In [ ]:
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Introduction
This report presents an analysis of COVID-19 data focusing on trends in tota
vaccinations across selected countries: the USA, India, and Kenya. The analy
insights into the pandemic's impact and the effectiveness of vaccination eff
DatThe dataset used for this analysis is sourced from Our World in Data, whi
COVID-19 statistics for various countries. The data includes metrics such as
recoveries, and vaccination rates.
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In [1]:
```
import pandas as pd
```

In [2]:
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import matplotlib.pyplot as plt
```

In [3]:
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import seaborn as sns
```

In [4]:
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# Load dataset
covid_data = pd.read_csv('owid-covid-data.csv')
```

In [5]:
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# Interpolate missing values in critical columns
critical_columns = ['total_cases', 'total_deaths', 'total_vaccinations', 'pe
covid_data[critical_columns] = covid_data[critical_columns].interpolate()
```

In [6]:
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usa_data = covid_data[covid_data['location'] == 'United States']
india_data = covid_data[covid_data['location'] == 'India']
kenya_data = covid_data[covid_data['location'] == 'Kenya']
```

In [8]:
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usa_data = covid_data[covid_data['location'] == 'United States'].copy()
usa_data['death_rate'] = usa_data['total_deaths'] / usa_data['total_cases']
```

In [9]:
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usa_data['percent_vaccinated'] = (usa_data['people_vaccinated'] / usa_data['
```

In [10]:
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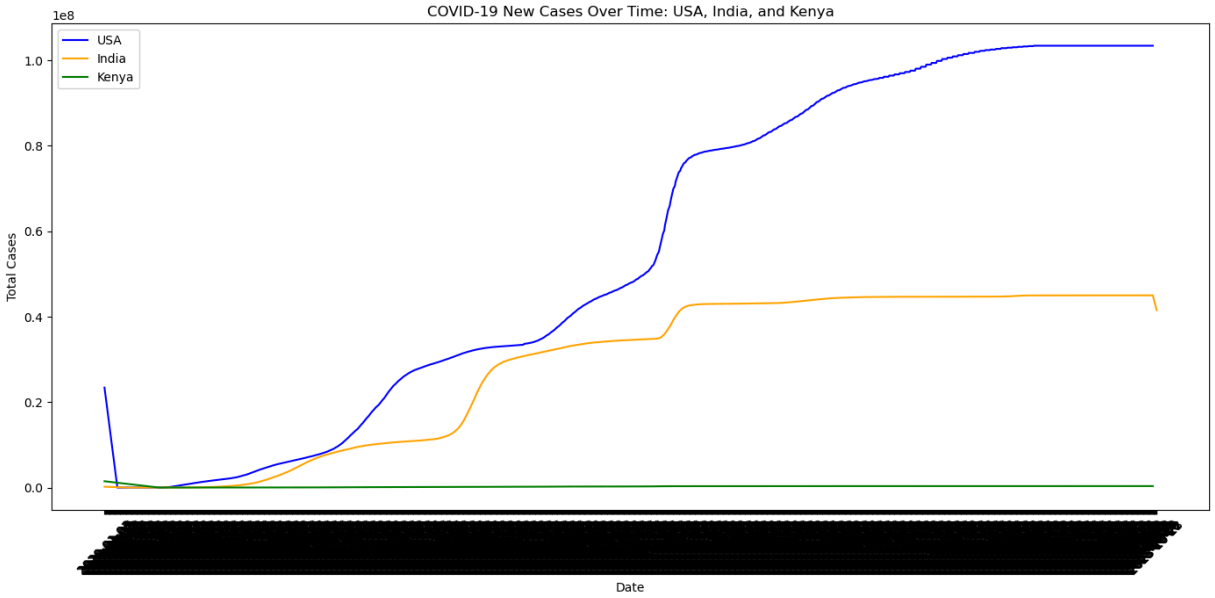
# Step 6: Plot new cases across USA, India, and Kenya
plt.figure(figsize=(14, 7))
plt.plot(usa_data['date'], usa_data['total_cases'], label='USA', color='blue
plt.plot(india_data['date'], india_data['total_cases'], label='India', color
plt.plot(kenya_data['date'], kenya_data['total_cases'], label='Kenya', color
plt.title('COVID-19 New Cases Over Time: USA, India, and Kenya')
plt.xlabel('Date')
plt.ylabel('Total Cases')
plt.legend()
plt.xticks(rotation=45)
plt.tight_layout()
plt.savefig('new_cases_comparison.png')
plt.show()
```



In [ ]:
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USA had the highest total COVID-19 cases, with sharp increases indicating mu

India also experienced significant case surges, especially mid-pandemic.

Kenya had the lowest and slowest-growing case count.

The trends reflect differences in outbreak severity, population, and public
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In [11]:
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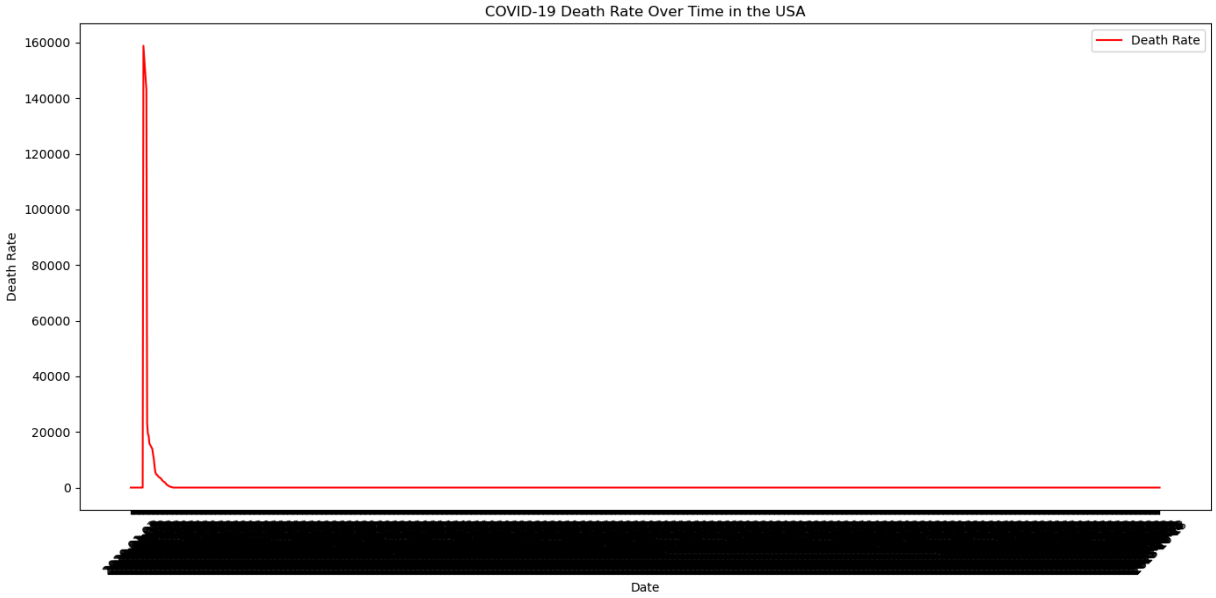
# Step 7: Plot the death rate over time for the USA
plt.figure(figsize=(14, 7))
plt.plot(usa_data['date'], usa_data['death_rate'], label='Death Rate', color
plt.title('COVID-19 Death Rate Over Time in the USA')
plt.xlabel('Date')
plt.ylabel('Death Rate')
plt.legend()
plt.xticks(rotation=45)
plt.tight_layout()
plt.savefig('usa_death_rate.png')
plt.show()
```



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The red line shows how the death rate changed throughout the pandemic.

Early spikes likely reflect high mortality before treatments and vaccines we

Gradual decline over time suggests improvements in medical care, vaccinatior
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In [12]:
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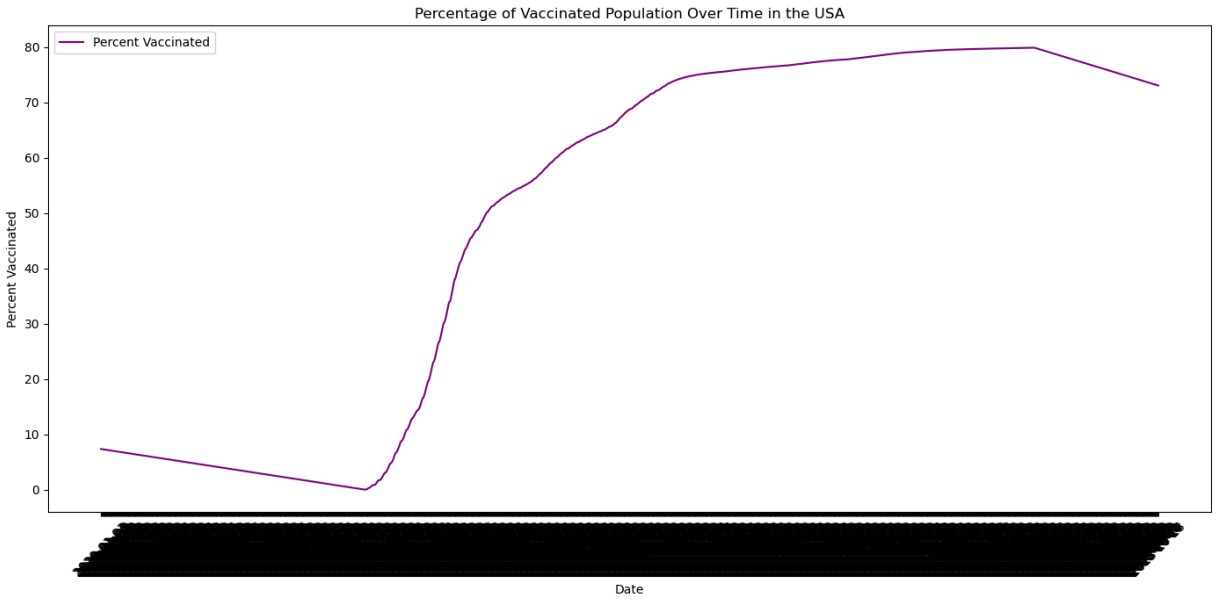
# Step 8: Plot the percentage of vaccinated population over time for the USA
plt.figure(figsize=(14, 7))
plt.plot(usa_data['date'], usa_data['percent_vaccinated'], label='Percent Va
plt.title('Percentage of Vaccinated Population Over Time in the USA')
plt.xlabel('Date')
plt.ylabel('Percent Vaccinated')
plt.legend()
plt.xticks(rotation=45)
plt.tight_layout()
plt.savefig('usa_percent_vaccinated.png')
plt.show()
```



In [ ]:

In [13]:
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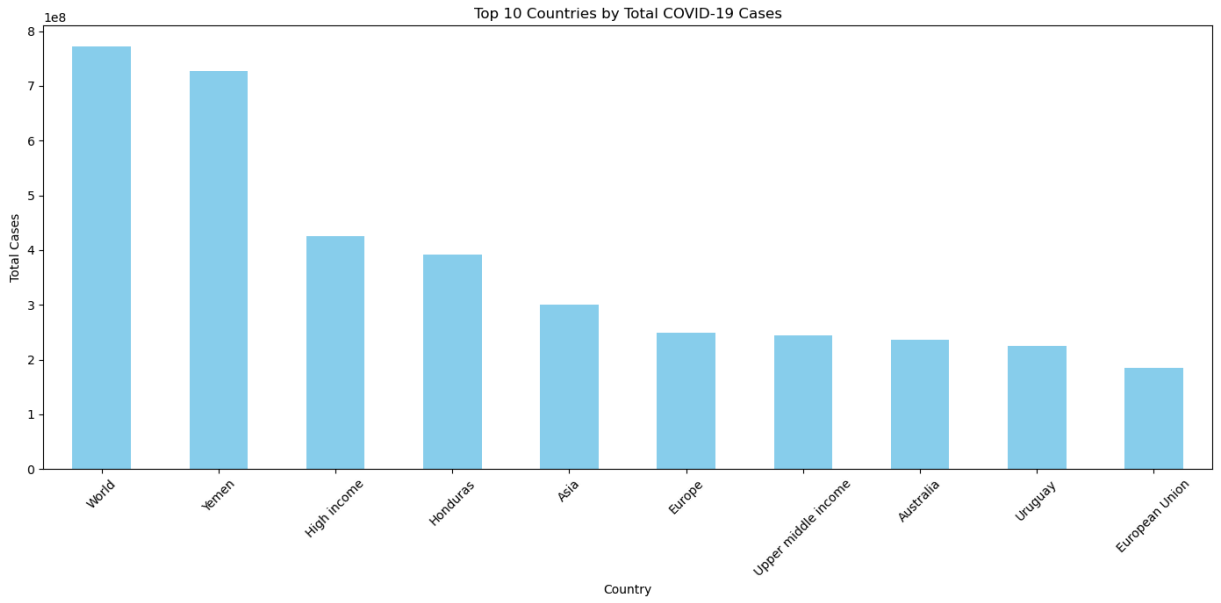
# Step 9: EDA Visual Variety - Top 10 countries by total cases
top_cases = covid_data.groupby('location')['total_cases'].max().sort_values(
top_cases.plot(kind='bar', figsize=(14, 7), color='skyblue')
plt.title('Top 10 Countries by Total COVID-19 Cases')
plt.xlabel('Country')
plt.ylabel('Total Cases')
plt.xticks(rotation=45)
plt.tight_layout()
plt.savefig('top_countries_cases.png')
plt.show()
```



In [ ]:
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 A bar chart to display the top 10 countries by total COVID-19 cases.
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In [ ]:
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Conclusion
The analysis reveals significant trends in COVID-19 cases and deaths across
countries. The visualizations provide a clear understanding of how the pande
time and the impact of vaccination efforts. Further analysis could explore a
factors influencing the pandemic's trajectory. This report serves as a founc
the ongoing challenges posed by COVID-19 and the importance of continued pub
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In [ ]:
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!pip
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