AI & Big Data in Health Research: Tools & Apps

18 – 22 October 2026
Johannesburg

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AI & Big Data in Health Research: Tools & Apps

Ref: 103600495_109758 **Date:** 18 – 22 October 2026 **Location:** Johannesburg **Fees:** 4500 Euro

Course Overview

This program provides a comprehensive and practical understanding of how AI and big data analytics are transforming modern health research, public health systems, and clinical studies. Participants explore AI in health research, big data analytics in healthcare, healthcare data science, and data-driven health research, learning how to translate health datasets into meaningful insights that support better decisions and improved health outcomes. The course highlights practical applications of machine learning in health research, predictive analytics in healthcare, public health data analytics, and digital health analytics to strengthen evidence-based practice.

Attendees gain a clear understanding of how AI healthcare analytics and medical big data analytics enhance disease detection, monitoring, research quality, treatment planning, and health system performance. Practical examples are used to illustrate real use-cases involving health informatics with AI, AI for epidemiology, and clinical data analytics training. By the end of the course, participants will be able to assess, interpret, and apply AI and big data techniques to health research and public health challenges using structured, method-driven learning.

Target Audience

- Public health professionals
- Clinical researchers
- Health data analysts and data scientists
- Health informatics teams
- Epidemiologists
- Government health officers
- Research coordinators
- Healthcare strategy and planning teams

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Targeted Organizational Departments

- Public health departments
- Clinical research units
- Healthcare analytics departments
- Health informatics and IT transformation
- Epidemiology and surveillance teams
- Digital health and innovation units
- Research and development divisions
  These benefit from AI in health research, big data analytics in healthcare, healthcare data science, and public health data analytics.

Targeted Industries

- Health ministries
- Public health agencies
- Hospitals and healthcare systems
- Pharmaceutical and biotechnology companies
- Insurance and health financing
- Clinical research organizations
- Universities and research institutes
- Digital health and med-tech companies

Course Offerings

By the end of this course, participants will be able to:

- Apply AI in health research for better data interpretation
- Use big data analytics in healthcare for advanced decision-making
- Utilize predictive analytics in healthcare and machine learning in health research
- Conduct data-driven health research and public health data analytics
- Implement clinical data analytics training methods for research teams
- Apply digital health analytics and health informatics with AI
- Evaluate medical big data analytics and integrate findings into research processes

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Training Methodology

The course uses case studies, scenario analysis, group work, and structured exercises focused on AI in health research, big data analytics in healthcare, predictive analytics in healthcare, and digital health analytics. Participants engage in real-world problem-solving, guided discussions, and collaborative exploration of health datasets to strengthen analytical capabilities without requiring programming experience.

Course Toolbox

- AI and big data health research use-case summaries
- Templates for analysis and reporting
- Checklists for research readiness
- Structured frameworks for data-driven health research
  Note: Tools are not provided; participants receive insights and examples only.

Course Agenda

Day 1: Foundations of AI and Big Data in Health Research

- **Topic 1:** Introduction to AI in health research and data-driven health research
- **Topic 2:** Big data analytics in healthcare: foundations and applications
- **Topic 3:** Healthcare data science fundamentals
- **Topic 4:** Public health data analytics and population-level insights
- **Topic 5:** Digital health analytics and mobile health data
- **Reflection & Review:** How AI and big data are reshaping modern health research

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Day 2: Applied AI for Clinical and Public Health Research

- **Topic 1:** AI healthcare analytics for clinical decision support
- **Topic 2:** Predictive analytics in healthcare and risk modeling
- **Topic 3:** Machine learning in health research for pattern detection
- **Topic 4:** AI for epidemiology and surveillance systems
- **Topic 5:** Medical big data analytics for advanced research interpretation
- **Reflection & Review:** The impact of AI and analytics on clinical and public health quality

Day 3: Data Engineering and Health Informatics

- **Topic 1:** Healthcare data preparation, integration, and preprocessing
- **Topic 2:** Health informatics with AI for improved interoperability
- **Topic 3:** Managing structured and unstructured health data
- **Topic 4:** Digital transformation using big data health research methods
- **Topic 5:** Clinical data analytics training for research teams
- **Reflection & Review:** Strengthening research outcomes through better data management

Day 4: Advanced Analytical Techniques in Health Research

- **Topic 1:** Predictive modeling and forecasting for health systems
- **Topic 2:** Evaluating AI models and ensuring reliability in healthcare analytics
- **Topic 3:** Public health data analytics for disease trends and early warnings
- **Topic 4:** Digital health analytics for real-time and wearable data
- **Topic 5:** Advanced AI and big data applications in medical research
- **Reflection & Review:** Key challenges and opportunities in advanced analytics

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Day 5: Implementation, Future Trends, and Strategic Integration

- **Topic 1:** Strategic integration of AI and big data in healthcare organizations
- **Topic 2:** Practical applications of machine learning in health research
- **Topic 3:** Predictive analytics in healthcare operations and planning
- **Topic 4:** AI for health systems and future public health innovation
- **Topic 5:** Building long-term data-driven research and performance frameworks
- **Reflection & Review:** Final integration of course concepts and future roadmap

FAQ

What specific qualifications or prerequisites are needed for participants before enrolling in the course?

Participants benefit from having basic knowledge of health systems, research concepts, or data interpretation. No programming or AI background is required.

How long is each day's session, and is there a total number of hours required for the entire course?

Each day's session lasts around 4–5 hours. The full course spans approximately 20–25 hours over five days.

Is AI reliable enough to be used in health research and public health analysis?

AI strengthens reliability by analyzing large, complex datasets and uncovering hidden patterns. When combined with expert interpretation and proper validation, AI significantly enhances research accuracy and decision-making.

How This Course is Different

This course is designed specifically for health-sector professionals who need to understand AI and big data analytics without requiring programming expertise. It focuses on applying AI in health research, predictive analytics in healthcare, healthcare data science, and public health data analytics through real-world scenarios and structured frameworks. Participants learn exactly how to use AI healthcare analytics, health informatics with AI, and medical big data analytics to solve practical challenges in clinical research, hospital decision-making, and public health analysis. The program emphasizes clarity, applicability, and measurable outcomes, offering insights that can be used immediately in research environments, ministries, hospitals, and global health organizations.