Main facts

- ICD is one of the reference classifications in the WHO Family of International Classifications, mainly used to capture information on mortality and morbidity.
- ICD 10th Revision was endorsed in May 1990 by the Forty-third World Health Assembly.
- “The purpose of the ICD is to permit 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 diagnosis of diseases and other health problems from words into an alphanumeric code, which permits easy storage, retrieval and analysis of the data”.
- ICD-10 is available in the six official languages of WHO (Arabic, Chinese, English, French, Russian, and Spanish) in print; however only the English and French versions are available in electronic format. From the Classifications Download Area, the English language ClaML file is accessible.
- The “Classification Mark-up Language” (ClaML) is an XML-based format designed specifically for classifications. This format allows to capture information on the classification hierarchy (i.e. parent-child relationships), a level of granularity that permits to identify different rubrics within the classification categories (titles, includes, excludes, definitions, coder instructions, etc.), as well as cross-references.
- National modifications of ICD-10 are developed in some countries (WHO is not responsible for them), such as:
  - US Clinical Modification ICD-10-CM
  - US Procedures Coding System ICD-10-PCS
  - Canadian Enhancement ICD-10-CA
  - Australian Modification ICD-10-AM
  - Swiss Modification
  - German Modification
  - Singapore Modification
- Updating process: the official updates to ICD-10 are available as annual list of changes.

Purpose

It is important to remember that ICD is a classification, i.e. a system of categories to which morbid entities may be assigned to, according to established criteria. Therefore, the purpose of ICD is to facilitate the systematic recording, analysis, interpretation, and comparison of mortality and morbidity data collected in different countries or areas and at different times.

ICD has become in practice the international standard diagnostic classification for all general epidemiological and various health-management purposes: e.g. monitoring incidence and prevalence of diseases and other health-related problems.
"The ICD can be used to classify diseases and other health problems recorded on many types of health and vital records. Its original use was to classify causes of mortality as recorded at the registration of death. Later, its scope was extended to include diagnosis in morbidity. It is important to note that, although the ICD is primarily designed for the classification of diseases and injuries, not every problem or reason for coming into contact with healthcare services can be categorized in this way. Consequently, the ICD provides for a variety of signs, symptoms, abnormal findings, complaints and social circumstances that may stand in place of a diagnosis on health-related records (see Volume 1, Chapters XVIII and XXI). It can therefore be used to classify data records under headings such as 'diagnosis', 'reason for admission', 'conditions treated' and 'reason for consultation', which appear on a wide variety of health records for which statistics and other health-situation information are derived.

... Although the ICD is suitable for many different applications, it does not serve all the needs of its various users. It does not serve provide sufficient detail for some specialties and sometimes information on different attributes of health conditions may be needed. The ICD is also not useful to describe functioning and disability as aspect of health, and does not include a full array of health interventions or reasons for encounter".

*ICD-10 Volume 2 Instruction manual* - Fifth Edition 2016

For a comprehensive explanation of the shortcomings of re-using a classification - ICD - for purposes other than its original intent read the article by J Cimino, ‘High quality, Standard, Controlled Healthcare Terminologies Come of Age’.

**History**

A detailed picture of the process leading to the current 10th Revision of ICD is presented in this report from the CDC National Center for Health Statistics.

The International Conference for the Tenth Revision of the ICD met in Geneva in September, 1989, recommended that the proposed revised chapters, with their 3-character categories and 4-character subcategories, and the Short Tabulation Lists for Morbidity and Mortality constituted the Tenth Revision of ICD. Next the World Health Assembly adopted ICD-10 to go into force on January 1, 1993. The implementation was, however, delayed until the publication of the Alphabetical Index in 1994. Importantly, it was recognized that more frequent updates than the decennial updating of ICD were needed to respond to largely non-statistical needs.

**Structure**

ICD-10 comprises three volumes:

1. **Volume 1** contains the main classifications
2. **Volume 2** provides guidance to the users
3. **Volume 3** presents the Alphabetical index to the classification

**Volume 1** is mostly made up by the main classification, composed of the 'List of three-character categories' and the 'Tabular list of inclusions and four-character subcategories'.

- The 'core' classification, i.e. the list of three-character categories, is the mandatory level for reporting to the WHO mortality database and for general international comparisons. It also lists chapter and block titles.
- The Tabular list, which gives full detail of the four-character level, is divided into 22 chapters.

**Example of the structure of ICD-10:**

<table>
<thead>
<tr>
<th>Chapters</th>
<th>ICD-10 is divided into 22 chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Each chapter is associated with a letter as the first character of the code, except for the letter D (used in both Chapter II, Neoplasms, and Chapter III, Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism) and the letter H (used in both Chapter VII, Diseases of the eye and adnexa and Chapter VIII, Diseases of the ear and mastoid process). Additionally, Chapters I, II, XIX, and XX, use more than one letter for the first position of their codes.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Categories</th>
<th>Chapters are subdivided into homogeneous blocks of three-character categories.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Within each block, some of the three-character categories are for single conditions, selected because of their frequency, severity, or susceptibility to public health intervention; while others are for groups of diseases with some common characteristic.</td>
</tr>
</tbody>
</table>
Four-character categories

Most of the three-character categories are subdivided by means of a fourth numeric character after a decimal point, allowing up to 10 sub-categories.

The ".8" fourth character is generally used for 'other' conditions belonging to the three-character category and the ".9" is mostly used to convey the same meaning as the three-character category title, without adding any additional information.

Supplementary subdivisions

The fifth and subsequent character levels are usually sub-classifications along a different axis from the fourth character.

Found in:
- Chapter XIII sub-divisions by anatomical site
- Chapter XIX sub-divisions to indicate open and closed fractures along with intracranial, intrathoracic, and intra-abdominal injuries with and without open wound
- Chapter XX former sub-divisions used to indicate the type of activity being undertaken at the time of the event, have now become optional additional information that is recorded in a separate field.

Updating process

As just mentioned in the previous section, the Tenth Revision Conference announced the need for more frequent updates to ICD; it was recognized that "WHO should endorse the concept of an updating process between revisions and give consideration as to how an effective updating mechanism could be put in place". The World Health Assembly then approved that WHO would developed a mechanism for considering and implementing ICD-10 modifications in the interim period between revisions. Consequently, WHO and the Collaborating Centers agreed to implement an annual updating process on a pilot basis for three years, effective with the 1997 annual meeting of the heads of Centers.

It was decided that two groups would constitute the updating mechanism: the "Update Reference Committee" - renamed later to "Updating and Revision Committee" (URC) and the "Mortality Reference Group". The URC would prepare recommendations for submission to the meetings of the Centers heads. The URC would be supported on mortality matters by the MRG.

Before ICD-10, there were no updates made between revisions, but with the establishment of the new mechanism that was established in 1997 and operational in 1999, this process started. The Heads of Collaborating Centers agreed that the function of the URC should reinforce the process of updating ICD-10 and creating the foundation of an ICD-11. The diagram below depicts the relationship between the various bodies participating in the process:

The Updating and Revision Committee (URC) receives proposals via the update proposal platforms for the Family of International Classifications (FIC). Those proposals are studied by the URC, who then submits recommendations on proposed updates to WHO-FIC Network, who in turn, makes recommendations to WHO.

The updates to ICD-10 are available as annual list of changes. The lists present the source of the recommendation and the implementation date. The date of approval is indicated for all changes except the corrigenda.
For a comprehensive description of the work carried out by the URC check this document for WHO; it explains the update cycle of ICD-10:

### Update cycle

<table>
<thead>
<tr>
<th>Tabular list</th>
<th>every three years for major changes, annually for minor changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index list</td>
<td>annually for changes that do not impact on the structure of the tabular list</td>
</tr>
</tbody>
</table>

Minor updates are accepted each October at the annual Network meeting and published the following year in the WHO website before implementation in January of the year following publication.

Major updates are accepted each October at the Heads of Centers meeting and published the following year before implementation in January of the year designated as major.

Example from the URC document:

<table>
<thead>
<tr>
<th>Year of Heads of Centers meeting</th>
<th>Minor/Major</th>
<th>Publication on WHO website</th>
<th>Official implementation date</th>
<th>ICD-10 Version</th>
</tr>
</thead>
</table>

*Note: Major years inclusive of minor changes.

### Minor changes

- Correction or clarification of existing index entry that only changes the code assignment to a code within the same three-character category.
- Enhancements to the tabular list or index, such as the addition of an inclusion term to an existing code, the addition of an exclusion note, the duplication of an existing index entry under another main term.
- Change to a code description that enhances the description, rather than changing the concept.
- Change to a rule or guideline that does not affect the integrity of morbidity or mortality data collections.
- Correction of typographical errors.

### Major changes

- Addition of a new code.
- Deletion of a code.
- Movement of a code to another category or chapter.
- Change to an existing index entry that changes the code assignment from one three-character category to another three-character category (movements of terms).
- Change to a rule or guideline that affects the integrity of morbidity or mortality collections.
- Introduction of a new term into the index.

### Example of updates as included in the annual list of changes: these changes may consist of revision of explanatory text, adding text, etc.

**Example of a minor change:**

Strengthen of arthritis, arthrosis and cartilages (170-179)

**Example of a major change:**

Ratified proposal:
Issues associated with the development of ICD-10

In the above mentioned document from the CDC National Center for Health Statistics, it is well explained how the evolution of ICD has been influenced by the use of the classification for non-statistical purposes: "[...] the needs of morbidity—a relative latecomer to ICD uses—have assumed an increasingly important role in structuring the ICD process as well as ICD content. This has lead to a dichotomy within the ICD user community, specifically between those who use ICD for statistical applications and those who use ICD for non-statistical applications. The statistical users, principally mortality data users, need continuity for trend analysis rather than frequent updates, and broad levels of disease aggregation consistent with diagnostic reporting on death certificates. In contrast, the administrative users need the most up-to-date diagnostic terminology and entity specificity."

The frequent updates to ICD-10 have impact on mortality statistics, requiring bridge-coding or comparability studies. Likewise, the changes to the classification imply changes in coding procedures, coding training, computer applications, etc. As a consequence, all these implications impose costs. The needs of non-statistical users are thus divergent versus that of statistical users and, increasingly, the ICD-10 process is driven by administrative rather than statistical and research necessities.

Limitations of ICD-10

It is worth reading the article by James Cimino where the limitations of the re-use of ICD are analysed: from the scarce level of detail permitted in ICD due to the reduced nature of the numbering system used to create the codes, its organisation as strict hierarchical structures in which terms can only have one lineage, to the fact that its periodic updates may result in changes to the meaning of terms.

Additional information: differences between ICD-9 and ICD-10

The differences between these two revisions are such that they are considered distinct code systems.
ICD-9 vs ICD-10: what are the differences?

- Introduction of an alphanumeric coding scheme - a letter followed by three numbers at the 4-character level - to replace the numeric scheme used in ICD-9; this change allowed more than double the size of the coding frame.
- Re-arrangement of diseases categories between Chapters and creation of new Sections with a total number of 21 Chapters. Sense organs (eye and ear) are now separated from the Nervous system Chapter and have their own Chapter. Major changes were introduced in Chapters:
  - V. Mental and behavioral Disorders
  - XIX. Injury, poisoning, and certain other consequences of external causes
  - XX. External causes of morbidity and mortality
- Modification and extension of the dual classification scheme for etiology and manifestations introduced in ICD-9 to 82 homogeneous 3-digit categories for optional use. Now diagnostic statements containing information about both a generalized disease process and a manifestation or complication relating to a particular organ or site can be double-coded allowing retrieval or tabulation to be performed by axis, etiology, or manifestation. The exclusion notes present at the beginning of each Chapter were extended to explain the relative hierarchy of Chapters, making clear that the special group Chapters that assemble together, for example, all neoplasms and all trauma, have priority of assignment over the organ or system Chapters.
- Inclusion of an overview to the block of 3-digit categories at the beginning of each Chapter and also, when relevant, to the asterisk categories.
- Increased detail compared to ICD-9, particularly to meet the needs of morbidity: e.g. viral hepatitis was expanded from ICD-9 070 - a single 3-character category, to five 3-character categories B15-B19 in ICD-10. Additionally, it is now possible to include the laterality (left vs. right).
- Change and re-grouping of category titles: e.g. some cerebrovascular disorders, specifically transient cerebral ischemic attacks were moved from Diseases of the circulatory system to Diseases of the nervous system; septic shock, which was classified in ICD-9 as Shock without mention of trauma in the Chapter Symptoms, signs, and ill-defined conditions, was re-classified to Unspecified septicemia, etc.