

COVID-19

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Abstract

This report analyses the global and country-specific trends associated with the COVID-19 pandemic.

1. Introduction

I have been tasked to examine the evolution of the Covid-19 outbreak.

Data

The data looks at Covid-19 globally.

1.1. Experience of African Countries

I provide insights into how African countries experienced the COVID-19 pandemic compared to other regions.

First, the average total cases for Africa is plotted over time. They steeply rose over time. The next figure compares Africa across continents. It had the lowest increase (flattest slope) in COVID cases over time. Europe, on the other hand, faced rapid increases in COVID-19, rising particularly steeply throughout.

Africa also has the least fully vaccinated people per hundred people. This is possibly due to being under-resourced. Oceania, mostly comprising Australia, has the highest population of fully vaccinated people.

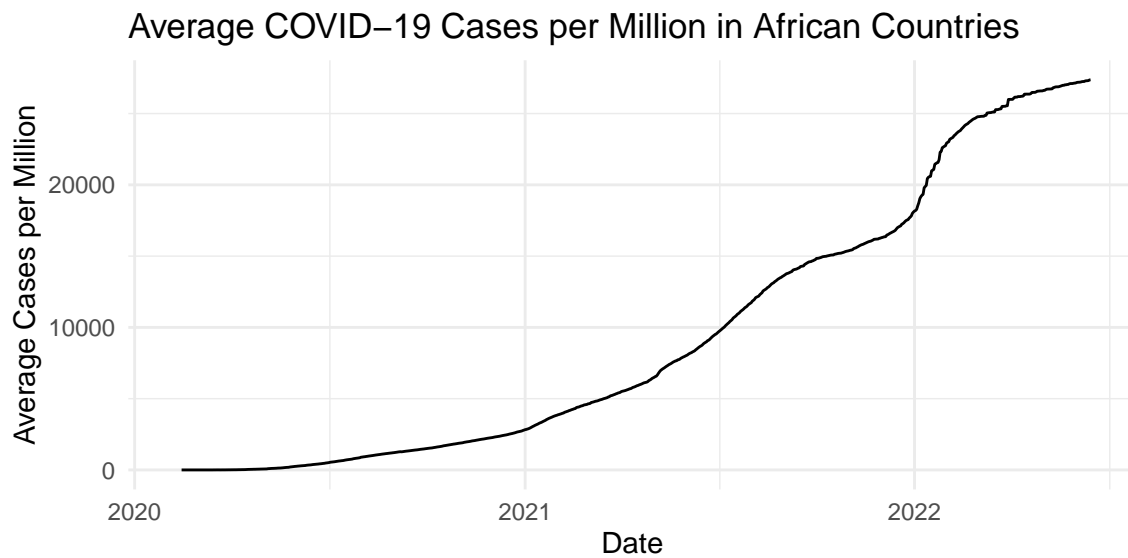


Figure 1.1: COVID-19 Cases per Million

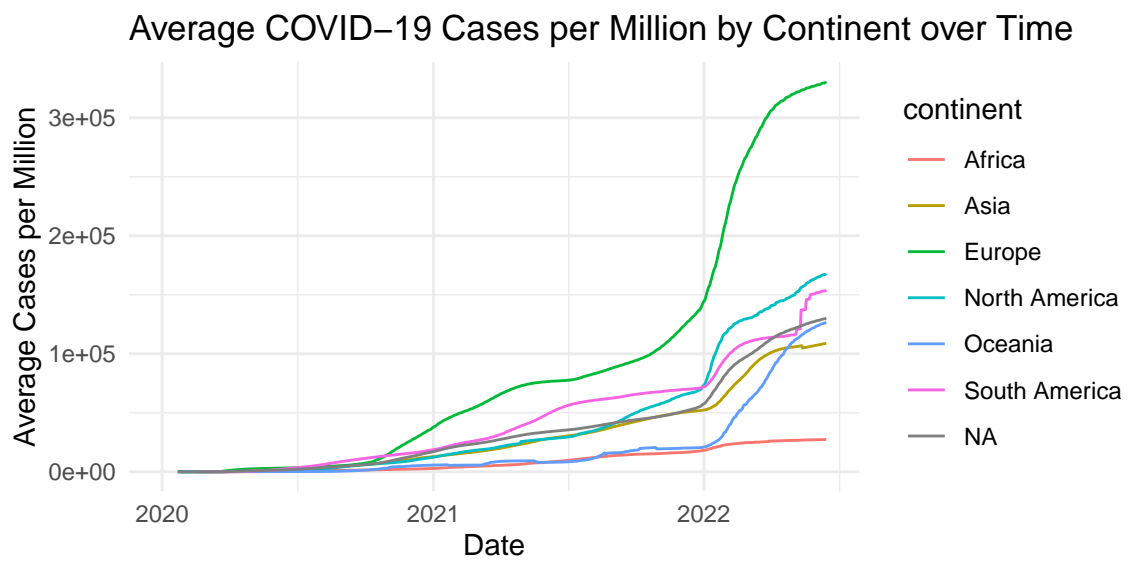


Figure 1.2: COVID-19 Cases per Million

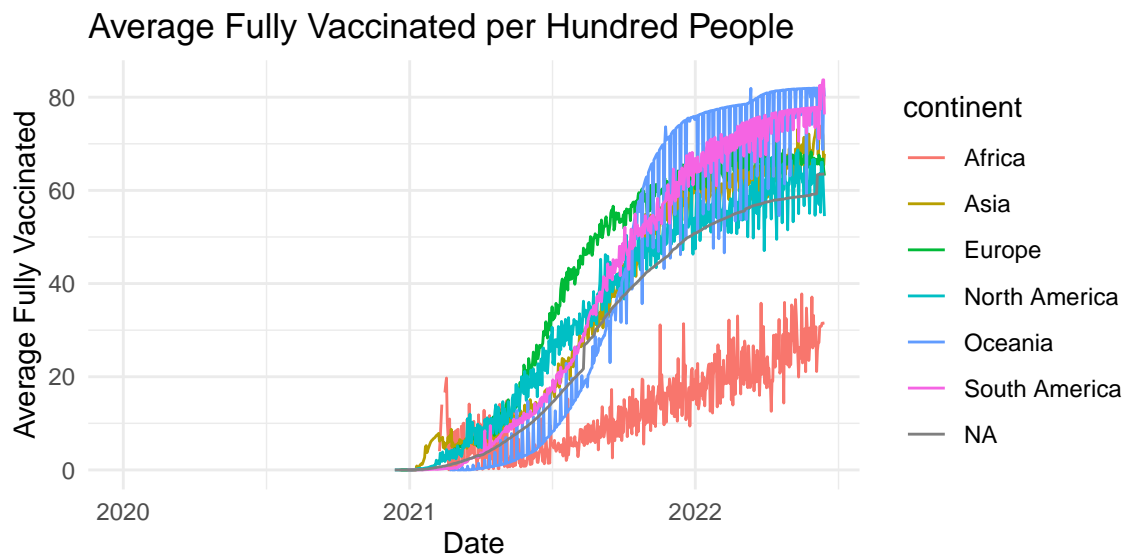


Figure 1.3: COVID-19 Cases per Million

1.2. Severity of COVID-19 in Countries with High vs Low Life Expectancy

Next I want to examine distinct patterns in the severity of their COVID experience in countries with higher and lower general life expectancy. By averaging life expectancy across locations, the five countries with the lowest life expectancy are Central African Republic, Chad, Lesotho, Nigeria and Sierra Leone.

From the below tables, we can see that Africa has the lowest Life Expectancy and Europe has the highest.

Among countries with the lowest life expectancy, total deaths remained relatively low except for Nigeria, where deaths roses rapidly from the beginning of 2020 to the end of 2022. Lesotho experienced the next highest number of deaths.

The five countries/locations with the highest life expectancies were Monaco (86.8 years), San Marino, Hong Kong, Japan, and Macao. Among countries with the highest life expectancy, Japan had the highest number of deaths, reaching over 30 000 around quarter 3 of 2022. Deaths were very low in the locations of Monaco, San Marino, and Macao.

```
## # A tibble: 5 x 2
##   location    average_life_expectancy
##   <chr>          <dbl>
## 1 Hong Kong      84.9
```

## 2	Japan	84.6
## 3	Macao	84.2
## 4	Monaco	86.8
## 5	San Marino	85.0

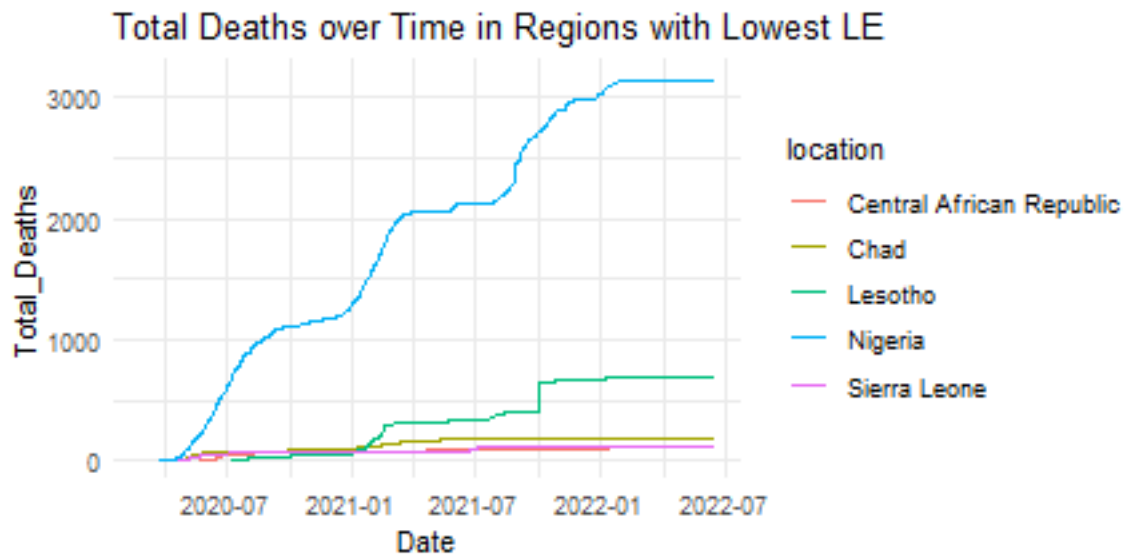


Figure 1.4: Caption Here

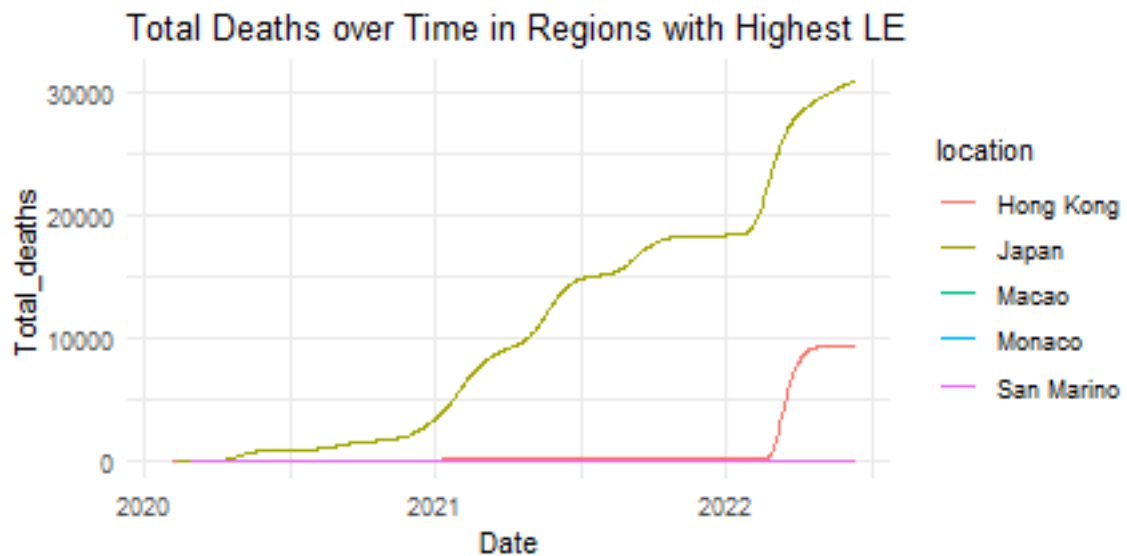


Figure 1.5: Caption Here

Total cases per million where the highest in Lesotho, probably owing to its small population. For areas

with high life expectancy, San Marino experienced the highest number of cases per million people, followed by Macao.

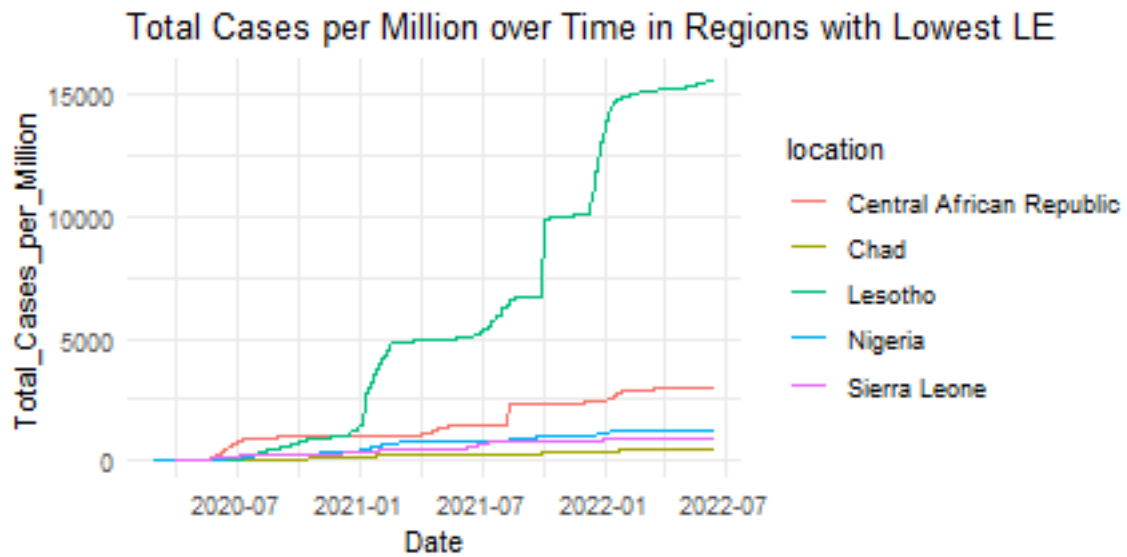


Figure 1.6: Caption Here

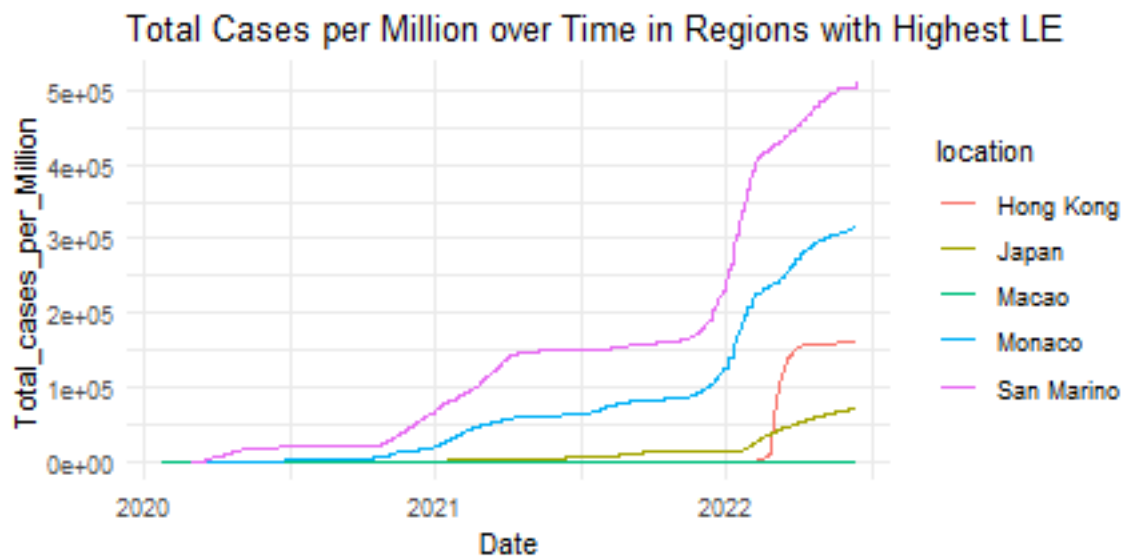


Figure 1.7: Caption Here

1.3. Changes in General and ICU Hospitalisation

Hospitalisations and ICU admissions are plotted.

Plotting across continent, we can see that each continent experienced waves of hospitalisation at different times. Europe, North America and Asia experienced the highest shocks in hospitalisations. Hospitalisations in Africa were always low. This is expected given the cases were fewer.

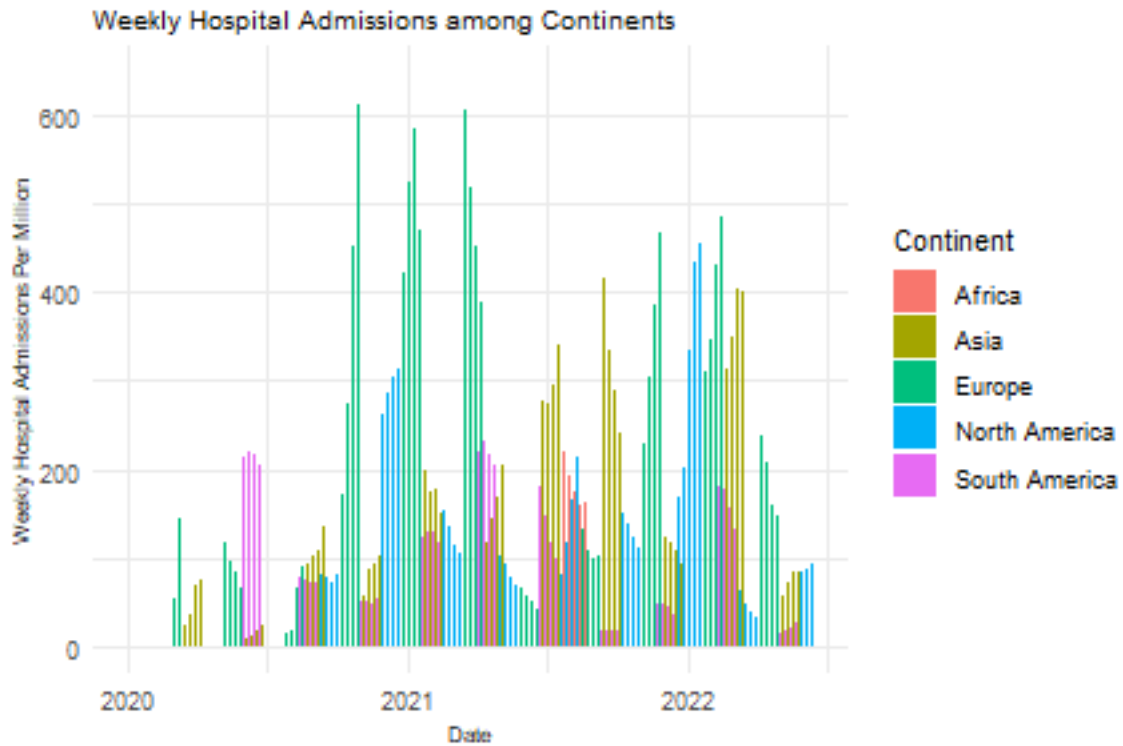


Figure 1.8: Hospital Admissions

Europe and South America experienced the highest numbers of weekly ICU admission per million . This is interesting because South America did not have as sharp spikes in general hospitalisations compared to other continents.

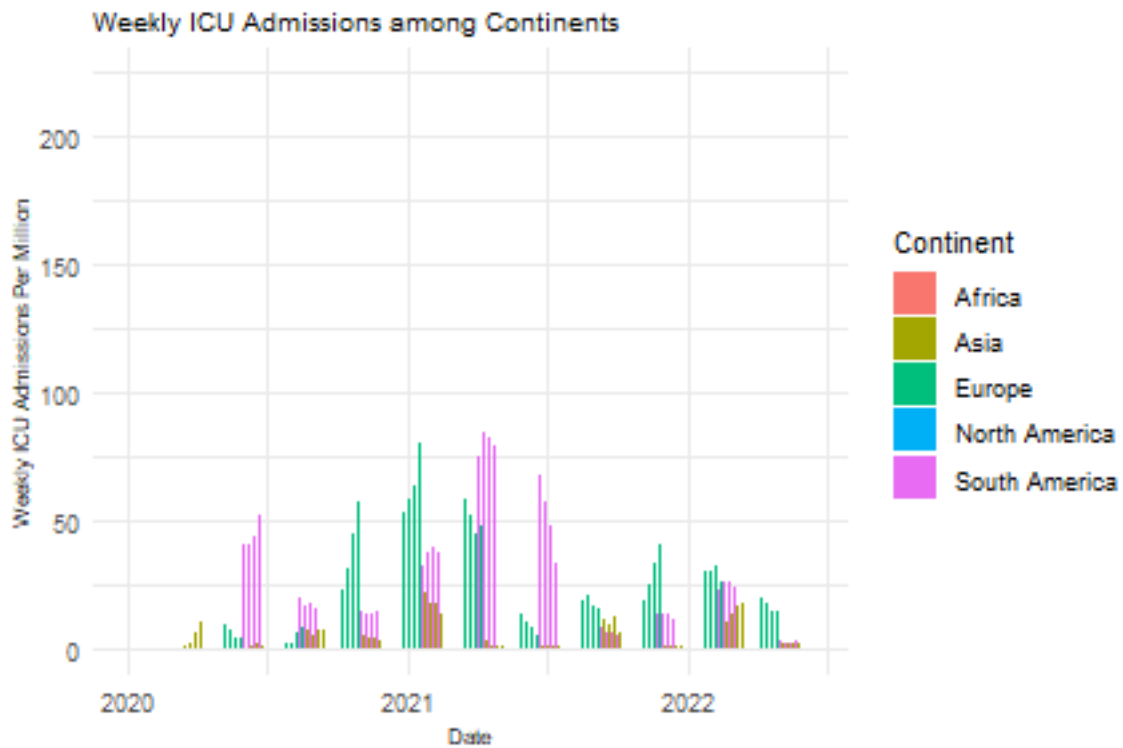
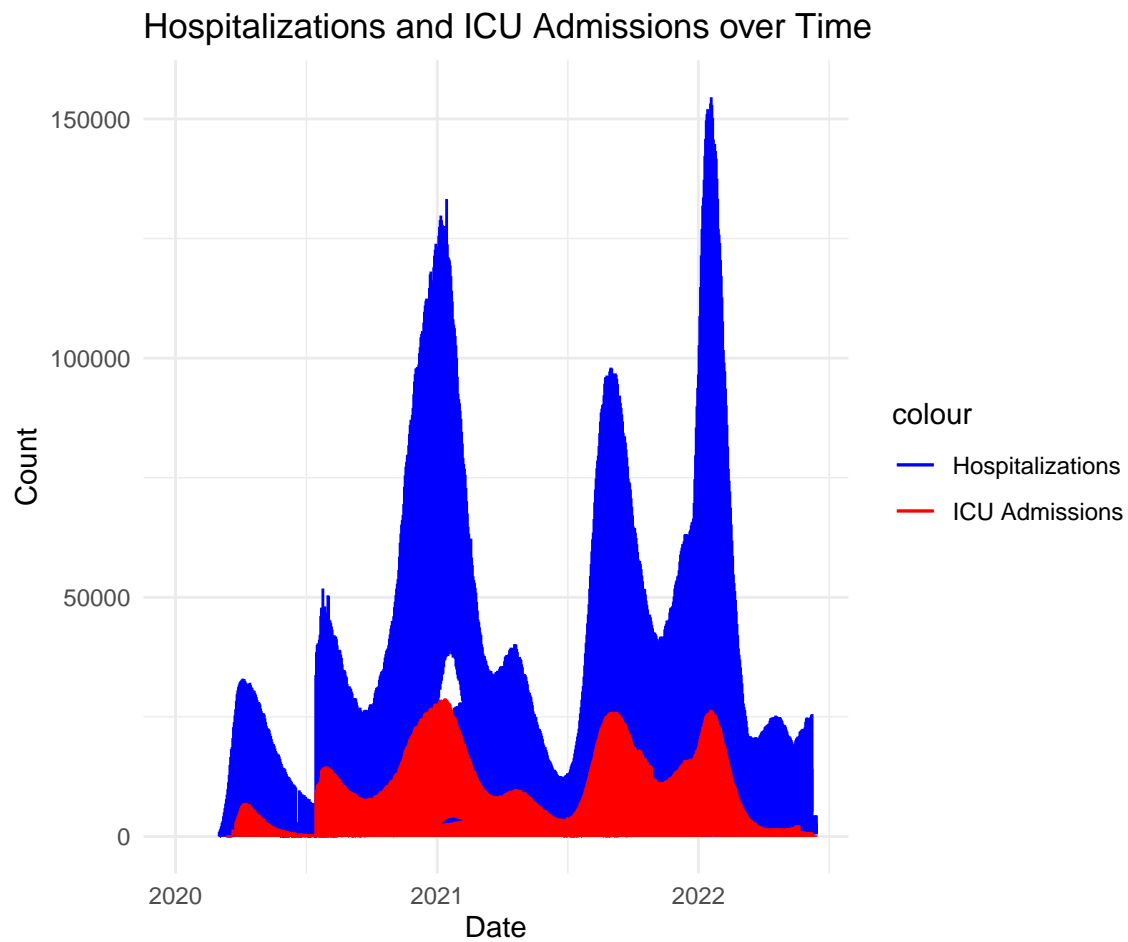


Figure 1.9: Hospital Admissions

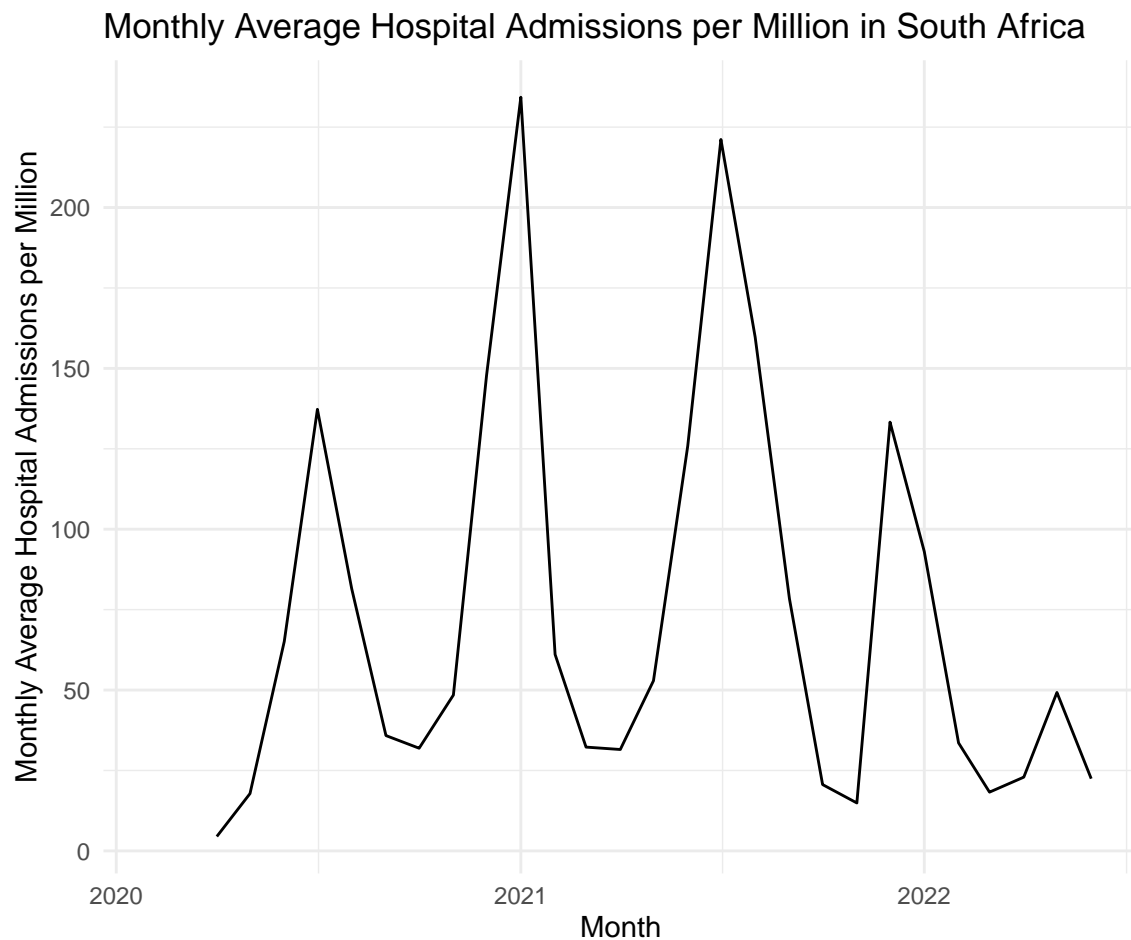
Plotting hospital patients and ICU patients, it can be seen that they follow the same trends and waves. ICU patient numbers always increase globally when global hospitalisations increase. Therefore, general hospitalisation led ICU hospitalisations.

We can also see that there is a positive correlation (0.6) between the number of hospital patients and number of tests. Therefore, the number of tests conducted can act as a good indicator of hospitalisation.



```
## [1] 0.6159445
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In South Africa, there are clear waves in hospitalisations. This shows how hospitalisations were clustered mostly likely when during times when the virus spread was high.



Discussion and Conclusion

In conclusion, Covid-19 wrecked havoc throughout the world, leading to increase deaths and hospitalisations. Africa experienced less COVID-19 cases compared to the rest of the world and consequently, less deaths. This could also be due to a lack of proper recording of COVID data.

By looking at countries with different life expectancies, the results are mixed. Total deaths were high and approximately the same in Japan and Nigeria, despite having very different life expectancies. Deaths were relatively low in the other specified areas. Total cases per million were typically higher in countries with high life expectancy. By not having substantially higher deaths in these countries, it is likely that citizens in high life expectancy countries had strong enough immune systems to cope with the virus.

It is clear that COVID presented itself in waves and these waves impacted different continents at different times. ICU hospitalisations were strongly associated with Hospital admissions.