Operating Room Utilization

Problem Statement :-

Operating room (OR) inefficiency is a significant financial burden on healthcare organizations, impacting both cost and patient care. While booked OR time represents a planned utilization metric, it often deviates from the actual time procedures take due to workflow delays, inaccurate booking estimates, and cancellations. This project aims to leverage a dataset containing surgical timestamps throughout the OR workflow to identify and quantify these areas of inefficiency. By analyzing this data, we can develop actionable insights to optimize OR utilization, potentially saving healthcare organizations substantial time and financial resources, and ultimately improving patient care delivery.

Interpretation

1. Procedures (CPT Codes) with **high average delays** and **high standard deviations** might indicate complexity or inefficiencies specific to those procedures.
2. Specialties with **consistent delays** suggest systemic issues within the department that need to be addressed.
3. OR Suites with significant delays could indicate **specific room-related issues** or **team performance problems**.
4. Actual time utilize in the OR Suite is **(59.00 %)** of the booking time (which conclude **overtime booking** then what is required)
5. There was inaccuracy in estimation of the **OR Schedule Time** to Wheels which between the groups (**Procedure, Speciality, Suite**) which has mean of (**33 min, 36 min, 37 min**) which shows huge delay and standard deviation of **(12,27,31)** which shows that time is even more scattered in.
6. the difference between the time when patient is wheels in and the surgical procedure are between group **(Procedure, Speciality, Suite)** which has mean of **(12,27,22**) which can be inference that there is

similar kind of delay which can be reduced with proper time management and pre-preparation for before patient wheels in, and has standard deviation of **(1,3,4,)** which are showing that there is **equal inefficency** in almost each groups.

7. Surgery start time and end time can be domain and the type of surgery reducing this can result in lower patient care hence it requires lots of domain knowledge.
8. There is a difference between the surgery end time and wheels out between group (**Procedure, Speciality, Suite**) with mean of **(13,12,13)** and which is utilizing unnecessary time contributing to the OT occupancy. standard deviation **(0,1,2)** is observed evenly in each surgery.
9. Out of total **2172** rows in **1743** records that is **79.83 %** of total records found that the next person wheels in after the previous person wheels out with mean of 86 minutes on monday to friday (**excluding saturday and sunday)**
10. Operating room does not operate on saturday and sunday which has brought the difference which leads to no utilization of resources and no care delivery to patients.
11. Operating room no **(8)** is mostly utilize with a mean of **113** minutes and Operating room no **(3)** is least utilize hence somewhere utilization of OR room is not done.
12. **On an average** operating rooms are used for only **82 minutes** which conclude that there are more than sufficient Operating rooms.

Conclusion

Improving OR efficiency requires a multifaceted approach targeting accurate booking, reducing workflow delays, better managing inter-case times, and optimizing the use of OR Suites. By focusing on the specific areas of inefficiency identified in this analysis, healthcare organizations can save time and resources, enhance patient care, and reduce financial burdens.