



**INTERNATIONAL STATISTICAL
CLASSIFICATION OF DISEASES
AND RELATED HEALTH PROBLEMS.
THE VALUE OF CLASSIFICATION
FOR STUDYING THE INCIDENCE
OF THE POPULATION**

*Guidelines to the practical lesson
for students in the specialties 222 “Medicine”
and 228 “Pediatrics” on the course “**Social Medicine,
Public Health (Public Health)**”*

МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
Харківський національний медичний університет

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ЗНАЧЕННЯ КЛАСИФІКАЦІЇ
ДЛЯ ВИВЧЕННЯ
ЗАХВОРИЮВАНОСТІ НАСЕЛЕННЯ**

*Методичні вказівки
до практичного заняття студентів
спеціальностей 222 «Медицина» та 228 «Педіатрія»
з дисципліни «Соціальна медицина,
громадське здоров'я» (Громадське здоров'я)*

Затверджено Вченою радою ХНМУ.
Протокол № 5 від 22.04.2021.

Харків
ХНМУ
2021

International statistical classification of diseases and related health problems. The value of classification for studying the incidence of the population : Guidelines for students to the practical lesson in the specialties 222 “Medicine” and 228 “Pediatrics” on the course “Social Medicine, Public Health”(Public Health) / compil. V. A. Ohniev, K. H. Pomogaybo, V. G. Nesterenko. – Kharkiv : KhNMU, 2020. – 12 p.

Compilers V. A. Ohniev
K. H. Pomogaybo
V. G. Nesterenko

Міжнародна статистична класифікація хвороб і проблем, пов'язаних зі здоров'ям. Значення класифікації для вивчення захворюваності населення : метод. вказ. до практичного заняття студентів спеціальностей 222 «Медицина» та 228 «Педіатрія» з дисципліни «Соціальна медицина, громадське здоров'я» (Громадське здоров'я) / упоряд. В. А. Огнєв, К. Г. Помогайбо, В. Г, Нестеренко. – Харків : ХНМУ, 2021. – 12 с.

Упорядники В. А. Огнєв
К. Г. Помогайбо
В. Г, Нестеренко

GUIDELINES FOR TOPIC TRAINING

The aim of the class: to teach students to use the international statistical classification of diseases.

Students need to know:

➤ **Programme Issues:**

- International Statistical Classification of Diseases, Traumas and Causes of Death, Principles of its Construction and Significance;
- types of morbidity that are studied in Ukraine, the state and trends in the incidence of the Ukrainian population;
- and differences in the incidence of urban and rural populations, different age and sex groups.

The main international and national normative legal documents on the topic:

- Fundamentals of the legislation of Ukraine on health (adopted by the Verkhovna Rada of Ukraine on November 19, 1992 № 2801-XII).

Accounting and reporting documentation:

- statistical coupon for registration of final (updated) diagnoses (*f. 025-2/0*);
- an out-patient's ticket (*f. 025-6/0*);
- out-patient ticket (abbreviated version) *f. 025-7/0*);
- control card of dispensary observation (*f. 030/0*);
- list of persons subject to periodic medical examination (*file 122/0*);
- card of the person subject to medical examination (*file 123/0*);
- a certificate of incapacity for work;
- Report on the causes of temporary incapacity for work (*form No. 23-TN*);
- medical certificate of death (*f. 106/0-95*);
- medical certificate of perinatal death (*f. 106/2-95*);
- and medical certificate of death (*f. 106/1-95*).

Need to be able:

- to identify and study the incidence among the population, as well as to complete the main accounting documents for the registration of morbidity.

Recommended literature

Basic literature

1. History of the development of the ICD URL : <https://www.who.int/classifications/icd/en/HistoryOfICD.pdf>
2. WHO. International Classification of Diseases URL : <https://www.who.int/classifications/icd/en/>
3. “World Health Assembly Update, 25 May 2019” (Press release). Geneva, Switzerland: WHO. 25 May 2019 URL : <https://www.who.int/news-room/detail/25-05-2019-world-health-assembly-update>

4. WHO (2018). “ICD-11: Classifying disease to map the way we live and die URL : <https://web.archive.org/web/20180620014204/https://www.who.int/health-topics/international-classification-of-diseases>
5. Chute Christopher. G. (2018). “The rendering of human phenotype and rare diseases in ICD-11” *Journal of Inherited Metabolic Disease*. 41 (3): 563–569. doi:10.1007/s10545-018-0172-5 PMC 5959961 PMID 29600497 URL : <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5959961>

Additional literature

1. O’Malley KJ, Cook KF, Price MD, Wildes KR, Hurdle JF, Ashton CM (2005). “Measuring diagnoses: ICD code accuracy” *Health Serv Res*. **40** (5p2): 1620–39. doi: 10.1111/j.1475-6773.2005.00444.x. PMC 1361216. PMID 16178999 URL : <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1361216>
2. Makary, MA; Daniel, M (3 May 2016) “Medical error – the third leading cause of death in the US” *BMJ*. 353: i2139. doi: 10.1136/bmj.i2139. PMID 27143499 URL : <https://www.bmj.com/content/353/bmj.i2139>
3. Moriyama, IM; Loy RM; Robb-Smith, AHT (2011). Rosenberg, HM; Hoyert, DL (eds.). *History of the Statistical Classification of Diseases and Causes of Death* (PDF). Hayatsville, MD: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics. ISBN 978-0-8406-0644-0. URL : https://www.cdc.gov/nchs/data/misc/classification_diseases2011.pdf

Information Resources

1. ICD Homepage World Health Organization (WHO)
2. ICD Implementation database World Health Organization (WHO)
3. ICD-10 updates World Health Organization (WHO)
4. ICD-10 INSTRUCTION MANUAL Volume 2 online World Health Organization (WHO)
5. ICD-11 Revision information World Health Organization (WHO)
6. ICD-11 Revision platform (interactive) World Health Organization (WHO)
7. ICD-11 for Mortality and Morbidity Statistics (ICD-11 MMS) 2018 version

THEORETICAL MATERIAL FOR CLASS TRAINING

1. The essence and significance of the ICD

The International Statistical Classification of Diseases and Related Health Problems is a document used as the leading statistical and classification basis in health care. Periodically (every ten years), it is reviewed under the guidance of the World Health Organization (WHO). The International Classification of Diseases (ICD) is a normative document that ensures the uniformity of methodological approaches and the international comparability of materials.

Classification of diseases can be defined as a system of headings into which specific nosological units are included in accordance with accepted criteria. **The purpose of the ICD** is to create conditions for the systematic registration, analysis, interpretation and comparison of data on mortality and morbidity obtained in different countries or regions and at different times. ICD is used for translation of verbal formulations of diagnoses of illnesses and other health problems into alphanumeric codes that provide the convenience of storing, retrieving and analyzing data.

In fact, the ICD has become the international standard diagnostic classification for all common epidemiological goals and many goals related to health management. They include an analysis of the general health situation of population groups, as well as monitoring the frequency and prevalence of diseases and other health problems in their relationship to various factors, such as certain characteristics or circumstances affecting individuals. ICD is not intended and is not suitable for indexing individual clinical cases. There are also some difficulties in using the ICD to study financial issues, such as billing or resource allocation.

The ICD can be used for classification of diseases and other health problems registered in various types of documentation related to health and natural movement of the population. It was originally used to classify the causes of death specified in the death certificate. Later, its scope was expanded and included diagnoses for morbidity statistics. It is important to note that although the ICD is primarily designed to classify diseases and injuries that have an official diagnosis, not every problem or reason for seeking medical help can be indicated by an official diagnosis. Therefore, the ICD provides for the possibility of processing data on a wide range of signs, symptoms, deviations found during the research, complaints, and social circumstances that may be indicated instead of the diagnosis in the medical records (see Volume 1, classes XVIII and XXI). Due to this, the ICD can be used to classify the data put in such graphs as “diagnosis” / “reason for hospitalization”, “conditions for which treatment was administered”, “reason for seeking medical help”, which are available in a variety of medical documents, from which statistics and other types of health information are extracted.

The International Statistical Classification of Diseases and Related Health Problems of the Tenth Revision is currently in force (ICD-10).

2. History of the formation of the “International Statistical Classification of Diseases”

The International Statistical Classification of Diseases and Related Health Problems (ICD-10) has high level of significance for the qualitative assessment of population health using the incidence of the population. Due to the fact that the indispensable condition for studying the morbidity of the

population is the standardization of the approaches of physicians of different countries to the definition and formulation of diagnoses of diseases, their coding, which makes possible the comparison of the incidence in time and in different regions of the world. It is known that there are about 5000 diagnostic terms used by doctors in practice. Naturally, statistical development of data on morbidity is not possible without a rationally constructed grouping, that is, classification and nomenclature of diseases. For this reason, in the middle of the 18th century, the anatomist **Giovanni Batista Morgagni (1682-1771)** in the book “On the location and causes of the disease discovered by the anatomist” (1761) offered the first classification of diseases sub-divided human illnesses into five classes. This classification was based on the localization of diseases.

The next attempt of systematizing of diseases made **François Bossier de Sauvage de Lacroix (1706-1767)**, better known as **Sauvage**, a French physician and botanist, who published the treatise “Nosologia Methodica”, in 1763.

Century earlier **John Graunt (1620-1674)** tried to determine the proportion of live births of children died before the age of 6 without knowing the age of children at the time of death. He selected all deaths identified as death from thrush, seizures, rickets, dental diseases and helminthic infestations, from prematurity, death in the first month of life, death of infants, death from the enlargement of liver, from choking in sleep and added to them half the cases deaths caused by smallpox, “pork pox”, measles and helminthic infestations, not accompanied by convulsions. Despite the imperfection of the methodology, Graunt obtained a fairly objective result: according to his calculations, the proportion of children under 6 years was 36%.

In the 19th century, **William Farr (1807-1883)**, a statistician of the Office of Civil Status of England and Wales, discussed the principles that should guide the compilation of the statistical classification of diseases, and insisted on the adoption of a unified classification. The First International Statistical Congress, held in Brussels in 1853, appealed to Dr. **William Farr** and Dr. **Marc d’Espine** from Geneva to prepare a unified classification of the death’s causes applicable at the international level. At the second Congress, held in Paris in 1855, Farr and d’Espine presented two separate lists based on completely different principles. The Farr’s classification consisted of five groups: epidemic diseases, organic (systemic) diseases, diseases classified by anatomical location, developmental diseases and diseases, which were a direct consequence of violence. M. d’Espine grouped the diseases according to the nature of their manifestation (gouty, herpetic, and hematological). The Congress adopted a compromise list of 139 headings. In 1864, this classification was revised in Paris on the basis of Farr’s model. The following revisions took place in 1874, 1880 and 1886.

The second classification of diseases was proposed in 1893 by **J. Bertillon (1851–1922)**, son of statistician **Louis Bertillon (1821–1883)** and adopted by the International Statistical Institute. It was based on the principles of the formation of diseases by localization and etiology. The second classification included 14 classes and 161 headings. In 1891, the International Statistical Institute commissioned the committee, under the chairmanship of **Jacques Bertillon (1851–1922)**, the head of the Paris Statistical Service, to prepare a classification of the causes of death. J. Bertillon presented the report of this committee to the International Statistical Institute, which accepted the report at the session held in 1893 in Chicago. J. Bertillon's classification was based on the classification of causes of death used in Paris and which, after the revision in 1885, was a synthesis of English, German and Swiss variants. This classification was based on Farr's principle of subdivision of diseases into systemic ones and related to a particular organ or its anatomical localization. J. Bertillon's classification of the causes of death was recognized and accepted for use by several countries and many cities. In 1898, the American Public Health Association, at its conference in Ottawa, Canada, recommended to accept Jacques Bertillon's classification in Canada, Mexico and the USA. The Association also offered to revise it every 10 years.

3. The history of the formation of the “International Statistical Classification of Diseases and Related Health Problems” (ICD-10)

The modern version of the classification of diseases was approved in 1900 at the International Statistical Conference in France (Paris), which was attended by more than 26 representatives of different countries. Later, international classifications approximately every 10 years was reviewed and supplemented. During this time, the statistical table was renamed several times: the first title was the “International Nomenclature and Classification of Diseases” (1900). In 1948, not only diseases were included in this classification, but also injuries, accidents, poisonings and it was renamed into the “International Statistical Classification of Diseases, Trauma and Causes of Death”. The last International Statistical Classification of Diseases of the Last Tenth Revision (ICD-10) was approved by the forty-third WHO Assembly in Geneva in 1989, and entered into force on January 1, 1993. According to the decision of the Assembly, it was renamed into the “International Statistical Classification of Diseases and Related Health Problems”, although the convenient abbreviation of the ICD was retained (Table 1).

The International Classification of Diseases and Related Health Problems (ICD) is a system of grouping of diseases and pathological conditions that reflects the current stage in the development of medical science.

ICD-10 is a normative document ensuring the unity and comparability of materials on public health, the epidemiological situation and the activities of health facilities, both within the country and between countries.

The basic principles for the construction of the International Classification of Diseases and Health-Related Problems is the commonality of the etiology or pathogenesis of diseases or the unification of local etiological and local pathogenetic principles.

The International Statistical Classification of Diseases and Related Health Problems (ICD-10) is consisted of three volumes:

Volume 1 contains the main classification, introduction, WHO Collaborating Centers for Classification of Diseases, the report of the International Conference on the Tenth Revision, a list of three-digit headings, a full list of three-digit headings and four-digit sub-headings and their content, morphology of tumors, special lists for statistical development of mortality and morbidity data, definitions, and nomenclature provisions.

Volume 2 contains instructions for use of ICD. There are largely updated instructions on registration of medical certificates and classifications, previously contained in Volume 1, guidance materials and recommendations on the use of Volume 1, on tabulated lists and planning for the use of the ICD. This volume also includes historical materials, previously contained in Volume 1.

Volume 3 is an alphabetical index to the classification. This volume contains the index itself, provided with an introduction and detailed instructions for its use.

The International Statistical Classification of Diseases and Related Health Problems (ICD-10) consist of 22 chapters, which are sub-divided into blocks, and headings and subheadings.

Table 1

Classes of ICD-10

Chapter	Block	Title
I	A00-B99	Certain infectious and parasitic diseases
II	C00-D48	Neoplasms
III	D50-D89	Diseases of the blood, blood-forming organs and certain disorders involving the immune mechanism
IV	E00-E90	Endocrine, nutritional and metabolic diseases
V	F00-F99	Mental and behavioural disorders
VI	G00-G99	Diseases of the nervous system
VII	H00-H59	Diseases of the eye and adnexa
VIII	H60-H95	Diseases of the ear and mastoid process
IX	I00-I99	Diseases of the circulatory system
X	J00-J99	Diseases of the respiratory system
XI	K00-K93	Diseases of the digestive system
XII	L00-L99	Diseases of the skin and subcutaneous tissue
XIII	M00-M99	Diseases of the musculoskeletal system and connective tissue

Chapter	Block	Title
XIV	N00-N99	Diseases of the genitourinary system
XV	O00-O99	Pregnancy, childbirth and the puerperium
XVI	P00-P96	Certain conditions originating in the perinatal period
XVII	Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities
XVIII	R00-R99	Symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified
XIX	S00-T98	Injury, poisoning and certain other consequences of external causes
XX	V01-Y98	External causes of morbidity and mortality
XXI	Z00-Z99	Factors affecting health status and contact with health facilities
XXII	U00-U99	Codes for special purposes

A letter is the first symbol in ICD code, and each one is in line with a certain class excepting letter D which is used for the chapter II “Neoplasms” and for the chapter III “Diseases of the blood and hematopoietic organs and certain disorders involving the immune mechanism”, as well as the letter H, which is used for defining the chapter VII “Diseases of the eye and adnexa” and in the chapter VIII “Diseases of the ear and mastoid process”. Four chapters (I, II, XIX and XX) use more than one letter as the first symbol of their codes.

Each chapter contains enough three-digit headings to cover all the material included in it. However, not all available codes are used, which allows future revisions and more detail characteristics.

Chapters I-XVII belong to diseases and other pathological conditions, chapter XIX – to injuries, poisoning and some other consequences of external factors. The rest of the chapters cover a number of modern concepts related to diagnostic data. Chapter XVIII covers “Symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified”. Chapter XX “External causes of morbidity and mortality” has traditionally been used for classification of external causes of injuries and poisoning, but since the 9th Revision, it has also been intended to record any external causes of disease and other pathological conditions. And finally, chapter XXI “Factors influencing health status and contact with health services” is intended to classify data explaining the reason for contacting a health institution of a person who is not currently ill, or the circumstances by which the patient receives medical care at that time, or who have anything to do with the care that he/she receives.

Chapters are sub-divided into homogeneous “blocks” of three-digit headings. In Chapter I, the names of the blocks reflect two axes of classification – the mode of transmission of infection and a wide group of pathogenic microorganisms. In Chapter II, the first axis is the nature of the neoplasms: within the grouping according to the nature of the neoplasms, the axis for the formation of subgroups is mainly localization, although several three-valued categories are intended for important morphological types of tumors (e.g., leukemia, lymphomas, melanoma, mesothelium, Kaposi’s sarcoma). The range of headings is given in parentheses after each block name.

Within each block, some of the three-digit headings are for only one disease selected because of its frequency, severity, susceptibility to health services, while the other three-digit rubrics are for groups of diseases with some common characteristics. In the block there are usually columns for “other” states, which make it possible to classify a large number of different, but rarely encountered states, as well as “unspecified” states.

Although this is not mandatory for international reporting, **the majority of the three-digit headings are subdivided by the fourth digit after the decimal point**, so that up to 10 subheadings can be used. If the three-digit heading is not sub-divided, it is recommended to use the letter “X” to fill the fourth place so that the codes have a standard size for statistical data processing.

Four-digit subheadings are used in any suitable way, identifying, for example, different localizations or varieties of one disease, if the three-place heading is only for one disease, or individual diseases, if the three-place heading is for a group of diseases.

The fourth sign “8” is usually used to refer the “other” states pertaining to this three-place heading, and the “9” sign is more often used to express the same concept as the title of the three-digit rubric, without adding any additional information .

When the same fourth signs are used for grading several three-digit headings, the meaning of these fourth signs is indicated only once, before the beginning of the list of headings. In each such section, a note is given indicating more detailed information is contained, for example, the headings O03-O06 for the different types of abortions have a common fourth sign reflecting the complications (see Volume 1, Part 2, page 51).

The fifth and subsequent levels of the code usually represent sub-classifications along different axes with respect to the four-digit code. They are contained in:

Chapter XIII	subheadings for anatomical localization;
Chapter XIX	subheadings for the designation of open and closed fractures, as well as intracranial, intra-thoracic and intra-abdominal injuries with and without an open wound;
Chapter XX	subheadings to indicate activities at the time of the accident.
Codes U00-U49	should be used to temporarily identify new diseases of an unclear etiology.
The codes U50-U99	can be used for research purposes, for example, to test alternative sub-classification in a special project.

ICD-10 differs from ICD-9 it has 22 chapters instead of 17 ICD-9 ones. The increase in chapters in the new revision occurred due to the formation of two new chapters: VII – “Diseases of the eye and its adnexa” and VIII – “Diseases of the ear and mastoid process”, which in ICD-9 were in the VI chapter “Diseases of the nervous system and sensory organs”. In addition, two separate chapters

XX and XXI are identified: “External Causes of Morbidity and Mortality” and “Factors Influencing Health Status and Contact with Health Services”.

ICD-10 uses alphanumeric coding of diseases and other conditions instead of digital in ICD-9. Each class of diseases is divided into groups, and groups respectively into categories.

The International Classification of Diseases (ICD) is the world standard methodology for collecting data on mortality and morbidity. It allows to organize and code health information used for statistics and epidemiology, health management, resource allocation, monitoring and evaluation, research, primary health care, prevention and treatment. It helps to get an idea of the overall health situation in countries and population groups.

4. Formation of the “International Statistical Classification of Diseases and Related Health Problems” (ICD-11)

Currently, within the framework of the innovative joint process, the 11th version of the ICD is being developed. For the first time, WHO calls on experts and users to participate in the revision process of the ICD on the Internet platform. This will allow the development of a classification based on users’ contributions and taking into account their needs. Users include doctors, nurses, other health care providers, researchers, health information managers and coders, health information technology service providers, policy makers, insurance companies and patients’ organizations. All member states use the ICD, which is translated into 43 languages. Most countries (117) use this system to report mortality data, which is the main indicator of health status.

ICD is significant, because it provides a common language for reporting and monitoring diseases. It allows specialists to compare data worldwide and share them in a consistent and standardized way – between hospitals, areas and countries, and for certain periods of time. It simplifies the collection and storage of information for analysis and decision-making on the basis of evidence.

The ICD is being revised for better reflection of scientific progress in health and medical practice. In line with advances in information technology, ICD-11 will be available for use in e-health devices and information systems.

The revision process of ICD-11 allows joining the Internet-based edition with the participation of all stakeholders. To ensure quality, incoming information will be reviewed in terms of its accuracy and relevance. The revision can be downloaded for free on-line for personal use (and paid for in print). Information on the revision process will be available in many languages. Definitions, signs and symptoms, as well as other diseases-related content, will be determined in a structured way with a view to their more accurate registration. The revision is compatible with e-health devices and information systems. The ICD-11 will officially come into force on 1 January, 2022.

TEST TASKS

1. The international statistical classification of diseases and related health problems is based on the following principles: a common etiology and local pathogenetic, a common pathogenesis and a local-etiological one. Indicate which is the following class of diseases is built on the etiological principle?

- A. *Diseases of the genitourinary system.*
- B. *Diseases of the skin and subcutaneous tissue.*
- C. *Diseases of the circulatory system.*
- D. *Infectious and parasitic diseases.**
- E. *Mental and behavioral disorders.*

2. The International Statistical Classification of Diseases and Related Health Problems (ICD-10) was approved by the 43rd WHO Assembly on 1 January 1993. Which of the following is the main innovation of ICD-10?

- A. *Alphabetic coding.*
- B. *Alphanumeric coding.**
- C. *Common etiology.*
- D. *Distribution of diseases by class.*
- E. *Digital coding.*

3. In the international statistical classification of diseases and health related problems of the 10th revision (ICD-10), the number of classes of diseases, causes and problems of health was increased. How many classes of diseases does the international statistical classification of diseases and problems that are associated with the health of the 10th revision include?

- A. 7.
- B. 12.
- C. 17.
- D. 22.*
- E. 27.

CONTROL QUESTIONS

1. What is the medico-social significance of the incidence of the population?
2. What types of morbidity in the population do you know?
3. What do you know about the history of the emergence and improvement of the International Statistical Classification of Diseases and Related Health Problems (ICD-10).
4. What are the principles of ICD-10 construction?
5. Can you describe distinctive features of ICD-10 from ICD 9?
6. What are the peculiarities of the revision process of ICD-11?

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Навчальне видання

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Формат А5. Ум. друк. арк. 0,8. Зам. № 21-34125.

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Свідоцтво про внесення суб'єкта видавничої справи до Державного реєстру видавництв, виготівників і розповсюджувачів видавничої продукції серії ДК № 3242 від 18.07.2008 р.