# Spatial Statistics for Disease Mapping Training Course

Professional Development Training Course Outline

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|---|---|---|---|
| **Category** | Research and Data Analysis | **Duration** | 5 Days |
| **Base Fee** | $1,500 USD | **Delivery Mode** | Online / On-site Hybrid |

## Course Introduction

In today’s data-driven public health landscape, spatial statistics plays a critical role in disease mapping, health surveillance, and epidemiological modeling. Spatial Statistics for Disease Mapping Training Course is designed to equip researchers, public health professionals, and data analysts with advanced spatial analysis techniques to identify disease clusters, detect outbreaks, and improve health resource allocation. By leveraging GIS tools, spatial data modeling, and statistical software, participants will gain the expertise to visualize and interpret spatial patterns of diseases, contributing to effective public health interventions and policy-making.

This highly practical and interactive course emphasizes real-world applications of spatial epidemiology, geostatistical analysis, and Bayesian mapping techniques. Participants will engage with case studies focusing on diseases such as malaria, COVID-19, tuberculosis, and cancer, and learn to work with datasets from international health organizations. The course enhances analytical thinking and empowers learners to apply cutting-edge spatial analysis tools in both urban and rural health contexts, ensuring precise disease tracking and health risk assessment.

## Programme Curriculum

**Spatial Statistics for Disease Mapping Training Course**

**Introduction**

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**Course Objectives**

1. Understand the fundamentals of spatial statistics in health research.
2. Apply GIS-based disease mapping for epidemiological surveillance.
3. Analyze spatial autocorrelation and disease clustering patterns.
4. Use Bayesian hierarchical models for health data interpretation.
5. Integrate geostatistical methods for environmental health monitoring.
6. Employ spatial regression analysis for risk factor modeling.
7. Visualize disease patterns using QGIS, ArcGIS, and R.
8. Conduct spatiotemporal analysis to track disease progression.
9. Design data-driven health interventions using spatial insights.
10. Perform risk mapping and hotspot detection for public health.
11. Manage health-related geospatial data for decision-making.
12. Critically evaluate case studies in epidemiological modeling.
13. Enhance skills in open-source spatial analysis tools.

**Target Audiences**

1. Epidemiologists and public health officers
2. GIS and spatial data analysts
3. Health data scientists
4. Environmental health specialists
5. University researchers and students
6. Healthcare policymakers
7. International health NGO professionals
8. Government health planners

**Course Duration:** 5 days

**Course Modules**

**Module 1: Introduction to Spatial Epidemiology**

- Concepts of disease mapping
- Importance of spatial statistics in public health
- Overview of spatial data types and sources
- Mapping disease incidence and prevalence
- Tools and software for spatial analysis
- **Case Study:** Malaria distribution mapping in Sub-Saharan Africa

**Module 2: Spatial Data Collection and Management**

- Health-related spatial data sources
- Geocoding and data cleaning techniques
- Data standardization and metadata
- Ethical considerations in health data use
- Handling missing spatial data
- **Case Study:** COVID-19 contact tracing and spatial data integrity

**Module 3: GIS Applications in Disease Mapping**

- GIS principles and tools overview
- Layering health and environmental data
- Geovisualization of disease data
- Creating choropleth and heat maps
- Basic spatial queries and analysis
- **Case Study:** Mapping cancer incidence with ArcGIS

**Module 4: Spatial Autocorrelation and Clustering**

- Moran's I and Geary's C statistics
- Global and local clustering techniques
- Hot spot analysis and significance testing
- Detecting spatial patterns in health data
- Interpretation of clustering results
- **Case Study:** Tuberculosis cluster detection in urban slums

**Module 5: Spatial Regression and Modeling**

- Spatial linear regression
- Geographically Weighted Regression (GWR)
- Multivariate spatial models
- Interpreting regression outputs
- Model validation and accuracy
- **Case Study:** Air pollution and asthma correlation modeling

**Module 6: Bayesian Approaches to Disease Mapping**

- Introduction to Bayesian statistics
- Hierarchical modeling for disease rates
- Software for Bayesian analysis (WinBUGS, R-INLA)
- Prior selection and model convergence
- Communicating Bayesian results
- **Case Study:** Bayesian mapping of COVID-19 mortality

**Module 7: Spatiotemporal Disease Analysis**

- Time-series spatial modeling
- Emerging hotspot analysis
- Disease diffusion models
- Interactive dashboards for time tracking
- Forecasting with spatiotemporal data
- **Case Study:** Ebola outbreak progression in West Africa

**Module 8: Policy Application and Risk Communication**

- Translating maps into policy
- Communicating spatial findings to stakeholders
- Interactive web-based health maps
- Community-level health risk reporting
- Integrating spatial insights into health planning
- **Case Study:** Risk mapping for dengue control in Southeast Asia

**Training Methodology**

- Hands-on exercises with real-world datasets

- Case-based learning and group discussions
- Step-by-step software demonstrations (QGIS, R, ArcGIS)
- Data visualization and interpretation projects
- Pre- and post-assessment evaluations
- Continuous support and access to learning materials

**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** | 27 Nov 2026 | Online | $1,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $1,500 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $3,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $3,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $6,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $4,500 |

| Start Date | End Date | Location | Price |
|---|---|---|---|
| **23 Nov 2026** | 27 Nov 2026 | Physical | $6,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $6,000 |

Ready to enroll or request a customized program? Book online or contact us:

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