DEPARTMENT OF EPIDEMIOLOGY, BIOSTATISTICS AND EVIDENCE-BASED MEDICINE

SHORT SUMMARY OF LECTURES

ON DISCIPLINE EPIDEMIOLOGY FOR PHARMACY

6 credits

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Short summary on Epidemiology Lectures

Lecture 1. **Introduction to Epidemiology.**

Definitions: health, sickness, illness, disease, Public Health, Epidemiology, frequency, distribution, determinants, health population, *health-related* condition, application. Hierarchy of Health Sciences. History of Epidemiology. Scope of Epidemiology. Purpose/use and objectives of Epidemiology. Types of Epidemiology: Descriptive and Analytical. Basic Features of Epidemiology. Core Epidemiologic Functions.

Lecture 2. **Concepts of Disease Occurrence. Natural History and Spectrum of Disease. Chain of Infection. Epidemic Disease Occurrence.**

Causation. Epidemiologic Triad. Component causes and causal pies. Natural History and Spectrum of Disease. Chain of Infection. Epidemic Disease Occurrence. Epidemic patterns. Implications for public health.

Lecture 3. **Quantitative and Qualified Epidemiology. Measures of risk: frequency of morbidity and mortality, birth measures. Measures of Association.**

Definitions. Data collection and analysis. Qualitative interviews. Documential analysis. Observation. Generalizability and validity . Frequences. Rates: incidence, prevalence, mortality, birth measures. Measures of association: odd ratio, relative risks. **Chi-square statistics.**

Lecture 4. **Epidemiological Investigation. Investigating an Outbreak.**

Introduction to Investigating of outbreak. Objectives. Steps of outbreak: 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; 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.

Lecture 5. **Public Health Surveillance**.

Introduction. Purpose and Characteristics of Public Health. Surveillance. Identifying Health Problems for Surveillance. Identifying or Collecting Data for Surveillance. Analyzing and Interpreting Data. Disseminating Data and Interpretation..Evaluating and Improving Surveillance.

Lecture 6. **Concepts and Design of Epidemiological Studies. Descriptive studies: case reports, case series, ecological and cross-sectional.**

Concepts of causality and probability. Definition of descriptive studies, case report, case series. Benefits and limitations of ecological and cross-sectional studies. Measures of outcomes.

Lecture 7. **Analytical studies. Case-control study: strength and limitions, using in Medicine. Measures of association or measures of excess risk.**

Structure of analytical studies. Definition of case-control study. Steps in conducting case-control studies. Benefits and limitations of case-control. Measures of association. Validity and accessibility.

Lecture 8. **Analytical studies. Cohort study. strength and limitations, measure association, using in Medicine. Evaluation and measurement of the occurrence of diseases.**

Definition of cohort study. Types of cohort studies. Steps in conducting cohort studies. Sources cases and controls. Measure the level of exposure in cases & controls. Compare the exposure between cases & controls. Advantages and limitations of case-control studies.

Lecture 9. **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).**

Experimental studies**.** Randomized controlled trial. Randomization. Intervention. Comparison groups. Historical and Simultaneous Control Groups. Design of a Randomized Clinical Trial. Gold Standard of Study Designs. Masking. Placebo and blinding. Non-randomized trial. Data collection. Analysis. Types of clinical trials.

Lecture 10. **Bias and confounding factors in studies. Overview of epidemiological studies.** Exposure and Disease Association. From Association to Causation. Approaches for Studying the Etiology of Disease. Observations in Human Populations. Usual Sequence of Studies in Human Subjects. Observed and interpretation of association. Types of bias. Bias and confounding. Types of statistical associations. Approaches to the problem of association.

Lecture 11. **Diagnostic and screening tests. Sensitivity and specificity of tests.**

Definition of screening test. Outcomes in the Screening Decision Tree. Sensitivity and Specificity: Tests of Validity. Positive and Negative Predictive Value: Yield of Screening Test. Calculating Measures of Validity and Yield. Low or High Risk Population? Importance of Prevalence in Screening. Effect of Prevalence on PPV with Constant Sensitivity and Specificity. Screening Program Considerations (Guidelines).

Lecture 12. . **Statistical methods in Epidemiology. Meta-Analysis.**

Statistical inference. Data management. Sample size determinations. Types of parameters. Regression method. Bayesian method. Survival analysis. Measurement of error. Missing data. Meta –Analysis: What is meta-analysis? When is it appropriate to use? Statistical methods. Software programmes. Publishing meta-analyses.

Lecture 13. **DEPTH model in Medicine. Implementation of epidemiologic studies in Medicine.**

DEPTH model: diagnostic, etiology, prognostic and therapeutic issues. Core Concepts in Diagnostic Research. Designing a Diagnostic Study. Designing a Diagnostic Study. Designing a Prognostic Study. Developing and Validating a Prediction Rule.

Lecture 14. **Exposure-Oriented Epidemiology.**

Life-course Epidemiology. Social Epidemiology. Occupational Epidemiology. Environmental Epidemiology. Nutritional Epidemiology. Reproductive Epidemiology. Clinical Epidemiology. Evidence-Based Medicine. Pharmacoepidemiology. Physical Activity Epidemiology. Radiation Epidemiology.

Lecture 15. **Outcome-Oriented Epidemiology.**

Infectious Disease Epidemiology. Cardiovascular Health and Diseases. Cancer Epidemiology. Epidemiology of Diabetes. Epidemiology of Respiratory Diseases. Epidemiology of Tuberculosis.