

AL-FARABI KAZAKH NATIONAL UNIVERSITY
FACULTY OF MEDICINE AND PUBLIC HEALTH
DEPARTMENT OF EPIDEMIOLOGY, BIostatISTICS AND EVIDENCE-
BASED MEDICINE

FINAL EXAM PROGRAM FOR THE DISCIPLINE
Managerial Epidemiology
5 Credits

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THE SYLLABUS FOR THE DISCIPLINE WAS APPROVED

*At a meeting of the Academic Council of the Faculty of Medicine and Public Health
Protocol No.*

REVIEWED AND RECOMMENDED

*At a meeting of the Department of Epidemiology, Biostatistics and Evidence-Based Medicine
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PROGRAM

of the Final Examination in the Discipline "**Managerial Epidemiology**"

Exam Topics:

The final exam is conducted in written form. The thematic content covers all types of coursework: Class items and seminar topics, as well as student self-study assignments.

Learning Outcomes:

In preparation for the exam, it is necessary to review the main theoretical content of the course, including terminology and methods.

1. Acquaint students with concepts, methods, and techniques of Managerial Epidemiology.
2. To study and provide a healthcare organization's management, research planning, and quality assurance.
3. To study and provide financing and economic analysis of a healthcare organization.
4. To analyze scientific research results.
5. To conduct the main directions, laws, methods, algorithms, and tools of medical statistics in research analysis.

Upon completion of the course, the student should be able to:

- Describe the core concepts and scope of Managerial Epidemiology.
- Identify concepts of managerial epidemiology.
- Perform methods and techniques of managerial epidemiology.
- Provide management of research planning.
- Provide a scenario of quality assurance of a healthcare organization.
- Create a scenario of financing analysis of a healthcare organization.
- Create a scenario of economic analysis of a healthcare organization.
- Analyze scientific research results (descriptive, analytical, and clinical trials).
- Determines the statistical significance of relationships and differences for all types of variables by applying the appropriate statistical criterion.
- Present results in the form of graphs and tables.
- Write a report on the effectiveness of one of the existing screening programs in Kazakhstan.

The list of exam topics

Class item 1: Introduction to Managerial Epidemiology

Core Concept: This Class item sets the tone for the entire course. It introduces the field of managerial epidemiology, which uses epidemiological data and methods to inform healthcare management decisions.

Expands the view from the individual patient to the entire community. Examines the factors that determine the health of groups of people.

Class item 3: Infectious Disease Epidemiology

Core Concept: A classic branch of epidemiology focused on diseases that are transmitted from person to person or from the environment to a person.

The chain of infection (source, mode of transmission, susceptible host), models of spread (pandemics, epidemics, outbreaks), control and prevention methods (vaccination, isolation).

Critical for managing outbreaks, planning hospital resources during epidemics, and developing prevention programs.

Class item 4: Epidemiology of Non-Communicable Diseases

Core Concept: Focuses on chronic diseases that are not transmitted from person to person, which are the leading cause of mortality in the modern world.

Major types of non-communicable diseases (cardiovascular, cancer, diabetes), risk factors (smoking, poor diet, physical inactivity), prevention and screening strategies.

Class item 5: Morbidity as an Indicator of Population Health

Core Concept: Studies the morbidity indicator—the frequency and prevalence of diseases in a population.

Definition and calculation of morbidity rates (prevalence, incidence), data sources (registries, surveys, hospital reports), and interpretation of morbidity data.

Morbidity is a key indicator for assessing the need for medical care, planning bed capacity, and staffing.

Class item 6: Mortality as an Indicator of Population Health and Risk Adjustment

Core Concept: Analyzes the mortality rate and its correct interpretation, accounting for differences across patient groups. Mortality rates (crude, infant, cause-specific), rate standardization, the concept of risk adjustment for comparing outcomes across different hospitals or doctors.

Class item 7: Healthcare Planning and Needs Assessment

Core Concept: The application of epidemiological data for strategic planning and determining the population's needs for medical care. Needs assessment methods, analysis of the gap between need and service provision, capacity planning (beds, equipment, personnel) based on data.

Managerial Significance: A practical tool for managers to develop realistic and evidence-based development plans for medical organizations.

Class item 8 Core Concept: Class item dedicated to how epidemiological methods can be used to assess and improve the quality of medical care. Structure, Process, and Outcome are the three components of quality. The use of indicators, control charts, and benchmarking. Analysis of adverse events and medical errors.

Class item 9. 5 steps of Evidence-Based Medicine (EBM)

Core Concept: Introducing the principles of Evidence-Based Medicine (EBM) into practice.

The five sequential steps of EBM are formulating a question, searching for evidence, critical appraisal, applying the evidence, and evaluating the results.

Class item 10: Epidemiologic Studies: Hierarchy, Observational Studies

Core Concept: An overview of different types of studies and their strength of evidence, with a focus on observational studies.

Hierarchy of evidence (from systematic reviews to descriptive studies). Types of observational studies: cohort, case-control, and cross-sectional. Their strengths and weaknesses.

Class item 11: Clinical Trials

Core Concept: Studying the "gold standard" of research—clinical trials, especially randomized controlled trials (RCTs).

Principles of RCTs (randomization, control, blinding), phases of clinical trials, and ethical aspects.

Understanding RCTs is necessary to evaluate the effectiveness of new drugs, technologies, and treatment methods before their implementation in practice and reimbursement.

Class item 12: Epidemiology and Financial Management

Core Concept: Connects epidemiological data with financial management in healthcare. Using morbidity and mortality data to forecast costs, calculate tariffs in health insurance systems (like SHI / VHI), and risk management in capitation systems.

Class item 13: Cost-effectiveness Analysis

Core Concept: A key tool for making decisions about the allocation of limited resources.

Principles of Cost-Effectiveness Analysis (CEA) and Cost-Utility Analysis (CUA). Calculating cost per quality-adjusted life year (QALY).

Class item 14: Clinical Epidemiology and Decision Making

Core Concept: A synthesis of all the topics covered, focusing on the application of epidemiological principles for clinical and managerial decision-making. Using probabilistic thinking, interpreting diagnostic tests (sensitivity, specificity), building clinical prediction rules and algorithms.

Class item 15. Epidemiology and Leadership.

Core Concept: This class item frames epidemiological data as a fundamental tool for strategic leadership, not just management. It explores how leaders use this data to inspire change, guide organizations through crises, and champion a culture of evidence-based practice.

Each exam ticket includes three questions on the course topics listed above.

	Block	Example Question	Assessment of Competency Level
1	Questions aimed at assessing cognitive competencies.	Explain the definitions of "Managerial Epidemiology as a science" and "Evidence-based Medicine in Management."	The Master's student demonstrates the ability to recall, define, and explain core concepts, terminology, and methods.
2	Questions Determining Systemic Competencies	The ability to judge the value, validity, and effectiveness of different interventions, policies, or research findings.	The ability to apply knowledge to specific situations, analyze data, and interpret results.
3	Questions Aimed at Determining Functional Competence	Using tools, methods, and data to complete a defined task.	The ability to integrate multiple concepts, make evidence-based recommendations, and propose strategic solutions.

Grading Criteria

Scores	Digital equivalent of points	Scores, % content	Traditional scores	Characteristic of student's work
A	4,0	95–100	Excellent	The student's answer was completed independently and meets high scientific and methodological standards. The text of the answer demonstrates the student's ability to evaluate and apply mastered scientific methods and techniques, as well as to propose concepts and models and to employ new methods and tools of professional activity. The work presents an independent perspective on the problem and corresponding argumentation. The work is meticulously prepared, and the student possesses a command of professional terminology and the skills necessary for writing academic papers.
A-	3,67	90–94		
B+	3,33	85–89	Good	The student's answer is generally well-written, but the author has not addressed or has only partially covered specific aspects of the topic. The work does not present the author's original perspective on the problem or corresponding argumentation. Some inaccuracies are present, but they do not affect the work's core content. The answer demonstrates knowledge and understanding of the material at a level of at least 75%.
B	3,0	80–84		
B-	2,67	75–79		

C+	2,33	70–74	Satisfied	The task has been completed in general, but the author has not demonstrated problem-analysis skills and has either not addressed or only partially covered specific aspects of the topic. The work does not present the author's original perspective on the problem. The author demonstrates insufficient command of scientific research methodology. The response contains inaccuracies regarding the question's core content.
C	2,0	65–69		
C-	1,67	60–64		
D+	1,33	55–59	Unsatisfied	The task has not been completed, or has been completed by less than 50%. The task has been completed incorrectly.

Recommended Literature

1. Managerial Epidemiology: Cases and Concepts, 4th Edition, by Steven T. Fleming (Editor). - 632 p.
[//chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://lib.zu.edu.pk/ebookdata/Epidemiology/Managerial%20epidemiology%20_%20cases%20and%20concepts-by%20Steven%20T.%20Fleming.pdf](https://lib.zu.edu.pk/ebookdata/Epidemiology/Managerial%20epidemiology%20_%20cases%20and%20concepts-by%20Steven%20T.%20Fleming.pdf)
2. Применение методов статистического анализа для изучения общественного здоровья и здравоохранения. Под редакцией В.З.Кучеренко. Учебное пособие для ВУЗОВ. Изд..группа Гэотар- Медиа.-2007.-245 с.
3. lectures on discipline

4. Web sites

Professional research databases

www.gapminder.com

www.cdc.gov

www.who.org

Internet sources

<http://elibrary.kaznu.kz/ru>

<https://www.stat.gov.kz/>