td>Chapter numbering is Arabic</td>
</tr>
<tr>
<td>3 character categories, each of which can</td>
<td>Stem code (category) is 4 characters and there</td>
</tr>
<tr>
<td>be further divided into up to 10 four-</td>
<td>are 2 levels of subcategories</td>
</tr>
<tr>
<td>character subcategories.</td>
<td>An alphanumeric code with a letter in the</td>
</tr>
<tr>
<td></td>
<td>first position and a number in the second,</td>
</tr>
<tr>
<td></td>
<td>third and fourth positions. The fourth</td>
</tr>
<tr>
<td></td>
<td>character follows a decimal point.</td>
</tr>
</tbody>
</table>

An alphanumeric code with a letter in the second position and number in the third character position to differentiate from the codes of ICD-10. The inclusion of a forced number at the 3rd character position prevents spelling 'undesirable words'. A letter in the 2nd character position allows for clear distinction between a code from ICD-11 and one from ICD-10. Alphanumeric codes cover the range from 1A00.00 to ZZ9Z.ZZ. Currently only 1A00 to TF7Z are used. Codes starting with an 'X' indicate an extension code (see Extension code chapter). The letters 'O' and 'I' are omitted to prevent confusion with the numbers '0' and '1'.

The first character of a code is a letter and does not relate to the chapter number. The letter may have been the same for two short chapters (e.g. Chapter VII (H00-H5) and Chapter VIII (H60-H95), or two letters may have been used for one long chapter (e.g. Chapter XIX S00-T98).

Residual category identified by numeric character .8 and unspecified category identified by numeric character .9.

Code cluster concept does not exist in ICD-10.

The first character of the code always relates to the chapter. A first character of 1-9 is used for chapters 1 through 9 and for chapters 10 through 27, the first character is a letter. The code range of a single chapter always has the same character in the first position. For example, 1A00 is a code in chapter 1, and BA00 is a code in chapter 11.

The terminal letter 'Y' is reserved for the residual category 'other specified' and the terminal letter 'Z' is reserved for the residual category 'unspecified'.

ICD-11 supports postcoordination and the linking codes within a code cluster (see 'Using extension codes').

Terminology

<table>
<thead>
<tr>
<th>ICD-10</th>
<th>ICD-11</th>
</tr>
</thead>
</table>

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A range of expressions are used to describe a causal relationship between conditions in a code title. The preferred term is 'due to' for categories where two conditions are mentioned and causal sequence exists. Other terms, such as 'caused by'; or 'attributed to' may be allowed synonyms. The phrase 'secondary to' is equivalent and may also be included as a synonym.

A range of expressions indicating the concurrence of two conditions in a code title (e.g. 'in' or 'with'). The preferred term is 'associated with' for categories where two conditions are mentioned and there is no causal sequence implied.

**Dagger-Asterisk system and additional subclassifications**

<table>
<thead>
<tr>
<th>ICD-10</th>
<th>ICD-11</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dagger asterisk system</strong></td>
<td>ICD-10 (and ICD-9) used the dagger asterisk system to describe the aetiological condition for primary tabulation (dagger code) and the clinical manifestation, relevant site and or other aspects (asterisk code). In addition, there were sets of codes to be used to add more detail (e.g. B95-B97) or lists of subclassifications to add anatomical detail to categories.</td>
</tr>
<tr>
<td><strong>Use of multiple codes for one condition/additional subclassifications</strong></td>
<td>More than one category could be used to specify more detail for another category. For example, infectious agents (B95-B97) or the asterisk codes.</td>
</tr>
<tr>
<td><strong>'Code also' instruction</strong></td>
<td>N/A</td>
</tr>
</tbody>
</table>

A number of former asterisk codes that were previously used to identify manifestations of diseases are now listed in Chapter 21 *Symptoms, signs, or clinical findings, not elsewhere classified*. They may be a reason for encounter and treatment in their own right, but the location in Chapter 21 indicates that the diagnosis is incomplete because the aetiology is missing. These clinical findings are manifestations of disease that deserve special clinical attention independent of the causing condition. Asterisk codes that were repetitions of the dagger code were removed. Lists for coding optional anatomical detail have been grouped into one chapter – Chapter X - Extension codes.
Other general differences:

<table>
<thead>
<tr>
<th>ICD-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category Definition</td>
</tr>
<tr>
<td>Content model</td>
</tr>
</tbody>
</table>

For morbidity, the definition of main diagnosis has changed to be the reason for admission after assessment at the end of the stay. This definition is less prone to interpretation, and countries that had switched from the 'biggest resources' definition to the 'reason for admission at the end of the stay' noticed only small changes in their activity statistics.

Chapter Structure of the Joint Linearization

The international core reference linearization is the ICD-11 for Mortality and Morbidity Statistics (ICD-11MMS). It is used for coding and reporting illnesses or causes of death for international comparison. The naming of this linearization highlights its two main use cases.

This core linearization is divided into 27 chapters, of which 24 refer to health conditions similar to past ICD versions, while one serves to identify external causes of morbidity and mortality, and another includes concepts of traditional medicine. Lastly, a separate chapter includes extension codes for optional additional use: to add more detail for different dimensions of a disease, such as anatomy, mark a condition to be present on admission, or a disease having been relevant in the family history (see also ‘Extension Code Chapter’). The following is an overview of the organizational principles and classification structure (hierarchy) for each of the 27 chapters (including extension codes). The structure and new sets of functionalities in ICD–11 were a result of incorporating scientific updates and making the classification more relevant for computerization. Some ICD–10 entities were replaced by more scientifically accurate concepts, removed, renamed, or regrouped elsewhere.

ICD–11 has five new chapters. As a result, the numbering of the chapters has changed. The new chapters are:

- Chapter 3 Diseases of the blood or blood-forming organs and Chapter 4 – Disorders of the immune system. Conditions affecting the immune system and conditions affecting the blood are now in two separate chapters.
• **Chapter 7 Sleep-Wake disorders.** Sleep wake disorders have been regrouped in this new chapter.

• **Chapter 17 Conditions related to sexual health.** Sexual conditions have been grouped in this new chapter.

• **Chapter 21 Symptoms, signs, or clinical findings. not elsewhere classified.**

• **Chapter 27 Traditional Medicine.** A chapter for traditional medicine has been added.

13.8.1 Chapter 01 – Certain infectious or parasitic diseases

**Structure of Chapter 01**

13.8.1.1 Chapter 01 – Structure of chapter 1

*Chapter 01 is divided into two major sections:*

The chapter lists the infectious diseases in the structure grouping by some clinical syndromes, then mode of transmission, followed by groups by agents. Some conditions of major public health concern are listed at the same level. Variants to the conditions in the chapter that occasionally spread as localized infections are primarily coded to this chapter. Infections that are localized, and where the agent usually is unknown, not relevant, or there is a mixed aetiology reside in the organ chapters. Frequent local infections agents may be listed as individual child categories under the localized infection. In some instance, infections could be with equal right in the infectious disease chapter and in an organ system chapter. In such cases, the decision that creates least change (ICD-10 legacy) has been chosen. Also the fact that some detail may not usually be reported and that requires a broader ‘unspecified’ may be a reason to group some conditions that would be expected to be coded elsewhere, as is the case for meningitis and encephalitis and respiratory infections.

A special tabulation list groups the infections by agents and is intended for special tabulation, only.

13.8.1.2 Chapter 01 – Differences between ICD–10 and ICD–11 in Chapter 01

The chapter includes more infectious items then in the past. Also, influenza has been moved from the respiratory to the infectious diseases chapter. Tuberculosis, Leprosy have been grouped under ‘mycoplasms’, because identification, course, and treatment are similar. Prion diseases have been moved to the Nervous system.

13.8.1.3 Chapter 01 – Rationale for chapter 1

The purpose of the structure of chapter 1 is to minimize the impact on longitudinal statistics of major infections, to allow reporting of main infections syndromes without mention of a specific agent and on the other hand allow for special tabulation by infectious agent using the information in segment 2. Influenza, though visibly affecting the respiratory tract, affects multiple parts of the body and is also of important public health concern. For that reason, it has been moved into the respiratory chapter. Prion diseases can be transmissible, genetic or arise spontaneously. They are rare conditions that only affect the nervous system. Many are inherited. The presence of a specific gene is a prerequisite to developing a prion disease. In view of these facts, it was decided to keep the prion diseases grouped and move the whole group to the neurology chapter.
13.8.1.4 Antimicrobial resistance

The ICD parts relating to Antimicrobial Resistance (AMR) have been designed to support the Global Antimicrobial Resistance Surveillance System. Priority pathogens are identified in combinations with currently (2016) relevant antimicrobial substances. The section is designed to allow postcoordination of other substance and agent combinations in a cluster. The section on AMR is located in the Signs and Symptoms chapter, so that the underlying disease or agent is always coded in conjunction with the AMR category. ICD and the surveillance system focus on specific tracer pathogen-substance combinations. However, ICD design allows to code the full antibiotic susceptibility pattern if desired. For tabulation, the AMR codes should be reported in combination with the infectious disease. Where only one condition can be reported, the infectious disease should be retained. However, at national level, the set of infectious diseases and the number of AMR cases among the infections cases, should be tabulated.

13.8.2 Chapter 02 – Neoplasms

Structure of Chapter 02

The general hierarchy of Chapter 02 consists of the following:

- Behaviour
  - Broad sites or systems
  - Specific site
  - Morphological (histology) type

There are three areas that are an exception to the above hierarchy. They are:

- Neoplasms of brain and central nervous system
  - Broad sites
  - Behaviour
  - Morphological (histology) type
- Neoplasms of haematopoietic and lymphoid tissues
  - Broad morphological (histology) type
  - Specific morphological (histology) type
- Malignant mesenchymal neoplasms
  - Specific morphological (histology) type
  - Site

Differences between ICD–10 and ICD–11 in Chapter 02

The most significant change to the hierarchy of Chapter 02 is the inclusion of certain morphology types within the chapter (previously found in ICD–10, Appendix A). There are now precoordinated codes consisting of both morphology and site. Other types of morphology and greater site specificity not included in Chapter 02 are found in the Chapter 21, Extension codes, and can be used for postcoordination.

Other changes include: grouping together all neoplasms of brain and central nervous system; grouping together all haematopoietic and lymphoid tissues; and the addition of the new group Malignant mesenchymal neoplasms. The previous ICD–10 group Neoplasms of
uncertain or unknown behaviour has been split into two separate groups – Neoplasms of uncertain behaviour and Neoplasms of unknown behaviour.

Rationale for Chapter 02

The progress in oncology has clearly demonstrated that a site-only based categorization of malignant and benign tumours provides limited information for prevention, treatment, and prognosis for persons that are affected by a tumour. ICD–10 had already included some categories based on histopathology (e.g. some lymphoid neoplasms).

In ICD–11, main tumour sites have subdivisions of histopathology first. The groups chosen were based on an analysis of international mortality and morbidity reporting, cancer registries, and clinical reporting. The redesigned sections were reviewed for missing details in relation to the ICD use cases.

Keeping the main anatomical axes intact allows backwards compatibility. However, the structure was adjusted in a few places to comply with new knowledge that is in use in the TNM classification.

For tumours of the central nervous system, the histological and behavioural distinction between benign and malignant is a grey area. As such, it was decided to move all central nervous system tumours outside the basic framework of behaviour and group them together.

The field of genetic markers is rapidly changing. Whereas for some tumours, such markers have been used for many years, for others, this is not the case. As such, with the exception of haematological tumours, genetic markers were not included, and have not been used for classification. They are, however, included in the Chapter 21, Extension codes, and can be added as a second code to the relevant code from the neoplasms chapter to fully describe the relevant tumour entity.

13.8.3 Chapter 03 – Diseases of the blood or blood-forming organs

Structure of Chapter 03

Anaemias and other erythrocyte disorders
Coagulation defects, purpura and other haemorrhagic and related conditions
Diseases of spleen

Neoplasms of haematopoietic and lymphoid tissues are primarily located in Chapter 2 Neoplasms while Symptoms, findings and clinical forms of blood and blood-forming organs and the immune system are primarily located in Chapter 21.

The first two major sections comprise of the following hierarchy:

1st level Anaemias and coagulation disorders
2nd level - broad category of disease/disorder type
3rd level - - congenital vs acquired
4th level - - - further specificity of disease/disorder type

The third major section comprises of the following hierarchy:
1st level Diseases of spleen
2nd level - congenital vs acquired
3rd level - specific disease/disorder type

Differences between ICD–10 and ICD–11 in Chapter 03

ICD–10, Chapter 03 Disease of the blood and blood-forming organs and certain disorders involving the immune mechanism has been split into two chapters: one for diseases of blood and blood-forming organs (Ch. 03) and the other for disorders of the immune system (Ch. 04).

In ICD-10 there were five major sections which have now been reclassified into three sections in ICD-11:

<table>
<thead>
<tr>
<th>ICD-10 broad structure</th>
<th>ICD-11 broad structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutritional anaemias</td>
<td>Anaemias and other erythrocyte disorders</td>
</tr>
<tr>
<td>Haemolytic anaemias</td>
<td>Anaemias and other erythrocyte disorders</td>
</tr>
<tr>
<td>Aplastic and other anaemias</td>
<td>Anaemias and other erythrocyte disorders</td>
</tr>
<tr>
<td>Coagulation defects, purpura and other haemorrhagic conditions</td>
<td>Coagulation defects, purpura and other haemorrhagic and related conditions</td>
</tr>
<tr>
<td>Other diseases of blood and blood-forming organs</td>
<td>Concepts reclassified to one of the following sections: Anaemias and other erythrocyte disorders Coagulation defects, purpura and other haemorrhagic and related conditions Diseases of spleen</td>
</tr>
</tbody>
</table>

Table: Comparison of ICD-10 block structure with ICD-11 equivalent structure

<table>
<thead>
<tr>
<th>ICD-10 block heading</th>
<th>ICD-11 equivalent structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>D50-D53 Nutritional anaemias</td>
<td>Now classified under the parent heading for Anaemias and other erythrocyte disorders. Content within remains relatively the same with expansion of some categories. Contains the following sections then further subdivided by congenital versus acquired: Iron deficiency anaemia Megaloblastic anaemia due to Vitamin B12 deficiency Folate deficiency anaemia Other nutritional or metabolic anaemias</td>
</tr>
<tr>
<td>D55-D59 Haemolytic anaemia</td>
<td>Now classified under the parent heading Anaemias and other erythrocyte disorders. Main axis is by congenital versus acquired and then subdivided by specific disorders</td>
</tr>
</tbody>
</table>
| D60-D64 Aplastic and other anaemias | Aplastic anaemia together with the following concepts: Thalassaemia Sickle cell disorders Pure red cell aplasia Anaemia of chronic disease Sideroblastic anaemia Congenital dyserythropoietic anaemia Acute posthaemorrhagic anaemia Polycythaemia have all been moved from this section and are now broad categories classified under the parent Anaemias and other
erythrocyte disorders. Many of these concepts are then further subdivided by congenital versus acquired.

D65-D69 Coagulation defects, purpura and other haemorrhagic conditions
Restructure of the concepts with additional detail indicating congenital, hereditary, inherited or acquired conditions. Main categories include: Coagulation defects Fibrinolytic defects Non-thrombocytopenic purpura Thrombophilia Qualitative platelet defects Thrombocytosis Thrombocytopenia

D70-D77 Other diseases of blood and blood-forming organs
Concepts originally classified to this section have been reclassified to one of the three main sections for this chapter. Diseases of spleen have been moved from this section and are now classified under the parent category for Diseases of the blood and blood-forming organs have its own main category. The main axis being congenital versus acquired disorders of spleen.

D80-D89 Certain disorders involving the immune mechanism
New chapter (Ch 04) created to capture the complexity of these disease processes

Rationale for Chapter 03 For Chapter 03, there has been a reorganization of the chapter into a clinical view of diseases of the blood, an aetiological view of diseases of the blood and diseases of the spleen. Anaemias are now all under one group with a separate group for Coagulation defects, purpura and other haemorrhagic and related conditions.

13.8.4Chapter 04 – Diseases of the immune system

Structure of Chapter 04

Four major sections:

1st level **Immune system disorders by clinical syndromes** 2nd level - broad category of disease/disorder type 3rd level - - specific disease/disorder type 4th level - - - further specificity of disease/disorder type

1st level **Immune system disorders by white cell lineages** 2nd level - broad category of disease/disorder type 3rd level - - specific disease/disorder type 4th level - - - further specificity of disease/disorder type

1st level **Non-organ specific systemic autoimmune disorders** 2nd level - broad category of disease/disorder type 3rd level - - specific disease/disorder type 4th level - - - further specificity of disease/disorder type

1st level **Autoinflammatory syndromes** 2nd level - specific syndrome 1st level **Allergic and hypersensitivity conditions** 2nd level - broad category for body systems

Differences between ICD–10 and ICD–11 in Chapter 04

ICD–10, Chapter 03 Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism has been split into two chapters: one for diseases of blood and blood-forming organs (Ch. 03) and the other for disorders of the immune system (Ch. 04).

Rationale for Chapter 04
For Chapter 04, there are five new sections for immune disorders that differ from the section previously located in Chapter 03 of ICD–10. For the immune system they are classified mainly by clinical syndrome, and in an alternate view the immune system conditions are shown by cell line. A section for Allergic and Hypersensitive conditions has been included in this chapter. Overall, more detail has been added to the chapter.

13.8.5 Chapter 05 – Endocrine, nutritional or metabolic diseases

Structure of Chapter 05

Chapter 05 has 4 major sections:

- Endocrine diseases
- Nutritional disorders
- Metabolic disorders
- Postprocedural endocrine or metabolic disorders

The section for endocrine diseases has a hierarchy consisting of glands and hormone systems and then the specific disease/disorder, while the sections for nutritional disorders and metabolic disorders consist of broad categories of diseases/disorder, followed by specific disease/disorder.

- broad category of disease/disorder type
- - specific disease/disorder type
- - - further specificity of disease/disorder type

Neoplasms of the endocrine system are primarily located in Chapter 2. Neoplasms and Symptoms, findings and clinical forms of endocrine and metabolic disorders are primarily located in Chapter 21.

Differences between ICD–10 and ICD–11 in Chapter 05

Changes and additions have been made to Diabetes mellitus with the inclusion of categories for Impaired glucose regulation and Insulin-resistance syndromes. Nutritional disorders section now includes current terminology and a detailed classification for vitamin and mineral deficiencies as well as for obesity. The Metabolic disorders section also includes more detail and the organization of the various types of metabolic disorders has been improved.

Table: Comparison of ICD-10 block structure with ICD-11 equivalent structure

<table>
<thead>
<tr>
<th>ICD-10 block heading</th>
<th>ICD-11 equivalent structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>E00-E07 Disorders of thyroid gland</td>
<td>The structure for this section has not changed but has been revised to better reflect current disease processes and includes: Congenital, acquired and subclinical iodine-deficiency hypothyroidism Iodine-deficiency-related thyroid disorders and allied conditions Nontoxic goitre Thyrotoxicosis Thyroiditis</td>
</tr>
<tr>
<td>E10-E14 Diabetes mellitus</td>
<td>Specifies the 'type' of diabetes mellitus i.e. Type 1, Type 2, other and unspecified. 'Diabetic' complications are primarily parented to their respective body system chapter. <strong>New section:</strong> Impaired glucose tolerance has been moved from the Symptoms chapter in ICD-10 and is now included in Chapter 5 of ICD-11 and is classified into 'Intermediate hyperglycaemia' and also includes Impaired fasting glucose. <strong>New section:</strong> A new section has been included to capture 'Insulin-resistance syndromes'</td>
</tr>
</tbody>
</table>
E15-E16 Other disorders of glucose regulation and pancreatic internal secretion

No change

E20-E35 Disorders of other endocrine glands

This block has been unbundled and the sections renamed to better reflect the conditions classified within each entity: Disorders of the parathyroid and parathyroid hormone system Disorders of the pituitary hormone system Disorders of the adrenal glands and adrenal hormone system Disorders of the gonadal hormone system Certain disorders of puberty Polyglandular dysfunction Disorders of lipoprotein metabolism and certain specified lipidaemias

E40-E46 Malnutrition

This section's name has changed to 'Undernutrition' and is now classified into two new subsections:

1-Undernutrition based on anthropometric and clinical criteria. Based on age parameters in particular, the following classification is made: -Infant, children, and adolescents -Adults

Note: Terms such as Protein-energy malnutrition, Kwashiorkor or Marasmus have been substituted for: Underweight (according to weight z-score), wasting (according to BMI z-score), and stunting (according to Length/Height z-score) in children, and for thinness in adults. 2-Undernutrition due to specific nutrient deficiencies (see next section) E50-E64 Other nutritional deficiencies This section, originally part of the previous section, has now been restructured and divided into three subsections: 1-Vitamin deficiencies E65-E68 Obesity and other hyperalimentation This section is now classified into two distinct subsections: 1-Overweight and obesity E70-E90 Metabolic disorders Section is now aetiolologically based and is classified into three distinct sections: Inborn errors of metabolism Disorders of metabolite absorption and transport Disorders of fluid, electrolyte and acid-base balance Cystic fibrosis has been reclassified to lower respiratory tract diseases in Chapter 12 Diseases of the respiratory system. Postprocedural endocrine or metabolic disorders is now a distinct entity and is no longer classified under 'metabolic disorders'.

Vitamin deficiencies

- Vitamin A deficiency
- Vitamin D deficiency (Rickets and Osteomalacia are now two different entities)
- Vitamin E deficiency
- Vitamin K deficiency
- Deficiencies of B group vitamins (all B group vitamins included, choline deficiency has been added)
- Vitamin C deficiency (Scurvy is now a specific entity in this section)

Mineral deficiencies

- Iron deficiency
- Calcium deficiency has been completed with: tetany due to acute calcium deficiency, neonatal hypocalcaemia, and neonatal osteopenia
- Zinc deficiency
Iodine, fluorine, and sodium chloride deficiencies have been added
Selenium deficiency has been completed and related to Keshan disease and Kaschin-Beck disease

**Certain specified nutritional deficiencies**

- Essential fatty acid deficiency
- Protein deficiency (new in this section)
- Overweight and localized adiposity (overweight has been added as an entity and adapted to age; infants, children and adolescents are distinguished from adults)
- Obesity is now aetiology-based and divided into:
  - Obesity due to energy imbalance (adapted to age; infants, children and adolescents are distinguished from adults)
  - Drug-induced obesity
  - Obesity-hypoventilation syndrome
  - Leptin-related genetic obesity (new in this block)

4. Specific nutrient excesses

- Vitamin (no changes)
- Mineral (new section): includes iron overload, hypercalcaemia, zinc excess, sodium chloride excess, fluorine excess, aluminium excess, and manganese excess

**Rationale for Chapter 05**

There is increased international standardization of endocrine disease terminology being used to describe the complex nature of endocrine conditions. The intent is to include all dysfunctions that lead to a specific endocrine disorder.

Diabetes Mellitus and Intermediate Hyperglycaemia has been expanded to reflect current terminology used internationally. The complications often associated with diabetes have continued to be included in the classification in the appropriate body system chapter in line with the various clinical modifications.

Source of change for this section was the current WHO Classification of Diabetes Mellitus and Intermediate Hyperglycaemia 2011 and the Department of Chronic Diseases, Health Promotion, WHO.

In addition, ‘diabetic’ complications have now been primarily classified to the appropriate body system chapter. Other complications associated with diabetes mellitus classified to other chapters can be assigned as additional codes to provide further specificity.

The WHO Department of Nutrition for Health and Development proposed changes to the section on Nutritional Disorders with advice from the Nutrition Guidance Expert Advisory Group (NUGAG) for updates to this section of the classification. Metabolic disorders are now aetiology-based and have been classified into three distinct areas; ‘Inborn errors of metabolism’, ‘Disorders of metabolite absorption and transport’ and ‘Disorders of fluid, electrolyte and acid-base balance’ following clinical advice received from the relevant international societies for metabolic diseases.
13.8.6 Chapter 06 – Mental, behavioural or neurodevelopmental disorders

Structure of Chapter 06

The hierarchy of Chapter 06 consists of:

- broad category of disease/disorder type
- specific disease/disorder type
- further specificity of disease/disorder type

Differences between ICD–10 and ICD–11 in Chapter 06

Changes to this chapter include restructuring of the hierarchy, the inclusion of more current terminology, and specific groupings for intoxication, harmful use, and dependence by substance type.

Rationale for Chapter 06

The overall linear structure of the proposed Mental, behavioural or neurodevelopmental disorders chapter for ICD–11 has been a topic of substantive and comprehensive discussions by the Topic Disorders Advisory Group for Mental Health, as well as extensive interactions with the American Psychiatric Association in relation to the just-published Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM–5) (American Psychiatric Association, 2013), from the time of the Advisory Group’s initial appointment in 2007.

In the ICD–10, the numbers of large groupings, or ‘blocks’, of disorders was artificially constrained by the decimal coding system used in the classification, such that it was only possible to have a maximum of ten major groupings of disorders within the mental and behavioural disorder chapter (corresponding to the digits 0 to 9). This meant that some groupings were created that were not based on clinical utility or scientific evidence. In the ICD–10, for example, one block (F30–F39) is devoted to Mood (affective) disorders, while Anxiety disorders represent only a portion of a broad and heterogeneous block (F40–F49) called ‘Neurotic, stress-related, and somatoform disorders’. Another block – ‘Behavioural syndromes associated with physiological disturbances and physical factors’ – unites disorders that are unrelated in terms of clinical symptoms and symptomatology except that they have something to do with the body.

Given the constrained structural parameters of the ICD–10, the developers of the classification provided a reasonable set of diagnostic groupings. However, the more flexible structural characteristics of ICD–11 make it possible to incorporate key features based on available scientific evidence and current practice for more optimal nosology.

The appropriate architecture of a diagnostic classification of mental and behavioural disorders is an issue that has received substantial attention over the course of the revision. One of the guiding principles of the ICD–11 is that it should reflect current scientific evidence regarding the relationships among disorders rather than antiquated concepts such as

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2 (e.g., Andrews et al, 2009; First, 2009a; Jablensky, 2009; Wittchen, Beesdo, & Gloster, 2009)

3 (Hyman, 2010)
‘neurosis’, which have poor construct and predictive validity. In addition, a major goal of the WHO Department of Mental Health and Substance Abuse for the current revision is to improve the clinical utility of this part of the ICD–11. Because the ICD–11 uses a different coding structure that is not based on a decimal numbering system, such that a larger number of blocks or groupings can be accommodated within the chapter, an important opportunity was presented to bring the classification more in line with current research and clinical practice in terms of how groupings of disorders are represented.

Three streams of work provide the rationale and evidence for the linear structure of Mental and Behavioural Disorders in the ICD–11.

**Evidence Reviews by Working Groups for ICD–11 Mental, behavioural or neurodevelopmental disorders**

The first stream of work relates to the outcome of evidence reviews by the 14 Working Groups reporting to the Advisory Group, each of which had multiple face-to-face meetings over at least a 2-year period. The Working Groups were asked to review the available scientific evidence and other information about clinical application of classifications in various settings throughout the world, and to provide evidence and a rationale for its groupings as well as the content and arrangement of categories within them. This work resulted in manuscripts describing the rationale for most groupings of disorders that have been published in or submitted to peer-reviewed journals. Space does not permit detailing the rationale and evidence base for each structural change here, but this information as it relates to any specific decision can be provided on request based on the material generated by the Working Groups.

**Formative Field Studies on Clinical Utility of the Linear Structure**

The second stream of work relevant to the linear structure of Mental and Behavioural Disorders focused on clinical utility, and is represented by two formative field studies undertaken by the WHO and the Field Studies Coordination Group reporting to the Advisory Group. The purpose of these studies was to examine the conceptualizations held by mental health professionals around the world of the relationships among mental disorders in order to inform decisions about the structure of the classification. From a clinical utility perspective, particularly in terms of improving the interface between health information and clinical practice, the most important and desirable features of a classification’s organization is that (a) it helps clinicians find the categories that most accurately describe the patients they encounter as quickly, easily, and intuitively as possible and (b) the diagnostic categories so obtained would provide them with clinically useful information about treatment and management. A mental disorders classification that is difficult and cumbersome to

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4 (Reed, 2010; International Advisory Group for the Revision of ICD–10 Mental and Behavioural Disorders, 2011)

5 (e.g., Al-Adawi et al., 2013; Creed & Gureje, 2012; Drescher, Cohen-Kettenis, & Winter, 2012; Gaebel, 2012; Maercker et al., 2013; Maj & Reed, 2012; Pozynak, Reed, & Clark, 2011; Rutter, 2012)

6 (Reed et al., 2013; Roberts et al., 2012)
implement in clinical practice and does not provide information that is of immediate value to
the clinician has no hope of being implemented accurately at the encounter level in real-
world health care settings. In that event, clinical practice will not be guided by the
standardization and operationalization of concepts and categories that are inherent in the
classification, and important opportunities for practice improvement and outcomes
assessment will be lost. In turn, a diagnostic system that is characterized by poor clinical
utility at the encounter level cannot generate data based on those encounters that will be a
valid basis for health programs and policies, or for global health statistics. The rationale
behind these two studies was that if the ways in which clinicians conceptualized the
organization of mental disorders as encountered in their day-to-day clinical practice was
found to be (a) consistent across countries, languages, and disciplines, and (b) distinct from
the organization of ICD–10, then this information could be used to create a classification of
mental disorders that corresponds more closely to clinicians’ cognitive organization of
categories and would therefore be more intuitive and efficient for use in real-world health
care settings.

The first formative field study7 was an internet-based study administered in both English and
Spanish, in which 1,371 psychiatrists and psychologists from 64 countries participated. The
second formative field study8 involved the face-to-face administration of a standardized
sorting and hierarchy-formation task to 517 mental health professionals in eight countries
and five languages. Both studies found that clinicians’ conceptual map of mental disorders
was rational and highly stable across profession, language, and country income level.
Moreover, both studies found that the proposed structure for mental and behavioural
disorders in ICD–11 was more consistent with clinicians’ conceptual models than the
structure of either ICD–10 or DSM-IV. The second study also clearly demonstrated that
clinicians preferred a ‘flatter’ structure with a larger number of groupings as compared with
a more hierarchical structure with fewer groupings as found in ICD–10.

Harmonization with DSM-5

The third stream of work relates to efforts to harmonize the structure of the ICD–11 chapter
on Mental and Behavioural Disorders with the structure of the DSM-59, where possible.
Overall, the high degree of similarity between the overall structure of DSM-5 and the
proposed linear structure for ICD–11 Mental and Behavioural Disorders represents a major
success of the ICD – DSM harmonization effort. Relatively minor differences relate primarily
to:

1. proposals to combine the classifications of ‘organic’ and ‘non-organic’ aspects of
   conditions such as sleep disorders and sexual dysfunctions in ICD–11 in separate
   chapters in ways that are more consistent with current evidence and clinical practice,
   which was not an option for DSM-5 given that it is by definition a classification of
   mental disorders; and

7 (Roberts et al., 2012)
8 (Reed et al., 2013)
9 (American Psychiatric Association, 2013)
differences in conventions related to residual categories and mental disorders associated with other underlying disease under ICD–11 from decisions about the organization of such categories in DSM-5. Additional information about the rationale for the few remaining substantive differences in overall structure between the two classifications is available upon request. It must be emphasized that the resulting similarity in organization between the two systems is the product of several years of complex negotiations. Given that DSM-5 has already been published, further changes to the ICD–11 structure would almost certainly move ICD–11 in the direction of reduced similarity and harmonization with DSM-5.

Chapter 07 – Sleep – Wake disorders

Structure of Chapter 07

Chapter 08 is a new chapter in ICD–11. It contains Sleep-wake disorders that were previously located within the respiratory, neurology, or mental health chapters. By combining these disorders into one chapter, more detail can be included for many of the disorders. The hierarchy consists of:

- broad category of disease/disorder type
- specific disease/disorder type
- further specificity of disease/disorder type

Differences between ICD–10 and ICD–11 in Chapter 07

Chapter 08 is a new addition to ICD–11 and was not found in past editions.

Rationale for Chapter 07

As Sleep-wake disorders pertain to an area of overlap between mental health, neurological disorders and pulmonary conditions, the decision was made to place them together in one chapter.

13.8.7Chapter 08 – Diseases of the nervous system

Structure of Chapter 08

1st level - Mixture of diseases, disorders and sites and combinations of both.
2nd level - Subcategory mixture of specific disease or disorder type and sometimes site.

Differences between ICD–10 and ICD–11 in Chapter 08

There has been a major restructuring and movement of previous ICD–10 concepts in this chapter. A number of new concepts have also been added. Cerebrovascular diseases have been moved to the Neurology chapter and multiply parented to the Circulatory chapter. Transient Ischaemic attack (TIA) is now also located under Cerebrovascular diseases and appears in Diseases of the nervous system.

Table: Comparison of ICD–10 block structure with ICD–11 equivalent structure

<table>
<thead>
<tr>
<th>ICD–10 block heading</th>
<th>ICD–11 equivalent structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>G00-G09</td>
<td>Infections of the nervous</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>G10-G14</td>
<td>Systemic atrophies primarily affecting the central nervous system</td>
</tr>
<tr>
<td>Split between the Movement disorders and Motor neuron disease and related disorders</td>
<td></td>
</tr>
<tr>
<td>G20-G26</td>
<td>Extrapyramidal and movement disorders</td>
</tr>
<tr>
<td>Movement disorders</td>
<td></td>
</tr>
<tr>
<td>G30-G32</td>
<td>Other degenerative diseases of the nervous system</td>
</tr>
<tr>
<td>Neurocognitive disorders</td>
<td></td>
</tr>
<tr>
<td>G40-G47</td>
<td>Episodic and paroxysmal disorders</td>
</tr>
<tr>
<td>Epilepsy and seizures, Headache disorders and cerebrovascular blocks. Sleep disorders are now a stand-alone chapter (Ch. 07)</td>
<td></td>
</tr>
<tr>
<td>G50-G59</td>
<td>Nerve, nerve root and plexus disorders</td>
</tr>
<tr>
<td>Disorders of nerve root, plexus and peripheral nerves</td>
<td></td>
</tr>
<tr>
<td>G70-G73</td>
<td>Diseases of myoneural junction and muscle</td>
</tr>
<tr>
<td>Diseases of neuromuscular junction and muscle</td>
<td></td>
</tr>
<tr>
<td>G90-G99</td>
<td>Other disorders of the nervous system, Diseases of the autonomic nervous system, Disorders of cerebrospinal fluid pressure and flow and Spinal cord disorders excluding trauma Syndromes with central nervous system anomalies as a major feature Syndromes with central nervous system anomalies as a major feature</td>
</tr>
</tbody>
</table>
ICD–11 sees a major overhaul in the organization of the blocks which make up the neurology chapter. These changes have been summarized above by comparing ICD–10 blocks with the new blocks structure of ICD–11. The restrictive decimal coding system of the ICD–10, with its capacity to contain only 11 blocks of disorders per chapter, resulted in blocks containing miscellaneous neurological entities which did not logically fit together, such as the episodic and paroxysmal disorders block, containing headache disorders, epilepsy, transient ischaemic attacks and sleep disorders. The ICD–11 now positions headache disorders, epilepsy and cerebrovascular disorders at block level, and sleep disorders at chapter level (Chapter 7).

Not only has the structure of the neurological chapter changed, but the approach to classification also integrates current clinical practice and advancements in the understanding of neurological diseases. In the time since the ICD–10 was published, enormous progress in the fields of genetics, molecular biology and medical technologies have been made. An increase in the number of codes is inevitable when one reflects on the recent knowledge gain in neurology, so a balance between comprehensiveness, clinical utility and maintaining a public health approach is the aim. The working groups tackled this issue by considering the more common disorders to appear in the chapter, with less common aetiological variations of these disorders being subject to a ‘double coding’ technique. One major change which illustrates the advancement of knowledge is the addition of a block entitled ‘Paraneoplastic and autoimmune disorders of the nervous system’. This block contains immune-mediated neurological diseases, a field in which knowledge has exploded in recent years. A second example of how the new version reflects molecular biological advancement is through awarding Prion diseases block status despite their rarity. Previously, they featured as part of
the infections of the central nervous system block, but research interest after the major public health issue in Europe in the 1990s has led to new variants of prion diseases being discovered.

The world has seen a large rise in the elderly population since the 1990s.

Neurocognitive disorders have been declared as a major public health concern and research into its aetiology and neuropharmacology has boomed. The ICD–11 block on Neurocognitive disorders reflects the better understanding in this area.

One final particularly noteworthy change can be found in the ‘Other disorders of the nervous system’ block. This block is employed to capture the ‘spill over’ from other neurology blocks and those disorders which are deemed unclassifiable elsewhere. In the ICD–10, due to the aforementioned decimal coding system, this block was an incongruent collection of diseases. This block has now reduced significantly in size due to the new, streamlined neurology chapter structure which includes new blocks of disorders previously contained in the ‘other disorders of the nervous system’ section of ICD–10. These include ‘disorders of consciousness’, ‘disorders of cerebrospinal fluid pressure and flow’, ‘disorders of the autonomic nervous system’, ‘nutritional and toxic disorders of the nervous system’ and ‘spinal cord disorders excluding trauma’. Their promotion to block status will hopefully have a positive effect on coding practices.

One complicating issue facing the Neurology Topic Advisory has been the need to cross-link disorders which have a neurological presentation or phenotype to their aetiological roots within other chapters or blocks within the neurology chapter. One of the countless examples of this kind of relationship would be mitochondrial disorders of neuromuscular junction. They must be cross-linked both in the neurology chapter, and in the Endocrine, nutritional and metabolic diseases chapter.

13.8.8 Chapter 09 – Diseases of the visual system

Structure of Chapter 09 The general hierarchy of Chapter 09 consists of the following:

- Broad category of anatomy
  - Specific anatomy category
    - Broad category of disease/disorder type
      - Further specificity of disease/disorder type

Differences between ICD–10 and ICD–11 in Chapter 09 There have been major changes to the structure and hierarchy of this chapter for ICD–11. The aetiology/manifestation convention (dagger/asterisk) of ICD–10 has not been kept in ICD–11.

13.8.9 Chapter 10 - Diseases of the ear or mastoid process

Structure of Chapter 10

The general hierarchy of Chapter 10 consists of the following:

- Broad category of anatomy
  - Specific disease/disorder type
    - Further specificity of disease/disorder type

Differences between ICD–10 and ICD–11 in Chapter 10
This chapter has retained a similar structure as in ICD–10, with only minor changes.

13.8.10 **Chapter 11 – Diseases of the circulatory system**

**Structure of Chapter 11**

There are two main hierarchies in Chapter 11.

- Broad category of disease/disorder type
  - Specific disease/disorder type
  - - Further specificity of disease/disorder type

OR

- Broad category of anatomy
  - Specific anatomy type
  - - Specific disease/disorder type

**Differences between ICD–10 and ICD–11 in Chapter 11**

There has been some restructuring and regrouping throughout this chapter, with new concepts based on medical advancements over the last 20 years added. Medical terminology has been updated. The sections on Hypertension and Heart valve diseases have been expanded. Heart valve diseases have moved from a classification based on aetiology (rheumatic/non-rheumatic) then valve type and disease physiology; to a hierarchy led by valve type, then disease physiology, followed by aetiology, in keeping with current clinical practice. Non-rheumatic valve disease has therefore been moved from ‘Other forms of heart disease’ to a heart valve disease section.

Cerebrovascular diseases have been moved to the Neurology Chapter (8) as their primary parent with the Circulatory Chapter being a secondary parent.

Infections of the circulatory system are primarily located in Chapter 1 Certain infectious and parasitic diseases, Neoplasms of the circulatory system are primarily located in Chapter 2 Neoplasms, Congenital anomalies of heart and great vessels and related acquired abnormalities are located in Chapter 20 and Symptoms, signs or clinical findings involving the circulatory system are primarily located in Chapter 21.

**Table: Comparison of ICD-10 block structure with ICD-11 equivalent structure**

<table>
<thead>
<tr>
<th>ICD-10 block heading</th>
<th>ICD-11 equivalent structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>I00-I02 Acute rheumatic fever</td>
<td>Acute rheumatic fever is now primarily classified in Chapter 1 Infectious diseases, while chronic rheumatic heart disease remains in Chapter 11</td>
</tr>
<tr>
<td>I05-I09 Chronic rheumatic heart diseases</td>
<td>Change in hierarchy for the classification of heart valve disorders to heart valve type and then by aetiology</td>
</tr>
<tr>
<td>I10–I15 Hypertensive diseases</td>
<td>Remains relatively the same with expansion of some categories, essential hypertension now includes subcategories for diastolic/systolic hypertension</td>
</tr>
<tr>
<td>I20–I25 Ischaemic heart diseases</td>
<td>Change in terminology for AMI to reflect STEMI/NSTEMI only. Concept of ‘subsequent’ AMI has been deleted. Inclusion of timeframe for old AMI. Expansion of complications following</td>
</tr>
</tbody>
</table>
and AMI. Ischaemic cardiomyopathy has been moved to Diseases of the myocardium. New section for ‘Diseases of coronary artery’ to include coronary atherosclerosis, coronary artery aneurysm, dissection, fistula.

I26–I28 Pulmonary heart disease and diseases of pulmonary circulation

Expansion of some categories to include new concepts, particularly pulmonary hypertension.

I30–I52 Other forms of heart disease

This block category title no longer exists in ICD-11 and the concepts within have been made distinct entities and expanded to include new terminology and disease processes:

I60–I69 Cerebrovascular diseases

Reclassified to Chapter 8 Diseases of the nervous system

I70–I79 Diseases of arteries, arterioles and capillaries

No major changes to this section

I80–I89 Diseases of veins, lymphatic vessels and lymph nodes, not elsewhere classified

This section has been separated into two main blocks: Diseases of veins and Disorders of lymphatic vessels and lymph nodes. Oesophageal varices (I85) and Haemorrhoids (I84) have been reclassified to Chapter 13 Diseases of the digestive system - Vascular disorders of the oesophagus and Vascular disease of anus and anal canal, respectively.

I95–I99 Other and unspecified disorders of the circulatory system

Marked expansion of post-procedural disorders section with new codes for postprocedural disorders following repair of congenital anomalies.

• Diseases of the myocardium, including extensive subsections on Myocarditis and Cardiomyopathy.
• Cardiac arrhythmia
• Endocarditis
• Heart Failure
• Pericarditis

Rationale for Chapter 11

There have been large scale changes in clinical practice in cardiovascular diseases and their management since ICD-10 was published over 20 years ago. Changes introduced for ICD-11 in this chapter reflect these changes and the shift in disease profiles and increased survival following procedures. As a consequence, there has been a major expansion in the number of disease entities within ICD-11, with new classification hierarchies and updated nomenclature. For instance, the incidence of heart valve disease is no longer dominated by rheumatic fever in developed societies, although it remains important in developing nations, and consequently there has been a shift in diagnostic paradigms to that of valve type, then valve pathology followed by aetiology.

Many items previously classified in ICD-10 as ‘Other forms of heart disease’ (I30-I52) have become major clinical issues in today’s cardiology, warranting the creation of new distinct higher level categories. Two examples are:
Diseases of the myocardium, including extensive subsections on Myocarditis and Cardiomyopathy.

Cardiac arrhythmia, including a large new subsection on ‘Cardiac arrhythmia associated with genetic disorder’ and ‘Pacemaker-Implantable cardioverter and defibrillator dysfunction and complication’, both of which are of an increasingly important areas of clinical practice. The changes in this section have had major input and endorsement from the Paediatric & Congenital Electrophysiology Society and the International Society for Nomenclature of Paediatric and Congenital Heart Disease.

The change in the ICD revision process to be clinically driven has meant that areas primarily managed by non-cardiologists have been relocated to more suitable chapters. Thus Cerebrovascular diseases (I60-I69) have been reclassified to Chapter 8, ‘Diseases of the nervous system’ and oesophageal varices (I85) have been relocated to ‘Diseases of the digestive system (Chapter 13).

A new subsection on Pulmonary Hypertension in the Pulmonary heart disease and diseases of pulmonary circulation section, is based on the resulting paper Updated Clinical Classification of Pulmonary Hypertension, following the 5th World Symposium held in Nice, France, in 2013.

The postprocedural disorders section has been markedly enlarged reflecting increased survival after cardiovascular procedures over the last two decades with recognition of an increasing number of patients with postprocedural morbidities and disease specific complications.

The section on Congenital anomaly of heart and great vessels and related acquired abnormalities classified to Chapter 20 Developmental anomalies has been based on the International Paediatric and Congenital Cardiac Code (IPCCC), which has been created over the last decade by the International Society for Nomenclature of Paediatric and Congenital Heart Disease (ISNPCHD, www.ipccc.net). As a consequence, the 73 congenital cardiology ICD-10 entities in Q20-Q29 have been expanded to 316 diagnoses, as an accurate summation of the heterogeneity of cardiac malformations seen in clinical practice. Reference was also made to the Anatomic and clinical classification of congenital heart defects (ACC-CHD) with the corresponding IPCCC and ICD-10 codes.

### 13.8.11 Chapter 12 – Diseases of the respiratory system

#### Structure of Chapter 12

There are two main hierarchies in Chapter 12.

- Broad category of disease/disorder type
- Specific disease/disorder type with some anatomy included
  - Further specificity of disease/disorder type
- OR
  - Broad category of anatomy
  - Specific disease/disorder type
  - Further specificity of disease/disorder type

#### Differences between ICD–10 and ICD–11 in Chapter 12
There has been some restructuring and regrouping of this chapter, with new concepts added and updated current terminology now included.

A new section, Inhalational, occupational and environmental lung disease has been added to improve the classification of respiratory disorders according to their aetiology.

Sleep disorders of breathing and respiratory control has been added to Chapter 08 and secondarily parented to the Respiratory Chapter.

Cystic fibrosis has been moved to the Respiratory Chapter and double parented to Chapter 5 Endocrine, nutritional and metabolic diseases.

**Table: Comparison of ICD-10 block structure with ICD-11 equivalent structure in chapter 12**

<table>
<thead>
<tr>
<th>ICD-10 block heading</th>
<th>ICD-11 equivalent structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>J00-J06 Acute upper respiratory infections</td>
<td>Upper respiratory tract disorders section, Infectious diseases by infectious agent</td>
</tr>
<tr>
<td>J09-J18 Influenza and pneumonia</td>
<td>Infections due to Influenza virus, Pneumonia was moved to the section of Lung infections now primarily parented to Chapter 1 Infectious diseases</td>
</tr>
<tr>
<td>J20-J22 Other acute lower respiratory infections</td>
<td>Infections of the respiratory system</td>
</tr>
<tr>
<td>J30-J39 Other diseases of upper respiratory tract</td>
<td>Upper respiratory tract disorders</td>
</tr>
<tr>
<td>J40-J47 Chronic lower respiratory diseases</td>
<td>Lower respiratory tract diseases</td>
</tr>
<tr>
<td>J60-J70 Lung diseases due to external agents</td>
<td>Inhalational, occupational and environmental lung disease</td>
</tr>
<tr>
<td>J80-J84 Other respiratory diseases principally affecting the interstitium</td>
<td>Certain specified respiratory diseases principally affecting the lung interstitium</td>
</tr>
<tr>
<td>J85-J86 Suppurative and necrotic conditions of lower respiratory tract (Abscess of lung or mediastinum and Pyothorax)</td>
<td>Abscess of lung or mediastinum and the pyothorax were moved to the section for Lung infections in Chapter 1 Infectious diseases</td>
</tr>
<tr>
<td>J90-J94 Other diseases of pleura</td>
<td>Pleural, diaphragm and mediastinal disorders</td>
</tr>
</tbody>
</table>
Rationale for Chapter 12

The changes to Chapter 12 have been made principally to provide current clinical terminology and classification of conditions primarily affecting the respiratory system and have been based on input from international societies and stakeholders. Infectious lung diseases have been moved to Chapter 01 to better reflect the infectious nature of these conditions. The major overhaul of the organization of the blocks have been summarized above by comparing ICD-10 blocks with the new blocks structure of ICD-11. Sub-classifications of Neoplasms of the respiratory system are located under Chapter 2 Neoplasms, and sub-classifications of the Developmental respiratory diseases are now located in Chapter 20 Developmental anomalies.

The Upper respiratory tract disorders was constructed in upper respiratory tract diseases except that moved to the Infectious disease Chapter.

The Lower respiratory tract diseases shifted from the Chronic lower respiratory diseases of the ICD-10, but Chronic obstructive pulmonary disease (COPD) was made an independent category based on an international concept.

Cystic fibrosis has been moved to under the Lower respiratory tract diseases and multiply parented, because:

The representative clinical conditions of cystic fibrosis are intractable respiratory infection, end stage respiratory failure, exocrine pancreatic insufficiency and digestive organ lesions such as the meconium ileus. Cystic fibrosis is a disease due to an abnormality of the Cl ion channel which is CFTR, symptoms of the respiratory symptom is recognized in nearly all cases of patients. The cause of death is mainly respiratory abnormality, and this disease is the target disease of lung transplantation. The description of cystic fibrosis in the following part in representative textbooks¹⁰.

‘OBSTRUCTIVE DISEASES’ in the textbook 'Murray and Nadel's Textbook of Respiratory Medicine'

‘OBSTRUCTIVE LUNG DISEASES’ in the textbook 'Fishman's pulmonary diseases and disorders'

‘Disease of the Airways’ in the textbook 'Fraser and Pare's Disease of the Chest' ‘Pulmonary Diseases’ in the textbook ‘Washington Manual of Medical Therapeutics, The, 34ed.’
The section pertaining to Inhalational, occupational and environmental lung disease has been based on input from the WHO Occupational Health Division.

The Certain specified respiratory diseases principally affecting the lung interstitium shifted from the Other respiratory diseases principally affecting the interstitium. The Idiopathic interstitial pneumonitis was made an independent category based on an international concept and the category of the Primary interstitial lung diseases specific to infancy and childhood was created independently based on the proposal of paediatric TAG.

The section of the Certain diseases of the respiratory system and the section of the Postprocedural respiratory disorders were shifted from Other diseases of the respiratory system of ICD-10 except the Mediastinal and diaphragm disorders that moved to the section of the Pleural, diaphragm and mediastinal disorders.

13.8.12 Chapter 13 – Diseases of the digestive system

Structure of Chapter 13

The general hierarchy of Chapter 13 consists of the following:

- Detailed anatomy
  - Specific disease/disorder type
    - Further specificity of disease/disorder type

Differences between ICD–10 and ICD–11 in Chapter 13

There has been a major restructuring and change of the previous ICD-10 concepts in this chapter. Detailed anatomical groups were added to the hierarchy, such as ‘Diseases of duodenum’, ‘Diseases of the anal canal’ or ‘Diseases of the pancreas’. Independent categories for functional gastrointestinal disorders and inflammatory bowel diseases have also been included to cover broad anatomical sites. Additional dimensions are available from the clinical findings section in Chapter 21 and Chapter 26 Extension Codes for use in postcoordination. For example, with and without haemorrhage, with and without obstruction, with and without ascites, laterality and greater site specificity, etc.

Although ICD-10 included diseases of the oral cavity, salivary glands and jaws, the corresponding section of Chapter 13 in ICD-11 has been improved in structure and content to include diseases and disorders of the orofacial complex.

Table: Comparison of ICD-10 block structure with ICD-11 equivalent structure

<To be added once final codes are set>

Rationale for Chapter 13

ICD-11 has been improved in structure and content to include diseases and disorders of the orofacial complex. There are several other tissues which as essential components of the orofacial complex have an important function and their impairment will have a direct impact on oral health status. It is important to recognize that oral health is more than having healthy teeth; having oral health is being free of chronic oral-facial pain conditions, oral and pharyngeal cancers, oral soft tissue lesions, periodontal (gum) disease, tooth decay and tooth loss and tooth surface loss, birth defects such as cleft lip and palate, and scores of other diseases and disorders that affect the oral, dental, and craniofacial tissues (orofacial
complex) as well as associations with systemic health and disease. This underlines the importance of providing a coherent system for coding and classifying data on orofacial complex diseases and disorders so that the oral health professional can record and collect data from each patient at their clinics, regardless of whether such facility may be part of large hospitals, or small clinics. It is anticipated that being able to record and interpret such data will enable health professionals to contribute to the improvement of oral health as an essential component of general health and will stimulate the use of ICD11 by oral health personnel.

Major changes have been made to this chapter with very detailed anatomical groups being added to the hierarchy for the digestive tract, according to rostral-caudal order, with the exception of categories for hernia, functional gastrointestinal disorders, and inflammatory bowel diseases.

Functional gastrointestinal disorders are independently described because their pathophysiology is considered from the standpoint of ‘Brain-Gut axis’, and not only from their impact on the gastrointestinal tract. Inflammatory bowel diseases are also independently described mainly because the Crohn disease involves several organs. In each anatomical group (organ group), aetiology based classifications are used to sub-classify disorders. Particularly, GI disorders are arranged in the following categories:

A. Acquired anatomical or morphological alterations
B. Motor disorders
C. Inflammation including ulcer (-including Infectious diseases which are not the proper items for Chapter 13)
D. Vascular disorders
E. Non-neoplastic polyps

In addition, there are two other categories listed, although Chapter 13 is not the primary place for these disorders.

F. Structural developmental anomalies
G. Neoplasms

Important or common digestive diseases have been allocated their own category, for example gastro-oesophageal reflux disease, columnar metaplastic epithelium, intestinal malabsorption and protein-losing enteropathy, ulcerative colitis, non-alcoholic fatty liver disease and diverticular disease. Polyps are now classified independently, and not in the ‘other diseases’ section of anatomical site.

Common digestive diseases extending several organs are classified principally into the disease category of rostral organ. For example, ‘Gastroenteritis’ is classified in ‘Gastritis’, and ‘Gastroduodenal ulcer’ is classified in ‘Gastric ulcer’. The item ‘Peptic ulcer, site unspecified’ should not be used due to advances in medical technology. It should be classified into either the ‘Oesophageal ulcer, Gastric ulcer, Duodenal ulcer or Anastomotic ulcer’ category, depending on the disease site.

Vascular disorders of GI organs have been allocated their own category. Oesophageal varices, gastric varices and haemorrhoids are now classified in Chapter 13. In ‘Diseases of liver’, there are new independent categories including Metabolic and transporter liver
disease, Autoimmune liver diseases, Non-alcoholic fatty liver disease and Vascular disorders of the liver.

For the classification of Chronic liver disease with cirrhosis, ‘Liver cirrhosis’, an item in ‘Hepatic fibrosis and cirrhosis’ (being proposed), is used. For example, ‘Chronic hepatitis B’ and ‘Liver cirrhosis’, ‘Chronic hepatitis C’ and ‘Liver cirrhosis’, ‘Autoimmune hepatitis’ and ‘Liver cirrhosis’, ‘Primary biliary cholangiopathy’ and ‘Liver cirrhosis’, etc. There are new independent sections for ‘Diseases of gallbladder and biliary duct’ and ‘Diseases of pancreas’. Within these new sections, there are new independent categories including Structural developmental anomalies, Congenital anomalies, Acquired anatomical alterations, Cholangitis, Cystic diseases of the pancreas, Chronic pancreatitis and Autoimmune pancreatitis.

13.8.13 Chapter 14 – Diseases of the skin

Structure of Chapter 14

The general hierarchy of Chapter 14 consists of the following:

- Broad category of disease/disorder type
- Specific disease/disorder type with some anatomical site
- Further specificity of disease/disorder type

Differences between ICD–10 and ICD–11 in Chapter 14

Chapter 14 has undergone major restructuring, with the addition of more detailed entities. The terminology has been updated to be more current.

Rationale for Chapter 14

Major changes have been made to this chapter adding detail coming from the fusion of the American, British and German dermatological terminologies.

13.8.14 Chapter 15 – Diseases of the musculoskeletal system or connective tissue

Structure of Chapter 15

The general hierarchy of Chapter 15 consists of the following:

- Broad category of disease/disorder type
- Specific disease/disorder type with some anatomical site
- Further specificity of disease/disorder type

Differences between ICD–10 and ICD–11 in Chapter 15 The blocks in this chapter have been reordered, and a new block Autoinflammatory syndromes has been added to the Immune Chapter and secondarily parented to here. The area of spinal conditions has been restructured and renamed to Conditions associated with the spine.

Rationale for Chapter 15

The American College of Rheumatology and European League Against Rheumatism (ACR/EULAR) Diagnostic Criteria for Rheumatoid Arthritis (under development) was used to
inform the code hierarchy and content model attributes for Rheumatoid arthritis. Current literature informed the change of title of ‘systemic connective tissue disorders’ to ‘non-organ specific systemic autoimmune disorders’. The changes to vasculitis were based on the classification of the Chapel Hill International Consensus Conference on the Nomenclature of Systemic Vasculitis.

The category ‘Dermatopolymyositis’ was changed to ‘Idiopathic inflammatory myopathies’ with a change of axes and introduction of further granularity.

The revisions to the classification of spondyloarthritis reflect current expert opinion with comments from Dr Robert Landewé, with a separation of axial and peripheral. Together, the axial and peripheral spondyloarthritis criteria cover the entire spectrum of what was formerly called (undifferentiated) spondyloarthritis and (ankylosing) spondylitis. There is re-arrangement of infective spondyloarthritis, with a secondary axis for the major types of infective process, i.e. bacterial, fungal etc., and supplementary codes to be used for the specific infection.

The new category for Auto-inflammatory syndromes is based on the work of the International Society of Systemic Auto-inflammatory Disease (ISSAID).

13.8.15 Chapter 16 – Diseases of the genitourinary system

Structure of Chapter 16

The general hierarchy of Chapter 16 consists of the following:

- Broad category of body system
  - Broad disease/disorder type (with some anatomy)
  - Specific disease/disorder type (with some anatomy)

Differences between ICD–10 and ICD–11 in Chapter 16

Chapter 16 has been reordered to distinguish diseases of the female genital system, the male genital system, and the urinary system. There is more specificity within the section on the female genital system reflecting current scientific understanding. The hierarchy is now divided into non-inflammatory disorders and inflammatory disorders, which are further divided by anatomical groupings. These groupings are in an order followed by gynaecological and obstetric examinations i.e. from external to internal genitalia. Neoplasms of the urinary system are primarily located in Chapter 2 Neoplasms, Structural developmental anomalies of the urinary system are primarily located in Chapter 20 and Symptoms, signs or clinical findings involving the urinary system are primarily located in Chapter 21.

All diseases relating to the kidney are now classified under the main category for ‘Diseases of the urinary system’. Acute kidney failure and chronic kidney disease now incorporates the currently used staging classification as proposed by Kidney Disease | Improving Global Outcomes (KDIGO).

The classification of Glomerular diseases has been restructured and is now divided into clinical features/syndromes. A new block has been added for Cystic and dysplastic kidney disease, originally, classified in ICD-10 to Chapter 17 Congenital malformations, deformations and
chromosomal abnormalities, with relevant entities grouped together and based on the 2015 KDIGO guidelines.

Table: Comparison of ICD-10 block structure with ICD-11 equivalent structure

<table>
<thead>
<tr>
<th>ICD-10 block heading</th>
<th>ICD-11 equivalent structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>N00-N08 Glomerular diseases N06 Isolated proteinuria with specified morphological lesion</td>
<td>Classified to Diseases of the urinary system. This section is now classified according to clinical features or syndromes. Still includes: Nephritic syndrome Nephrotic syndrome Isolated proteinuria and albuminuria Electron microscopy and immunofluorescence findings subdivisions have been removed from proteinuria with morphological lesion. This is now classified to Isolated proteinuria and albuminuria.</td>
</tr>
<tr>
<td>N10-N16 Renal-tubulo-interstitial diseases</td>
<td>Classified to Diseases of the urinary system. Section remains relatively the same. Tubular and cortical necrosis has been unbundled from acute renal failure to be a distinct codable entity classified to this section.</td>
</tr>
<tr>
<td>N17-N19 Renal failure</td>
<td>Classified to Diseases of the urinary system. Acute renal failure is no longer a bundled concept which previously identified the acute kidney damage i.e. acute tubular necrosis. Extension codes can now be used with CKD to identify the stage of the disease. New section included for CKD with mineral or bone disease.</td>
</tr>
<tr>
<td>N20- N23 Urolithiasis</td>
<td>Classified to Diseases of the urinary system. Subdivided into upper urinary tract (includes kidney and ureter) and lower urinary tract (includes bladder and urethra). Renal colic has been reclassified to Chapter 20 Symptoms, signs and clinical findings involving the urinary system</td>
</tr>
<tr>
<td>N25-N29 Other disorders of kidney and ureter</td>
<td>Classified to Diseases of the urinary system. Reclassification of disorders relating to the size of the kidney to Chapter 20 Symptoms, signs and clinical findings involving the urinary system - Macroscopic changes of size of the kidney</td>
</tr>
<tr>
<td>N30-N39 Other diseases of urinary system</td>
<td></td>
</tr>
<tr>
<td>N40-N51 Diseases of male genital organs</td>
<td></td>
</tr>
<tr>
<td>N60-N64 Disorders of breast</td>
<td></td>
</tr>
<tr>
<td>N70-N77 Inflammatory diseases of female pelvic organs</td>
<td></td>
</tr>
<tr>
<td>N80-N98 Noninflammatory disorders of female</td>
<td></td>
</tr>
</tbody>
</table>
Rationale for Chapter 16

The changes to Chapter 16 are aimed at increasing the clinical utility of the classification by providing a more user-friendly hierarchical structure, increased international comparability and standardization of genitourinary conditions by including the most scientifically accurate and internationally agreed-upon terms and definitions provided by various international stakeholders, including the WHO department of Reproductive Health and Research, the International Federation of Gynaecology and Obstetrics (FIGO), National Kidney Foundation and the Kidney Disease International Global Outcomes (KDIGO).

The chapter hierarchy is subdivided into Diseases of the Female Genital System, Diseases of the Male Genital System and Diseases of the Urinary system. This architecture of the female genital system and male genital system was designed to improve the end-user experience. The female genital system hierarchy is broken down into noninflammatory and inflammatory disorders, and then further divided by anatomical grouping in the order of gynaecologic (and obstetric) examination (from external to internal genitalia), where applicable.

- Vulva
- Vagina
- Cervix
- Uterus
- Fallopian Tube
- Ovary
- Pelvic Cavity

These groupings have further subdivisions for congenital and acquired abnormalities, as appropriate.

To reflect the current scientific understanding for certain genitourinary conditions, additional detail has been included for the following areas:

- Amenorrhea
- Ovarian dysfunction
- Female pelvic pain
- Endometriosis
- Adenomyosis
- Female infertility
- Male infertility
- Early pregnancy loss
- Pregnancy outcomes
The Kidney failure section of the classification has been revised to reflect the current evidence based definitions of acute kidney versus chronic kidney disease and the new Kidney Disease:

"Improving Global Outcomes (KDIGO) definitions and staging system for acute kidney failure."

13.8.16 Chapter 17 – Conditions related to sexual health

Structure of Chapter 17
- broad category of condition
  - specific type of condition

Rationale for Chapter 17
The chapter has been formulated to group sexually related conditions. This also allows categorization of gender identity related conditions without stigmatization, while maintaining recognition of these entities as real conditions so that related health interventions can be accommodated within the health system.

13.8.17 Chapter 18 – Pregnancy, childbirth or the puerperium

Structure of Chapter 18
The general hierarchy of Chapter 18 consists of the following:
- Broad category related to the stages of pregnancy, childbirth and the puerperium
  - Specific disease/disorder type
  - Further specificity of disease/disorder type

Differences between ICD–10 and ICD–11 in Chapter 18
The Chapter has been reordered but remains similar to that in ICD–10. There have been some changes and additions made to the sections Maternal care related to the fetus and amniotic cavity and possible delivery problems and Complications of labour and delivery. A new section Obstetric haemorrhage has been added to enable all types of haemorrhage to be together.

Rationale for Chapter 18
The changes to this chapter are intended to increasing clinical utility of the classification by providing a more user-friendly hierarchical structure. Increasing the international comparability and standardization of conditions related to pregnancy, childbirth and the puerperium by including the most scientifically accurate and internationally agreed-upon terms and definitions provided by various international stakeholders, such as the WHO department of RHR, International Federation of Gynaecology and Obstetrics (FIGO), was also a highly important aspect of the modifications. Particular attention was given to correct integration of concepts and definitions of the International Committee Monitoring Assisted Reproductive Technologies (ICMART).

The changes reflect the current understanding for certain conditions related to pregnancy, childbirth and the puerperium. Additional specifications have been included for the area:
1. Early pregnancy loss

13.8.18 Chapter 19 – Certain conditions originating in the perinatal period

Structure of Chapter 19

The general hierarchy of Chapter 19 consists of the following:

- Broad category disease/disorder type and some anatomy
  - Specific disease/disorder type
    - Further specificity of disease/disorder type

Differences between ICD–10 and ICD–11 in Chapter 19

This chapter remains similar to that in ICD–10.

Rationale for Chapter 19

13.8.19 Chapter 20 – Developmental anomalies

Structure of chapter 20 hierarchies:

- Structural developmental anomalies
  - Broad category of anatomy
    - Specific disease/disorder type
      - Further specificity of disease/disorder type

- Multiple developmental anomalies and syndromes
  - Broad category of anatomy
    - Specific disease/disorder type
      - Further specificity of disease/disorder type

- Chromosomal anomalies, excluding gene mutations
  - Specific disease/disorder type
    - Further specificity of disease/disorder type

- Conditions with disorders of intellectual development as a relevant clinical feature
  - Non-syndromic vs syndromic conditions
    - Further specificity of disease/disorder type

Differences between ICD–10 and ICD–11 in Chapter 20

This chapter has undergone major restructuring including a title change from Congenital malformations, deformations and chromosomal abnormalities to Developmental anomalies. All genetic syndromes without structural developmental anomalies have been reallocated to appropriate chapters of the ICD, according to the affected body system(s).

Rationale for Chapter 20

The ICD–10 classification of developmental anomalies is covered by chapter XVII: Q00-Q99 Congenital malformations, deformations and chromosomal abnormalities.
It is a very heterogeneous chapter, including malformations, genetic syndromes (with or without malformations) and chromosomal anomalies. This leads to confusion between genetic origin of a disease and malformation. Therefore, all genetic syndromes without structural developmental anomalies are excluded from this chapter, and are reallocated to appropriate chapters of the ICD, according to the affected body system(s).

**The new chapter 20 has three main divisions:**
- Structural developmental anomalies/malformations
- Multiple developmental anomalies and syndromes
- Chromosomal anomalies and genetic defects

The first division ‘Structural developmental anomalies/malformations’ includes isolated conditions affecting only one body system. It is organized in sections corresponding to those body systems, which are also classified in the other relevant chapters of ICD–11.

The second division ‘Multiple developmental anomalies and syndromes’ includes conditions affecting several locations within one body system, or several body systems simultaneously. Syndromes which can be said to predominantly affect one body system are assigned to corresponding sections within this division. Syndromes which affect several body systems, without one clearly predominating, are put together in a specific section at the end of the division. There is also a section for Dysplasia syndromes due to inborn errors of metabolism, all of them primarily classified in the chapter for metabolic diseases.

The third division ‘Chromosomal anomalies and genetic defects’ departs from the clinical approach generally followed in the ICD and classifies developmental anomalies defined genetically or cytogenetically, since there is no clear-cut distinction between genetics and cytogenetics. We have started to include specific deletions and duplications corresponding to a clear phenotype, knowing that many more will be described in the coming years. Future ones will be added whenever necessary, during the post-publication revisions of the ICD–11.

A special problem is how to deal with diseases historically defined clinically but including a chromosomal/genetic anomaly as aetiology. In some cases, there are several aetiologies for the clinical entity, and not all of them are chromosomal anomalies: for instance, Silver-Russell syndrome can be caused by a 11p15 duplication, a 7p11.2p13 duplication, but also by maternal uniparental disomy of chromosome 7 or 11 and imprinting defects of 11p15. In other cases, there is an overwhelming correspondence between the clinical entity and a cytogenetic aetiology: for instance, Williams-Beuren syndrome corresponds to the 7q11.23 deletion.

Polyhierarchy is used in a restricted way within the frame of this chapter: once a disease is assigned to a section, it is generally not secondarily classified elsewhere in the chapter. The structure would otherwise become too intricate. On the other hand, all entities in this chapter are to be classified in other chapters of ICD–11, when appropriate.

13.8.20 Chapter 21 – Symptoms, signs or clinical findings, not elsewhere classified

Structure of Chapter 21
Chapter 21 is divided into major sections based on body systems. Each of these sections has the following categories, as appropriate:**

- Symptoms and signs
- Abnormal findings
- Abnormal results of function studies
- Certain clinical forms
- An additional section is located at the end of this chapter for ill-defined and unknown causes of mortality.

** Differences between ICD–10 and ICD–11 in Chapter 21

This chapter has undergone major restructuring with the high level hierarchy now in line with the ICD chapters. Certain clinical forms previously located in other chapters as asterisk codes are located here. A new category has been added for Findings of microorganism resistant to antimicrobial drugs.

** Rationale for Chapter 21

The different chapters of ICD–10 included several clinical manifestation categories, some of them as asterisk codes. In order to simplify the structure, improve the use of postcoordination, and also to remove ‘ill-defined’ conditions from organ chapters, several former asterisk codes, additional detail for diverse conditions, and the said ill-defined conditions have been moved here. All follow the main organization by anatomy, and the anatomical groupings have a secondary parent to the relevant organ chapter, improving the user guidance.

** Chapter 22 – Injury, poisoning or certain other consequences of external causes

** Structure of Chapter 22

The general hierarchy of Chapter 22 consists of the following:

- Broad category of anatomy (e.g. head; hip & thigh)
- Broad category of injury type (e.g. fracture; open wound)
- Further specification

OR

- Broad category of cause of injury
- Specific injury type
- Further specificity of injury type

** Differences between ICD–10 and ICD–11 in Chapter 22

The high level categories have few changes. Changes are mainly at the lower character level, and include additions of more specific categories of injury types and bodily location of injury. Additional dimensions are available from Chapter 26 Extension codes, for postcoordination to add further detail such as laterality, depth of burn, or duration of loss of consciousness.

** Rationale for Chapter 22
The principles of the revision were:

- Maintain good back-compatibility with ICD–10, particularly by minimizing change at the former three-character level. Change at the former four-character level is more extensive, but has also been done with this principle in mind.

1. Take account of the extensions to this chapter in clinical modifications of ICD–10 because:
   - They are evidence of extensions required to serve clinical purposes in identified situations.
   - It is preferable to minimise incompatibilities with these classifications.

2. Take account of classifications other than ICD that are in wide clinical use for conditions in scope for this chapter.

3. Take account of advice, solicited and proffered.
   - Increased attention to distinctions pertinent to treatment choices and to outcomes, including disability.

These include allowing identification of clinically and prognostically important aspects of fractures (notably whether they extend into a joint) and organ/vessel injuries (degree). Some conditions are much more important when bilateral, and in such instances side has been proposed precoordinated (e.g. injury of the eyes). ICD–10-CM was particularly valuable in this regard, as its injury chapter makes many distinctions, beyond ICD–10, which follow or are consistent with credible and widely used clinical classifications relevant to injury treatment and outcome.

Increased attention has been given to injury conditions specific to childhood (e.g. greenstick and epiphyseal fractures) and to injury conditions that are indicative of possible intentional injury (e.g. posterior rib fractures, ‘bucket-handle’ and ‘corner’ fractures).

The work was done with awareness that this chapter is not used to code Underlying Cause of Death.

The morbidity use case is particularly important for this chapter.

13.8.22 Chapter 23 – External causes of morbidity or mortality

Structure of Chapter 23

The general hierarchy of Chapter 23 consists of the following axis:

Intent of external cause (unintentional, intentional self-harm, assault, undetermined intent and intent pending.)
- Broad category of mechanism of external cause
  - More specific mechanism and objects/substances involved in causing injury
  - Further characterization of the external cause

Differences between ICD–10 and ICD–11 in Chapter 23

The primary axis is now based on ‘intent’. The codes are a combination of intent, followed by mechanism and object or substance involved in occurrence of injury. There has been an expansion in the areas of vehicle types, places of occurrence, types of activities, legal/war
codes, and substances. The areas of Complications of medical and surgical care and Maltreatment syndromes have been revised and improved. The term ‘armed conflict’ has been included in the section on war operations with separate codes for civilians and military persons. Additional dimensions are available from the Chapter 21 Extension codes, for use in postcoordination.

Rationale for Chapter 23

The main aim of the changes was to provide a more uniform coding structure while still maintaining high compatibility with ICD–10. The changes to the traffic accident categories are aimed at simplifying code selection, while the section on Operations of war and armed conflicts has been revised to capture the more current situations of armed conflicts. Another enhancement has been to produce a single, hierarchical list of noxious substances to serve the Injury and External Causes chapters. This list has been drawn from appropriate external systems (e.g. SNOMED-CT) for reference information.

All mechanisms/objects codable for all intents

- More uniform code structure
- Revised ‘Intent’ dimension (n.b. Intent pending; ISH: suicidal/non-suicidal)
- Retain transport codes, but expand vehicle types
- Expanded Place of Occurrence codes
- Expanded and revised Activity dimension (n.b. work-relatedness)
- Revision of Complications of Medical & Surgical Care
- Expanded Legal/War Codes
- Improved provision for maltreatment syndromes
- Introduction of additional dimensions (optional)
- Revision of External Cause index, rules and guidelines
- Provide for Mortality, Morbidity, Lower Resource Settings, Research

Progress has been made on all of these points, though constrained in some respects, particularly for the mortality use-case (due to the tight constraints on code-space combined with the lack of provision for postcoordination/cluster-coding). A section on limitations is at the end of these notes.

Notes provided here focus on several of these points; additional material will be provided on other aspects on request. Comments are also provided here on the two main issues that involve both the External Causes chapter and the Injury chapter (both also involve Chapter 26 Extension codes): substances; complications of care (Safety & Quality).

Transport

Four dimensions are implicit in the ICD–10 range V01-V89: injured person’s mode of transport (e.g. motorcycle), whether the injurious event occurred in road traffic (if so, the resulting injury is a road injury), the injured person’s role (e.g. passenger), and what type of other vehicle was involved, if any (counterpart). All four dimensions are required for a revised structure that is conceptually equivalent to the ICD–10 ‘transport accidents’ module at four-character level.

All four dimensions have been precoordinated in the Unintentional transport injury module. This produces a structure with high back-compatibility with ICD–10 V-- at four-character level. It preserves all top-level modes of transport categories (some now split) and the four
conceptual dimensions (mode; and for land transport modes: whether in traffic, transport user role and counterpart).

In recognition of code-space limitations, and of the fact that most transport injury cases are unintentional, pre-coordination of transport cases in the other main intent blocks (intentional self-harm, assault, undetermined intent and intent pending) is limited to intent by mode of transportation. However, the other dimensions are available for optional use.

The revised transport block includes changes made to resolve problems identified with the ICD–10 transport section.

- Split several modes of transport to enable identification of important and emerging types that cannot be identified in ICD–10.
- Refined and revised terms and definitions (for clarity, to fill gaps in the set provided in ICD–10 and to improve comparability with terms used internationally for road safety).
- Various other revisions (e.g. of types of vessel in water transport section) Note that the coordination order has been altered from the equivalent in ICD–10, from: mode, counterpart, then user role and traffic status combined to: mode, traffic status, user role, counterpart.

The main reason for this change was to simplify the selection of ‘traffic accident’ categories, which are frequently required when reporting road injury.

**War and armed conflict** A revised classification is provided for inclusion as the expansion of intent category Operations of war and armed conflict (Operations of war in ICD–10). The classification largely follows the expansion of Y36 in the United States' clinical modification of ICD–10 (ICD–10-CM). This follows the 4-character categories in ICD–10 and provides subdivisions, which follow inclusion notes given in ICD–10. In addition, sub-categories are provided to distinguish whether the injured person was military or civilian.

The rubric has been altered by the addition of ‘...and armed conflict’ to ‘Operations of war’, and the inclusion term has been altered accordingly. ‘War’ and ‘civil insurrection’ (which also formed part of the inclusion term) were not defined in ICD–10. The use of a term broader than ‘war’ is considered desirable because war, in the sense of formally declared armed conflicts between nation states (or subnational entities) has become uncommon. Armed conflicts of a range of types and intensities, while tending to become less common, remain much more numerous than wars. Restriction of use of this category to declared wars, and/or to armed conflicts that meet a commonly used criterion of intensity (1,000 or more battle-related deaths in a calendar year = war) was thought to be unduly restrictive. The alternative proposed here is to also include injuries due to ‘Minor’ armed conflicts, defined as those resulting in 25 to <1,000 battle-related deaths in a calendar year. Application of the definition is aided by the existence of a publicly accessible database listing conflicts found to satisfy it.

**Crossover issues**

These are matters that affect both the injury and the external causes chapters, and also other parts of the ICD.

**Toxic effects of substances**
Toxic effects of noxious substances appear in ICD–10 at several points, in the Injury and External Causes chapters, and in other chapters. Code lists at those points differ in specificity and are not completely consistent. A design aim for ICD–11 is to produce a single, hierarchical list of noxious substances to serve all of the purposes required for the Injury and External Causes chapters. It is also intended to draw and link with appropriate external systems (n.b. SNOMED-CT) to provide reference information. The benefits of this are: external source(s) can define-by-example the inclusions of the ICD–11 list; and if the external source(s) are actively updated, then this provides a way for the ICD–11 coverage of substances to remain current.

The term ‘Toxic effects’ is used for all types of harm resulting from harmful chemical effects of substances of all types. It is recognised that other terms, such as ‘poisoning’, ‘chemical corrosion’ and ‘envenomation’ are sometimes used in the context of particular substances. These terms will be included as synonyms and subordinate terms where in common use. A number of sources were consulted, including: ICECI Objects & Substances dimension; Anatomical Therapeutic Chemical (ATC) classification; TAG-IEG advisory groups on drugs and poisons; Quality and safety TAG; SNOMED; IPCS INTOX.

The list has two main hierarchical levels.

The first, with 16 categories, is conceptually related to the code-list that is present in ICD–10 at X40-X49 (Accidental poisoning by and exposure to noxious substances) and the equivalent points in the Intentional Self-harm and Undetermined intent code-blocks. The list results from application of these principles:

- It should have few categories. This is necessary for practicability, especially in the context of cause of death coding and because the block structure of the external causes chapter has the effect that each additional category adds several rows.
- The categories should refer to substances or classes of substances that are important causes of mortality or morbidity.
- As many as possible of the categories should be sufficiently specific to be meaningful as reporting groups. (By comparison, several categories in the ICD–10 blocks such as X40-X49 are so broad as to be difficult to interpret).
- The several main contexts of exposure were kept in mind when specifying categories (i.e. recreational/street use; clinical use; self-harm; industrial and other exposures).

The 16 categories, either alone or combined with others, allow backwards comparability with eight of the ten categories in ICD–10 X40-X49 (and the equivalent groups in the ISH and Undetermined intent blocks). The only exceptions are two residual groups: ‘...other gases and vapours’ and ‘...other and unspecified chemicals and noxious substances’. The second level provides categories (n=381), with about the same number and specificity of substances that are provided for in the injury and external causes chapters of ICD–10. It includes all of the categories of substances that are specified in the ‘Cause of harm’ component of the Quality and Safety TAG classification.

Some categories have been added: to allow for pharmacological innovation and changes in drug use (e.g. synthetic cannabinoids); to reflect additions to ICD–10 made in its clinical modifications (e.g. more specificity concerning anticoagulants); to allow more specific identification of prominent drugs (e.g. paracetamol); to provide for additional widely-used recreational drugs (e.g. Cathinone, the main active agent in khat); and on advice from other
TAGs (e.g. types of substance added by the Safety and Quality TAG). We anticipate that more categories will be added in future updates, to reflect changes in drug availability and use.

A more comprehensive list of substances (a superset of the hierarchical list, with synonyms for many of the entries, will be provided in Chapter 26 Extension codes. That list shares the same hierarchical structure as the precoordinated codes. It also takes account of the ICD–11 Supplementary Classification of Contact Allergens prepared by the Dermatology TAG. Entries in the Chapter 26 Extension codes substances list will be specified in terms of equivalent terms in SNOMED-CT.

**Complications of care (Quality and Safety)**

This section briefly describes the model for coding complications of care that has been developed by the Quality and Safety TAG. This section also provides a description of how the code-set is currently implemented, some considerations concerning how it may best be implemented (considering Chapter 26 Extension codes) and notes on cluster-coding arrangements, which are crucial for implementing this coding model but are not yet firmly in place.

In outline, the model has three parts, each of which must be coded. The postcoordinated codes for all the parts must be designated as belonging to a cluster. The three concepts are: (1) the resultant injury or harm; (2) the cause or ‘Mode’ of harm; and (3) the ‘Mechanism’ of harm.

Classifications and code-sets have been developed for (1) and (2) by the Quality and safety TAG. The categories have been entered into the External Causes chapter. The resultant harm (1) is to be coded by using the most appropriate disease or injury code from any part of ICD–11. A few conditions that are considered to be relevant in the context of complications of care appear not to have a suitable code in the draft of ICD–11. These conditions are provided for by means of categories in the Injury chapter. These are related to the ICD–10 block T8; however, most categories in that block have been dropped from ICD–11 because suitable categories for the conditions to which the T8- categories referred are available elsewhere in ICD–11.

The operationalization of this construct remains somewhat problematic due to unresolved matters related to the role of Chapter 26 Extension codes, and of postcoordination (if any) in the mortality linearization.

In outline, the construct would, in principle, fit well into ICD–11 as follows:

1. Resultant injury or harm. Code selected from anywhere in ICD–11.
2. The cause or ‘Mode’ of harm: Code selected from the relevant block in External Causes chapter
3. ‘Mechanism’ of harm

Sanctioning rules lead coders to the subset of ‘Mode’ codes that are relevant, given the selected ‘Cause’ (e.g. if ‘Cause’ is a drug, then the relevant ‘Modes’ are categories such as over-dose and under-dose). At present, the ‘Mode’ categories are in the External cause chapter, implying that a second External Cause code must be selected. If the Chapter 26 Extension codes mechanism operates as foreshadowed, then it will be a suitable place for the ‘Mode’ categories. However, that may be problematic for coding Complications of care.
as a cause of death, if Chapter 26, Extension codes, and post coordination turn out not to form part of the mortality linearization.

13.8.23 Chapter 24 – Factors influencing health status or contact with health services

Structure of Chapter 24

The general hierarchy of Chapter 24 consists of the following axis:

- Broad category of a particular health status or service
- Specific condition

Differences between ICD–10 and ICD–11 in Chapter 24

The main hierarchy is now related to health status or service condition, rather than the reason for the admission.

Rationale for Chapter 24

Initially, the Functioning Topic Advisory Group for ICD–11 (fTAG) was tasked with the review of the Factors Chapter. They were to evaluate the necessity of each of the 801 codes and propose a revised hierarchical structure for the essential content that would remain. This content was to be both clinically relevant and use friendly as well as allowing the necessary space for expansion using the extension codes, as necessary. fTAG organized a review that identified the major ‘types’ of codes as ‘diagnostic’, ‘interventional’, ‘contextual factors’ and ‘other/debatable’. This review was combined with the general structure of the ICPC2 classification section on ‘social problems’ and a new organization was designed that combined the ICPC2 hierarchy with the ICD–11 codes. For the JLMMS, a shoreline exercise was then undertaken on the new structure to decrease granularity seen as unnecessary.

13.8.24 Chapter 25 – Codes for Special purposes

Structure of Chapter 25

This chapter contains two blocks. International provisional assignment of new diseases of uncertain aetiology, contains the international emergency codes, National provisional assignment of new diseases of uncertain aetiology, is for use by individual countries

Differences between ICD–10 and ICD–11 in Chapter 25

Diseases formerly coded here have been moved to their primary places within ICD–11. New codes for use as international provisional codes have been included.

13.8.25 Chapter 27 - Traditional medicine

Structure of Chapter 27

The content and structure of the TM Chapter represent a common language developed jointly through the international cooperation of traditional medicine clinicians, researchers, academics and classification experts to enable international comparability of practice and reporting of morbidity patterns in traditional medicine. Standardisation of this TM classification will allow clinical documentation in different countries to incorporate the same concepts and enable coders and users to extract comparable morbidity data from that
documentation. Coders must also be guided by rules which reflect the clinical diagnostic decision making process. However, the rules outlined below are relatively flexible to allow for national adaptations and research questions concerning relationships between diseases, disorders and patterns to be framed from a number of different angles.

The English terms do not necessarily represent the most common translation of the TM terms in Chinese, Korean or Japanese. There are reasons for this. If the terms did not conform to the overall ICD terminology such as ‘disease’ or ‘syndrome’ their usage was not preferred. Also it was necessary to indicate a difference between the western medicine (WM) concept and the TM concept where both used the same term but differed in their definition. An example is the use of the word ‘cholera’ in TM which is defined in terms of presenting symptoms and signs of cholera but for which no organism is identified. In such cases, the term Cholera-like disorder (™) is used in the traditional medicine chapter. Throughout the TM chapter there are many such instances for specific disorders (™) as well as general concepts such as Rheumatism like disorder (™).

**Terminology:**

The traditional medicine chapter uses the terms ‘disorder’ and ‘pattern’ to describe concepts. This is different from the concept descriptions in the western medicine chapters which refer to diseases (clinical pictures) and syndromes (clinical presentations).

**Definitions**

A disorder in traditional medicine (disorder (™)) refers to a set of dysfunctions in any body system which presents with associated signs, symptoms or findings. Each disorder (™) may be defined by its symptomology, aetiological explanation based on traditional medicine, course and outcome, or treatment response or linkage to interacting environmental factors. A disorder is a clinical picture that is relatively stable.

A pattern in traditional medicine (pattern (™)) refers to the complete clinical presentation of the patient at a given moment in time including all findings which may include:

- **Symptomatology:** signs, symptoms or unique findings by traditional medicine diagnostic methods, including the taking of the pulse, examination of the tongue, abdominal examination and other methods.
- **Constitution:** the characteristics of an individual, including structural and functional characteristics, temperament, ability to adapt to environmental changes, or susceptibility to various health conditions.

Traditional Medicine disorder and pattern are similar in that they are named after the body structures, causes, properties, severity etc. for clinical investigation and diagnosis. However, they deal with different aspects of clinical pictures. A TM pattern may be an overlapping clinical picture of a given patient with a WM disease or TM disorder. A TM pattern may denote an individually different pattern of systemic responses to the WM disease or a TM disorder. A TM pattern may be different from TM disorder in the following ways:

- A disorder in traditional medicine is a clinical picture that is relatively constant throughout the duration of that disorder. A pattern in traditional medicine is relatively temporary. (Constant/Temporary)
- A disorder in traditional medicine usually delivers information reflecting the local manifestation of the pathology. A pattern in traditional medicine usually delivers
information reflecting the systemic manifestation or the systemic response of the patient. (Local pathology/Systemic Response)

- A disorder in traditional medicine is a concept that summarises findings that are specific to the pathologic process under investigation. A pattern in traditional medicine means the pattern of combination of the manifestations that encompasses both specific symptoms/signs and non-specific findings such as pulse diagnosis and tongue diagnosis. (Specific/Non-specific)

- A disorder may be applied for a time span. A disorder coding may be based on the main pathologic process which may show a causal relationship with the main manifestations in the patient. A pattern may also be applied for a specific time span. However, a pattern code is based on the summarised whole picture that may be observed in the patient based on the perspectives of traditional medicine theories. The recognition of a pattern is based on the analysis of the systemic findings in the patient’s body and mind which reflect the pathologic processes, responses to the pathologic processes, other concomitant findings, and innate or acquired constitutional traits of the patient. (Linear/Multifactorial).

- A disorder in traditional medicine is used to describe the general characteristics considered to be relatively common to the general population. A pattern in traditional medicine is used to describe the individual characteristics considered to be relatively specific to the patient at that time. (Commonality/Individuality)

- A disorder in traditional medicine is usually described with general terms of anatomy and physiology together with terms of signs and symptoms. A pattern in traditional medicine is usually described with terms of the traditional medicine theories that are used to summarise the whole picture findings in the patient such as yin and yang balance, cold and heat, meridian, or constitution. (General/Theoretical)

**Rationale for Chapter 27**

This traditional medicine (TM) chapter is a new chapter for the ICD. The rationale for its inclusion in ICD–11 is to enable traditional medicine health services and encounters to count and be counted nationally and internationally. The chapter in its current form (Module 1) refers to disorders and patterns which originated in ancient Chinese Medicine and which are commonly used in China, Japan, Korea and elsewhere around the world. The classification rubrics represent a unified set of harmonised traditional medicine disorders and patterns from national classifications from China, Japan and Korea.

Traditional medicine coding may be used only as a supplementary coding scheme. It should not replace the coding that is required for international comparison.

**13.8.26 Extension Codes**

This chapter is new. Extension codes are envisaged as providing the basis for postcoordination of ICD–11 codes, being the repository for all codes in a linearization that are not eligible for use as stem codes. This mechanism is clearly envisaged for use with the morbidity linearization, and in that context mandatory (i.e. required) postcoordination can be accommodated. The role of Extension codes and postcoordination in the context of the mortality linearization is less clear, and the provision for mandatory postcoordination of Extension codes dimensions in the mortality linearization has been judged to be unlikely.
14 References


