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

SUMMARY OF LECTURES

ON THE SUBJECT OF MANAGEMENT EPIDEMIOLOGY

5 credits

Almaty, 2025

SUMMARY OF LECTURES ON THE SUBJECT OF MANAGEMENT EPIDEMIOLOGY

Lecture 1: Introduction to Managerial Epidemiology
Core Concept: This lecture sets the tone for the entire course. It introduces the field of managerial epidemiology, which uses epidemiological data and methods to make informed management decisions in healthcare.
Key Topics: Definition of managerial epidemiology, its role in planning, financing, quality assessment, and overall management of health systems. The connection between population health and resource management.
Managerial Significance: Explains why modern healthcare managers need to understand epidemiological principles to work effectively.
Lecture 2: Introduction to Population Health
Core Concept: Expands the view from the individual patient to the entire community. Examines the factors that determine the health of groups of people.
Key Topics: Definition of "population health," determinants of health (genetics, behavior, socio-economic conditions, physical environment), measuring health at the population level.
Managerial Significance: Teaches managers to think broadly, understanding the wide-ranging factors that affect the demand and need for healthcare services.
Lecture 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.
Key Topics: The chain of infection (source, mode of transmission, susceptible host), models of spread (pandemics, epidemics, outbreaks), control and prevention methods (vaccination, isolation).
Managerial Significance: Critical for managing outbreaks, planning hospital resources during epidemics, and developing prevention programs.
Lecture 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.
Key Topics: Major types of non-communicable diseases (cardiovascular, cancer, diabetes), risk factors (smoking, poor diet, physical inactivity), prevention and screening strategies.
Managerial Significance: Helps managers predict the long-term burden on the healthcare system, plan services for chronic patients, and allocate resources to prevention programs.
Lecture 5: Morbidity as an Indicator of Population Health
Core Concept: Studies the morbidity indicator—the frequency and prevalence of diseases in a population.
Key Topics: Definition and calculation of morbidity rates (prevalence, incidence), data sources (registries,

surveys, hospital reports), interpretation of morbidity data.
Managerial Significance: Morbidity is a key indicator for assessing the need for medical care, planning bed capacity, and staffing.
Lecture 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.
Key Topics: Mortality rates (crude, infant, cause-specific), rate standardization, the concept of risk adjustment for comparing outcomes across different hospitals or doctors.
Managerial Significance: Allows for an objective comparison of medical organizations' performance, accounting for differences in patient severity. The basis for benchmarking and pay-for-performance programs.
Lecture 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.
Key Topics: 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.
Lecture 8 Core Concept: Two lectures dedicated to how epidemiological methods can be used to assess and improve the quality of medical care.
Key Topics: Structure, Process, and Outcome as the three components of quality. The use of indicators, control charts, and benchmarking. Analysis of adverse events and medical errors.
Managerial Significance: Gives managers the tools to monitor quality, identify areas for improvement, and manage risks in a medical organization.
Lecture 9. 5 steps of Evidence-Based Medicine (EBM)
Core Concept: Introducing the principles of Evidence-Based Medicine (EBM) into practice.
Key Topics: The five sequential steps of EBM: formulating a question, searching for evidence, critical appraisal, applying the evidence, and evaluating the results.
Managerial Significance: Teaches managers to make administrative and clinical decisions not based on intuition or tradition, but on the best available scientific evidence.
Lecture 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.
Key Topics: Hierarchy of evidence (from systematic reviews to descriptive studies). Types of observational studies: cohort, case-control, and cross-sectional. Their strengths and weaknesses.
e: Allows managers to evaluate the reliability of medical literature critically and reports on which they base their decisions.
Lecture 11: Clinical Trials
Core Concept: Studying the "gold standard" of research—clinical trials, especially randomized controlled trials (RCTs).
Key Topics: Principles of RCTs (randomization, control, blinding), phases of clinical trials, ethical aspects.
Managerial Significance: Understanding RCTs is necessary to evaluate the effectiveness of new drugs, technologies, and treatment methods before their implementation in practice and reimbursement.
Lecture 12: Epidemiology and Financial Management
Core Concept: Connects epidemiological data with financial management in healthcare.
Key Topics: Using morbidity and mortality data to forecast costs, calculate tariffs in health insurance systems (like SHI / VHI), risk management in capitation systems.
Managerial Significance: Shows how population health data directly impacts financial planning and the sustainability of a medical organization.
Lecture 13: Cost-effectiveness Analysis
Core Concept: A key tool for making decisions about the allocation of limited resources.

Key Topics: Principles of Cost-Effectiveness Analysis (CEA) and Cost-Utility Analysis (CUA). Calculating cost per quality-adjusted life year (QALY).
Managerial Significance: Gives managers a quantitative method to compare different medical interventions and choose those that provide the greatest "value" for money.
Lecture 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.
Key Topics: Using probabilistic thinking, interpreting diagnostic tests (sensitivity, specificity), building clinical prediction rules and algorithms.
Managerial Significance: A concluding lecture that brings together data, analytical methods, and economics into a unified system for evidence-based strategic management in healthcare.
Lecture 15. Epidemiology and Leadership.
Core Concept: This lecture 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.
Key Topics:
Translating data into a compelling narrative for motivation and funding, leading decisively during public health crises using epidemiological principles, fostering an evidence-based organizational culture, and using trends and predictive models for strategic foresight and advocating for health equity by identifying and addressing disparities.
Managerial Significance: Equips leaders to use data as a strategic compass, transforming them from administrators into influential champions who can justify decisions, inspire teams, and steer their organizations toward greater impact and equity.