An IPD Admission Trend and Forecast Analysis (January 2020 - May 2025)

About Project

Organization

Umaid Hospital is a major government healthcare center in Jodhpur, Rajasthan, known for its wide-reaching services in maternal and child health. As a referral-level tertiary care facility, it handles a high volume of in-patient admissions every year, especially in departments like Obstetrics & Gynaecology and Pediatrics. The hospital serves a large section of the rural and urban population and plays a key role in state healthcare schemes. With its focus on accessibility and service delivery, Umaid Hospital supports both emergency care and specialized treatments, making it a critical part of the region's public health system.

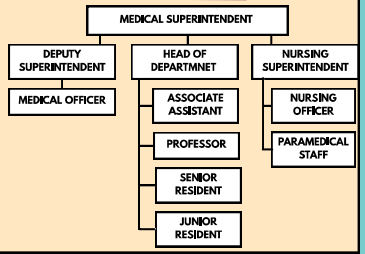
Vision

To become a reliable and accessible public healthcare center that delivers quality care especially in maternal and child health while using data and technology to improve hospital planning and patient outcomes.

Mission

- To deliver free and timely healthcare services to maternal and child health.
- To ensure that no patient is denied treatment due to financial limitations.
- To use hospital data effectively for better planning of doctors, staff, medicines, and beds.
- To actively support state and national health programs, improving access and outcomes for underserved communities.

Organisation Structure



Objectives :

- Analyze IPD admission trends (Jan 2020–May 2025) by department, age, and gender
- Identify peak months and high patient-load areas.
- Create interactive dashboards for real-time insights.
- Support planning of hospital staff, beds, and resources.
- Build a foundation for future healthcare analytics projects.

Methodology :

- Data Source: 5,5 years of IPD admission data from UMAID Hospital, Jodhpur (Jan 2020–May 2025).
- Tools Used: Excel, Power Query, & Power BI.

Steps Followed:

- Cleaned and standardized raw data.
- Created dashboards showing trends and forecasts.
- Used Power BI for time-series forecasting and visual storytelling.

Software & Tools Used :

- Microsoft Excel – For initial data collection and sorting
- Power Query – For cleaning, transforming, and preparing hospital data
- Power BI – For dashboard creation, visualizations, and forecasting

DATASET OVERVIEW :

- Source: IPD admission records from Umaid Hospital, Jodhpur
- Time Period Covered: January 2020 – May 2025 (5,5 Years)
- Total Records: 3.85+ lakh patient entries
- Departments Covered: Obstetrics & Gynaecology, Pediatrics, Emergency, Pediatric Surgery
- Key Data Fields:
- Department & Ward Name
- Age & Gender (Adult/Child – Male/Female/Others)
- Total Admissions
- Month & Year

SWOT Analysis

Strengths

- Handled a large dataset with over 3,85 lakh patient records across 5,5 years
- Developed user-friendly Power BI dashboards for clear decision-making
- Identified seasonal peaks and high-load departments using real hospital data.

Weaknesses

- Raw data had entry mistakes and inconsistencies, especially in gender and department tags
- Lack of OPD and discharge data limits complete patient journey analysis
- Manual data processes reduce efficiency and increase chances of human error.

Opportunities

- Clean data can improve accuracy in hospital planning and forecasting
- Scope to expand analytics into areas like cost tracking and patient feedback
- Strong base to adopt EHR systems and real-time dashboards for smarter management

Threats

- Resistance from staff to shift from traditional methods to data-driven tools
- Poor data practices may affect reliability and long-term digital transformation
- Limited infrastructure and manpower could struggle during peak patient load.

Challenges

- Raw data had missing entries, wrong gender tags, and inconsistent department names
- Extra time was spent fixing errors before starting analysis.
- Standardizing categories (e.g. "OBS AND GYNAE" vs "OBG") was critical for dashboard accuracy.
- Couldn't analyze full patient journey or length of stay & disease.
- Insights were limited to admissions only, not treatment outcomes.
- Coordination with departments for clarification was time-consuming.
- No automation tools in use at the hospital.

Sn.	Theoretical understanding	Practical understanding
1	Based on case studies, models, and structured lessons.	Real-time problem-solving with hospital data.
2	Clean, ideal datasets used for teaching.	Raw, unstructured data with real-life errors and inconsistencies.
3	Learned tool concepts (Excel, Power BI, SQL)	Applied tools for live dashboards, forecasting, and data cleaning.
4	Theoretical models and assumptions.	Data-driven decisions aligned with hospital needs and workflow.
5	Simulated classroom assignments.	Fast-paced work under deadlines, teamwork, and mentor reviews.

key Insights :

1. **OBG Department** :
   - Handled the highest patient load over 2.65 lakh admissions (≈69% of total admission)
   - Reflects Umaid's primary role in maternal healthcare
2. **Pediatrics Department** :
   - Second-highest admissions with 95,000+ child patients (≈25%)
   - Highlights critical role in neonatal and child health services

3. **Gender Distribution** :
   - 98% adult admissions were female (due to maternity care)
   - Child admissions: 57% male, 43% femalePeak Admission
4. **Months:**
   - March & October saw the highest patient inflow (~36,000 each)
   - June had the lowest admissions (~21,000)
5. **Forecast Insights:**
   - 2026 projected admissions: ~72,000
   - 2027 forecast: ~85,000 — showing growing demand

Learnings :

- Gained hands-on experience in cleaning, transforming, and analyzing real hospital data.
- Improved skills in Excel, Power BI and Power Query.
- Understood how to identify trends, peak periods, and department-wise workloads.
- Learned how to build interactive dashboards for decision-making.
- Explored forecasting techniques to support resource planning.

Outcomes of the Project :

- Converted 3.85 lakh+ raw records into actionable insights
- Developed a dashboard used for identifying high patient load and peak months
- Provided forecast models to help Umaid Hospital plan staffing and resources
- Created a base for future analytics like OPD trends, cost tracking, and patient satisfaction

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