Al-Farabi Kazakh National University

Faculty of Medicine and Healthcare

Education program in specialty: «7M10102 Public Health»

Guideline on seminars for master’s students on Managerial Epidemiology course

Composer:

FA.Iskakova, Associate Professor

Almaty, 2025

Seminar Framework: Managerial Epidemiology

Seminar 1: Introduction to Managerial Epidemiology

Learning Objective: Define managerial epidemiology and articulate its critical role in informing the core functions of health services management: planning, organizing, staffing, controlling, and evaluating.
Key Concepts: The interface of epidemiology and management; evidence-based management; using population data for organizational strategy.
Managerial Application: Analyze a real-world scenario where a hospital system used local disease burden data to justify the expansion of a specific service line.

Seminar 2: Introduction to Population Health for Managers

Learning Objective: Apply a population health perspective to managerial decisions, understanding key determinants of health and the concept of health equity.
Key Concepts: Population health vs. individual health; social determinants of health (SDOH); the manager's role in addressing health disparities.
Managerial Application: Map how different SDOH (e.g., transportation, literacy) impact utilization rates for a primary care clinic and propose managerial interventions.

Seminar 3: Infectious Disease Epidemiology in Management

Learning Objective: Utilize principles of infectious disease dynamics to guide operational planning, infection control budgets, and outbreak response protocols.
Key Concepts: Transmission dynamics, Ro (basic reproduction number), surveillance systems, prevention strategies (vaccination, isolation).
Managerial Application: Develop a costed preparedness plan for a seasonal influenza surge, addressing staffing, supplies, and surge capacity.

Seminar 4: Epidemiology of Non-Communicable Diseases (NCDs)

Learning Objective: Interpret the burden and trends of NCDs to plan long-term care services, chronic disease management programs, and preventative initiatives.

Key Concepts: Global and local NCD burden; multifactorial etiology; implications for healthcare systems (cost, complexity, continuity of care).
Managerial Application: Design the outline of a value-based care bundle for diabetes management, based on epidemiologic projections of disease prevalence.

Seminar 5: Morbidity as an Indicator of Population Health

Learning Objective: Calculate, interpret, and apply morbidity measures (incidence, prevalence) to assess community health needs and service demand.
Key Concepts: Point vs. period prevalence; incidence density; limitations of morbidity data; data sources (surveys, registries, EHRs).
Managerial Application: Use prevalence data to forecast the required number of patient visits and specialist referrals for a rising condition like hypertension in a defined population.

Seminar 6: Mortality, Risk Adjustment, and Fair Comparison

Learning Objective: Calculate key mortality rates and apply risk-adjustment methodologies to compare outcomes across providers or populations fairly.
Key Concepts: Crude, specific, and standardized mortality rates; risk adjustment (e.g., using APR-DRGs, Elixhauser Comorbidity Index); comparing "like with like."**Managerial Application:** Analyze risk-adjusted mortality reports for different hospital departments to identify true performance outliers versus differences due to patient case-mix.

Seminar 7: Healthcare Planning and Needs Assessment

Learning Objective: Conduct a systematic community health needs assessment (CHNA) using epidemiologic data as a foundation for strategic planning.
Key Concepts: Steps in CHNA; asset mapping; quantitative and qualitative data synthesis; priority-setting techniques.
Managerial Application: In groups, draft the executive summary of a CHNA for a specific community, identifying top 3 priorities with epidemiologic justification.

Seminar 8: Quality of Care Measurement & Management

Learning Objective: Design and implement a quality measurement dashboard using epidemiologic principles for performance monitoring and improvement.
Key Concepts: Donabedian's triad (Structure, Process, Outcome); core quality metrics (HAIs, readmissions); benchmarking; audit and feedback cycles.
Managerial Application: Select relevant quality indicators for a new cardiac surgery program and propose a data collection and reporting plan.

Seminar 9: Evidence-Based Management of Medicine

Learning Objective: Integrate clinical evidence, patient preferences, and operational context to make informed management decisions about treatment pathways and resource use.
Key Concepts: The three pillars of EBM (evidence, clinical expertise, patient values) applied to management; clinical practice guidelines.
Managerial Application: Develop a protocol for a Pharmacy & Therapeutics (P&T) committee to evaluate and make a formulary decision about a new, expensive oncology drug.

Seminar 10: Hierarchy of Evidence & Observational Studies

Learning Objective: Critically appraise observational studies (cohort, case-control) for their strengths, limitations, and utility in answering managerial questions about effectiveness and safety.
Key Concepts: Evidence pyramid; study design validity; identifying confounding in observational data; real-world evidence (RWE).
Managerial Application: Critique an observational study linking a hospital process to patient outcomes, assessing its potential for confounding and its applicability to your organization.

Seminar 11: Clinical Trials & Interpreting Causal Inference

Learning Objective: Decode the results of Randomized Controlled Trials (RCTs) for managerial decision-making, understanding threats to validity.
Key Concepts: RCT design (randomization, blinding, control); internal vs. external validity; **confounding, bias, effect modification**.

Managerial Application: Evaluate an RCT of a new surgical device. Decide if the results support a capital investment, considering the trial's population versus your hospital's patient mix.

Seminar 12: Epidemiology and Financial Management

Learning Objective: Explain how population disease trends directly drive healthcare utilization, revenue forecasting, and financial risk under different payment models.**Key Concepts:** Capitation vs. fee-for-service; risk pools; predictive modeling for budgeting; epidemiology in actuarial science.
Managerial Application: Project the financial impact (revenue and cost) of an aging population with increasing arthritis prevalence on an orthopedic service line.

Seminar 13: Cost-Effectiveness Analysis (CEA)

Learning Objective: Conduct a basic CEA to compare the value of health interventions and inform resource allocation decisions.
Key Concepts: Costs (direct, indirect), outcomes (QALYs, life-years gained), Incremental Cost-Effectiveness Ratio (ICER), cost-utility analysis.
Managerial Application: Perform a simplified CEA of two screening strategies for a condition, calculate the ICER, and make a coverage recommendation.

Seminar 14: Clinical Epidemiology and Decision Analysis

Learning Objective: Apply clinical epidemiologic tools (predictive rules, decision trees) to inform policy-level and individual clinical management decisions.**Key Concepts:** Predictive values, probability revision, diagnostic test thresholds; constructing and analyzing simple decision trees.
Managerial Application: Use a decision tree to analyze the policy choice of implementing a widespread screening program versus a targeted high-risk approach.

Seminar 15: Epidemiology and Leadership

Learning Objective: Synthesize epidemiological concepts into the leadership competencies of communication, advocacy, ethical stewardship, and creating a data-driven culture.

Key Concepts: Data-driven leadership; communicating risk and uncertainty to diverse stakeholders (board, public, staff); ethical use of population data; advocacy for evidence-based policy.

Managerial Application: Final Capstone Role-Play: As a health director, prepare a persuasive briefing for city council using epidemiologic data to advocate for a specific public health funding initiative, addressing potential counter-arguments.