Section **Секція**	**VII**	**INFORMATION TECHNOLOGY IN BIOMEDICINE**

ІНФОРМАЦІЙНІ ТЕХНОЛОГІЇ В БІОМЕДИЦИНІ

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USE OF THE METHOD OF INDUSTRIES AND BOUNDARIES IN MEDICINE

Abstract. This article examines the application of the method of branches and boundaries in medicine. The method of branches and boundaries (MGTG) is an analytical approach to the study of complex systems, which allows you to break the system into separate parts for further research. In medicine, this method is used to study physiological and pathological processes, diagnose and treat various diseases. The article will consider examples of the use of the method of branches and boundaries in medicine, as well as its advantages and disadvantages.

Key words: method of branches and boundaries, medicine, physiological processes, pathological processes, diagnostics, treatment.

The method of branches and boundaries in medicine. Medicine is one of the most complex sciences, as it deals with the study and treatment of various diseases and pathologies of the human body. In modern conditions, with a high level of development of technologies and information systems, effective methods of research and treatment are necessary to achieve success in medicine. One of them is the method of branches and borders. The method of branches and boundaries is a mathematical tool for researching and solving complex problems in various fields of knowledge, including medicine. This method allows problems that have many parameters and relationships to be investigated using computer algorithms and simulations [1].

Advantages of MGTG and application of the method of branches and boundaries in medicine. The main advantages of MHTG in medicine are the ability to analyze and manage complex medical systems, visualize and build models, evaluate treatment effectiveness and predict treatment outcomes. The use of MHTG also reduces the risks of failure and provides more accurate diagnosis [2].

For example, MHTG can be used to analyze the effect of individual components of the drug on the effectiveness of treatment of patients. In addition, it can be used to identify risks during operations, ensure patient safety and manage clinical processes.

One of the main applications of the method of branches and boundaries in medicine is the study of the relationship between various indicators of health and disease. For example, one can investigate the relationship between blood cholesterol levels and cardiovascular disease risk, the relationship between the amount of smoking and lung cancer risk, or the relationship between blood sugar levels and diabetes risk [3].

Programmatic support for the method of branches and boundaries. The Boundary and Domain Analysis method is a software testing method that is based on breaking down input data into groups that differ in the different branches and bounds of values that can be entered into the program.

In medicine, this method can be used to test medical information systems, medical records management systems and other programs related to the medical field.

For example, if we consider the system of processing laboratory results, then the following areas and boundaries can be distinguished:

Branch "Blood indicators": in this area, the values of such indicators as hemoglobin, leukocytes, platelets, erythrocytes, etc. can be introduced. The limits for these indicators are set depending on the normal values for a particular indicator depending on the age and sex of the patient.

Branch "Urine indicators": in this area, values of such indicators as the amount of protein, glucose, ketones, creatinine, etc. can be entered. Limits for these indicators are also established depending on the normal values for a particular indicator depending on the age and sex of the patient [4].

Industry "Diagnosis": in this area it is possible to establish a diagnosis that has been established for the patient. The data entered must correspond to a medical dictionary, i.e. terms used in medical practice.

The main directions. One of the main directions of using the method of branches and boundaries in medicine is the development of mathematical models for the analysis of data obtained as a result of clinical research. This allows researchers to obtain more accurate and objective research results, which can lead to more effective treatment of patients [5].

In addition, the method of industries and borders is used to model epidemiological processes and predict trends in the development of diseases. This avoids the spread of diseases and provides effective control over their spread.

Calculations when using the method of branches and boundaries. To carry out calculations according to the method of branches and borders, it is necessary to perform the following steps: divide the regions into sub-regions, which are limited by the boundaries agreed with the initial conditions and/or boundary conditions; for each branch, construct an approximate solution, which can be obtained by approximating the differential level on this branch, for example, using finite-difference or finite-element methods; determine the accuracy of the approximate solution by comparing it with the exact solutions that may be known or obtained from other sources, if the accuracy of the approximate solution does not satisfy the need, change the partition region and/or approximation method, and repeat steps 2-3. When the accuracy of the approximate solution satisfies the needs, use it for further analysis of the problem, for example, for plotting graphs, calculating the properties of the solution, and others [6].

Examples of the use of the method of branches and boundaries in medicine. After analyzing individual cases of application of methods of branches and boundaries, we obtained a table of correspondence (Table 1), which provides a classification of joint use of the method of branches and boundaries in medicine [7].

Calculation and reflection of this method by the number of patient visits per year. We divide the obtained data into quarters and make summary diagrams, first quarterly, then reduced to one diagram (Fig. 1) for 2022.

After analyzing the obtained chart, it becomes clear that in January, patients' appeals increase, and at the beginning of the month, the pace of appeals decreases significantly, this is due to a properly selected industry point and a boundary point. Having considered this reflection, the calculated months of patients' appeals for consultation regarding the replacement of any indicators in relation to the method or industry, the treatment limit. We conclude that these indicators have become more equivalent and more useful than at the beginning of testing. So, after analyzing the summary data during 2022, we can safely conclude that the method of boundaries and branches in medicine for a given period of time of use is correct.

Conclusion

The method of branches and boundaries is a powerful tool for solving problems in medicine. Its use allows the analysis of medical data and modeling of processes using mathematical methods. This method is especially useful for solving problems related to the health of the population and the organization of medical services. In general, the use of the method of branches and boundaries in medicine is very important for improving the quality of medical care and ensuring the health of the population.

Table 1

Classification of sharing method of industries and borders in medicine

| INDUSTRY	BORDER	EXAMPLE OF SHARING IN MEDICINE
Neurology	Cardiology	Joint study of the effects of heart disease on the work of the nervous system and on turnover, the effect of neurological diseases on the cardiovascular system
Ophthalmology	Endocrinology	Studying the relationship of thyroid and eye diseases, as well as the mutual influence on the treatment of these diseases on both systems
Gastroenterology	Pulmonology	The study of the common causes and risk factors for the development of diseases of the gastrointestinal tract and the pulmonary system, as well as the study of the effectiveness of treatment using drugs that affect both systems
Hematology	Oncology	The study of the interaction between pathological processes in the blood and cancer, as well as the study of joint treatments, for example, chemotherapy, which is used in both areas
Nephrology	Rheumatology	Study of the common causes of kidney and joint diseases, as well as studying the effectiveness of treatment using drugs that affect both systems
Ophthalmology	Endocrinology	Studying the relationship of thyroid and eye diseases, as well as the mutual influence on the treatment of these diseases on both systems
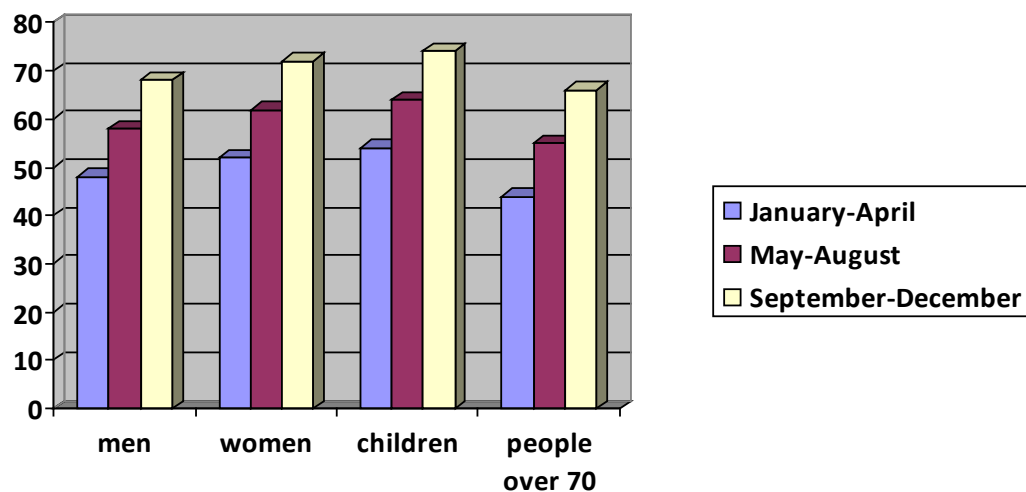
Fig. 1. Chart for 2022

To achieve these goals, it is necessary to further develop this method and use it in practical medical research.

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