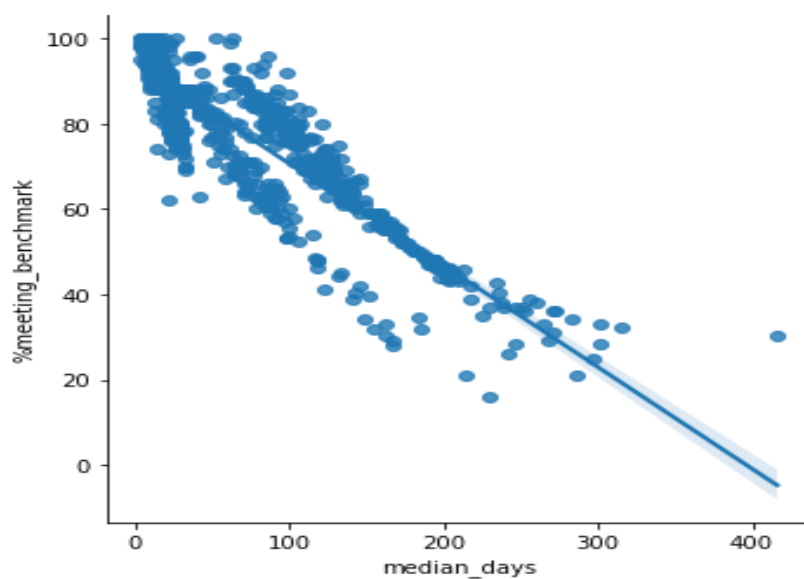
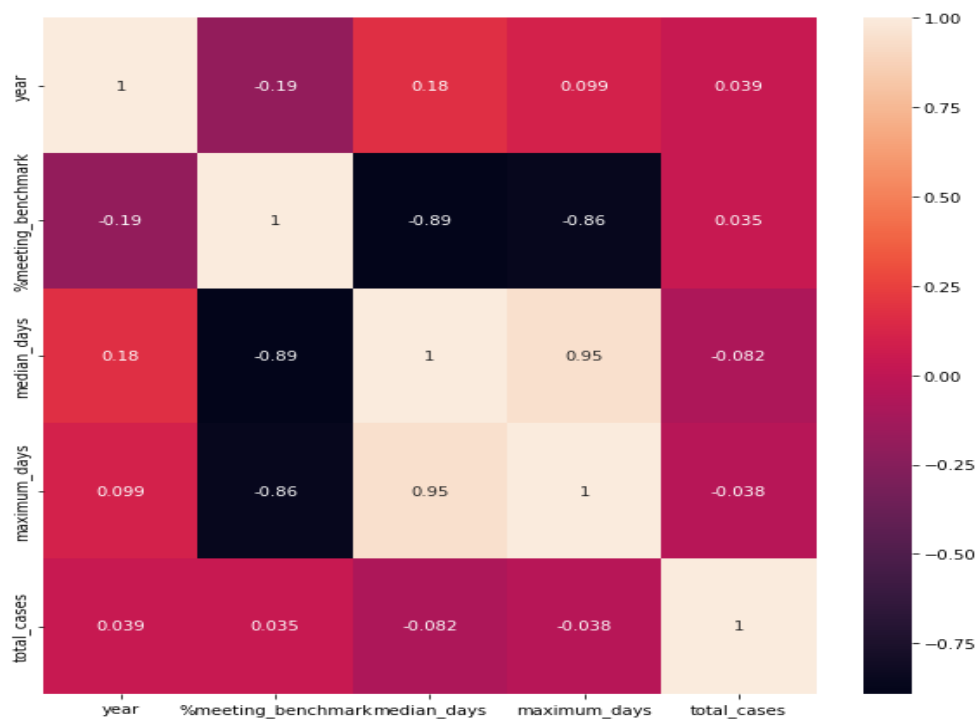
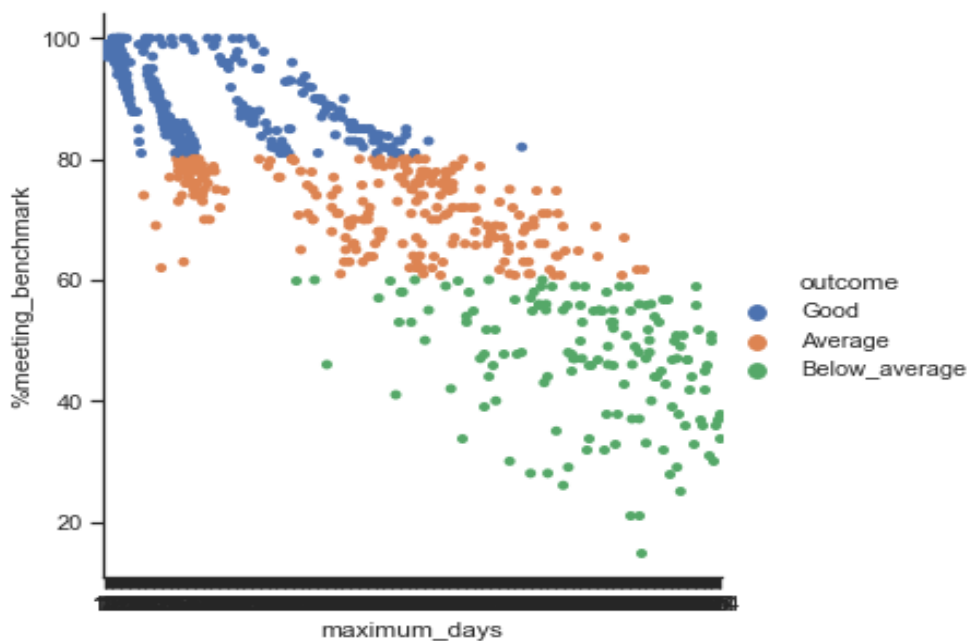
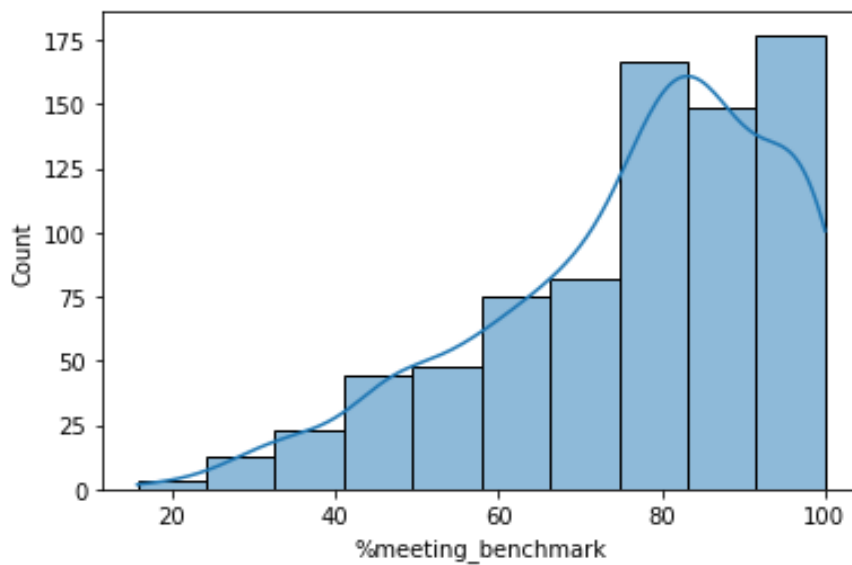


## DATA EXPLORATION:



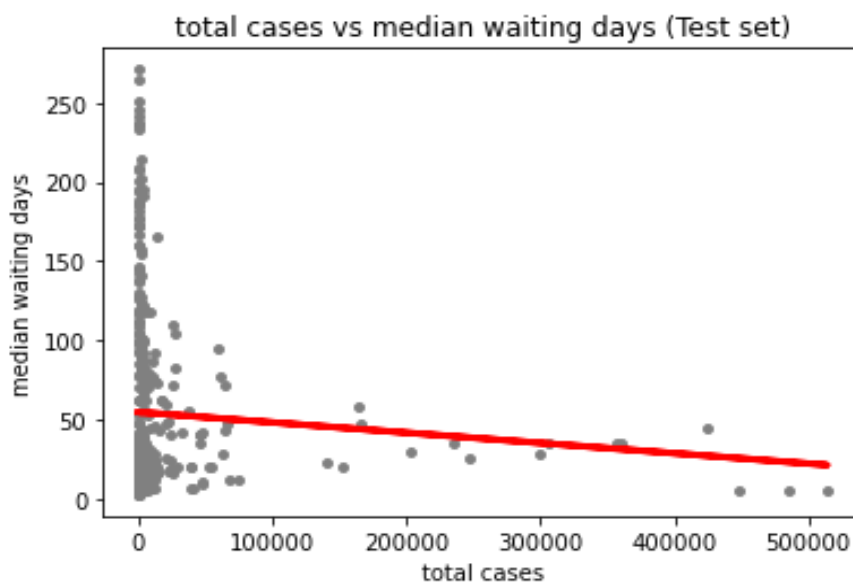
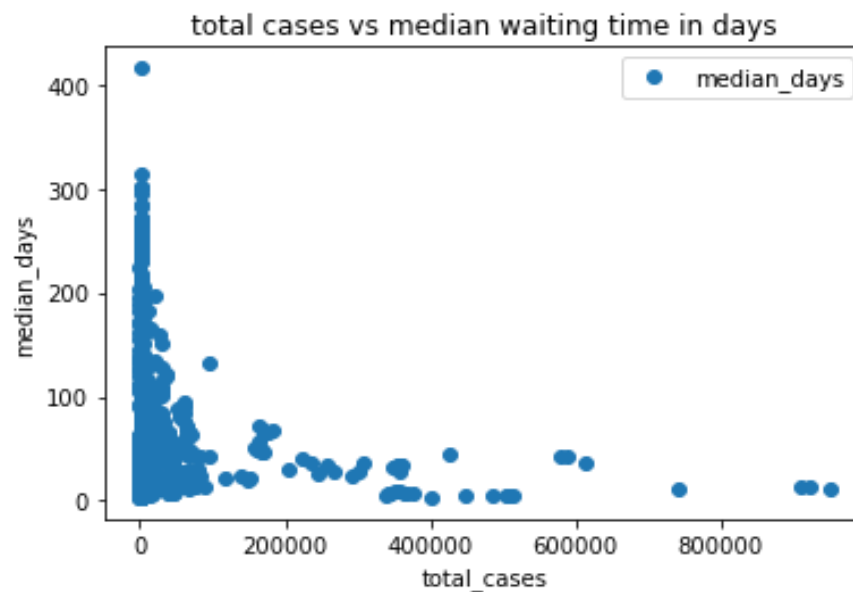
- There is a strong negative correlation(-0.89) between median waiting time and % cases meeting benchmark.
- There appears a mild negative correlation(-0.082) between median days and total cases.

Percentage meeting benchmark:



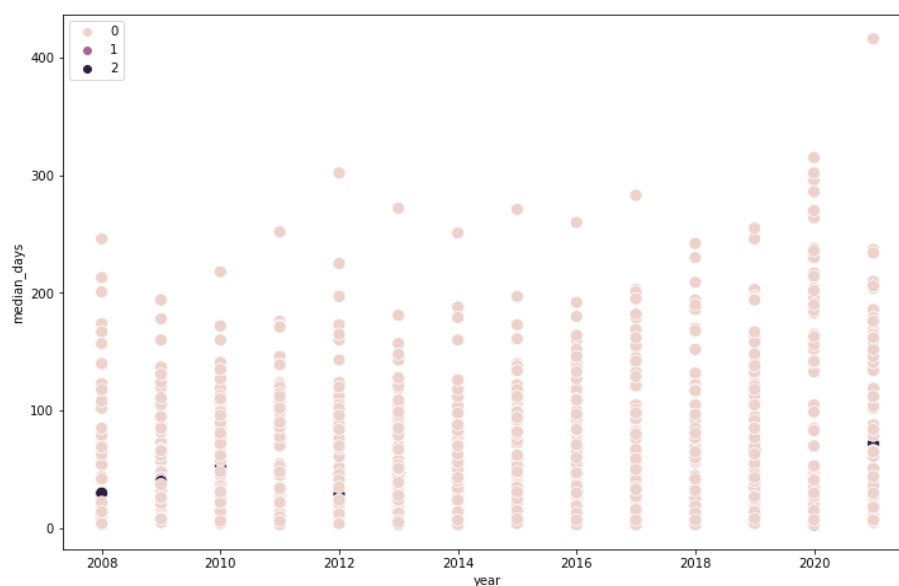
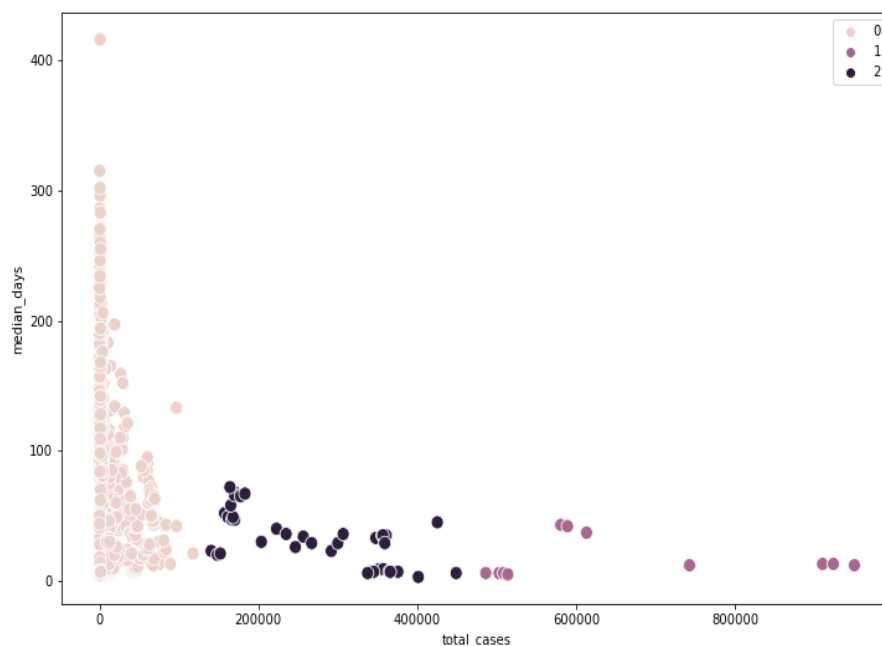
- Majority of the reported procedure fall in the good (blue) and Average(orange) performance category of Benchmark achievement.
- There is a considerable amount of cases which fall in the below average(green) category of benchmark performance.
- The below average performance has a considerably high waiting time(maximum days). The reasons for this have been explored further.

## REGRESSION ANALYSIS:



- The scatter plot shows that majority of reports show very less total number of cases but the waiting time is still very high.
- The regression plot also confirms the same. The regression line shows a very mild negative relationship between the variables.
- This indicates that the median waiting time is high where the total number of cases is high. In other words we can say that inspite of lesser number of cases the waiting time is high. Why??

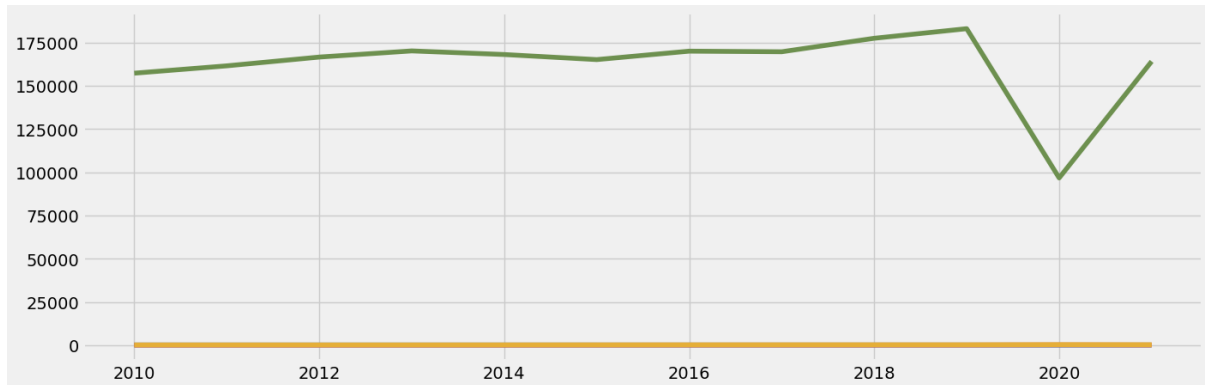
### 3: CLUSTER ANALYSIS: Unsupervised Machine Learning



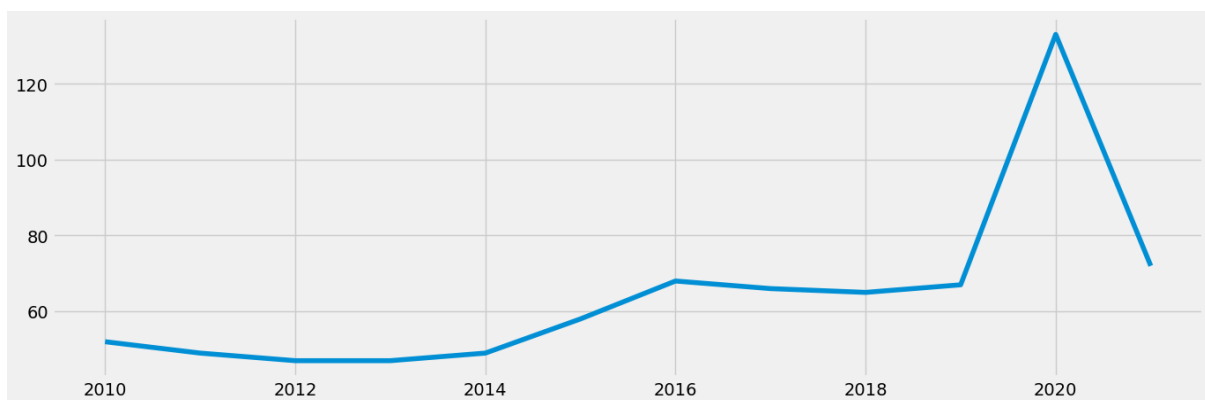
- The light pink cluster in the cluster chart is the largest cluster which is characterized by Lower total number of cases and higher median waiting days.
- When the waiting time('median\_days') is plotted against the years show that the median waiting time for this cluster has considerably risen in period between 2018 to 2020 which corresponds to the COVID-19 pandemic.
- Since the pink cluster is the majority cluster and we know from the bubble chart that majority of surgical procedures performed were Cataract surgeries we shall perform a time series analysis of Cataract

surgeries to uncover the reasons for Higher waiting times for lower total number of cases.

### TIME SERIES ANALYSIS : Cataract Surgery



Total number of cases vs time



Median waiting vs time

- The Time series chart for cataract surgeries pretty much answers all questions.
- When the two time series charts are compared, it is clear that from 2010 to 2019 the median waiting time was roughly between 40 to 70 days in spite of High total number of cases (150000- 175000).
- A complete contrast was seen in the year 2019-2020 when the median waiting time soared to over 130 days that too when the total number of cases had plunged to around 100000.
- This is true for almost all medical procedures especially the ones with higher risk.