Covid-19 & Vaccination
Analysis with the latest information

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1. INTRODUCTION

In this module, I will make various visualizations using Tableau and check the the gestalt and design principles. I used the most recent Covid-19 data provided by WHO (World Health Organization). This was downloaded on March 14th, 2023. The data is the March 7th, 2023, the last statistic. I will learn which visualization type I have to use in Tableau according to data that I have. I will also look at what role that visualization plays while answering my business question. Finally, I will check how the story of the data can be effectively conveyed through visualization. And what story can be said with data visualization.

2. ANALYSIS

Q. Why did you choose the types of visualizations that you did?

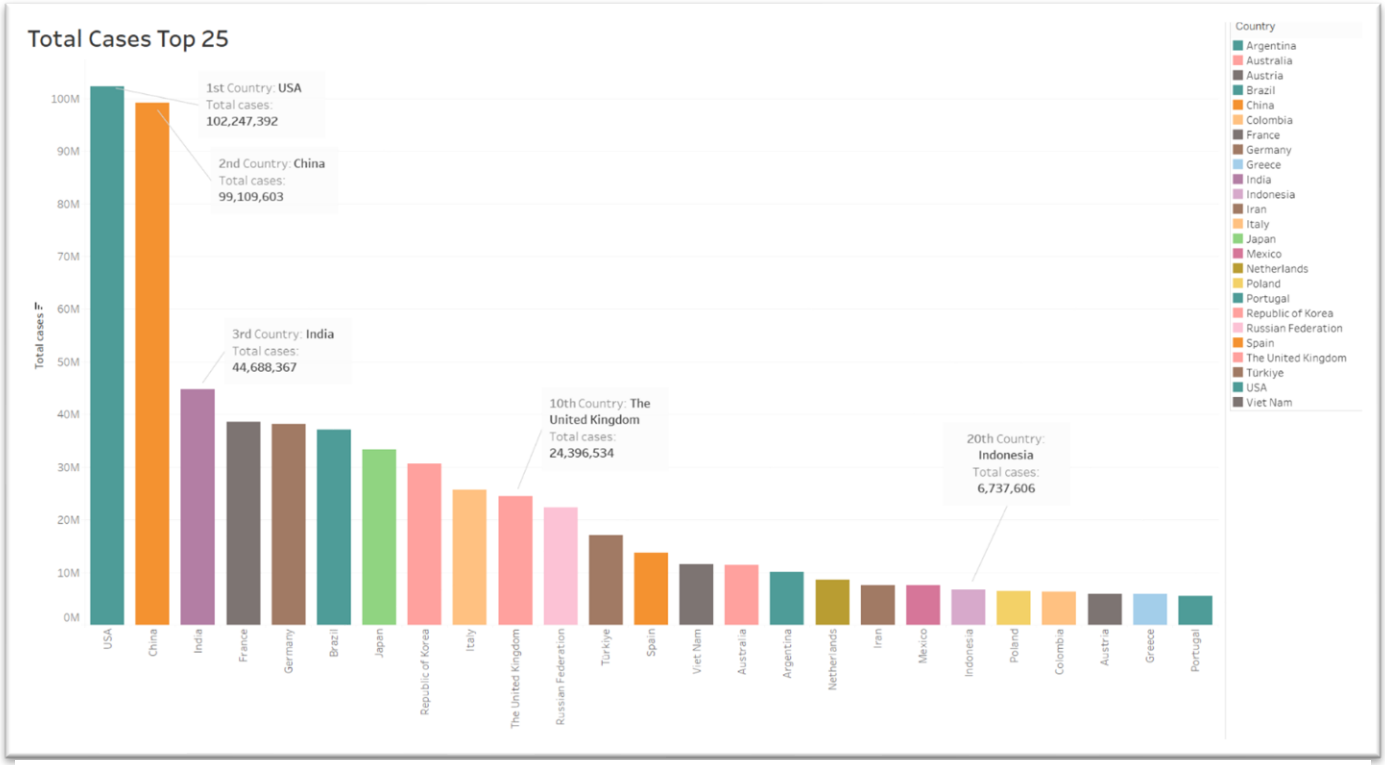

Figure 1 Histogram of Total Covid-19 Cases

I used a histogram to show the total Covid-19 cases. Above graphs show the top 25 of the 237 countries. I filtered through descending order to select the top 25 countries. This help recognize countries with the most Covid-19 cases easily. Each country has a different colored histogram bar. This allowed us to distinguish countries on the histogram. And from the 1st to the 3rd countries, I made annotations for them which are United States, China, and India. And to find out the overall numbers, I used the annotation of the The United Kingdom, the 10th country, and Indonesia, the 20th country.

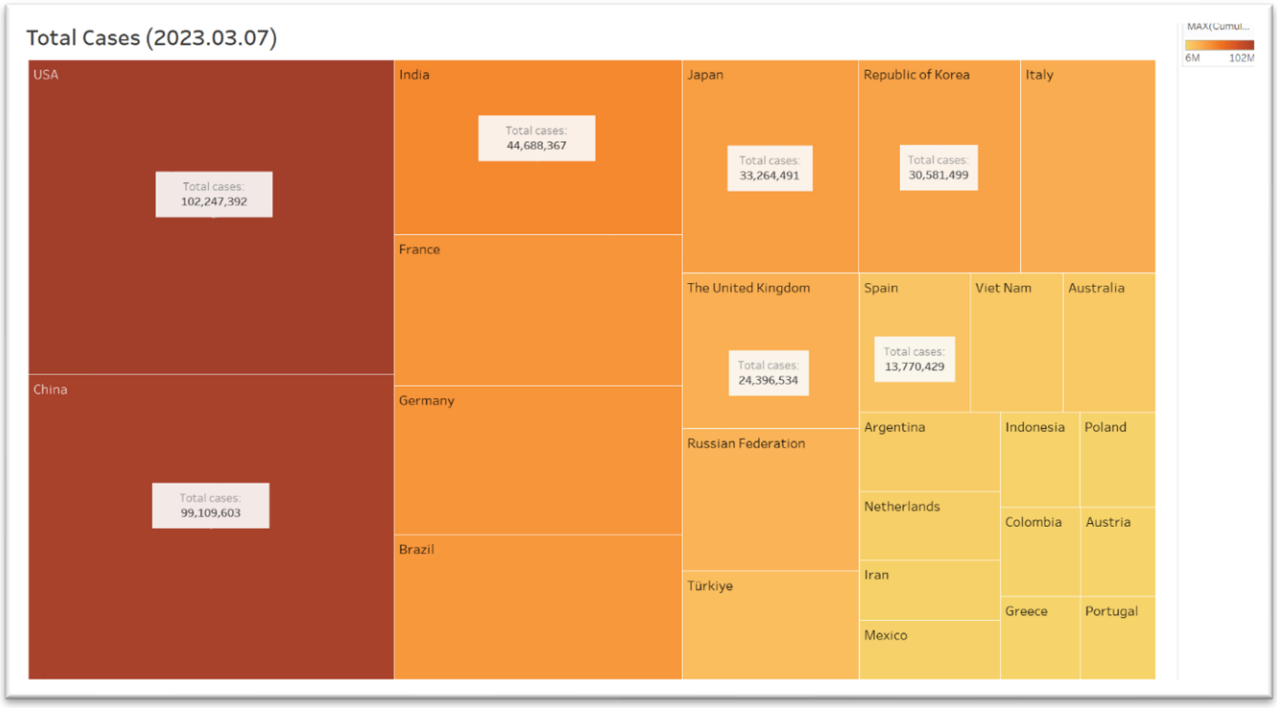

Figure 2 Heatmap of Total Covid-19 Cases

In Figure 2, Heatmap of Total Covid-19 Cases, the square size indicated the number of cases. And this indicates that there were more cases if the color was close to red. Using color and size at the same time, we can intuitively find out which country had the most cases. You can also see what percentage in the 25 top countries. I can see that the United States and China account for a huge portion, which is similar to the combined numbers of India to Brazil, which are ranked 3rd to 6th.

Q. How are the visualizations effective and address the gestalt and design principles discussed in the course?

Proximity and Similarity: In ‘Figure 2, Heatmap of Total Covid-19 Cases’, I made a visualization using color and size together. Size and color help recognize proximity and similarity of each country. This will intuitively make the graph easier to understand if even a person, who are not familiar with Covid-19 cases, can understand what the graph is.

Enclosure: I've grouped the eight highest-numbered countries in Figure 3 into the same group with boundaries. When you look at the normal map, each country doesn't seem to have no connection at all, but if you group it by color and physical boundaries like this, you can see that it belongs to the same group when it comes to cases of Covid-19. In this case, it means that they are highest 8 countries in total Covid-19 cases.

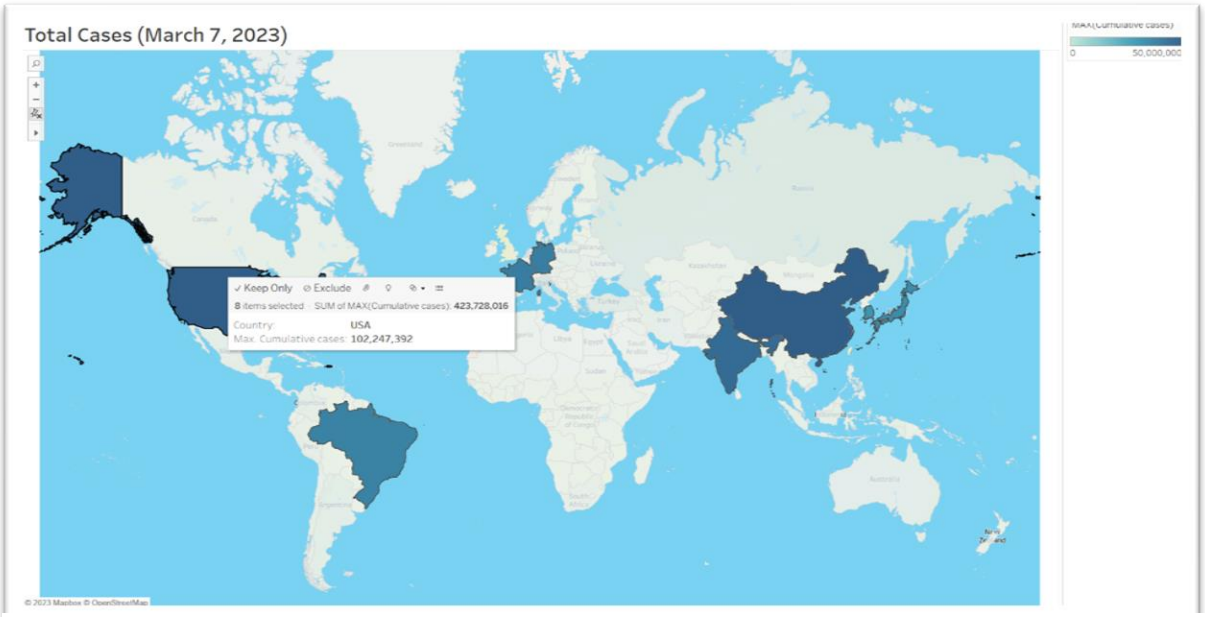

Figure 3 Total Covid-19 Cases in Map

Closure: It might not be a perfect example of a closure, but if Africa is in the center of the map and dark red is common in Africa as shown in the Figure 4, we might recognize it as in the lower figure of Figure 4. This is how we automatically create borders to recognize pictures, if there is some common characteristics in near parts.

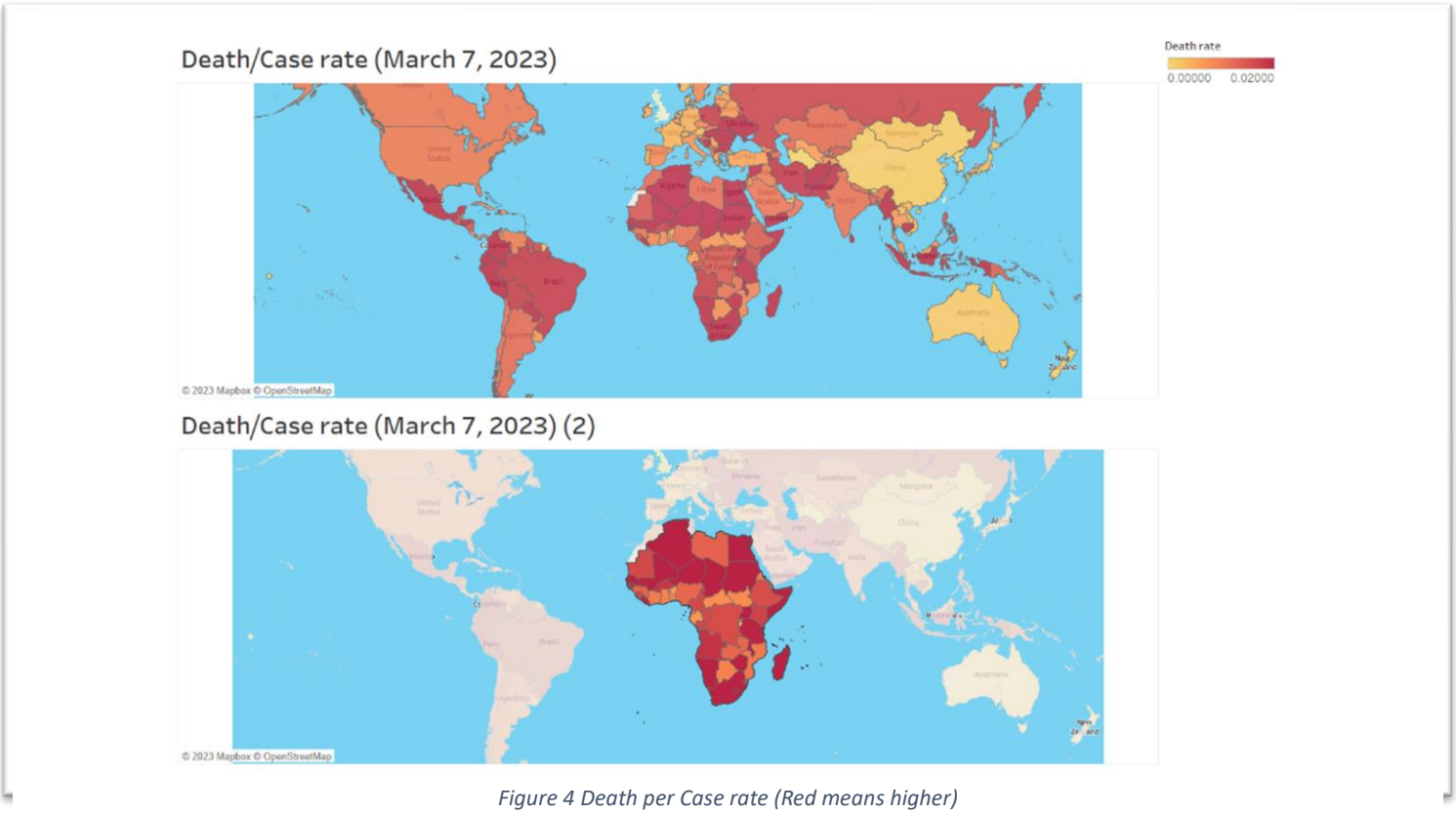

Figure 4 Death per Case rate (Red means higher)

Continuity: I have listed the top 30 countries with the highest number of vaccines per 100 people in the Figure 5. Countries with more than 300 doses (i.e. countries with more than 3 vaccinations per person) are countries above Japan. When we interpret this graph, we understand it as if it were a graph with continuity. Although each country is not related, it shows similar number of vaccines per 100 people with continuity on the graph.

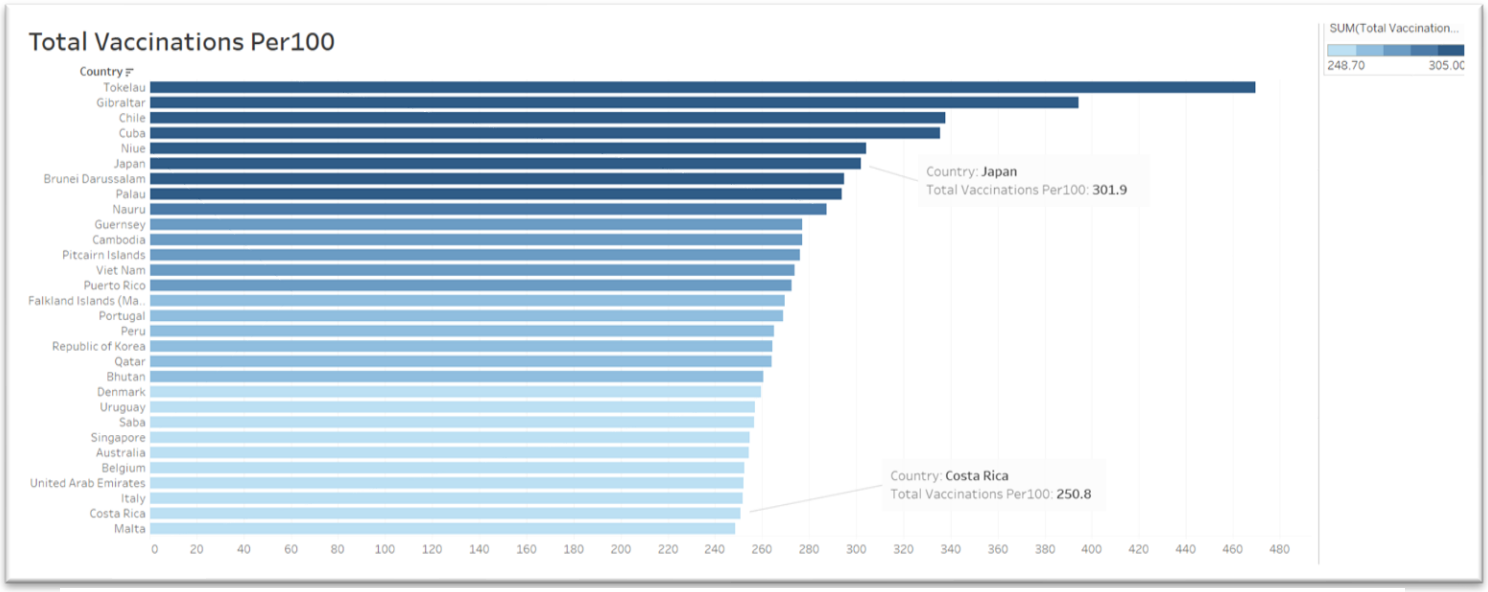

Figure 5 Total Vaccinations Per100

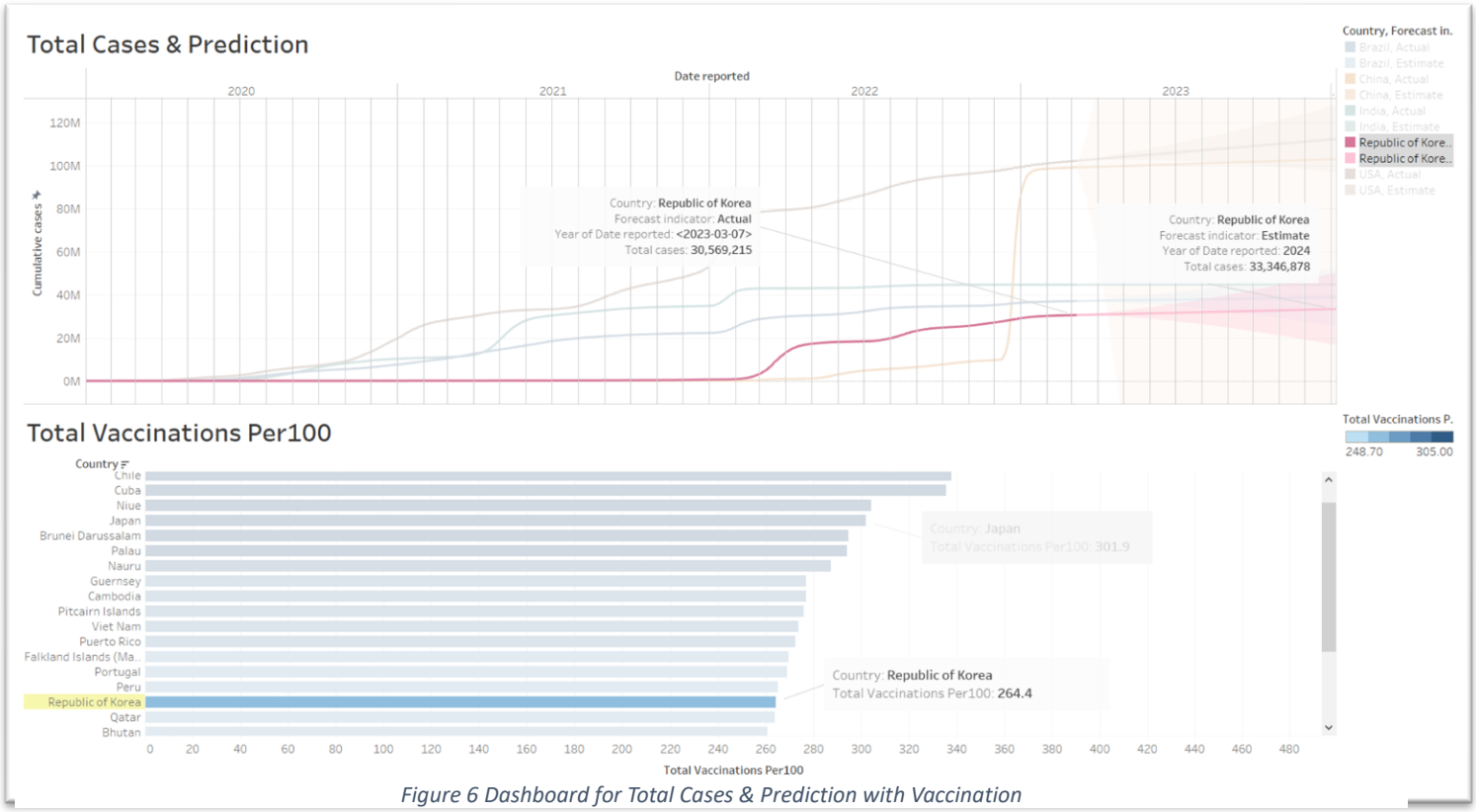

Figure 6 Dashboard for Total Cases & Prediction with Vaccination

Connection: Although the two graphs, in Figure 6, on the dashboard represent different information, information is recognized as one connection, Republic of Korea. The graph above represents the Total Cases & Prediction of Covid-19 in South Korea. Below is Total Vaccinations Per 100. It means that Republic of Korea has been vaccinated more than 2.5 times per person, and accordingly, the relationship between the above cases and future predictions can be considered within the context of total vaccination per 100 people.

Q. How do the visualizations answer the research/business question?

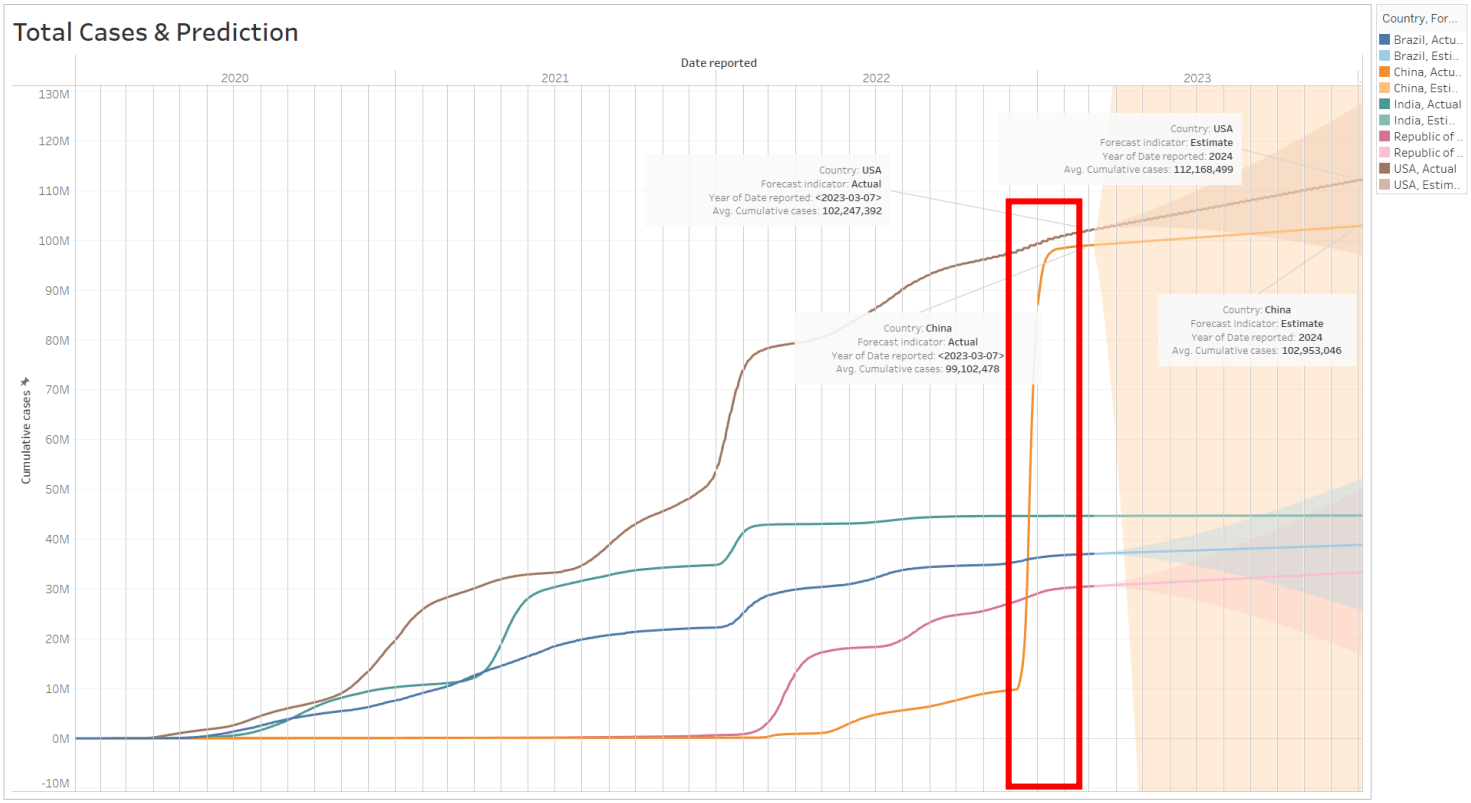

Figure 7 Covid-19 Total Cases & Prediction

Using the prediction model provided by tableau, I check how the future Covid-19 cases will progress. The figure 7, Covid-19 Total cases & prediction, provides the range of Covid-19 cases through predictions with confidence interval setting. China shows unusual prediction range which is colored by wide orange. It seems like that this is because the number of Covid-19 cases suddenly increased in December 2022. Therefore, the range appears very wide even if the model contains predicted number of future cases with a line.

However, in general, the increase might be the same as the current trend. This allows us to predict that the number of Covid-19 will not increase dramatically. It can be used by companies which produce vaccines or governments preparing countermeasures related to Covid-19. Population information is missing from this prediction data, but if you include it in the analysis, more accurate results will be obtained.

Q. What story do the visualizations tell?

The figure 7, Covid-19 Total cases & prediction, provide the latest information about Covid-19 cases. Let's focus on if the graph shows a sharp increase in 2022. China shows a sharp increase in cases in December 2022. This allows us to predict that the Covid-19 increase in the future can be moderate, because we already have the sharp increase. Or, we have to think about that sharp increase like China could happen again in some country in the future.

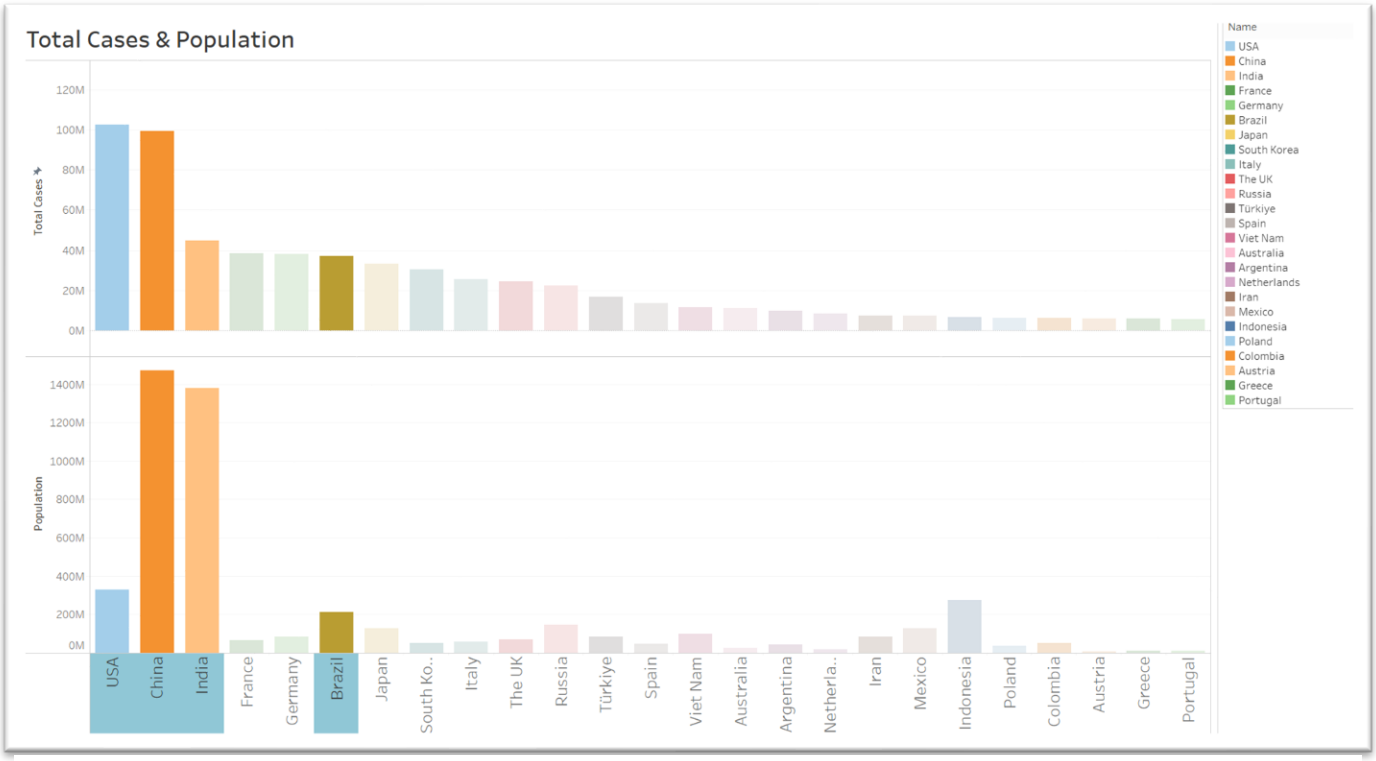

Figure 8 Covid-19 Total Cases & Population

Figure 8, Covid-19 Total Cases & Population shows Total Cases and Population. You can see that all countries in the top 3 in Total Cases are also ranked high in Population. This means that there is a tendency that if the country's population is large, the total cases are also high.

Finally, In the Figure 9, let's focus on the countries which have top three newly reported cases in 7 days. USA and China still have high numbers as we saw in Total cases. However, comparatively, India does not appear in the top countries, after checking the data in Excel, the number of cases 1,996 and deaths are 4, which is quite low. Through this, there are still a lot of Covid-19 cases in China and the United States, but it seems to have decreased a lot in India. By analyzing the reasons of India's decreasing, we can find a way to lower the number of Covid-19 infections in the United States, China, and other countries also.

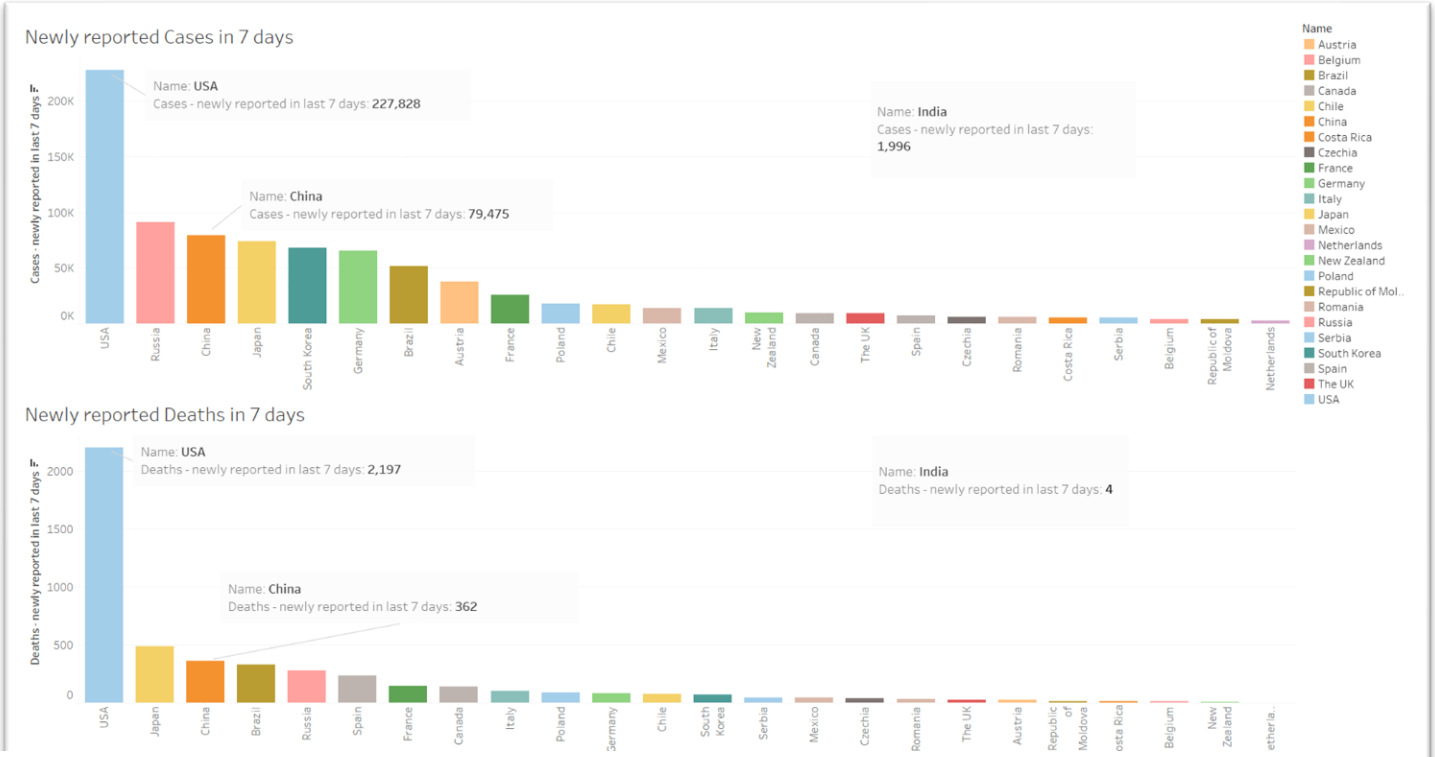

Figure 9 Newly reported Cases & Deaths in 7 days

4. CONCLUSION

I learn a idea of how to use Tableau in this assignment. The ability to visualize data is influenced by the application or program being used. This is because the amount of time it takes to visualize, or the form of visualization can vary. Tableau has an excellent ability to visualize geographic data, and it is easy to use. Tableau also suggested a prediction model for Covid-19 cases, so I was able to use it to answer business questions. I tried to download the latest Covid-19 data from WHO and to solve most similar to the problem that needs to be solved in real business world.

REFERENCE

WHO (World Health Organization). (2023). WHO Coronavirus (COVID-19) data. Retrieved from https://covid19.who.int/data

Tableau. (2023). Create a forecast. Retrieved from https://help.tableau.com/current/pro/desktop/en-us/forecast_create.htm

Tableau. (2023). How to localize content in Tableau. Retrieved from https://www.tableau.com/learn/whitepapers/how-localize-content-tableau

Tableau. (2023). Free training videos. Retrieved from https://www.tableau.com/learn/training/20231