# Healthcare Data Analysis Project Presentation

## 🌟 Business Problem in the Healthcare Domain

The healthcare industry faces several challenges that directly impact patient care, operational efficiency, and cost management. From your dataset, we can infer a realistic scenario:

### 🏥 Problem Statement:

Healthcare providers lack data-driven insights to optimize patient outcomes, reduce operational inefficiencies, and control healthcare costs. As a result, hospitals and doctors are unable to make strategic decisions regarding resource allocation, treatment efficacy, and financial planning.

## ✅ Project Objective

To use patient, admission, treatment, and billing data to generate actionable insights that improve clinical outcomes, enhance hospital efficiency, and optimize financial performance.

## 📚 Top 10 Healthcare Case Studies for Data Analysis Using MySQL

### 🧠 Case Study 1: Common Conditions in Elderly Patients

* **Objective:** Identify the most prevalent health issues in patients aged 60 and above.
* **SQL Insight:**

SELECT c.condition\_name, COUNT(\*) AS total\_cases

FROM Admissions a

JOIN Patients p ON a.patient\_id = p.patient\_id

JOIN Conditions c ON a.condition\_id = c.condition\_id

WHERE p.age >= 60

GROUP BY c.condition\_name

ORDER BY total\_cases DESC

LIMIT 1;

* **Impact:** Enables targeted elderly care programs and prioritization of chronic disease management.

### 🧠 Case Study 2: High-Billing Medical Conditions

* **Objective:** Determine which condition has the highest average billing.
* **SQL Insight:**

SELECT c.condition\_name, ROUND(AVG(a.billing\_amount), 2) AS avg\_billing

FROM Admissions a

JOIN Conditions c ON a.condition\_id = c.condition\_id

GROUP BY c.condition\_name

ORDER BY avg\_billing DESC

LIMIT 1;

* **Impact:** Helps identify cost-heavy diseases and enables insurance companies to adjust coverage strategies.

### 🧠 Case Study 3: Top Performing Doctors

* **Objective:** Find doctors with the highest patient count.
* **SQL Insight:**

SELECT d.name AS doctor\_name, COUNT(\*) AS total\_patients

FROM Admissions a

JOIN Doctors d ON a.doctor\_id = d.doctor\_id

GROUP BY d.name

ORDER BY total\_patients DESC

LIMIT 5;

* **Impact:** Aids in recognizing efficient doctors and identifying staff for mentorship roles or promotions.

### 🧠 Case Study 4: Average Hospital Billing

* **Objective:** Understand billing trends across hospitals.
* **SQL Insight:**

SELECT h.name AS hospital\_name, ROUND(AVG(a.billing\_amount), 2) AS avg\_billing

FROM Admissions a

JOIN Hospitals h ON a.hospital\_id = h.hospital\_id

GROUP BY h.name

ORDER BY avg\_billing DESC;

* **Impact:** Assists in benchmarking hospital costs and finding outliers for operational review.

### 🧠 Case Study 5: Emergency Care Leaders

* **Objective:** Identify hospitals handling the most emergency cases.
* **SQL Insight:**

SELECT h.name AS hospital\_name, COUNT(\*) AS emergency\_admissions

FROM Admissions a

JOIN Hospitals h ON a.hospital\_id = h.hospital\_id

WHERE a.admission\_type = 'Emergency'

GROUP BY h.name

ORDER BY emergency\_admissions DESC

LIMIT 1;

* **Impact:** Informs resource allocation and emergency infrastructure improvements.

### 🧠 Case Study 6: Insurance Billing Analysis

* **Objective:** Compare average billing amounts across insurance providers.
* **SQL Insight:**

SELECT ip.provider\_name, ROUND(AVG(a.billing\_amount), 2) AS avg\_billing

FROM Admissions a

JOIN Insurance\_Providers ip ON a.provider\_id = ip.provider\_id

GROUP BY ip.provider\_name

ORDER BY avg\_billing DESC;

* **Impact:** Useful for financial planning and negotiating better rates with insurers.

### 🧠 Case Study 7: Condition-Wise Healthcare Spending

* **Objective:** Identify the most expensive condition in terms of total healthcare cost.
* **SQL Insight:**

SELECT c.condition\_name, ROUND(SUM(a.billing\_amount), 2) AS total\_spending

FROM Admissions a

JOIN Conditions c ON a.condition\_id = c.condition\_id

GROUP BY c.condition\_name

ORDER BY total\_spending DESC

LIMIT 1;

* **Impact:** Supports focused cost-reduction strategies for high-impact conditions.

### 🧠 Case Study 8: Diabetes Medication Trends

* **Objective:** List the top 3 medications prescribed to diabetic patients.
* **SQL Insight:**

SELECT a.medication, COUNT(\*) AS count

FROM Admissions a

JOIN Conditions c ON a.condition\_id = c.condition\_id

WHERE c.condition\_name = 'Diabetes'

GROUP BY a.medication

ORDER BY count DESC

LIMIT 3;

* **Impact:** Aids pharmacy inventory management and clinical decision-making.

### 🧠 Case Study 9: Medication Patterns by Demographics

* **Objective:** Analyze medication trends by gender and age group.
* **SQL Insight (By Gender):**

SELECT p.gender, a.medication, COUNT(\*) AS count

FROM Admissions a

JOIN Patients p ON a.patient\_id = p.patient\_id

GROUP BY p.gender, a.medication

ORDER BY p.gender, count DESC;

* **SQL Insight (By Age Group):**

SELECT

CASE

WHEN p.age < 30 THEN 'Under 30'

WHEN p.age BETWEEN 30 AND 59 THEN '30-59'

ELSE '60 and above'

END AS age\_group,

a.medication,

COUNT(\*) AS count

FROM Admissions a

JOIN Patients p ON a.patient\_id = p.patient\_id

GROUP BY age\_group, a.medication

ORDER BY age\_group, count DESC;

* **Impact:** Enables gender- and age-sensitive prescription protocols.

### 🧠 Case Study 10: Hospital Stay Duration Analysis

* **Objective:** Find average length of stay per condition.
* **SQL Insight:**

SELECT

c.condition\_name,

ROUND(AVG(DATEDIFF(a.discharge\_date, a.admission\_date)), 2) AS avg\_stay\_days

FROM Admissions a

JOIN Conditions c ON a.condition\_id = c.condition\_id

GROUP BY c.condition\_name

ORDER BY avg\_stay\_days DESC;

* **Impact:** Helps optimize patient discharge processes and reduce hospital overcrowding.