

Hormozgan University of Medical Sciences
Faculty of Medicine
Department of Community Medicine

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Course Plan

Principles of Epidemiology

1. Course Information

Course Title: Principles of Epidemiology

Course Type: Theoretical

Credit Hours: 2 credits

Program: Doctor of Medicine / Medical Doctor Program

Semester: First Semester, Academic Year 2026–2027

Start Date: 28/06/1405, corresponding to 19/09/2026

Department: Community Medicine

Faculty: Faculty of Medicine

University: Hormozgan University of Medical Sciences

Course Instructor:

Dr. Razie Togholi

Course Coordinator:

Dr. Razie Togholi

2. Course Description

The course “Principles of Epidemiology” is designed to introduce medical students to the basic concepts, principles, and methods of epidemiology. Epidemiology is a core discipline in medicine and public health that studies the distribution, determinants, and control of health-related events in populations.

This course helps students understand how diseases occur in populations, how health problems are measured, how risk factors are identified, and how epidemiological evidence is used in prevention, clinical decision-making, health planning, and health policy. The course also provides students with a foundation for understanding medical research, disease surveillance, outbreak investigation, screening programs, and evidence-based medicine.

For international medical students, this course emphasizes both global epidemiological principles and practical examples relevant to communicable diseases, non-communicable diseases, environmental exposures, occupational health, and health system challenges.

3. General Objectives

By the end of this course, students are expected to be able to:

Explain the meaning, scope, and uses of epidemiology in medicine and public health.

Describe the concepts of disease distribution and determinants.

Measure disease frequency using incidence, prevalence, mortality, and morbidity indicators.

Interpret basic epidemiological measures of association.

Describe the natural history of disease and levels of prevention.
Explain the main types of epidemiological studies.
Differentiate between descriptive, analytical, and experimental studies.
Understand the principles of screening and diagnostic test evaluation.
Explain the concepts of bias, confounding, validity, and reliability.
Describe the basic steps of outbreak investigation.
Understand the role of surveillance systems in disease control.
Apply epidemiological thinking to clinical and public health problems.

4. Specific Learning Objectives

At the end of the course, students should be able to:

Define epidemiology and describe its historical development.
Explain the terms population, exposure, outcome, risk factor, determinant, epidemic, endemic, pandemic, and outbreak.
Describe the person, place, and time distribution of disease.
Calculate and interpret prevalence and incidence.
Differentiate between cumulative incidence and incidence rate.
Explain crude, specific, and adjusted rates.
Calculate and interpret mortality indicators such as crude death rate, cause-specific mortality rate, case fatality rate, infant mortality rate, and maternal mortality ratio.
Describe the natural history of disease and the prevention spectrum.
Explain the epidemiological triad and chain of infection.
Describe the main characteristics of cross-sectional, case-control, cohort, ecological, and experimental studies.
Identify the advantages and limitations of different study designs.
Calculate and interpret risk ratio, odds ratio, attributable risk, and population attributable risk at a basic level.
Explain the concepts of sensitivity, specificity, positive predictive value, and negative predictive value.
Describe the criteria for a suitable screening program.
Identify common types of bias in epidemiological studies.
Explain confounding and basic approaches to its control.
Describe the purpose and components of public health surveillance.
Explain the basic steps of investigating an outbreak.
Use epidemiological evidence to support prevention and control strategies.

5. Teaching and Learning Methods

Interactive lectures
Class discussions
Problem-solving exercises
Analysis of epidemiological tables and graphs
Case-based learning
Small group activities
Interpretation of simple epidemiological scenarios
Review of selected real or hypothetical outbreak examples
Short student presentations
Application of epidemiological concepts to clinical and public health problems

6. Course Schedule

Session	Date	Topic	Main Contents
1	28/06/1405	Introduction to Epidemiology	Definition, scope, history, uses of epidemiology in medicine and public health
2	04/07/1405	Basic Epidemiological Concepts	Population, exposure, outcome, determinant, risk factor, epidemic, endemic, pandemic, outbreak
3	11/07/1405	Disease Distribution	Distribution by person, place, and time; descriptive epidemiology
4	18/07/1405	Measures of Disease Frequency I	Prevalence, point prevalence, period prevalence, incidence, cumulative incidence
5	25/07/1405	Measures of Disease Frequency II	Incidence rate, morbidity indicators, crude, specific, and adjusted rates
6	02/08/1405	Mortality Indicators	Crude death rate, cause-specific mortality rate, case fatality rate, infant mortality rate, maternal mortality ratio
7	09/08/1405	Natural History of Disease and Prevention	Natural history of disease, spectrum of disease, levels of prevention
8	16/08/1405	Epidemiology of Communicable Diseases	Epidemiological triad, chain of infection, transmission routes, control measures
9	23/08/1405	Screening and Diagnostic Tests	Screening concepts, sensitivity, specificity, predictive values, criteria for screening programs
10	30/08/1405	Descriptive and Ecological Studies	Descriptive studies, case reports, case series, ecological studies, advantages and limitations
11	07/09/1405	Cross-Sectional Studies	Design, uses, prevalence studies, strengths and limitations
12	14/09/1405	Case-Control Studies	Design, selection of cases and controls, odds ratio, advantages and limitations
13	21/09/1405	Cohort Studies	Prospective and retrospective cohort studies, risk ratio, incidence, advantages and limitations
14	28/09/1405	Experimental Studies	Clinical trials, field trials, community trials, randomization, ethical considerations

Session	Date	Topic	Main Contents
15	05/10/1405	Bias, Confounding, and Causality	Types of bias, confounding, validity, reliability, causal association
16	12/10/1405	Surveillance, Outbreak Investigation, and Course Review	Public health surveillance, outbreak investigation steps, review of key concepts

7. Student Responsibilities

Students are expected to:

- Attend all sessions regularly and punctually.
- Participate actively in classroom discussions and group activities.
- Review assigned materials before selected sessions.
- Complete classroom exercises and short assignments.
- Interpret simple epidemiological tables, graphs, and scenarios.
- Apply epidemiological concepts to clinical and community health problems.
- Respect academic ethics and professional behavior during all course activities.

8. Assessment Methods

- Class attendance and active participation: 10%
- Class assignments and problem-solving exercises: 20%
- Midterm exam or quiz: 20%
- Final examination: 50%

Total: 100%

9. Recommended References

- Park's Textbook of Preventive and Social Medicine
- Gordis Epidemiology
- Basic Epidemiology, World Health Organization
- Modern Epidemiology by Rothman, Greenland, and Lash
- CDC Principles of Epidemiology in Public Health Practice
- Selected educational materials approved by the Ministry of Health and Medical Education
- Selected scientific articles and examples related to communicable and non-communicable disease epidemiology

10. Course Policies

- Class attendance is required according to the educational regulations of Hormozgan University of Medical Sciences.
- Excessive absence will be handled according to university rules.
- Students are expected to participate respectfully and professionally in all classroom activities.
- Assignments must be submitted on time.
- Academic honesty is required in all written and oral activities.
- Mobile phone use during class should be limited to educational purposes.
- The final grade will be calculated based on the assessment methods described above.

11. Expected Course Outcomes

After successfully completing this course, students should be able to understand and apply the basic principles of epidemiology in medical and public health settings. They should be able to describe disease patterns in populations, calculate and interpret basic epidemiological measures, recognize different study designs, understand screening and surveillance, and use epidemiological evidence to support prevention, diagnosis, control, and health planning.