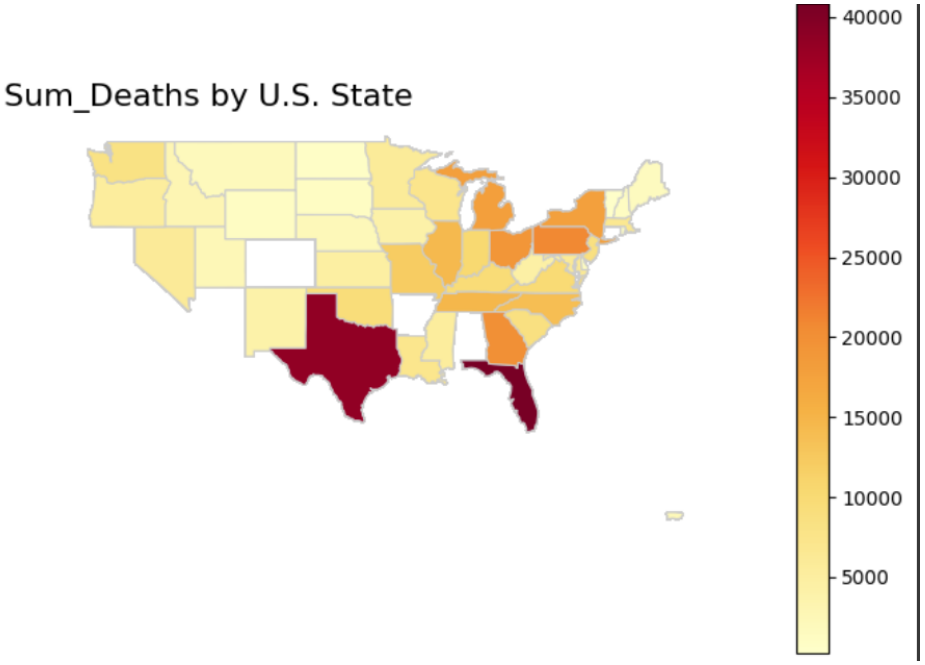
Final Project – Visualizations

DECEMBER 2023

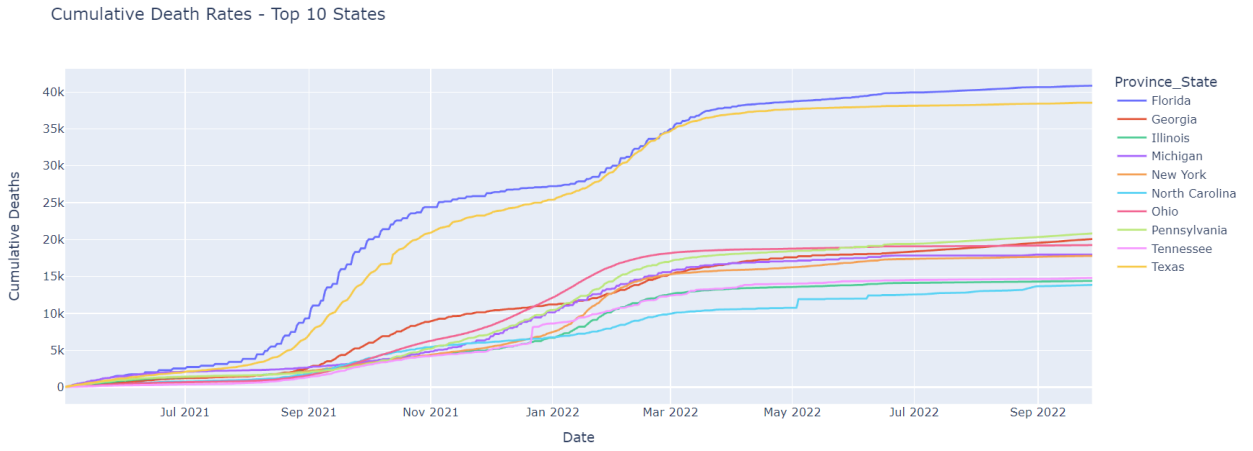
Team

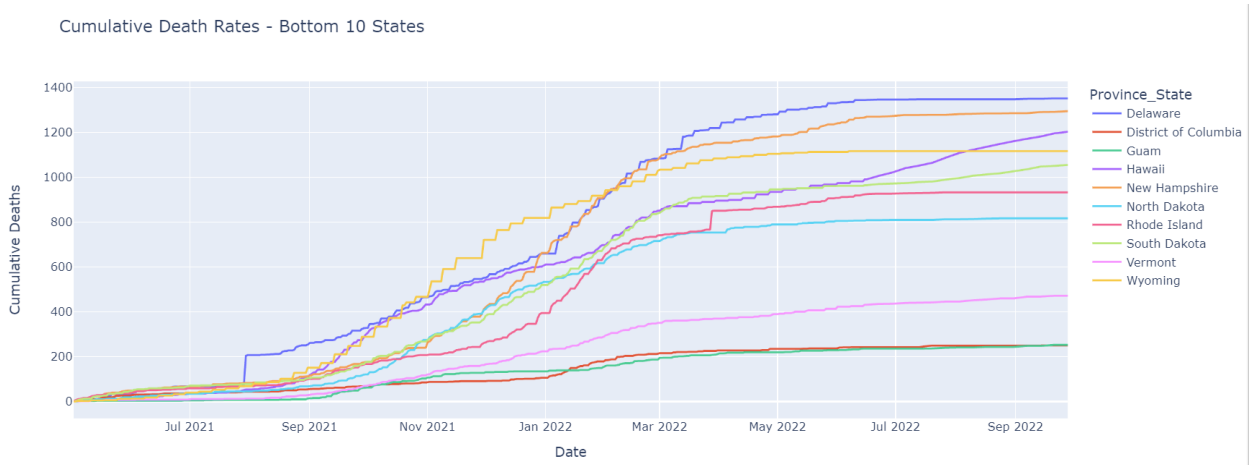
1. Hossein Khoshhal (hkhoshha)
2. Keerthi Jayaram (keerthij)
3. Sathiya Chakravarthy (sathiyac)
4. Sivashakti Komaragiri (skomarag)
5. Tejo Vinay Potti (tpotti)

Exhibits

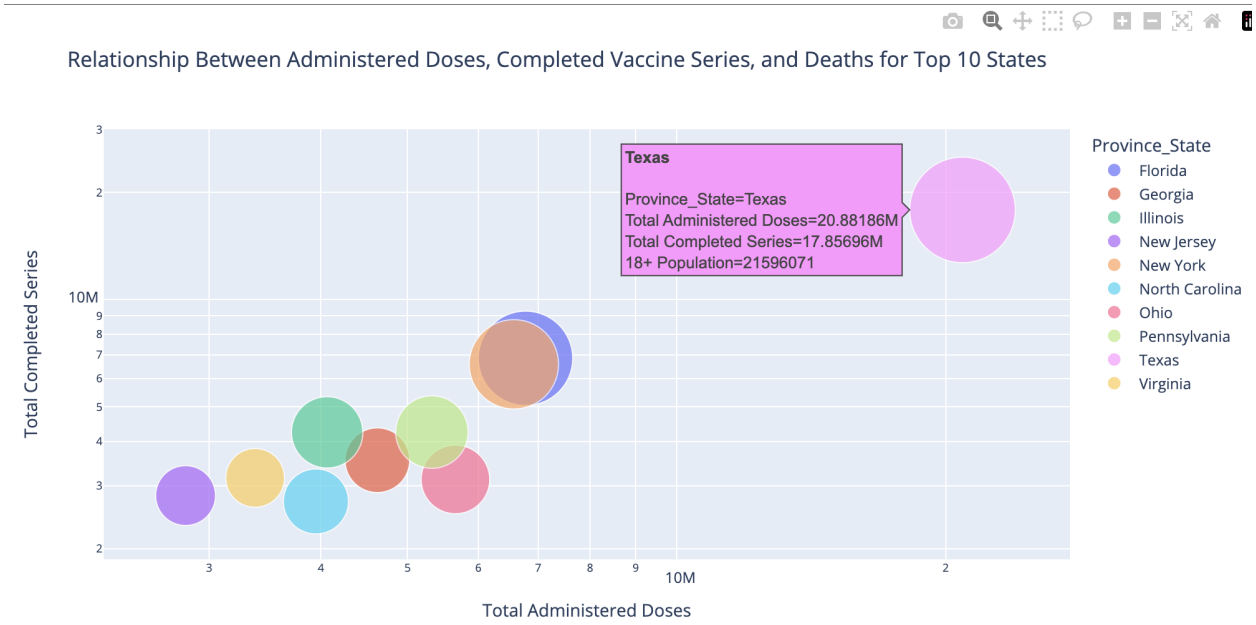


Choropleth indicates the total number of COVID deaths per state. Of the data available in the plot, the most affected areas were Texas, Florida, and Pennsylvania.



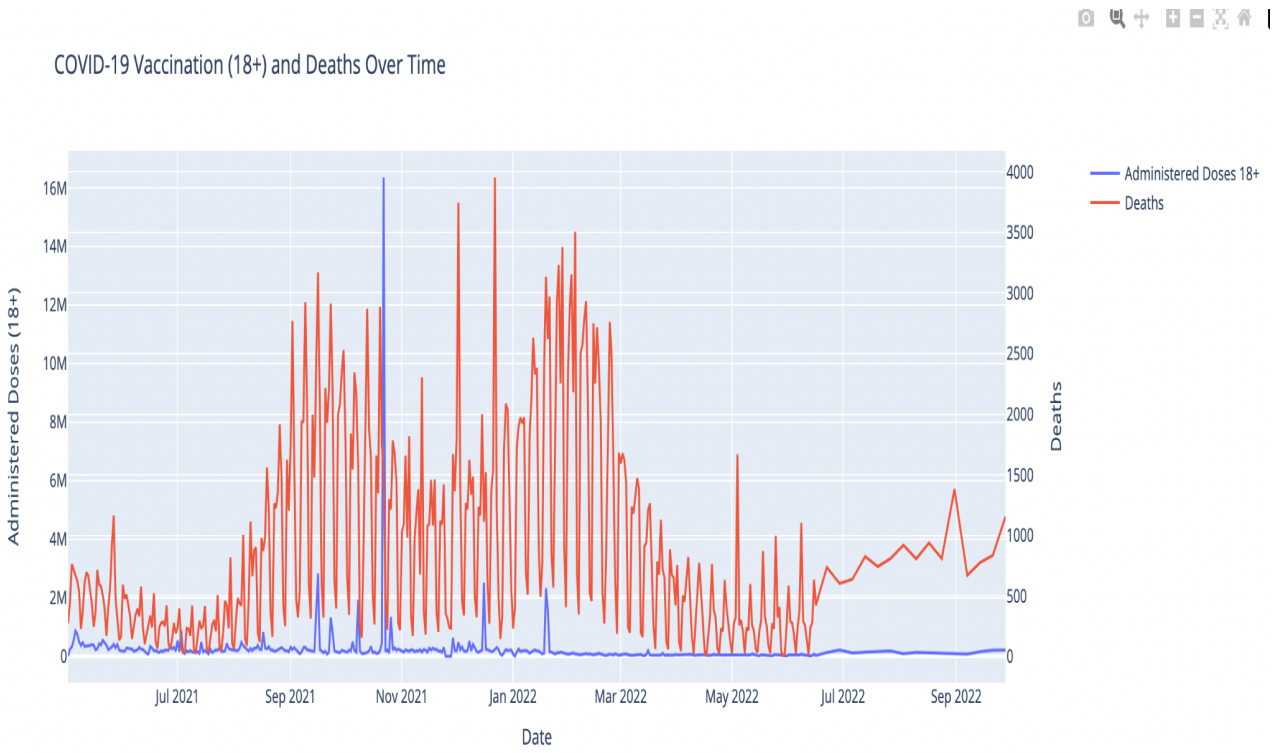


Both the Top Ten States with the most and least reported COVID deaths were mapped here. The line plot indicates the cumulative death count for each state. The sharp spikes indicate dates where COVID deaths peaked on a given day, while flatlines were days with zero deaths reported.



There appears to be a positive correlation between the total administered doses and the total completed vaccine series. States with higher administered doses also tend to have a higher number of completed vaccine series, which is expected as more doses would naturally lead to more people completing the vaccination series.

Larger bubbles in states with more administered doses could indicate higher death tolls, which may reflect larger populations or more severe COVID-19 outbreaks in those states prior to or during the vaccination campaigns.

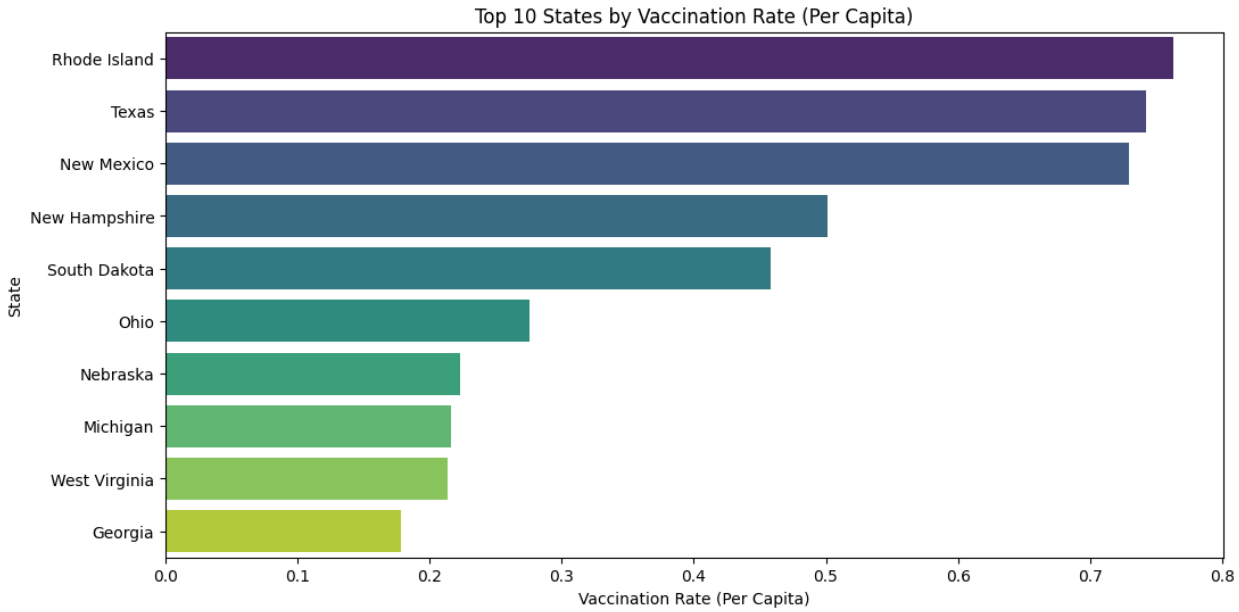


The blue line representing administered vaccine doses shows fluctuations over time, with peaks suggesting periods of intensified vaccination efforts. These could correlate with vaccine rollouts, booster campaigns, or responses to rising cases.

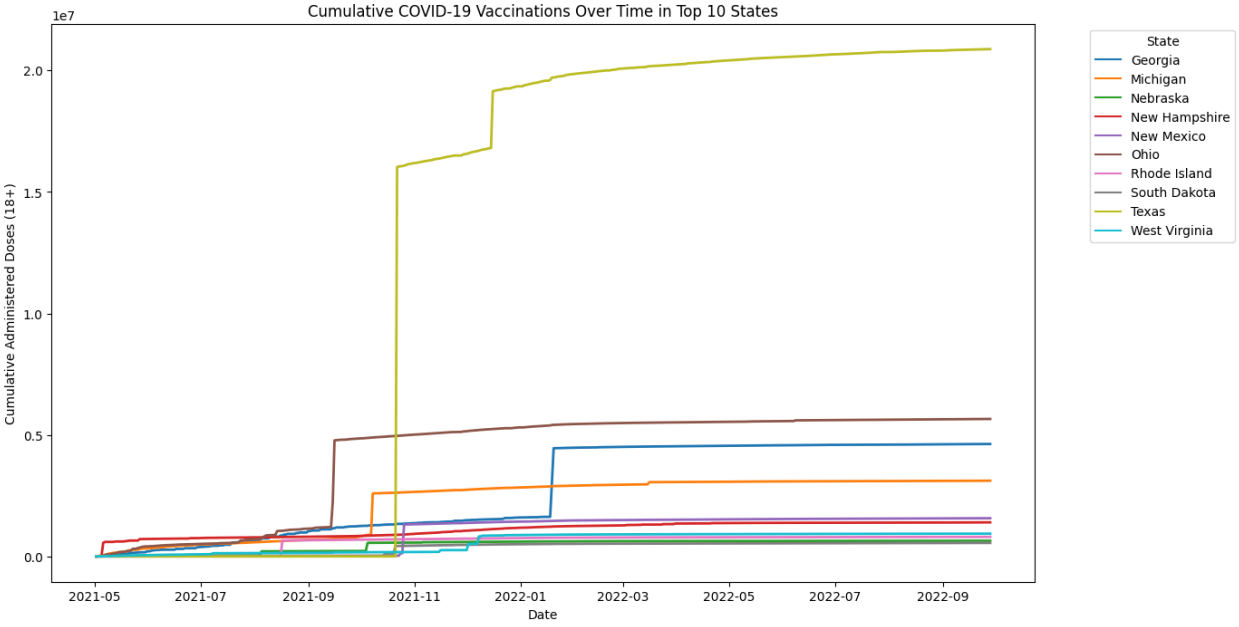
The red line indicating deaths shows variability as well, with what appears to be a decline over time, albeit with some periodic spikes. These spikes may align with waves of COVID-19 cases or variants, which typically lead to increased deaths with a lagging effect after case surges.

Initially, there doesn't seem to be a direct inverse correlation visible in the graph between vaccine doses administered and deaths; however, a general trend suggests that as vaccine administration increased, deaths plateaued or decreased. This would be consistent with the understanding that vaccines reduce the severity of COVID-19 outcomes, leading to fewer deaths.

Towards the later dates in the graph, despite fluctuations in vaccine administration, the death counts seem to show a gradual decline, possibly indicating the long-term benefits of vaccination in reducing COVID-19 mortality.



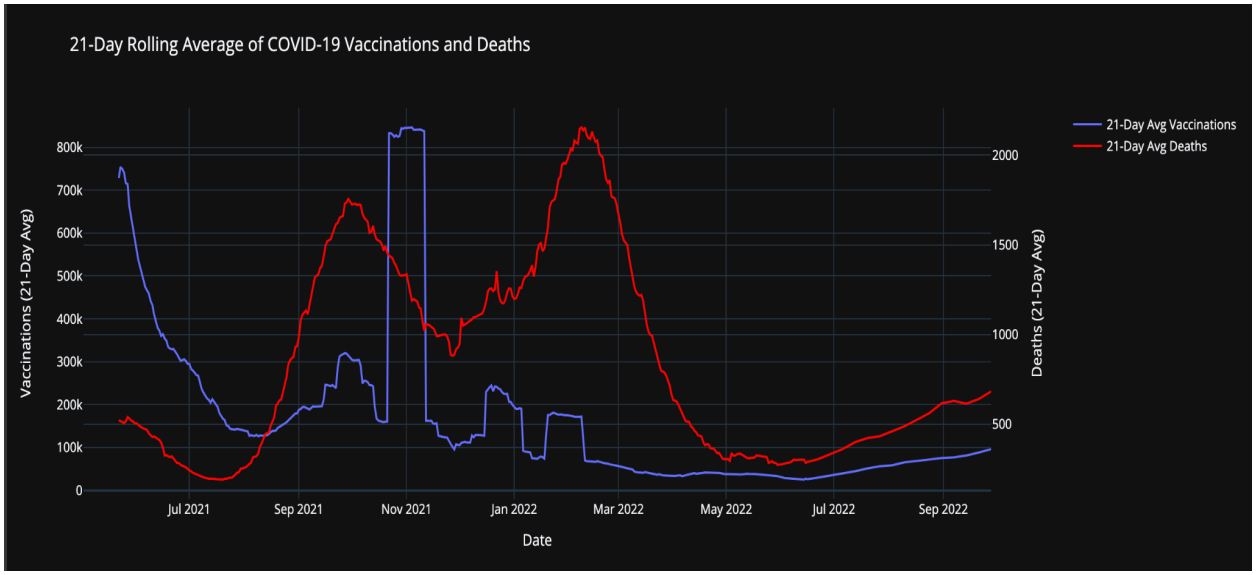
The states with the highest vaccination rate per capita were listed here. You'll notice that Texas, Georgia, and New Mexico were the highest by a large margin, each going over 0.7. Below is a plot indicating the cumulative vaccinations administered over time. Namely, you'll notice each state has large spikes in the data that indicates a day with a large number of vaccinations taking place. However, a trend is noticeable with most states where they will slowly decrease in slope over time as less vaccines are getting administered.



This is a step plot displaying the cumulative number of COVID-19 vaccine doses administered to individuals aged 18 and over in the top 10 U.S. states. There are steep increases in the cumulative doses administered at certain points, particularly early in the time series. This likely

corresponds to the initial phases of the vaccine rollout, where there was a high demand and states were rapidly administering vaccines.

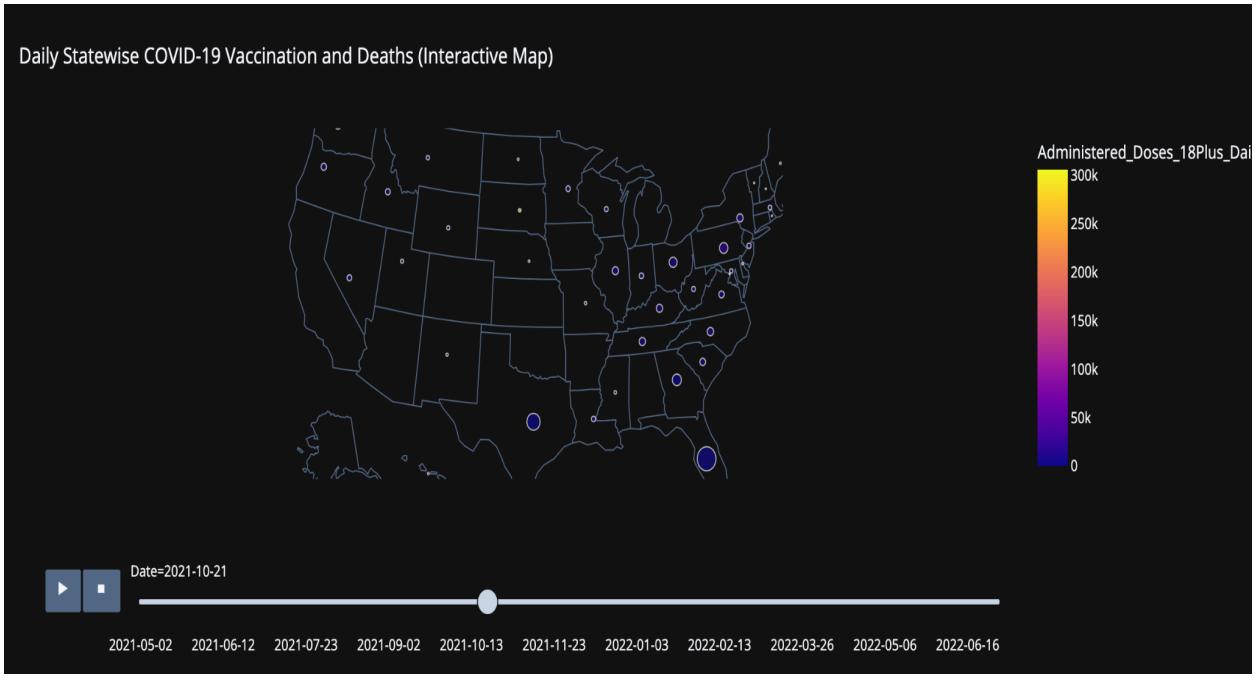
After the initial phases, the lines become horizontal, indicating a plateau. This suggests that the vaccination rates slowed down, possibly as the most eager segments of the population had already been vaccinated.



The graph shows a 21-day rolling average of COVID-19 vaccinations and deaths over time. The blue line, which represents the 21-day rolling average of vaccinations, shows an initial peak followed by a decline and then several smaller peaks. The initial peak may correspond to the initial vaccine rollout when there was high demand and eligibility was expanding.

The red line, representing the 21-day rolling average of deaths, shows fluctuations with a notable rise towards the latter half of the graph. This could be due to a number of factors, including the emergence of new variants, waning immunity, or changes in social behavior and public health measures.

The plateauing and the drops in the number of vaccinations over certain periods could reflect vaccine hesitancy, the achievement of certain vaccination targets, or natural barriers to increasing vaccination coverage.



References:

[COVID-19 Vaccinations in the United States,County | Data | Centers for Disease Control and Prevention (cdc.gov)]

[vaccines/data at main · ds5010/vaccines (github.com)]

Personal Consultation with OpenAI's ChatGPT (see details in *Interactions.pdf*)
[COVID-19/csse_covid_19_data/csse_covid_19_daily_reports_us at f57525e860010f6c5c0c103fd97e2e7282b480c8 · CSSEGISandData/COVID-19 (github.com)]

[https://stackoverflow.com/questions/61615818/setting-up-mlflow-on-google-colab]