Al-Farabi Kazakh National University

Faculty Medicine and Health Care

Education program on specialty:

«8D101 Medicine»

Short summary of lectures

On course "Modern Epidemiologic methods

in medicine" 3 credits

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Short summary of lectures on course "Modern Epidemiologic methods in Medicine"

	Content	
Lecture 1	Introduction to modern epidemiologic study in Medicine.	
Lecture 2	Classification of Epidemiologic studies. Observational studies. Descriptive studies. Sampling.	
Lecture 3	Descriptive studies: ecological and cross-sectional studies.	
Lecture 4	Planning and design of an epidemiological study.	
Lecture 5	Overview of observational descriptive studies	
Lecture 6	Analytical studies. Case-control study.	
Lecture 7	Analytical studies. Cohort study.	
Lecture 8	Evaluation and measurement of the occurrence of diseases. Measurement of expose in studies: RR, OR, AR	
Lecture 9	Exposure or outcome. Measurement of expose in studies: RR, OR, AR.	
Lecture 10	Bias and confounding factors in studies.	
Lecture 11	Experimental studies Experimental studies. Randomized controlled trial and non-randomized trial. Stratified, crossover, factorial design and group randomization.	
Lecture 12	Design of clinical trials (phases, safety and effectiveness of drugs).	
Lecture 13	Diagnostic and laboratory tests. Sensitivity and specificity of tests.	
Lecture 14	DEPTH model in Medicine. Implementation of epidemiologic studies in Medicine.	
Lecture 15	Overview of Clinical Trial.Pyramid of evidence.	

Module I. Introduction to modern epidemiologic studies.

Lecture 1. Introduction to modern epidemiologic study in Medicine.
Lecture summary: Epidemiology definition. Core Epidemiologic Functions: Public health surveillance, Field investigation, Analytic studies, Evaluation, Linkages. Meaning of Health, Disease, Population, Study, Research, Design. Disease frequancies, distribution and determinants. History of Epidemiology. Modern Epidemiology.

Epidemiology Purposes in Public Health and Medicine. Descriptive Epidemiology. Analytical Epidemiology. Biomedical and population perspectives. Health outcomes and causes of them. Disease criteria and progression.

Lecture2 Classification of Epidemiologic studies. Observational studies. Descriptive studies. Sampling.
Lecture summary. Classification of Epidemiologic studies. Observational and Interventional, Analytical and Descriptive studies. Terminology, definition, basics and examples. Advantages and limitations. Case report and case series.

Lecture 3. Descriptive studies: ecological and cross-sectional studies.
Lecture summary. Ecological and cross-sectional studies: definition, types, hypothesis, groups vs individual data, fallacy, measures, bias, samples.

Lecture 4. Planning and design of an epidemiological study.
Lecture summary . Problem definition, scientific justification, protocol, design, measurement of associations of exposure to risk factors and disease outcomes, the effect of confounding factors and conclusion. Research Involving Human Subjects. Fund Raising. Scientific Collaborations and Multi-centre. Analysis. Publication.

Lecture 5. Overview of observational descriptive studies
Lecture summary. Study designs. Descriptive studies: case reports vs.case series vs.ecolocial study vs.cross-sectional study. Aims, tasks, using in Medicine, advantages and limitations. Measurement.

Lecture 6. Analytical studies. Case-control study.
Lecture summary. Definition of case-control study. Aim, tasks, groups, sampling, measurement of association, advantage and limitations, using in Medicine. OR, p-value.

Lecture 7. Analytical studies. Cohort study.
Lecture summary. Definition of cohort study. Aim, tasks, groups, sampling, measurement, advantage and limitations, using in Medicine. RR, p-value.

Lecture 8. Evaluation and measurement of the occurrence of diseases. Measurement of expose in studies: RR, OR, AR
Lecture summary. Measurement of disease occurrence: frequency, magnitude, amount of disease in populations. Rates, types of rate. Incidence, Prevalence and Mortality rates (types)., ratio, proportions. Definition, formula and p-value and interpretation of: RR, OR, AR, AR%, PAR, PAR%.

Lecture9. Exposure or outcome. Measurement of expose and outcomes in studies: RR, OR, AR.
Lecture summary. Meaning and type of outcome. Measurement of association. RR, OR, AR, AR%, PAR, PAR%. Possible outcomes in studying the relationship between exposure & disease. Risk Vs Preventive factors.

Lecture 10. Bias and confounding factors in studies.
Lecture summary. Observed Association. Interpretation of Association. Types of Bias. Selection Bias. Examples of Selection Bias. Controlling Selection Bias. Information Bias. Confounding. Types of Statistical Associations. Examples of Confounding. Approaches to the Problem of Confounding.

Lecture 11. Experimental studies. Randomized controlled trial and non-randomized trial. Stratified, crossover, factorial design and group randomization.
Lecture summary. Experimental studies. Classification based on population studies, on design and on objective. Challenges in intervention studies. Randomization, blinding and placebo. Randomized controlled trial and non-randomized trial. Stratified, crossover, factorial design and group randomization. Data Collection and Documentation. Strength and limitations. Examples.

Lecture 12. Design of clinical trials (phases, safety and effectiveness of drugs).
Lecture summary. Design of clinical trials: phases, interventions, estimation of safety and effectiveness of drugs and tests. Data Collection and Documentation.

Lecture 13. Diagnostic tests. Sensitivity and specificity of tests.
Lecture summary. Diagnostic test: normal findings, indications, test explanation, contraindications, complications, procedure and result interpretation, outlining all aspects to understand a given diagnostic test. Sensitivity and specificity of tests. Estimation of significance and using, P-value.

Lecture 14. DEPTH model in Medicine. Implementation of epidemiologic studies in Medicine.
Lecture summary. DEPTH model in Medicine. Diagnostic, etiologic, prognostic and therapeutic research. Implementation of epidemiologic studies in Medicine. Examples.

Lecture 15. Overview of Clinical Trial. Pyramid of evidence.
Lecture summary. Overview of Clinical Trial. Therapy vs. no therapy. Therapy vs. placebo or sham. Therapy A vs. Therapy B. Randomized controlled trial vs. non-randomized trial. Methods of randomization. Types of RCT. Validity. Analysis strategies to avoid bias. Pyramid of evidence.