Healthcare Analysis with Power BI

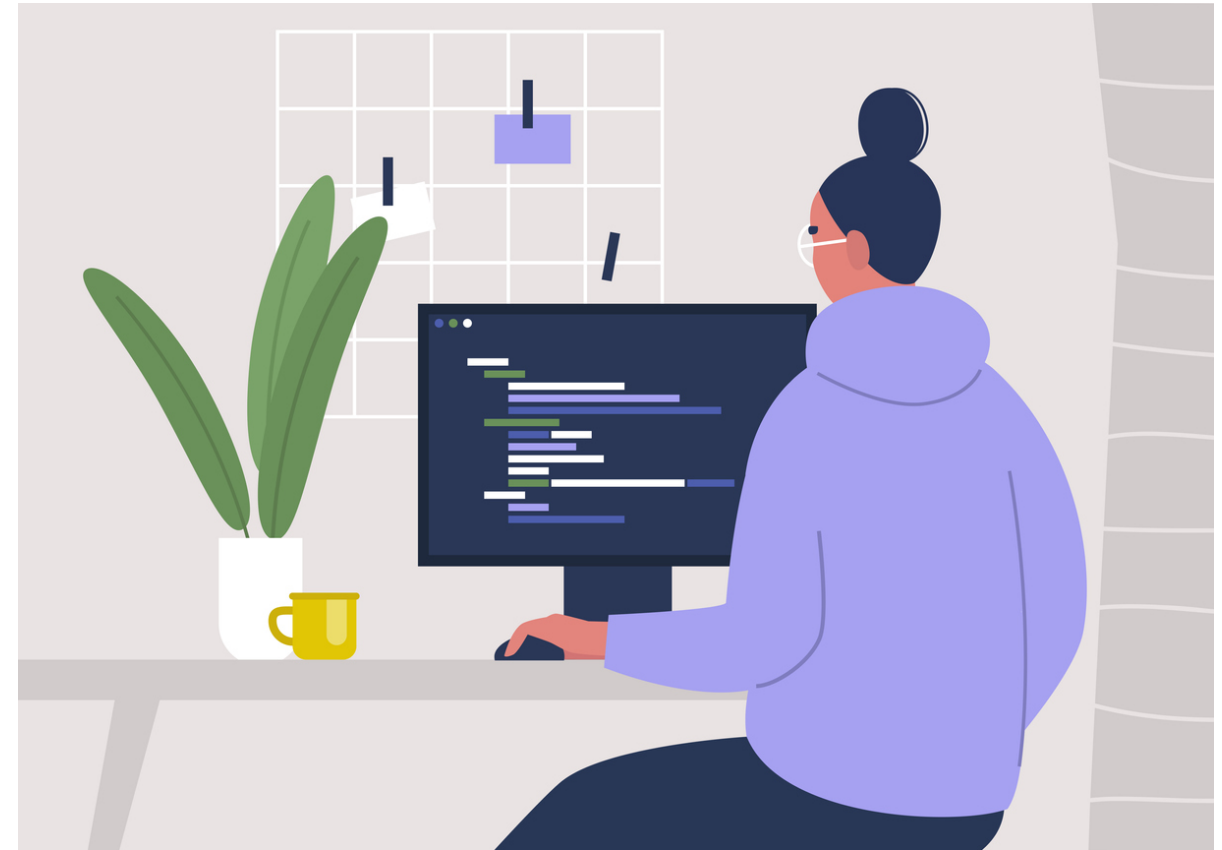## CASE STUDY: ANALYZING HEALTHCARE DATA IN POWER BI

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What is a case study?

- Apply Power BI Skills

- Combine previously learned concepts

- Solve an example real-world problem

Prerequisite Courses:

- Data Visualization in Power BI

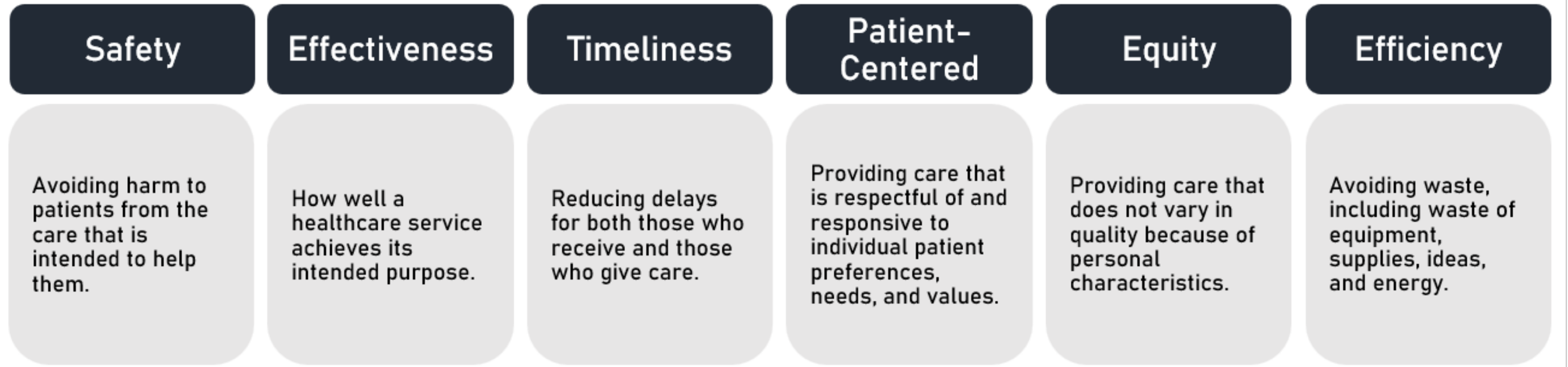- DAX Functions in Power BI

Case study goals

A fictitious consulting company (HealthStat) has hired you to uncover insights on potential hospital efficiency opportunities.

- Analyze an anonymized dataset from hospitals.

- Leverage Power BI to create an engaging dashboard.

Framework for healthcare quality

Safety	Effectiveness	Timeliness	Patient-Centered	Equity	Efficiency
Avoiding harm to patients from the care that is intended to help them.	How well a healthcare service achieves its intended purpose.	Reducing delays for both those who receive and those who give care.	Providing care that is respectful of and responsive to individual patient preferences, needs, and values.	Providing care that does not vary in quality because of personal characteristics.	Avoiding waste, including waste of equipment, supplies, ideas, and energy.

- Analytical framework for healthcare quality.

- Focus for this case study is efficiency domain.

[1] https://www.ahrq.gov/talkingquality/measures/six-domains.html

Measuring Hospital efficiency

Length of stay (LOS) is the duration in days for a patient stay in a hospital.

- Reducing LOS can lower costs, increase capacity, and improve throughput.

- Factors impacting LOS: patient age, health status, procedure, complications, mortality risk, hospital size, etc.

[1] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5898738/

Terminology overview

- **Inpatient**: person who has been admitted to a hospital bed.

- **Discharge**: release of a patient from hospital care by a medical worker.

- **Disposition**: the patient destination or status upon discharge.

- **Elective**: reason for surgery was planned (not an emergency).

Patient population for analysis

Elective hip replacement surgery

- Patients with hip pain, typically arthritis, may require elective hip replacement surgery.

- Damaged bone and cartilage is removed and replaced with prosthetic components.

- Arrival to hospital with surgery on day zero, stay 0-2 days.

[1] https://orthoinfo.aaos.org/en/treatment/total-hip-replacement/

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The dataset

Key characteristics

- New York state-wide hospital discharge data for 2016.

- Elective hip replacement surgery patients.

- One single table with 30 columns.

- Each row represents a single inpatient stay, or **discharge**.

Dataset outcome attributes

Key outcome attributes of interest for the case study

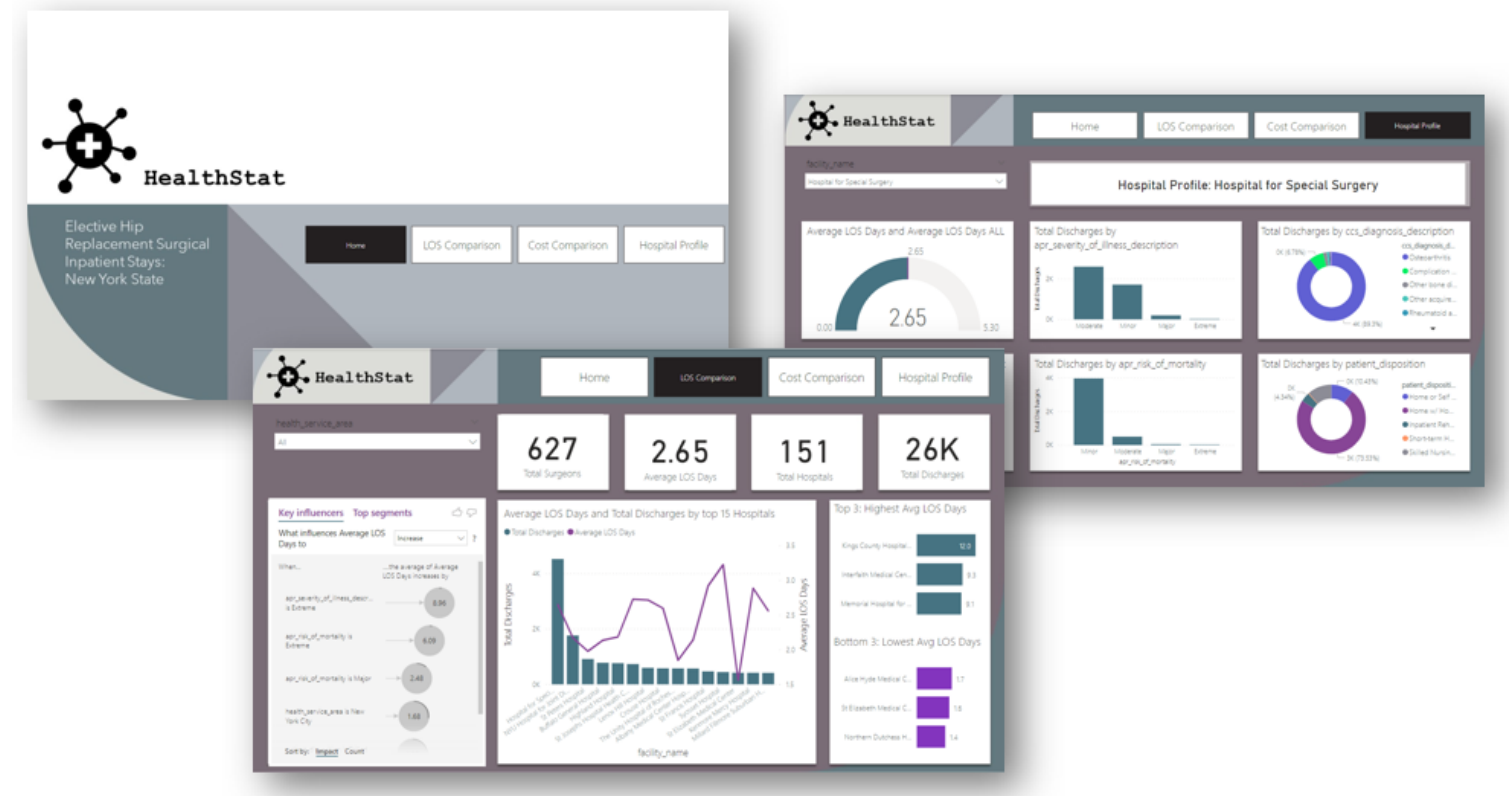| Column name	Description
length_of_stay	Total days the patient stayed in hospital, including surgery and recovery time.
total_costs	Total cost for the stay.

Dataset explanatory attributes

Key attributes of interest for the case study

Column name	Description
facility_id	A unique id that identifies each distinct hospital.
age_group	Age of patient at the time of discharge.
patient_disposition	The patient's destination status upon discharge.
ccs_diagnosis_description	Most responsible diagnosis code associated with the hospital stay.
apr_severity_of_illness_description	Illness severity level assigned standard score on scale from 1 (Minor) to 4 (Extreme).
apr_risk_of_mortality	Mortality risk assigned standard score on scale from 1 (Minor) to 4 (Extreme).

Your final deliverable

Create a dashboard that enables your stakeholders to:

- Progress through key insights in a logical flow.

- View informative, concise visuals.

- Get data to make business decisions to improve efficiency.

Let's start analyzing!

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