



# Research on COVID-19 vaccination

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## 1 Data set introduction

The data set for this report was obtained from the World Bank database, and it contains the following information:

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## **2 Research questions :**

### **3 Exploratory data analysis**

## Research Question 1

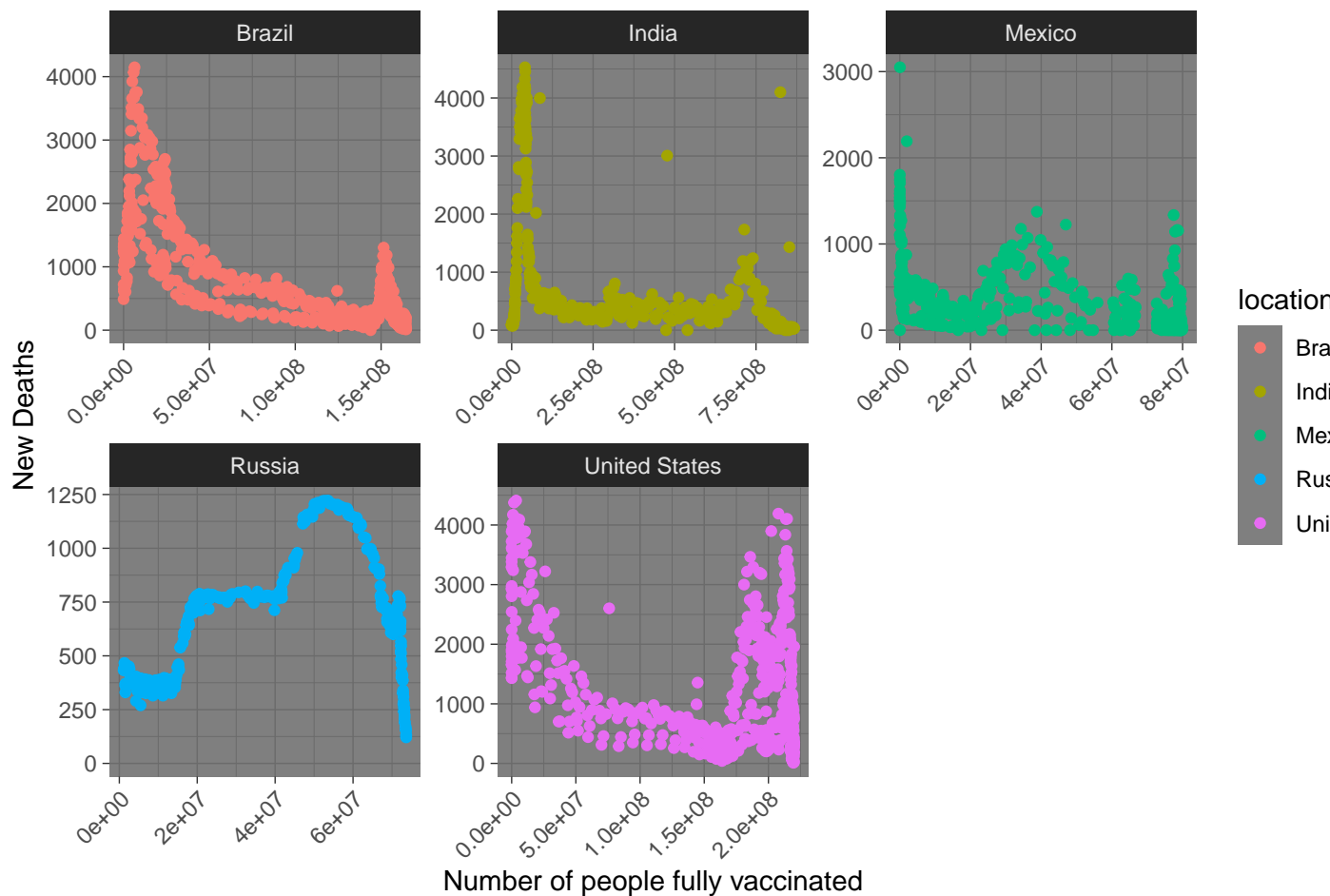
## **Research Question 2**

## Research Question 3

**Table 1:** Average daily vaccinations and deaths for the countries with highest death rates.

location	average_vaccinations_per_day	average_deaths_per_day
United States	1135290	1246
Brazil	934008	847
India	4057187	657
Russia	434410	472
Mexico	444551	407

Table 1 shows the average daily vaccinations and deaths for the countries with highest death rates. We can see that **United States** has the highest deaths per day of 1264 while **India** has the highest average vaccinations per day of approx 4057187.

**Figure 1:** Relationship between new deaths and vaccination status

From the figure 1 we can clearly see that in countries like Brazil, India and Mexico, there is a clear effect of vaccinations on the death rates. The death rates in the third wave (second peak of the graph) have fallen to around 25% of what they were in the second wave (first peak of the graph).

For the countries like Russia and United States the case is a little different as the vaccinations have increased but the number of deaths due to COVID-19 have remained constant or have increased. This may be due to many reasons such as the vaccine that was being used in the particular country, the immunity of the individual at the given location. Also, the vaccine was designed using the first strain of COVID-19 virus and mutations caused in the virus might have affected the efficacy of the vaccine.

A research published Rustagi et al. (2022) also confirmed that double vaccination against COVID-19 will decrease the death rate by 74.89 %

## CONCLUSIONS

## References

Rustagi, V, M Bajaj, Tanvi, P Singh, R Aggarwal, MF AlAjmi, A Hussain, MI Hassan, A Singh, and IK Singh (2022). Analyzing the Effect of Vaccination Over COVID Cases and Deaths in Asian Countries Using Machine Learning Models. *Frontiers in Cellular and Infection Microbiology* **11**.