Apollo Hospital Data Analysis

Enhancing Operational Efficiency Through Data-Driven Insights

Presented by Md Tarif

Project Overview

- Focus: Creating a Power BI dashboard to enhance operational efficiency in the emergency room.
- Tools: Excel (Data Cleaning), MySQL (Database Management), Power BI (Visualization).
- Outcome: Empower stakeholders with actionable insights for decision-making.

Problem Statement

- Rising patient volumes strain the emergency department.
- Need for optimized workflows, improved patient satisfaction, and efficient care delivery.
- Goal: Maintain Apollo Hospital’s reputation for high-quality emergency services. Visual: Infographic showing overcrowded ER and solutions.

Process and Methodology

Business Understanding

Identified key metrics and goals.

Data Preparation

- Cleaned data in Excel.
- Imported data into MySQL.

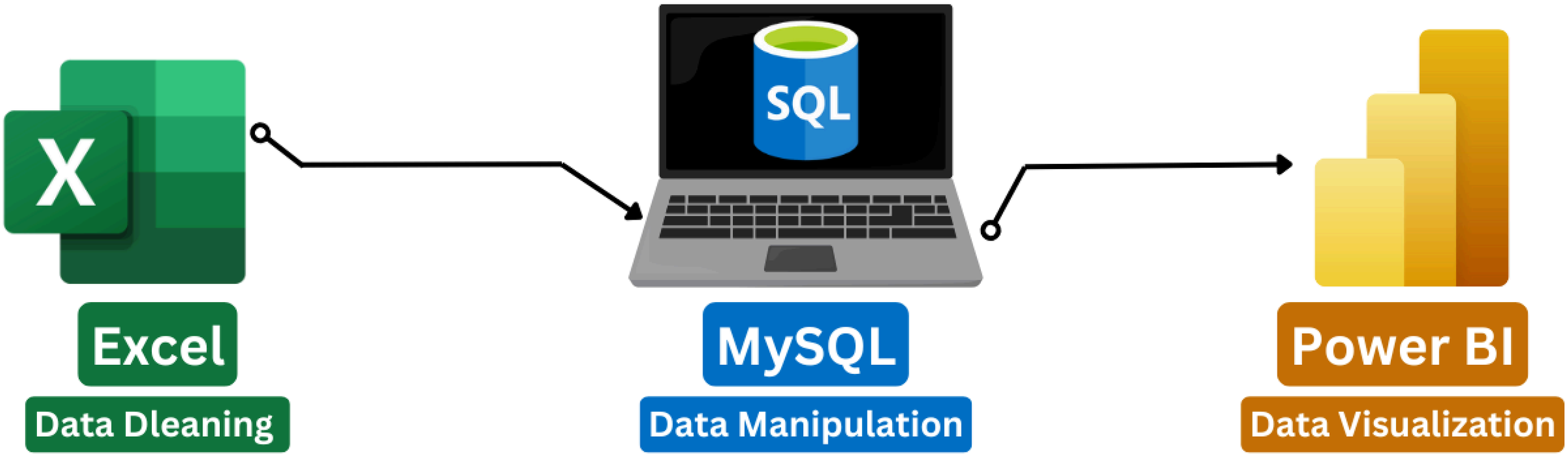
Data Exploration

Performed exploratory analysis using SQL.

Data Visualization

- Connected MySQL to Power BI.
- Built interactive dashboards. Visual: Diagram of the workflow from data collection to visualization.

Project Architecture



Dashboards Overview

1

Monthly View

Trends and metrics by month.

2

Consolidated View

Holistic summary for a selected date range.

3

Patient Details

Granular patient data.

4

Key Takeaways

Actionable insights and recommendations.

Dashboard- 1

Hospital Emergency Room Dashboard

MONTHLY VIEW **Feb 2024**

Year: 2024

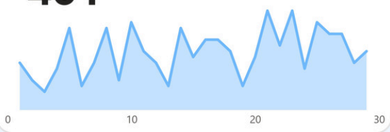
Month Name: Feb

Apollo HOSPITALS

- MONTHLY VIEW
- CONSOLIDATED VIEW
- PATIENT DETAILS
- KEY TAKEAWAYS

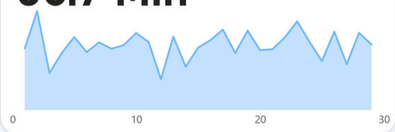
No. of Patients

431



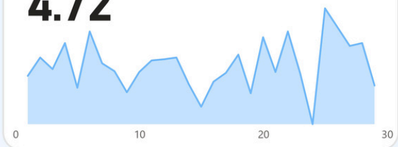
Avg Wait Time

36.7 Min



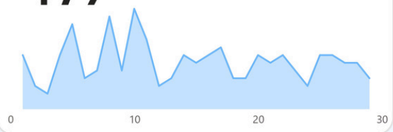
Patient Satisfaction Score

4.72



No. of Patients Referred

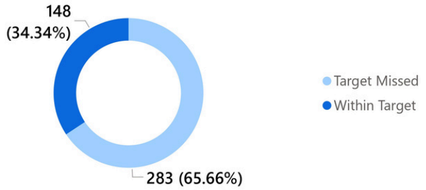
179



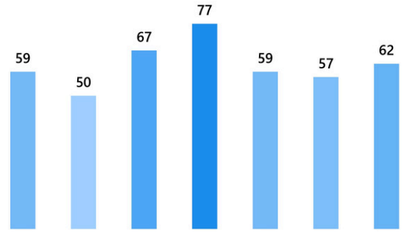
Patient Admission Status

Admission Status	Patients	% of Total
Admitted	224	51.97%
Not Admitted	207	48.03%

% of Patients Seen Within 30 Min

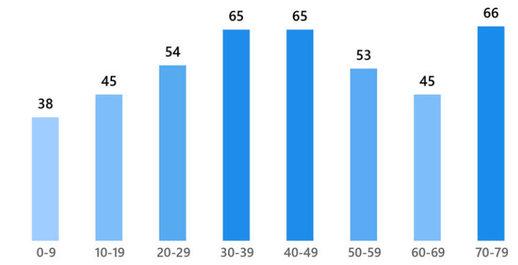


No of Patients by Day and Hour

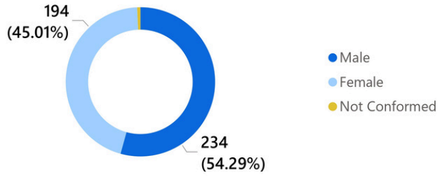


Hours	Mon	Tue	Wed	Thu	Fri	Sat	Sun
00-02	7	3	6	6	4	2	5
03-04	6	4	5	6	5	3	
05-06	3	7	5	4	7	5	6
07-08	6	5	2	7	2	6	2
09-10	5	3	6	9	2	10	3
11-12	8	5	5	3	7	9	8
13-14	6	5	8	6	4	1	6
15-16	3	1	5	5	3	4	10
17-18	2	5	7	10	6	4	3
19-20	8	2	4	6	5	2	4
21-22	3	5	6	5	8	5	7
23-24	2	5	8	10	6	6	8

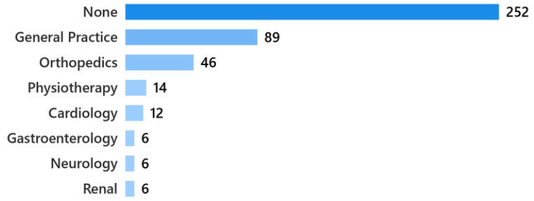
No of Patients by Age Group



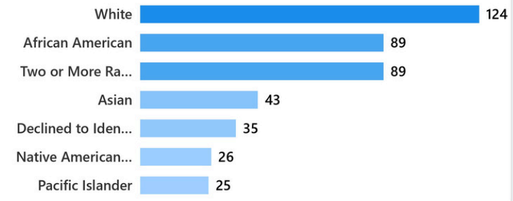
No of Patients by Gender



No of Patients by Department Referral



No of Patients by Patient Race



Dashboard- 2

Apollo HOSPITALS

Hospital Emergency Room Dashboard

CONSOLIDATED VIEW

4/1/2023 | 10/30/2024

MONTHLY VIEW

CONSOLIDATED VIEW

PATIENT DETAILS

KEY TAKEAWAYS

No. of Patients

9216

Avg Wait Time

35.3 Min

Patient Satisfaction Score

4.99

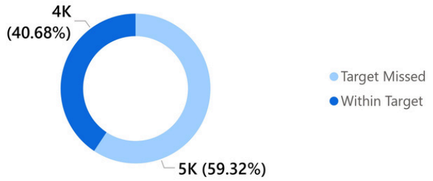
No. of Patients Referred

3816

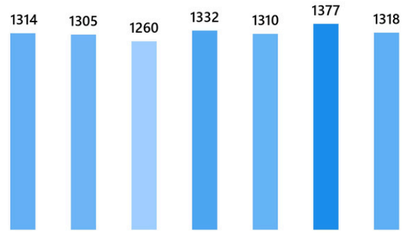
Patient Admission Status

Admission Status	Patients	% of Total
Admitted	4612	50.04%
Not Admitted	4604	49.96%

% of Patients Seen Within 30 Min

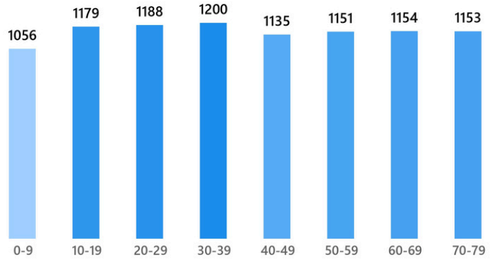


No of Patients by Day and Hour

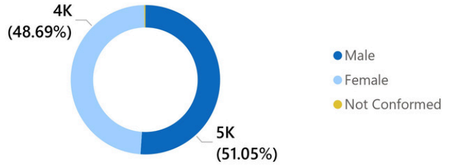


Hours	Mon	Tue	Wed	Thu	Fri	Sat	Sun
00-02	114	107	102	106	113	118	118
03-04	111	107	104	100	113	128	98
05-06	125	122	104	104	98	114	110
07-08	84	123	111	124	127	102	119
09-10	116	112	107	113	102	124	100
11-12	107	106	98	111	122	109	99
13-14	115	107	117	105	107	123	102
15-16	99	94	117	111	102	110	129
17-18	104	116	102	121	98	99	97
19-20	123	84	94	105	124	113	110
21-22	110	105	97	116	89	110	121
23-24	106	122	107	116	115	127	115

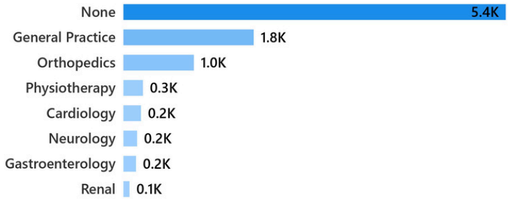
No of Patients by Age Group



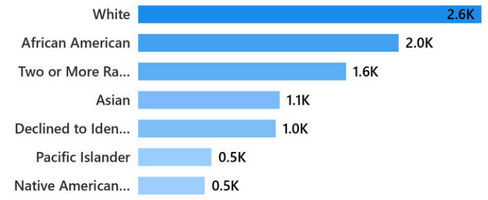
No of Patients by Gender



No of Patients by Department Referral



No of Patients by Patient Race



Dashboard- 3

Apollo HOSPITALS

Hospital Emergency Room Dashboard

PATIENT DETAILS

4/1/2023 10/30/2024

MONTHLY VIEW

CONSOLIDATED VIEW

PATIENT DETAILS

KEY TAKEAWAYS

Patient Id	Patient Name	Patient Gender	Patient Age	Patient Admin Date	Patient Race	Patient Waittime	Department Referral	Admission Status
108-35-4145	B Brychan	Male	79	Monday, May 01, 2023	White	48	None	Admitted
108-82-5384	H Rodie	Female	79	Monday, September 23, 2024	Declined to Identify	56	None	Not Admitted
110-12-8128	D Scoates	Male	79	Monday, May 22, 2023	Pacific Islander	15	None	Admitted
125-52-4944	N Sommerscales	Male	79	Saturday, April 01, 2023	White	21	General Practice	Not Admitted
147-55-5405	L Crolly	Female	79	Saturday, March 02, 2024	White	11	None	Admitted
154-20-9417	A Roberti	Male	79	Friday, September 13, 2024	Asian	36	Gastroenterology	Not Admitted
181-11-9701	R Wetwood	Female	79	Saturday, July 22, 2023	Declined to Identify	44	None	Not Admitted
182-52-6741	K L'Hommee	Male	79	Tuesday, September 26, 2023	White	56	None	Admitted
183-34-1466	V Antoons	Male	79	Thursday, December 21, 2023	Pacific Islander	40	General Practice	Not Admitted
186-16-0532	B Pinckstone	Female	79	Wednesday, April 24, 2024	White	19	General Practice	Admitted
186-18-2336	L Ryal	Male	79	Monday, April 15, 2024	Two or More Races	53	None	Not Admitted
190-98-0234	C Poltone	Male	79	Wednesday, July 10, 2024	Asian	52	None	Admitted
193-43-6202	D Jon	Male	79	Thursday, April 06, 2023	White	13	Gastroenterology	Not Admitted
196-55-4306	L Caghan	Female	79	Tuesday, June 27, 2023	African American	37	None	Not Admitted
204-74-7032	D Mingardo	Male	79	Thursday, June 29, 2023	Two or More Races	39	None	Not Admitted
212-94-9148	F Buey	Female	79	Sunday, April 14, 2024	White	51	General Practice	Admitted
213-37-6807	S Douce	Male	79	Wednesday, August 16, 2023	White	48	Orthopedics	Not Admitted
220-33-1376	T Holtom	Male	79	Tuesday, October 24, 2023	Native American/Alaska Native	45	None	Admitted
221-94-0515	S Stillman	Female	79	Wednesday, January 24, 2024	Declined to Identify	49	None	Not Admitted
222-26-0023	X Swaite	Female	79	Sunday, September 22, 2024	White	10	None	Admitted
247-22-9153	W Freeborne	Female	79	Thursday, August 08, 2024	Two or More Races	35	General Practice	Admitted
259-09-5907	U Kimbrough	Male	79	Tuesday, May 02, 2023	White	56	Physiotherapy	Admitted

Dashboard- 4

Apollo HOSPITALS

Hospital Emergency Room Dashboard

KEY TAKEAWAYS

MONTHLY VIEW

CONSOLIDATED VIEW

PATIENT DETAILS

KEY TAKEAWAYS

Descriptive Analysis

(April 2023 - October 2024)

The emergency room dataset, covering a period of 19 months, records a total of 9,216 unique patients.

Patient Wait Time & Satisfaction:
The Average wait time was approximately **35.3 minutes**, indicating a need for improvement to enhance patient flow. The **average satisfaction score** was **4.99 out of 10**, suggesting moderate satisfaction and highlighting areas for improving patient experiences.

Departmental Referrals:
A significant number of Patients (5400) did not required referrals. Among those referred, the most common were **General Practice (1840 cases**) and Orthopedics (995 Cases), followed by Physiotherapy (276 Cases) and Cardiology (248 Cases)

Peak busy Periods:
The busiest day were **Saturday (1377 Patients)**, Saturdays (1322 Patients), and Tuesdays (1318 Patients). The busiest hours were 11 AM, 7 PM, 01 PM, and 11 PM indicating need of ample staffing during these periods.

Patient Demographics:
Age Groups: Adults **(30 - 39 Years)** formed a large group **(1200 Patients)**, followed by young adults (20 - 29 Years) with 1188 Patients. Other significant groups included middle aged as well (40 - 50 Years).

Race Distribution:
The largest racial group was **White (2571)**, followed by African American (1951), multi racial (1557), and Asian (1060) patients. A significant number of patients (1030) declined to identify their race.

Admission Patterns:
Nearly half of the patients **(4612) were admitted**, while the rest **(4604) were treated and released**.

Summary:
The dataset reveals high patient volumes, moderate satisfaction levels, and common referrals to General Practice and Orthopedics. Mondays and late night to early mornings hours are particularly busy. The patient demographics show a diverse age and racial composition, with nearly equal numbers of admitted and non admitted patients. These insights can help optimize resource allocation and improve patient care in the emergency room.

Insights and Recommendations

1

Longer wait times on weekends: Suggest more staff allocation.

2

High referral rates to Cardiology and Pediatrics: Recommend increased resources.

3

Gender and age group analysis for demographic campaigns. Visual: Bulleted insights alongside relevant graphs.

Challenges and Learnings

- Limited historical data restricted long-term trend analysis.
- Balancing detailed insights with user-friendly dashboards.
- Enhanced skills in SQL and Power BI.
- Practical experience in healthcare analytics. Visual: Two-column layout with challenges and learnings.

Thank you!

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