

DANYLO HALYTSKY LVIV NATIONAL MEDICAL UNIVERSITY

Department of Social Medicine, Economics and Organization of Health Care

«APPROVED»

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
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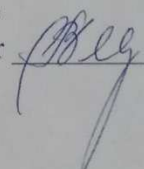
EDUCATIONAL DISCIPLINE PROGRAM

"SOCIAL MEDICINE, PUBLIC HEALTH"
(Content module 1. Biostatistics)
OK 33.1

**for the training of second-level (master's) higher education professionals
in the field of knowledge 22 "Healthcare" specialty 222 "Medicine"**



Discussed and approved
at the methodical meeting of the department
of Social medicine, economics and
organization of Health care
Danylo Halytsky LNMU
(minute No 8 dated 13 June 2023)
Head of the department
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Approved by
the Specialized methodical commission
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INTRODUCTION

Educational program on educational discipline "**Social medicine, public health (Content module 1 "Biostatistics")**" in accordance with the Educational and professional program "*Medicine*" Standard of higher education of the *second (master's) level* field of knowledge 22 "*Health*" specialty 222 "*Medicine*"

DESCRIPTION OF THE EDUCATIONAL DISCIPLINE (ANNOTATION)

The discipline "Social Medicine, Public Health" (Content module 1 "Biostatistics") involves mastering:

- biostatistics, which involves the definition and analysis of basic biostatistical indicators and criteria based on the principles of evidence-based medicine;
- population health statistics based on the analysis of a set of medical indicators: demographic, morbidity, disability, physical development.

Structure of educational discipline	Number of credits, hours				Year of study semester	Type of control
	Total	Auditory		IWS		
		Lectures (hours)	Practical lessons (hours)			
Name of the discipline: « Social medicine, public health » (Content module No 1 "Biostatistics")	3 credits / 90 hours	14	30	46	3-year (5 – 6 semester)	Credit

The subject of the discipline is modern principles of evidence-based medicine, theoretical and methodological foundations of biostatistics, the laws of public health.

Interdisciplinary connections:

Discipline "Social Medicine, Public Health" (module 1 "Biostatistics") as a discipline:

- is based on the study of students of disciplines: biophysics and higher mathematics, history of medicine, medical informatics and computer technology, ethics, hygiene and ecology, epidemiology, sociology and medical sociology, basics of economic theories;
- related to clinical disciplines in the context of assessing the effect of methods of diagnosis and prevention of diseases and their consequences, optimizing the patient's route, the activities of hospitals, etc .;
- lays the foundations for the study of the organization of medical and diagnostic process, as well as assessment of its scope and quality in the study of clinical disciplines;
- provides a study of the legal and organizational principles of health care;
- promotes the formation of preventive activities of future doctors, taking into account the possible impact on public health of factors of various origins, risk assessment in the development of comprehensive medical and social measures in cooperation with the public health system.

1. PURPOSE AND TASK OF EDUCATIONAL DISCIPLINE

1.1. The purpose of teaching the discipline "Social Medicine, Public Health" (module 1 "Biostatistics") is to acquire the necessary knowledge, skills and skills in research, analysis and evaluation of public health indicators, which will develop from the standpoint of evidence-based medicine recommendations prevention and elimination of harmful effects of factors on public health.

1.2. The main tasks of studying the content module No 1 «Biostatistics» of educational discipline «Social medicine, public health» is:

- mastering the theoretical foundations of biostatistics;
- mastering modern principles of evidence-based medicine;
- acquaintance with methods of definition and analysis of the basic biostatistical indicators and criteria;
- mastering the methodological and theoretical foundations of the formation of statistical aggregates for their further adequate analysis;
- mastering the methods of determining, analyzing and evaluating the main indicators of population health according to individual criteria and in relation to the factors that affect it.

1.3. Competences and learning outcomes, the formation of which is facilitated by the discipline.

- General competences (GC)

GC-1 – Ability to abstract thinking, analysis and synthesis.

GC-2 – Ability to learn and master modern knowledge.

GC-3 – Ability to apply knowledge in practical situations.

GC-4 – Knowledge and understanding of the subject area and understanding of professional activity.

GC-5 – Ability to adapt and act in a new situation.

GC-6 – Ability to make informed decisions.

GC-7 – Ability to work in a team.

GC-8 – Ability to interpersonal interaction.

GC-9 – Ability to communicate in a foreign language.

GC-10 – Ability to use information and communication technologies.

GC-11 – Ability to search, process and analyze information from various sources.

GC-12 – Definiteness and perseverance in terms of tasks and responsibilities.

GC-13 – Awareness of equal opportunities and gender issues.

GC-14 – The ability to exercise their rights and responsibilities as a member of society, to be aware of the values of civil (free democratic) society and the need for its sustainable development, the rule of law, human and civil rights and freedoms in Ukraine.

GC-15 – Ability to preserve and multiply moral, cultural, scientific values and achievements of society based on understanding the history and patterns of development of the subject area, its place in the general system of knowledge about nature, society and in the development of society, techniques and technologies. active recreation and leading a healthy lifestyle, use different types and forms of physical activity for active recreation and a healthy lifestyle-

- Special (professional, subject) competences (PC)

PC-1 – Ability to collect medical information about the patient and analyze clinical data.

PC-11 – Ability to solve medical problems in new or unfamiliar environments with incomplete or limited information, taking into account aspects of social and ethical responsibility.

PC-13 – Ability to carry out sanitary and hygienic, preventive measures.

PC-14 – Ability to plan and carry out preventive and anti-epidemic measures against infectious diseases.

PC-15 – Ability to conduct an examination of working capacity.

PC-16 – Ability to keep medical records, including electronic forms.

PC-17 – Ability to assess the impact of the environment, socio-economic and biological determinants on the health state of the individual, family, population.

PC-18 – Ability to analyze the activities of a doctor, subdivision, health care institution, ensure the quality of medical care and improve the efficiency of the use of medical resources.

PC-19 – Ability to organize and integrate the provision of medical care to the population and the marketing of medical services.

PC-20 – Ability to conduct epidemiological and medical-statistical studies of public health; processing of social, economic and medical information.

PC-21 – Clearly and unambiguously convey their own knowledge, conclusions and arguments on health care issues and related issues to specialists and non-specialists, in particular to students.

PC-22 – Ability to manage workflows, in the field of health care, which are complex, unpredictable and require new strategic approaches

PC-23 – Ability to develop and implement scientific and applied projects in the field of health care.

PC-24 – Adherence to ethical principles when working with patients, laboratory animals.

PC-25 – Adherence to professional and academic integrity, to be responsible for the accuracy of the obtained scientific results

Detailing of competencies according to NQF descriptors in the form of "Competence Matrix"

Matrix of competences

№	Competence	Knowledge	Skills	Communication	Autonomy and responsibility
		Kn1 - Critical understanding of problems in the field and on the border of fields of knowledge	S1 - Ability to solve problems in new or unfamiliar environments with incomplete or limited information, taking into account aspects	C1 - Use of foreign languages in professional activity	AR1 - Responsibility for contributing to professional knowledge and practice and / or evaluating the results of activity of teams and collectives
		Kn2 - Specialized conceptual knowledge, which includes modern scientific achievements in the field of professional activity or field of knowledge and is the basis for original thinking and conducting research	S2 - Ability to integrate knowledge and solve complex or multidisciplinary contexts	C2 - Clear and unambiguous communication of own knowledge, conclusions and arguments to specialists and non-specialists, in particular to students	AR2 - Managing work or learning processes, which are complex, unpredictable and require new strategic approaches
			S3 - Specialized problem-solving skills/abilities required for conducting researches and / or innovative activity in order to develop new knowledge and procedures		AR3 - Ability to continue studies with a high degree of autonomy
1	Ability to collect medical information about the patient and analyze clinical data.	Kn1	S1	C1	AR1
2	Ability to solve medical problems in new or unfamiliar environments with incomplete or limited information, taking into account aspects of social and ethical responsibility	Kn1	S1	C2	AR1
3	Ability to carry out sanitary and hygienic, preventive measures	Kn1	S2	C2	AR1
4	Ability to plan and carry out preventive and anti-epidemic measures against infectious diseases.	Kn1	S1	C2	AR1

5	Ability to conduct an examination of working capacity	Kn1	S3	C2	AR2
6	Ability to keep medical records, including electronic forms	Kn1	S3	C2	AR2
7	Ability to assess the impact of the environment, socio-economic and biological determinants on the health state of the individual, family, population.	Kn1	S1	C2	AR2
8	Ability to analyze the activities of a doctor, subdivision, health care institution, ensure the quality of medical care and improve the efficiency of the use of medical resources	Kn1	S1	C2	AR2
9	Ability to organize and integrate the provision of medical care to the population and the marketing of medical services	Kn1	S2	C2	AR2
10	Ability to conduct epidemiological and medical-statistical studies of public health; processing of social, economic and medical information	Kn1	S2	C2	AR1
11	Clearly and unambiguously convey their own knowledge, conclusions and arguments on health care issues and related issues to specialists and non-specialists, in particular to students.	Kn1	S1	C1	AR1
12	Ability to manage workflows, in the field of health care, which are complex, unpredictable and require new strategic approaches	Kn1	S1	C2	AR1
13	Ability to develop and implement scientific and applied projects in the field of health care	Kn1	S1	C1	AR3
14	Adherence to ethical principles when working with patients, laboratory animals.	Kn2	S2	C2	AR2
15	Adherence to professional and academic integrity, to be responsible for the accuracy of the obtained scientific results	Kn1	S2	C1	AR3

Program learning outcomes (PLO), the formation of which is facilitated by the discipline:

PLO-1 – Have a thorough knowledge of the structure of professional activity. Be able to carry out professional activities that require updating and integration of knowledge. To be responsible for professional development, ability to further professional training with a high level of autonomy.

PLO-2 – Understanding and knowledge of basic and clinical biomedical sciences, at a level sufficient to solve professional problems in the field of health care.

PLO-3 – Specialized conceptual knowledge, which includes scientific achievements in the field of health care and is the basis for researches, critical understanding of problems in the field of medicine and related interdisciplinary problems.

PLO-15 – Organize the provision of medical care, medical and evacuation measures to the population and servicemen in the conditions of emergency situations and military operations, taking into account the field conditions.

PLO-16 – To form rational medical routes of patients; to organize interaction with colleagues in their own and other institutions, the organizations and establishments; to apply tools for the promotion of medical services on the market, based on the analysis of the needs of the population, in the conditions of functioning of the health care institution, its subdivision, in a competitive environment.

PLO-18 – Determine the state of functioning and limitations of a person's life and duration of incapacity for work with the execution of the relevant documents, in the conditions of the health care facility on the basis of data on the disease and its course, features of professional activity of a person, etc. Maintain

medical records of the patient and the population on the basis of regulatory documents.

PLO-19 – Plan and implement a system of anti-epidemic and preventive measures for the occurrence and spread of diseases among the population.

PLO-20 – Analyze the epidemiological state and carry out measures of mass and individual, general and local prevention of infectious diseases.

PLO-21 – Search for the necessary information in the professional literature and databases of other sources, analyze, evaluate and apply this information.

PLO-22 – Apply modern digital technologies, specialized software, statistical methods of data analysis to solve complex health care problems.

PLO-23 – Assess the impact of the environment on state of human health to assess the incidence state of the population.

PLO-24 – Organize the necessary level of individual safety (own and persons cared for) in case of typical dangerous situations in the individual field of activity.

PLO-25 – Clearly and unambiguously convey their own knowledge, conclusions and arguments on health care issues and related issues to professionals and non-specialists.

PLO-26 – Manage workflows in the field of health care, which are complex, unpredictable and require new strategic approaches, organize the work and professional development of staff based on acquired skills of effective teamwork, leadership positions, proper quality, accessibility and fairness, ensuring the provision of integrated health care assistance.

PLO-27 – Communicate fluently in the state and English languages, both orally and in writing to discuss professional activities, researches and projects.

PLO-28 – Make effective decisions on health care issues, assess resources, take into account social, economic and ethical implications.

PLO-29 – Plan, organize and conduct activities for the specific prevention of infectious diseases, in accordance with the National Calendar of preventive vaccinations, both mandatory and recommended. Manage vaccine residues, organize additional vaccination campaigns, including immunoprophylaxis measures.

2. INFORMATION VOLUME OF THE DISCIPLINE

3 ECTS credits / 90 hours are allocated for the study of the discipline.

Topic 1. Basics of biostatistics: history, practical significance, basic concepts

Definitions of "biostatistics", "evidence-based medicine", "clinical epidemiology". The main stages of development of biostatistics. Outstanding scientists and their contribution to the development of biostatistics. Relative values, their graphic images. Types of statistical research.

Topic 2. Clinical epidemiology, its significance for health care practice, including during martial law

Grouping of statistical data, methods, values. The concept of multidimensional classifications. Data encryption and encryption. Program for the development and compilation of statistical material.

Topic 3. Analysis of general theoretical and methodological foundations of the formation and development of biostatistics as an independent science

Medical information: its components, problems of information retrieval. Literature databases, medical libraries. Generalization of the results of clinical trials. Analytical reviews.

Topic 4. Organization and conduct of statistical research

Methodological bases, forms and methods of statistical observation and data collection. Accuracy of observations. Types, stages, research design, sampling methods, sampling volume calculation methods.

Topic 5. Types of quantities used in biostatistics and methods of visual representation of statistical data

Methodical bases of application for data analysis. Concepts and types of structure of medical-biological data, structural changes, features of their analysis.

Topic 6. Relative values

The concept of statistical indicators, their types, form of presentation. Absolute data, relative values, their practical significance. Types of relative values, methods of their calculation

Topic 7. Grouping values in the table. Graphic representation of statistics

Types of diagrams, rules of their construction, correctness of use. Modern methods of graphic image, infographics, animation of diagrams, interactive diagrams.

Topic 8. Descriptive statistics of quantitative indicators. Estimation of probability of the received results

Measures of variation, the concept of distribution laws, their types, characteristics. Description of results for Gaussian and non-Gaussian distributions. Principles of assessing the probability of the difference between the results obtained in clinical trials.

Topic 9. Characteristics and analysis of statistical data. Types of averages and criteria for variability of characteristics

Average values in clinical and epidemiological studies, their practical significance. Variability of population parameters, estimation methods.

Topic 10. Variation series. Mean values (Gaussian distribution)

Elements and characteristics of variation series. Measures of variation, the concept of the laws of separation, their types, characteristics. Assessment of the normality of the distribution, "jumping" options. Average values: their types, calculation methods, features of use. The rule of "three sigma", its practical application.

Topic 11. Mean values (non-Gaussian distribution)

The concept of variation, its meaning. Absolute indicators of variation. Fashion, median, quartiles.

Topic 12. Time series and bases of prediction, including acute respiratory disease COVID-19 caused by coronavirus SARS-CoV-2

Types of time series. The main indicators of the analysis of time series. The main methods of processing the time series in order to determine the trend. Methods for aligning time series. Forecasting based on extrapolation of time series.

Topic 13. Methods of alignment and indicators of the time series

Basic rules of construction and analysis of time series in the study of the dynamics of medical and biological phenomena. Levels of a number.

Topic 14. Method of standardization

Types of standardization methods: direct, indirect, reverse. Characteristics of the stages of the standardization method. Selection and calculation of the standard. Calculation of expected numbers. Calculation of standardized indicators.

Topic 15. Methods of standardization in assessing the health of the population and the analysis of performance indicators of health care facilities

Problems of comparing statistical indicators in inhomogeneous aggregates. The practical significance of the standardization method.

Topic 16. Methods for assessing the reliability of statistical research results

Estimation of reliability of the received results. The concept of internal and external validity. The

level of significance of statistical criteria. Zero and alternative hypotheses. Re-test hypotheses. Error of the 1st and 2nd kind.

Topic 17. Parametric criteria for assessing the probability of the results obtained (Student's criteria)

Hypotheses are zero, alternative, relative and mean errors, confidence intervals according to Wald. Calculation and interpretation at $n > 30$ and $n < 30$, Student's table

Topic 18. Non-parametric criteria for estimating the probability of the results (Mann-Whitney test). Comparison of particles by Pearson's xi-square method

Features of the use of nonparametric criteria: Mann-Whitney, Kruskala-Wallis. Using Pearson's xi-square method.

Topic 19. Survival analysis. Mortality

The concept of one-way analysis of variance and multifactor analysis. Patient survival analysis (Kaplan-Meyer method). The concept of cluster analysis.

Topic 20. Methods of sociological research in medical practice, including during martial law

Methods of collecting statistical material. Types of questionnaires, their characteristics. Marketing and sociological surveys, types of survey questions, problems of organizing health care surveys.

Topic 21. Risk factors

Absolute, relative, attributive risks, chance, ratio of chances, added risk (addition, multiplication of risks).

Topic 22. Correlation analysis (linear, rank correlations, regression)

Exploring the relationship between quantitative variables. The concept of functional and correlation. Strength and direction of communication. Types of correlation coefficients. Pearson's linear correlation coefficient, its estimation, characteristic. Spearman's rank correlation coefficient.

Topic 23. Analysis of the relationship between the studied parameters of statistical aggregates

Paired and multiple correlation coefficients. Regression analysis, regression coefficient, regression equation. Using regression analysis for prediction.

Topic 24. Evidence-based medicine. Statistical indicators of diagnostic tests on the example of the diagnosis of acute respiratory disease COVID-19 caused by coronavirus SARS-CoV-2

Basic principles of evidence-based medicine. Theory and practice of evidence-based medicine. The concept of the final results. Accuracy, sensitivity and specificity of diagnostic tests. ROC analysis. Bayesian distribution.

Topic 25. The effectiveness of diagnostic tests

Screening. Evaluation of screening results. Requirements for screening tests. Sensitivity and specificity of the screening test. The relationship between sensitivity and specificity. Accuracy, PPV, NPV.

Topic 26. Power analysis. Types of errors in clinical trials

The practical significance of the method of power analysis. Statistical research planning. The size of the effect, its clinical significance.

Typical errors at the stages of research. Random and systematic error.

Topic 27. Sociological research in the health care system. Brain analysis

Sociology of health. Principles and rules of conducting surveys and questionnaires. Expert assessments. Rank and linear methods for estimating the relationship between indicators.

Topic 28. Methods of scientific research

Statistical research planning. The purpose and objectives of the study. Sources of statistical information. Object of research, unit of observation. Types of research by volume

Topic 29. Medical and social problems of public health and methodology of its study

Population health as a conditional statistical concept. Methods of studying health. Population health indicators: demographic (birth rate, mortality rate, average life expectancy); physical development; morbidity; disability.

Topic 30. Medical and social problems of demographic processes. Features of demographic indicators in different regions of the world and in Ukraine

Demography as a science. Sources. Dynamics of population and population in different regions of the world, countries and in Ukraine. Natural population movement. Fertility, indicators and factors influencing fertility. Current trends and regional features of birth rate in Ukraine and the world. Overall mortality, its leading causes in different regions

Topic 31. Medical and social problems of demographic processes. Features of demographic indicators in different regions of the world and in Ukraine, including during martial law

The value of the demographic indicator for assessing the state of health of the population, the level of socio-economic well-being and the development of society. Leading causes of infant mortality. Average life expectancy, definition.

Topic 32. Morbidity of the population as a medical and social problem. Types and epidemiological methods of studying morbidity

Disease surveillance system. Monitoring the incidence and prevalence of diseases. Registers of infectious and non-infectious diseases. Monitoring of diseases and indicators of maternal and child health, mental health, social health.

3. STRUCTURE OF THE DISCIPLINE

No	Title of subject of the discipline	Lecture	Practical lessons	IWS	Individual tasks
1.	Fundamentals of biostatistics: history, practical significance, basic concepts	2	-	-	-
2.	Clinical epidemiology, its significance for health care practice, including during martial law	-	-	4	-
3.	Analysis of general theoretical and methodological foundations of the formation and development of biostatistics as an independent science	-	-	4	-
4.	Organization and conduct of statistical research	-	2	-	-
5.	Types of values used in biostatistics and methods of visual representation of statistical data	-	-	5	-
6.	Relative values	-	2	-	-
7.	Grouping values in the table. Graphic representation of statistical data	-	2	-	-

8.	Descriptive statistics of quantitative indicators. Estimation of probability of the received results	2	-	-	-
9.	Characteristics and analysis of statistical data. Types of average values and criterion of variability of features	-	-	5	-
10.	Variation series. Mean values (non-Gaussian /Gaussian distribution)	-	2	-	-
11.	Mean values (Gaussian /Gaussian distribution)	-	2	-	-
12.	Types of dynamics series and basics of forecasting, including acute respiratory disease COVID-19 caused by coronavirus SARS-CoV-2	-	2	-	-
13.	Methods of alignment and indicators of time series	-	-	5	-
14.	Standardization method	-	2	-	-
15.	Methods of standardization in the assessment of health of population and analysis of performance indicators of health care institutions	-	-	4	-
16.	Methods of assessing the reliability of the results of statistical research	-	-	5	-
17.	Parametric methods for assessing the reliability of the results (Student's criterion)	-	2	-	-
18.	Nonparametric methods for assessing the reliability of the results (Mann-Whitney test). Comparison of particles by the Pearson chi-square method	-	2	-	-
19.	Survival analysis. Mortality	-	2	-	-
20.	Methods of sociological research in medical practice	-	2	-	-
21.	Risk factors	-	2	-	-
22.	Correlation analysis (linear, rank correlations, regression)	-	2	-	-
23.	Analysis of the relationship between the studied parameters of statistical aggregates	-	-	5	-
24.	Evidence - based medicine. Statistical indicators of diagnostic tests on the example of diagnostics of acute respiratory disease COVID-19 caused by coronavirus SARS-CoV-2	2	-	-	-
25.	Effectiveness of diagnostic tests	-	2	-	-
26.	Power analysis. Types of errors in clinical trials	-	2	-	-
27.	Sociological research in the health care system. Interrelation analysis	2	-	-	-
28.	Methods of conducting of scientific research	-	-	4	-
29.	Medical and social problems of the health of population and methodology of its study	2	-	-	-
30.	Medical and social problems of demographic processes.	2	-	-	-

	Features of demographic indicators in different regions of the world and in Ukraine, including during martial law				
31.	Medical and social problems of demographic processes and morbidity of the population, including acute respiratory disease COVID-19 caused by coronavirus SARS-CoV-2	-	-	5	-
32.	Morbidity of the population as a medical and social problem. Types and epidemiological methods of studying morbidity	2	-	-	-
Total hours – 90 / 3 ECTS credits		14	30	46	0
Final control		Credit			

4. THEMATIC PLAN OF LECTURES OF THE DISCIPLINE

No	Name of the lecture	Number of hours
1.	Fundamentals of biostatistics: history, practical significance, basic concepts	2
2.	Descriptive statistics of quantitative indicators. Estimation of probability of the received results	2
3.	Evidence - based medicine. Statistical indicators of diagnostic tests on the example of diagnostics of acute respiratory disease COVID-19 caused by coronavirus SARS-CoV-2	2
4.	Sociological research in the health care system. Interrelation analysis	2
5.	Medical and social problems of the health of population and methodology of its study	2
6.	Medical and social problems of demographic processes. Features of demographic indicators in different regions of the world and in Ukraine, including during martial law	2
7.	Morbidity of the population as a medical and social problem. Types and epidemiological methods of studying morbidity	2
	Total	14

5. THEMATIC PLAN OF PRACTICAL LESSONS OF THE DISCIPLINE

No	Name of the topic of the practical lesson	Amount of hours
1.	Organization and conduct of statistical research	2
2.	Relative values	4
3.	Grouping values in the table. Graphic representation of statistical data	2
4.	Variation series. Mean values (Gaussian /Gaussian distribution)	2
5.	Mean values (non-Gaussian /Gaussian distribution)	2
6.	Time series and basics of prediction, including acute respiratory disease COVID-19 caused by SARS-CoV-2 coronavirus	2

7.	Standardization method	2
8.	Parametric methods for assessing the reliability of the results (Student's criterion)	2
9.	Nonparametric methods for assessing the reliability of the results (Mann-Whitney test). Comparison of particles by the Pearson chi-square method	2
10.	Survival analysis. Mortality	2
11.	Methods of conducting sociological research in medical practice, including during martial law	2
12.	Risk factors	2
13.	Correlation analysis (linear, rank correlations, regression)	2
14.	Effectiveness of diagnostic tests	2
15.	Power analysis. Types of errors in conducting clinical trials	2
	Total	30

6. THEMATIC PLAN OF INDEPENDENT WORK OF STUDENTS

No	Name of the topic of the independent work of students	Number of hours	Type of control
1.	Clinical epidemiology, its significance for health care practice, including during martial law	4	Current control in practical classes
2.	Analysis of general theoretical and methodological foundations of the formation and development of biostatistics as an independent science	4	Current control in practical classes
3.	Types of values used in biostatistics and methods of visual representation of statistical data	5	Current control in practical classes
4.	Characteristics and analysis of statistical data. Types of average values and criterion of variability of features	5	Current control in practical classes
5.	Methods of alignment and indicators of time series	5	Current control in practical classes
6.	Methods of standardization in the assessment of health of population and analysis of performance indicators of health care institutions	4	Current control in practical classes
7.	Methods of assessing the reliability of the results of statistical research	5	Current control in practical classes
8.	Analysis of the relationship between the studied parameters of statistical aggregates	5	Current control in practical classes
9.	Methods of conducting of scientific research	4	Current control in practical classes

10.	Medical and social problems of demographic processes and morbidity of the population, including acute respiratory disease COVID-19 caused by coronavirus SARS-CoV-2	5	Current control in practical classes
	Total	46	

7. INDIVIDUAL TASKS. An individual situational task is provided for each topic of the practical lesson and for the topic of independent work. VTS assessment is carried out by the teacher in the format of "credited" or "not credited".

8. TEACHING METHODS

1. Verbal methods: lecture, conversation, story, explanation, work with literature.
2. Visual methods: illustration, demonstration, observation.
3. Practical methods: situational tasks, independent work, research work.
4. Interactive methods: discussion, work in small groups, brainstorming, case method, business game.

9. METHODS OF CONTROL

Types of control - current and final.

The form of final control in accordance with the curriculum - credit

Evaluation criteria:

10. CURRENT CONTROL is carried out in each practical lesson in accordance with the specific objectives of the topic, during the individual work of the teacher with the student for those topics that the student develops independently and they are not part of the practical lesson. training students.

10.1. Evaluation of current educational activities. During the assessment of mastering each topic for the current educational activity of the student, grades are set on a 4-point (traditional) scale, taking into account the approved criteria for assessing the discipline. This takes into account all types of work provided by the curriculum. The student must receive a grade on each topic. Forms of assessment of current educational activities are standardized and include control of theoretical and practical training.

Students' independent work is assessed during the current control of the topic in the relevant lesson. Assimilation of topics that are submitted only for independent work is controlled during the final control.

11. FORM OF FINAL CONTROL (credit) is carried out upon completion of the module at the last practical lesson. Students who have completed all types of work provided for in the curriculum and scored at least the minimum number of points in the discipline are admitted to the final control.

12. SCHEME OF ACCOUNTING AND DISTRIBUTION OF POINTS RECEIVED BY STUDENTS

Final (semester) control - a form of final control is a test.

Final control is carried out in order to assess learning outcomes at a separate final stage of the educational qualification level on the national scale and the ECTS scale. Final control includes semester control and student certification.

Traditional scales are converted into points.

The maximum number of points that a student can earn for the current academic activity for the semester for admission to the exam is 200 points.

The minimum number of points that a student must score for the current academic activity for the semester for admission to the exam is 120 points.

The calculation of the number of points is based on the grades obtained by the student on the traditional scale during the study of the discipline, by calculating the arithmetic mean (SA), rounded to two decimal places. The value obtained is converted into points on a multi-point scale as follows:

$$X = \frac{AM \times 200}{5}$$

For convenience, a table is converted into a 200-point scale:

**Recalculation of the average score for current activities on a multi-point scale
for disciplines that end with a credit test**

4-grade scale	200-grade scale	4-grade scale	200-grade scale	4-grade scale	200-grade scale	4-grade scale	200-grade scale
5	200	4.45	178	3.92	157	3.37	135
4.97	199	4.42	177	3.89	156	3.35	134
4.95	198	4.4	176	3.87	155	3.32	133
4.92	197	4.37	175	3.84	154	3.3	132
4.9	196	4.35	174	3.82	153	3.27	131
4.87	195	4.32	173	3.79	152	3.25	130
4.85	194	4.3	172	3.77	151	3.22	129
4.82	193	4.27	171	3.74	150	3.2	128
4.8	192	4.24	170	3.72	149	3.17	127
4.77	191	4.22	169	3.7	148	3.15	126
4.75	190	4.19	168	3.67	147	3.12	125
4.72	189	4.17	167	3.65	146	3.1	124
4.7	188	4.14	166	3.62	145	3.07	123
4.67	187	4.12	165	3.57	143	3.02	121
4.65	186	4.09	164	3.55	142	3	120
4.62	185	4.07	163	3.52	141	<3	Insufficient
4.6	184	4.04	162	3.5	140		
4.57	183	4.02	161	3.47	139		
4.52	181	3.99	160	3.45	138		
4.5	180	3.97	159	3.42	137		
4.47	179	3.94	158	3.4	136		

Discipline points are independently converted into ECTS and 4-point (national) scales. The ECTS scores on the 4-point scale are not converted and vice versa.

Points of students who undergo a course of studies on one specialty, taking into account the number of points scored on the discipline, are ranked on the ECTS scale as follows:

ECTS Point	The statistical indicator
A	The best 10 % of students
B	The next 25 % of students
C	The next 30 % of students
D	The next 25 % of students
E	The last 10 % of students

Discipline scores for students who have successfully completed the program are converted into a traditional 4-point scale according to absolute criteria, as shown in the table

Discipline points	Score on the 4-point scale
From 170 to 200 points	5

From 140 to 169 points	4
From 139 points to the minimum number of points a student should get	3
Below the minimum number of points a student should get	2

The ECTS mark is not converted on a traditional scale because the ECTS scale and the four-point scale are independent.

Objectivity of evaluation of students' educational activity is checked by statistical methods (correlation coefficient between ECTS assessment and national scale assessment).

13. METHODOLOGICAL SUPPORT

- Theoretical questions on the topics of practical classes
- Theoretical questions for final control
- Tasks for current control of knowledge
- Tasks for final control of knowledge
- List of tasks for independent work
- Abstracts of lectures
- Methodical developments for practical classes
- Methodical developments for independent work of students

14. REFERENCES

Basic

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2. The public health: textbook for students of higher educational establishments. Vinnytsia: «New book/Nova Knyha », pub. 3. 2013. 560 p.

3. Workshop for preparation for practical classes in the academic discipline "Public Health". Lviv, 2020.

4. Jekel's Epidemiology, Biostatistics, Preventive Medicine, and Public Health: With Student Consult. Joann G. Elmore, Dorothea Wild, Heidi D. Nelson, David L. Katz. Elsevier; 5th edition. 2020. 464 p.

5. Oxford Textbook of Global Public Health, 6 edition. / Edited by Roges Detels, Martin Guliford, Quarraisha Abdool Karim and Chorh Chuan Tan. Oxford University Press, 2018. 1728 p.

Additional

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2. Board Review in Preventive Medicine and Public Health. Gregory Schwaid. Elsevier, 2017. 450 p.

3. Liam J. Donaldson, Paul Rutter. Donaldson`s Essential Public Health, Fourth Edition. CRC Press, Taylor&Francis Group, 2017. 374 p.

15. INFORMATION RESOURCES

The Legislation of Ukraine. The electronic resource: zakon.rada.gov.ua/

The medical legislation of Ukraine. The electronic resource: <http://mozdocs.kiev.ua/>

The statistical data of Ukraine. The electronic resource: <http://www.ukrstat.gov.ua/>

The statistical data of the Lviv region. The electronic resource: <https://www.lv.ukrstat.gov.ua/>

The center of public health WHC of Ukraine (Ministry of Health of Ukraine): <https://phc.org.ua/>

The Ukrainian database of medico-statistical information «Health for all»: <http://med-stat.gov.ua/ukr/news.html?id=203>

The World Health Organization www.who.int

The European Regional Bureau of WHO www.euro.who.int/ru/home
The Kokhranivsky centre of evidence-based medicine www.cebm.net
The Kokhranivsky library www.cochrane.org
The National medical library of the USA – MEDLINE PubMed www.ncbi.nlm.nih.gov/PubMed
The Canadian evidence-based centre of public care www.cche.net
The Centre of control and disease prevention www.cdc.gov
The Journal British Medical Journal www.bmj.com
The Journal Evidence-Based Medicine www.evidence-basedmedicine.com