

**HAMDARD INSTITUTE OF MEDICAL SCIENCES AND
RESEARCH
Department of Community Medicine**

**Electives on Field Epidemiology and Basic Principles of
Epidemiology**

Name of Elective:	Field Epidemiology and Basic Principles of Epidemiology
Name of Supervisor:	Dr. Mukesh Kumar, Assistant Professor
Name of Co-Supervisor:	Dr. Sarah Ali Habib, Assistant Professor
Department:	Department of Community Medicine
Duration:	15 days
Intake:	05 Students

Introduction

In today's rapidly evolving public health landscape, field epidemiology and epidemiological methods have become fundamental to understanding disease occurrence, identifying determinants of health, investigating outbreaks, and informing evidence-based public health policies and interventions. These methods provide a structured framework for the systematic collection, analysis, interpretation, and dissemination of health data, enabling researchers and public health practitioners to detect disease trends, evaluate risk factors, measure the impact of preventive strategies, and assess the performance of health programs.

The growing burden of emerging and re-emerging infectious diseases, non-communicable diseases, and other global health challenges underscores the need to strengthen expertise in field epidemiology and the application of sound epidemiological methods.

Department of Community Medicine is providing opportunity for MBBS students to learn field epidemiology and related activities such as disease surveillance, outbreak investigations, screening initiatives, and emergency response.

Field epidemiologists generate timely and reliable evidence that supports effective decision-making and the implementation of appropriate prevention and control measures.

Led by skilled and experienced mentors, this course will be a great help if learners are interested in turning thoughts into papers and standing out in the academic and research community.

Objectives

This course will provide the opportunity for MBBS student to

1. Understand basic epidemiological concepts.
2. Describe measures of disease frequency and association.
3. Learn descriptive and analytical epidemiology.
4. Understand surveillance and outbreak investigation.
5. Apply epidemiological methods to common health conditions.

Proposed Activities

Following activities will be undertaken during the course duration:

- **Classroom sessions for detailed learning activities on topics-**
 - Introduction to Epidemiological concepts
 - Measures of disease frequency (incidence, prevalence)
 - Measure of Association (RR, OR, AR etc)
 - Types of Epidemiological Study Design (Descriptive, Analytical)

- **Hand on approach for the following topics-**
 - Disease Surveillance
 - Outbreak Investigation
 - Screening Tests
 - Interpretation of Epidemiological data
 - Interpretation of Epidemic curve

- **Field Visits/Practical Sessions-**
 - Field visit to health facility/community (wherever feasible)
 - Short Field Study

Expected Outcomes

By the end of the course, the MBBS student is expected to be skilled in

1. Explain the basic concepts and principles of epidemiology and their application in public health and clinical practice.
2. Calculate and interpret common measures of disease frequency, and measures of association.
3. Differentiate between descriptive and analytical epidemiological study designs and identify their appropriate applications.
4. Describe the principles and components of disease surveillance systems and their role in disease prevention and control.
5. Demonstrate the basic steps involved in the investigation of a disease outbreak.
6. Explain the principles of screening, including the characteristics of an ideal screening test, and interpret common screening test indicators (sensitivity, specificity, predictive values).
7. Collect, organize, and present data from a short field study using basic epidemiological methods.
8. Communicate epidemiological findings effectively through oral presentations and brief written reports.

Conclusion

The proposed activities aim to bridge the gap between medical research and statistical methodologies, fostering a culture of data-driven inquiry in healthcare. By equipping researchers with the necessary skills to use statistical software effectively, this initiative will contribute significantly to advancing the quality and impact of medical research.

Assessment Guidelines

- Assessment will align with the general assessment pattern document of CBME.
- Students should maintain and submit a logbook with all academic and non-academic activities, along with their stories and reflections about each event.
- Students will be assessed during and at the end of each elective posting.
- Feedback, comments, and/or grades about the student's performance by the faculty mentor will be documented with the help of a checklist, including both professional and academic attributes.
- 75% attendance is mandatory for each block of electives.

Teaching Learning Methods

The following strategy is used for organizing teaching learning activities:

1. Interactive Lectures are used for teaching the basic principles of Epidemiology and Field epidemiology.
2. Field visits
3. Surveillance and Screening exercises
4. Seminars presentations of common topics.
5. Self-directed learning
6. Mini field investigation.

Course Contents

- Introduction to Epidemiology
- Epidemiological triad
- Natural History of disease
- Measures of morbidity and mortality
- Measures of association
- Surveillance and Screening
- Investigation of Outbreak
- Data Interpretation
- Practical Exercises

Log book:

Attached Separately

HAMDARD INSTITUTE OF MEDICAL SCIENCES AND RESEARCH

Department of Community Medicine

Electives on Applications of Statistical Software in Medical Research

Name of Elective:	Application of Statistical Software in Medical Research
Name of Supervisor:	Dr. Azhar Uddin, Assistant Professor (Statistician)
Name of Co-Supervisor:	Dr. Asma Aftab, Assistant Professor
Department:	Department of Community Medicine
Duration:	15 days
Intake:	05 Students

Introduction

In the modern era of medical research, the application of statistical software has become indispensable for analyzing complex datasets, interpreting findings, and ensuring the validity and reproducibility of results. Statistical software, such as Excel, SPSS and R, offers powerful tools for conducting diverse analyses ranging from descriptive statistics to advanced modeling techniques like survival analysis, machine learning, and predictive modeling.

Medical research benefits immensely from these tools, as they enable researchers to uncover patterns, identify risk factors, and assess interventions with a high degree of accuracy. The growing demand for data-driven decision-making in healthcare further emphasizes the need for equipping researchers and practitioners with statistical software proficiency.

This proposal outlines a series of research activities designed to explore, implement, and disseminate the application of statistical

software in medical research. These activities aim to enhance methodological rigor, foster interdisciplinary collaboration, and build capacity among researchers.

Objectives

This course will provide the opportunity for MBBS student to

1. To provide hands-on training for medical researchers on statistical software tools relevant to healthcare research.
2. To apply statistical software for analyzing real-world datasets in areas such as epidemiology, clinical trials, and public health.
3. To develop guidelines and workflows for integrating statistical software into routine medical research processes.
4. To evaluate the role of some basic and advanced statistical techniques in improving the quality of medical research outcomes.

Proposed Activities

1. Training Programs

- Introduction of types of Statistical software such as Excel, SPSS and R.
- Topics include data cleaning, visualization, hypothesis testing and regression modeling.
- Target datasets: Analyze of primary and secondary datasets.

2. Research Projects

- Use case studies to demonstrate the practical application of software in areas like disease prevalence, vaccine efficacy, and health economics.

3. Learning Resources

- Online tutorials, manuals, and video lectures to make statistical software accessible.
- Focus on case-based learning to highlight real-world medical research applications.

4. Publication of Research Findings

- Analyze medical datasets using statistical software and publish findings in peer-reviewed journals.

- Topics may include risk factor analysis, prevalence studies, and treatment outcome evaluations.

5. Evaluation of Software Tools

- Compare the performance of different statistical software packages in handling medical research datasets.
- Assess usability, efficiency, and accuracy to guide researchers in selecting the right tools.

Expected Outcomes

By the end of the course, the MBBS student is expected to be skilled in

- Enhanced capacity among researchers to utilize statistical software for robust medical research.
- High-quality research outputs that inform evidence-based decision-making in healthcare.
- Establishment of a knowledge base and resources that can be utilized by the medical research community.
- Increased interdisciplinary collaboration between statisticians, medical researchers, and healthcare providers.

Conclusion

The proposed activities aim to bridge the gap between medical research and statistical methodologies, fostering a culture of data-driven inquiry in healthcare. By equipping researchers with the necessary skills to use statistical software effectively, this initiative will contribute significantly to advancing the quality and impact of medical research.

Assessment Guidelines

- Assessment will align with the general assessment pattern document of CBME.
- Students should maintain and submit a logbook with all academic and non-academic activities, along with their stories and reflections about each event.

- Students will be assessed during and at the end of each elective posting.
- Feedback, comments, and/or grades about the student's performance by the faculty mentor will be documented with the help of a checklist, including both professional and academic attributes.
- 75% attendance is mandatory for each block of electives.

TEACHING LEARNING METHODS

The following strategy is used for organizing teaching learning activities:

7. Interactive Lectures are used for teaching the basic principles of statistical data analysis.
8. Tutorials and hands on activities
9. Seminars presentations of case studies
10. Self-directed learning
11. Problem solving in Epidemiology and Biostatistics using computers provides opportunity for skill development for the students

COURSE CONTENTS

- Introduction of Medical Research and its benefits in healthcare
- Different types of use of Epidemiology Study design in Medical Research
- Ethics of use of Medical Data in Research

- Introduction of different types of data used in Medical Research
- Introduction of Statistical methods in Medical Research
- Introduction of Statistical software (Excel, SPSS and R)
- Data Analysis using statistical software
- Data presentation and interpretation
- Practical Exercises
- Writing statistical analysis in publication

Log book:

Attached Separately

