



Healthcare Data Analytics Course: Hospital KPIs, Case-Mix and Performance Dashboards

27 September – 8 October 2027

Barcelona - Eixample district four-star



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Ref: 1476_24228 **Date:** 27 September – 8 October 2027 **Location:** Barcelona - Eixample district four-star **Fees:** 42300 SAR

Introduction:

Healthcare data analytics for hospital KPIs, case-mix and performance dashboards is a 10-day course for hospital performance, quality, finance, health information and planning analysts that ends with a Hospital Performance Dashboard and Insight Report built from case data. Many hospitals publish indicators that clinicians dispute because definitions, data quality checks and case-mix adjustment differ between reports, so meetings debate the numbers instead of acting on them. Nominees already extract and report activity data, and work through a modelling build in Excel, Power BI and Python. CoreConcept Training Center delivers this healthcare data analytics course.

Course Objectives:

- Profile EHR, patient administration, claims and registry extracts and fix data quality issues before indicators are calculated
- Specify hospital KPIs with numerators, denominators, exclusions and data owners so every report uses one definition
- Calculate length of stay, readmission, mortality and infection indicators with basic risk adjustment for case-mix
- Analyse DRG and case-mix index data, patient flow, theatre and bed utilisation, waiting times, cost per case and revenue cycle KPIs
- Apply control charts, funnel plots and time-series forecasts to separate real change from noise and plan bed and theatre capacity
- Build a Power BI hospital performance dashboard and insight report that clinicians and executives can act on under agreed privacy rules

Target Audience:

- Analysts who produce hospital performance, activity and contract monitoring reports
 - Quality and patient safety analysts who track clinical indicators and infection rates
 - Finance and costing analysts responsible for cost per case, payer mix and revenue cycle reporting
 - Health information and clinical coding staff who supply episode and case-mix data
 - Planning and capacity analysts who forecast admissions, beds and theatre sessions
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Course Outline:

Day 1: Healthcare Data Sources and the Hospital Analytics Landscape

- EHR, PAS and Claims Extracts Mapped to Analytical Questions
- Clinical Registries and Coded Activity Data as Analytic Sources
- Patient Episode, Spell and Encounter Data Model Design
- Diagnosis and Procedure Coding Fields in Activity Datasets
- Hospital Analytics Request Log and Question Framing Template

Day 2: Data Quality, Indicator Definitions and KPI Specification

- Data Quality Profiling for Completeness, Validity and Timeliness
- Excel Power Query Cleansing of Admission and Discharge Extracts
- Indicator Specification Sheet with Numerator, Denominator and Exclusions
- Strategy Map Linking Hospital KPIs to Organisational Goals
- Data Dictionary and Metadata Register for Hospital Indicators

Day 3: Clinical and Quality Metrics for Length of Stay, Readmission, Mortality and Infection

- Average Length of Stay and Excess Bed Day Calculations
- Thirty-Day Readmission Rate Logic with Planned Admission Exclusions
- Standardised Mortality Ratio Using Observed Versus Expected Deaths
- Device-Associated Infection Rates per Thousand Device Days
- Risk Adjustment Basics Using Age, Comorbidity and Admission Type

Day 4: Case-Mix, DRG Grouping and Analytical Tooling

- DRG Grouping Logic Using Diagnosis, Procedure and Complication Fields
- Case-Mix Index Calculation and Peer Hospital Comparison
- Coding Depth and Documentation Effects on Case-Mix Results
- Power BI Star Schema Data Model for Activity Data
- Python Pandas Scripts for Episode Linking and Indicator Calculation

Day 5: Week-One Case Study on Clinical and Quality Indicator Analysis

- Case Hospital Activity Extract Profiling and Quality Issue Log
 - Length of Stay and Readmission Indicator Build for Case Wards
 - Case-Mix Adjusted Comparison of Specialty Performance Results
 - Infection and Mortality Indicator Review with Clinical Leads Panel
 - Week-One Clinical Indicator Findings Brief and Peer Challenge
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Day 6: Operational Analytics for Patient Flow, Beds, Theatres and Waiting Times

- Bed Occupancy and Midnight Census Analysis by Ward
- Admission and Discharge Time Profiles for Patient Flow Bottlenecks
- Theatre Session Utilisation, Late Starts and Cancellation Analysis
- Outpatient Waiting Time Distribution and Referral Pathway Tracking
- Emergency Department Length of Stay and Boarding Time Analysis

Day 7: Financial Analytics, Data Privacy and Analytics Governance

- Patient-Level Costing and Cost per Case by DRG
- Revenue Cycle KPIs for Claim Denials and Debtor Days
- Payer Mix and Contribution Margin Analysis by Service Line
- De-Identification, Pseudonymisation and Small Number Suppression Rules
- Analytics Data Access Approvals and Indicator Sign-Off Governance

Day 8: Dashboard Design and Data Storytelling for Clinicians and Executives

- Audience Mapping for Board, Executive and Ward Dashboards
- Power BI Layout, Visual Hierarchy and Drill-Through Design
- Chart Selection for Rates, Trends, Proportions and Distributions
- Data Storytelling Structure for Clinician and Executive Briefings
- Dashboard Usability Testing with Clinical and Management Users

Day 9: Statistical Process Control, Demand Forecasting and Benchmarking

- SPC Run Charts and Control Charts for Hospital Indicators
- Common Versus Special Cause Variation Rules for Indicator Signals
- Funnel Plots Comparing Unit Rates Against Control Limits
- Excel and Python Time-Series Forecasting of Admissions and Attendances
- Bed and Theatre Capacity Modelling from Demand Forecasts

Day 10: Capstone Modelling Build of a Hospital Performance Dashboard and Insight Report

- Capstone Case Data Pack and Executive Analytical Brief
 - Clinical Quality, Flow and Finance Indicator Set Assembly
 - Power BI Hospital Performance Dashboard Build with SPC Views
 - Insight Report Narrative with Forecast-Based Capacity Recommendations
 - Hospital Performance Dashboard and Insight Report Presentation to Panel
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Skills You Will Gain:

- Healthcare Data Profiling
- Indicator Specification
- Clinical Outcome Measurement
- Case-Mix Analysis
- Patient Flow Analysis
- Cost per Case Analysis
- Control Chart Interpretation
- Healthcare Dashboard Design

Why Attend This Course:

- Deliver a Hospital Performance Dashboard and Insight Report from case data to the executive team, clinical directors and quality committee
- Decide whether a change in length of stay, readmissions or theatre utilisation is a real signal that needs action or normal variation
- Avoid disputed reports, duplicated indicator builds and privacy breaches caused by inconsistent definitions and uncontrolled data extracts
- Share indicator specification sheets, Power BI templates and Python scripts with reporting, quality and finance colleagues

Conclusion:

Back at work, the participant hands the Hospital Performance Dashboard and Insight Report to the executive team, clinical directors and the quality committee. They use it to agree which wards, specialties and services need action on length of stay, readmissions, theatre utilisation or cost per case, and to set bed and theatre capacity plans from the demand forecast. After the first monthly review cycle, the analytics unit should check which indicators raised special-cause signals, confirm that definitions held up under clinical challenge and refine data quality rules where users raised questions.

Frequently Asked Questions FAQ:

What should participants know before a healthcare data analytics course on hospital KPIs and dashboards?

Participants should already extract or report hospital activity, quality or finance data and be comfortable with Excel. Basic Power BI exposure helps; Python is introduced from simple scripts. Bringing an anonymised extract of admissions or indicator data lets participants apply each method to their own hospital.

How does healthcare data analytics differ from a health information systems or biostatistics course?

It focuses on turning hospital data into defined KPIs, case-mix adjusted indicators, control charts, forecasts and dashboards. System selection and interoperability belong to health information systems courses, and research statistics and trial appraisal belong to biostatistics courses; both appear only briefly here.

Why does healthcare data analytics need case-mix adjustment for hospital KPIs?

Hospitals treating older or more complex patients naturally show longer stays and higher mortality. Case-mix adjustment using DRG data, age and comorbidity compares observed results with expected ones, so units are judged on performance rather than on the patients they happen to treat.

What does a participant take back from the healthcare data analytics course?

Participants take back a Hospital Performance Dashboard and Insight Report built from case data, with indicator specification sheets, a Power BI data model, control chart views, a demand forecast and Python scripts they can adapt to their own hospital data.