Big Data in Epidemiology 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

Big Data in Epidemiology is revolutionizing public health by enabling real-time disease tracking, predictive outbreak modeling, and evidence-based decision-making using massive, diverse datasets. Big Data in Epidemiology Training Course equips learners with cutting-edge skills in data analytics, machine learning, genomic epidemiology, and digital health surveillance. Participants will explore how structured and unstructured data from electronic health records, mobile health apps, social media signals, and genomic sequencing are transforming modern epidemiological intelligence.

With the rise of global health threats such as pandemics, antimicrobial resistance, and climate-driven disease patterns, Big Data analytics has become essential for rapid response and prevention strategies. This course integrates advanced computational tools, AI-driven modeling, and spatial-temporal analytics to empower professionals to extract actionable insights for disease prevention, control, and health system strengthening at scale.

Programme Curriculum

Big Data in Epidemiology Training Course

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Course Duration

10 days

Course Objectives

1. Master Big Data analytics in epidemiology for real-time disease surveillance
2. Apply machine learning models for outbreak prediction
3. Integrate AI-powered public health intelligence systems
4. Analyze electronic health records (EHR) for epidemiological insights
5. Utilize geospatial analytics for disease mapping
6. Leverage real-time syndromic surveillance systems
7. Process unstructured health data from social media and mobile apps
8. Apply genomic epidemiology and pathogen sequencing analytics
9. Build predictive models for pandemic preparedness
10. Implement cloud-based epidemiological data pipelines
11. Conduct time-series analysis for disease trend forecasting
12. Enhance data-driven health policy formulation
13. Strengthen digital epidemiology and population health monitoring systems

Target Audience

1. Public Health Professionals
2. Epidemiologists and Biostatisticians
3. Data Scientists in Healthcare
4. Medical Researchers and Academics
5. Health Informatics Specialists
6. Government Health Policy Makers
7. NGO and Global Health Workers
8. Graduate Students in Public Health, Data Science, or Medicine

Course Modules

Module 1: Introduction to Big Data in Epidemiology

- Concepts of big data in health sciences
- Data sources in epidemiology
- Structured vs unstructured health data
- Role of AI in epidemiology
- Case Study: COVID-19 global data dashboards

Module 2: Data Collection Systems in Public Health

- Electronic health records integration
- Mobile health (mHealth) data collection
- Wearable health devices
- Surveillance systems
- Case Study: WHO disease surveillance systems

Module 3: Data Cleaning and Preprocessing

- Data normalization techniques
- Handling missing epidemiological data
- Outlier detection
- Data standardization frameworks
- Case Study: Dengue data preprocessing in Southeast Asia

Module 4: Descriptive Epidemiology Analytics

- Incidence and prevalence modeling
- Mortality trend analysis
- Data summarization techniques
- Visualization dashboards
- Case Study: Malaria incidence mapping in Africa

Module 5: Predictive Modeling in Epidemiology

- Regression and classification models
- Machine learning algorithms
- Risk prediction models
- Validation techniques
- Case Study: Influenza outbreak forecasting

Module 6: Spatial Epidemiology & GIS

- Geographic Information Systems (GIS)
- Hotspot detection
- Spatial clustering methods
- Mapping disease spread
- Case Study: Cholera outbreak mapping in Haiti

Module 7: Time-Series Analysis

- Seasonal disease modeling
- Trend decomposition
- Forecasting models
- ARIMA and LSTM applications
- Case Study: COVID-19 wave prediction

Module 8: Genomic Epidemiology

- Pathogen sequencing data analysis
- Mutation tracking
- Phylogenetic analysis
- Genomic surveillance systems
- Case Study: SARS-CoV-2 variant tracking

Module 9: Syndromic Surveillance Systems

- Early warning systems
- Emergency data reporting

- Real-time monitoring tools
- Signal detection techniques
- Case Study: Ebola outbreak early detection

Module 10: Social Media & Digital Epidemiology

- Infodemiology concepts
- Social media trend mining
- NLP in health surveillance
- Misinformation tracking
- Case Study: Twitter-based flu monitoring

Module 11: Cloud Computing in Epidemiology

- Cloud data architecture
- Scalable health databases
- Distributed computing systems
- Data security in cloud platforms
- Case Study: Cloud-based COVID dashboards

Module 12: AI & Machine Learning in Disease Prediction

- Deep learning models
- Neural networks in epidemiology
- Feature engineering
- Model optimization
- Case Study: AI-based cancer prediction models

Module 13: Health Data Visualization

- Dashboard design principles
- Interactive visualization tools
- Storytelling with data
- Real-time analytics dashboards
- Case Study: WHO COVID-19 visualization portal

Module 14: Public Health Decision Support Systems

- Evidence-based policy tools
- Decision analytics
- Simulation modeling
- Resource allocation systems
- Case Study: Vaccine distribution optimization

Module 15: Future of Digital Epidemiology

- AI-driven epidemiological ecosystems
- IoT in health monitoring
- Blockchain in health data security
- Ethical considerations
- Case Study: Smart city health surveillance systems

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

Start Date	End Date	Location	Price
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

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

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