ZOHAIB SAQIB

ANALYSIS OF PAKISTAN'S HEALTH SECTOR

PROJECT REPORT

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INTRODUCTION

This report is on an analysis done on a comprehensive health dataset from various hospitals that included personal and medical data. The task was to explore patient demographics to understand the distribution of age, gender, height, and weight across different hospitals.

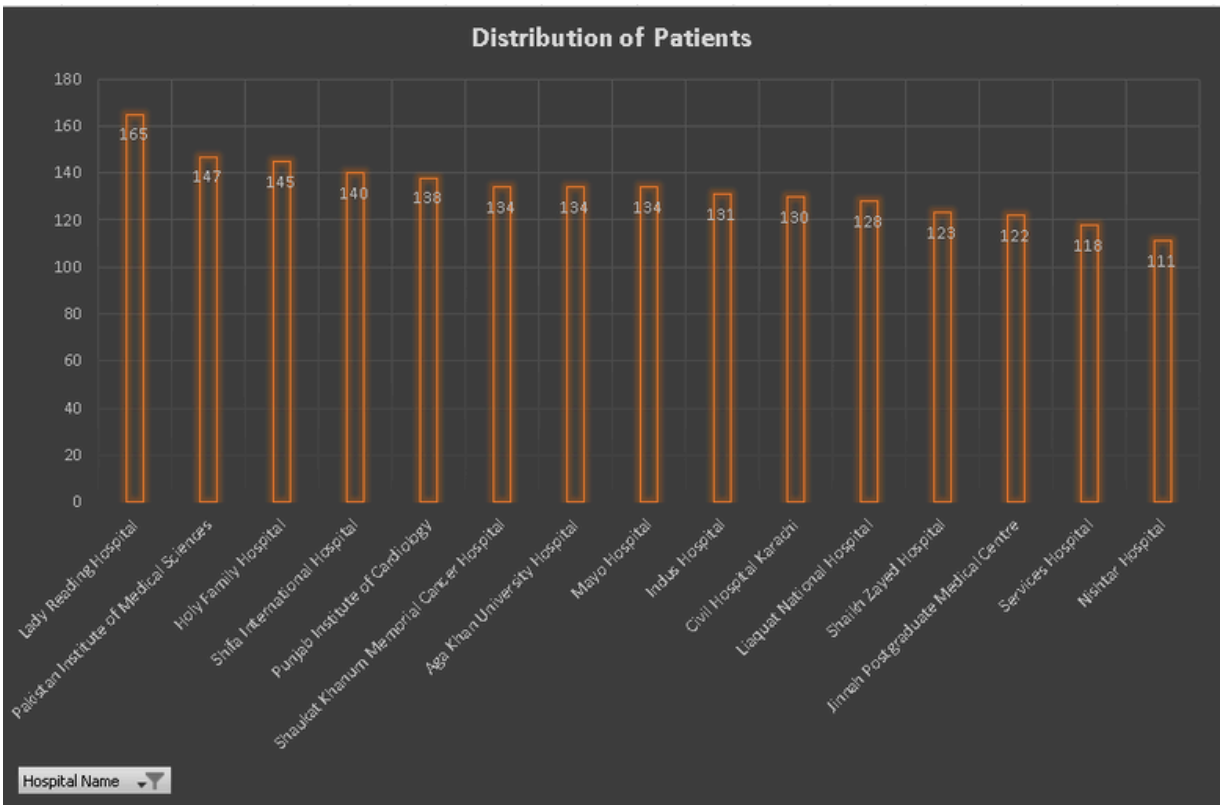
Pakistan Health sector long has been criticized not only for being inefficient and inadequate, but also has expensive treatments for common health problems people face in their lives. This analysis is conducted to evaluate the approachibility of the hospitals in providing treatment for common diseases like diabetes, cancer, COVID-19, and more. The analysis covers Key Performance Indicators (KPIs) like treatment cost per age group and disease, peak admission and discharge months, etc.

The report contains key visuals of the KPIs mentioned in the TOC along with the explainations of the findings and insights extracted from the visuals and the dataset. Finally, there is a conclusion paragraph at the end on the current state of the Pakistan Health sector.

HOSPITAL STATISTICS

Distribution of patients across each hospital

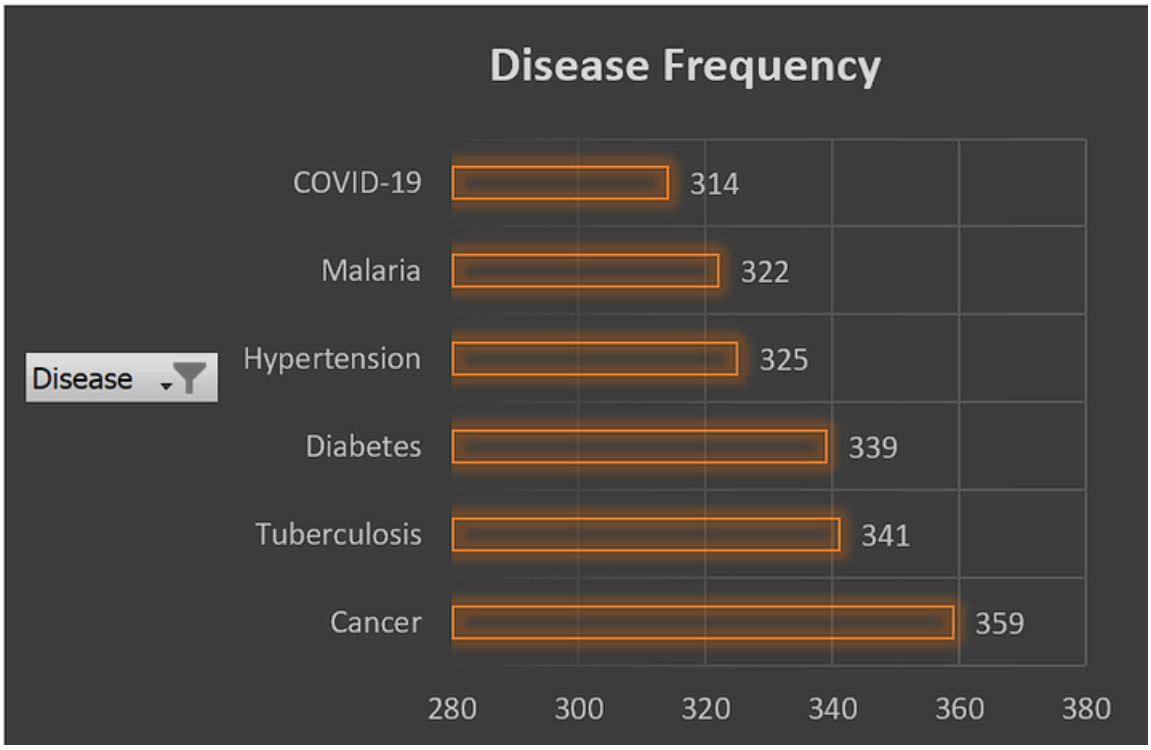
In this visualization, the distribution of patients across different hospitals are shown in descending order from left to right. Overall, the distribution of patients is pretty even across all the hospitals as there isn't a big difference apart from maybe the difference between Lady Reading Hospital and the Pakistan Institute of Medical Sciences. So, it looks like there isn't a clear cut preference of patients when it comes to hospitals.



DISEASE FREQUENCY

Most common diseases treated in the hospitals

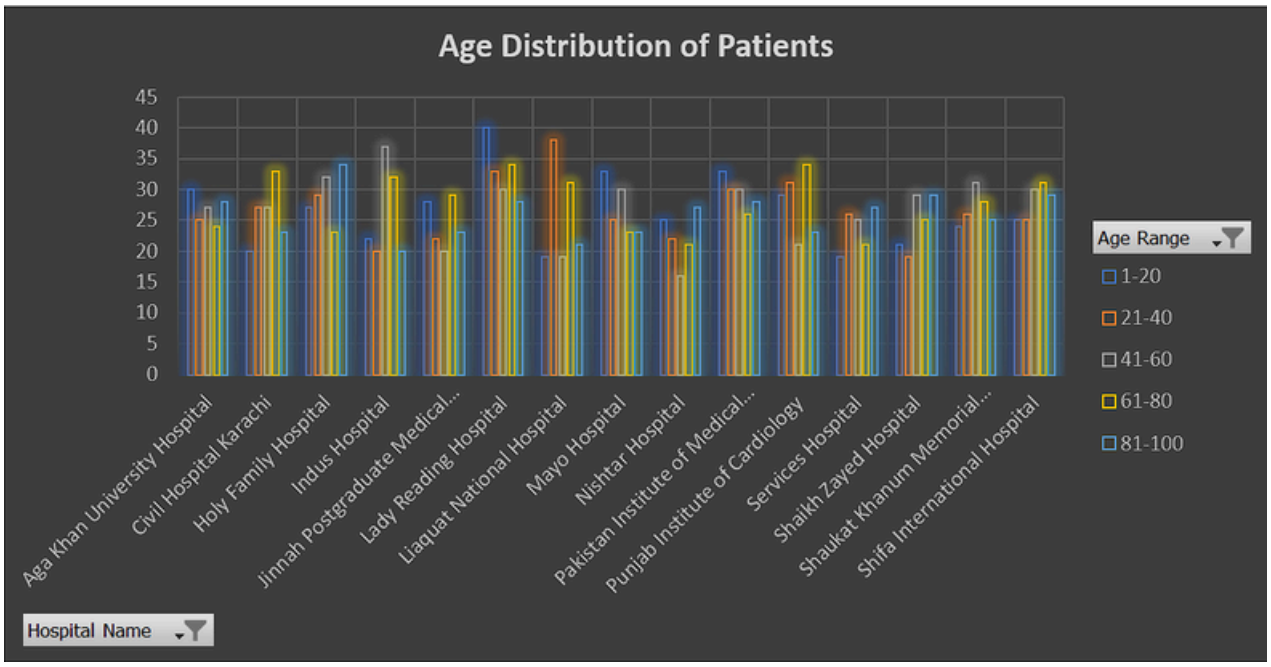
The following graph shows the frequency of the diseases that the patients have. We collected the data for COVID-19, Malaria, Hypertension, Diabetes, Tuberculosis and Cancer. Out of all of these diseases, Cancer is the most frequent reported one with over 350+ cases. Due to the small amount of data we have, we can't conclusively say that Cancer is the most common disease reported in the hospitals across Pakistan, more data should be collected before we can come to that conclusion. But, the graph still gives us an idea of what are the most common diseases in Pakistan.



AGE DISTRIBUTION

Age distribution of patients across hospitals

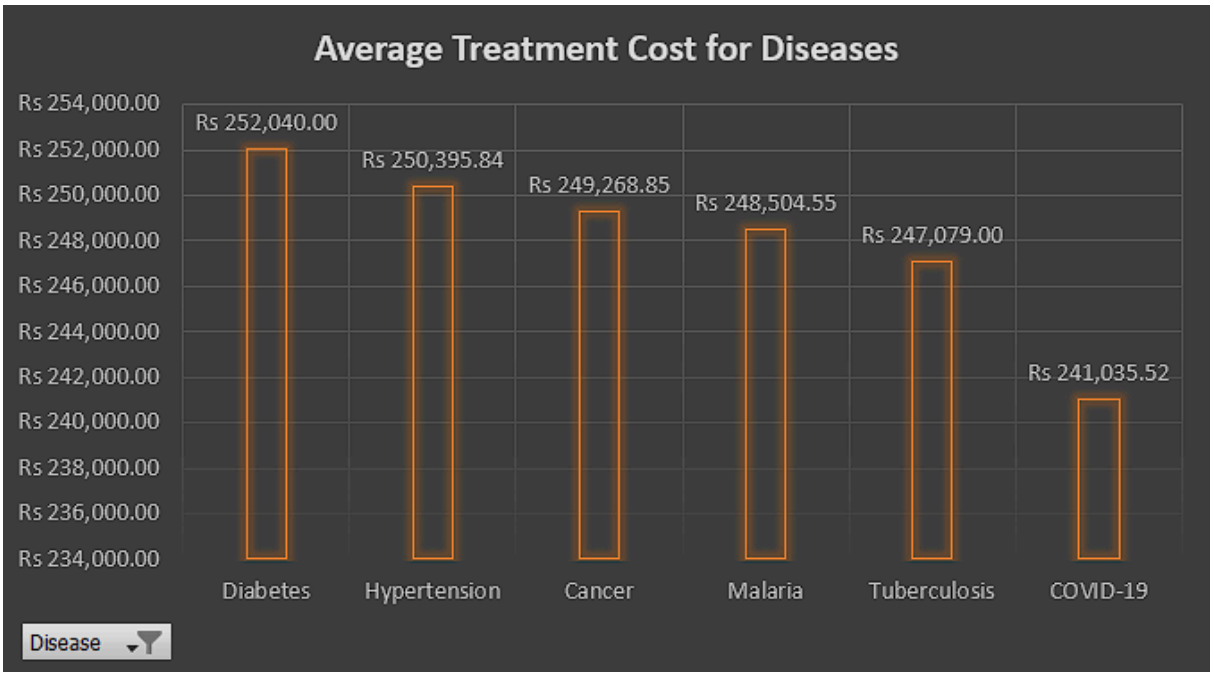
The next graph shows the age distributions of patients across different hospitals. The dataset had information about patients of all ages, from 1 to 100. So, to showcase the frequency in a much more digestable way, I categorized the patients into different ranges, from 1-20, 21-40, 41-60, 61-80 and 81-100. This resulted in a much cleaner graph that shows the frequency of patients of each age category in each hospital. We can see that the patients of age category of 61-80 (represented by yellow bar) are in the majority.



TREATMENT COST ANALYSIS

Average treatment costs for each disease

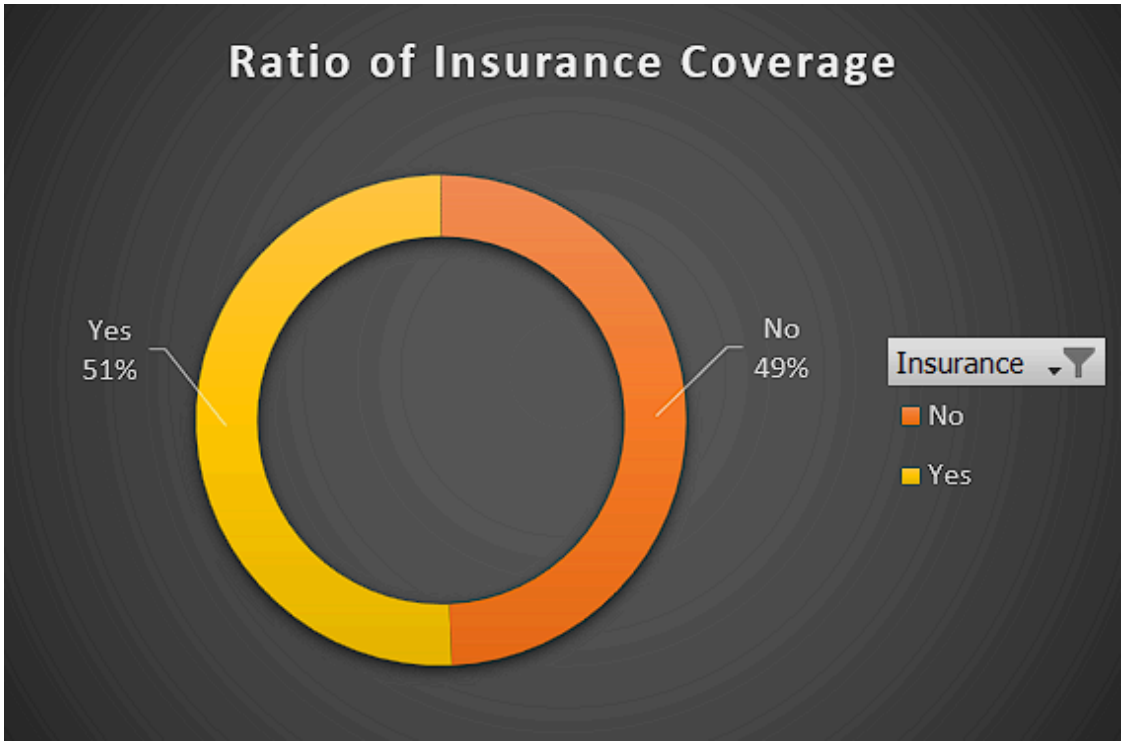
This visualization shows the average treatment cost of treating a disease in the hospitals. This gives us a general idea of what the approximate cost is to treat a disease. The average cost of the treatment are pretty similar, even the cost of treating COVID-19, as it's only seperated by a few thousand rupees. Even the treatment cost of all the diseases are similar, they are pretty high. The average median salary of an average Pakistani household is Rs. 70,700, which means half of the population have to pay more than triple their salary to treat the diseases, which is not good as some of the diseases whose data we have are potentially fatal diseases like Cancer, Malaria, COVID-19 and Tuberculosis. Of course, after analyzing this small data, we can't say anything conclusively, but if this turns out to be true, it means potentially more than half of the population of Pakistan are at risk if they contract any of these diseases. Let's look at the patients that had insurance coverage to see how many patients can actually afford the treatments.



INSURANCE COVERAGE

The percentage of the patients that had insurance coverage

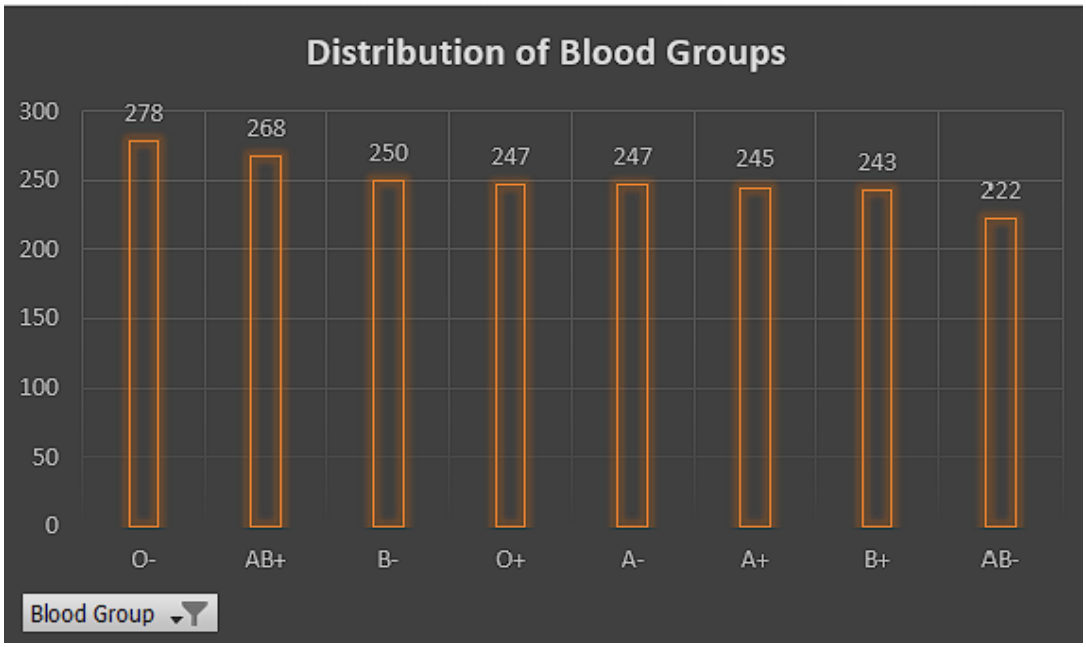
The graph shows that the half the patients that had gotten treatment had insurance coverage, 51% to be exact. Meanwhile the other 49% don't have coverage. For finding more about the approachibility of the hospitals, we can collect more data from the patients like what is their salary, etc, which can give us more of an idea about what percentage of the patients, that don't have insurance coverage, that can actually afford the treatments.



BLOOD GROUP DISTRIBUTION

The distribution of the blood groups among the patients

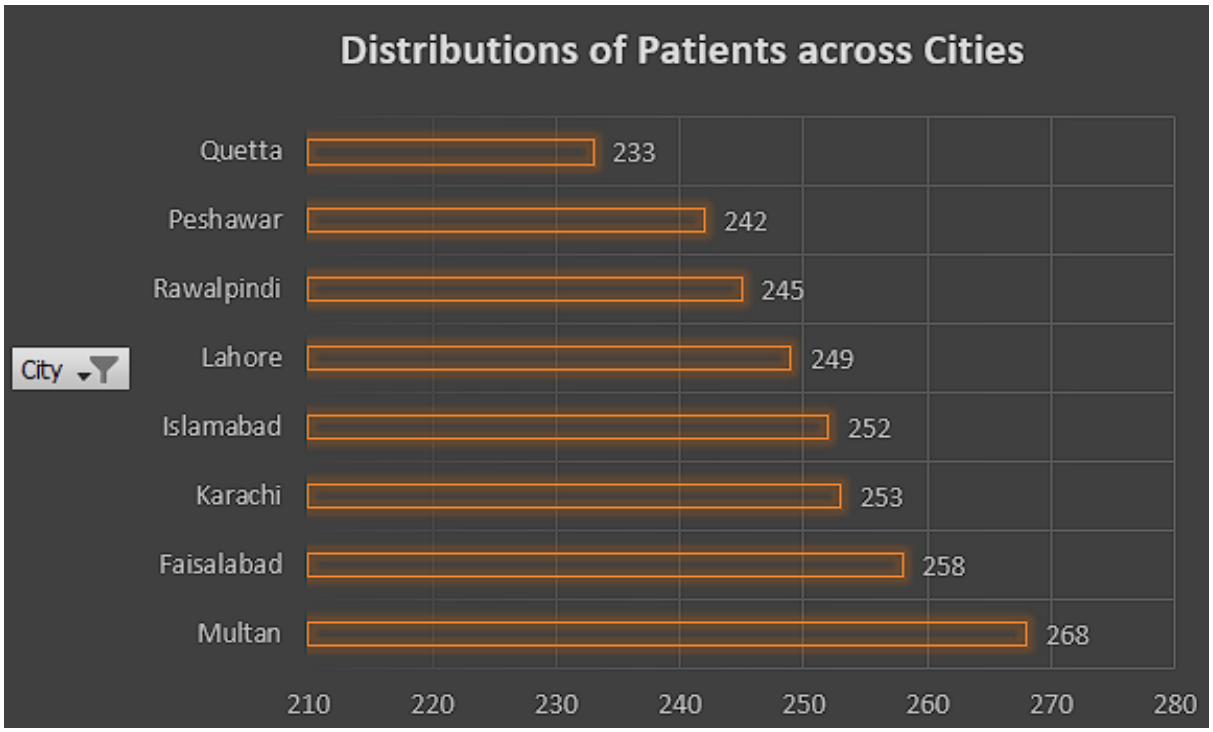
The next visual shows the distribution of blood groups among the patients. The O- is the most common blood group among the patients, followed by AB+, B-, etc. AB- was the least common blood group among the patients.



CITY-WISE PATIENT COUNT

The amount of patients that are treated in hospitals belonging to different cities

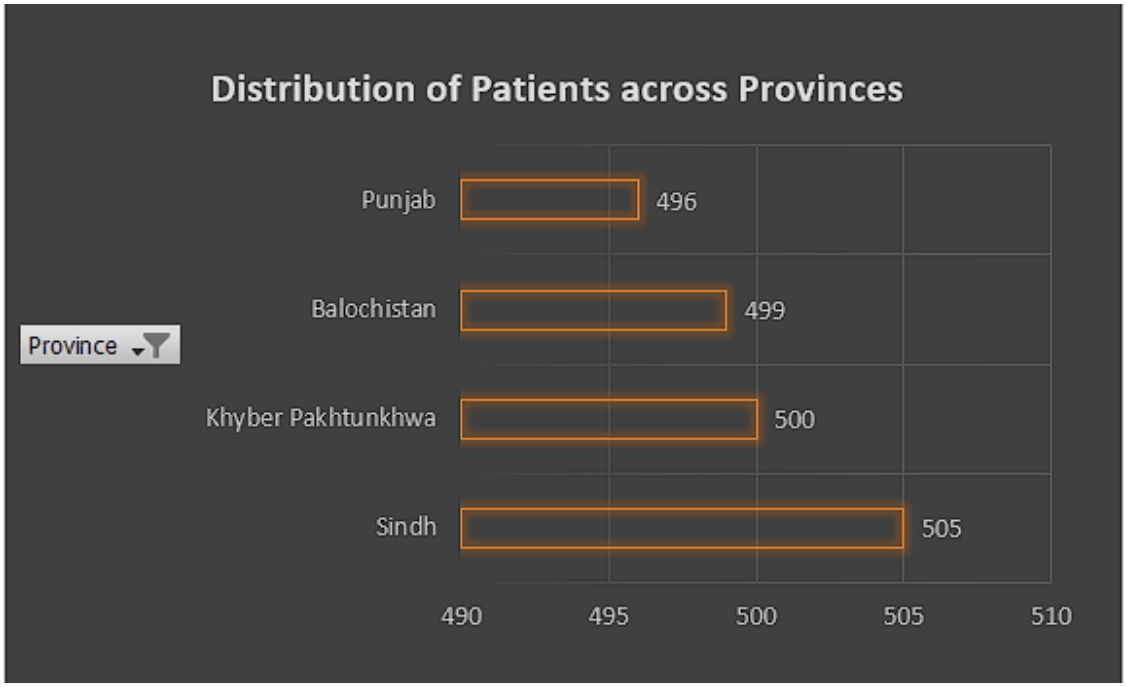
The following distribution of the patients across the different cities is pretty even, with Multan coming out on top with the most recorded patients treated and Quetta being the lowest in terms of patients treated.



PROVINCE-WISE PATIENT COUNT

The amount of patients that are treated in hospitals belonging to different provinces

Similarly to the distribution of patients across cities, the following distribution of the patients across the different provinces is also pretty even, with Sindh coming out on top with the most recorded patients treated and Punjab being the lowest in terms of patients treated.



PEAK ADMISSION AND DISCHARGE TIMES

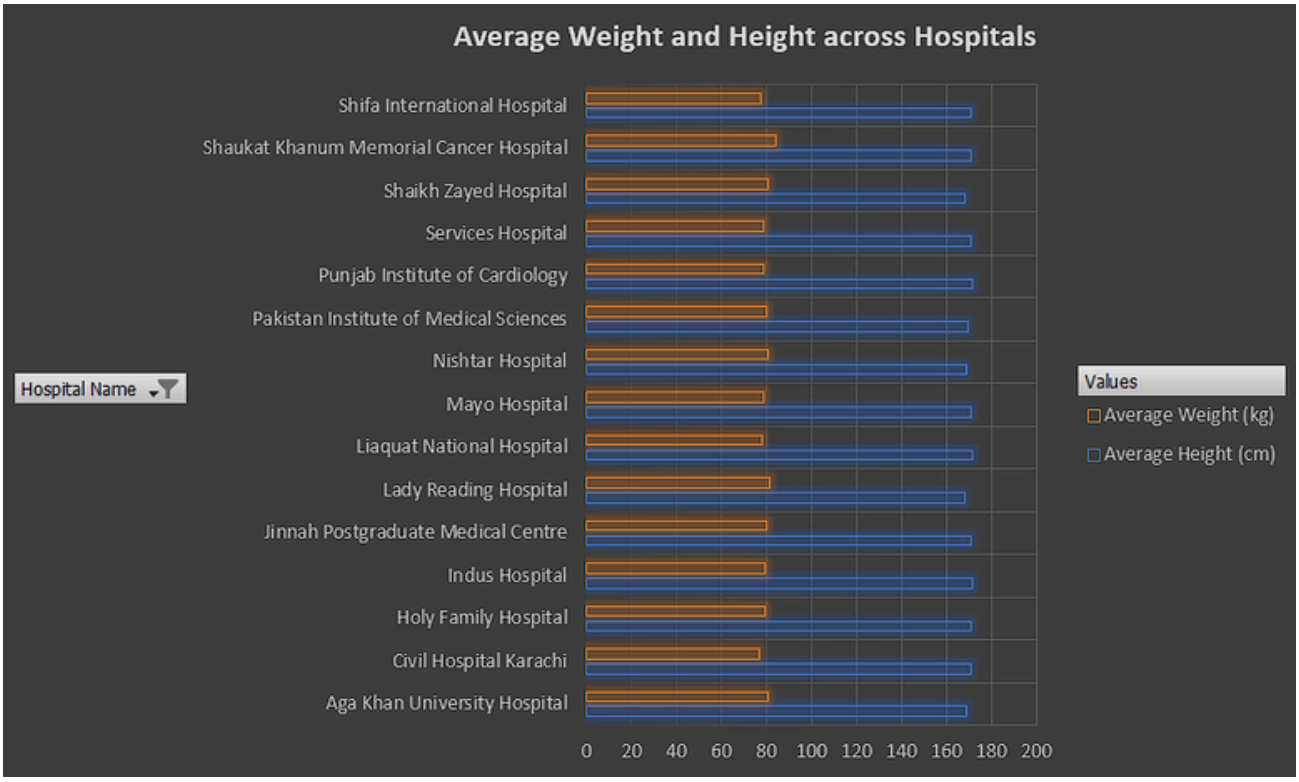
Peak times for admissions and discharges in each hospital

The following two charts shows the admission and discharge frequency of patients bacross different months. The original data was in terms of dates, but for better visualization, I grouped the admission and discharge time of patients in terms of months. The peak month of admission and discharge times of the patients was January and December respectively.

HEIGHT AND WEIGHT STATISTICS

Average height and weight of patients in each hospital

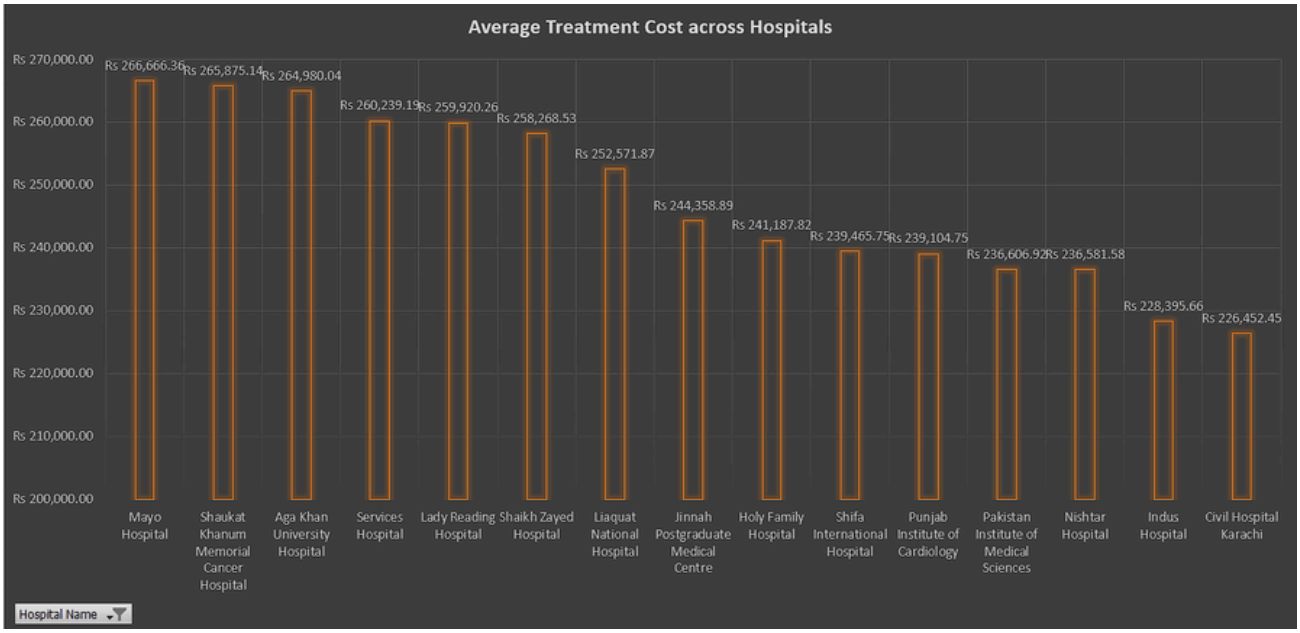
The below visualization shows the average weight (kg) and height (cm) of the patients treated across the hospitals. There is barely any difference across the graph as almost all the patients lie around the 80 kg weight and 170 cm height mark.



TREATMENT COST BY HOSPITAL

Average treatment cost across different hospitals

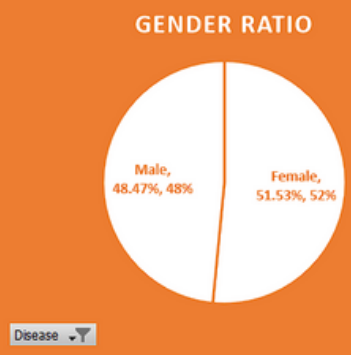
The graph below shows the treatment cost across the hospitals. The treatment cost from Mayo Hospital to the Liaquat National Hospital is comparable, from then onwards there is a slight drop in the average treatment cost. One thing to note is, that despite providing the lowest average cost, Civil Hospital still isn't among the frequent visited hospitals among the hospitals in the dataset. There can be multiple reasons for the low performance of the hospitals, so more research should be done on the quality of treatments Civil Hospital provides so we can gain more insights on the matter.

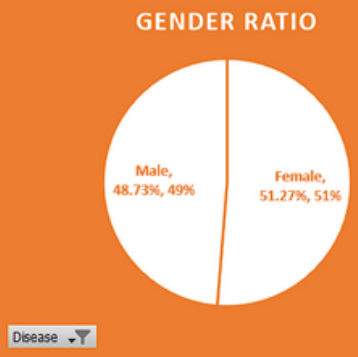


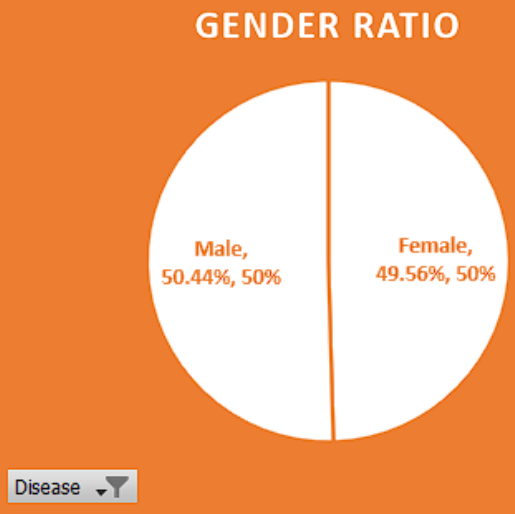
GENDER RATIO

Gender ratio of patients for each disease

Generally, there is a pretty even ratio of male and female patients across the diseases. The following are some of the graphs that show the ratio for cancer, COVID-19 and diabetes.



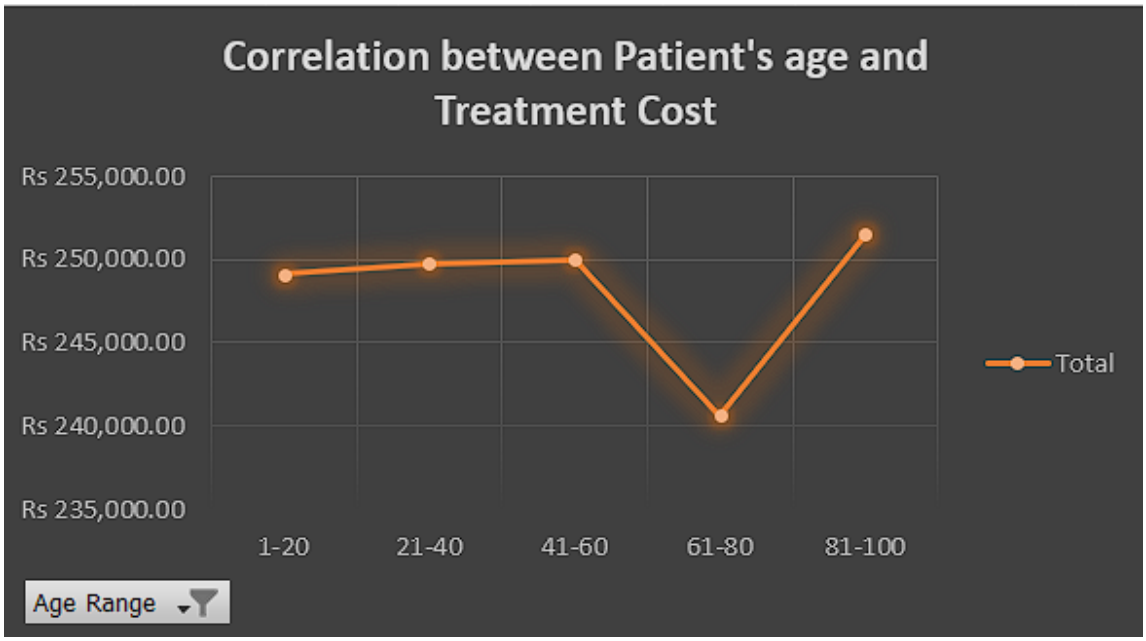




PATIENT AGE VS. TREATMENT COST

Correlation between patient age and average treatment cost

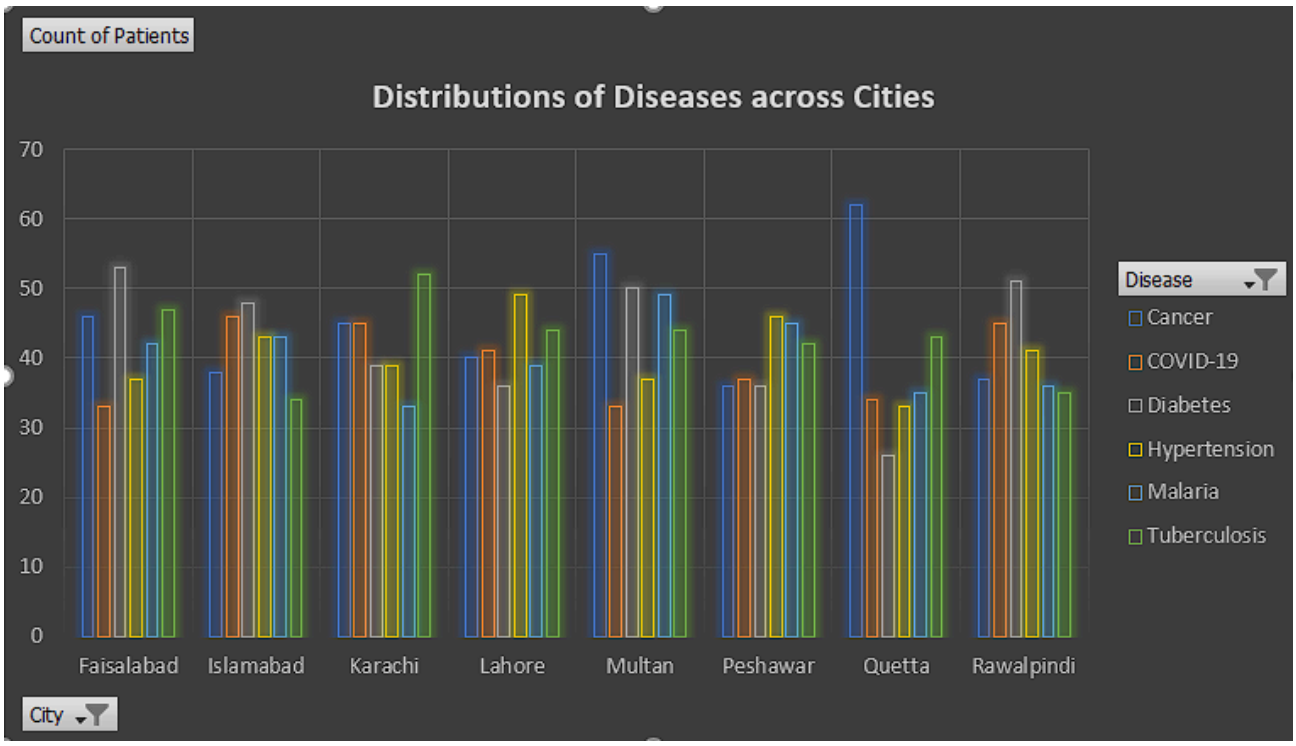
In favor of better visualization, I also opted for making a graph using the age categories and average treatment cost of each patient age category. There is generally a positive correlation between the patient's age and treatment cost, i.e. as the patient's age increases, the treatment cost increases with it as well. This is true except for the patient of age category 61-80, there is a sharp decline in treatment cost.



DISEASE BY CITY

Most common diseases in each city

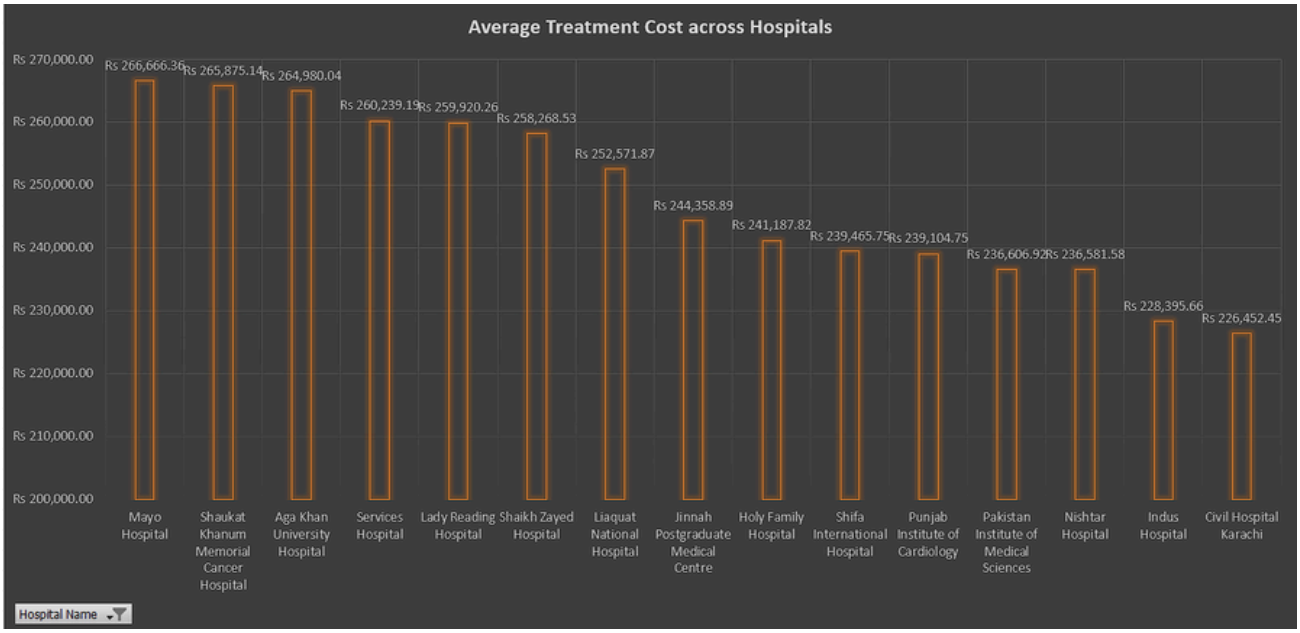
The following graph shows the distributions of diseases across cities, so that finding the common diseases across cities becomes easy. For Faislabad, Islamabad and Rawalpindi, diabetes is the most common disease. For Multan and Quetta, it is cancer. For Lahore and Peshawar, it is hypertension. For Karachi, it is tuberculosis. For 3 out of 8 cities, namely Multan, Quetta and Karachi, the most common disease is a fatal one.



HOSPITAL PERFORMANCE

Highest and Lowest treatment costs across hospitals

The graph below shows the treatment cost across the hospitals. As discussed before, the Civil Hospital has the lowest treatment cost meanwhile Mayo Hospital has the hightes treatment cost.



CONCLUSION

Overall, even though the dataset was small, it gave us great insights into the current state of Pakistan Health sector. In light of the findings, we can say that the Pakistan's Health sector still has to go a long way to provide affordable treatments to patients