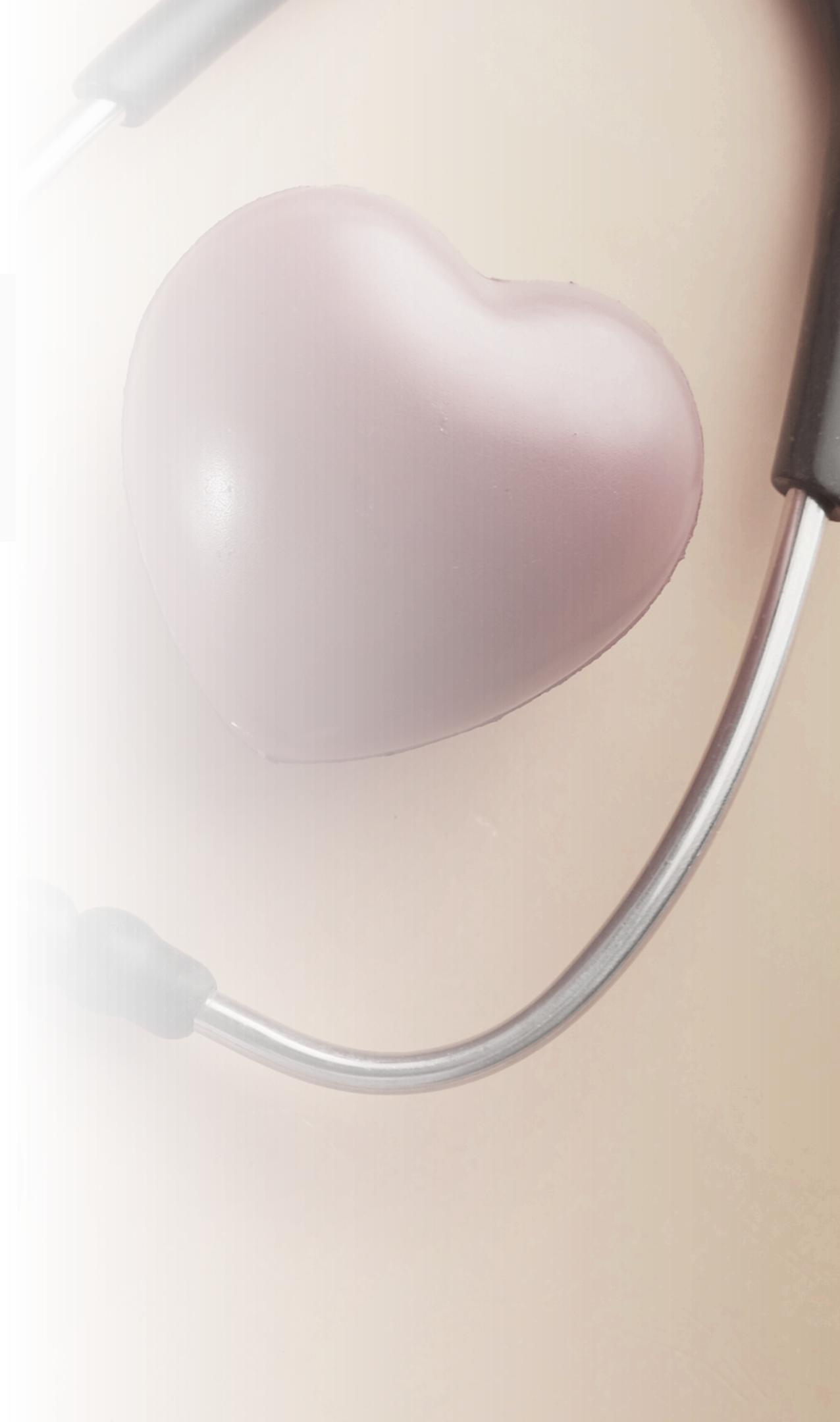




# COLUMBIA ASIA

## HOSPITAL DATA ANALYSIS

**Moupia Gain**  
**21/07/2025**





- Columbia Asia Hospital is a leading multi-specialty healthcare provider, known for delivering high-quality, patient-centered medical services. Equipped with state-of-the-art infrastructure and advanced technology, the hospital offers comprehensive care across a wide range of specialties including General Practice, Orthopedics, Cardiology, Neurology, Gastroenterology, and more.
- With a strong emphasis on clinical excellence, Columbia Asia combines skilled medical expertise with modern facilities to ensure safe, effective, and compassionate treatment







# Problem Statement

- Assess the hospital's revenue generation 01
- Assess the hospital's revenue generation 02
- Strategies suggestions for patient discounts 03



# Data Overview

- **Date:** This column contains date and time information without specifying AM or PM. The format is **DD-MM-YYYY HH:MM**.
- **Patient ID:** Each patient is assigned a unique identifier, which seems to be in the format **124-62-3289**.
- **Patient Gender:** This column records the gender of the patient, denoted by 'M' for male and 'F' for female.
- **Patient Age:** The age of the patients is listed in years.
- **Patient Sat Score:** It seems to represent a satisfaction score given by or for the patient. However, the scores are single-digit, and it's not clear what the scale is.
- **Patient First Initial:** This column contains the first initial of the patient's first name.
- **Patient Last Name:** The surname of the patient is listed in this column.





# Data Overview

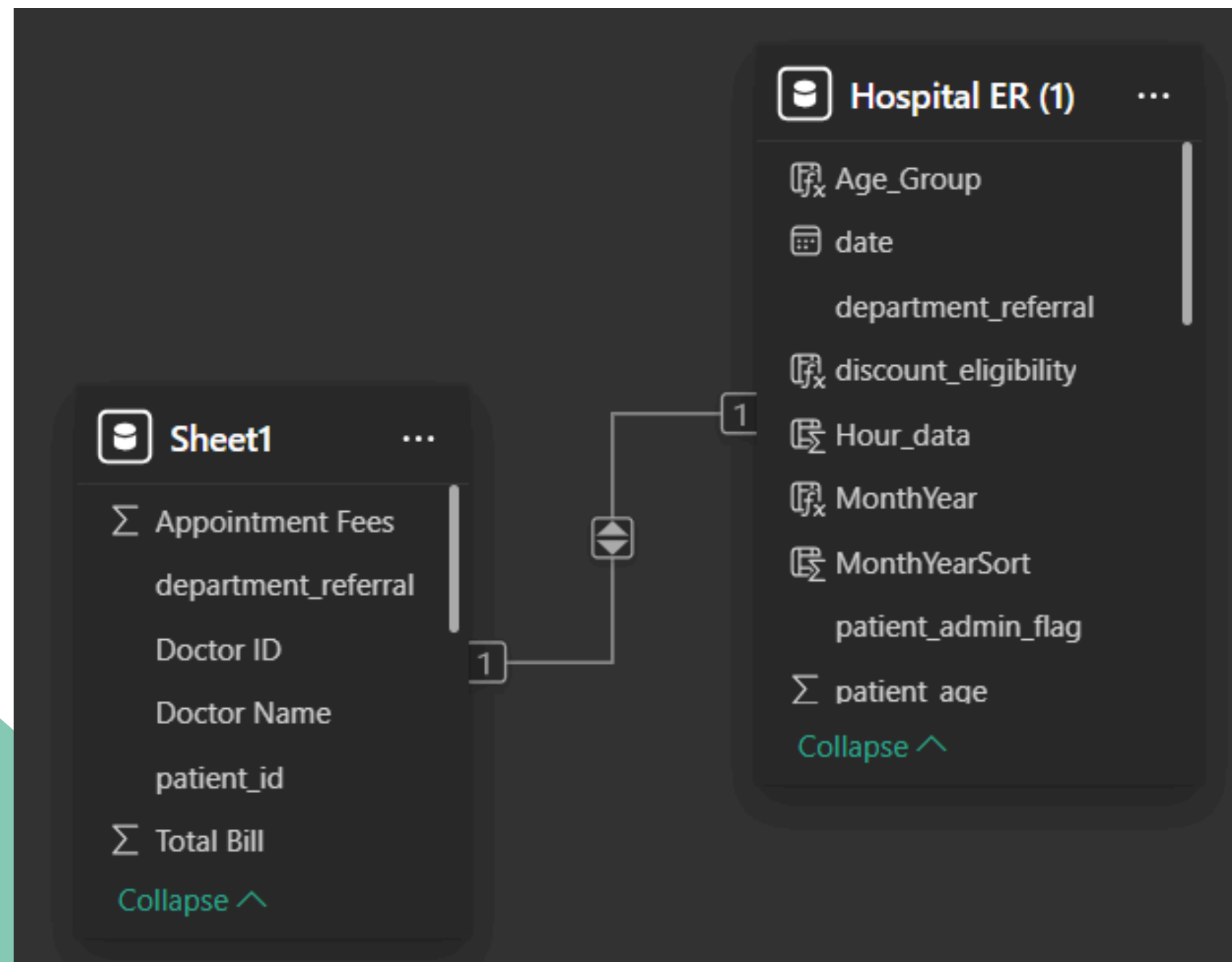
- **Patient Race:** The racial or ethnic background of the patient is recorded here, with categories such as 'White', 'African American', 'Asian', 'Native American/Alaska Native', and 'Two or More Races'.
- **Patient Admin Flag:** This column contains boolean values ('TRUE' or 'FALSE') which might indicate whether the patient was admitted or some other administrative flag.
- **Patient Wait Time:** Appears to indicate the time the patient waited, possibly in minutes, before being seen or processed.
- **Department Referral:** This column lists the department to which the patient was referred, with entries such as 'General Practice', 'Orthopedics', 'Gastroenterology', or 'None' indicating no referral.
- **Doctor Name:** Identifies the doctor who attended each patient.
- **Appointment Fees:** The cost charged for a doctor's consultation.
- **Total Bill:** The overall amount billed to the patient, including all services and charges.



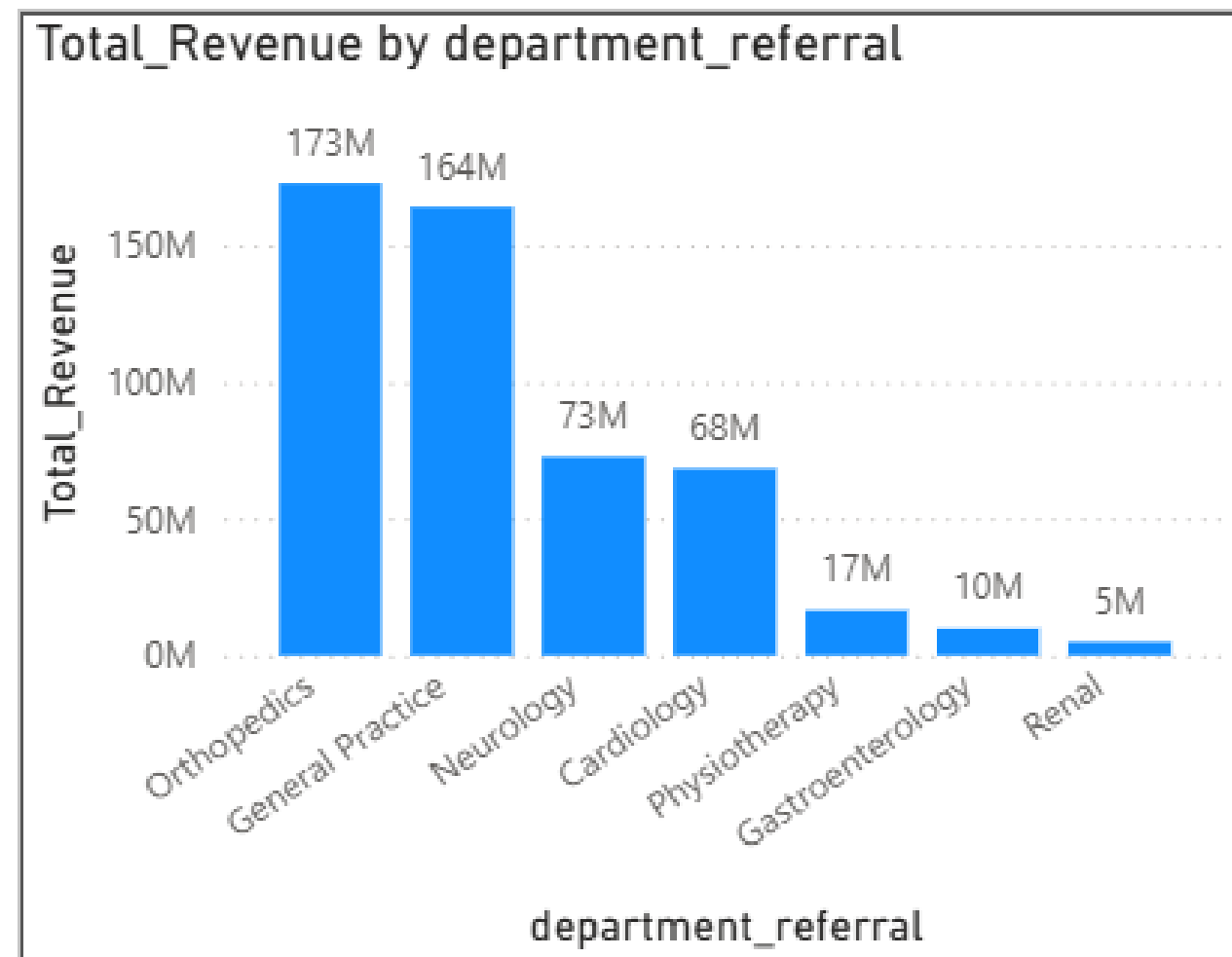
# Data Methodology

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# Database Schema



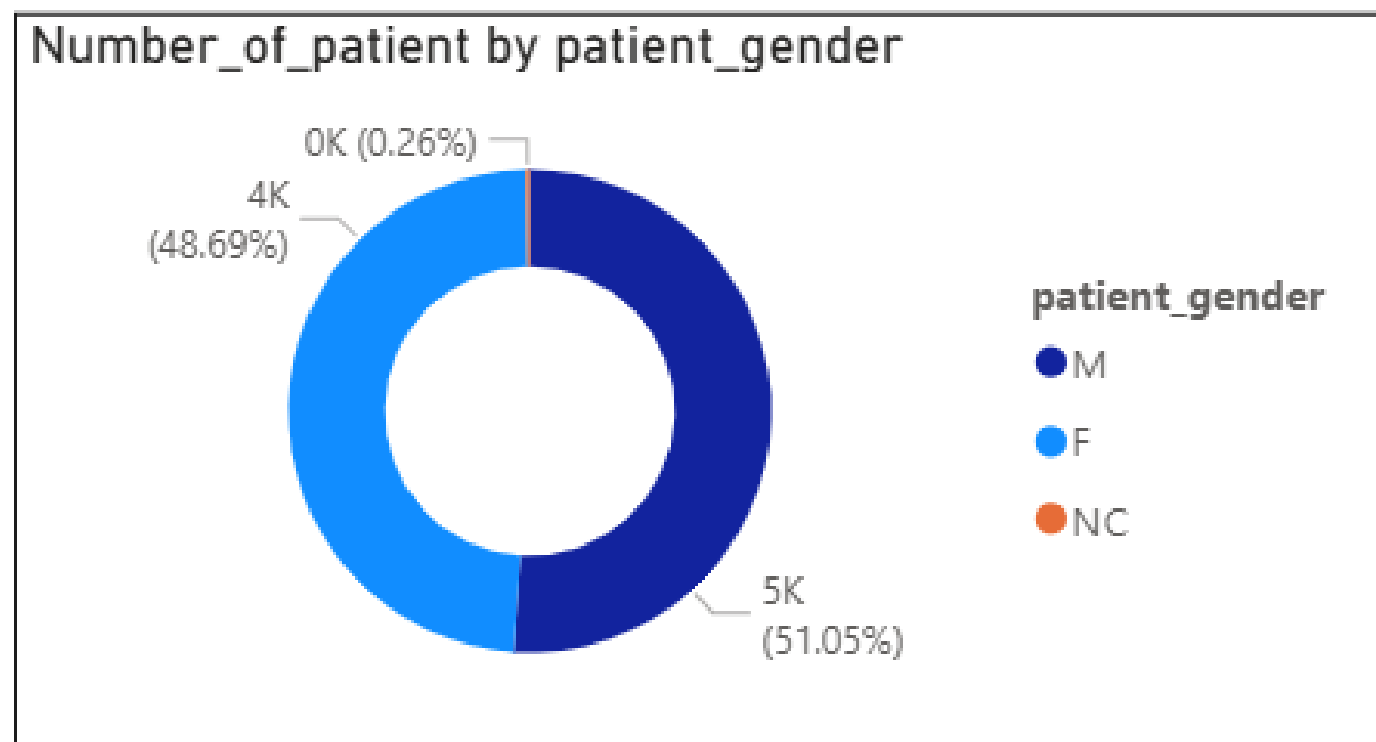
# Department-wise Revenue Analysis



- Orthopedics and General Practice emerge as the highest revenue-generating (173M and 163M respectively) departments, contributing significantly to the hospital's overall financial health.
- Physiotherapy, Gastroenterology, and Renal departments have the lowest revenue (17M, 10M and 5M respectively) contributions reflecting limited patient volumes, lower-cost services, or underutilization of available resources

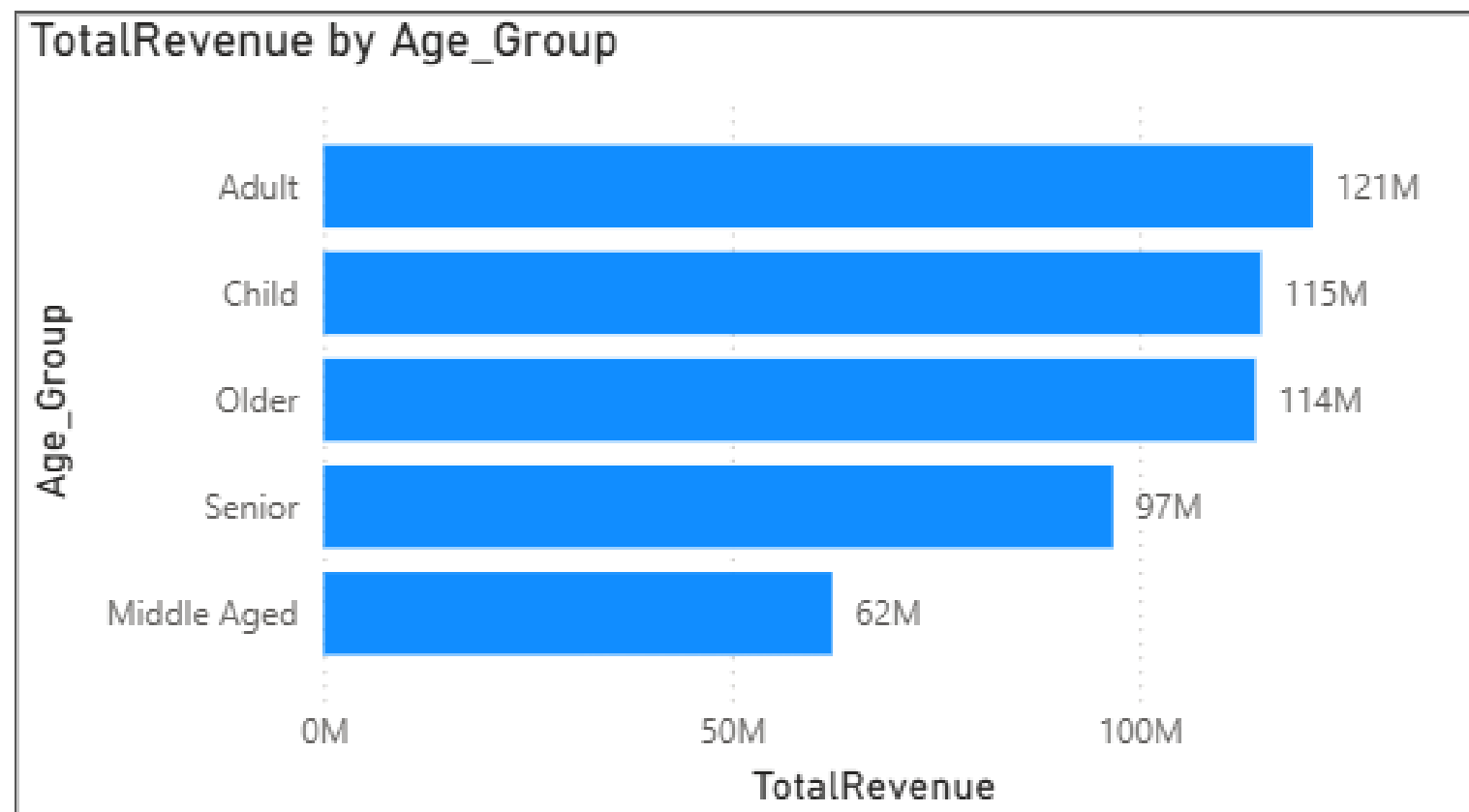


# Number of patients by gender



- Patient visits are nearly evenly split between males (51.05%) and females (48.69%), indicating no strong gender bias in hospital visitation rates.
- A minimal proportion of visits (0.26%) fall under the "Not Categorized" (NC) group.
- The donut chart effectively illustrates the close parity between male and female patient visits.

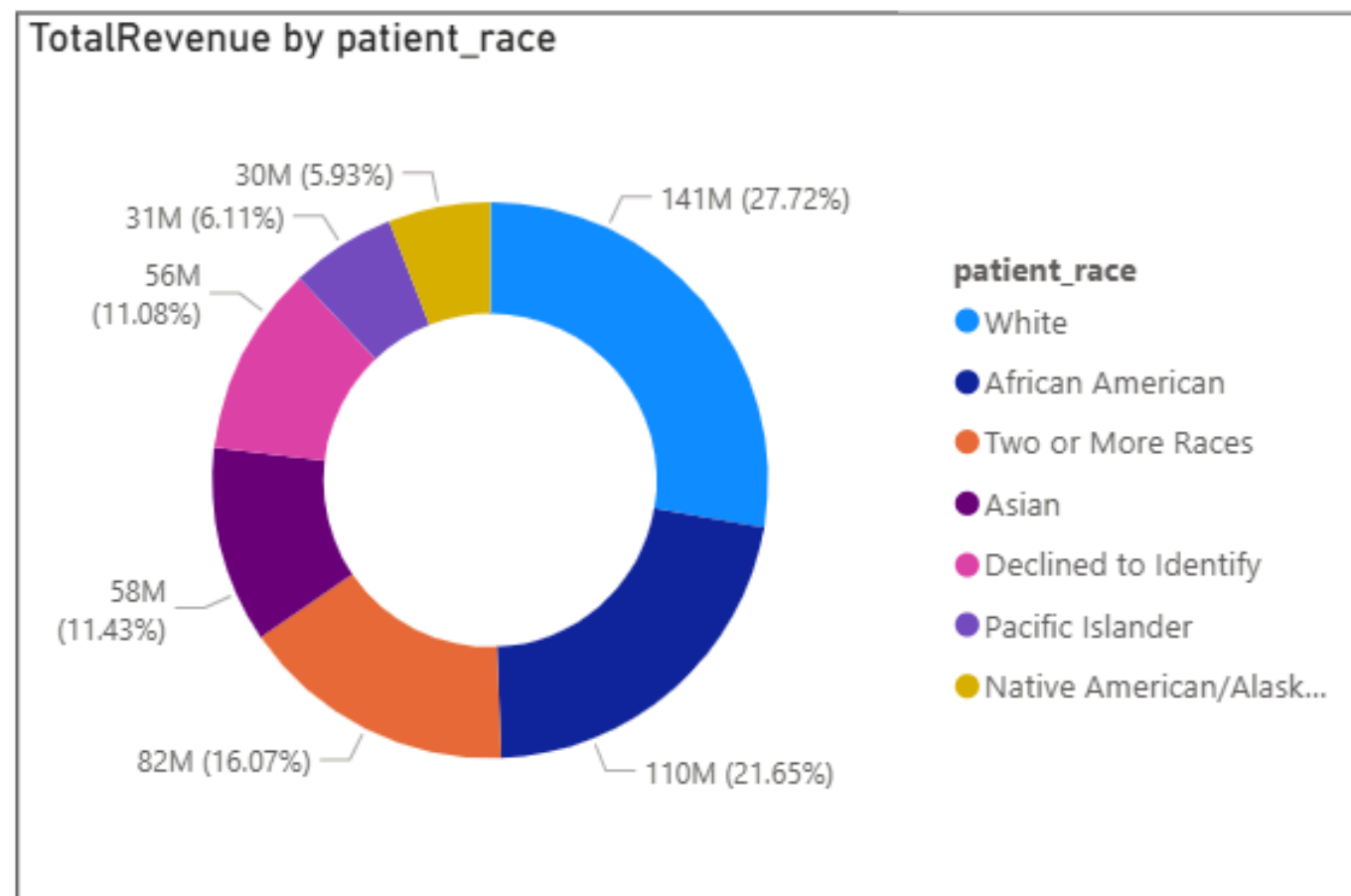
# Revenue distribution by age group



- **Adults , Child, and Older people are top contributors to revenue.**
- **This age-wise revenue distribution underscores the importance of focusing on middle aged and senior care services for financial sustainability.**

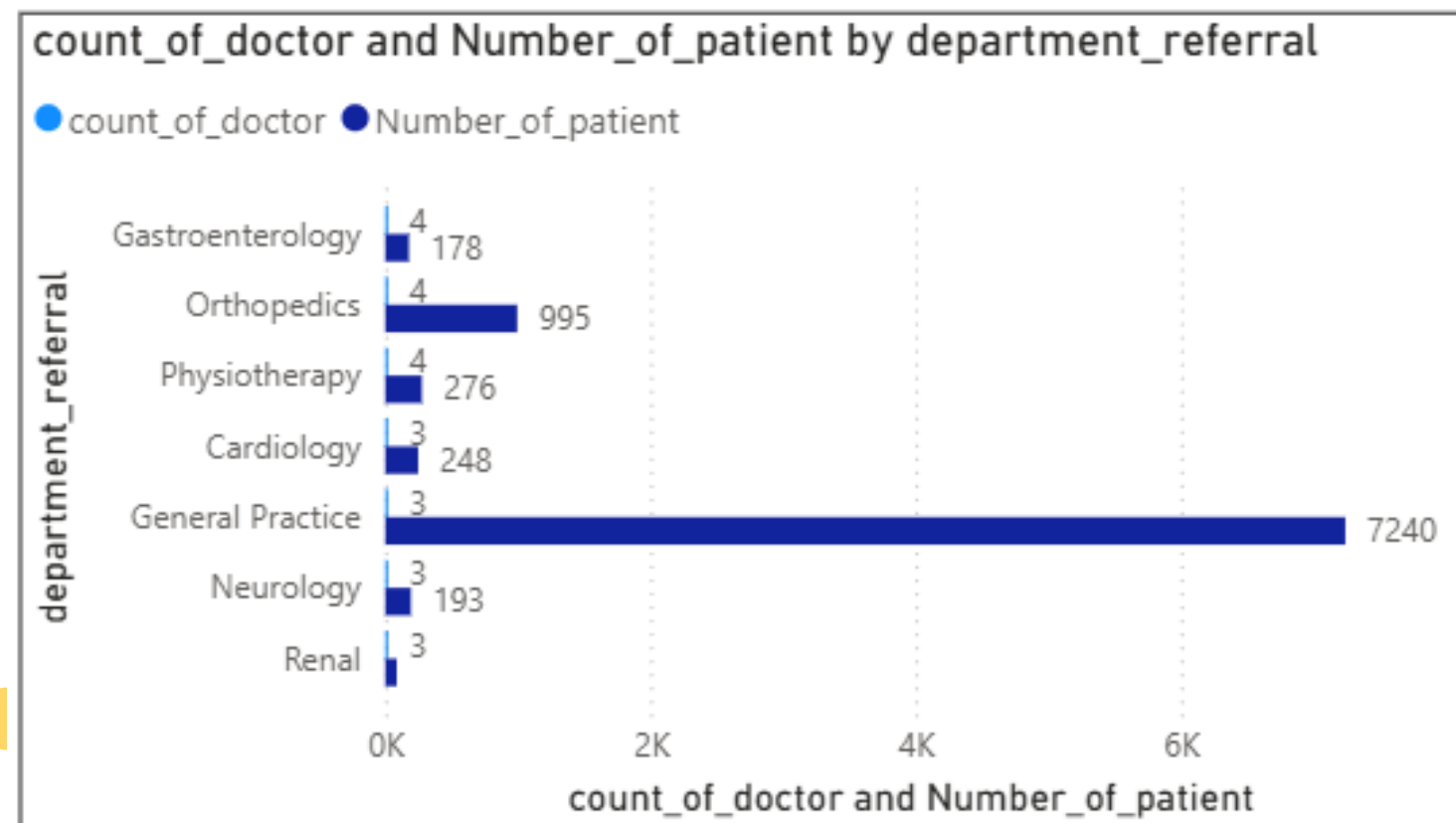


# Revenue Analysis by Patient Race



- **White patients generate the highest (141M) total revenue, followed by African American (110M) and Two or More Races .**
- **Lower Revenue generation from Native American/Alaska Native (30M) and Pacific Islander (31M) reflects either smaller patient volumes or lower bill sizes.**

# Department Staffing Analysis: Doctor-Patient Ratio

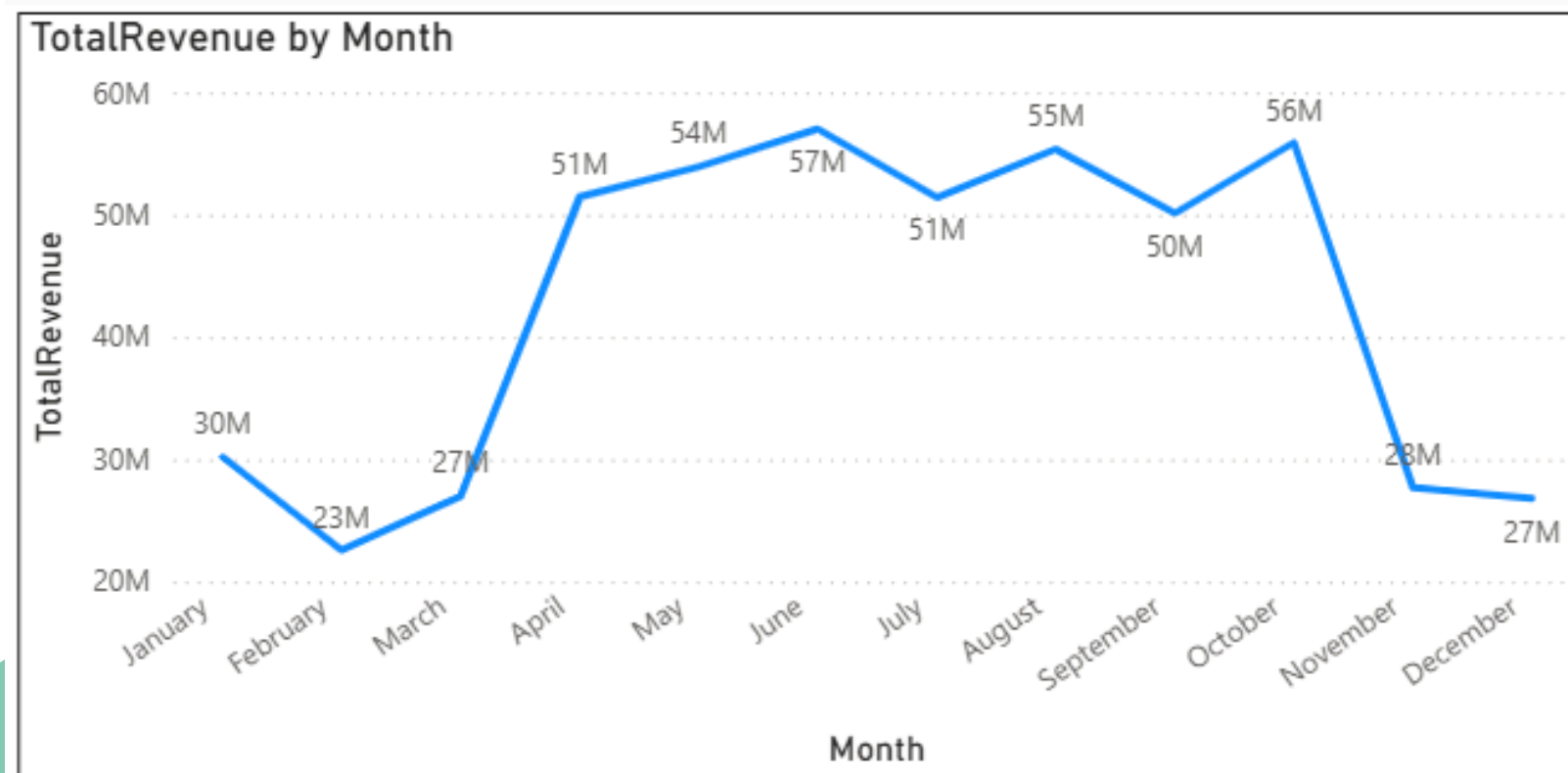


- General Practice has the highest patient volume (7,240) with only 3 doctors – a very high workload per doctor with orthopedics in second with 4 doctors, also indicating a heavy load.
- Physiotherapy, Cardiology, Renal, Gastroenterology, Neurology have lower volumes and no immediate staffing.





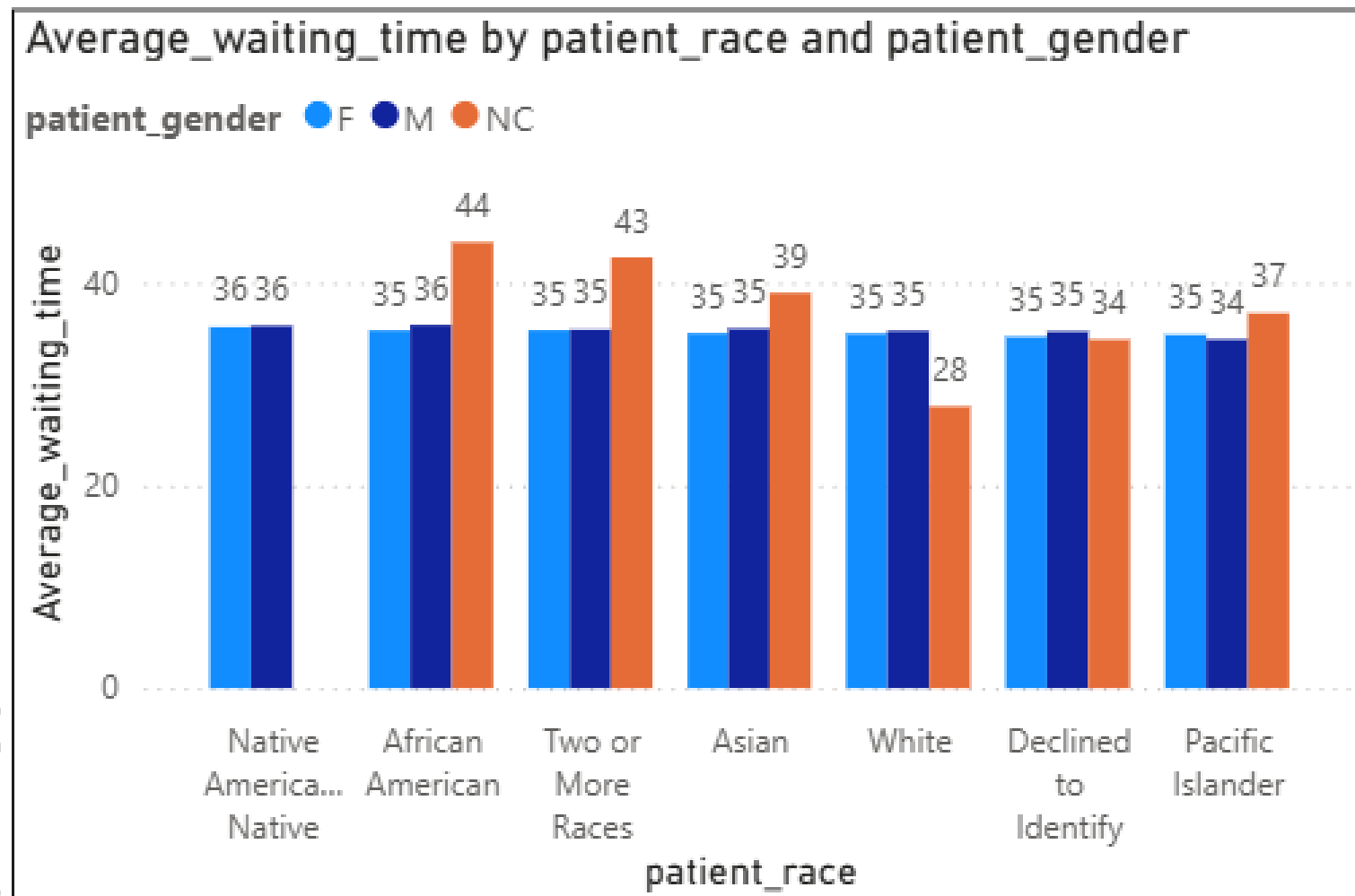
# Monthly Revenue Trend



- Profit trends show strong peaks between April and October, with highest values (~₹54M–₹56M) in May and October.
- A sharp dip in profit is evident during January–March and November–December, suggesting seasonal fluctuations in patient volumes or billing.
- The consistent mid-year peak may reflect higher elective procedures, preventive care initiatives, or annual check-up trends



# Discrimination Analysis by Gender and Race



- Each people from different gender are having the same waiting time while visiting to the doctors. Hence no discrimination is seen based on gender.
- And people from different race are also having almost same waiting time. So no discrimination is found on the basis of race

# Main Tab



9216

Count\_of\_Patient

22

count\_of\_doctor

509M

TotalRevenue

35.26

Average\_waiting\_time

patient\_gender, patient\_race, ...

- ☐ F  
☐ M  
☐ NC

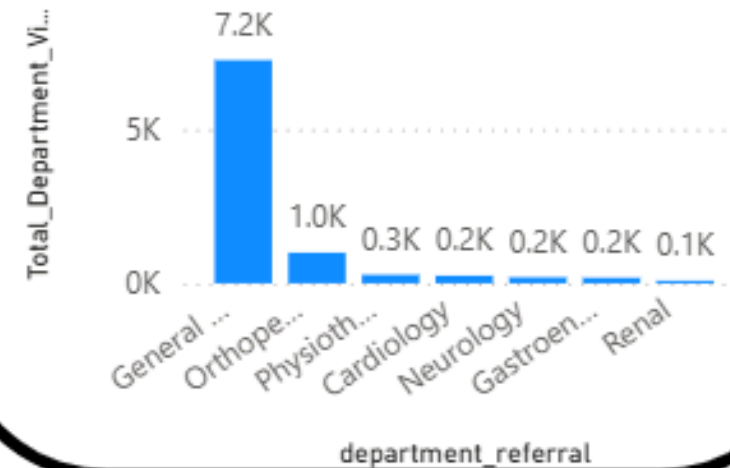
date

01-04-2019

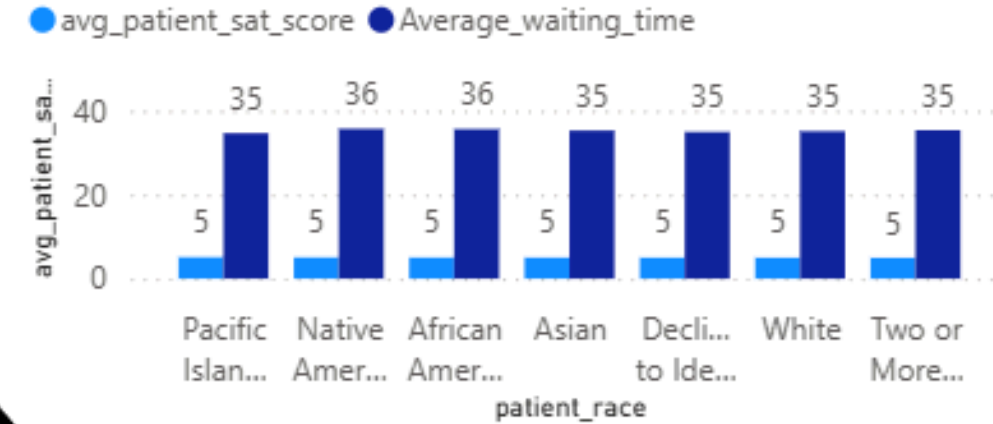
30-10-2020



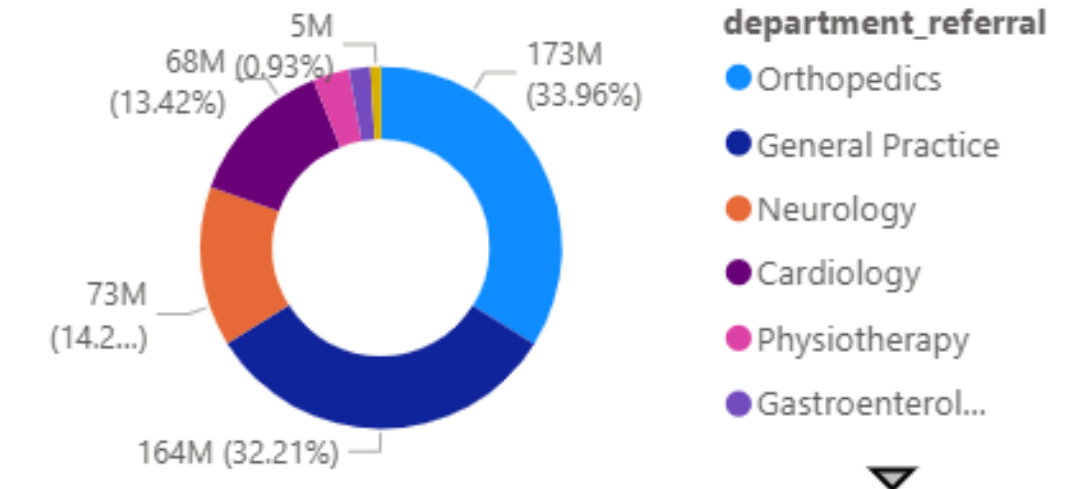
Total\_Department\_Visits by department\_referral



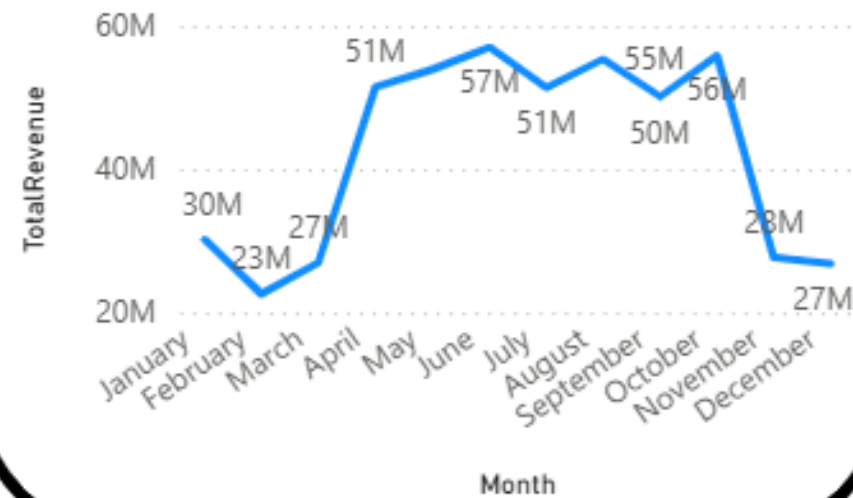
avg\_patient\_sat\_score and Average\_waiting\_time by patient\_race



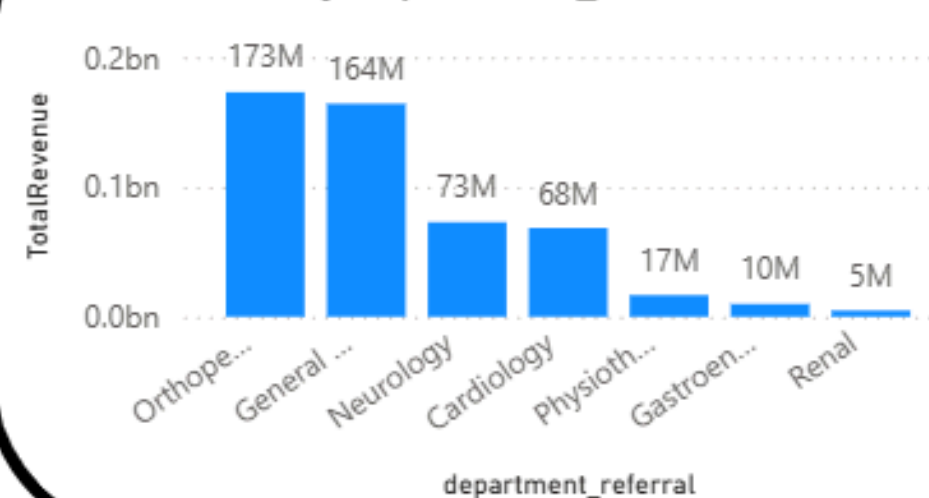
TotalRevenue by department\_referral



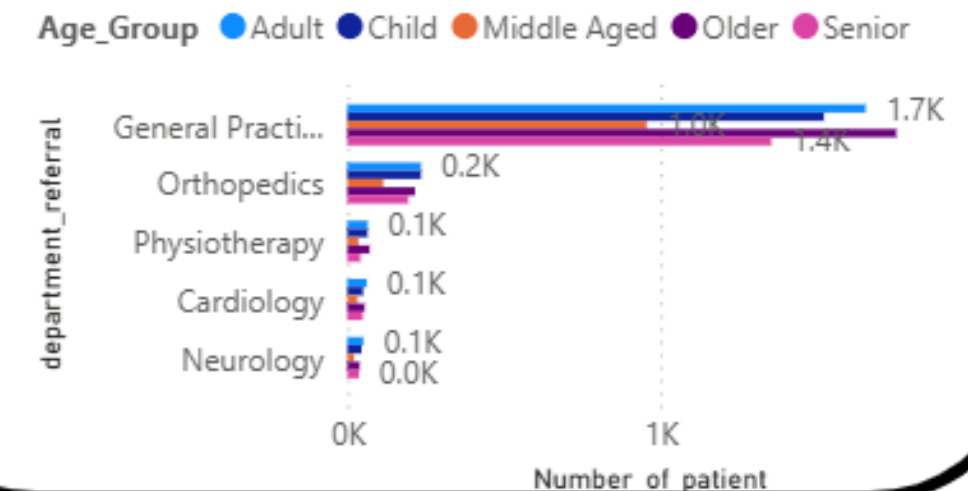
TotalRevenue by Month



TotalRevenue by department\_referral



Number\_of\_patient by department\_referral and Age\_Group

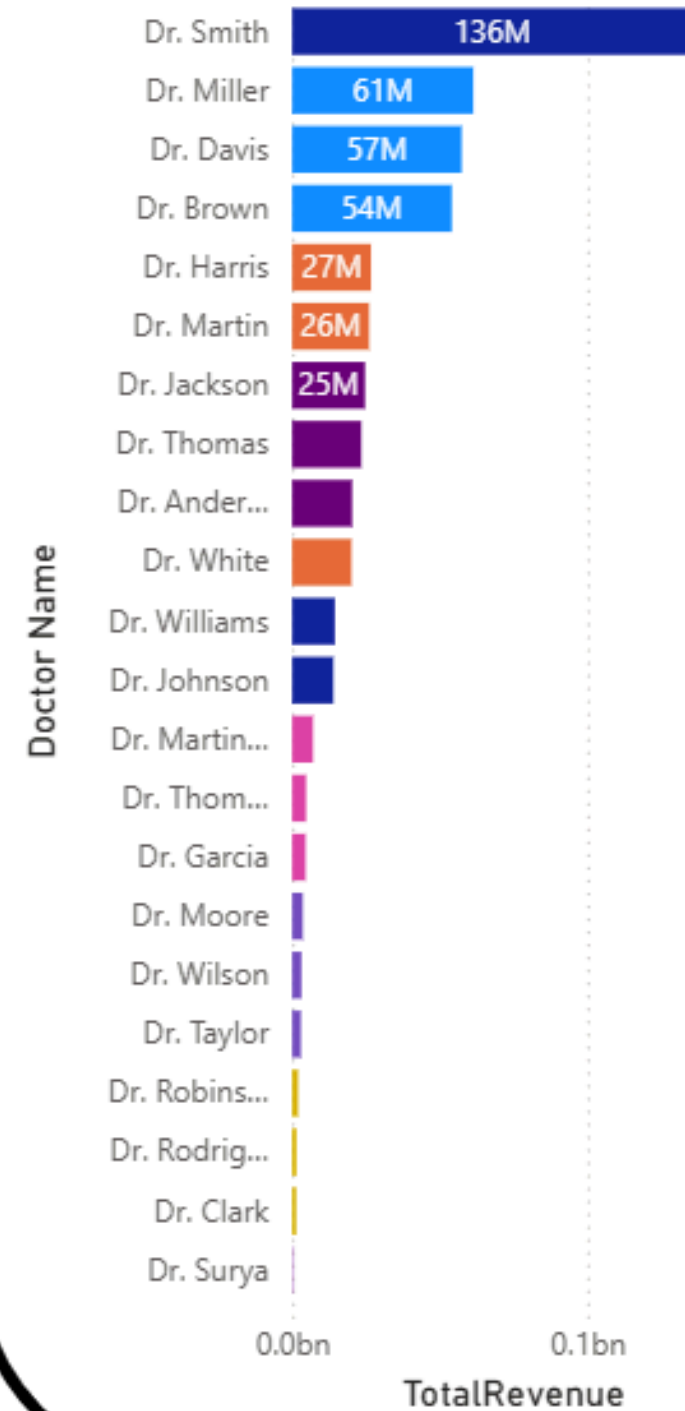


# Doctor's Tab



TotalRevenue by Doctor Name and department\_referral

departm... ● Cardiology ● Gastroenterolo...



22

count\_of\_doctor

509M

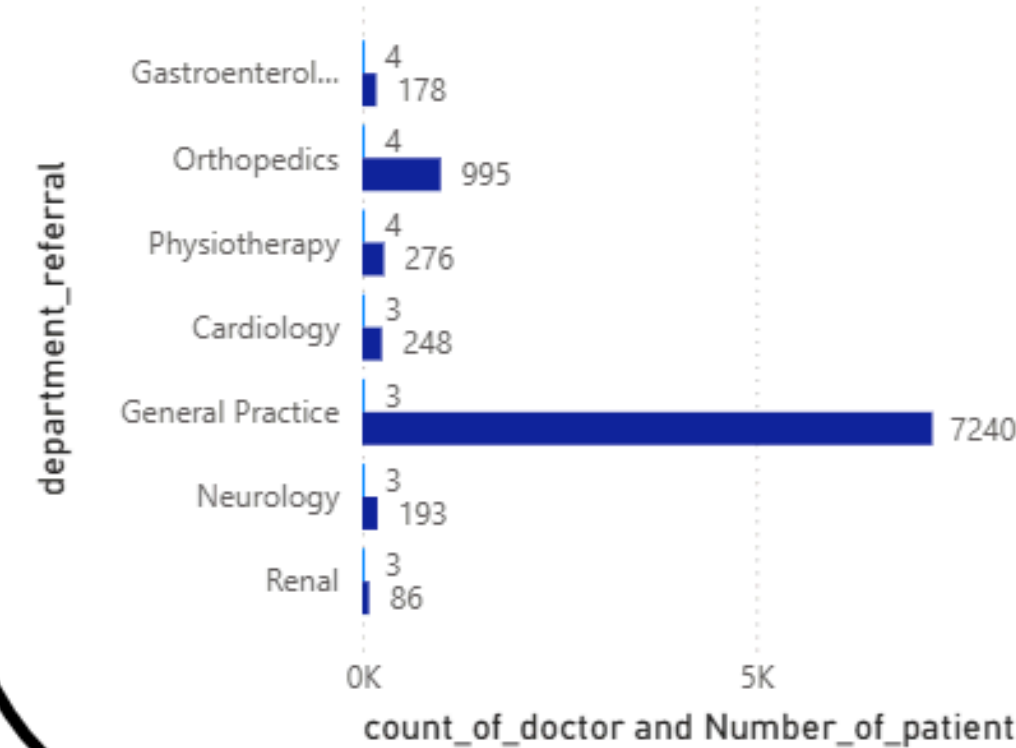
TotalRevenue

5.00

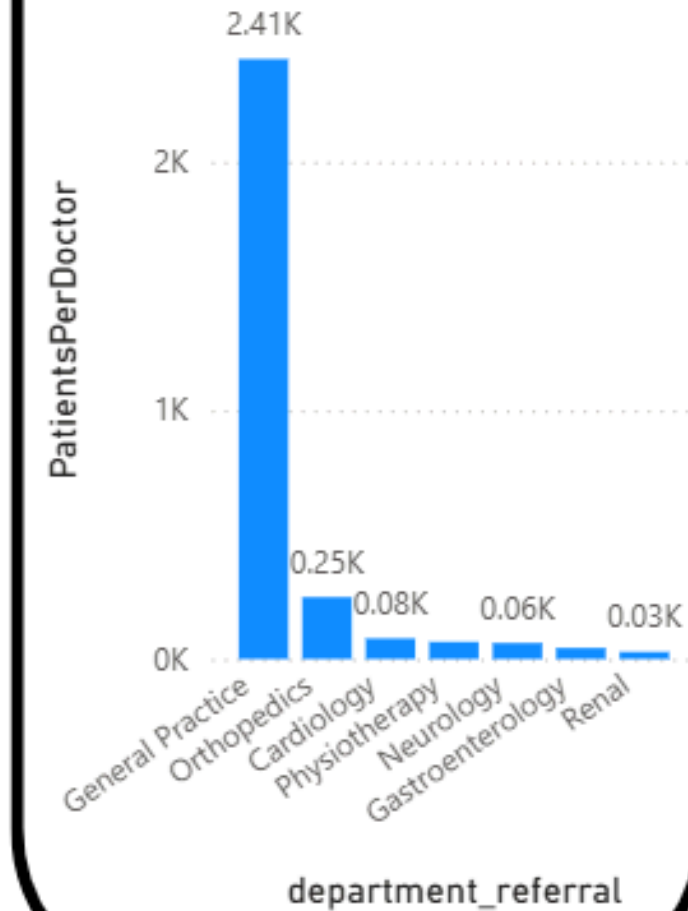
avg\_patient\_sat\_score

count\_of\_doctor and Number\_of\_patient by department\_referral

● count\_of\_doctor ● Number\_of\_patient



PatientsPerDoctor by department\_referral



Doctor Name

- ☐ Dr. Anderson
- ☐ Dr. Brown
- ☐ Dr. Clark
- ☐ Dr. Davis
- ☐ Dr. Garcia
- ☐ Dr. Harris
- ☐ Dr. Jackson
- ☐ Dr. Johnson
- ☐ Dr. Martin
- ☐ Dr. Martinez
- ☐ Dr. Miller
- ☐ Dr. Moore
- ☐ Dr. Robinson
- ☐ Dr. Rodriguez
- ☐ Dr. Smith
- ☐ Dr. Surya
- ☐ Dr. Taylor
- ☐ Dr. Thompson
- ☐ Dr. White



# Patient's Tab



9216

Number\_of\_patient

509M

TotalRevenue

35.26

Average\_waiting\_time

Average\_waiting\_time and  
avg\_patient\_sat\_score  
correlation for departme...



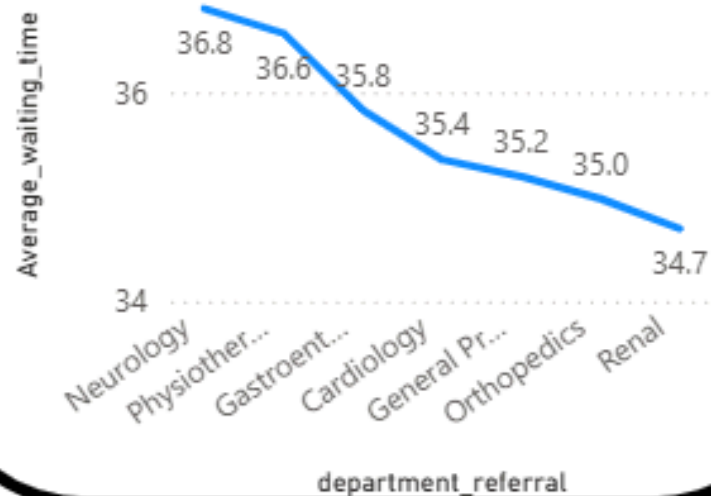
patient\_id

- ☐ 100-04-3993
- ☐ 100-17-5081
- ☐ 100-21-9648
- ☐ 100-34-6753
- ☐ 100-34-9587

patient\_gender Number\_of\_patient

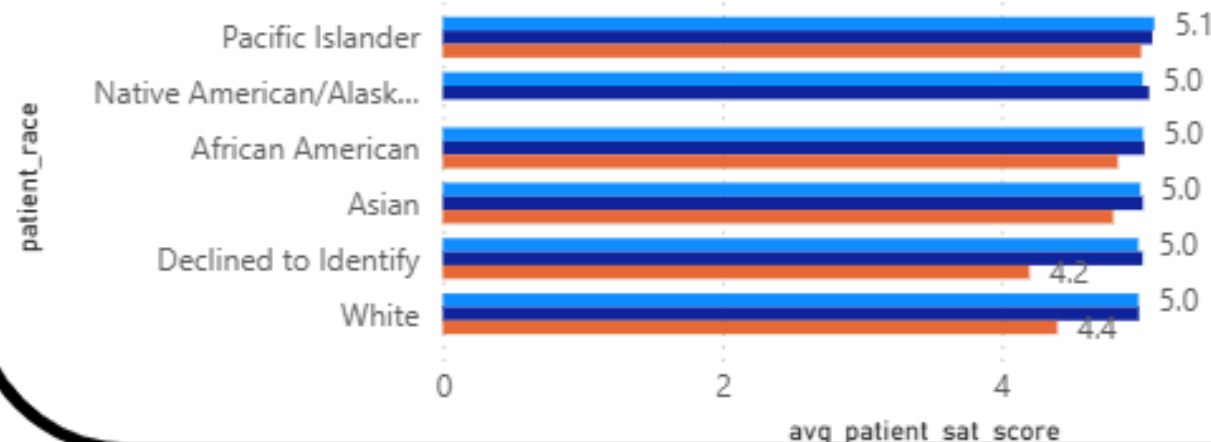
F	4487
M	4705
NC	24
Total	9216

Average\_waiting\_time by  
department\_referral

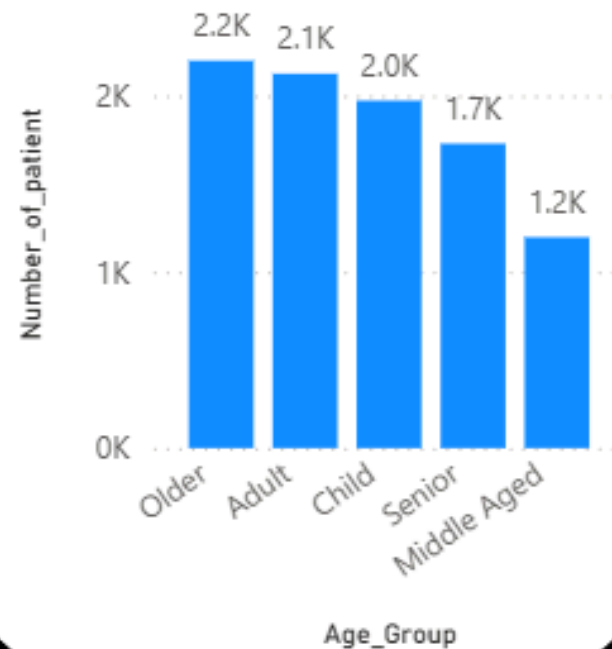


avg\_patient\_sat\_score by patient\_race and patient\_gender

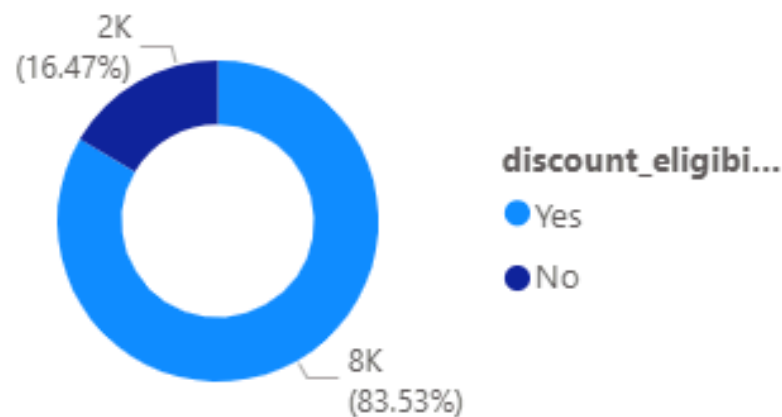
patient\_gender ● F ● M ● NC



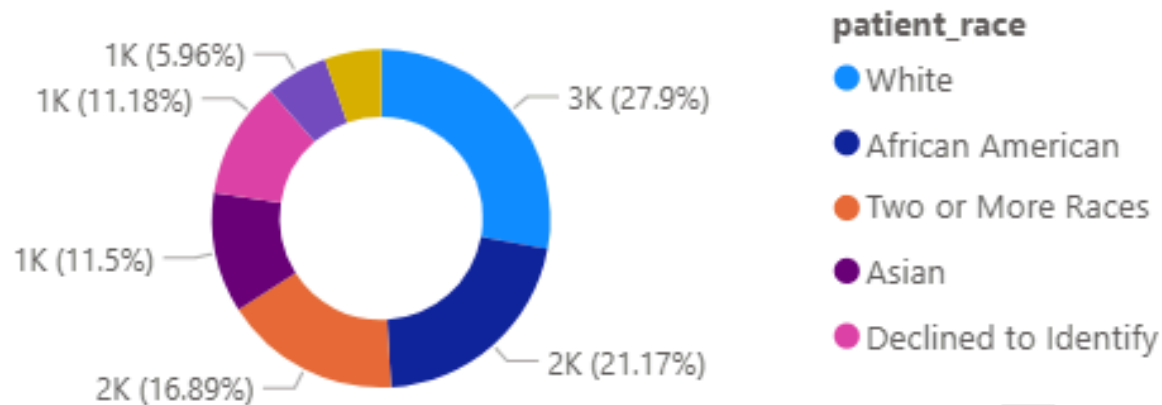
Number\_of\_patient by  
Age\_Group



Number\_of\_patient by discount\_eligibility



Number\_of\_patient by patient\_race



# Strategic Recommendation

## Enhance High-Performing Departments & Services

- Continue investing in high-revenue departments like Orthopedics and General Practice by improving facilities, adding advanced treatment options, and strengthening patient follow-up programs.
- Promote specialized high-billing services (e.g., Cardiology, Neurology) to maximize revenue while maintaining quality and accessibility.

## Optimize Underperforming Areas

- Investigate low-revenue or low-visit departments (e.g., Gastroenterology, Physiotherapy, Renal) to identify causes such as limited awareness, operational inefficiencies, or outdated service packages.
- Launch targeted outreach and marketing campaigns to improve visibility and encourage patient utilization in these areas.

## Prioritize Patient-Centric Care

- Provide discounts or loyalty-based incentives for seniors, frequent visitors, and high-bill patients to improve accessibility and strengthen patient trust.
- Maintain equitable care by monitoring patient satisfaction across age groups, genders, and racial backgrounds, ensuring no demographic is underserved

## Strengthen Operational Efficiency

- Analyze and manage departments with high waiting times; consider increasing staffing, optimizing scheduling, and adopting pre-appointment triaging to reduce delays and improve patient experiences.
- Monitor monthly workloads and adjust resources dynamically to balance capacity and avoid overburdening doctors.

## Improve Revenue Diversification & Cross-Referrals

- Create bundled preventive care or family packages encouraging cross-department referrals, boosting volumes in specialized and low-performing services.
- Design tailored wellness programs to attract patients throughout the year, thereby smoothing seasonal revenue fluctuations.

## Department for New Hiring

- Focus on hiring more doctors in General Practice, which faces the highest patient volume and highest doctor workload.
- Support Orthopedics and Cardiology, where patient loads are high and additional staffing can prevent burnout.
- Monitor other departments proactively to ensure staffing aligns with future demand and maintains patient care quality



**THANK  
YOU !**

