

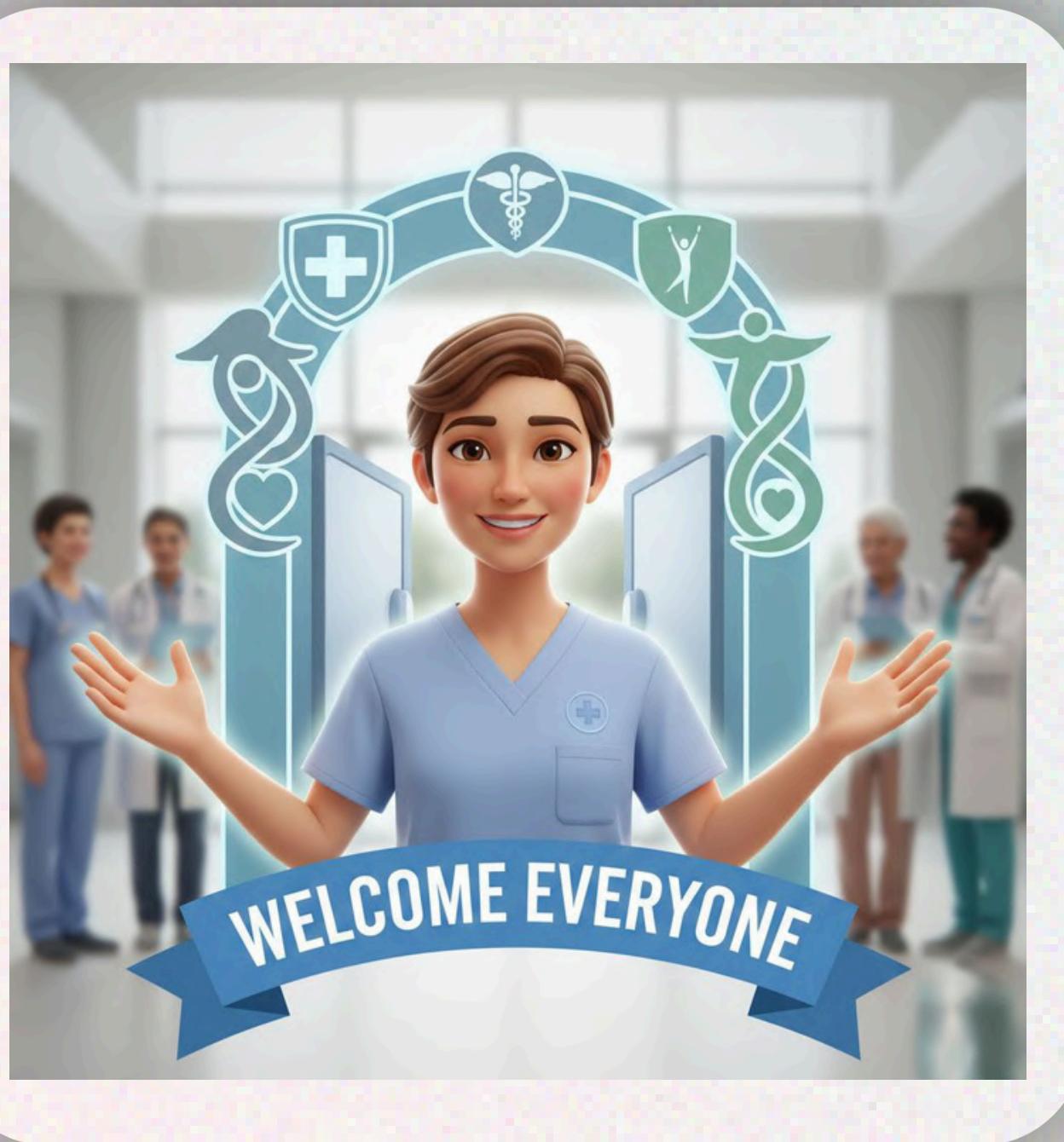
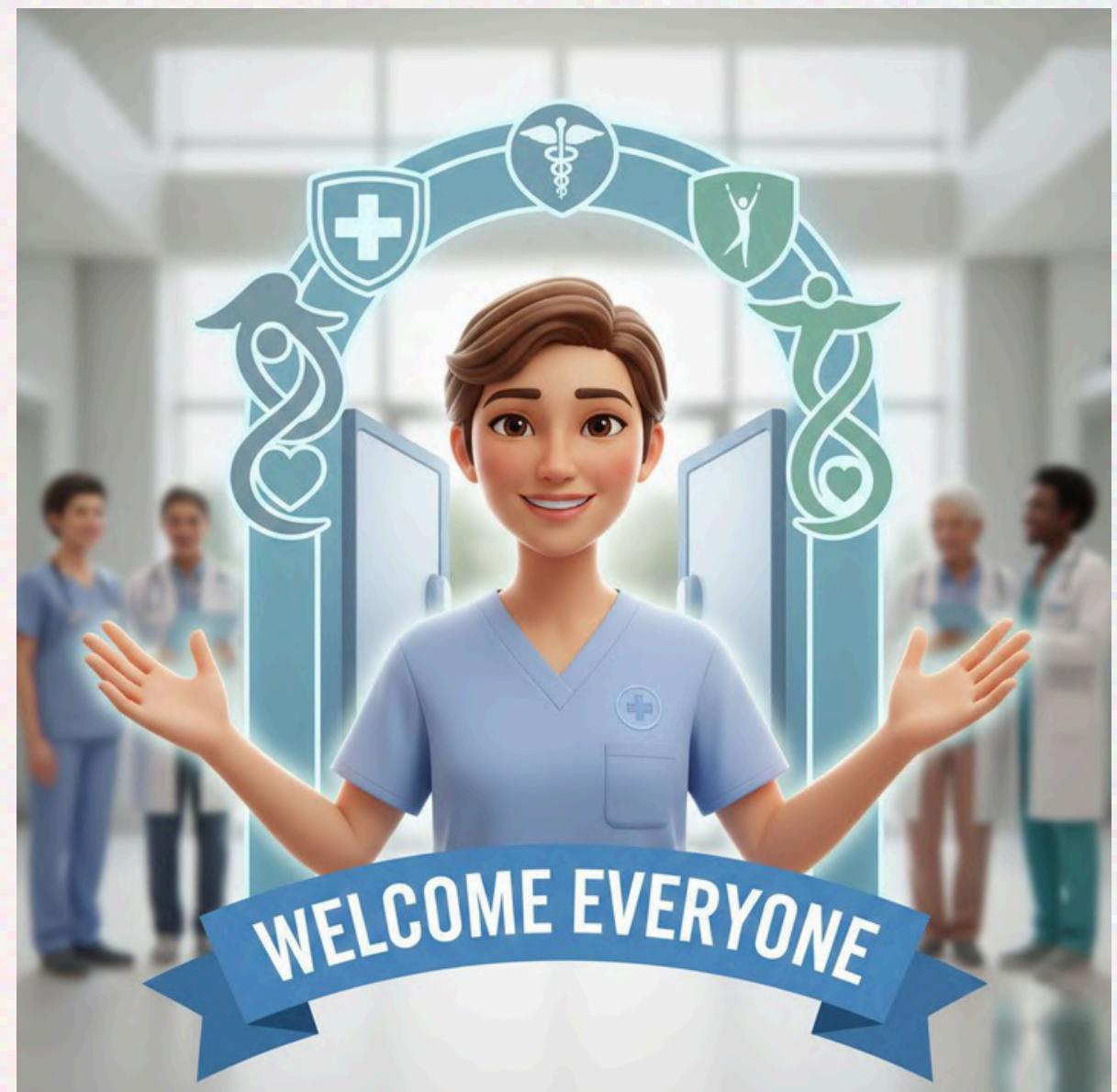
DON'T JUST SURVIVE.  
THRIVE.

# Healthcare Analytics

Presented By

Soumyadeep Dhar





ABOUT ME

# SOUMYADEEP DHAR

SKILLS

- Excel
- SQL
- Python
- ETL
- Power Bi

DESCRIPTION

CURRENTLY DOING  
VIRTUAL INTERNSHIP  
AT CODEBASICS

# Understanding the Healthcare Ecosystem

The healthcare ecosystem extends beyond hospitals and doctors to include :

- Public health agencies
- Insurance providers
- Pharmaceutical companies
- Technology systems
- Patients (at the center)

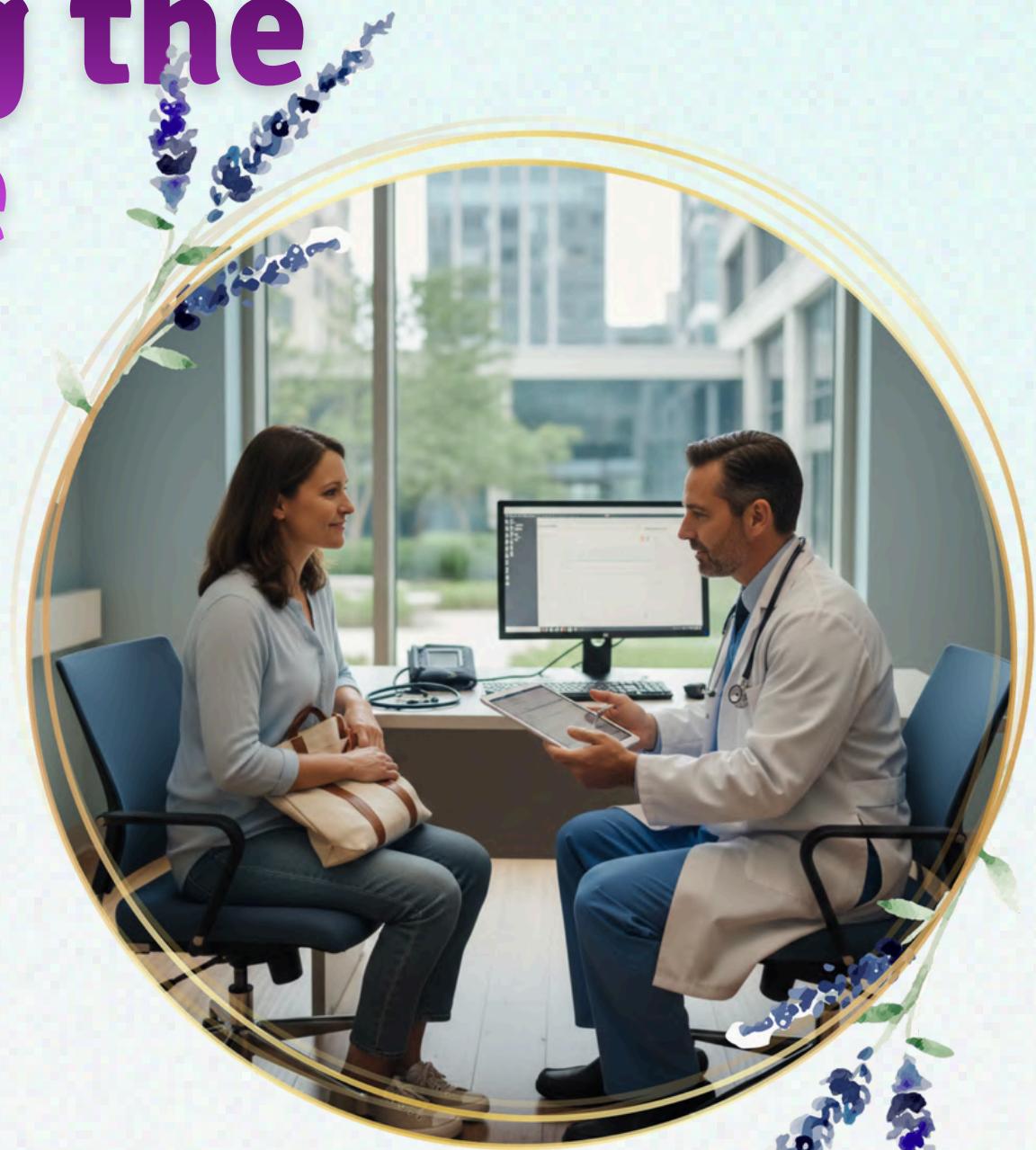
*Effective management = Aligning all parts to deliver accessible, affordable, high-quality care*



# Inpatient vs Outpatient: Understanding the Difference



🛏️ **Inpatient :** A patient **who is admitted to a hospital or healthcare facility and stays overnight** (or longer) for treatment, surgery, or observation



🏡 **Outpatient :** A patient who receives medical care or treatment but **does NOT stay overnight in the hospital or healthcare facility.** They arrive, get treated, and go home the same day.

# PROBLEM STATEMENT

## Healthcare Waiting List Analysis ⏳



### Overall Objective

- Track current status of patient waiting list
- Analyze historical monthly trend of waiting list in Inpatient & Outpatient categories
- Detailed specialty level & age profile analysis

### Data Scope

- 2018 – 2021

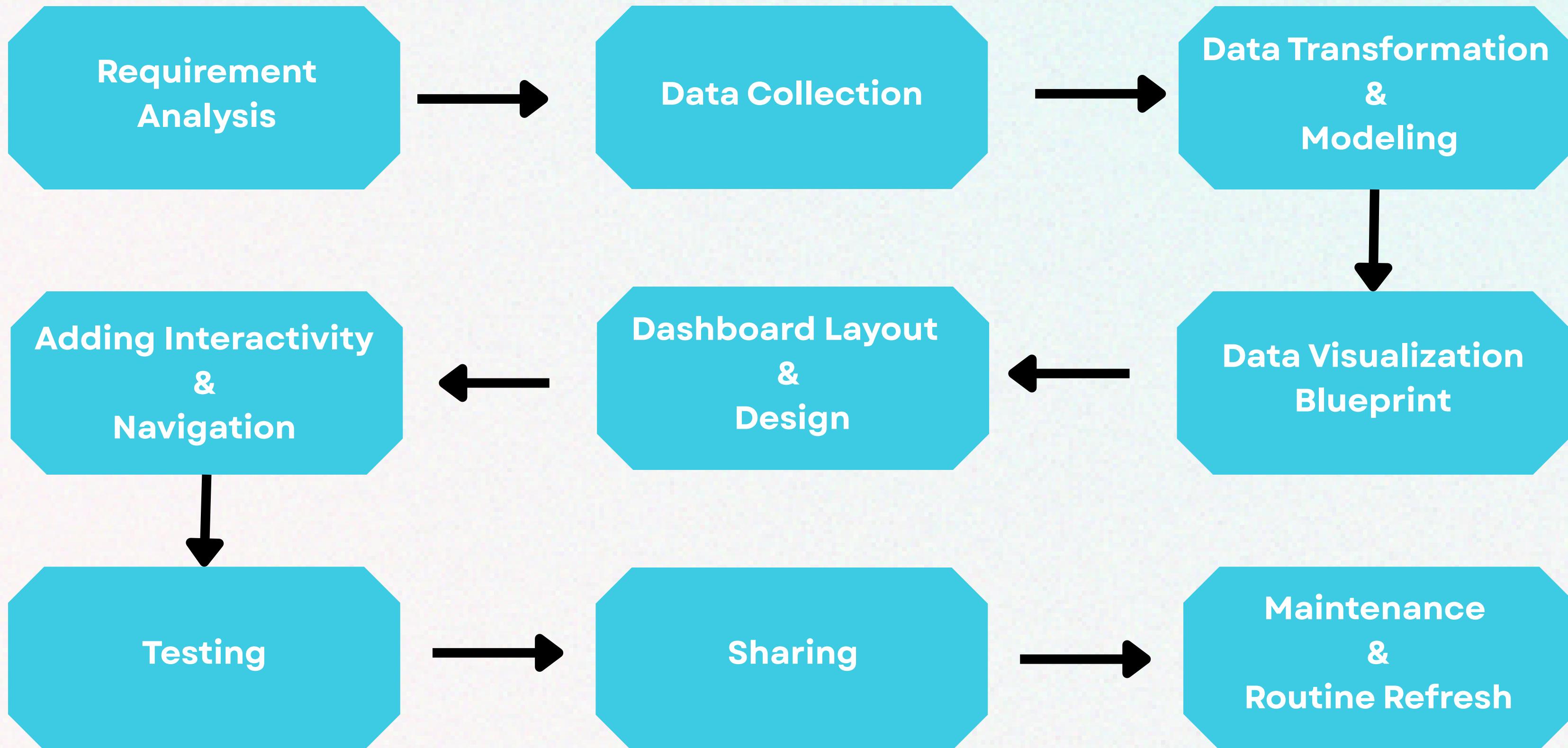
### Metrics

- Average & Median Waiting List
- Current Total Wait List

### View

- Summary Page
- Detailed Page for Granular Analysis

# The process of creating a Dashboard in Power BI consist of following steps:



# Step 1 : Requirements Analysis

## Stakeholder Mapping

- Identify primary users
- Establish domain expert contacts
- Connect with decision makers

## Establish Business Objectives

- Conduct discovery meetings
- Ask open-ended questions
- Clarify success criteria

## Data Assessment

- Review available data sources
  - Column Description
  - Evaluate data quality
  - Assess volume & frequency
  - Check for missing values or Anomalies

## Define Scope & Timeline

- Document key metrics & KPIs
  - Set calculation methods
  - Establish realistic deadlines
  - Define project boundaries



# Step 2 : Data Collection



## ⬇ WORKFLOW STEPS

### Data Description

- Unprocessed Patient Wait List data taken from the Healthcare industry , includes detailed records like Date, Specialty Name, Case Type, Age Profile etc.

### Key Decisions

- This is the phase where you choose where to get all of your data.
- This step is crucial because it will specify how the dashboard will be refreshed following the solution's deployment.

## 📁 SOURCE

Google Drive

# Step 3 : Data Transformation & Modeling

## DATA TRANSFORMATION

- Data transformation is the process of tweaking your data's structure or adding extra steps to clean or prepare it for use. These transformations are carried out using Power BI's built-in Power Query Editor.
- Now for our purposes we will mainly see below steps:
  - Renaming Columns
  - Rearranging Columns
  - Appending 2 Tables
  - Replacing & trimming values



# Step 3 : Data Transformation & Modeling

## DATA MODELLING

- Data modelling is a way **to create relationship with one table to another**, so that we can fetch valuable information from them in our reporting layer.
- Lets jump into the Data Modelling View, which is located **at the left hand panel on Power BI**. We will be using All\_Data from now onwards, so we can safely hide inpatient and outpatient data. We can also stop it from loading into the data model by disabling it from the power query editor. Just right click on the table name in power query and uncheck Enable Load
- Now since specialty name is one of the key attributes that we are looking in this project, lets focus on that column now. As you have seen in the data, we have a huge number of specialty available and using all of them in our report layer directly will create a clutter in our visualization. **A better approach would be to distribute them in buckets**. So to do this I have created a specialty mapping file which you will find in the downloaded resources.  
Lets import that file in power bi to create the relationship with All\_Data.
- Once you import this file, **Power BI should auto detect relationship and connect both the tables**. However if it does not then you can do it manually by following below steps:

1.

**Go to the model view**

2.

**Click on Specialty\_Name column in All\_Data**

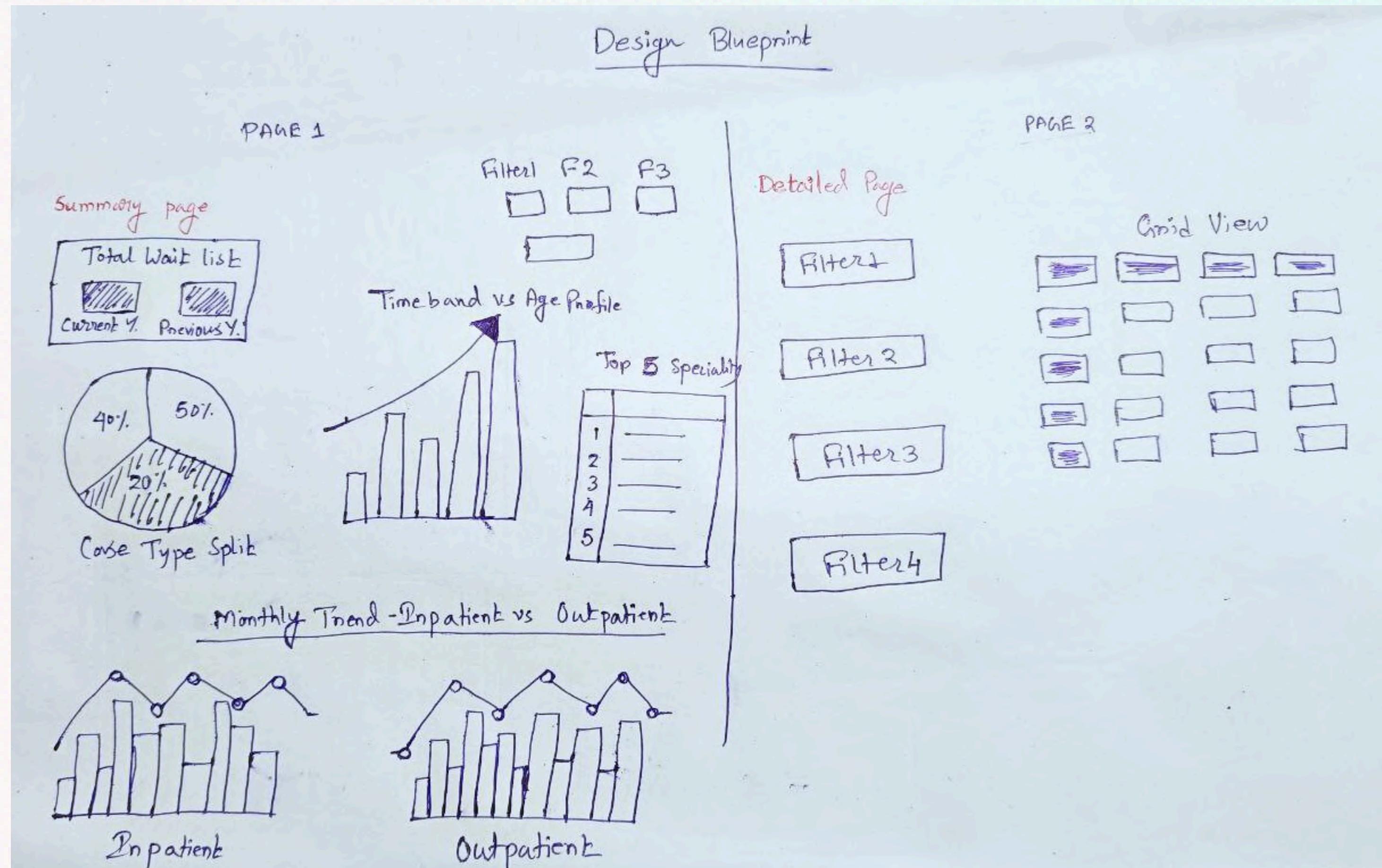
3.

**Drag this column over the Specialty column in Mapping table**

Now you should see a line connecting both the tables and an arrow pointing towards All\_Data from Mapping table. This means that we have created a relationship between both the tables. The arrow signifies the filter context and tells you that now you can use columns from Mapping table to filter data in All\_Data.

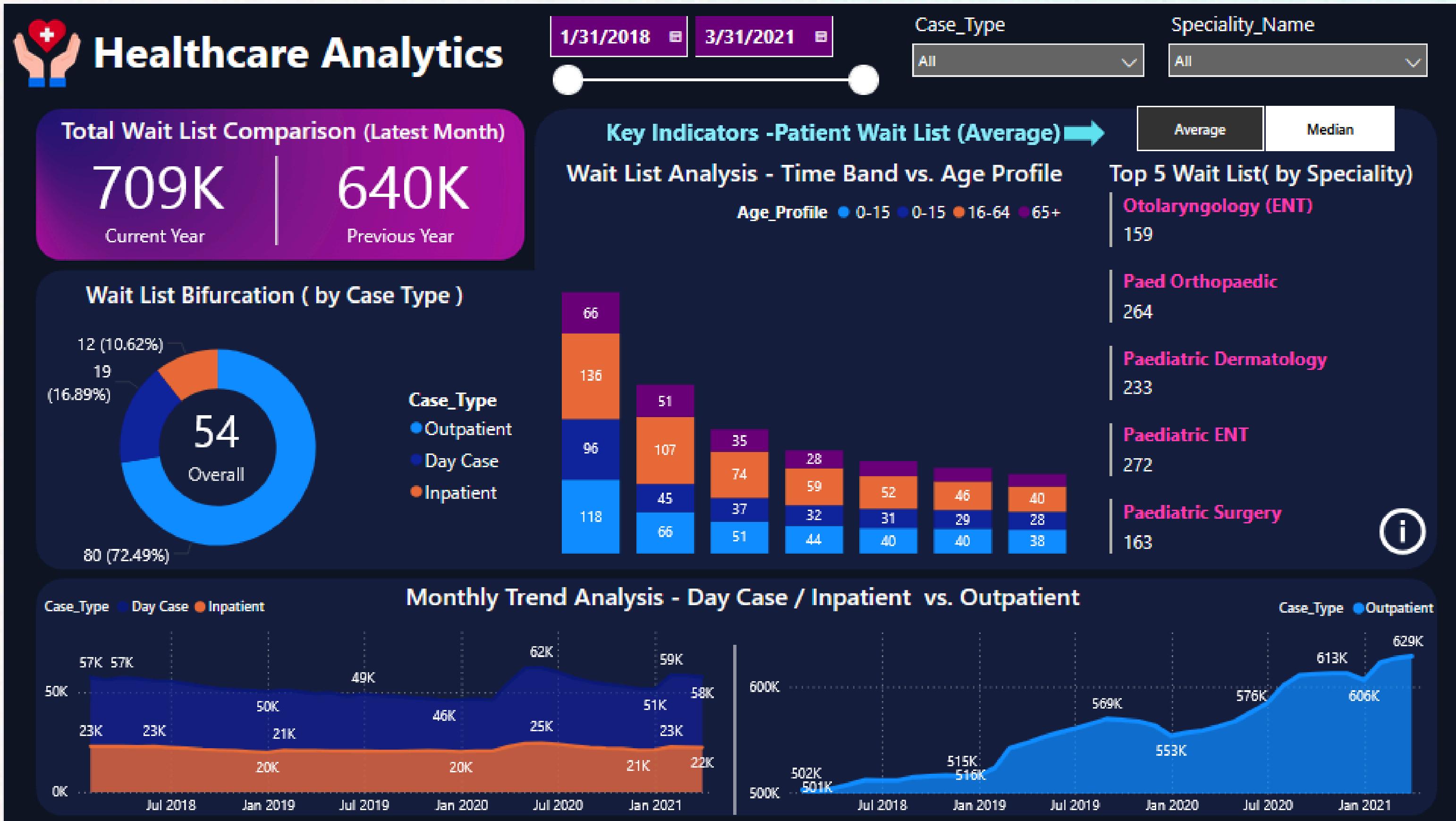


# Step 4 : Visualization Blueprint



# Step 5 : Dashboard Layout & Design

Summary Page



# Step 5 : Dashboard Layout & Design

## Detailed View

Inpatient :- A patient who got admitted in a hospital for more than one day.

Outpatient :- A patient who receives medical treatment without being admitted to a hospital.

Day Case :- A patient who got admitted in a hospital for one day.

⬅

### Filter Criteria

**Archive Date**  
 -

**Case Type**  
 All

**Specialty Name**  
 All

**Age Profile**  
 All

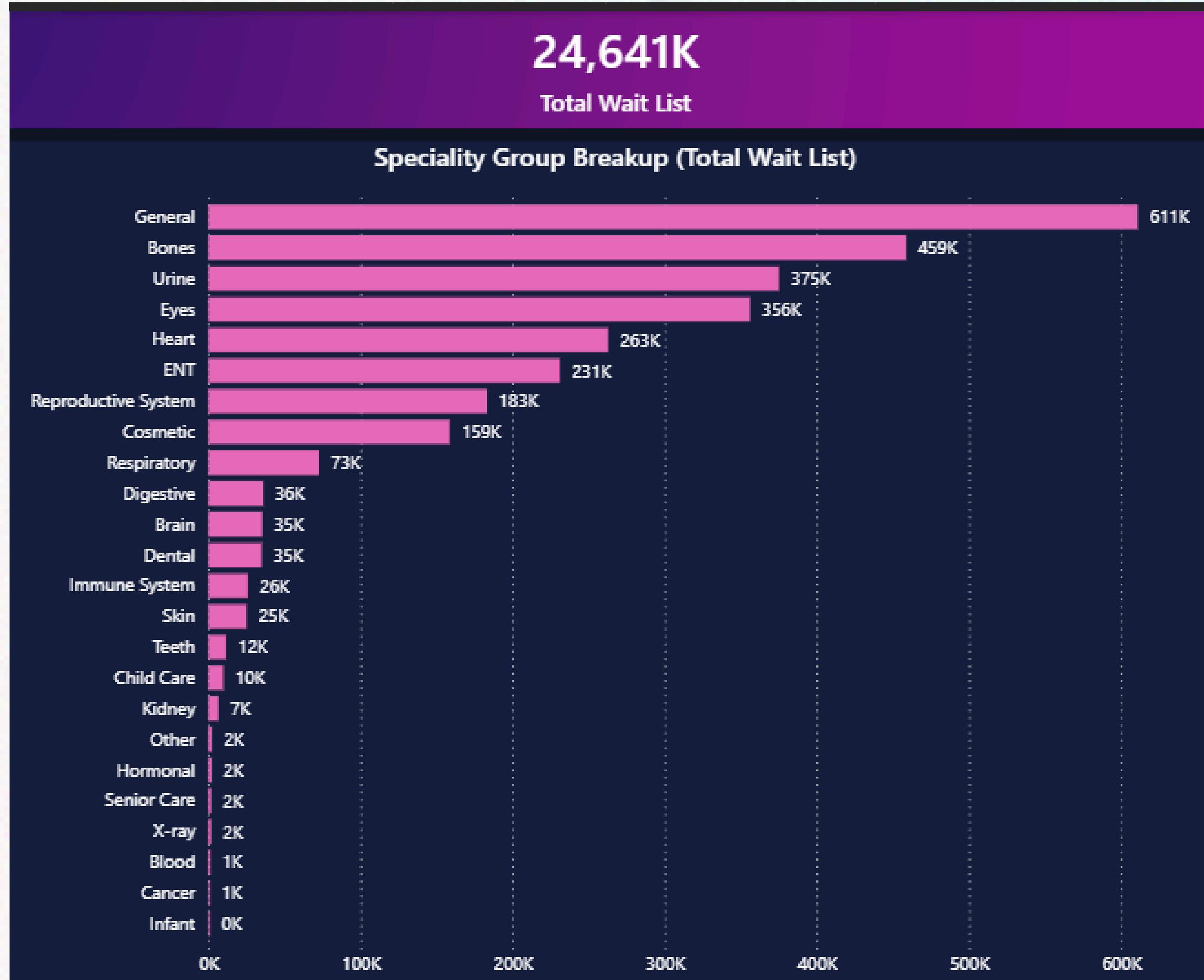
**Time Bands**  
 All

### Detailed Grid View

Archive Date	Day Case	Inpatient	Outpatient	Total
Wednesday, January 31, 2018	57,267	22,937	502,482	582,686
	57,267	22,937		80,204
			1,949	1,949
			18	18
			5	5
			1	1
			1	1
			3	3
			3	3
			5	5
			1,458	1,458
			442	442
			74	74
			73	73
			419	419
			195	195
			150	150
			105	105
			473	473
Total	2,059,882	845,348	21,735,739	24,640,969

# Step 5 : Dashboard Layout & Design

Tooltip Page



# Key Measures

- **Latest Month Wait List** = CALCULATE(SUM(All\_Data[Total]),All\_Data[Archive\_Date] = MAX(All\_Data[Archive\_Date])) + 0
- **PY Latest Month Wait List** = CALCULATE(SUM(All\_Data[Total]),All\_Data[Archive\_Date] = EDATE(MAX(All\_Data[Archive\_Date]),-12)) + 0
- **Median Wait List** = MEDIAN(All\_Data[Total])
- **Average Wait List** = AVERAGE(All\_Data[Total])
- **Avg/Med Wait List** = SWITCH(VALUES('Calculation Method'[Calc Method]),"Average",[Average Wait List],"Median",[Median Wait List])
- **Dynamic Title** = SWITCH(VALUES('Calculation Method'[Calc Method]),"Average","Key Indicators - Patient Wait List (Average)","Median","Key Indicators - Patient Wait List (Median)")
- **NoDataLeft** = IF(ISBLANK(CALCULATE(SUM(All\_Data[Total])),All\_Data[Case\_Type]<>"Outpatient")),"No data for selected criteria","",")
- **NoDataRight** = IF(ISBLANK(CALCULATE(SUM(All\_Data[Total])),All\_Data[Case\_Type] = "Outpatient")),"No data for selected criteria","",")

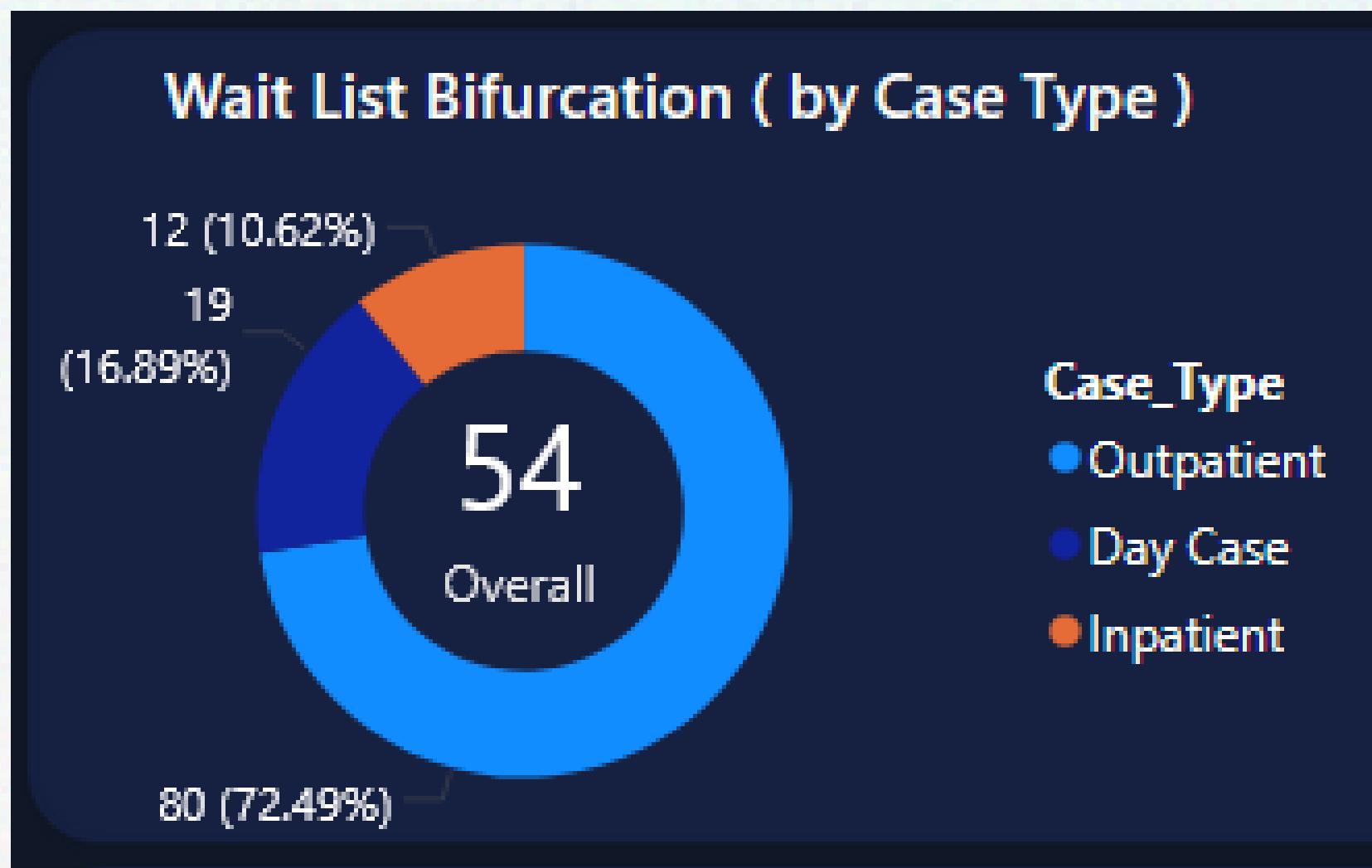
# Insights

## Key Performance Metrics

**Wait List Growth Crisis** The total wait list has grown by approximately **10.8% year-over-year (from 640K to 709K patients)**, indicating increasing demand or capacity constraints in the healthcare system.

## Case Type Distribution

**Outpatient Dominance:** **72.49% of cases are outpatient**, representing the vast majority of healthcare encounters. **Inpatient cases account for just 16.89%, with day cases at 10.62%**. This suggests a shift toward less intensive care settings, possibly driven by efficiency initiatives or changes in treatment protocols.



# Insights

## Age-Related Patterns

Pediatric Concentration: The **0-15 age group** shows significant wait times across specialties, particularly in **Anaesthetics (1,949 patients)**. The **16-64 working-age population** has the highest **outpatient volume (1,458 patients)**, likely reflecting chronic condition management and preventive care needs.

Detailed Grid View				
Archive Date	Day Case	Inpatient	Outpatient	Total
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			442	442
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			73	73
			419	419
			195	195
			150	150
			105	105
Total	2,059,882	845,548	21,735,759	24,640,969

# Insights

## Specialty-Specific Concerns

### Top 5 Specialties by Wait List:

- **Paediatric Dermatology (233) and Paediatric ENT (272)** show substantial pediatric care backlogs
- **Paediatric Surgery (163)** indicates potential capacity issues for children requiring surgical intervention
- **Otolaryngology/ENT (159) and Paed Orthopaedic (264)** round out the top concerns

### Top 5 Wait List( by Speciality)

**Otolaryngology (ENT)**

**159**

**Paed Orthopaedic**

**264**

**Paediatric Dermatology**

**233**

**Paediatric ENT**

**272**

**Paediatric Surgery**

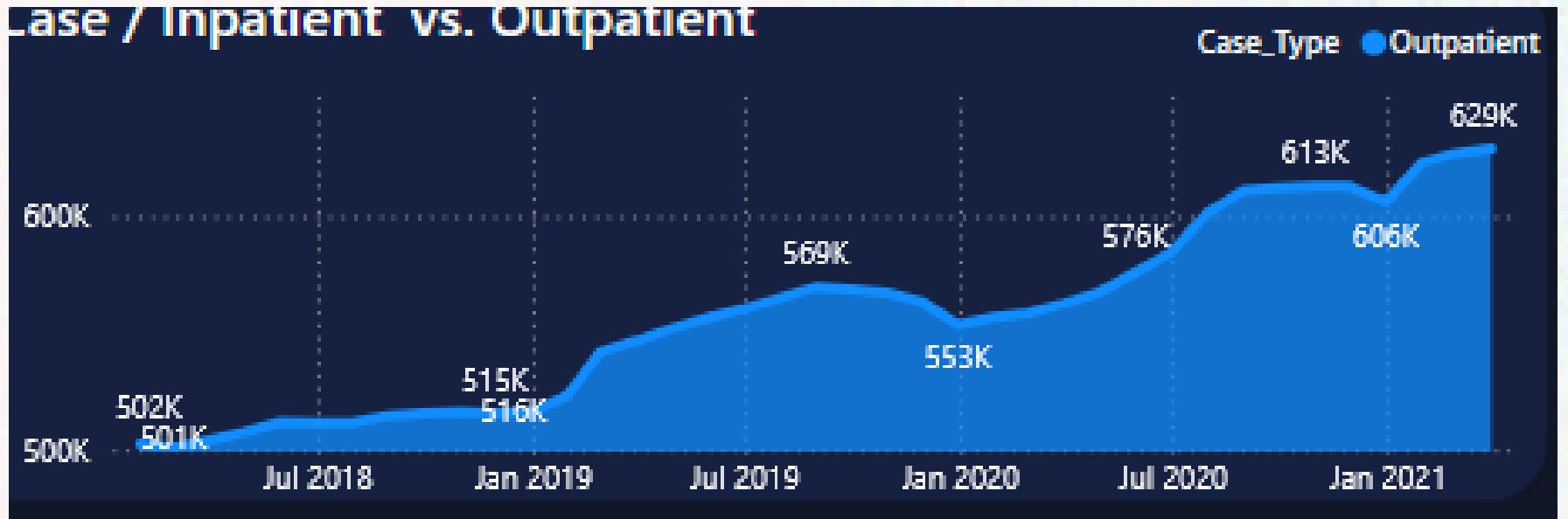
**163**



# Insights

## Temporal Trends

Case / Inpatient vs. Outpatient



Monthly Trend Analysis - Day

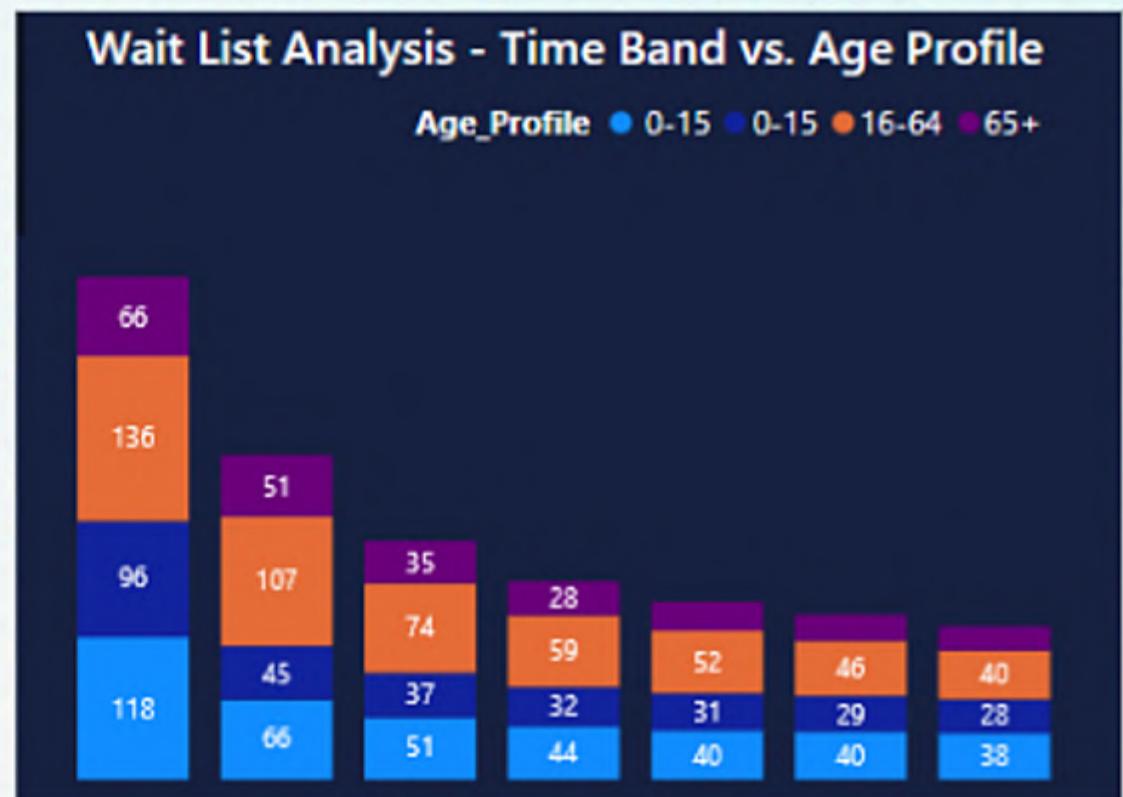


- **Sustained Growth:** The monthly trend analysis shows consistent growth in outpatient cases from approximately **500K (July 2018)** to **606K (January 2021)**. Inpatient cases have remained relatively stable around **50-60K**, suggesting the growth is primarily in outpatient services.
- **COVID-19 Impact:** There's a noticeable dip around **July 2020**, likely reflecting pandemic-related disruptions, followed by aggressive recovery and growth.

# Insights

## Time Band Analysis

The wait list analysis shows distribution across age profiles with peak waits in the **16-64 age bracket**, indicating working-age adults face the longest delays for care—potentially impacting workforce productivity and economic outcomes.



A photograph showing a man in a dark polo shirt and khaki pants being assisted by a healthcare professional in a teal uniform. The man is leaning forward, and the professional is supporting him. A third person's arm is visible on the far left. The background is a bright, possibly hospital-like environment.

# Strategic Recommendations

- Address pediatric specialty bottlenecks through targeted capacity expansion
- Investigate outpatient growth drivers to determine if additional facilities or staffing are needed
- Implement wait time reduction strategies for the 16-64 demographic to minimize economic impact
- Monitor case type distribution trends to ensure appropriate resource allocation across care settings

# Step 6 : Adding Interactivity

Now add interactivity in your dashboard like navigation buttons, chart alt display text and hovering info.



Navigation buttons



Hovering info



Chart alt display  
text(Alternative Text)

# Step 7 : Testing

Ensure to conduct an extensive **UAT** session which will identify any bugs or data issues

## **UAT (User Acceptance Testing)**

- Final testing phase before going live
  - Real users test the dashboard
  - Validates it works for end users
  - Identifies bugs and data issues
- Once UAT is complete, you're ready to deploy to production



# Step 8 : Sharing

Sharing is the process of distributing your completed healthcare dashboard to stakeholders, users, and decision-makers so they can :



- Access real-time data
- Make informed decisions
- Monitor key metrics
- Track performance
- Collaborate on insights

## Sharing Methods :

- Power BI Service workspace
- Email subscriptions
- Mobile apps
- Embedded in systems

# Step 9 : Routine Refresh & Maintenance

Congratulations! Your dashboard is live!

Now transition to BAU (Business As Usual):

- Establish routine data refresh schedule
- Implement regular maintenance procedures
- Monitor performance and usage
- Provide ongoing user support



# THANKS FOR WATCHING

## CONTACT DETAILS

soumyadeepdhar433@gmail.com 

Soumyadeep Dhar 

dharsoumyadeep96 



Canva

presentation design