Epidemiological Research Methods Training Course

Professional Development Training Course Outline

Category	Public Health	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Epidemiological research methods form the backbone of modern public health surveillance, disease prevention, and evidence-based healthcare decision-making. In an era defined by emerging infectious diseases, global pandemics, climate-sensitive health risks, and data-driven health systems, mastering epidemiology has become essential for researchers, clinicians, policymakers, and data scientists. Epidemiological Research Methods Training Course provides a comprehensive foundation in advanced epidemiological study designs, biostatistics, outbreak investigation, causal inference, and public health analytics, enabling participants to generate reliable, actionable, and policy-relevant evidence.

With the rise of big data analytics, AI-driven epidemiology, digital health surveillance, One Health approaches, and global health security frameworks, the demand for skilled epidemiologists continues to grow. This course integrates classical epidemiological principles with modern tools such as R programming, Python for epidemiology, GIS mapping, real-time disease tracking systems, and machine learning for predictive modeling, ensuring learners are equipped for both field-based and computational epidemiology roles.

Programme Curriculum

Epidemiological Research Methods Training Course

Introduction

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Course Duration

10 days

Course Objectives

1. Master core principles of descriptive, analytical, and experimental epidemiology
2. Apply advanced biostatistics and inferential statistical modeling
3. Design and evaluate cohort, case-control, and cross-sectional studies
4. Conduct outbreak investigation and epidemic response analysis
5. Develop skills in public health surveillance systems and real-time monitoring
6. Understand causal inference and confounding bias adjustment techniques
7. Utilize R, Python, and STATA for epidemiological data analysis
8. Integrate GIS mapping and spatial epidemiology tools
9. Apply machine learning in predictive disease modeling
10. Strengthen competencies in infectious disease modeling and transmission dynamics
11. Interpret and critique peer-reviewed epidemiological literature
12. Implement One Health and global health security frameworks
13. Translate epidemiological findings into public health policy and intervention strategies

Target Audience

1. Public health professionals and epidemiologists
2. Medical doctors and clinical researchers
3. Biostatisticians and data scientists
4. Laboratory scientists in infectious diseases
5. Health policy makers and government health officers
6. NGO and humanitarian health workers
7. Academic researchers and postgraduate students
8. AI and health informatics specialists

Course Modules

Module 1: Foundations of Epidemiology

- History and evolution of epidemiology
- Epidemiological triad and disease causation
- Measures of disease frequency
- Health indicators and burden of disease
- Case Study: Cholera outbreaks in urban settlements

Module 2: Study Designs in Epidemiology

- Observational vs experimental studies
- Cohort study design principles
- Case-control methodology
- Cross-sectional surveys
- Case Study: COVID-19 vaccine effectiveness studies

Module 3: Biostatistics for Epidemiology

- Descriptive statistics and probability theory
- Hypothesis testing
- Confidence intervals
- Regression models
- Case Study: Malaria incidence statistical modeling

Module 4: Disease Surveillance Systems

- Passive and active surveillance
- Syndromic surveillance systems
- Digital surveillance tools
- Data reporting frameworks
- Case Study: Ebola surveillance systems in West Africa

Module 5: Outbreak Investigation

- Steps in outbreak response
- Case definition development
- Hypothesis generation and testing
- Contact tracing methods
- Case Study: COVID-19 cluster investigations

Module 6: Infectious Disease Epidemiology

- Transmission dynamics
- Basic reproduction number (R0)
- Endemic vs epidemic patterns
- Vaccination impact studies
- Case Study: Measles resurgence analysis

Module 7: Chronic Disease Epidemiology

- Risk factor identification
- Longitudinal disease tracking
- Lifestyle and NCD burden
- Prevention strategies
- Case Study: Diabetes epidemiology trends

Module 8: Environmental & Climate Epidemiology

- Environmental risk factors
- Climate change and health impacts
- Pollution exposure assessment
- Disaster epidemiology

- Case Study: Heatwave mortality studies

Module 9: Spatial Epidemiology (GIS)

- Mapping disease distribution
- Spatial clustering techniques
- Geo-statistical analysis
- Hotspot identification
- Case Study: Malaria hotspot mapping in Africa

Module 10: Molecular Epidemiology

- Genetic markers of disease
- Pathogen sequencing
- Molecular tracing techniques
- Evolutionary epidemiology
- Case Study: COVID-19 variant tracking

Module 11: Public Health Informatics

- Health information systems
- Digital health dashboards
- Data interoperability
- Electronic health records analysis
- Case Study: National health MIS systems

Module 12: Data Science in Epidemiology

- Big data analytics
- Machine learning models
- Predictive modeling
- Data visualization tools
- Case Study: Influenza outbreak prediction

Module 13: Causal Inference Methods

- Confounding and bias control
- Propensity score matching
- Directed acyclic graphs (DAGs)
- Counterfactual analysis
- Case Study: Smoking and lung cancer studies

Module 14: Global Health Security

- Pandemic preparedness frameworks
- International health regulations (IHR)
- Emergency response systems
- One Health integration
- Case Study: COVID-19 global response evaluation

Module 15: Applied Epidemiological Research Project

- Research proposal development

- Data collection and analysis
- Ethical approval processes
- Scientific writing and publication
- Case Study: Field-based outbreak investigation project

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price

23 Nov 2026	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

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