In [5]:
```python
import pandas as pd
import plotly.express as px
import plotly.graph_objects as go
data = pd.read_csv(r"C:\Users\91970\Downloads\covid-19_python_project\transformed_data.csv")
data2 = pd.read_csv(r"C:\Users\91970\Downloads\covid-19_python_project\raw_data.csv")
print(data)
```

```
      CODE      COUNTRY        DATE    HDI        TC        TD       STI  \
0      AFG  Afghanistan  2019-12-31  0.498  0.000000  0.000000  0.000000
1      AFG  Afghanistan  2020-01-01  0.498  0.000000  0.000000  0.000000
2      AFG  Afghanistan  2020-01-02  0.498  0.000000  0.000000  0.000000
3      AFG  Afghanistan  2020-01-03  0.498  0.000000  0.000000  0.000000
4      AFG  Afghanistan  2020-01-04  0.498  0.000000  0.000000  0.000000
...    ...          ...         ...    ...       ...       ...       ...
50413  ZWE     Zimbabwe  2020-10-15  0.535  8.994048  5.442418  4.341855
50414  ZWE     Zimbabwe  2020-10-16  0.535  8.996528  5.442418  4.341855
50415  ZWE     Zimbabwe  2020-10-17  0.535  8.999496  5.442418  4.341855
50416  ZWE     Zimbabwe  2020-10-18  0.535  9.000853  5.442418  4.341855
50417  ZWE     Zimbabwe  2020-10-19  0.535  9.005405  5.442418  4.341855

             POP    GDPCAP
0      17.477233  7.497754
1      17.477233  7.497754
2      17.477233  7.497754
3      17.477233  7.497754
4      17.477233  7.497754
...          ...       ...
50413  16.514381  7.549491
50414  16.514381  7.549491
50415  16.514381  7.549491
50416  16.514381  7.549491
50417  16.514381  7.549491

[50418 rows x 9 columns]
```

In [6]:
```python
print(data.head())
```

```
  CODE      COUNTRY        DATE    HDI   TC   TD  STI        POP    GDPCAP
0  AFG  Afghanistan  2019-12-31  0.498  0.0  0.0  0.0  17.477233  7.497754
1  AFG  Afghanistan  2020-01-01  0.498  0.0  0.0  0.0  17.477233  7.497754
2  AFG  Afghanistan  2020-01-02  0.498  0.0  0.0  0.0  17.477233  7.497754
3  AFG  Afghanistan  2020-01-03  0.498  0.0  0.0  0.0  17.477233  7.497754
4  AFG  Afghanistan  2020-01-04  0.498  0.0  0.0  0.0  17.477233  7.497754
```

In [7]:
```python
print(data2.head())
```

```
  iso_code     location        date  total_cases  total_deaths  \
0      AFG  Afghanistan  2019-12-31          0.0           0.0
1      AFG  Afghanistan  2020-01-01          0.0           0.0
2      AFG  Afghanistan  2020-01-02          0.0           0.0
3      AFG  Afghanistan  2020-01-03          0.0           0.0
4      AFG  Afghanistan  2020-01-04          0.0           0.0

   stringency_index  population  gdp_per_capita  human_development_index  \
0               0.0    38928341        1803.987                    0.498
1               0.0    38928341        1803.987                    0.498
2               0.0    38928341        1803.987                    0.498
3               0.0    38928341        1803.987                    0.498
4               0.0    38928341        1803.987                    0.498

  Unnamed: 9 Unnamed: 10 Unnamed: 11  Unnamed: 12  Unnamed: 13
0      #NUM!       #NUM!       #NUM!    17.477233  7.497754494
1      #NUM!       #NUM!       #NUM!    17.477233  7.497754494
2      #NUM!       #NUM!       #NUM!    17.477233  7.497754494
3      #NUM!       #NUM!       #NUM!    17.477233  7.497754494
4      #NUM!       #NUM!       #NUM!    17.477233  7.497754494
```

In [8]:
```python
data["COUNTRY"].value_counts()
```

Out[8]:
```
COUNTRY
Afghanistan        294
Indonesia          294
Macedonia          294
Luxembourg         294
Lithuania          294
                  ...
Tajikistan         172
Comoros            171
Lesotho            158
Hong Kong           51
Solomon Islands      4
Name: count, Length: 210, dtype: int64
```

In [9]:
```python
data["COUNTRY"].value_counts().mode()
```

Out[9]:
```
0    294
Name: count, dtype: int64
```

In [10]:
```python
code = data["CODE"].unique().tolist()
country = data["COUNTRY"].unique().tolist()
hdi = []
tc = []
td = []
sti = []
population = data["POP"].unique().tolist()
gdp = []
```

In [11]:
```python
for i in country :
    hdi.append((data.loc[data["COUNTRY"] == i,"HDI"]).sum()/294)
    tc.append((data2.loc[data2['location'] ==i,"total_cases"]).sum())
    td.append((data2.loc[data2["location"] == i,"total_deaths"]).sum())
    sti.append((data.loc[data["COUNTRY"] ==i,"STI"]).sum()/294)
    population.append((data2.loc[data2["location"] == i,"population"]).sum()/294)
aggregated_data = pd.DataFrame(list(zip(code,country,hdi,tc,td,sti,population)),
                               columns = ["Country Code","Country","HDI","Total Cases",
                                          "Total Deaths","Stringency Index","Population"])
print(aggregated_data.head())
```

```
  Country Code      Country       HDI  Total Cases  Total Deaths  \
0          AFG  Afghanistan  0.498000    5126433.0      165875.0
1          ALB      Albania  0.600765    1071951.0       31056.0
2          DZA      Algeria  0.754000    4893999.0      206429.0
3          AND      Andorra  0.659551     223576.0        9850.0
4          AGO       Angola  0.418952     304005.0       11820.0

   Stringency Index  Population
0          3.049673   17.477233
1          3.005624   14.872537
2          3.195168   17.596309
3          2.677654   11.254996
4          2.965560   17.307957
```

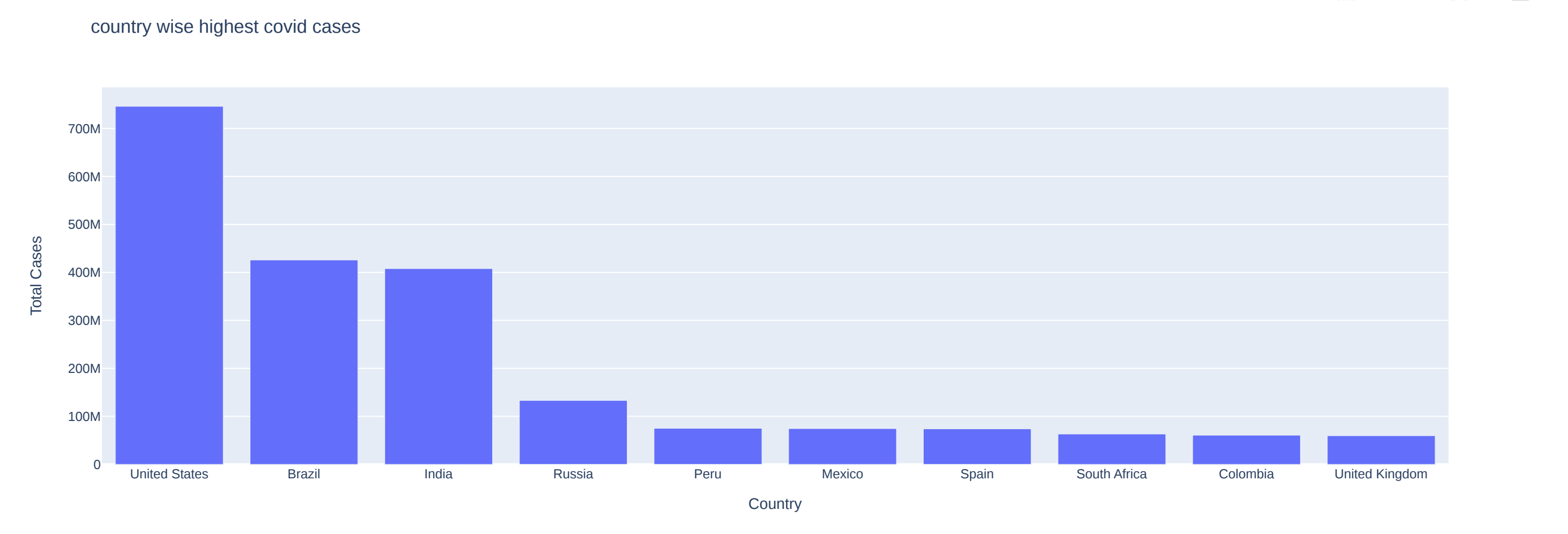
In [12]:
```python
data = aggregated_data.sort_values(by=["Total Cases"],ascending = False)
print(data.head())
```

```
    Country Code        Country      HDI  Total Cases  Total Deaths  \
200          USA  United States  0.92400  746014098.0    26477574.0
27           BRA         Brazil  0.75900  425704517.0    14340567.0
90           IND          India  0.64000  407771615.0     7247327.0
157          RUS         Russia  0.81600  132888951.0     2131571.0
150          PER           Peru  0.59949   74882695.0     3020038.0

     Stringency Index  Population
200          3.350949   19.617637
27           3.136028   19.174732
90           3.610552   21.045353
157          3.380088   18.798668
150          3.430126   17.311165
```

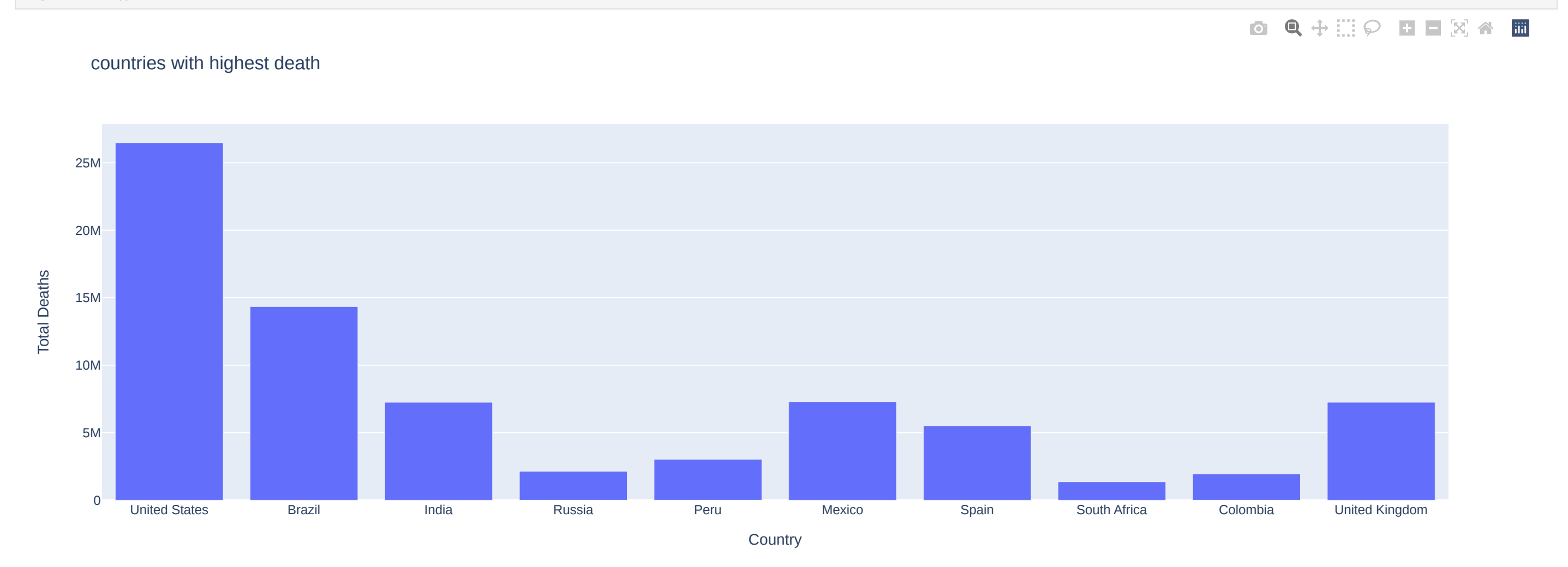
In [13]:
```python
data = data.head(10)
print(data)
```

```
    Country Code         Country       HDI  Total Cases  Total Deaths  \
200          USA   United States  0.924000  746014098.0    26477574.0
27           BRA          Brazil  0.759000  425704517.0    14340567.0
90           IND           India  0.640000  407771615.0     7247327.0
157          RUS          Russia  0.816000  132888951.0     2131571.0
150          PER            Peru  0.599490   74882695.0     3020038.0
125          MEX          Mexico  0.774000   74347548.0     7295850.0
178          ESP           Spain  0.887969   73717676.0     5510624.0
175          ZAF    South Africa  0.608653   63027659.0     1357682.0
42           COL        Colombia  0.581847   60543682.0     1936134.0
199          GBR  United Kingdom  0.922000   59475032.0     7249573.0

     Stringency Index  Population
200          3.350949   19.617637
27           3.136028   19.174732
90           3.610552   21.045353
157          3.380088   18.798668
150          3.430126   17.311165
125          3.019289   18.674802
178          3.393922   17.660427
175          3.364333   17.898266
42           3.357923   17.745037
199          3.353883   18.033340
```

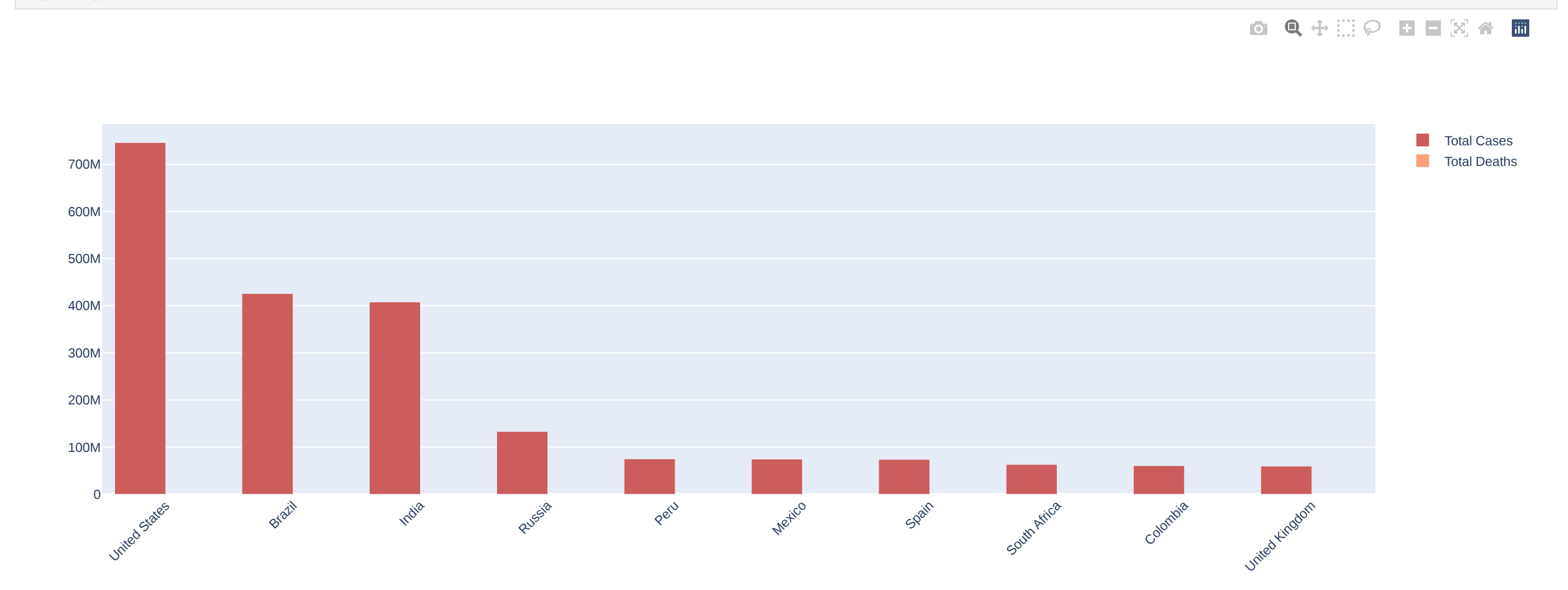
In [14]:
```python
figure = px.bar(data ,y ='Total Cases', x = "Country",title = "country wise highest covid cases")
figure.show()
```



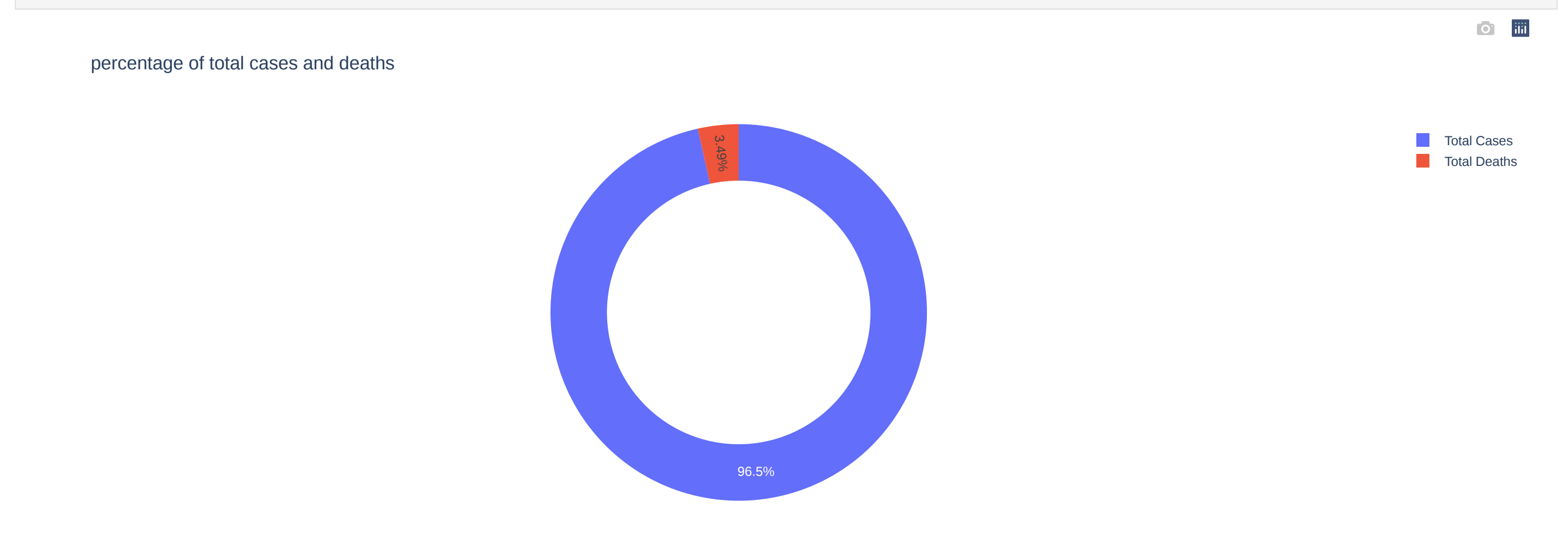
In [15]:
```python
figure = px.bar (data , y = "Total Deaths", x = "Country",title = "countries with highest death",)
figure.show()
```



In [16]:
```python
fig = go.Figure()
fig.add_trace(go.Bar(
   x=data["Country"],
   y=data["Total Cases"],
   name = 'Total Cases',
   marker_color = 'indianred'
))
fig.add_trace(go.Bar(
    x = data["Country"],
    y = ["Total Death Cases"],
    name = 'Total Deaths',
    marker_color = 'lightsalmon'))
fig.update_layout(barmode = 'group', xaxis_tickangle = -45)
fig.show()
```



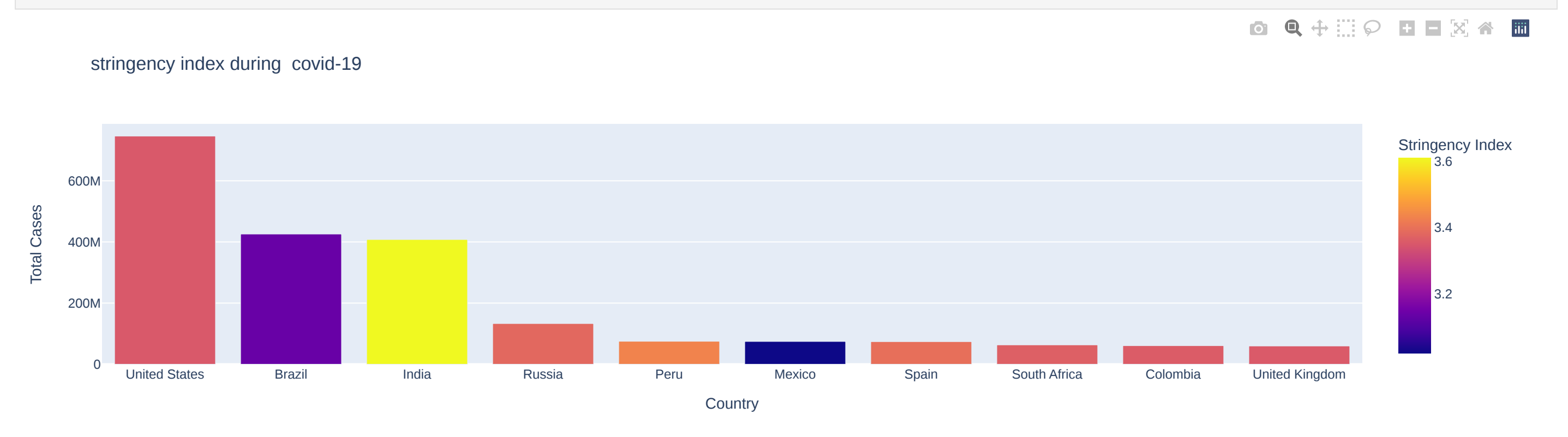
In [17]:
```python
cases = data["Total Cases"].sum()
deceased = data["Total Deaths"].sum()
labels = ["Total Cases","Total Deaths"]
values = [cases,deceased]
fig = px.pie(data,values=values,names=labels,title = 'percentage of total cases and deaths',hole =0.7)
fig.show()
```



In [18]:
```python
death_rate = (data["Total Deaths"].sum()/data["Total Cases"].sum())*100
print("death_rate =",death_rate)
```

```
death_rate = 3.6144212045653767
```

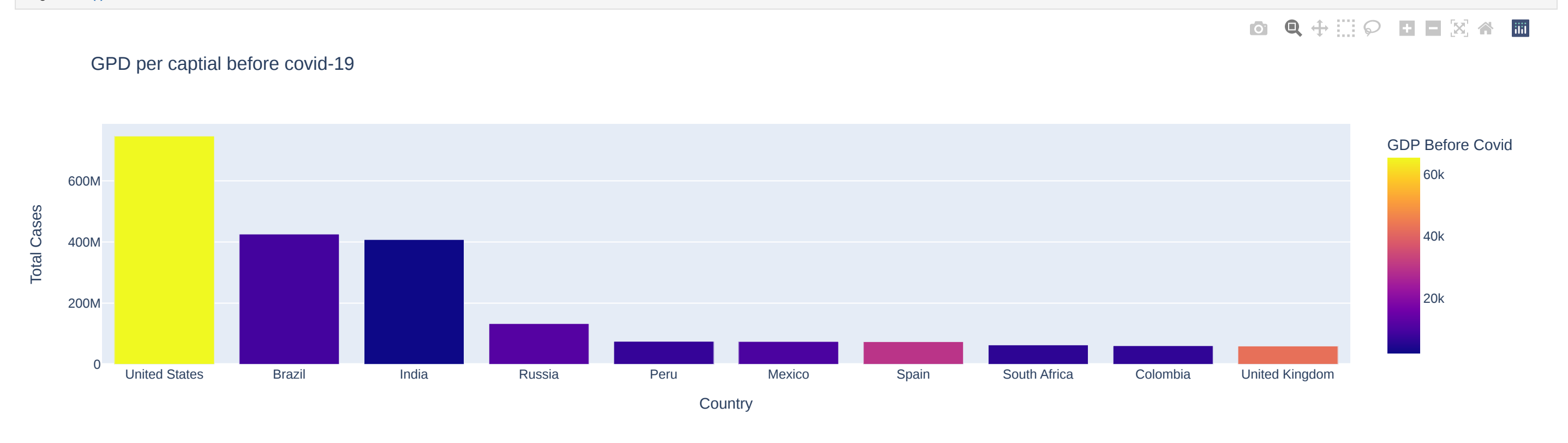
In [19]:
```python
fig = px.bar(data,x='Country',y='Total Cases',
             hover_data=['Population','Total Deaths'],
             color = 'Stringency Index', height =400,
             title = "stringency index during  covid-19")
fig.show()
```



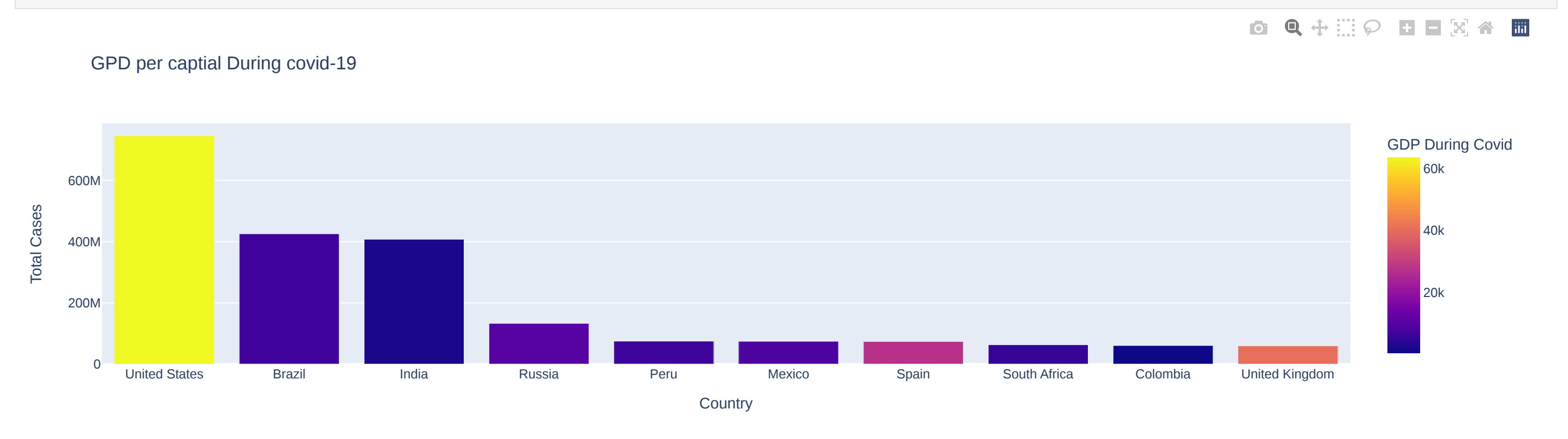
In [20]:
```python
data["GDP Before Covid"] = [65279.53,8897.49,2100.75,11497.65,7027.61,9946.03,29564.74,6001.40,6424.94,42354.41]
data["GDP During Covid"] = [63543.58,6796.84,1900.71,10126.72,6126.87,8346.70,27057.16,5090.72,332.77,40284.64]
print(data)
```

```
    Country Code         Country       HDI  Total Cases  Total Deaths  \
200          USA   United States  0.924000  746014098.0    26477574.0
27           BRA          Brazil  0.759000  425704517.0    14340567.0
90           IND           India  0.640000  407771615.0     7247327.0
157          RUS          Russia  0.816000  132888951.0     2131571.0
150          PER            Peru  0.599490   74882695.0     3020038.0
125          MEX          Mexico  0.774000   74347548.0     7295850.0
178          ESP           Spain  0.887969   73717676.0     5510624.0
175          ZAF    South Africa  0.608653   63027659.0     1357682.0
42           COL        Colombia  0.581847   60543682.0     1936134.0
199          GBR  United Kingdom  0.922000   59475032.0     7249573.0

     Stringency Index  Population  GDP Before Covid  GDP During Covid
200          3.350949   19.617637          65279.53          63543.58
27           3.136028   19.174732           8897.49           6796.84
90           3.610552   21.045353           2100.75           1900.71
157          3.380088   18.798668          11497.65          10126.72
150          3.430126   17.311165           7027.61           6126.87
125          3.019289   18.674802           9946.03           8346.70
178          3.393922   17.660427          29564.74          27057.16
175          3.364333   17.898266           6001.40           5090.72
42           3.357923   17.745037           6424.94            332.77
199          3.353883   18.033340          42354.41          40284.64
```

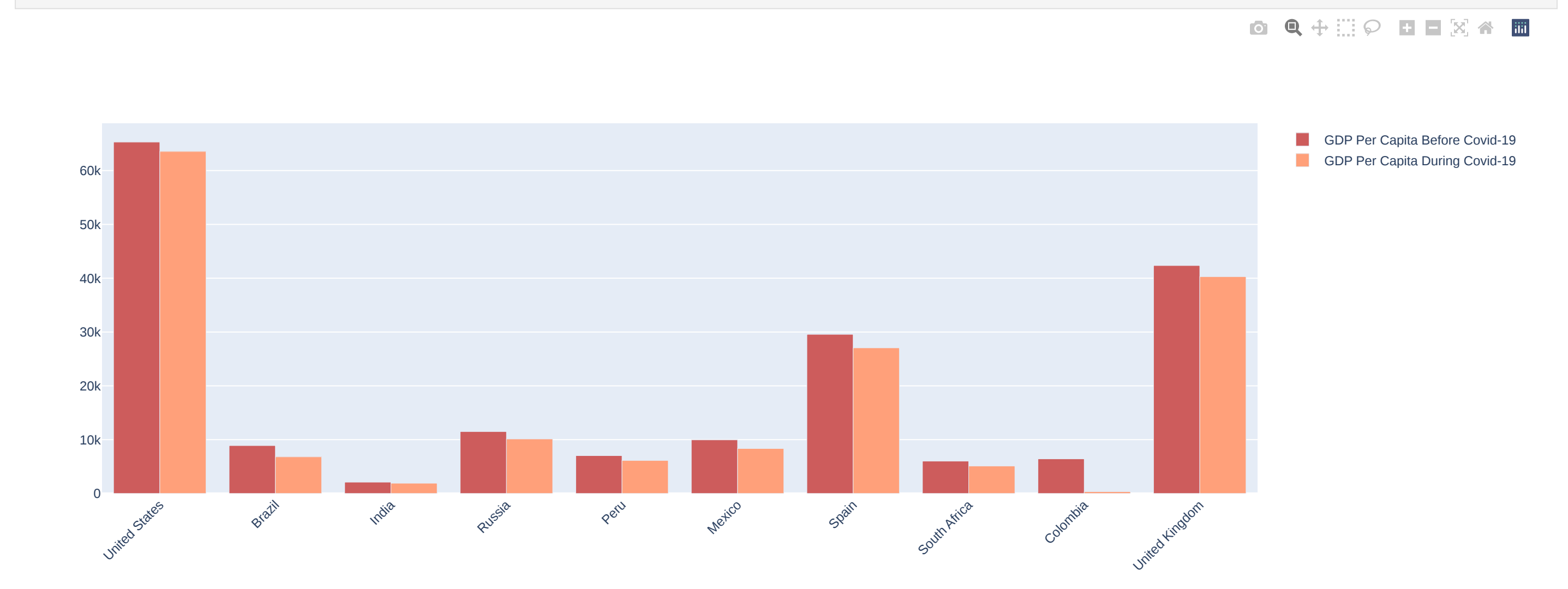
In [21]:
```python
fig = px.bar(data,x = 'Country',y = 'Total Cases',
             hover_data = ['Population','Total Deaths'],
             color = 'GDP Before Covid', height =400,
             title = "GPD per captial before covid-19")
fig.show()
```



In [22]:
```python
fig = px.bar(data,x = 'Country',y = 'Total Cases',
             hover_data = ['Population','Total Deaths'],
             color = 'GDP During Covid', height =400,
             title = "GPD per captial During covid-19")
fig.show()
```



In [23]:
```python
fig = go.Figure()
fig.add_trace(go.Bar(
    x=data["Country"],
    y=data["GDP Before Covid"],
    name='GDP Per Capita Before Covid-19',
    marker_color='indianred'
))
fig.add_trace(go.Bar(
    x=data["Country"],
    y=data["GDP During Covid"],
    name='GDP Per Capita During Covid-19',
    marker_color='lightsalmon'
))
fig.update_layout(barmode='group', xaxis_tickangle=-45)
fig.show()
```



In [24]:
```python
fig = px.bar(data,x = 'Country',y = 'Total Cases',
             hover_data = ['Population','Total Deaths'],
             color = 'GDP Before Covid', height =400,
             title = "GPD per captial before covid-19")
fig.show()
```