

Report on

COVID-19 ANALYSIS

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Abstract :

Covid-19 was first reported in Wuhan, China and has spread over more than 200 countries. WHO declared COVID-19 as a public health emergency on 30 , JANUARY 2020 .As of writing this, till 5th September 2020, there are about 65 lakh confirmed cases in INDIA (*according to COVID-19 portal*).

In this report, We will take a look at the current situation in India. We will take a look at the regions which are most hampered by the outbreak and how numbers have steadily climbed in the country .

Analysis :

I am using 14 different raw_data files as a source of data from COVID-19 portal(*source link*). So, we can see that dataset provide day be day record of number of cases in different Districts. In which they have various features out of which we use

Date	Detected_District	Number_of_Cases
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Environmental and Demographic factors :

The population density of India is 414 persons/km², which is higher than the six countries with maximum COVID-19 cases. Such a finding is a paradox as countries with higher densities and people staying closer to each other are theoretically at a higher risk of contracting communicable diseases transmitted by fomites or aerosols. Since the advent of COVID-19, research on its transmission has been continued so far. The main route of transmission is claimed to be indirect contact, that is, contact with infected surfaces and then mediating the COVID-19 infection through the mouth, nose and also being transmitted from person to person through respiratory droplets that a certain amount of pathogens existing in the droppers produced by speech, coughing, sneezing .

District-wise Analysis :

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In [14]: tem = tem.sort_values(['Cases'])
          print(tem.tail())
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	District	Overall	Cases
73	174	1	247959.0
645	746	1	257984.0
121	222	1	269369.0
430	531	1	279974.0
516	617	1	330482.0

Figure 1: Districts with Highest Number of Cases

On Inspecting on above visualization we see that *mumbai* and *pune* have most number of Confirmed Cases. Now Let's see some insights in mumbai as one of the most affected city due to this pandemic and what are the effects of *Lockdown* and *Unlockdown 1.0* . Also from this visualization we can see that how movement of people are major cause of spread of this virus .

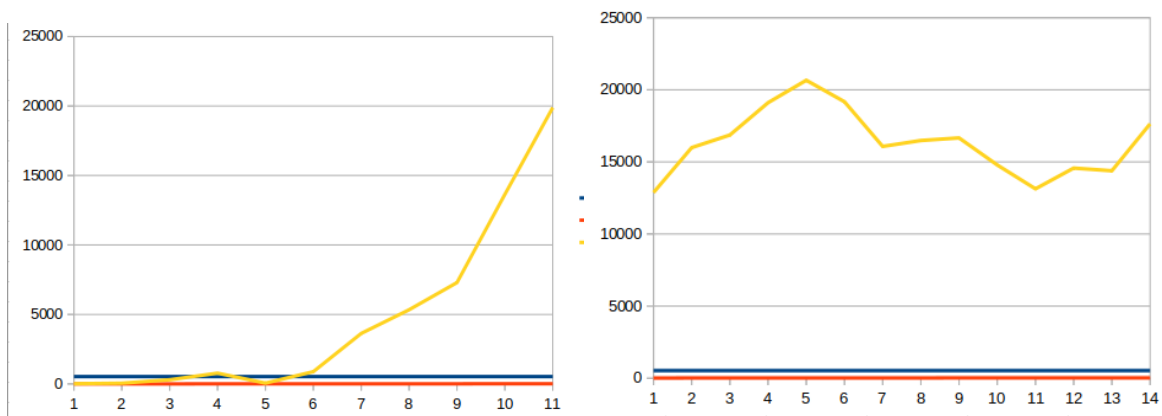


Figure 2: Cases During Lockdown

As we can see that cases are increasing in lockdown period also but after unlockdown on an average 16k confirmed cases comes every week. One of the main reason behind is this *Volume* and *Density* of Population. With nearly quarter of deaths Nationally . Mumbai as one of the most biggest city of Maharastra has emerged as the centre of India's coronavirus outbreak. According to our data and Doctors also , the peak began on 6 May and has no sign or flatting the curve with cases increasing with every passing day.

With state-run hospitals quickly running out of beds and keeping symptomatic patients waiting, the Mumbai municipal corporation has raced to convert a series of stadiums and office complexes into coronavirus wards and quarantine centres.

Also, one of the reasons of death of persons is dozens of patients with *non-Covid* related diseases are dying because they are being denied access to treatment, with some Mumbai hospitals ordered to only take in Covid-19 patients. Non-Covid patients have a right to live, they have a right to get their treatments, There has to be some kind of balanced policies so non-Covid patients don't suffer. Now Lets take a look with a district with few number of cases.

District	Cases	Polulation density
Vijayapura	34	265/ km^2
pherzawl	48	21/ km^2
mokokchung	48	110/ km^2
saiha	56	40/ km^2
lawngtlai	59	40/ km^2

Lets take a look with a district with highest number of cases.

District	Cases	Polulation density
Pune	330459	10,412/ km^2
Mumbai	279147	32,303/ km^2

From this visualization we see that Population density is one of the most important factor in spreading of Disease. With a very small Population denstiy Districts like Vijayapura , pherzawl having very few number of cases while District like Mumbai and Pune with very high Population density are on top of number of confiremd cases chart. Also there are many other factors too which cause

this virus to spread faster. Like a Major city is more worstly effected unlike a internal city. For Ex - Mumbai is worstly effected because it is one of the major cities of India.

Analysis using Z-Score :

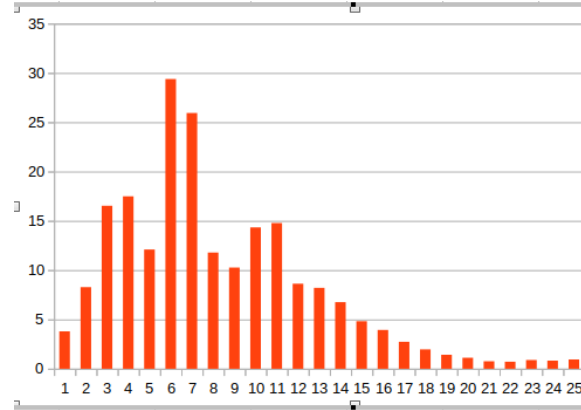


Figure 3: Mumbai Weekly Z-score on basis of neighborhood

From the above visualization we see that *Z-Score* of Mumbai is very high till 11th and 12th week and then after that it decreases. A positive *Z-Score* implies that the raw score is above than the mean average and similarly , A negative *Z-Score* implies that the raw score is below than the mean average. So when the pandemic start and cases start increasing , Goverment of India imposed Lockdown and due to which inter District movements are stopped and we can see from above visualization that z-score is much greater in initial weeks, it indicates that Mumbai has more cases than average of its neighbors and after lockdown when Unlock 1.0 imposed the z-score starts decreasing because people start migrating to their native districts(may be neighbors) and disease spread all over region because major cause behind spread of this virus is person to person transfer. The value of Z-score in continously deacreased till 5th of september as shown in the figure.

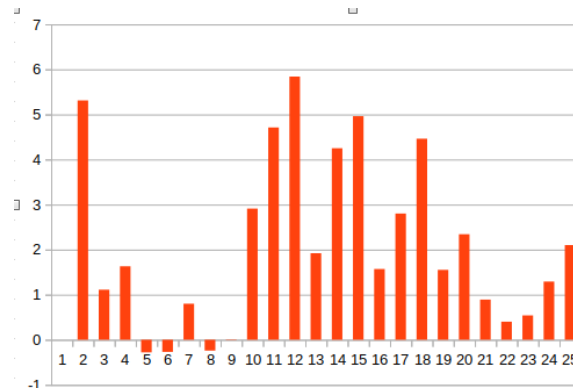


Figure 4: Delhi Weekly Z-score on basis of neighborhood

From above visualization we can see that Delhi has initially less cases but when the unlock imposed and another reason is people coming back to airports of delhi from another countries ,The Z-score of Delhi is Rising.

State-wise Analysis :

We also calculated the State-Wise Z-Score of a particular district from which we can visualize the cases in a district in comparison with the state .

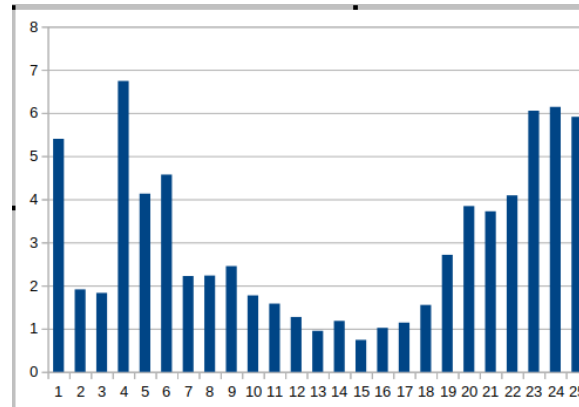


Figure 5: Pune Weekly Z-score on basis of State

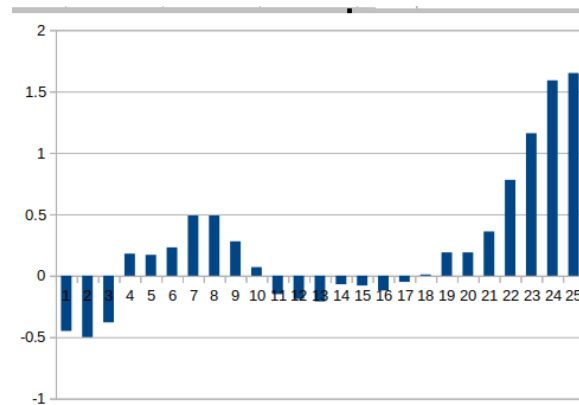


Figure 6: Nasik Weekly Z-score on basis of state

From above visualization we can see the comparison between Z-score of *Pune as one of the most affected district in Maharashtra* and *Nasik as one of the least affected district of Maharashtra* . One

Reason is Population Density but also Pune has many industries due to which chances of people affecting from each other is also high.

Overall Analysis :

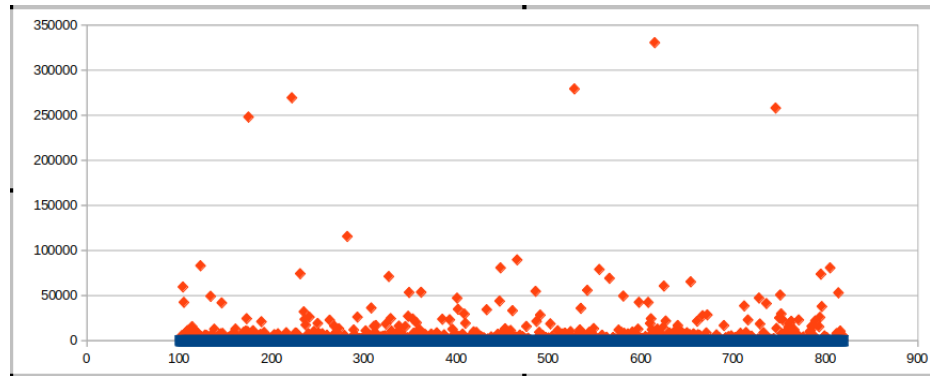


Figure 7: Overall Cases Of Districts

From this we can see that some districts are most affected by Covid-19 pandemic. Some of the most affected districts from above visualization are:

1. Benagaluru
2. Chennai
3. Mumbai
4. Pune
5. Thane

Reason Why Metro Cities are Worst hit by Covid-19 Pandemic :

Coronavirus continues to spread across India, despite the efforts by both the central and state governments, with the metropolises bearing the dual brunt of health and economic crisis with no respite from the disease and the consequent shutting down of businesses.

India's major cities, including Delhi, Mumbai, Kolkata, Chennai, Pune and Bangalore, are facing a major burden of Covid-19, with Mumbai and Delhi being the worst-hit. b

1. **Major Trade Hubs :** The cities are striving to prevent the spread of the virus and are largely bearing the brunt of the economic impact because of the lockdown and the resultant disruption of services as they are hubs of trade, restaurants, hotels and other businesses.
2. **Migration :** Concentration of activities in large cities results in productivity gains and, hence, real wages are also higher in metros compared to small- and medium-sized towns. That is the reason why rural-to-large city migration in India is high, though the rural-to-all-urban areas migration is only moderate.

The covid-19 pandemic has created a critical situation in terms of the economy of these cities as the spread of coronavirus has displaced people and all sizes of businesses.

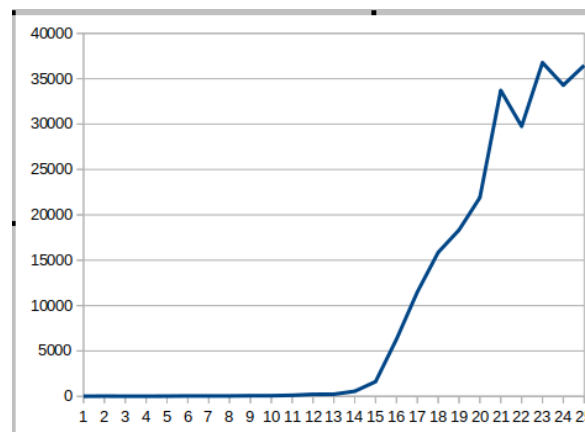


Figure 8: Weekly Cases Of Bangalore

From Above visualization of Bangalore we can see Bangalore as one of the most successful Metro City during lockdown , hit very hard by covid-19 after lockdown because of opening of State borders and travelling of people in and out of the state borders.

Impact of Covid-19 :

1. Healthcare

- (a) Patients with other disease and health problems are getting neglected
- (b) Overload on doctors and other healthcare professionals, who are at a very high risk
- (c) Disruption of medical supply chain
- (d) High burden of the functioning of the existing medical system

2. Economic

- (a) Slowing of the manufacturing of essential goods
- (b) Disrupt the supply chain of products
- (c) Losses in national and international business
- (d) Significant slowing down in the revenue growth

3. Social

- (a) Service sector is not being able to provide their proper service
- (b) Cancellation or postponement of large-scale sports and tournaments
- (c) Avoiding the national and international travelling and cancellation of services
- (d) Disruption of celebration of cultural, religious and festive events
- (e) Social distancing with our peers and family members
- (f) Closure of the hotels, restaurants and religious places
- (g) Closure of places for entertainment such as movie and play theatres, sports clubs, gymnasiums, swimming pools, and so on.
- (h) Postponement of examinations

Conclusion :

The main aim of this report is to analyze the *COVID-19* spread in india from *15th March* to *5th September* and to understand why National and local authorities are having a difficult time in dealing with the *COVID-19*.

Moreover in this report we mostly considered confirmed cases on weekly , monthly and overall basis. But as a future expand we can extend this analysis to see pattern in different age groups and which type of society affected most by this pandemic.