📊 Hospital Visit Performance – Detailed EDA Report

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1️⃣ Project Overview

Hospitals experience varying demand throughout the year based on patient needs, diseases, symptoms, and operational factors.
 The goal of this analysis is to understand:

✓ Which patients visit the most
 ✓ When hospital visits peak
 ✓ Which diseases are common & when
 ✓ Which departments and doctors contribute most to revenue
 ✓ Operational gaps and improvement areas

Dataset contains information on:

- Patient demographics

- Symptoms & Diagnoses

- Visit date

- Department & Doctor name

- Treatment cost

- Payment method

2️⃣ Data Cleaning & Preparation

✓ Converted `VisitDate` into datetime format
 ✓ Extracted:

- `Year`, `Month`, `Quarter`, `Day`, `Month_Name`

✓ Categorized Age into:

- Child (12–17)
- Adult (18–44)
- Middle-Aged (45–64)
- Senior (65–90)

✓ Removed inconsistencies in categorical fields
✓ Checked for nulls & duplicates

3️⃣ Demographic Insights

Feature	Key Findings
Age Group	Middle-Aged & Seniors contribute majority visits
Gender	Nearly equal visits → No gender bias
City	Higher hospital volume from major cities (urban population more active in care-seeking)

📌 Business Insight:

Hospital must prioritize chronic care services for middle-aged and senior patients.

4️⃣ Symptoms & Diagnosis Patterns (Heatmap Analysis)

🔥 **Strong Clinical Relationships Found:**

Symptom	Most Likely Diagnosis
Fever	Flu
Headache	Migraine

Cold	Viral Infection
Pain	Sprain & Migraine
Injury	Fracture / Sprain
Skin Rash	Skin Infection & Viral Infection

📌 Clinical Insight:

> Seasonal viral illnesses and orthopedic cases are the highest contributors to hospital load.

5️⃣ Visit Trends (Time Analysis)

Peak Seasons:

✓ Higher patient traffic in **Quarter 3**
✓ Winter & monsoon months show increased viral symptoms (cold, cough, flu)

Week Patterns:

✓ More unplanned visits (injuries/colds) on weekends

📌 Operational Insight:

> Hospital staffing should be increased during seasonal peaks and weekends.

6️⃣ Department-Level Performance

Department	Key Findings
Orthopedics	Highest revenue contributor
Gynecology & Pediatrics	Consistent visit volume
Dermatology & ENT	Moderate seasonal spikes
Neurology	High-cost treatment cases

📌 Revenue Leader:

Orthopedics generates the highest revenue — driven by injury/fracture cases.

📌 Demand Dependency:

General Medicine receives high daily footfall — essential for staffing.

7️⃣ Doctor-Level Performance

✓ Top 5 doctors found by:

- Number of patients

- Revenue generated

📌 Insight:

High-visit doctors ≠ highest revenue doctors (treatment type matters)

This helps identify:

- Star performers

- Departments requiring more specialists

8️⃣ Cost Analysis

📌 Positive correlation between **Age and Treatment Cost**
→ Seniors require more expensive treatments

Revenue is highest in:

- Orthopedics

- Gynecology

- Pediatrics

📌 Financial Insight:

Aging population = higher hospitalization cost burden

9️⃣ Payment Method Analysis

✓ Insurance most used for **high-cost procedures**
✓ Cash payments dominant for **OPD / General Medicine**

📌 Financial Strategy:

Promote insurance tie-ups and digital payments for efficiency

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📌 Final Business Recommendations

Problem Identified	Recommendation
Seasonal peaks due to viral infections	Seasonal awareness & temporary staffing increases
Orthopedic department overloaded	More orthopedic staff during weekends/sports season
High cost burden on seniors	Special senior-clinic + chronic care plans
Pediatric & Gynecology stable demand	Focus on improving service quality
High returns for certain symptoms	Deeper follow-up mechanisms to avoid readmissions

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🎯 Final Conclusion

This hospital is:

- Strong in **Orthopedics**, **General Medicine**, **Gynecology**

- Affected significantly by **seasonal viral diseases**

- Catering largely to **middle-aged & senior population**

- Capable of driving further revenue through optimized staffing & targeted clinical programs

Overall: A financially stable, patient-focused hospital — with opportunities to scale preventive care and ensure timely service.