Hi-Tech Public School, Bhawanipatna

# Information Practice Investigatory Project

## Analyzing the impact of Covid-19 using Data-Visualization


**Submitted to :**
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(IP)

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# CERTIFICATE

It is a certificate that Abhinab Choudhury, Student of class XII,has successfully completed the research on the topic "Analysis of Covid-19 using Data-Visualization" under the guidance of Monmohan Mishra,during the year 2022-23,Central Board of Secondary Education(CBSE).

Principal Subject Teacher

# ACKNOWLEDGEMENT

I warmly acknowledge the continuous encouragement and timely suggestions offered by our dear Principal.I extend my hearty thanks for giving me the opportunity to make use of the facilities available in the campus to carry out the project successfully.

I am highly indebted to my IP Teacher for the constant supervision, providing necessary information and supporting in completing the project. I would like to express my gratitude towards them for their kind cooperation and encouragement.

Finally, I extend my gratitude to one and all who are directly or indirectly involved in the successful completion of this project work.

I am making this project not only for marks but to also increase my knowledge.

# INDEX

# What is Covid-19 ?

Coronavirus disease 2019 (COVID-19) is a contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first case was identified in Wuhan, China, in December 2019. It has since spread worldwide, leading to an ongoing pandemic.

Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness.

A new strain of coronavirus is discovered in Britain. It is said to mutate faster than the older variant.

# Covid-19 in India

The first case of COVID-19 in India, which originated from China, was reported on 30 January 2020. India currently has the largest number of confirmed cases in Asia and has the second-highest number of confirmed cases in the world after the United States.

On 24 March, the prime minister ordered a nationwide lockdown for 21 days, affecting the entire 1.3 billion population of India. On 14 April, India extended the nationwide lockdown till 3 May which was followed by two week extensions.

From 1 June, the government started "unlocking" the country (barring "containment zones") in three unlock phases

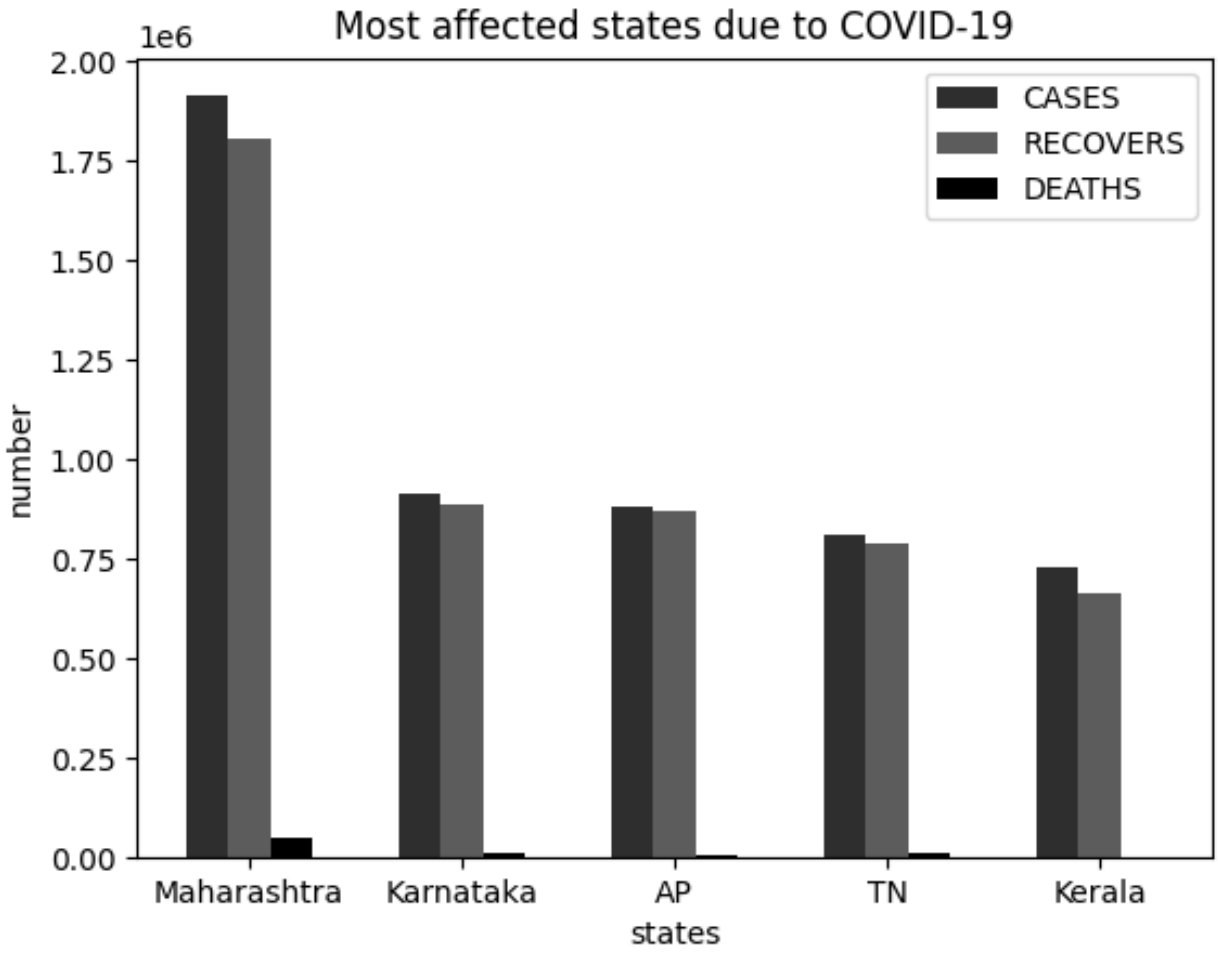
# Worst affected states from Covid-19 in India

Five worst affected states in India are Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Kerala. Given below is the bar graph as on 26th December, 2020.

CSV FILE:-

| | A | B | C |
|---|---|---|---|
| 1 | CASES | RECOVERS | DEATHS |
| 2 | 1913382 | 1806298 | 49129 |
| 3 | 914488 | 888917 | 12044 |
| 4 | 880430 | 869478 | 7091 |
| 5 | 812142 | 790965 | 12048 |
| 6 | 732048 | 664951 | 2930 |

```
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
data = pd.read_csv('.\data.csv')
x = np.linspace(1,61,5)
plt.xticks(x+6/2,['Maharashtra','Karnataka','AP','TN','Kerala'])
plt.bar(x+0,data['c'],width = 3,color = '#2E2E2E',label =
'CASES')
plt.bar(x+3,data['r'],width = 3,color = '#5C5C5C', label =
'RECOVERS')
plt.bar(x+6,data['d'],width = 3,color = '#000000', label =
'DEATHS')
plt.title('Most affected states due to COVID-19')
plt.legend()
plt.xlabel('states')
plt.ylabel('number')
plt.show()
```



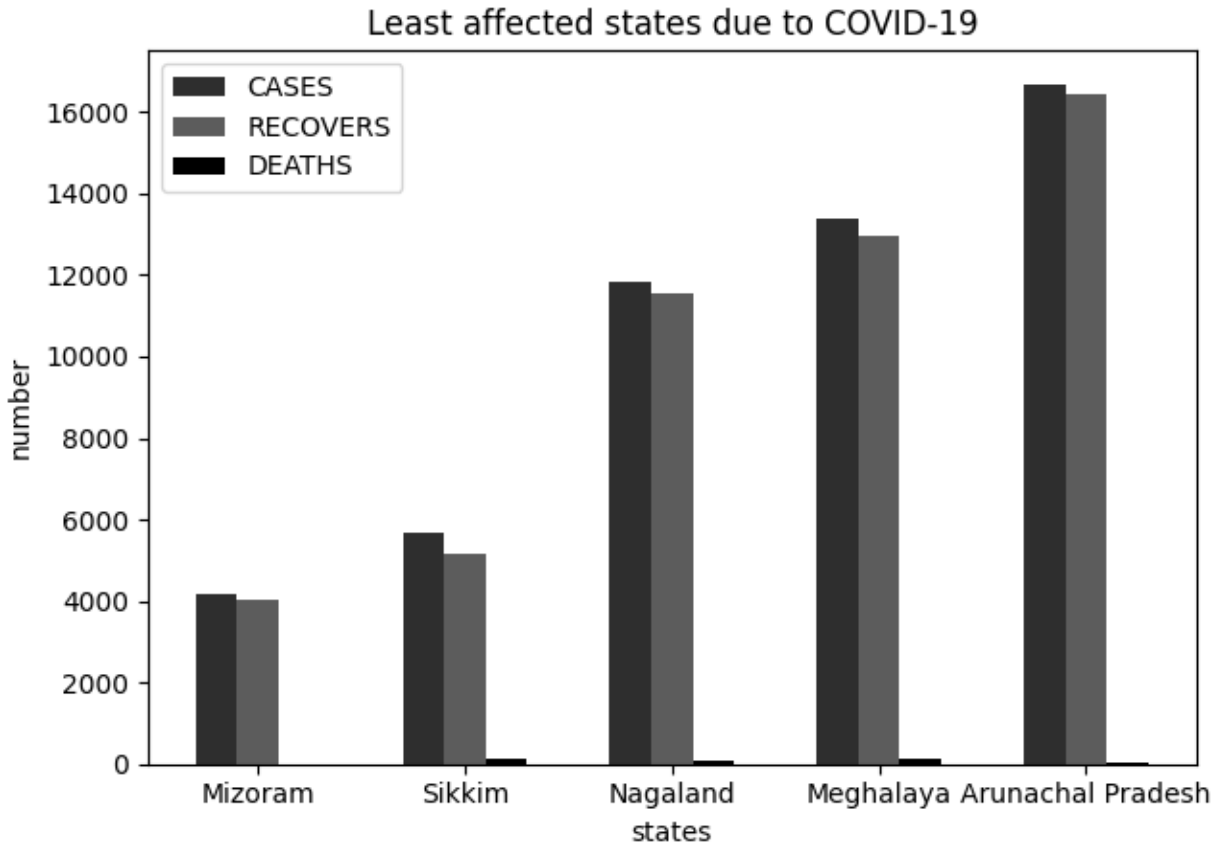

# Least affected states from Covid-19 in India

Five worst affected states in India are Mizoram, Sikkim, Nagaland, Meghalaya and Arunachal Pradesh. Given below is the bar graph as on 26th December, 2020

CSV FILE:-

| | A | B | C |
|---|---|---|---|
| 1 | CASES | RECOVERS | DEATHS |
| 2 | 4178 | 4036 | 8 |
| 3 | 5684 | 5142 | 125 |
| 4 | 11845 | 11544 | 77 |
| 5 | 13396 | 12940 | 135 |
| 6 | 16678 | 16454 | 56 |

```
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
data = pd.read_csv('.\data_1.csv')
x = np.linspace(1,61,5)
plt.xticks(x+6/2,['Mizoram','Sikkim','Nagaland','Meghalaya','Aru
nachal Pradesh'])
plt.bar(x+0,data['c'],width = 3,color = '#2E2E2E',label =
'CASES')
plt.bar(x+3,data['r'],width = 3,color = '#5C5C5C', label =
'RECOVERS')
plt.bar(x+6,data['d'],width = 3,color = '#000000', label =
'DEATHS')
plt.title('Least affected states due to COVID-19')
plt.legend()
plt.xlabel('states')
plt.ylabel('number')
plt.show()
```




# Deaths in each age group due to Covid-19

Deaths caused in each age group are shown below through a line graph as at 2 nd September, 2020.

CSV FILE:-

| | A | B |
|---|---|---|
| 1 | x | y |
| 2 | 0-10 | 0.5 |
| 3 | 11-20 | 0.7 |
| 4 | 21-30 | 2.6 |
| 5 | 31-40 | 6.1 |
| 6 | 41-50 | 13.4 |
| 7 | 51-60 | 25.13 |
| 8 | 61-70 | 28.6 |
| 9 | 71-80 | 17 |
| 10 | 81-90 | 5.3 |
| 11 | >90 | 0.5 |

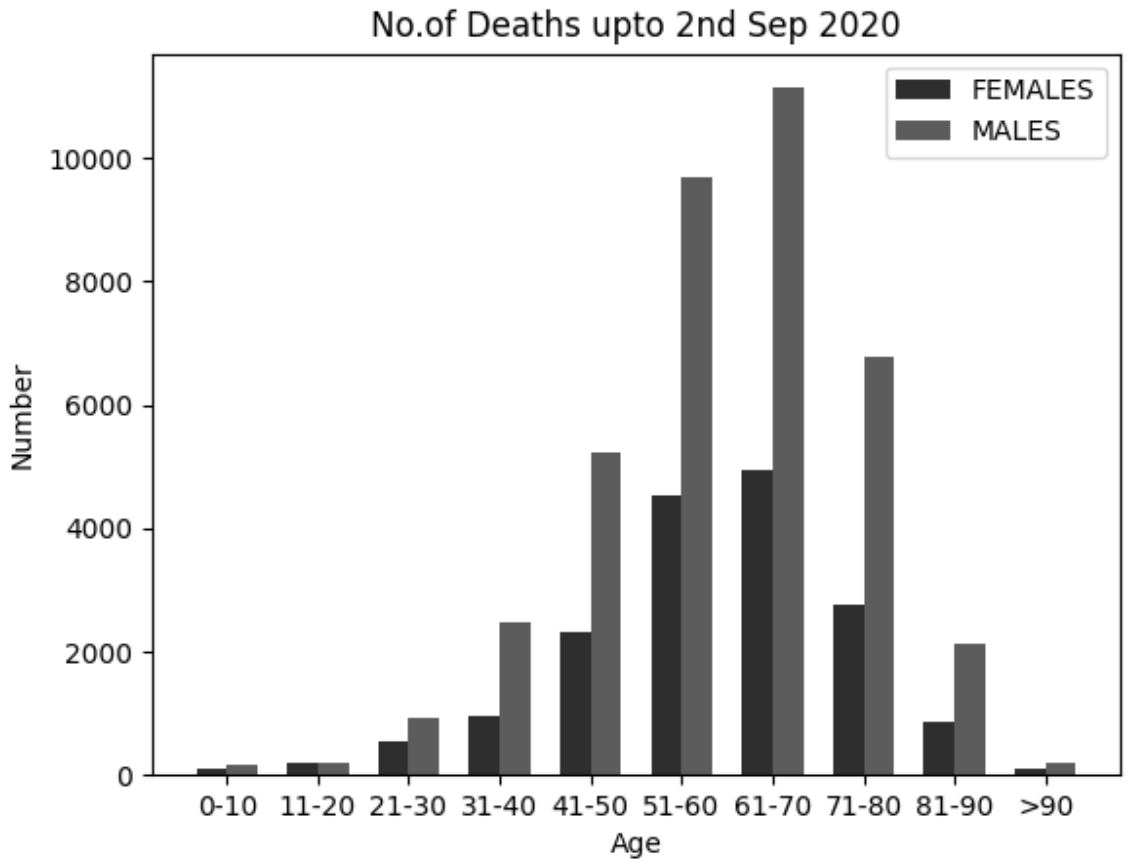
```
import matplotlib.pyplot as plt
import pandas as pd
data = pd.read_csv('.\data_2.csv')
plt.plot(data['x'],data['y'],marker = '*',color =
'#000000',markersize = 10)
plt.title('% of death in each age group')
plt.xlabel('Ages')
plt.ylabel('percent')
plt.show()
```


# Deaths in each age group in male and female due to Covid-19

Deaths caused in each age groups in male and female is shown below through a bar graph as at 2 nd September, 2020

| CSV FILE | A | B |
|---|---|---|
| 1 | female | male |
| 2 | 109 | 180 |
| 3 | 195 | 202 |
| 4 | 529 | 926 |
| 5 | 952 | 2484 |
| 6 | 2308 | 5230 |
| 7 | 4548 | 9683 |
| 8 | 4947 | 11142 |
| 9 | 2766 | 6788 |
| 10 | 857 | 2141 |
| 11 | 104 | 197 |

```
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
data = pd.read_csv('.\data_3.csv')
x = np.linspace(1,81,10)
plt.xticks(x+3/2,['0-10','11-20','21-30','31-40','41-50','51-60'
,'61-70','71-80','81-90','>90'])
plt.bar(x+0,data['female'],width = 3,color = '#2E2E2E',label =
'FEMALES')
plt.bar(x+3,data['male'],width = 3,color = '#5C5C5C', label =
'MALES')
plt.title('No.of Deaths up to 2nd Sep 2020')
plt.legend()
plt.xlabel('Age')
plt.ylabel('Number')
plt.show()
```



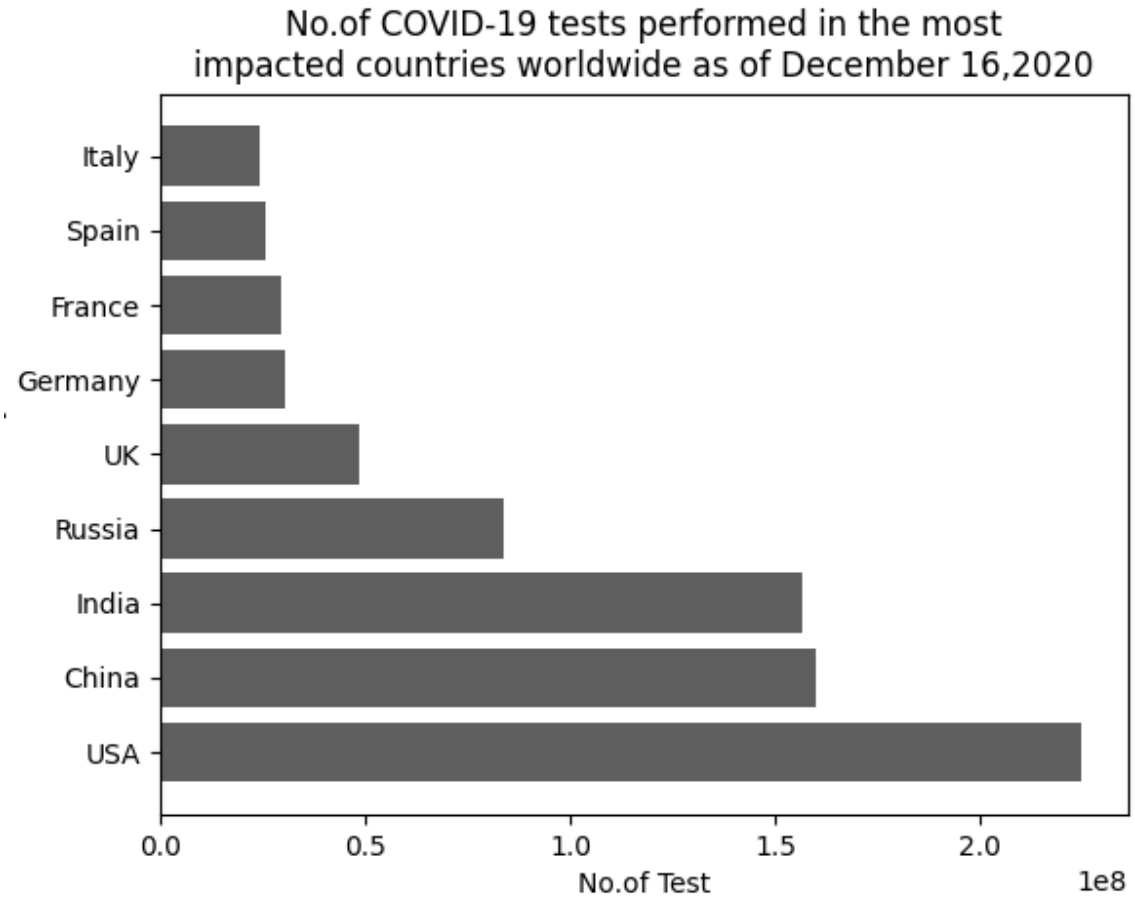

# Covid-19 test conducted by different Countries in the World

Number of Covid-19 tests conducted by different countries all over the world up to 16th December, 2020. India has done 3rd largest testing in the world.

CSV FILE:-

| | A | B |
|---|---|---|
| 1 | n | c |
| 2 | 224938642 | USA |
| 3 | 160000000 | China |
| 4 | 156646280 | India |
| 5 | 83867186 | Russia |
| 6 | 48488168 | UK |
| 7 | 30494036 | Germany |
| 8 | 29323706 | France |
| 9 | 25700000 | Brazil |
| 10 | 24918644 | Spain |
| 11 | 24482190 | Italy |

```
import matplotlib.pyplot as plt
import pandas as pd
data = pd.read_csv('.\data_4.csv')
plt.barh(data['c'],data['n'],color = '#5E5E5E')
plt.title('No.of COVID-19 tests performed in the most\n'+
          'impacted countries worldwide as of December
16,2020')
plt.xlabel('No.of Test')
plt.ylabel('Country')
plt.show()
```




# Conclusion

By visualizing data in form of bar and line graphs we are able to easily analyze that the states worsley affected due to Covid-19 are states with dense population and least affected are not so densely populated.
The worst affected age group is 61 to 70 as there are More deaths caused in this group due to Covid-19. We can also clearly see that in every age group there are more deaths caused in males than in females.
We are also able to see that India stands at third position in global testing of coronavirus with more than 15.6 crores samples already tested.