

Al-Farabi Kazakh National University Faculty of Medicine and Healthcare Education program in the specialty “6B10109 Public Health”

PROGRAM OF THE FINAL EXAM IN THE DISCIPLINE OF COURSE “GENERAL EPIDEMIOLOGY”

6 credits

Author:

FA. Iskakova, MD, PhD

TMC OF COURSE IS CONFIRMED

On the Academic Council of Medicine and Public Care Faculty

Protocol N.

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PROGRAM OF THE FINAL EXAM ON COURSE "BASIC EPIDEMIOLOGY" 6 credits

Study topics for the exam: The final exam will be in writing form as a Case Study. The thematic content covers all types of work: topics from lectures and seminars, as well as assignments for master's students' independent work.

The outcome of learning:

1. To demonstrate knowledge and understanding of the principles of Epidemiology as a science in Public Health.
2. To distinguish concepts of causality in Epidemiology.
3. Demonstrate skills to estimate Population Health.
4. To demonstrate knowledge and skills in understanding the hierarchy and design of epidemiologic studies.
5. To show the ability to plan and provide an investigation of Infectious Diseases

List of examination items for preparation for the exam

Module I. Introduction to Epidemiology

Class 1. Introduction to Epidemiology. Definition of Epidemiology. History of Epidemiological methods and concepts. Core Epidemiologic Functions. Causal thinking. Core The Epidemiologic Approach.

Content. Epidemiology is the study of the frequency and determinants of diseases that are distributed in a specific population group. In recent years, epidemiology has become an increasingly important approach in both public health and clinical practice. Epidemiology is the basic science of disease prevention and plays a significant role in the development and evaluation of public policy and social and legal arenas.

Epidemiology studies are used in Medicine. So, Epidemiology and Clinical Epidemiology have a close relationship for solving the problem of People's health, quantitative and qualitative epidemiology.

Class 2: History and Evolution of Epidemiology.

From Hippocrates to the Modern Era of sharing the function of Epidemiology as a Science of Infectious Diseases for Monitoring and Controlling Diseases, and giving Recommendations to Public Health. It is estimated that the Era of Observation is transitioning to Quantification. Following Field is Investigation, next is Germ Theory, the focus of Chronic Disease.

And now it is the Integration of data, Genetics, and Global Collaboration.

Class 3 . Concepts of Epidemiology: Causation, Epidemiological Triad.

Content. A critical premise of epidemiology is that disease and other health events do not occur randomly in a population. Some models of disease causation have been proposed. The traditional model for infectious disease consists of an external **agent**, a susceptible **host**, and an **environment** that brings the host and agent together. In this model, disease results from the interaction between the agent and the susceptible host in an environment that supports the transmission of the agent from a source to that host.

Class 4. L. Summarize Data and Display Public Health Data.

Collect raw data (surveillance, surveys, etc.). Summarize it using measures of frequency (rates, proportions). Display it clearly using an appropriate method (table, graph, map).

Interpret the patterns to inform public health action.

Class 5. Measures of Disease Frequency. Sources of Health-Related Data.
Content. Quantitative and qualitative research employ different research methods to collect and analyze data, enabling the answer to various research questions. For quantitative data, statistical analysis methods were used to test relationships between variables. For qualitative data, techniques such as thematic analysis

were used to interpret patterns and meanings in the data. Qualitative vs. quantitative research. A descriptive research design uses a wide variety of quantitative and qualitative methods to investigate one or more variables. The researcher observes and measures variables related to disease and their outcomes.

Class 6. Compare Disease Frequency. Standardization.

Explain why crude rates can be misleading when comparing populations. Define confounding and how it relates to population structure. Describe the purpose of direct and indirect age-standardization. Interpret an adjusted (standardized) rate and ratio.\

Class 7. Public Health Surveillance

Content. The health department is responsible for protecting the public's health using a program called Public Health Surveillance, which has the function of surveying and controlling population health. The objectives of PHS are Identifying Health Problems for Surveillance, Collecting Data for Surveillance, Analyzing and Interpreting Data, Disseminating Data and Interpretations, Evaluating and Improving Surveillance, Summary, and

Class 8. Design of Epidemiological Studies.

Descriptive studies include case reports, case series, ecological studies, and cross-sectional studies. Content. Epidemiologic studies are divided into observational and interventional. Observational studies can be descriptive and analytical. Descriptive studies identify patterns among cases and in populations by time, place, and person. From these observations, epidemiologists develop hypotheses about the causes of these patterns and about the factors that increase the risk of disease. Descriptive research answers what, when, where, and how questions, but not why and how questions. Hypotheses are formed based on descriptive studies. In other words, epidemiologists can use descriptive epidemiology to generate hypotheses.

Class 9. Observational analytic studies.

Analytical studies. Case-control study: strengths and limitations, using in Medicine. Measures of association or measures of excess risk. OR, RR, AR, AR%, PAR, PAR%. Content.

Analytical studies. Cohort study: strengths and limitations, measuring association, and its use in Medicine. Practical work: analysis of a case-control study using scientific articles from websites as an example. Evaluation and measurement of the occurrence of diseases. Exposure measurement in studies: RR, OR, AR, AR%, PAR, PAR%. Practical work using scientific articles from websites as an example.

Content. Analytic studies are then undertaken to test specific hypotheses. Samples of subjects are identified, and information about exposure status and outcome is collected. The essence of an analytic study is that groups of subjects are compared to estimate the magnitude of association between exposures and outcomes. This is a cohort study.

Class 10. Experimental studies. Experimental studies. Randomized controlled trial and non-randomized trial. Stratified, crossover, factorial design, and group randomization. Design of clinical trials (phases, safety, and effectiveness of drugs).

Content. Experimental studies are studies in which the investigator artificially manipulates study factors or subjects, such as a therapeutic regimen or some other parameter. An experimental study is the preferred means of hypothesis testing in most laboratory settings, and relevant methods are subject to continuing improvements. Types of experimental studies are randomized and non-randomized trials.

Class 11. Diagnostic and Screening Test. Sensitivity and specificity of tests.

Content. A diagnostic test is used to determine the presence or absence of a disease when a subject shows signs or symptoms of the disease. A screening test identifies asymptomatic individuals who may have the disease. The diagnostic test is performed after a positive screening test to establish a definitive diagnosis. The probability of having the disease, given the test results, is called the predictive value of the test. Positive predictive value is the probability that a patient with a positive (abnormal) test result actually has the disease. Negative predictive value is the probability that a person with a negative (typical) test result is genuinely free of disease.

Sensitivity is the ability of the test to identify those who have the disease correctly. Specificity is the ability of the test to identify those who do not have the disease correctly.

Class 12. Basics of Epidemiology of Infectious Diseases. Infectious Agent. Reservoir. Portal of Exit:

Mode of Transmission. Portal of Entry. Susceptible Hos. Modes of Transmission: Direct and indirect

contacts.

Direct Contact: Skin-to-skin, kissing, sexual contact (e.g., Herpes, STIs), Droplet spread.

Vertical: Mother to fetus/newborn. (e.g., HIV, Syphilis). Modes of Transmission: Indirect by Airborne, Vehicle-borne, and Vector-borne.

Class 13. Epidemiology of Non-communicable Diseases. Medical conditions or diseases that are not caused by an acute infectious agent and are therefore not transmissible from person to person. Complex Etiology: Multiple causes (not a single agent). Long Latency Period. Prolonged Duration. Functional Impairment or Disability.

Class 14. Outbreak Investigation. Epidemiological Investigation. Investigating an Outbreak. Content.

The steps of outbreak investigations are Prepare for field work, Establish the existence of an outbreak, Verify the diagnosis, Construct a working case definition, Find cases systematically and record information, Perform descriptive epidemiology, Develop hypotheses, Evaluate hypotheses epidemiologically, As necessary, reconsider, refine, and re-evaluate hypotheses, Compare and reconcile with laboratory and/or environmental studies, Implement control and prevention measures, Initiate or maintain surveillance, Communicate findings.

Class 15. Prevention and Prophylaxis. The Levels of Prevention: Primordial, Primary Secondary and Tertiary Prevention. Types of Prophylaxis: Primary, Secondary, and Continuous Prophylaxis.

RULES

1. Bachelor students are authorized in the Moodle LMS and get access to the task "Final exam in the discipline" at the time set by the teacher.
2. Learn the topics of the instructor's essay. case-study
3. Perform the task within 3 hours

4. Load the completed work on the case study into the LMS Moodle for this:

- 4.1 Students should be authorized in the LMS Moodle,
- 4.2 Open the element "Final exam in the discipline",
- 4.3 Select the item "Add an answer to the task",
- 4.4 upload their works in the file upload field,
- 4.5 Click "Save".

The form of the final control (exam): WRITTEN- CASE STUDY

Form of conducting final control (exam) *.	Used platform	For whom recommend	Availability of proctoring, video recording, and verification for plagiarism	Possibility of generating questions	How is the verification of the work done?
WRITTEN: – case study	LMS MOODLE	bachelors	Video recording at individual work - not required. Mandatory check for plagiarism in the works of doctoral students. Provided automatic checks for plagiarism and availability using two services: Antiplagiarism (required) and Strike Plagiarism (if necessary).	no	1. Teacher discipline gets ready files/responses in DLS Moodle. 2. Evaluates the work and checks for plagiarism. 3. Puts points in DLS MOODLE. 4. Transfer points to

Grading

Final assessment of the two stages of the exam: report assessment	Numerical assessment	Scores (%)	Traditional assessment	Requirements
A A-	4,0 3,67	95-100 90-94	Excellent	Complete understanding of course topics. Use of cognitive, systemic, and functional competencies. Critical thinking, analysis, and application of knowledge and skills.
B+ B B- C+	3,33 3,0 2,67 2,33	85-89 80-84 75-79 70-74	Good	Understanding of course topics with a few inaccuracies. Using cognitive, systemic, and functional competencies, as well as standard critical thinking, analysis, and application of knowledge and skills.
C C-	2,0 1,67	65-69 60-64	Satisfied	Incomplete understanding of course topics. Students do not utilize their cognitive, systemic, and functional competencies to the fullest extent. Standard critical thinking, poor analysis, and incomplete application of knowledge and skills.
D+ D- FX	1,33 1,0 0,5	55-59 50-54 25-49	Unsatisfied	There is a lack of understanding of course topics. The student does not use cognitive, systemic, and functional competencies. There is no critical thinking, and there is poor analysis and application of knowledge and skills.

Required and Recommended Literature:

1. Aschengrau A., Essentials of Epidemiology in Public Health, 3rd Edition, 2008. **Recommended reading:**

1. Gordis: Epidemiology, 5th Edition, Saunders, 2013
2. Rothman K., Modern Epidemiology, 3rd Edition, 2008
3. Pickles A. Epidemiological Methods in Life Course Research, 1st Edition, 2007
4. Webb P and Bain C. Essential Epidemiology: An Introduction for Students and Health Professionals. Second Edition. Cambridge University Press. 2011.
5. Wolfgang, A. Handbook of Epidemiology. Vol. 1//Ahrens Wolfgang, Peugeot Iris. - 2 ed.- Springer Reference, 2014.- 469 p.
6. Principles and methods of Epidemiology. 3-d Edition. R. Dicker, Office of Epidemiologic Programs, CDC, USAID. -2012.-457 P.
7. Principles of Epidemiology in Public Health Practice. Third Edition. An Introduction to Epidemiology and Biostatistics, US, CDC, Atlanta. -2012.-6-75 p.
8. Heinekens, C., & Buring, J. (1987). Epidemiology in Medicine, Boston/Toronto: Little, Brown and Company.
9. Kelsey, J., Whittemore, A., Evans, A. & Thompson, D. (1996). Methods in Observational Epidemiology, Second Edition, New York: Oxford University Press.

Electronic source:

10. www.who.org
11. www.cdc.gov
12. www.medline
13. www.cockraine.library
14. www.PubMed