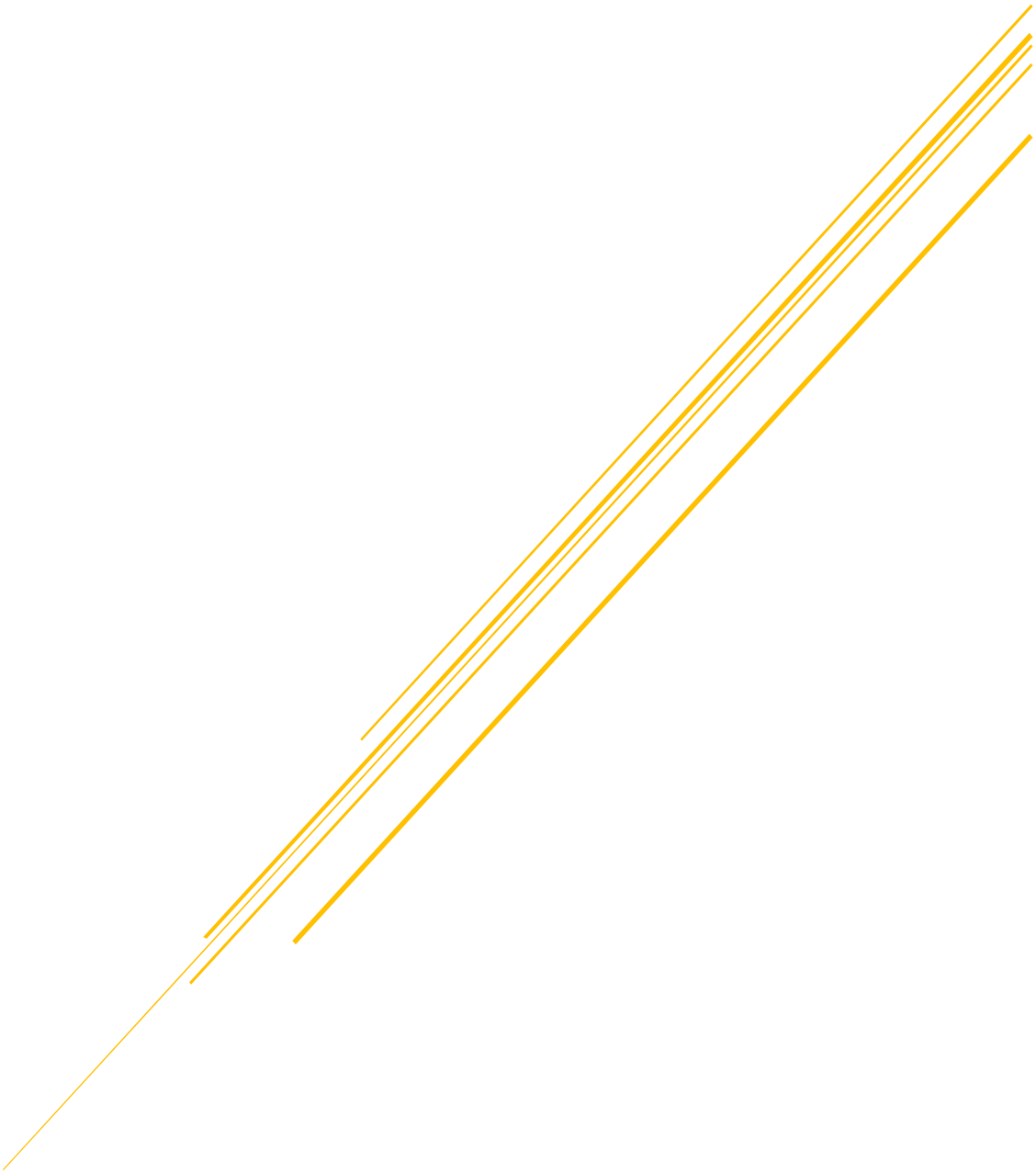
UNDERSTANDING HEALTHCARE

In New South Wales - Australia



IBM Data Science
Capstone Project

Introduction: Business Problem

In order to provide better healthcare service, it is imperative for every government to understand and forecast the demand of healthcare services as the population grows.

The issue is that it requires large amount of budget to maintain the existing healthcare infrastructure and to develop new ones. Therefore, governments generally struggle to balance the available resources where the actual need is.

In this project we will identify the gaps where there is requirement for more health services in the state of New South Wales (NSW) in Australia.

Methodology

In this project we will start by identifying the location of the existing public hospital within the state of New South Wales.

Once we will be able to plot the public hospital on the map, we will identify the boundaries of the Local Health Districts and super-impose the population density of each district. This will help us to identify the number of public hospitals in highly dense population areas.

Then we will develop a key progress indicator of beds / 1000 persons to check the demand of beds vs. the population density. After that we will plot each district's total number of beds per 1000 persons and identify which district falls short of the required benchmark KPI.

Once the districts are identified we can predict that only these Local Health Districts require extra resources to increase the supply of healthcare services.

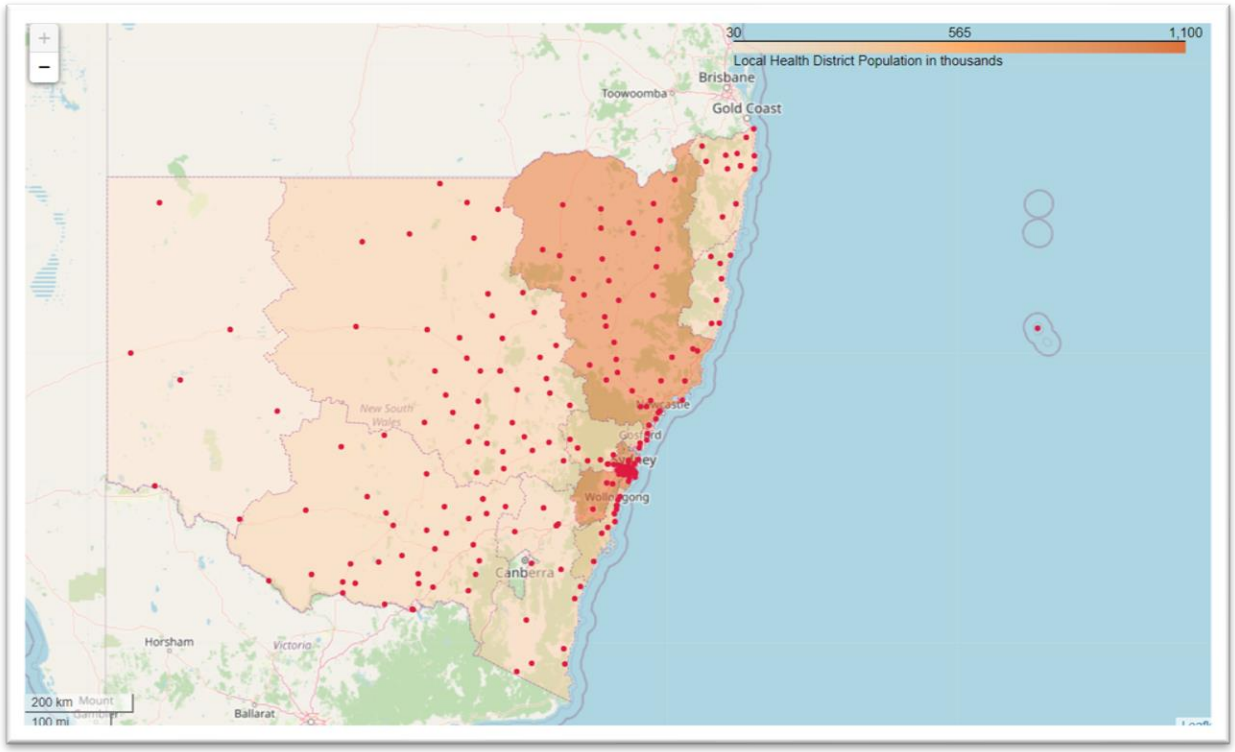
Data Collection

The data was collected from following sources:

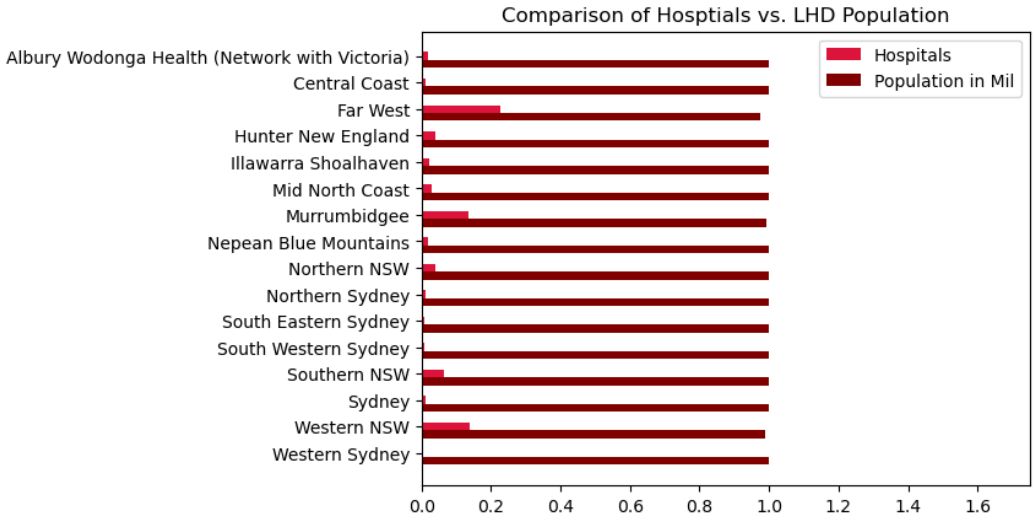
1. Foursquare API calls for the list of hospitals in the NSW state, which was then converted into a data frame.
2. List of Local Health Districts and their population from NSW Health website.
3. List of Local Health Districts' boundaries from NSW Heath website.

Analysis

First the mapping of the public hospitals was done within each Local Health District. This was done by mapping the locations of hospitals via Foursquare API on the NSW state map.



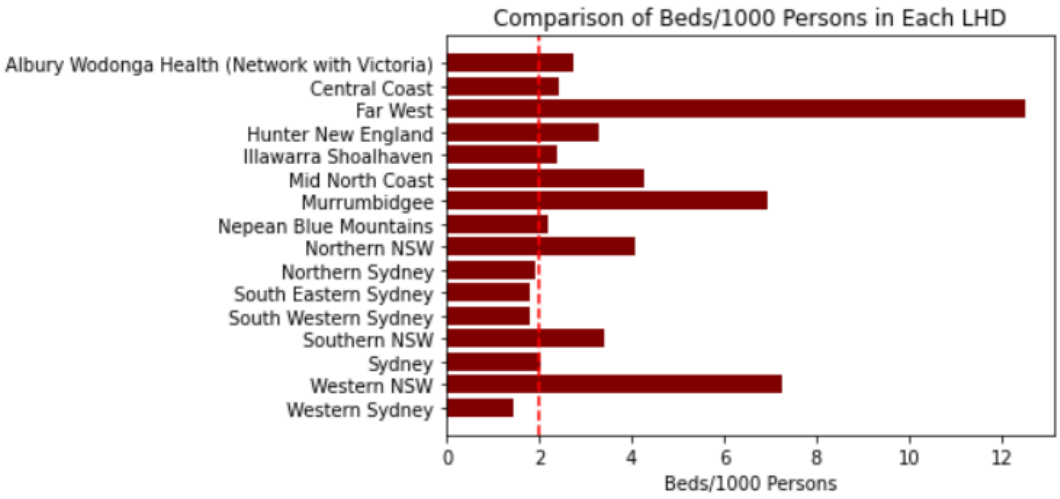
This identified that most of the hospitals lie within the high population density areas. Then the population vs. hospitals bar chart was developed to understand the distribution of healthcare services.



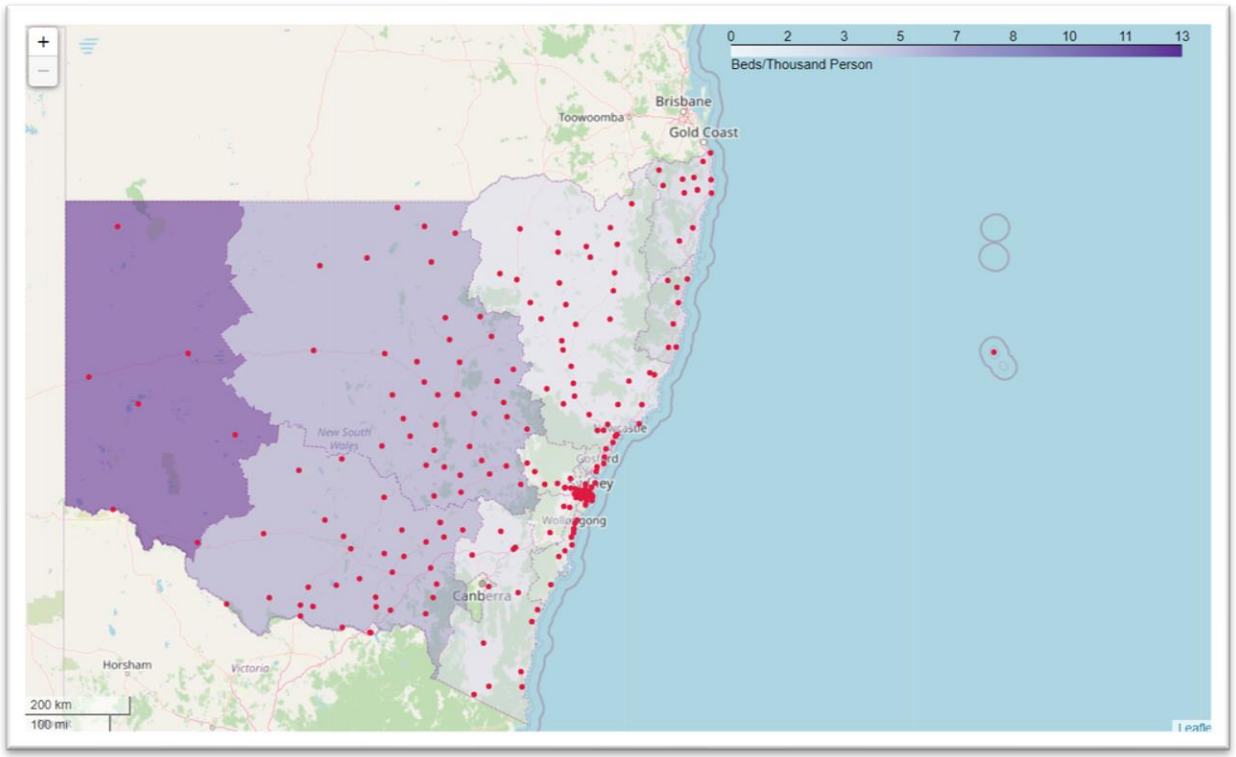
Benchmarking

The KPI was developed and the benchmarking was done to understand the supply and demand of the public hospital in the Local Health Districts.

The standard KPI is number of beds/1000 persons in the area of interest. The relevant benchmark is 2 beds/1000 persons.



This was also plotted on the geo-map.



The lighter colour areas in the map above shows the areas of shortage.

Results and Conclusion

As we can see as from the map and the graph that the low public hospital availability is mainly in the areas which are densely populated. However, low density areas have ample supply of healthcare services.

The local health districts having ratio lower than this are:

1. Northern Sydney
2. South Eastern Sydney
3. South Western Sydney
4. Western Sydney

Therefore, these districts should be provided more hospitals to cover the shortage.