# covid-19-analysis

February 2, 2024

### 0.0.1 Covid_19 Analysis

[1]:
```
import pandas as pd
import matplotlib.pyplot as plt
```

**Reading Dataset**

[2]:
```
covid_19 = pd.read_csv("E:/PYTHON/Covid_19/Covid_19 datasets/worldometer_data.
↪csv")
```

[3]:
```
covid_19.head()
```

[3]:

| | Country/Region | Continent | Population | TotalCases | NewCases | TotalDeaths | NewDeaths | TotalRecovered | NewRecovered | ActiveCases | Serious,Critical | Tot Cases/1M pop | Deaths/1M pop | TotalTests | Tests/1M pop | WHO Region |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | USA | North America | 3.311981e+08 | 5032179 | NaN | 162804.0 | NaN | 2576668.0 | NaN | 2292707.0 | 18296.0 | 15194.0 | 492.0 | 63139605.0 | 190640.0 | Americas |
| 1 | Brazil | South America | 2.127107e+08 | 2917562 | NaN | 98644.0 | NaN | 2047660.0 | NaN | 771258.0 | 8318.0 | 13716.0 | 464.0 | 13206188.0 | 62085.0 | Americas |
| 2 | India | Asia | 1.381345e+09 | 2025409 | NaN | 41638.0 | NaN | 1377384.0 | NaN | 606387.0 | 8944.0 | 1466.0 | 30.0 | 22149351.0 | 16035.0 | South-EastAsia |
| 3 | Russia | Europe | 1.459409e+08 | 871894 | NaN | 14606.0 | NaN | 676357.0 | NaN | 180931.0 | 2300.0 | 5974.0 | 100.0 | 29716907.0 | 203623.0 | Europe |
| 4 | South Africa | Africa | 5.938157e+07 | 538184 | NaN | 9604.0 | NaN | 387316.0 | NaN | 141264.0 | 539.0 | 9063.0 | 162.0 | 3149807.0 | | |

```
4       53044.0          Africa
```

### 0.0.2 Data Cleaning

**Find NaN values and change NaN values into 0**

[4]:
```
covid_19.fillna(0, inplace=True)
covid_19.head()
```

[4]:
```
  Country/Region      Continent    Population  TotalCases  NewCases  \
0            USA  North America  3.311981e+08     5032179       0.0
1         Brazil  South America  2.127107e+08     2917562       0.0
2          India           Asia  1.381345e+09     2025409       0.0
3         Russia         Europe  1.459409e+08      871894       0.0
4   South Africa         Africa  5.938157e+07      538184       0.0

   TotalDeaths  NewDeaths  TotalRecovered  NewRecovered  ActiveCases  \
0     162804.0        0.0       2576668.0           0.0    2292707.0
1      98644.0        0.0       2047660.0           0.0     771258.0
2      41638.0        0.0       1377384.0           0.0     606387.0
3      14606.0        0.0        676357.0           0.0     180931.0
4       9604.0        0.0        387316.0           0.0     141264.0

   Serious,Critical  Tot Cases/1M pop  Deaths/1M pop  TotalTests  \
0           18296.0           15194.0          492.0  63139605.0
1            8318.0           13716.0          464.0  13206188.0
2            8944.0            1466.0           30.0  22149351.0
3            2300.0            5974.0          100.0  29716907.0
4             539.0            9063.0          162.0   3149807.0

   Tests/1M pop      WHO Region
0      190640.0        Americas
1       62085.0        Americas
2       16035.0  South-EastAsia
3      203623.0          Europe
4       53044.0          Africa
```

**Changing Scientific Notation format**

[5]:
```
pd.set_option('display.float_format', '{:.0f}'.format)
```

**Describe of Covid_19 Data**

[6]:
```
covid_19.describe()
```

[6]:
```
       Population  TotalCases  NewCases  TotalDeaths  NewDeaths  \
count         209         209       209          209        209
mean     30269958       91718        38         3412          4
```

```
std     104535128      432587       464        14729         57
min             0          10         0            0          0
25%        897095         712         0           12          0
50%       6942854        4491         0           70          0
75%      25528864       36896         0          600          0
max    1381344997     5032179      6590       162804        819

       TotalRecovered  NewRecovered  ActiveCases  Serious,Critical  \
count             209           209          209               209
mean            57752            24        27135               312
std            254347           293       172987              1584
min                 0             0            0                 0
25%               308             0           74                 0
50%              2010             0          858                 2
75%             19596             0         7113                41
max           2576668          4140      2292707             18296

       Tot Cases/1M pop  Deaths/1M pop  TotalTests  Tests/1M pop
count               209            209         209           209
mean               3181             88     1281623         76728
std                5184            168     5322273        147870
min                   0              0           0             0
25%                 279              4       10808          6261
50%                1000             20      109946         29041
75%                3806             80      692430         75521
max               39922           1238    63139605        995282
```

### 0.0.3 Covid_19 Visualizations

**Top_10 Total Deaths Country wise**

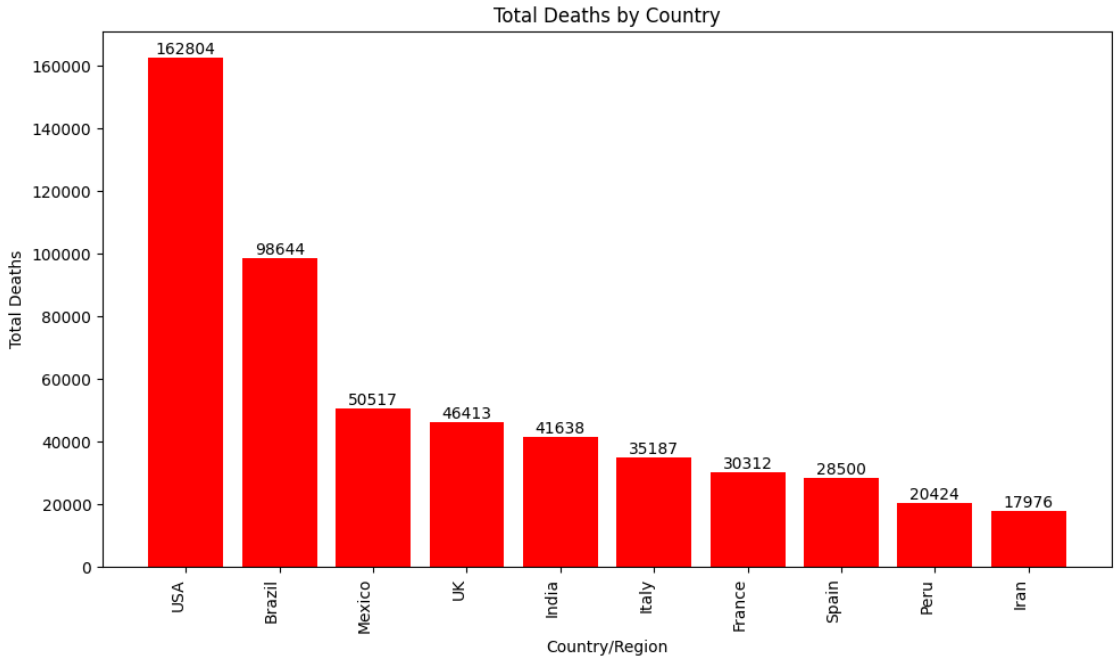
[7]:
```
covid_copy = covid_19.copy() # copy the original data from covid_19 to df_copy
covid_copy = covid_copy.sort_values(by='TotalDeaths', ascending=False) # sort␣
 ↪the totaldeath in descending order
Top_10 = covid_copy.head(10) #its shows top 30 higest values
```

[8]:
```
plt.figure(figsize=(10, 6))
bars1 = plt.bar(Top_10['Country/Region'], Top_10['TotalDeaths'], color='red')

# Add labels for Active Cases on top of each bar
for bar in bars1:
    plt.text(bar.get_x() + bar.get_width() / 2, bar.get_height(), f'{int(bar.
 ↪get_height())}', ha='center', va='bottom', color='black', fontsize=10)

plt.title('Total Deaths by Country')
plt.xlabel('Country/Region')
plt.ylabel('Total Deaths')
```

```
plt.xticks(rotation=90, ha='right', fontsize=10)  # Rotate x-axis labels for
  ↪better readability
plt.tight_layout()
```

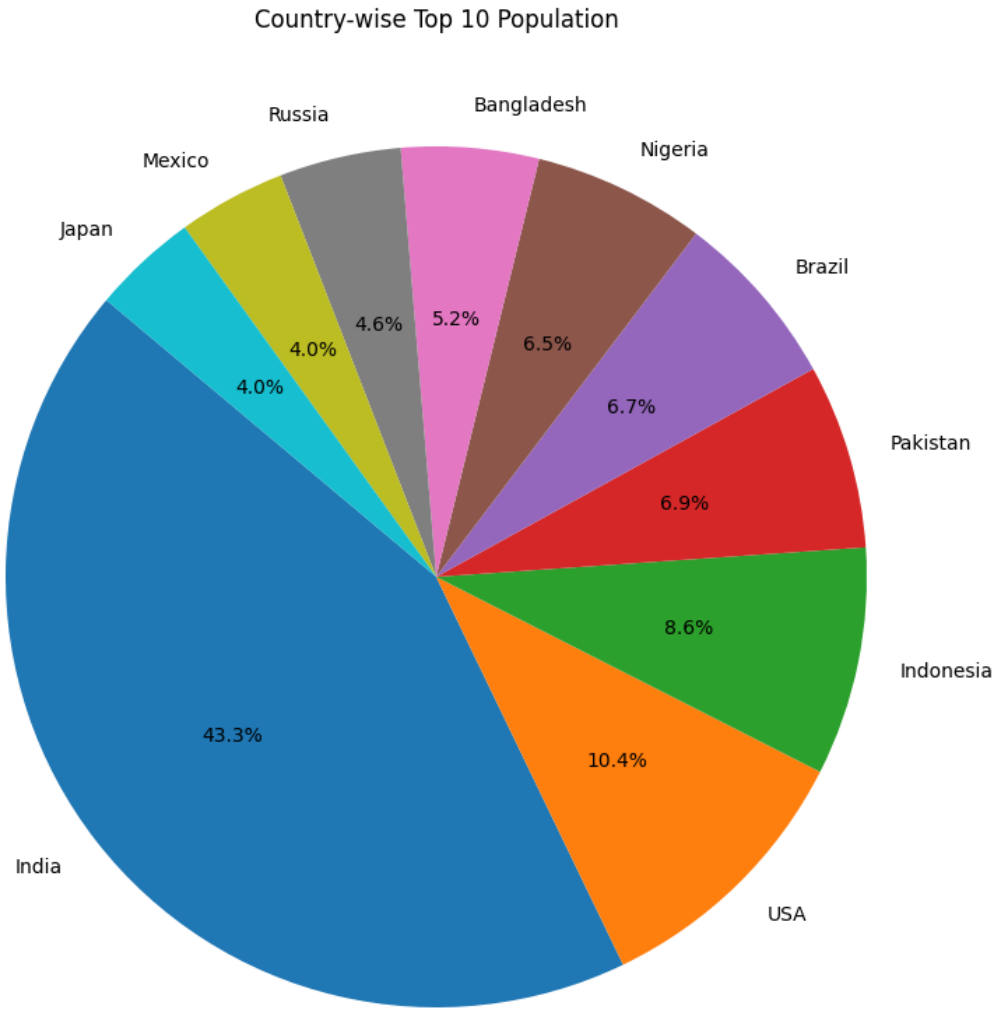



### Country wise top_10 High Population

[9]:
```
pop_copy = covid_19.copy() # copy the original data from covid_19 to df_copy
pop_copy = pop_copy.sort_values(by='Population', ascending=False) # sort the
  ↪totaldeath in descending order
Top_10 = pop_copy.head(10) #its shows top 30 higest values
```

[10]:
```
plt.figure(figsize=(10, 10))
plt.pie(Top_10['Population'], labels=Top_10['Country/Region'], autopct='%1.
  ↪1f%%', startangle=140)
plt.title('Country-wise Top 10 Population')
```

[10]:
```
Text(0.5, 1.0, 'Country-wise Top 10 Population')
```

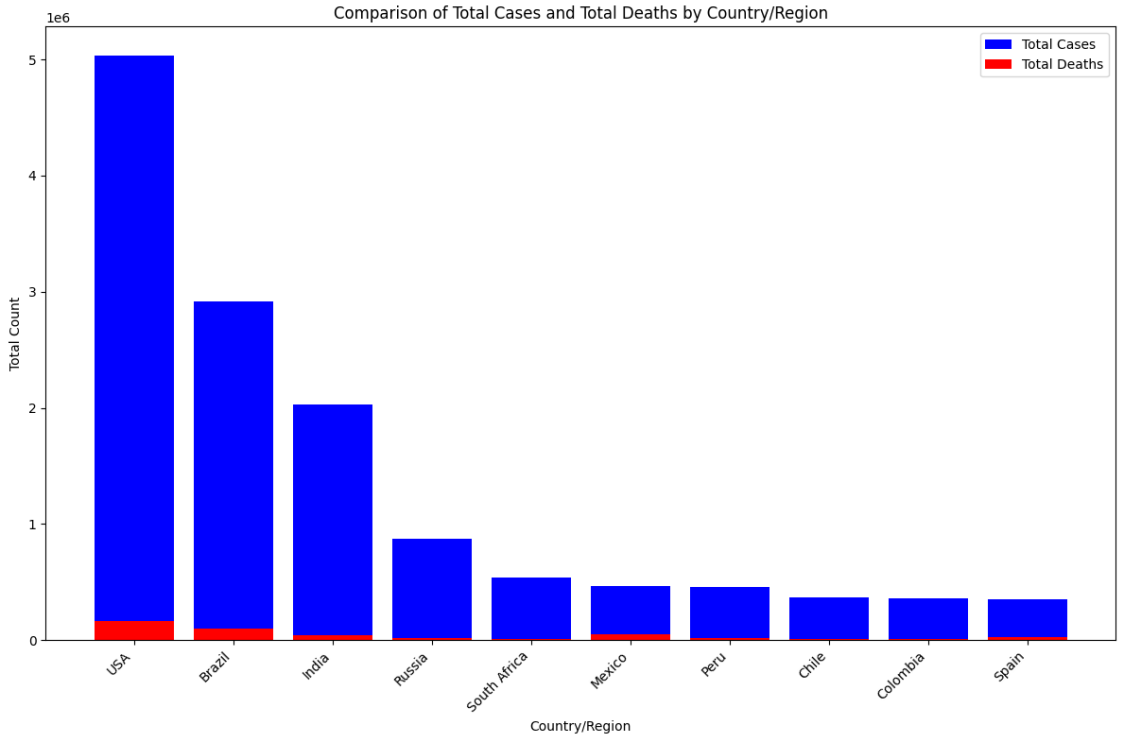



**Total Cases and Total Deaths comparison**

[11]:
```
# Sort the DataFrame by TotalCases for better visualization
cases_copy = covid_19.copy()
cases_copy = covid_19.sort_values(by='TotalCases', ascending=False)
Top_10 = cases_copy.head(10)
```

[12]:
```
plt.figure(figsize=(12, 8))
plt.bar(Top_10['Country/Region'], Top_10['TotalCases'], color='blue',␣
 ↪label='Total Cases')
plt.bar(Top_10['Country/Region'], Top_10['TotalDeaths'], color='red',␣
 ↪label='Total Deaths')
plt.title('Comparison of Total Cases and Total Deaths by Country/Region')
```

```
plt.xlabel('Country/Region')
plt.ylabel('Total Count')
plt.legend()
plt.xticks(rotation=45, ha='right')  # Rotate x-axis labels for better␣
 ↪readability
plt.tight_layout()
```




**Total Deaths by Continent wise**

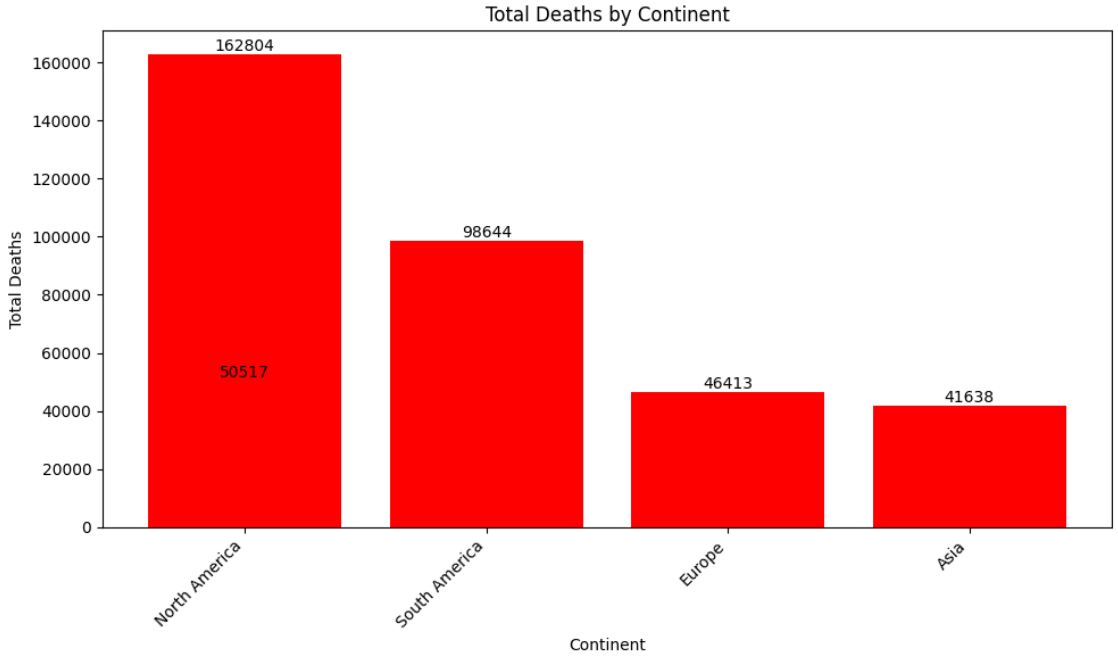
[13]:
```
cont_copy = covid_19.copy() # copy the original data from covid_19 to df_copy
cont_copy = cont_copy.sort_values(by='TotalDeaths', ascending=False) # sort the␣
 ↪totaldeath in descending order
cont_copy = cont_copy.head()
```

[14]:
```
plt.figure(figsize=(10, 6))
bars1 = plt.bar(cont_copy['Continent'], cont_copy['TotalDeaths'], color='red')

# Add labels for Active Cases on top of each bar
for bar in bars1:
    plt.text(bar.get_x() + bar.get_width() / 2, bar.get_height(), f'{int(bar.
 ↪get_height())}', ha='center', va='bottom', color='black', fontsize=10)

plt.title('Total Deaths by Continent')
```

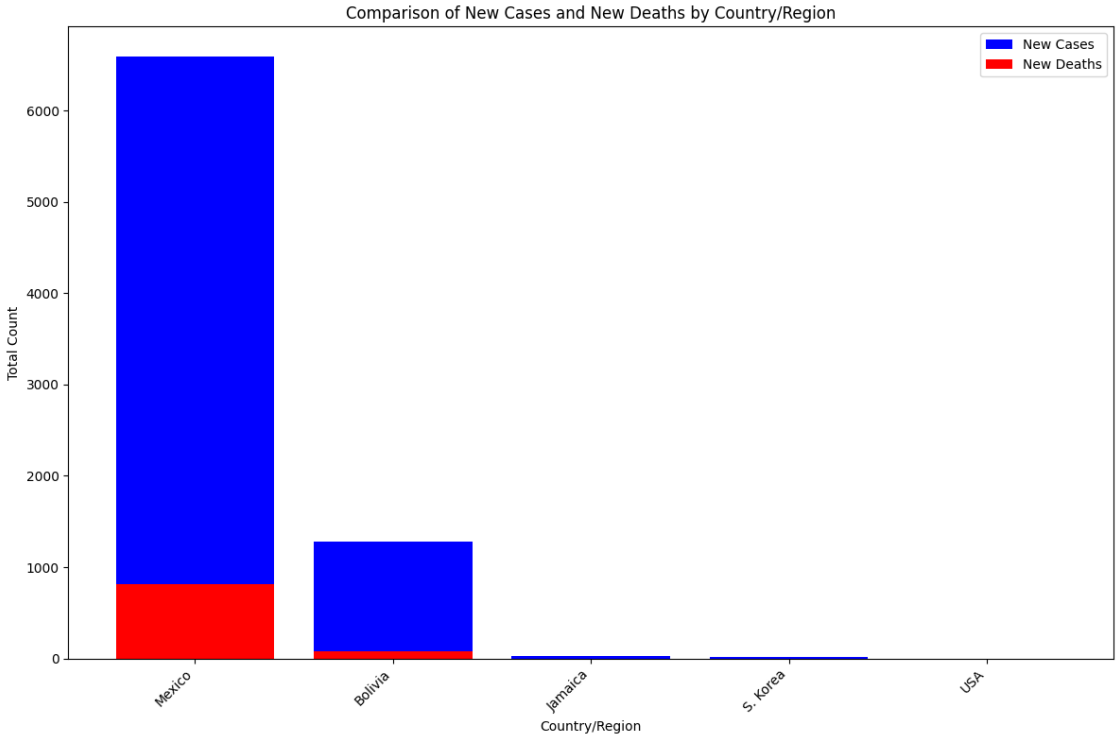
```
plt.xlabel('Continent')
plt.ylabel('Total Deaths')
plt.xticks(rotation=45, ha='right', fontsize=10)  # Rotate x-axis labels for␣
 ↪better readability
plt.tight_layout()
```




**New Cases and New Deaths Comparison country wise**

[15]:
```
NewCase_copy = covid_19.copy()
NewCase_copy = NewCase_copy.sort_values(by='NewCases', ascending=False)
Top_5 = NewCase_copy.head(5)
```

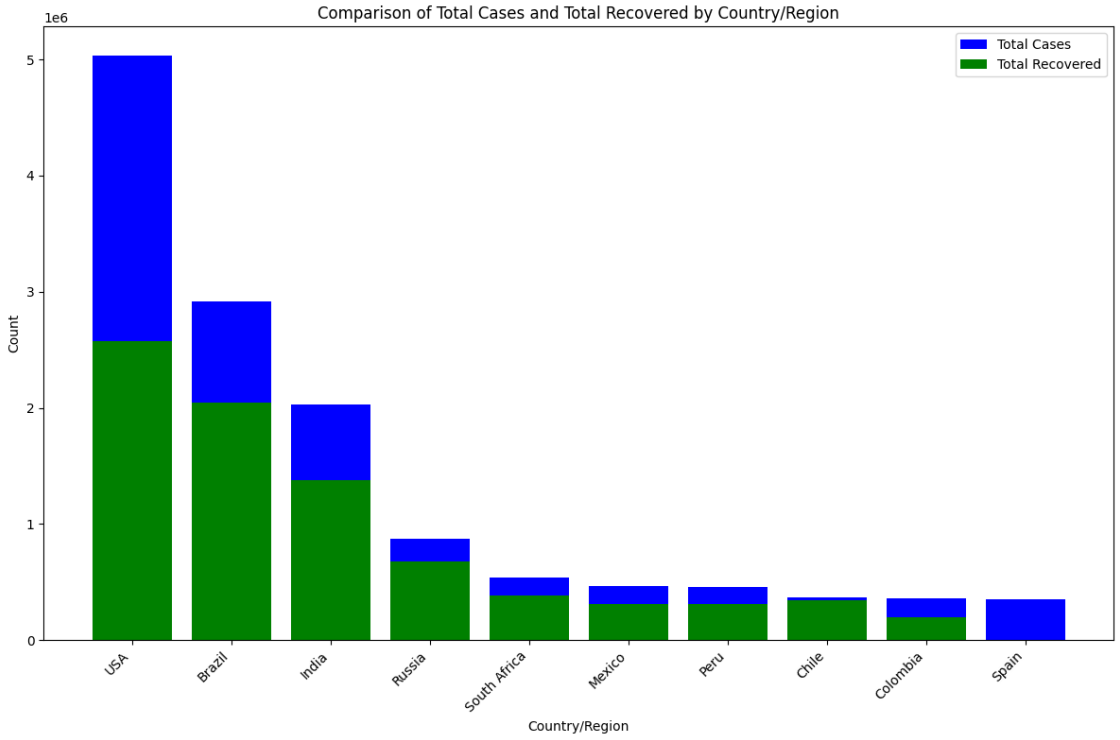
[16]:
```
plt.figure(figsize=(12, 8))
plt.bar(Top_5['Country/Region'], Top_5['NewCases'], color='blue', label='New␣
 ↪Cases')
plt.bar(Top_5['Country/Region'], Top_5['NewDeaths'], color='red', label='New␣
 ↪Deaths')
plt.title('Comparison of New Cases and New Deaths by Country/Region')
plt.xlabel('Country/Region')
plt.ylabel('Total Count')
plt.legend()
plt.xticks(rotation=45, ha='right')  # Rotate x-axis labels for better␣
 ↪readability
plt.tight_layout()
```




### Total Cases and Total Recovered Country wise

[17]:
```
Recovered_copy = covid_19.copy()
Recovered_copy = Recovered_copy.sort_values(by="TotalCases", ascending=False)
Top_10 = Recovered_copy.head(10)
```

[33]:
```
plt.figure(figsize=(12, 8))
plt.bar(Top_10['Country/Region'], Top_10['TotalCases'], color='blue',␣
 ↪label='Total Cases')
plt.bar(Top_10['Country/Region'], Top_10['TotalRecovered'], color='green',␣
 ↪label='Total Recovered')
plt.title('Comparison of Total Cases and Total Recovered by Country/Region')
plt.xlabel('Country/Region')
plt.ylabel('Count')
plt.legend()
plt.xticks(rotation=45, ha='right')  # Rotate x-axis labels for better␣
 ↪readability
plt.tight_layout()
```




### Comparison of Active Cases and Serious,Critical Cases country wise

[19]:
```
covid_19.head()
```

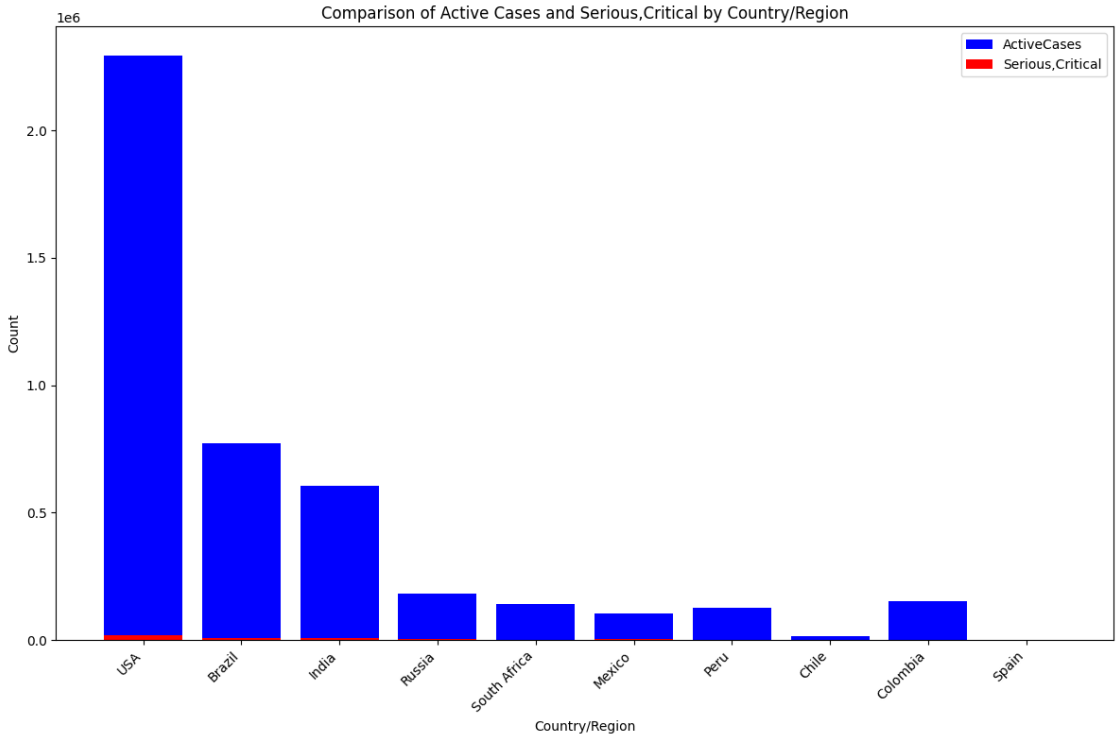
[19]:

| | Country/Region | Continent | Population | TotalCases | NewCases | TotalDeaths | NewDeaths | TotalRecovered | NewRecovered | ActiveCases | Serious,Critical | Tot Cases/1M pop | Deaths/1M pop | TotalTests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | USA | North America | 331198130 | 5032179 | 0 | 162804 | 0 | 2576668 | 0 | 2292707 | 18296 | 15194 | 492 | 63139605 |
| 1 | Brazil | South America | 212710692 | 2917562 | 0 | 98644 | 0 | 2047660 | 0 | 771258 | 8318 | 13716 | 464 | 13206188 |
| 2 | India | Asia | 1381344997 | 2025409 | 0 | 41638 | 0 | 1377384 | 0 | 606387 | 8944 | 1466 | 30 | 22149351 |
| 3 | Russia | Europe | 145940924 | 871894 | 0 | 14606 | 0 | 676357 | 0 | 180931 | 2300 | 5974 | 100 | 29716907 |
| 4 | South Africa | Africa | 59381566 | 538184 | 0 | 9604 | 0 | 387316 | 0 | 141264 | 539 | 9063 | 162 | 3149807 |

```
   Tests/1M pop      WHO Region
0        190640        Americas
1         62085        Americas
2         16035  South-EastAsia
3        203623          Europe
4         53044          Africa
```

[20]:
```
Serious_copy = covid_19.copy()
Serious_copy_copy = Serious_copy.sort_values(by="ActiveCases", ascending=False)
Top_10 = Serious_copy.head(10)
```

[21]:
```
plt.figure(figsize=(12, 8))
plt.bar(Top_10['Country/Region'], Top_10['ActiveCases'], color='blue',␣
 ↪label='ActiveCases')
plt.bar(Top_10['Country/Region'], Top_10['Serious,Critical'], color='red',␣
 ↪label='Serious,Critical')
plt.title('Comparison of Active Cases and Serious,Critical by Country/Region')
plt.xlabel('Country/Region')
plt.ylabel('Count')
plt.legend()
plt.xticks(rotation=45, ha='right')  # Rotate x-axis labels for better␣
 ↪readability
plt.tight_layout()
```



### Country with Highly Recovered Cases

[24]:
```
most_rec = covid_19.copy()
most_rec = most_rec.sort_values(by='TotalRecovered', ascending=False)
Top_5 = most_rec.head()
```

[35]:
```
plt.figure(figsize=(12, 8))
bars1 = plt.bar(Top_5['Country/Region'], Top_5['TotalRecovered'],␣
 ↪color='green', label='TotalRecovered')

# Add labels for Active Cases on top of each bar
for bar in bars1:
    plt.text(bar.get_x() + bar.get_width() / 2, bar.get_height(), f'{int(bar.
 ↪get_height())}', ha='center', va='bottom', color='black', fontsize=10)

plt.title('Country with Highly Recovered Cases')
plt.xlabel('Country/Region')
plt.ylabel('Count')
plt.legend()
plt.xticks(rotation=45, ha='right')  # Rotate x-axis labels for better␣
 ↪readability
plt.tight_layout()
```