



# COLUMBIA ASIA HOSPITAL ANALYSIS

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# INTRODUCTION

- Columbia Asia Hospital is a leading healthcare provider known for its multi specialty services and patient-centric approach.
- With an increasing patient base and growing operations, the hospital aims to enhance both financial performance and service quality through data-driven insights.



# PROBLEM STATEMENT

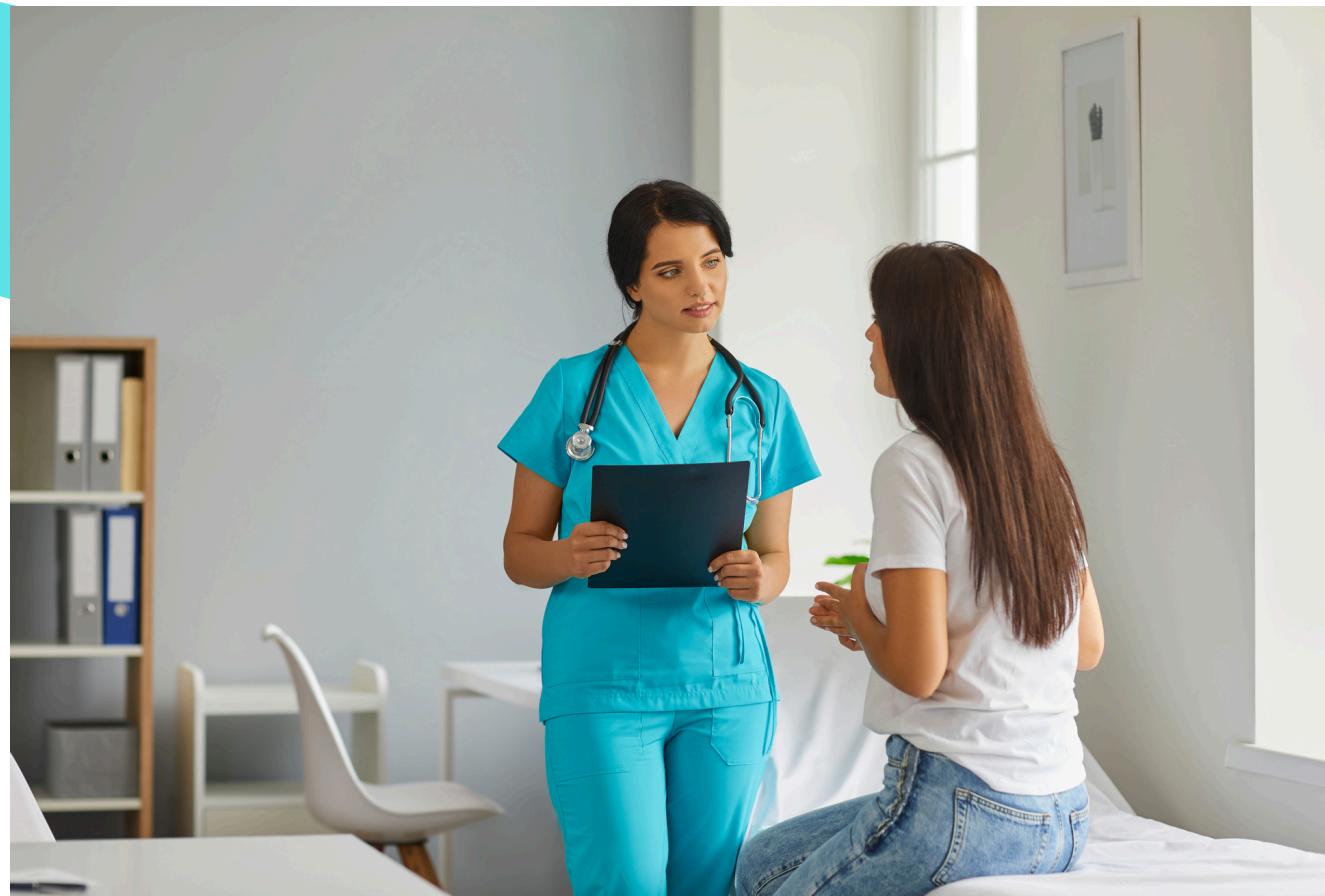


Columbia Asia Hospital aims to leverage data analytics to gain deeper insights into its operations and improve overall performance.

The key focus areas include:

- Revenue Analysis: Clear visibility into profitability drivers and areas needing strategic investment.
- Workforce Planning: Balanced workloads, reduced patient wait times, and improved staff efficiency
- Discount Strategy: Design effective discount policies to boost patient satisfaction while keeping profitability intact

# OBJECTIVE OF ANALYSIS



- Patient Satisfaction & Engagement
- Discount Strategy Development
- Operational Insights
- Strategic Decision Support
- Workforce Efficiency
- Revenue Optimization

# DATA OVERVIEW

The doctor\_patients\_data table captures doctor details, visits, fees, and satisfaction, while hospital\_er records demographics, wait times, and referrals—together offering insights into hospital performance and patient experience.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	date	patient_id	patient_gender	patient_age	patient_sat_sc	patient_first_initial	patient_last_name	patient_race	patient_admin	patient_waittime	department_referral		
2	20-03-2020 08:47	145-39-5406	M	69	10	H	Glasspool	White	FALSE	39	General Practice		
3	15-06-2020 11:29	316-34-3057	M	4		X	Methuen	Native America	TRUE	27	General Practice		
4	20-06-2020 09:13	897-46-3852	F	56	9	P	Schubuser	African Americ	TRUE	55	General Practice		
5	04-02-2020 22:34	358-31-9711	F	24	8	U	Titcombe	Native America	TRUE	31	General Practice		
6	04-09-2020 17:48	289-26-0537	M	5		Y	Gionettitti	African Americ	FALSE	10	Orthopedics		
7	20-04-2019 00:13	255-51-2877	M	58		H	Buff	Asian	FALSE	59	General Practice		
8	23-08-2019 08:26	465-97-0990	F	68		F	Perrat	White	TRUE	43	General Practice		
9	29-07-2019 16:57	157-31-7520	F	47		K	Gwillim	Two or More R	TRUE	23	General Practice		
10	19-02-2020 06:54	432-34-5614	F	79	1	E	Dewhurst	White	FALSE	42	General Practice		
11	11-10-2020 05:25	609-17-8678	M	62		M	Crebo	African Americ	FALSE	51	General Practice		
12	26-07-2020 01:45	497-14-6812	F	73		Q	Churchard	White	TRUE	34	Gastroenterology		
13	10-03-2020 22:02	393-38-9502	F	16		N	Corpes	White	FALSE	39	Orthopedics		
14	12-11-2019 16:00	288-05-6370	F	16		R	Brixey	Native America	TRUE	53	General Practice		
15	25-06-2019 09:40	784-54-9931	M	46		M	Goudie	Pacific Islander	FALSE	45	General Practice		
16	04-05-2019 13:16	662-21-6522	M	69		G	Stanlack	White	TRUE	49	General Practice		
17	19-09-2019 01:53	628-73-1801	M	37		C	McMurty	Declined to Ide	TRUE	57	General Practice		
18	25-05-2020 22:11	370-19-2271	F	50		I	Scorthorn	Asian	FALSE	35	General Practice		
19	25-06-2019 18:59	458-98-8860	M	37		J	Helgass	Declined to Ide	FALSE	55	General Practice		
20	04-09-2019 16:15	728-31-2493	F	70		W	Chittcock	Asian	TRUE	50	Physiotherapy		
21	16-11-2019 23:46	823-34-5523	M	55	2	F	Prendergast	Asian	TRUE	40	General Practice		
22	30-06-2019 05:22	621-70-7472	F	63		T	Bissiker	Native America	TRUE	25	General Practice		
23	22-05-2019 16:48	344-36-7156	F	44	2	M	Mandell	Asian	FALSE	51	General Practice		
24	17-11-2019 07:24	455-21-3671	F	11	4	D	Coste	Declined to Ide	FALSE	30	General Practice		

# METHODOLOGY

**Data Preparation**

**Patient's & Department  
Analysis**

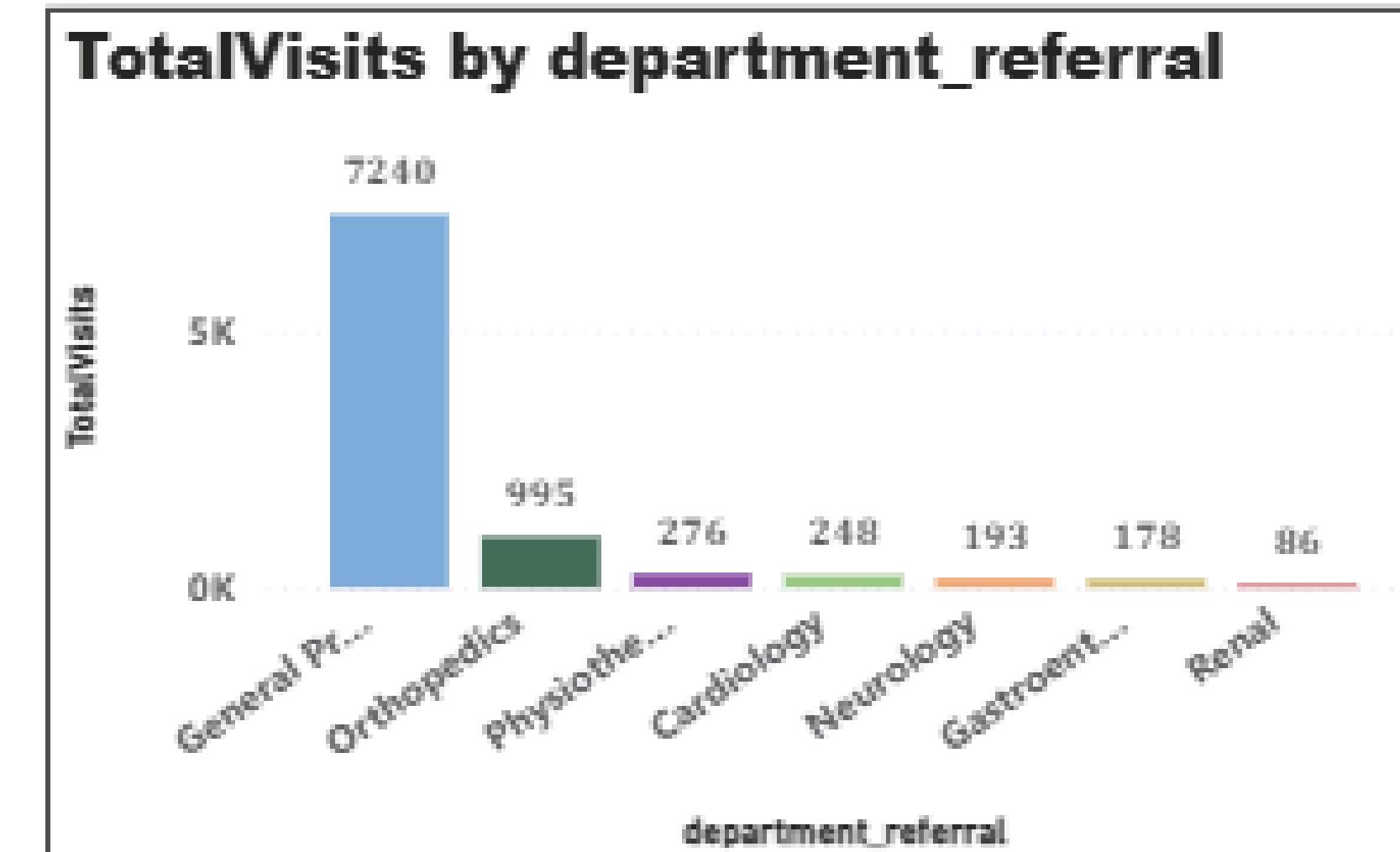
**Financial Insights**

**Recommendations**

**Dashboard & Conclusion**

# DEPARTMENT WISE PATIENT

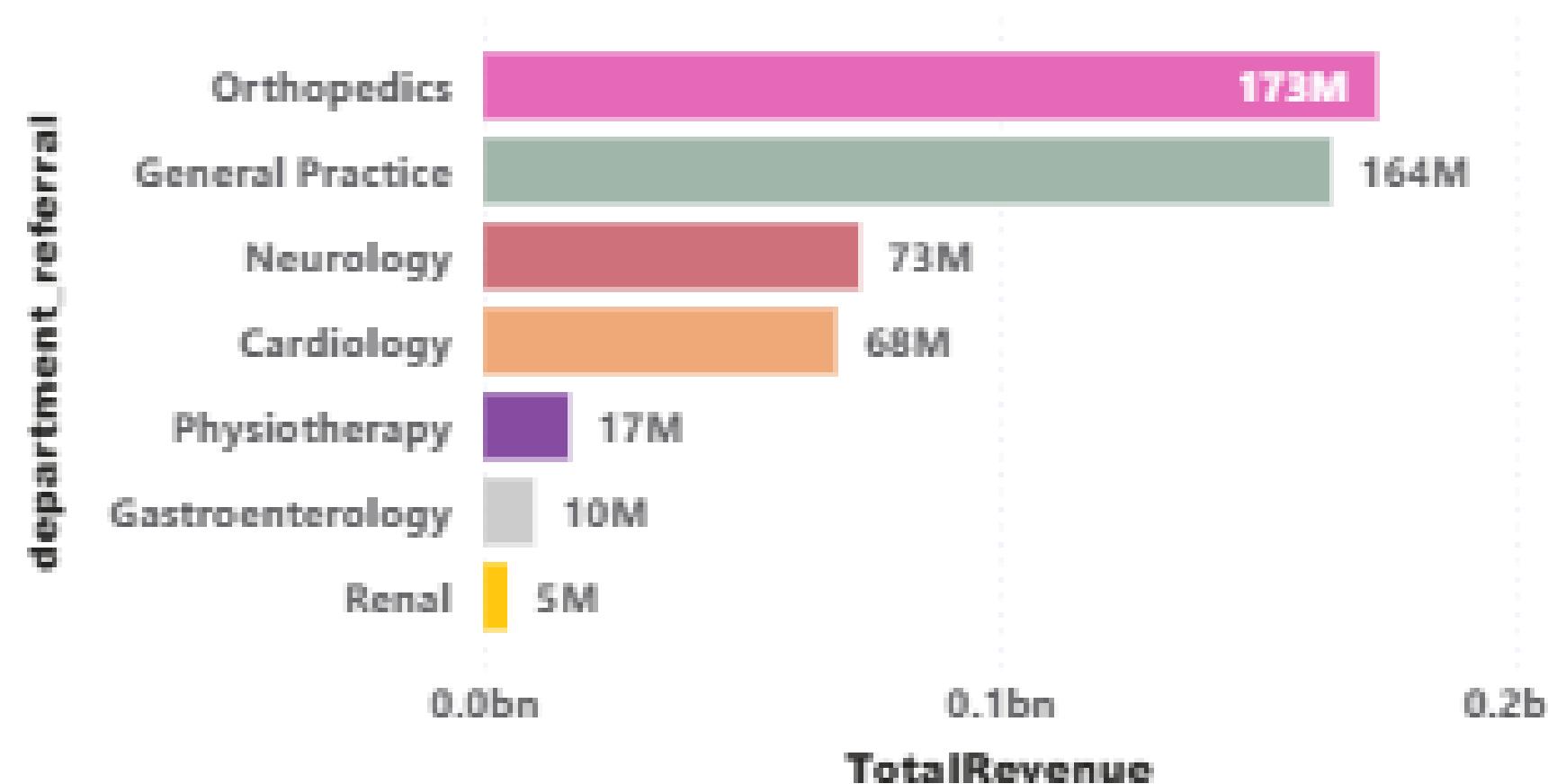
- General Practice dominates hospital operations with 7,240 patient visits, cementing its status as the facility's primary engine for patient volume and critical care intake.
- Renal and Gastroenterology report the lowest patient volumes, signaling significant underutilization that highlights an immediate opportunity to boost traffic through targeted awareness and outreach campaigns.



# DEPARTMENT WISE REVENUE

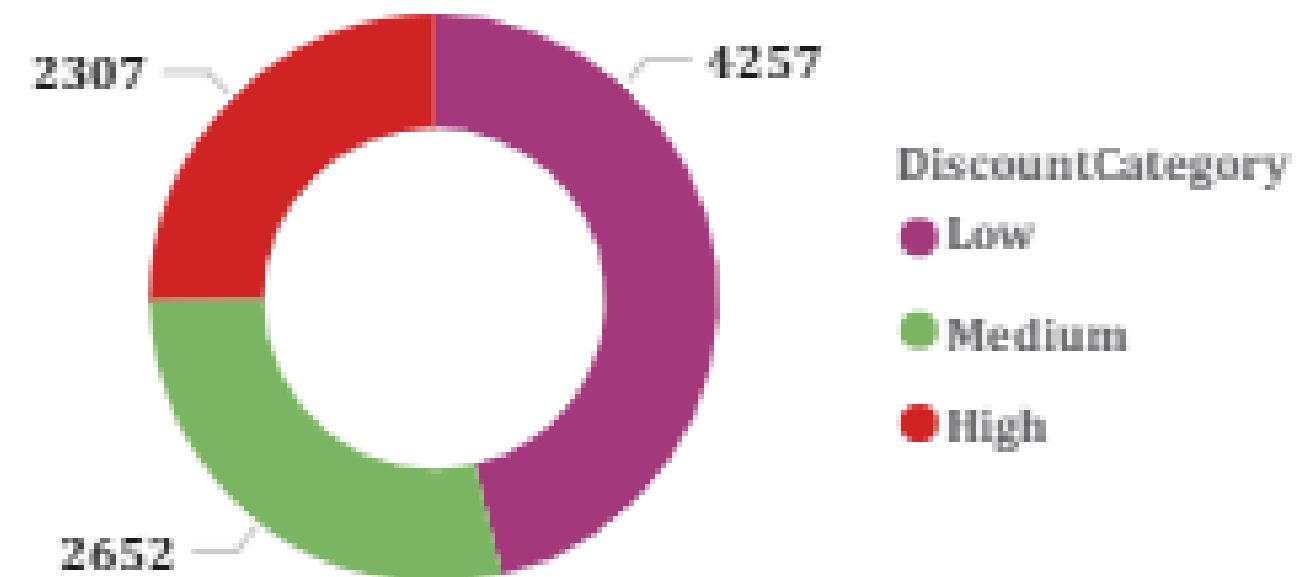
- Dominant Revenue Streams: General Practice and Orthopedics stand as the hospital's primary financial engines, converting high patient demand and consistent service utilization into the largest share of overall income.
- Area for Financial Optimization: Renal and Gastroenterology currently report the lowest revenue contributions, highlighting a gap in patient inflow or service scope that requires a focused strategic review to unlock growth.

**TotalRevenue by department\_referral**



- Discounts were primarily determined by age group and revenue contribution.
- Average satisfaction score was considered only at the group level to ensure fairness and simplicity.
- Most patients fall under the Low discount category, reflecting strong revenue-performing age groups.
- High discounts were assigned to lower-revenue or less-engaged groups to encourage better participation.

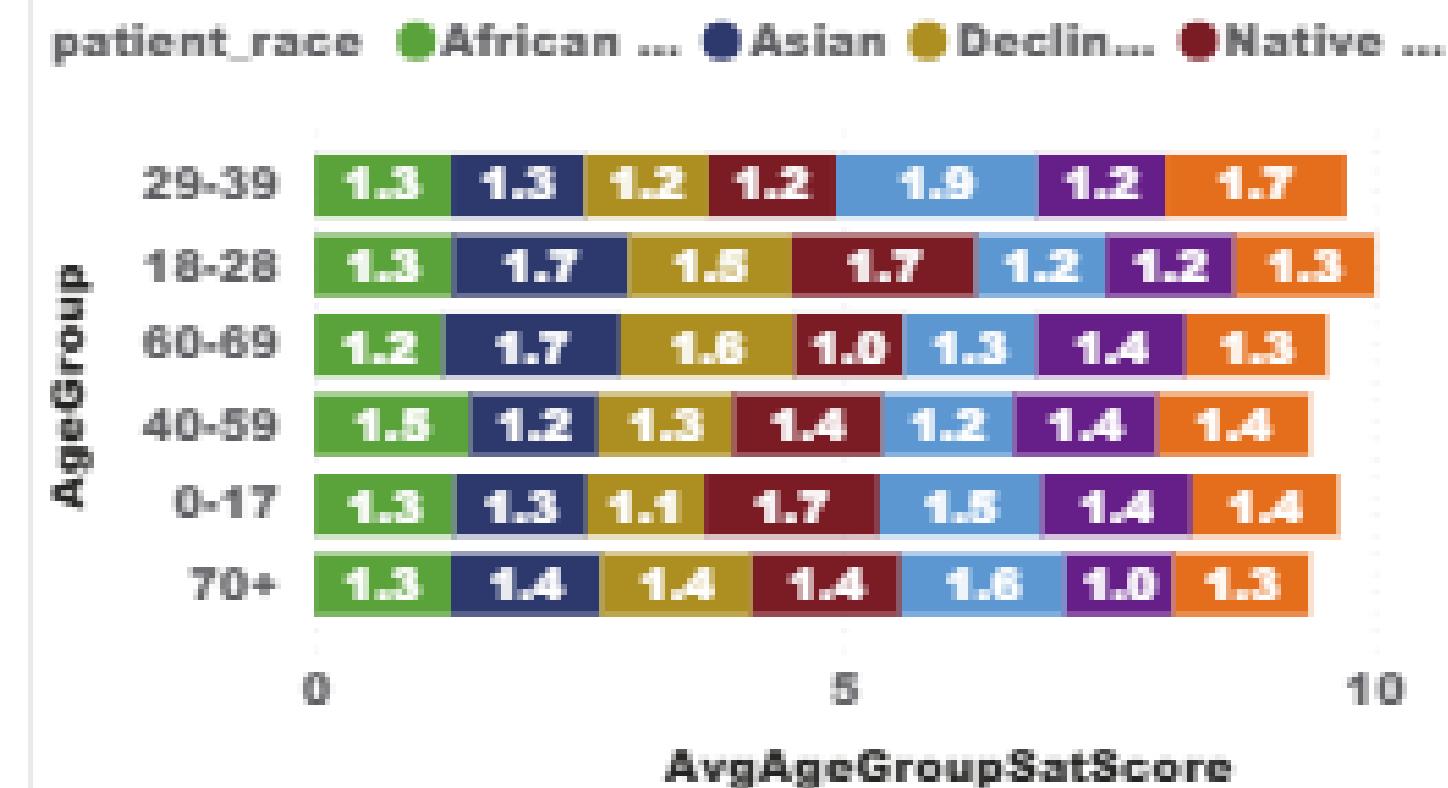
DiscountCategory based on AgeGroup and Revenue



# PATIENT SATISFACTION ANALYSIS BY AGE & RACE

- Around 72% of patient satisfaction scores were missing during data cleaning.
- Likely causes included incomplete survey submissions, unrecorded feedback from emergency visits, and manual entry gaps in the hospital system.
- Patients aged 18–39 showed slightly higher satisfaction levels compared to other age groups.
- Racial differences were minimal, suggesting fairly consistent patient experiences across demographics.

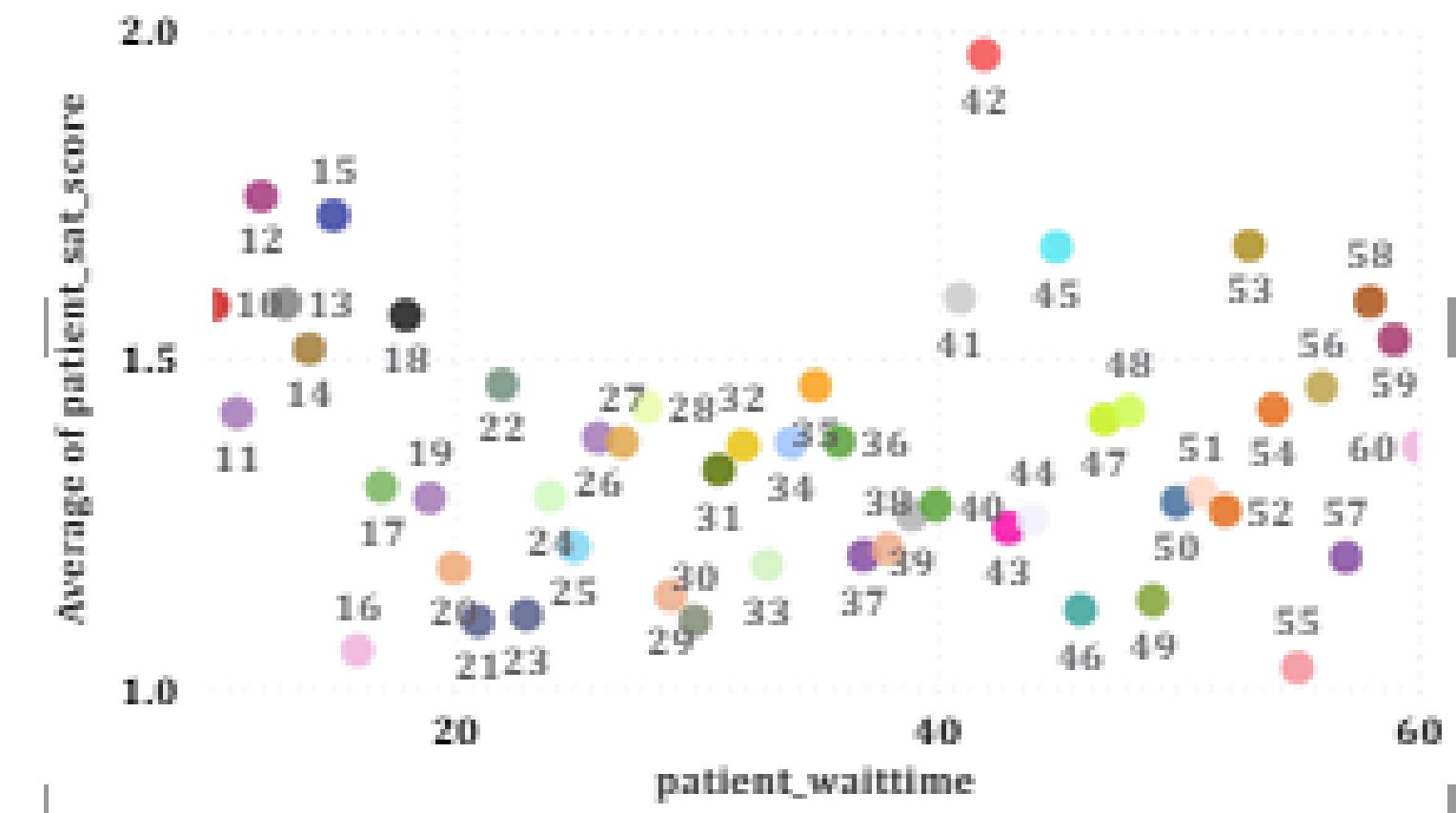
**AvgAgeGroupSatScore by AgeGroup and patient\_race**



# SATISFACTION ANALYSIS VS. PATIENT WAIT TIME

- Overall satisfaction scores remain low and scattered, showing that wait time alone does not explain patient experience.
- Additional factors such as service quality and staff interaction may also play a significant role
- Longer waiting periods generally correspond to lower patient satisfaction.

Average of patient\_sat\_score by patient\_waittime



# FINANCIAL & OPERATIONAL PERFORMANCE BY AGE DEMOGRAPHICS

## Top Performers:

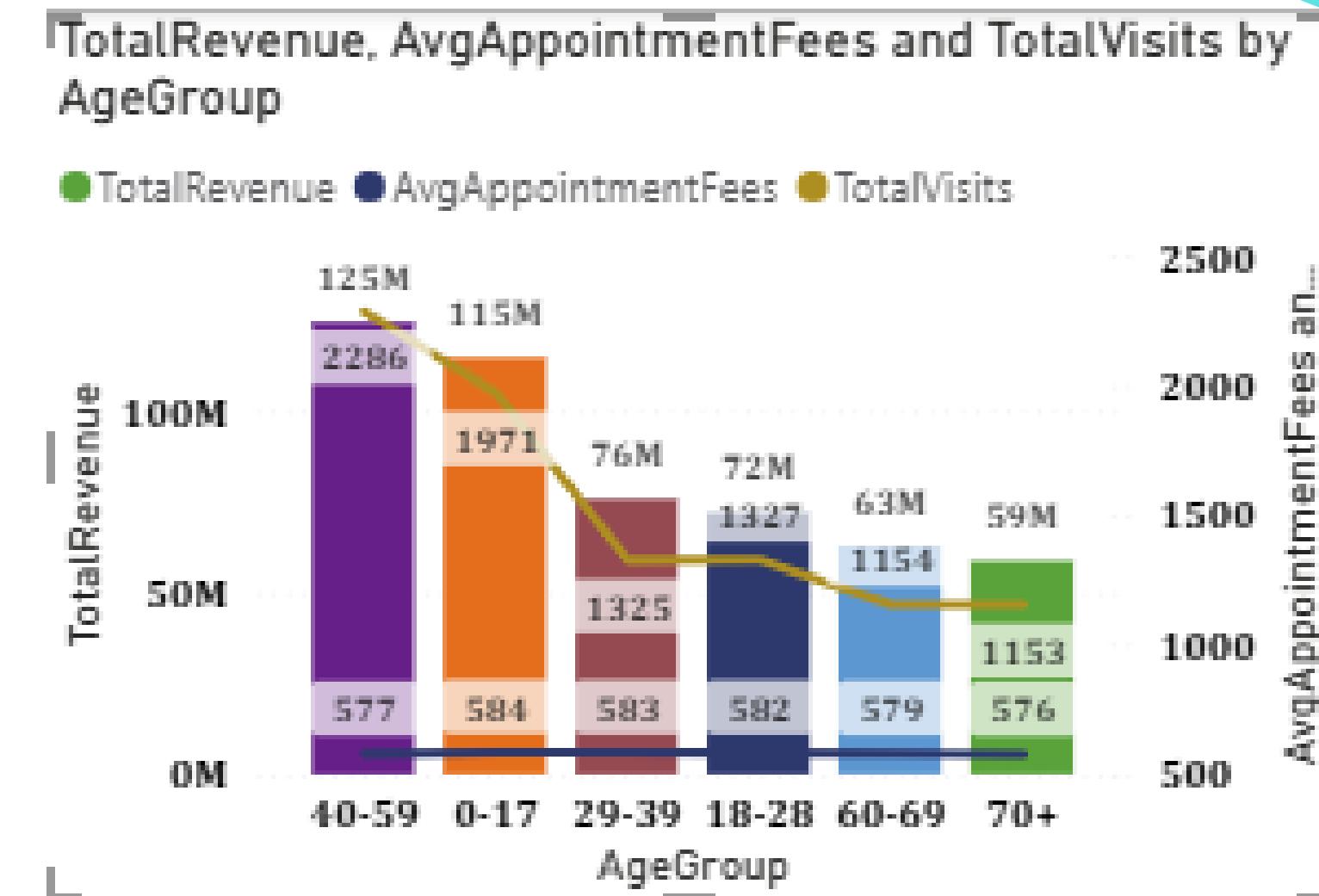
- The 40–59 age group is the key financial driver, generating the highest revenue (\$125M) and patient volume (2,286 visits).

## Direct Correlation:

- Revenue trends perfectly match patient traffic, with both metrics steadily declining as the patient demographic gets older (60+).

## Stable Pricing:

- The average appointment fee remains consistent (~580) across all groups, indicating a uniform pricing strategy regardless of patient age.



# RECOMMENDATION

## Optimizing Physician Distribution Across Departments

- Increase physician numbers in revenue-intensive and high-demand departments to alleviate workload pressures.
- Redistribute personnel from low-volume departments to enhance resource utilization.
- Employ continuous monitoring of patient flow trends to inform future staffing decisions.

## Improving Feedback Mechanisms for Patient Experience

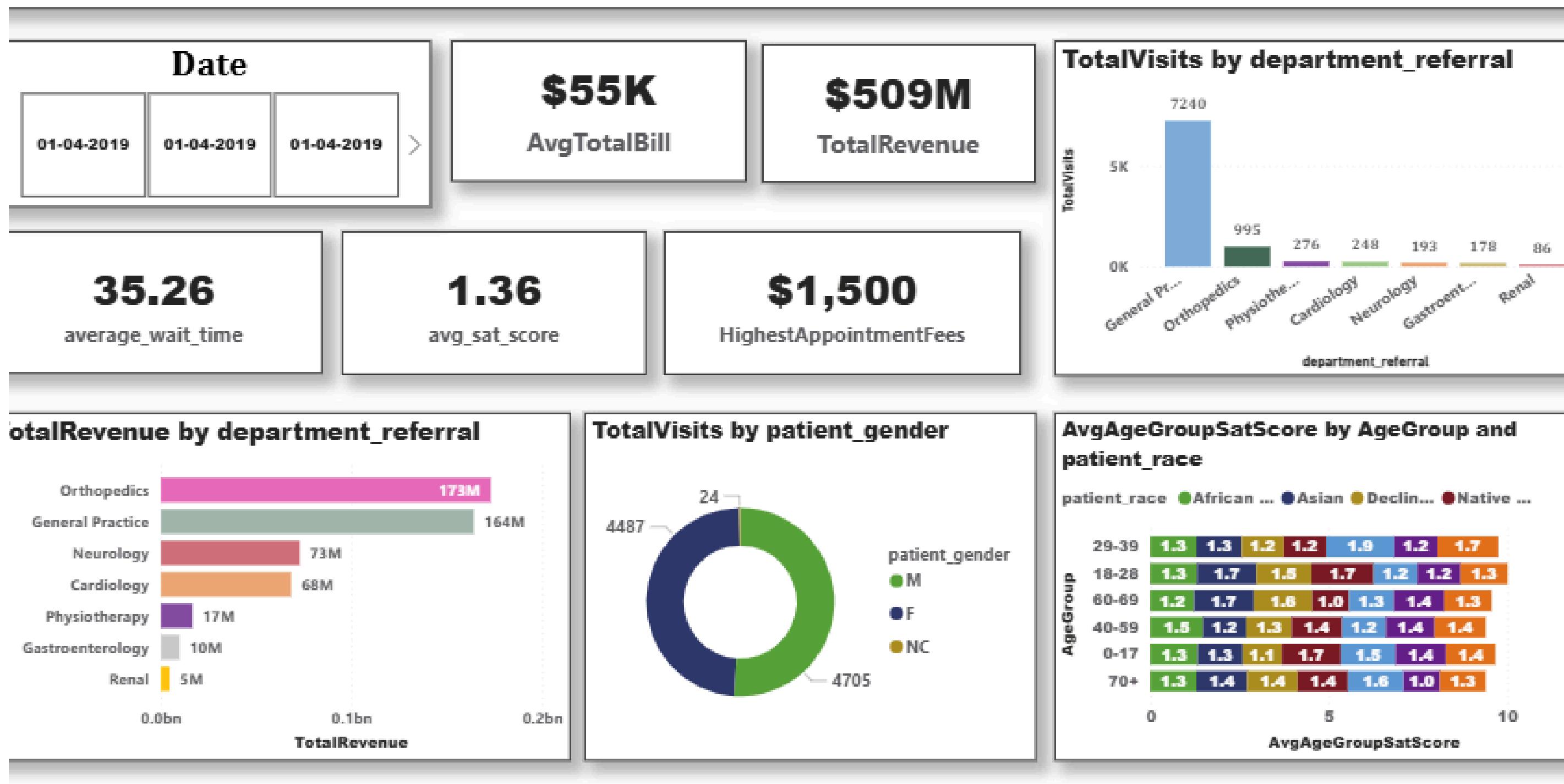
- Address ~72% missing satisfaction scores by deploying digital or mobile survey systems.
- Standardize post-visit feedback collection to ensure comprehensive patient experience data.
- Enhance engagement through accessible and consistent feedback channels.

## Optimizing Discount Structures for Patient Retention

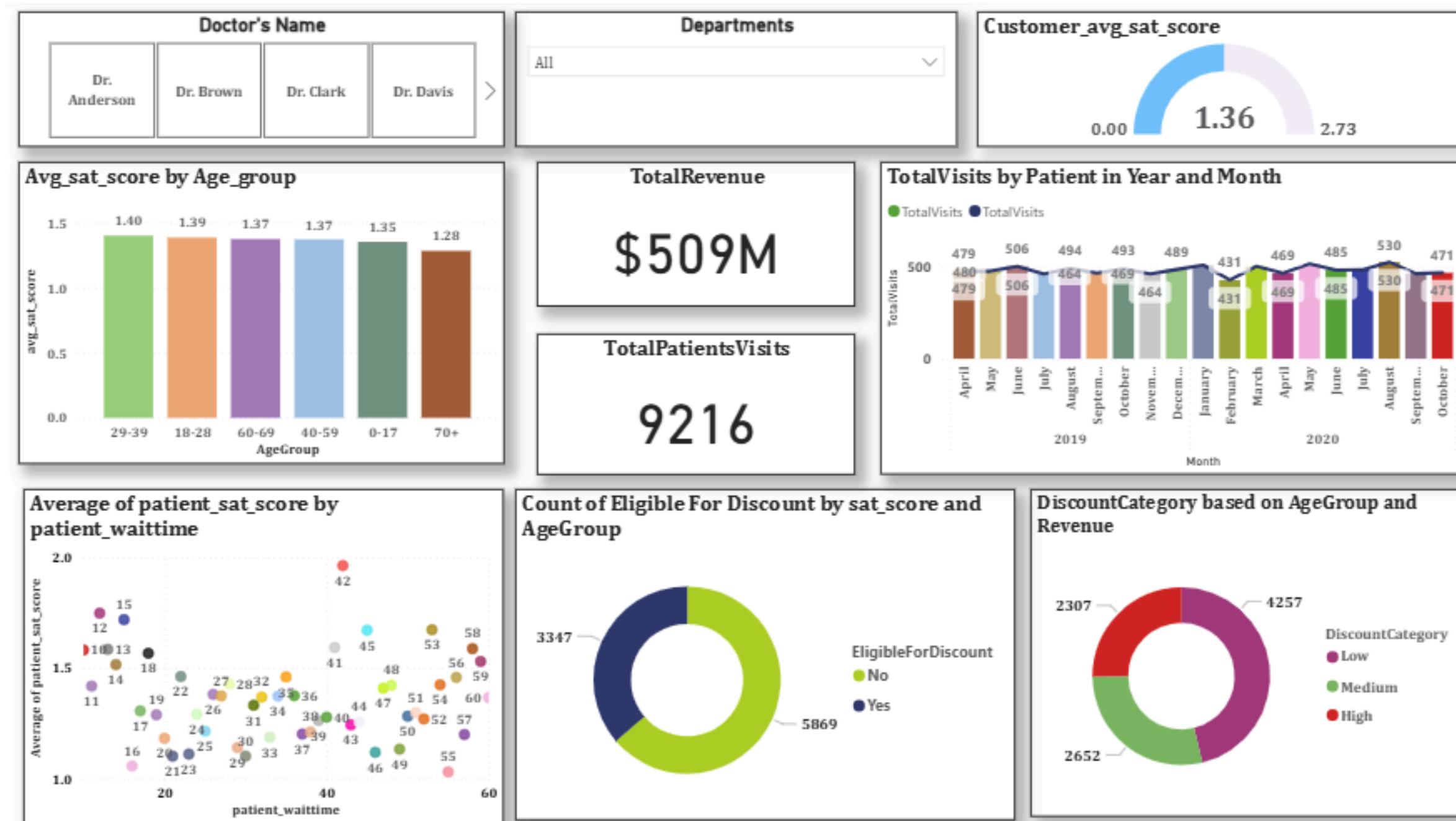
- Discounts should be primarily determined by age group and revenue contribution, ensuring equitable distribution.
- Elderly and low-revenue cohorts should receive higher discounts to foster accessibility and engagement.
- As satisfaction data becomes more reliable, incorporate sat\_scores into discount models to incentivize loyalty and satisfaction.

# DASHBOARD (MAIN TAB)

## Columbia Asia Hospital Analysis



# DASHBOARD (DOCTOR'S TAB)



# DASHBOARD (PATIENT'S TAB)



# CONCLUSION

## Strong Revenue Performance

- Columbia Asia Hospital demonstrates robust revenue generation, with Orthopedics and General Practice leading in both patient volume and financial contribution.

## Staffing Optimization Needs

- Increasing the number of doctors in high-demand departments can reduce workload and patient wait times.
- Redistributing resources from low-inflow departments will improve overall efficiency.

## Enhancing Patient Feedback Systems

- A more engaging and consistent feedback mechanism is required to capture patient satisfaction effectively.
- Real-time tracking of patient experiences will help improve service quality.

## Fair Discount Strategy

- Current discount allocation based on age group and revenue ensures fairness across patient segments.

## Future Refinement of Discounts

- Integrating reliable satisfaction data into discount logic will enable more personalized and data-driven allocation.

## Balanced Growth Approach

- Combining strong revenue practices with staffing optimization, improved feedback, and refined discount strategies will ensure sustainable growth and patient engagement.



# THANK YOU AND STAY HEALTHY

END PRESENTATION

