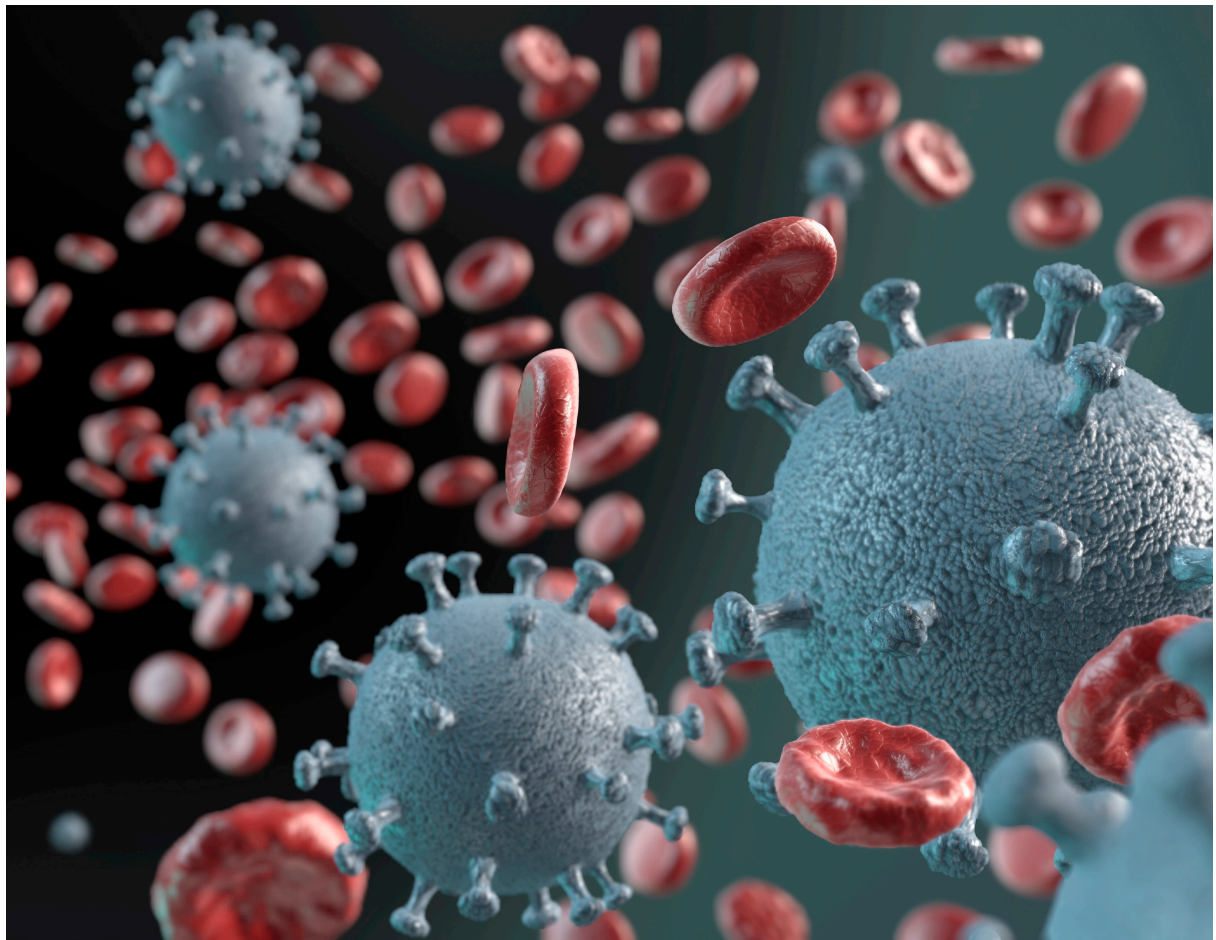


Anirudh Tulasi
6 April 2020

COVID19 India EDA and Forecasting



Coronavirus disease (COVID-19) is an infectious disease caused by a new virus. The disease causes respiratory illness (like the flu) with symptoms such as a cough, fever, and in more severe cases, difficulty breathing.

How it spreads

Coronavirus disease spreads primarily through contact with an infected person when they cough or sneeze. It also spreads when a person touches a surface or object that has the virus on it, then touches their eyes, nose, or mouth.

Libraries

In [1]:

```
# Basic Libraries
import numpy as np
import pandas as pd
```

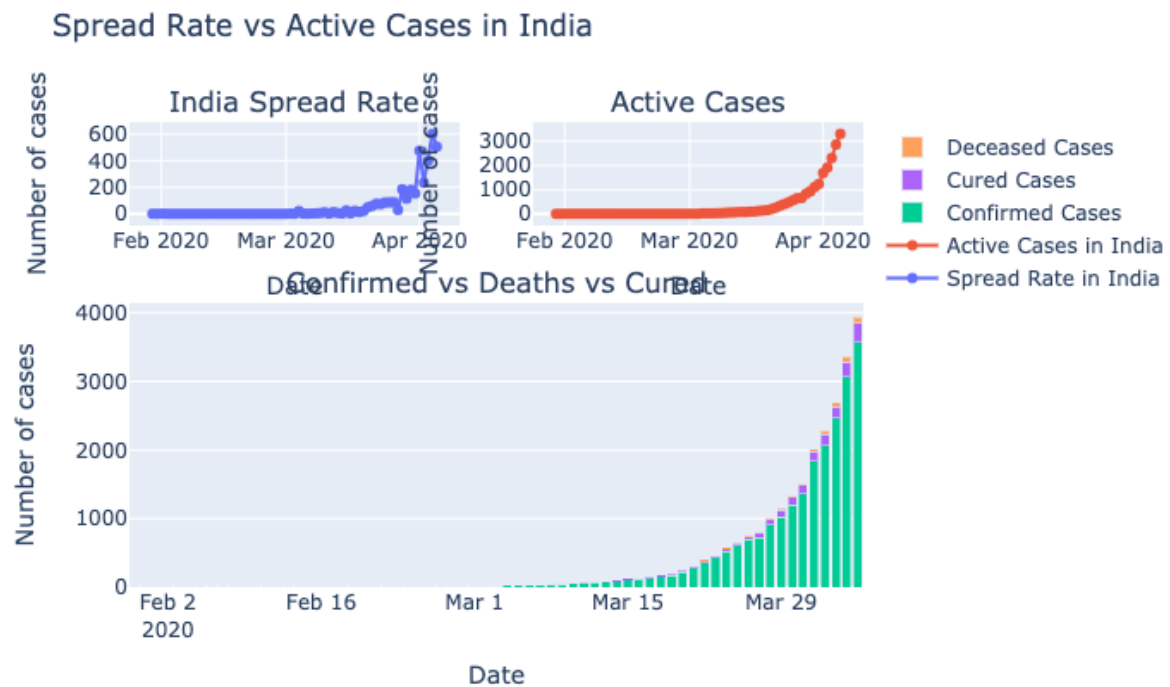
```
# Plotting and Visualization
import matplotlib.pyplot as plt
import seaborn as sns
import plotly.graph_objects as go
import plotly.express as px
from plotly.subplots import make_subplots
```

```
# Datetime
import warnings
warnings.filterwarnings('ignore')
```

In [2]:

```
# Importing data
data = pd.read_csv('../input/covid19-in-india/
covid_19_india.csv')
```

India Spread Rate in General



Observation 1:

- The Spread rate in India has a spiking increase after March 25th and it fluctuates a lot.
- The Number of Active cases in India has steadily increased.

Observation 2:

- The top 3 states with highest active cases are as follows
 1. Tamil Nadu
 2. Delhi
 3. Maharashtra

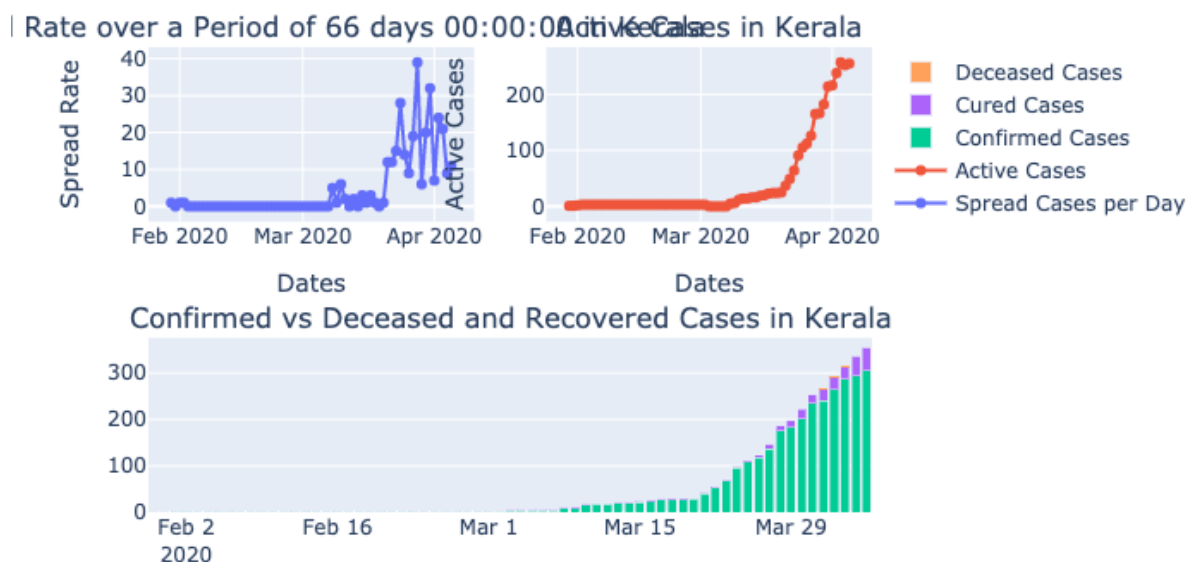
Specific State wise Analysis

Kerala

In [17]:

```
# Spread Rate from the day of first detection
state_details('Kerala')
```

Spread Rate and Comparison of Cured vs Deceased vs Confirmed in Kerala

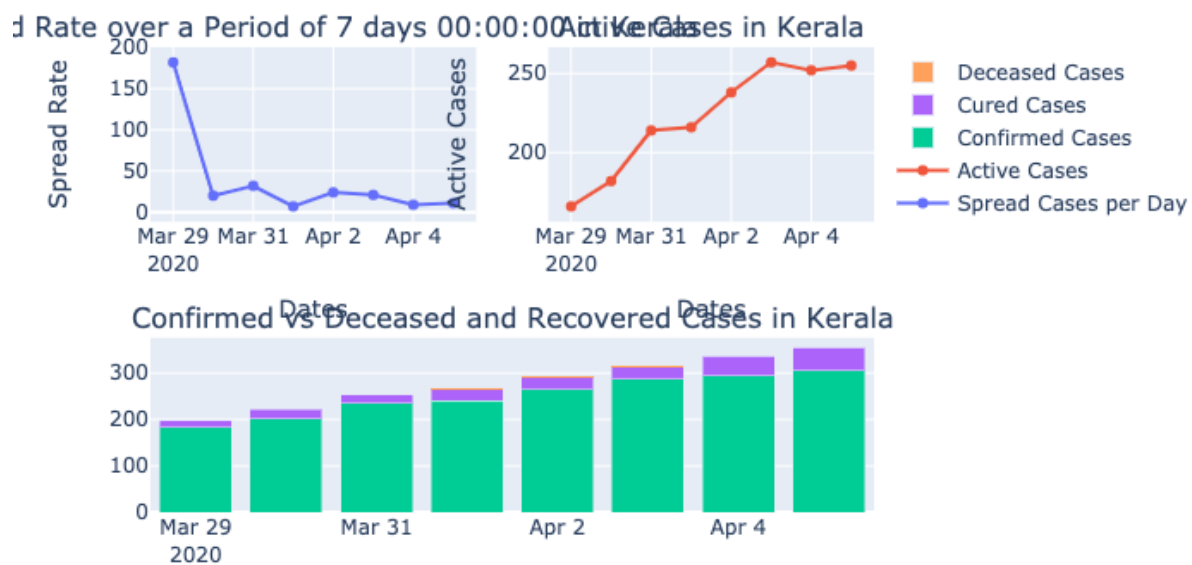


Average Spread Rate in Kerala is 4.567164179104478

In [18]:

```
# Spread Rate in Kerala for past 7 days
```

Spread Rate and Comparison of Cured vs Deceased vs Confirmed in Kerala



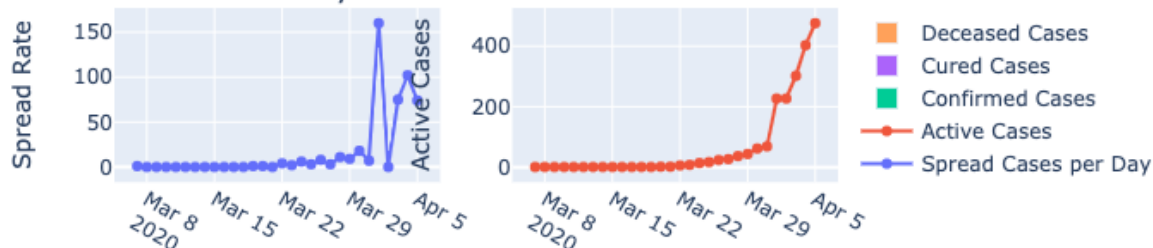
```
state_details('Kerala', '2020-03-29')
```

Tamil Nadu

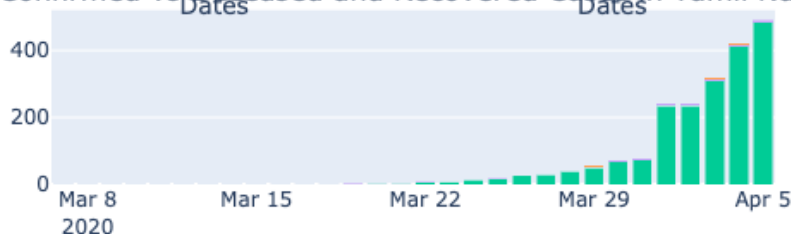
```
# Spread Rate in Tamil Nadu since First Detection
state_details('Tamil Nadu')
```

Spread Rate and Comparison of Cured vs Deceased vs Confirmed in Tamil Nadu

ate over a Period of 29 days 00:00:00Active Cases in Tamil Nadu



Confirmed vs Deceased and Recovered Cases in Tamil Nadu



Average Spread Rate in Tamil Nadu is 16.166666666666668

```
# Spread Rate in Tamil Nadu Over past 7 Days
state_details('Tamil Nadu', '2020-03-29')
```

Spread Rate and Comparison of Cured vs Deceased vs Confirmed in Tamil Nadu

ate over a Period of 7 days 00:00:00Active Cases in Tamil Nadu



Confirmed vs Deceased and Recovered Cases in Tamil Nadu



Maharashtra

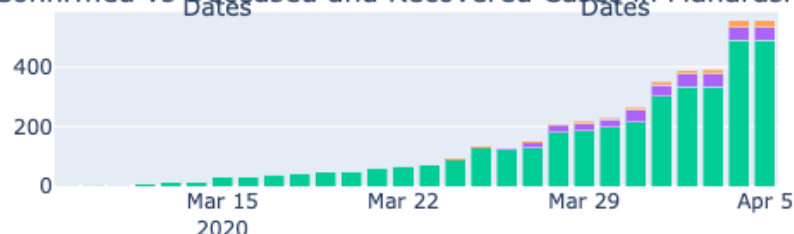
```
state_details('Maharashtra')
```

Spread Rate and Comparison of Cured vs Deceased vs Confirmed in Maharashtra

ite over a Period of 27 days 00:00:00 Active Cases in Maharashtra



Confirmed vs Deceased and Recovered Cases in Maharashtra



Average Spread Rate in Maharashtra is 17.5

```
# Spread Rate in Maharashtra Over past 7 Days
```

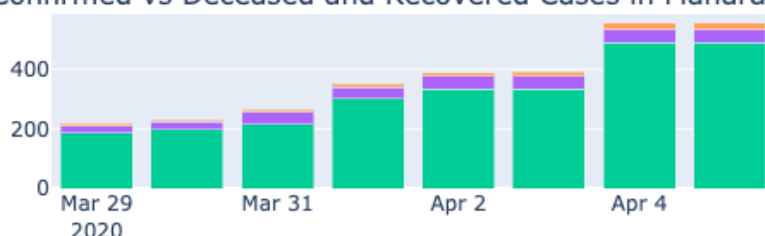
```
state_details('Maharashtra', '2020-03-29')
```

Spread Rate and Comparison of Cured vs Deceased vs Confirmed in Maharashtra

ate over a Period of 7 days 00:00:00 Active Cases in Maharashtra



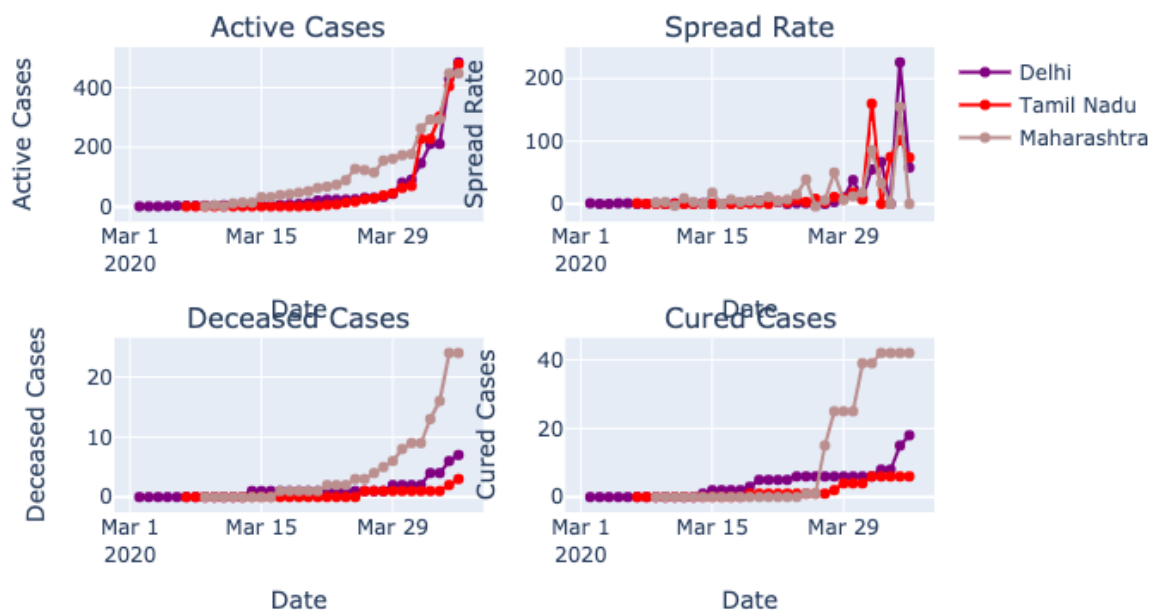
Confirmed vs Deceased and Recovered Cases in Maharashtra



Comparing top 3 States with High Number of Active cases

```
state_details(top3)
```

Comparison between ['Delhi', 'Tamil Nadu', 'Maharashtra']

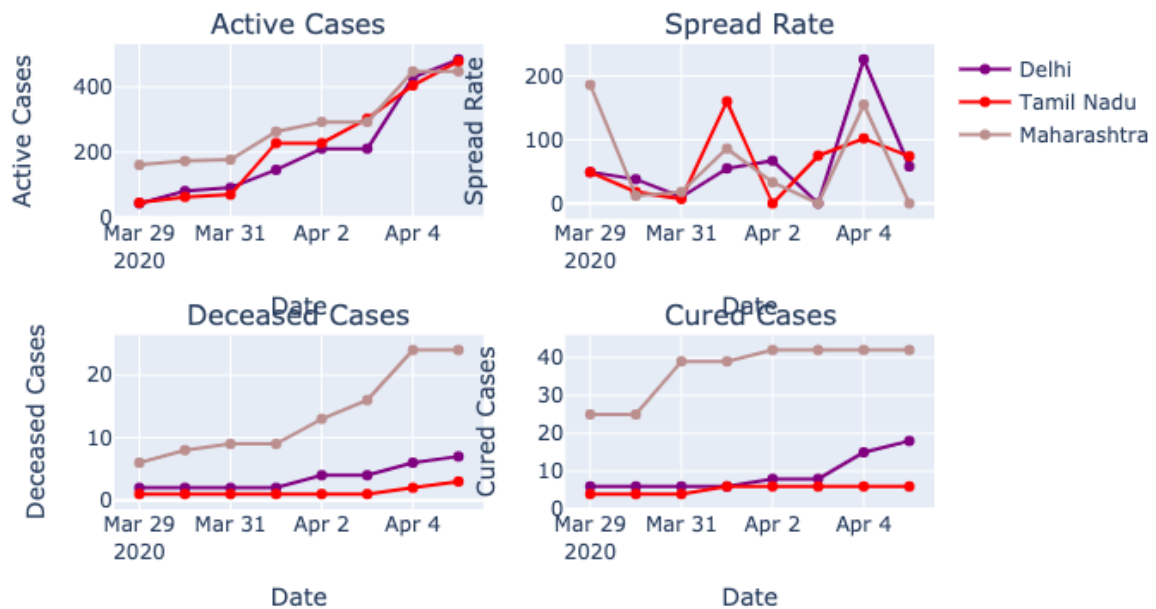


Observation:

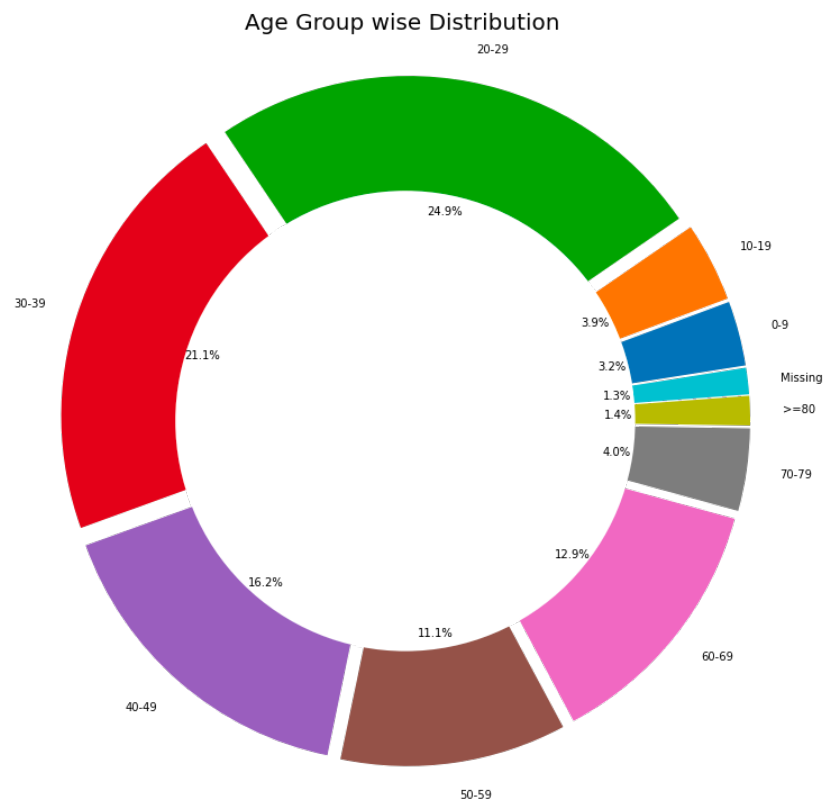
- Active Cases:
 - Maharashtra shows a gradual climb in Active cases where as Delhi and Tamilnadu show a very steep climb in the past few days.
 - This might be due to different factors. Some of them might be,
 - Availability of Test-Kits
 - End of 2-week Incubation period, etc.
- Spread Rate:
 - The Spread Rate peaks in each state at different days.
 - Visual plotting cannot be used just to find a pattern.

```
state_details(top3,start_date=data.Date.max()-pd.Timedelta(7,'D'))
```

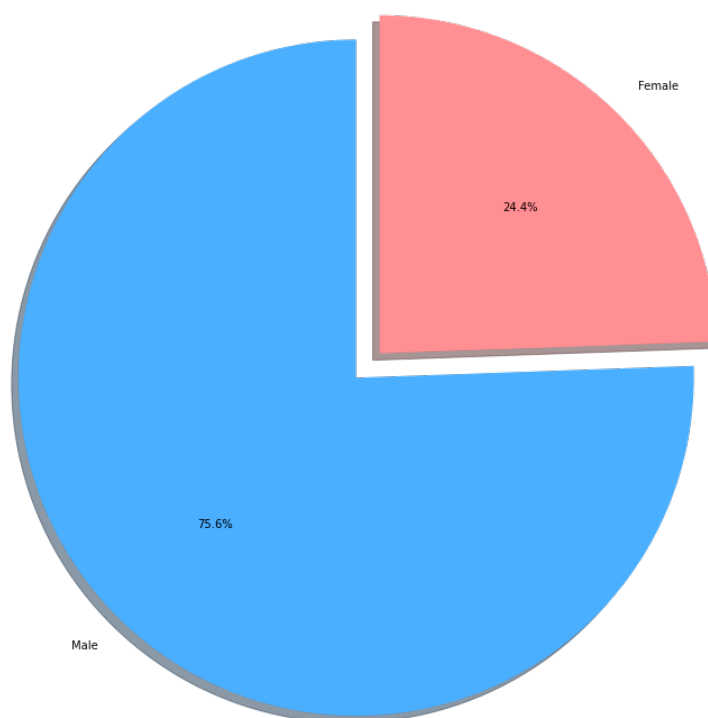
Comparison between ['Delhi', 'Tamil Nadu', 'Maharashtra']



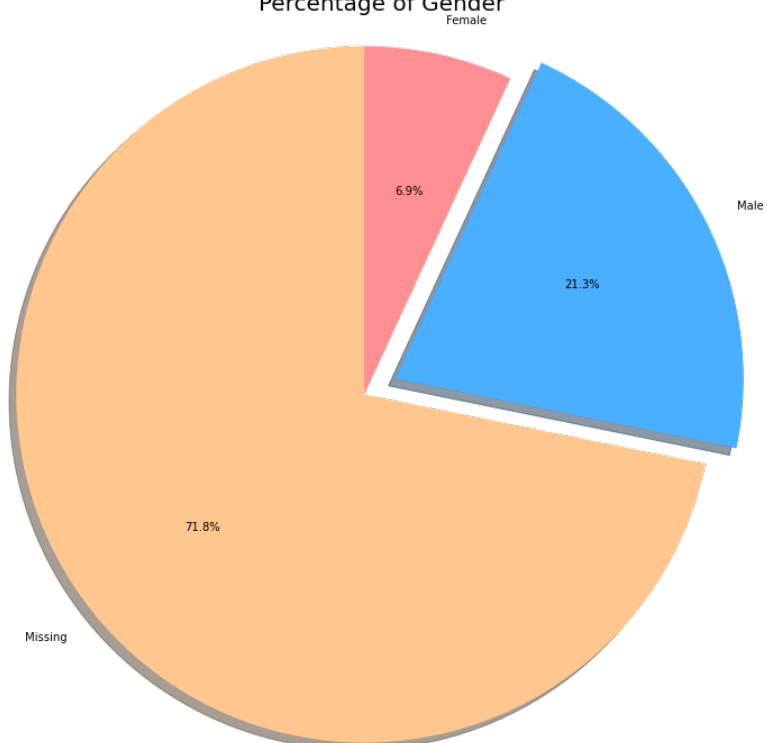
Data Visualization

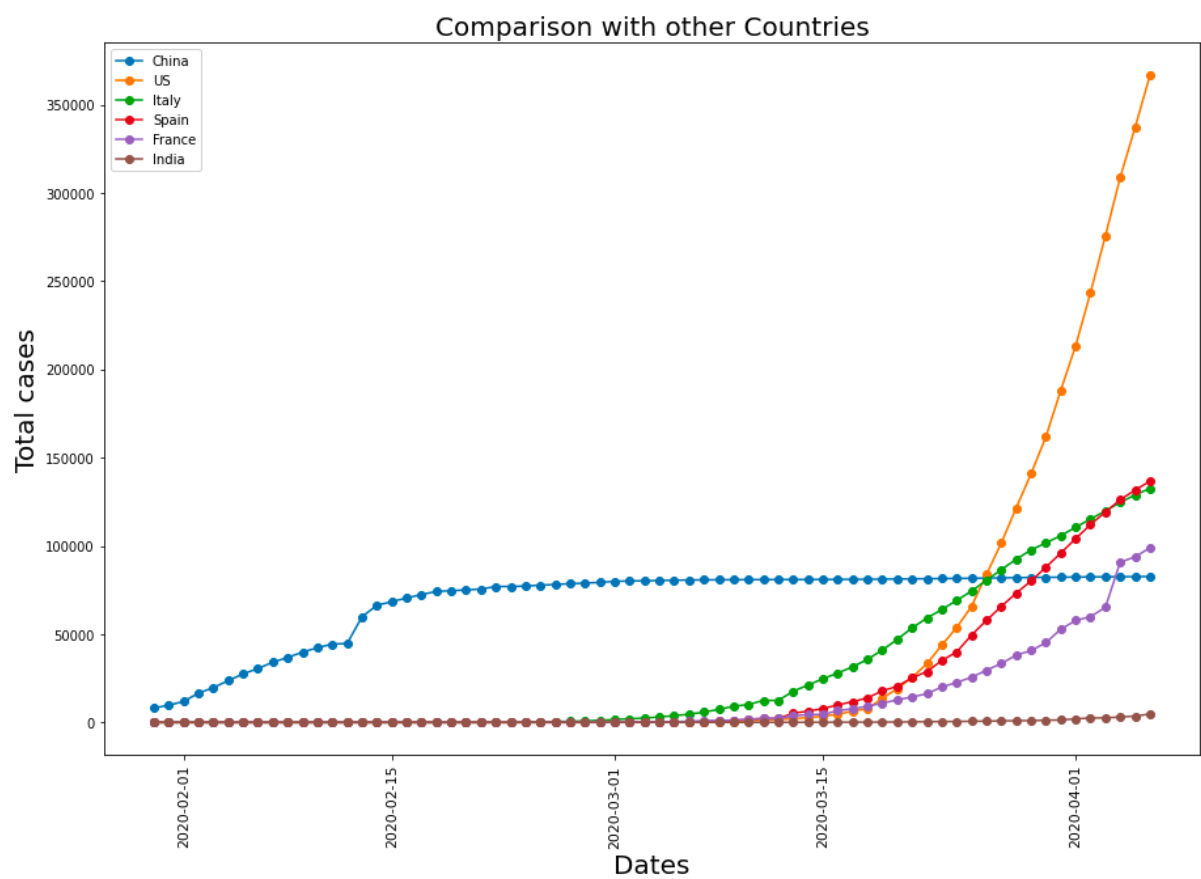
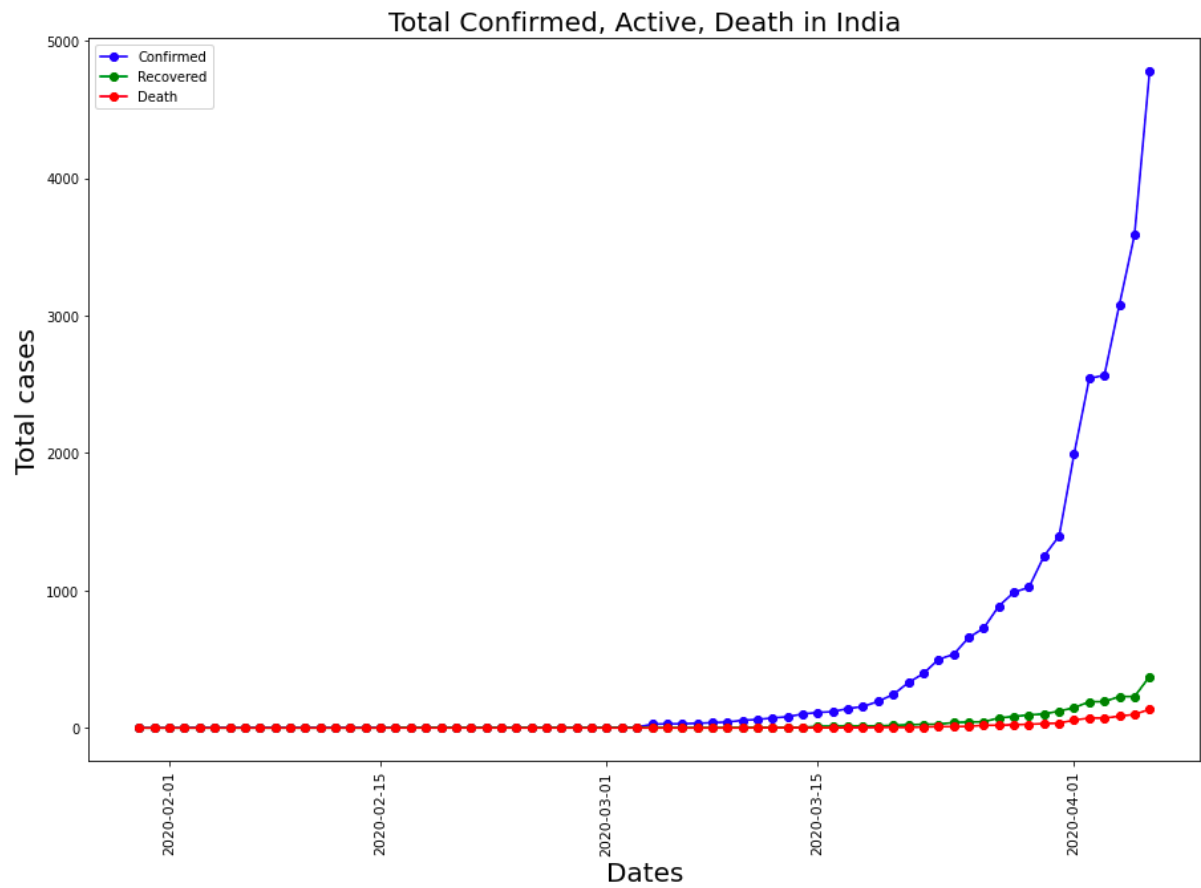


Percentage of Gender (Ignoring the Missing Values)



Percentage of Gender

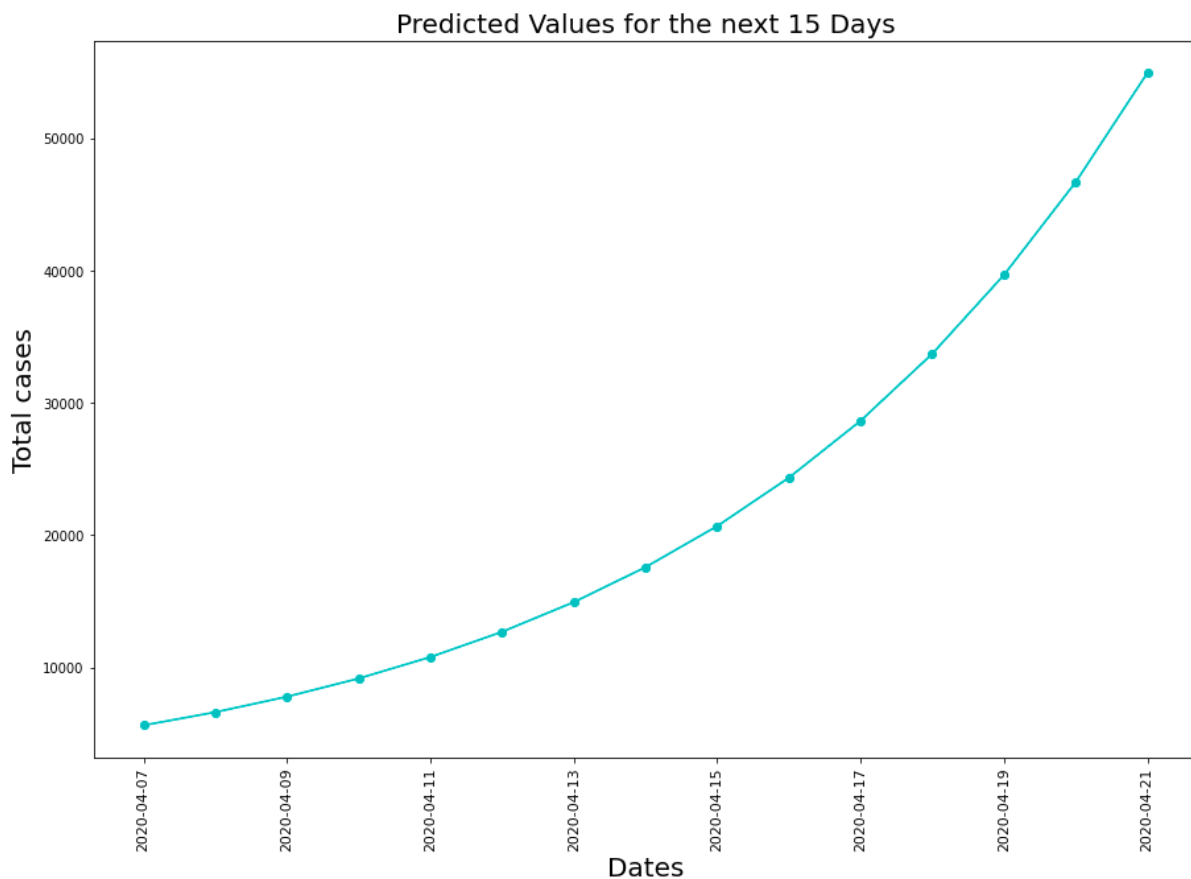




Prediction

Prediction using growth factor

Assuming the same growth factor continues for the next 15 days



Average growth factor

1.1768163131895364

We could see that the graph is increasing exponentially if the average growth factor doesn't decrease. It is important that the growth factor is reduced to flatten the curve.

Acknowledgements

Thanks to Indian [Ministry of Health & Family Welfare](#) for making the data available to general public.

Thanks to [covid19india.org](#) for making the individual level details and testing details available to general public.

Thanks to [Wikipedia](#) for population information.

Find the complete code and dataset [here](#).