

# OPD APPOINTMENT ANALYSIS

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# INTRODUCTION

In healthcare facilities, patients fail to show up for appointments or arrive late can result in financial losses, wasting of resources, and inefficient use of staff time. This not only impacts the hospital's operations but can also have serious implications for the patients' health condition due to delayed diagnoses and treatments. Furthermore, it can lead to dissatisfaction among other patients who may not be able to secure their preferred appointment slots. The purpose of this analysis is to provide solutions that enhance appointment scheduling efficiency and minimize patient no-show rates. By doing so, we aim to improve the overall patient experience during their hospital visits, which could ultimately boost the hospital's revenue and reduce operational expenses.

# DATA OVERVIEW

Column name	Data type	Explanation	Example
PID	Varchar	Patient unique ID	900012345
Gender	Varchar	Gender of patient	Male, Female
Nation	Varchar	Country where patient come from	VNM, USA,...
Department	Varchar	OPD departments in hospital	Pediatrics, Endocrinology,...
Appointment date	Date	The date that patients have an appointment	01/09/2023
Appointment time	Time	The scheduled time for the appointment	8:00
Arrival time	Time	The actual time that patients arrive	8:05
SMS	Varchar	Status of reminder by SMS	0: remind messages were not sent to patient 1: remind messages were successfully sent to patient
Call	Varchar	Status of reminder by phone call	0: do not pick up the phone 1: Done
Delay time	INT	The time that patients arrive later than the scheduled time. Calculated by subtracting the appointment time from the arrival time	5: later than the scheduled time 5 mins -5: earlier than the scheduled time 5 mins -100000: No show

Data was collected from **12900** visits of appointments at OPD departments in the hospital from **01/08/2023 - 27/10/2023**. The patient's name, address, cell phone number were hidden due to personal privacy

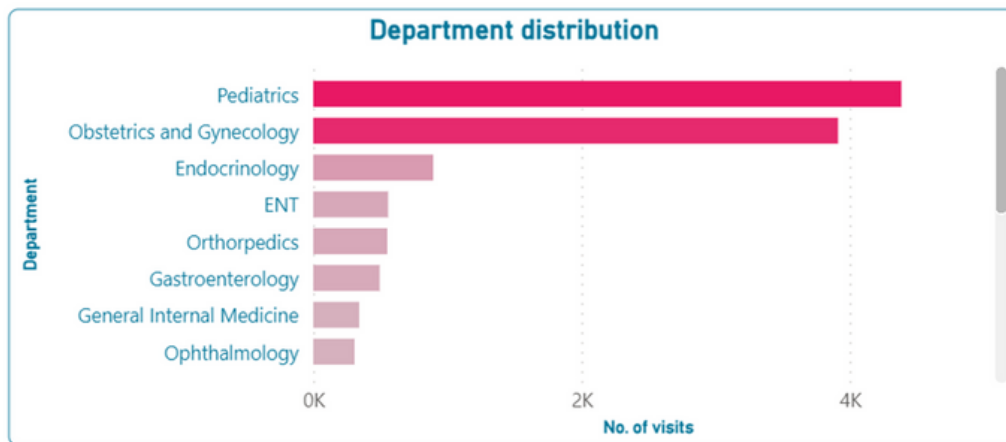
# ANALYSIS

## APPOINTMENT OVERVIEW

12.90K	6195	58	17	1442	13.30	2055	15.93
Visits	Customers	Countries	Departments	Late	Late rate (%)	No show	No show rate (%)

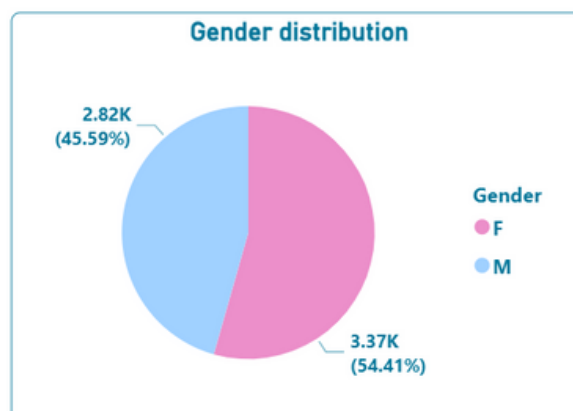
The total number of visits during this period was substantial, reaching **12,900**. These visits were made by **6195 customers**. Customers are diverse in nationality, coming from **58 different countries**. The rate of customers arriving **late** for their appointments is **13.3%**, and the **no-show** rate is **15.93%**

## DEPARTMENT DISTRIBUTION



The majority of customers come from the **Pediatrics** and the **Obstetrics & Gynecology** department, with a total of **8,298 visits**, accounting for **64.32%** of the total hospital visits. Next are the **Endocrinology** and **ENT** departments with **894** and **558** visits respectively

## GENDER DISTRIBUTION



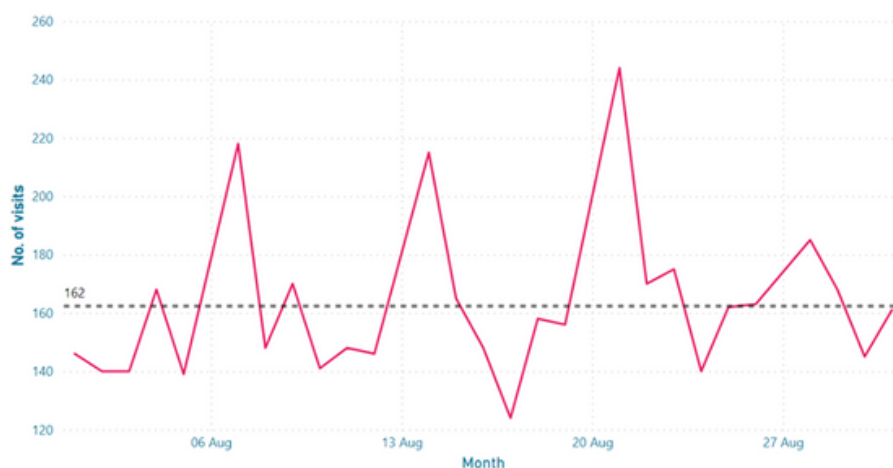
Based on the number of visits to each department, the **Obstetrics & Gynecology** department has the highest number of visits, followed by the **Pediatrics** department. Therefore, it is not surprising that **Female** customers account for **54.4%** of the total visits, while **males** account for **45.6%**

# NATIONAL DISTRIBUTION

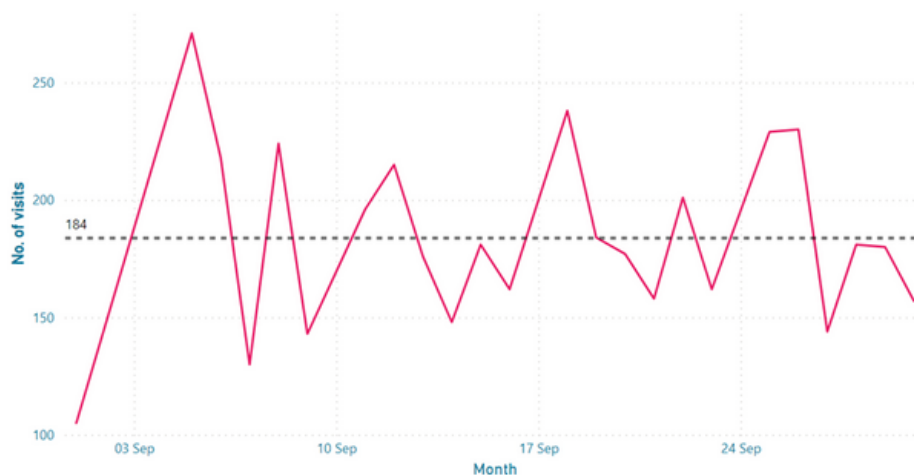
National distribution	
Nation	No. of customers
VNM	5288
KOR	374
USA	112
FRA	54
AUS	40
GBR	32
CHN	24
THA	23
RUS	21
DEU	17
Total	6195

The majority of customers are **Vietnamese**, followed by customers of **Korean** and **American** nationality

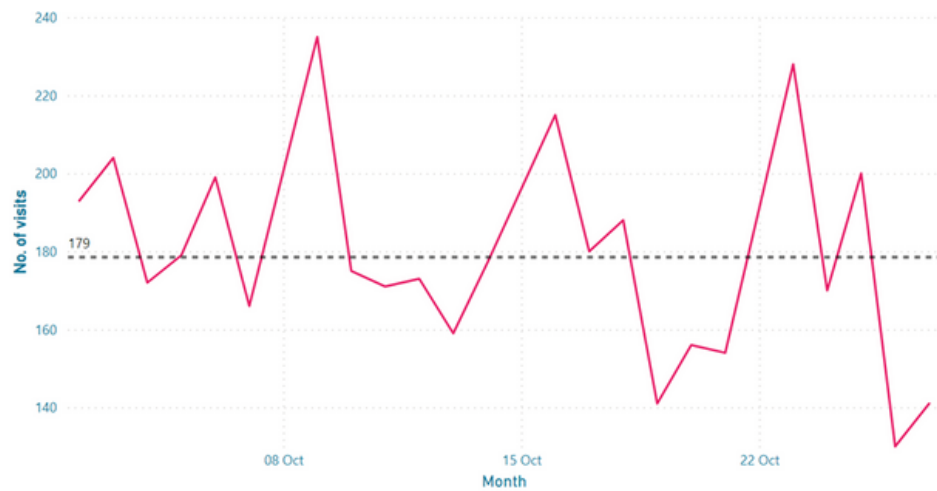
## VISIT BY MONTH



The **average number of visits** in **August** was **162**. The days with high number of visits in August **mainly fall on Mondays** each week, and tend to **decrease on midweek days** such as Wednesday and Thursday



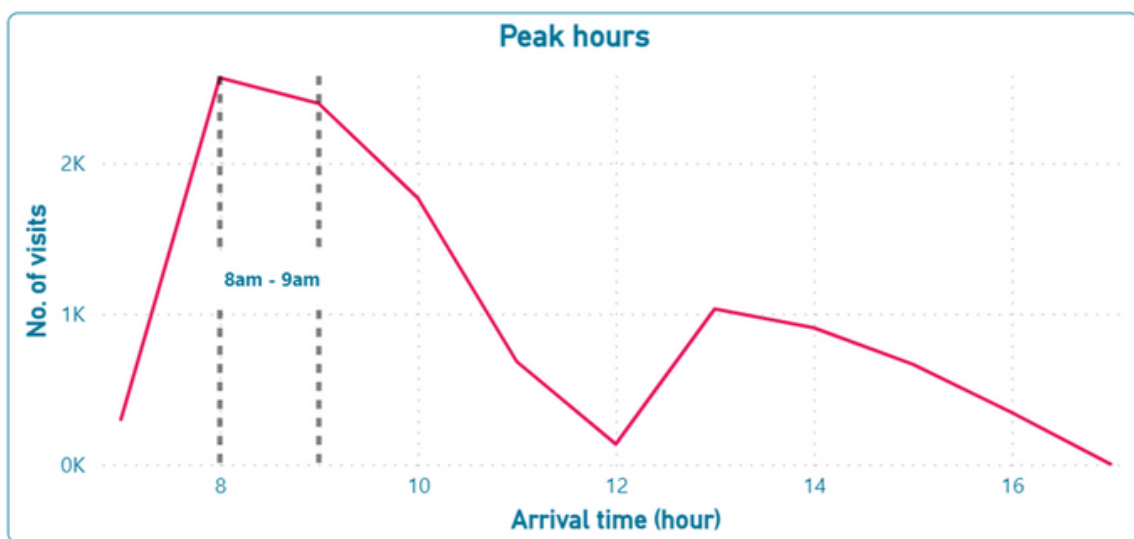
The **average number of visit** in **September** was **184**. The number of visits on September 1st was very low because it were the day before Vietnam's National Day, and the hospital only operated in the morning. The number of visits in September also **mainly concentrates on the Mondays** of the week and gradually **decreases on Wednesday and Thursday**



The **average number of visit** in **October** was **179**. October also has a similar trend, with high number of visits **falling on Mondays** and **gradually decreasing midweek**

In general, the number of customers visiting for medical examination is **mainly on Monday**. The trend **decreases on Wednesday and Thursday**

## PEAK HOURS



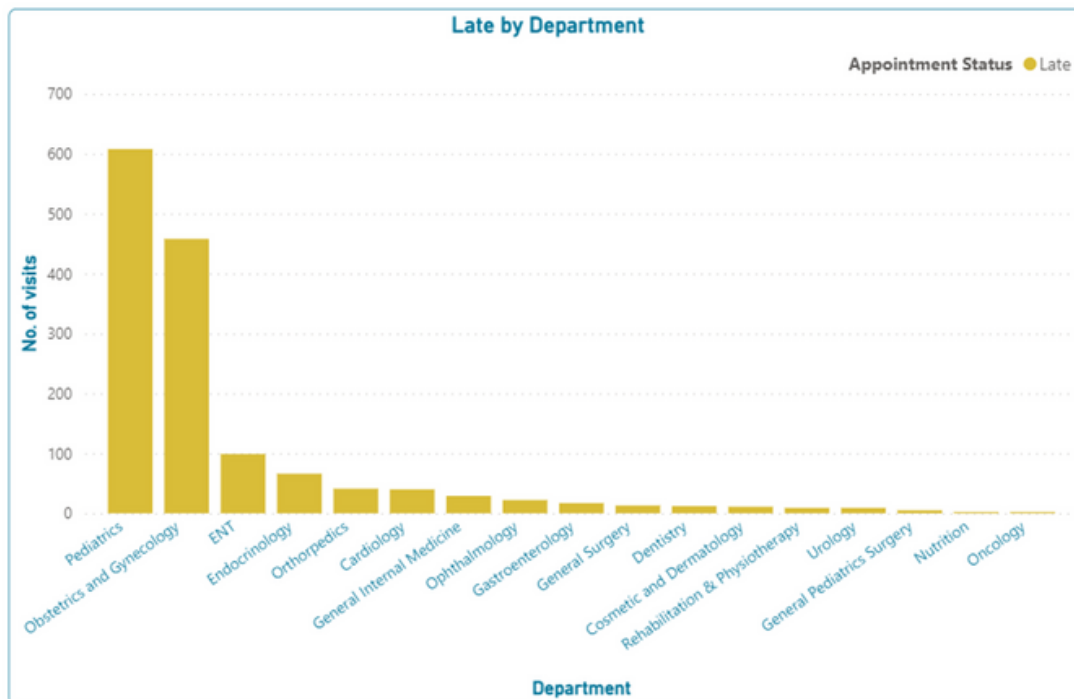
There were **4595 visits** arrived from **8am-9am**, accounting for **35.6%**. The **O&G** and **Pediatrics** departments had the most visits during this time frame

After the morning peak, there's a significant **drop** in visits **around 10am**

There is a **slight increase** in visits **around 2pm**, but it doesn't reach the morning peak levels

# LATE

Arriving late will affect the hospital's examination schedule and delay other patients who arrive on time, resulting in longer waiting times. This leads to a poor customer experience. According to the hospital's policy, any customer who arrives **more than 15 minutes later than their scheduled appointment** will be considered late



As we can see, **Pediatrics** has the **highest number of late visits: 608/3755 visits**, account for **16.2%**. The Pediatrics department has the highest rate of late arrivals. The appointment and arrival times of patients in the Pediatrics department are influenced by many factors. The patients are children, but the **arrival time largely depends on the parents**. In the Pediatrics department, arriving late for an appointment will affect the waiting time, customers will have to wait for a long time, because the pediatric department has a high amount of visits

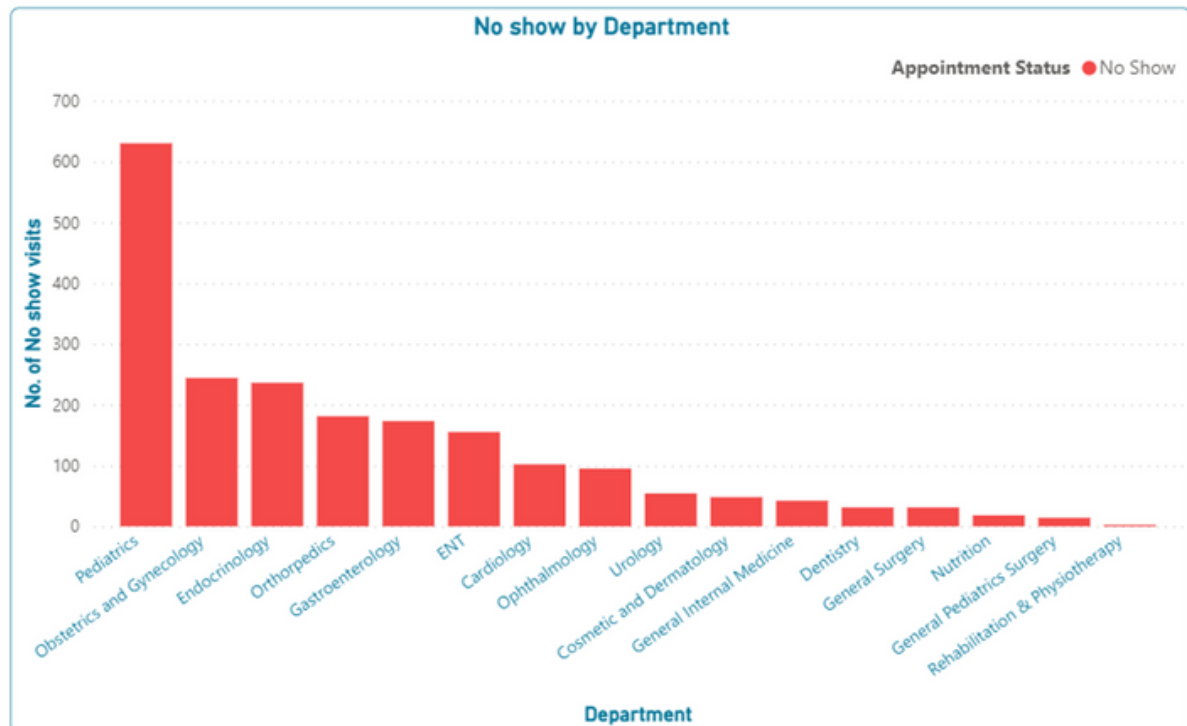
The department with the **second highest number of late visits** is **Obstetrics and Gynecology (O&G)**, with **458 visits**, accounting for **12.5%** of the total visits to the O&G department. The O&G department has a very high number of visits, so arriving late not only **lead to delays and long waiting times for clinical tests**, but it also **affects the health of the patients** due to the requirement to be fasting for certain tests

**ENT** has the **third highest number** of late visits with **99 out of 403 visits**, accounting for **24.6%**. This rate is **relatively high** and will **greatly affect the customer experience** because the waiting time for each ENT visit is quite long due to the ear, nose and throat issues that can range from simple to complex, involving many body systems. The complexity and diversity of these issues can sometimes lead to **longer consultation times**, in addition to the time required for procedures before and after endoscopy.

The **Endocrinology** department has **66 late visits out of 658 visits**, accounting for **10%**. This is an **acceptable rate** for the Endocrinology department. Most patients will have to do **blood tests**, so **arriving early or on time is necessary**, as they need to be fasting for blood tests. Therefore, the rate of late visits in the Endocrinology department is not high.

# NO SHOW

Patient no-shows can lead to **discontinuity of care, reduced access to medications, and increased risk of chronic conditions**. These missed appointments can result in patients not receiving necessary preventive care, screenings, or treatment for acute illnesses. This not only **affects the patients' health** but also impacts healthcare providers through **lost revenue, wasted resources, and lower patient satisfaction**



The **Pediatrics** Department has the **highest number of no-show visits**, with **630 out of 4395 visits**, accounting for **14.4%**. In Pediatrics department, missing an appointment can be **affected to patient's condition** as most of the children come for vaccinations and common childhood illnesses such as fever, cough, and nasal congestion

**O&G** department has **244 no show visits over 3913 total visits**, accounting for **6.2%**. In the O&G department, **no show can significantly affect the entire process**. Pregnancy is a long-term process, so regular prenatal check-ups during pregnancy are crucial as they ensure the health of both mother and baby. Skipping these appointments can lead to **missed detection of potential health issues, lack of preventive care**

The no-show rate in the **Endocrinology** Department is quite high, with **236 out of 894 visits** being no-shows, accounting for **26.4%** of the total visits to the Endocrinology Department. The customers who visit the Endocrinology department are those with conditions related to hormones, thyroid glands, diabetes. These conditions often require long-term treatment because they are typically chronic and can **significantly impact a person's quality of life**

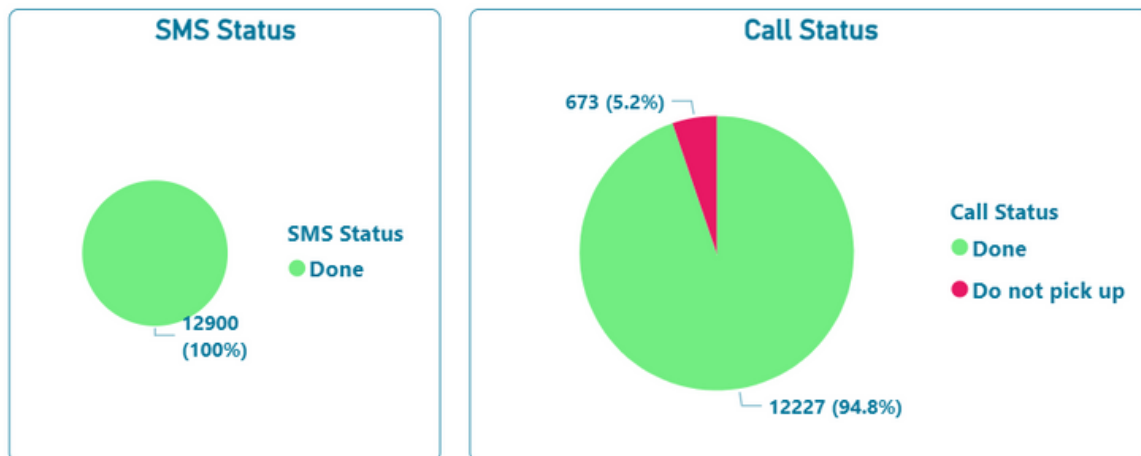


# REMINDERS

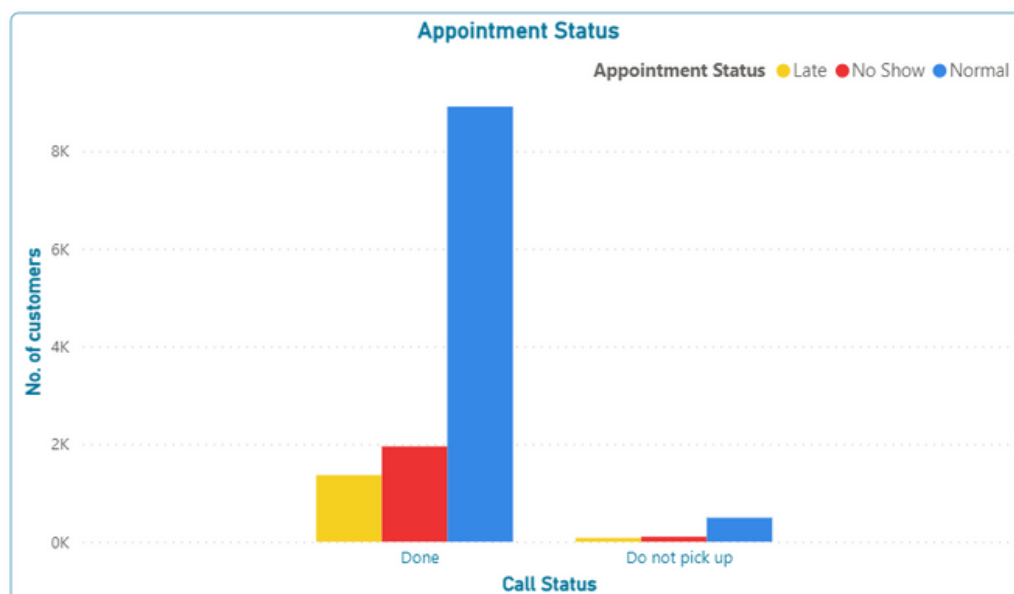
The hospital has two types of appointment reminders:

**Text message reminders:** customers will receive the first message from the time the appointment is set on the doctor's schedule. The second reminder message will be sent 1-2 days before the appointment date.

**Phone call reminders:** the operators will call to remind customers 1-2 days before the appointment date



**100% of visits received reminder messages** from the system. For the phone call, there were **12227 (90.58%) successful calls**, meaning that customers picked up the phone and were informed by the operator about the appointment. And there were **673 (9.42%) visits did not picked up the phone**.



**For customers who could not be reached:** there are **491 out of 673 (73%)** customers who **arrived on time**, and **79 out of 673 (11.7%)** customers who were **late**. It shows that even though customers were not successfully reminded for the appointment, **they still did not no-show**.

**For customers who were successfully reminded:** there are **1952 out of 12227 (16%)** customers who were **no-shows**. This is a **high no-show rate** when **customers were reminded but still did not show up** and did not take any action to reschedule or cancel the appointment during the reminder call.

# RECOMMENDATIONS

**Future order:** order in advance (future order) for patients who need tests on the day of examination. This will save time, doctors will not need to meet patients at the beginning. And doctors can use that time for other patients, so that we can **reduce waiting time**. Future order can be applied to **O&G and Endocrinology** departments

**Support at peak hours:** from **8am - 9am** at **O&G** and **Pediatrics** department. There should be more staff to coordinate and guide customers

**Adjust reminder message:** add a reminder message to show that if the patient **arrive later 15 minutes than scheduled appointment**. They will be **rescheduled the appointment** in order to reduce late rate

**10 minutes appointment slot:** set 10 minutes for vaccine consultation appointment to **maximize the number of appointment**

**Two ways confirmation SMS:** sending text messages to patients to **confirm or cancel** their appointments with doctors. It is a convenient and efficient way of **managing the appointment book and reducing no-shows and cancellations**

**Mobile app for OPD:** develop an app for OPD, which allows customers to access their medical records and get appointment information through the app. The app will send notifications if the customer does not check in by the scheduled time, reducing the no-show rate.

**Tracking the appointment:** Operators **tracking the patients who have appointments** for the day, support **calling if the patient does not check in by the scheduled time** on the system