

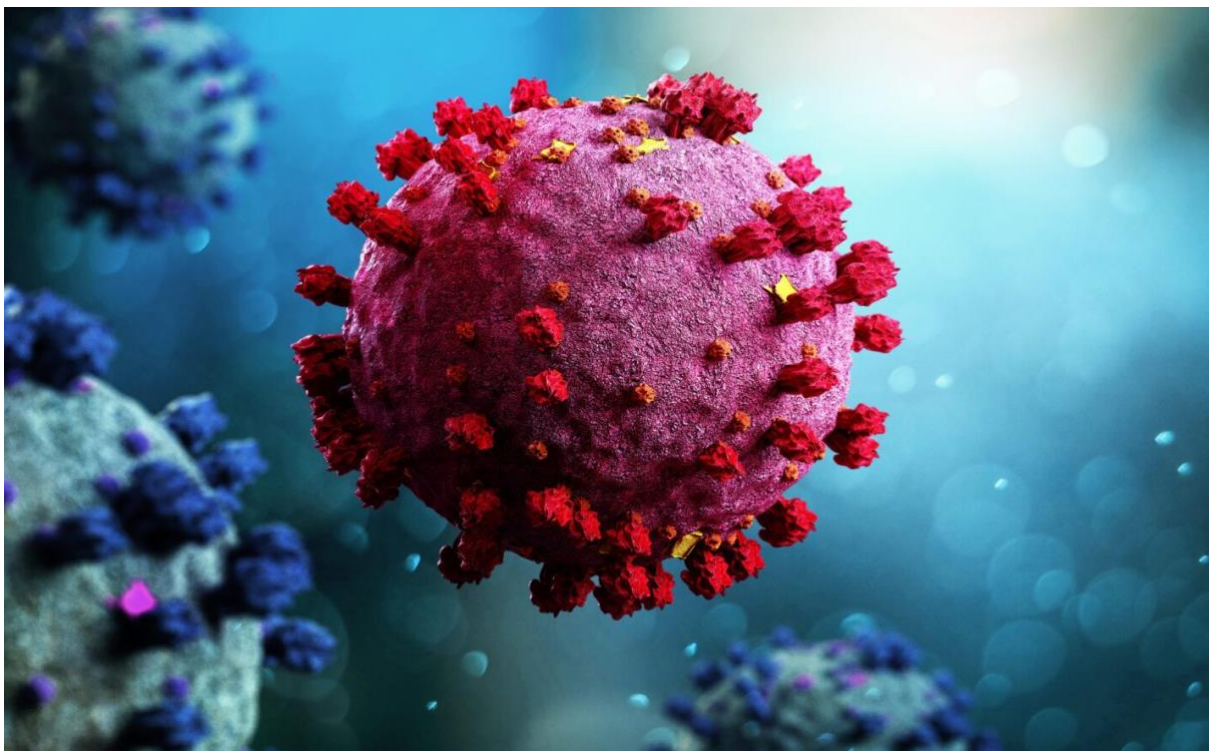
COVID-19 VACCINE ANALYSIS

PHASE 4 SUBMISSION DOCUMENTS

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COVID-19 VACCINE ANALYSIS

Introduction:

In this part you will continue Building the project

It continues conducting the covid-19 vaccine analysis by :

- Performing exploratory data analysis
- Statistical analysis
- Visualization



PERFORMING EXPLORATORY DATA ANALYSIS:

Exploratory Data Analysis (EDA) for COVID-19 vaccines involves analyzing and visualizing data to gain insights and understand the distribution, patterns, and trends. Here are some steps you can follow:

1. Data Collection: Gather data related to COVID-19 vaccines. This could include vaccine distribution, administration, adverse events, and effectiveness data.

2. Data Cleaning: Check for missing values, duplicate records, and inconsistencies in the data. Clean the data to ensure it's ready for analysis.

3. Data Visualization:

- Create visualizations like bar charts to show the distribution of vaccines by type and region.
- Use line charts to track the vaccination progress over time.
- Heatmaps can help identify areas with higher vaccination rates.
- Pie charts can illustrate the share of vaccine manufacturers.

4. Descriptive Statistics:

- Calculate summary statistics (mean, median, standard deviation) for relevant variables.
- Perform statistical tests to compare vaccination rates between different regions or groups.

Program:

```
# Import necessary libraries
```

```
import pandas as pd
```

```
import matplotlib.pyplot as plt
```

```
# Load COVID-19 data
```

```
data = pd.read_csv("covid19_data.csv")
```

```
# Basic EDA
```

```
print(data.head()) # Display the first few rows  
of the dataset
```

```
print(data.info()) # Display information about  
the dataset
```

STATISTICAL ANALYSIS:

Statistical analysis for COVID-19 vaccines involves using statistical methods to draw conclusions from data related to vaccine effectiveness, safety, and distribution. Here are some key statistical analyses commonly performed in this context:

1. Vaccine Efficacy Analysis:

- Calculate vaccine efficacy based on clinical trial data, comparing infection rates in the vaccinated and placebo groups.
- Use relative risk reduction, absolute risk reduction, and number needed to treat (NNT) metrics.
- Perform hypothesis tests to determine if observed differences are statistically significant.

2. Vaccine Safety Analysis:

- Analyze adverse event data to assess the safety of vaccines.
- Calculate the incidence of adverse events and their confidence intervals.
- Use statistical tests to identify any significant associations between adverse events and vaccination.

3. Distribution Analysis:

- Analyze vaccine distribution data to assess whether vaccines are being distributed equitably.
- Use descriptive statistics to summarize vaccine allocation and coverage across regions or demographic groups.
- Employ statistical tests to detect significant disparities in distribution.

VISUALIZATION:

Visualizations play a crucial role in conveying information about COVID-19 vaccines effectively. Here are some types of visualizations commonly used in the context of COVID-19 vaccines:

1. Vaccine Distribution Map: Create a map showing how vaccines are distributed across regions or countries. Use different colors or shades to represent the number of doses administered in each area.

2. Vaccination Progress Line Chart: Plot the daily or weekly progress of vaccination, showing the cumulative number of doses administered over time. This helps track the speed of the time.

3. Vaccine Type Pie Chart: Use a pie chart to illustrate the distribution of different vaccine types or manufacturers in a particular region or globally.

4. Bar Charts:

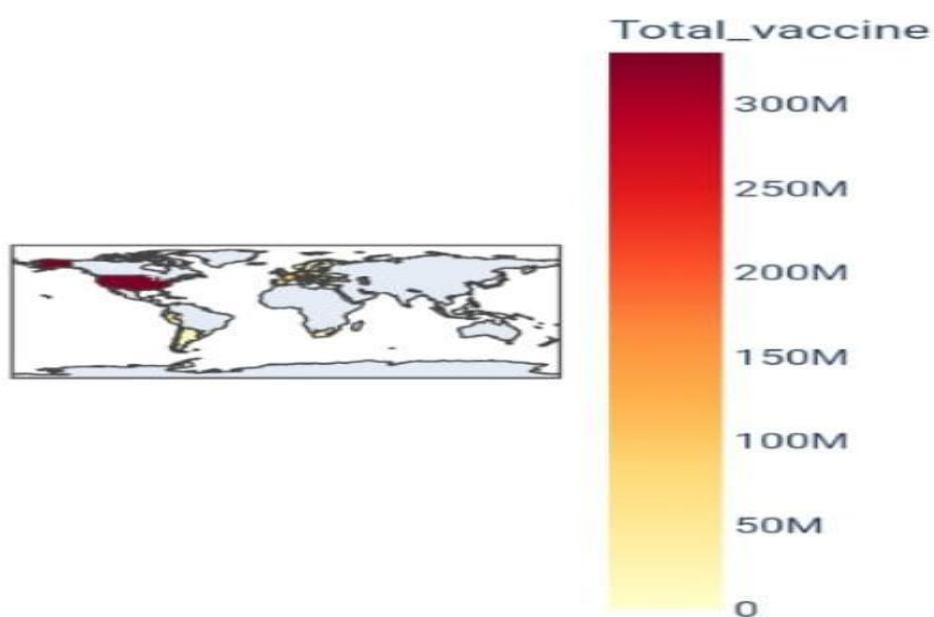
- Compare vaccination rates between different regions, age groups, or demographic categories using horizontal or vertical bar charts.
- Show the percentage of the population that has received one or both doses of the vaccine.

Program:

```
fig = px.choropleth(data_frame=dtfrm,
                    locations=dtfrm.index,
                    locationmode='country names',
                    color='Total_vaccine',
                    color_continuous_scale='YlOrRd',
                    title='Ülkelerde Yapılan Biontech Aşıları')

fig.update_layout(title_x=0.5)
```

Output:



Conclusion:

- ❖ The following projects contains the performance of exploratory data analysis
- ❖ It also contains statistical analysis
- ❖ It conclude the project with the visualization of covid-19 vaccine analysis

THANK YOU!