

# Informatics Practices Investigatory Project

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Analyzing the impact of Covid-19  
using Data-Visualization

**Python**



Submitted to :

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(IP)

Submitted by :

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(SCIENCE)

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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).

Subject Teacher

Principal

External Teacher

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# 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.

Abhinab Choudhury, XII  
SCIENCE

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## DECLARATION

I hereby declare that the project work entitled **"Analyzing the impact of Covid-19 using Data-Visualization."** submitted to the Hi-Tech Public School is a record of original work done by me under the guidance of **"Manmohan Mishra"** and this project work is submitted to the partial fulfillment of the requirement of 12<sup>th</sup> CBSE Board, 2023.

I also declare it has not been previously or concurrently submitted for any other studies or to any other institution.

Name : \_\_\_\_\_

Date: \_\_\_\_\_

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# 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

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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:-

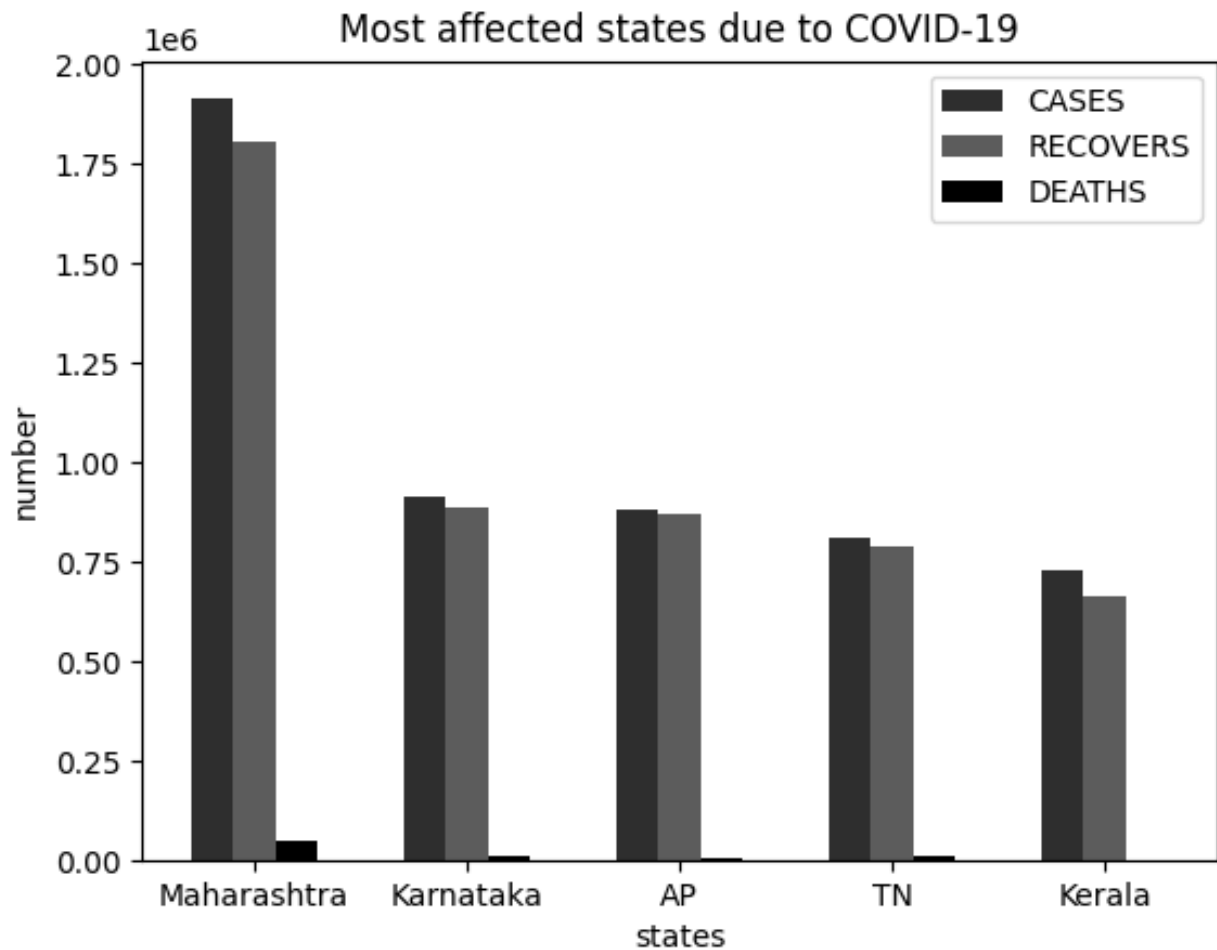
	A	B	C
1	CASES	RECOVERS	DEATHS
2	1913382	1806298	49129
3	914488	888917	12044
4	880430	869478	7091

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	A	B	C
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

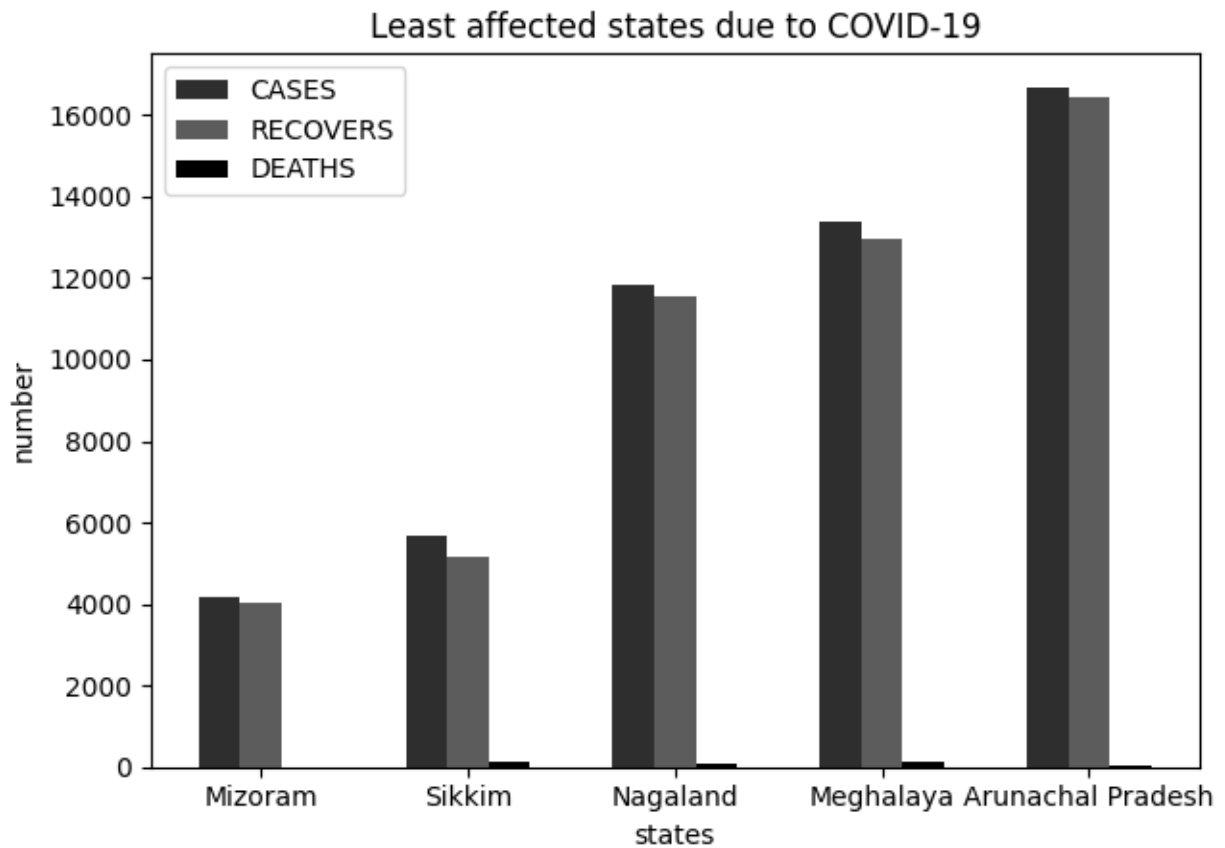
Five worst affected states in India are Mizoram, Sikkim, Nagaland, Meghalaya and Arunachal Pradesh. Given below is the bar graph as on 26th December, 2020

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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','Arunachal 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

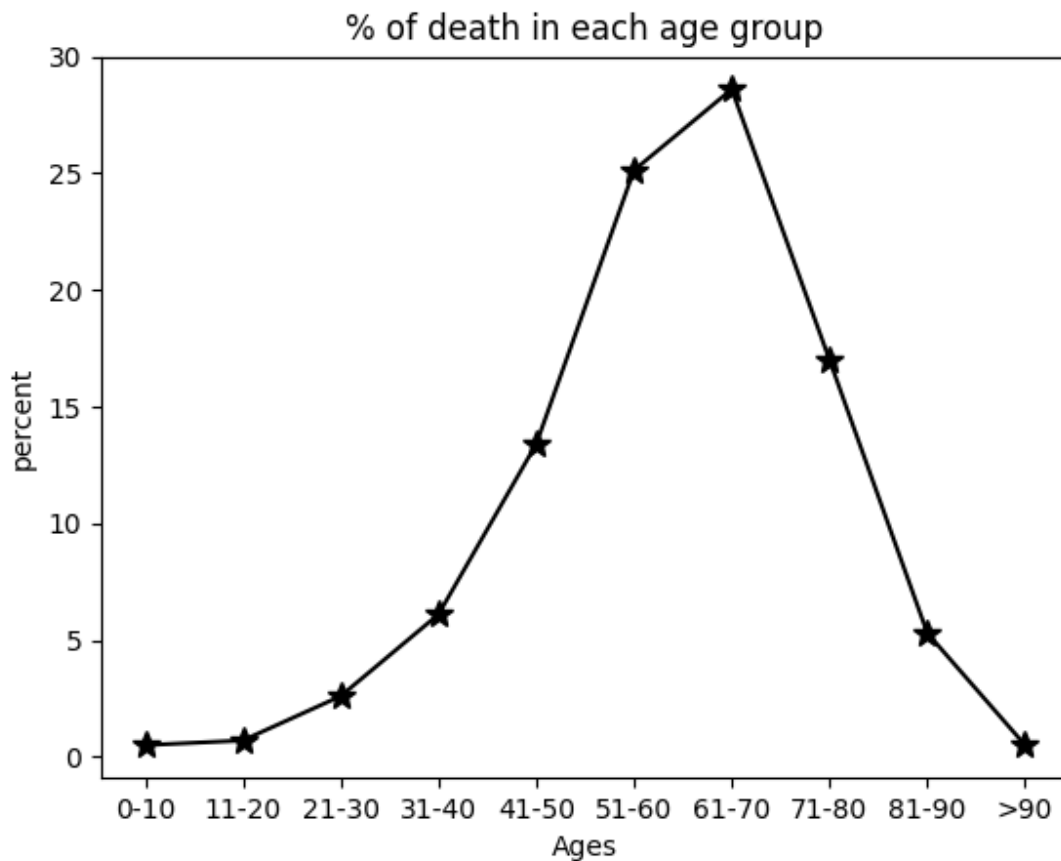
Deaths caused in each age group are shown below through a line graph as at 2 nd September, 2020.

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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()
```



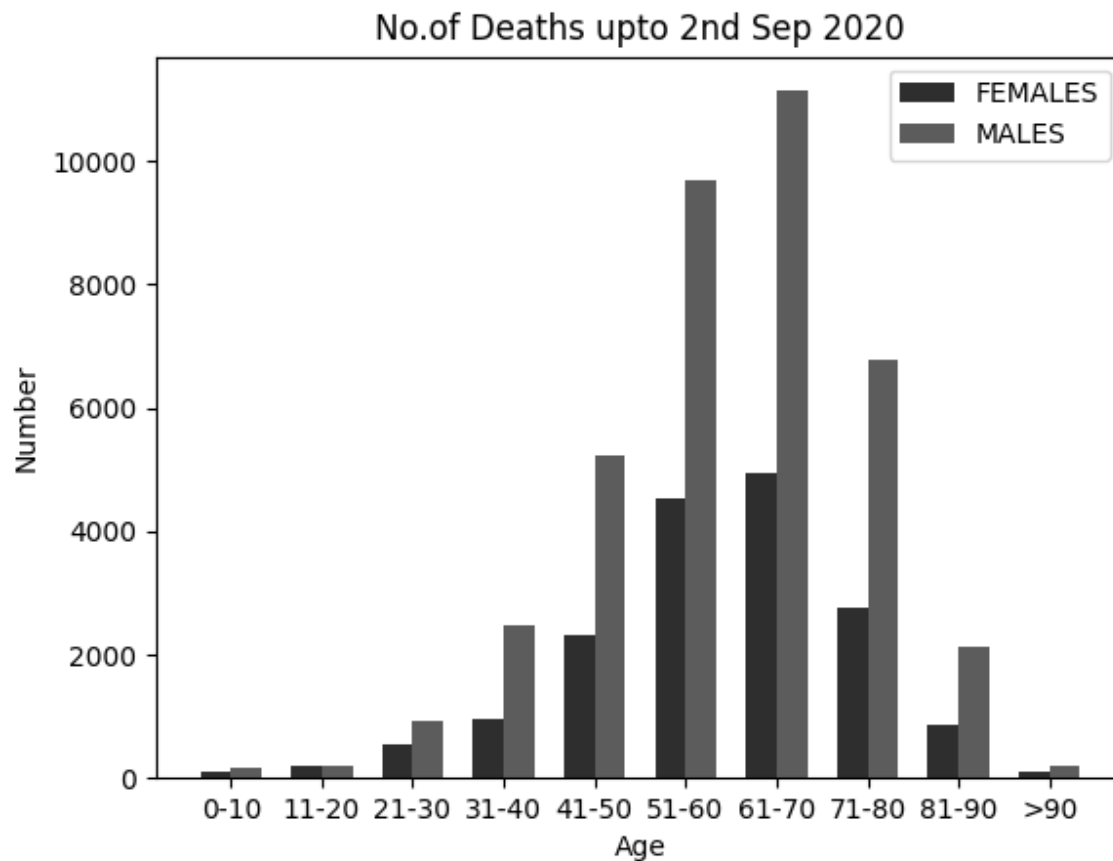
## Deaths in each age group in male and female due to Covid-19

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

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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.

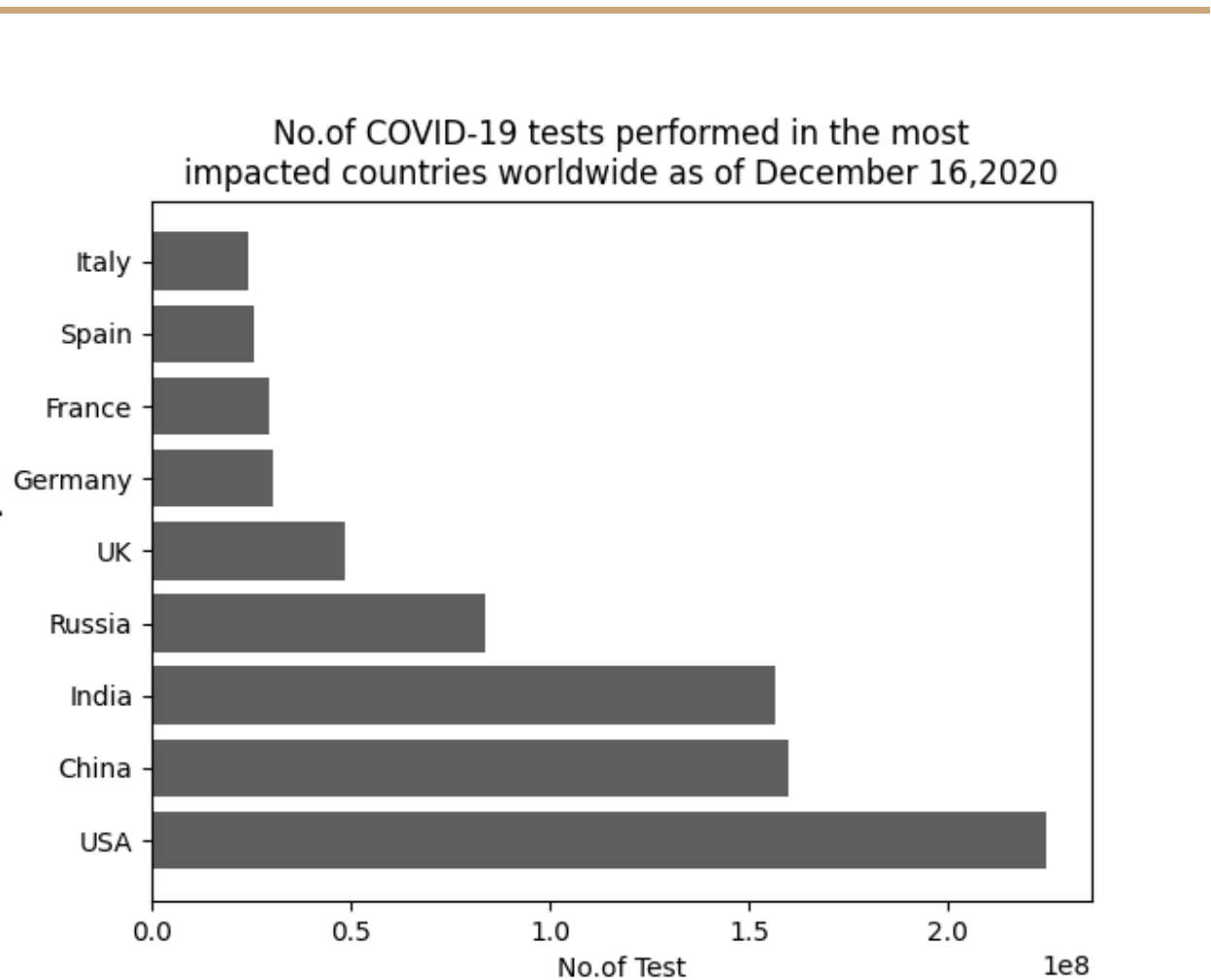
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CSV FILE:-

	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 worst 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.

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# Bibliography

sources :

<https://www.geeksforgeeks.org>

<https://github.com>

<https://en.wikipedia.org/wiki/Wikipedia>