

# India's Capital Delhi Fighting with COVID-19: A Comprehensive Study

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## ARTICLE DETAILS

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## ABSTRACT

COVID-19 is a highly infectious disease which does not have any vaccination or therapeutic medicine till now. Delhi, which is the capital of India, is profoundly affected by more confirmed cases. In this paper, we discuss the trend of the number of positive cases, death cases, cumulative positive and death cases of Delhi. Test per million, total samples tested, and the ratio of positive cases among sample tested of Delhi has been discussed. Statistics of various parameters related to COVID-19 for Delhi has been compared with Indian Major cities and major cities of the world as well. The forecasting technique has been used to predict the future state of confirmed cases, death cases, cumulative confirmed cases and death cases till 30 September 2020, based on the recent past data. Further, we have discussed the various efforts, initiatives by the Government of Delhi.

## 1. Introduction

Delhi- The National Capital Territory (NCT) of India which is the large metropolitan area in India. Delhi's 2020 population is projected at 30,290,936. In 1950, the population of Delhi was 1,369,369. Since 2015, Delhi's population has grown by 4,425,060, which represents a 3.21% annual change. By 2020, Delhi is estimated to be the third-largest conurbation after Tokyo and Mumbai. These estimates represent the Urban agglomeration of Delhi, which typically includes Delhi's population in addition to adjacent suburban areas. The NCT<sup>1</sup> and its urban area are granted the special status of the National Capital Region (NCR). The NCR includes adjacent cities of Baghpat, Alwar, Sonapat, Gurgaon, Ghaziabad, Faridabad, Greater Noida, Noida, and nearby towns. Area size of Delhi is 1,484 square kilometers. The city has a population density of 29,259 people per square mile, which is one of the highest in the world. As of 2000, the largest ethnic group is Indo-Aryan which is 72%, Dravidian, which is 25%, Mongoloid and other groups are 3%. Delhi has a tilted female-to-male proportion; there are 866 women for every 1,000 men. The city has an overall literacy rate of 86%, to be specific, 91% of men are educated, and 81% female are educated. Hindi is the utmost spoken language which is 81%, Punjabi which is at 7% and Urdu speaking population are 6%. Approximately 82% of the population practices Hinduism, 12.86% are Islam, Christianity are 0.87%, and Buddhism is 0.11%. Delhi has continuously been inhabited from the sixth century onwards. Delhi was the capital of many empires and kingdom. It has also been captured, demolished and reconstructed many times. It was the place of Indraprastha, the mythical capital of the Pandavas. During the time of the Delhi sultans, it became a significant trade route between the Gangetic plain and northwest India. In the year of 1639, the walled city of Shahjahanabad was built in Delhi to aid as the capital of the Mughal Empire. In 1911, the British authorities decided to change the capital of India to Delhi from the existing capital Calcutta, and New Delhi was developed in 1912 south of the old city. At present, New Delhi is part of the larger city of Delhi, and New Delhi is the capital of India. Delhi has proliferated and

is facing substantial pressure to improve commercial and residential infrastructure. Delhi is a second populated city in India after Mumbai. The capital<sup>2</sup> of India consists of a vast metropolitan area that combines a cultural and short-term political centre. Delhi has more museums than in other places. Also, 58 embassies and consulates are located in Delhi. Delhi has an annual average of 200 days over 30°C.

Delhi is surrounded<sup>3</sup> by Haryana state on three sides and by Uttar Pradesh in the east side. Delhi is located at North Latitude from 28.24 28.53 degrees and East Longitude from 76.50 - 77.20 degrees. Delhi covers an area of 1483 Sq. Km., 25% in rural and 75% in urban. i.e. 369.35 Sq. Km. as rural and 1113.65 Sq. Km. as urban, which contributes to Delhi to be the largest city in the country in terms of area. It has a length of 51.9 km and breadth of 48.48 Km. Delhi has 11 districts with 33 Sub-Divisions. Two notable characteristics of Delhi are the Yamuna flood plains and the ridge. NCT of Delhi has 11 districts (figure 1), two districts of Shahdara and South-East were developed in 2012. Delhi has five municipalities within the National Capital Territory.



Figure 1. Districts of Delhi<sup>4</sup>

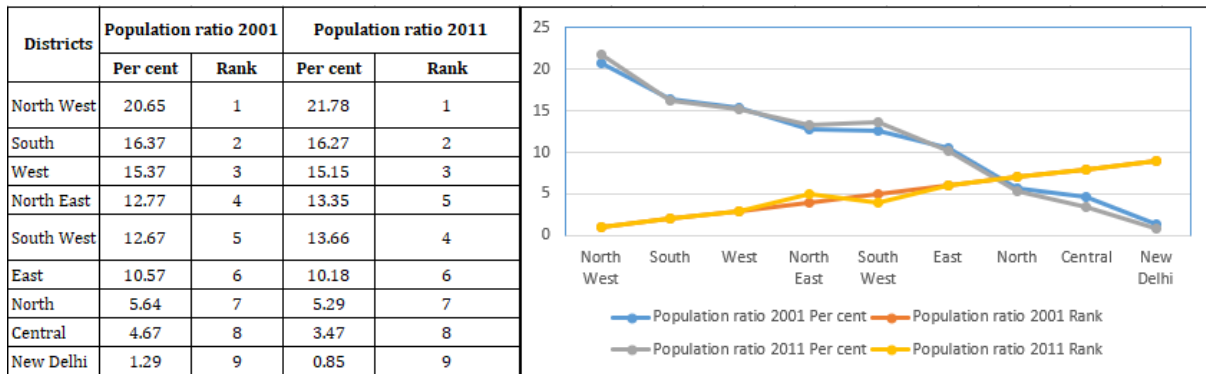


Figure 2. Population ratio and ranks of districts in Delhi (2001 and 2011)<sup>5</sup>

The population of the districts in Delhi are shown in figure 2. The northwest district has the highest population, and New Delhi has the least population. North-east was in 4th place as per the 2001 population study and moved to 5th place in 2011. Similarly, South-west was in 5th place as per 2011 population study and moved to 4th place in 2011. Population density of Northeast district was 29468 in 2001 and increased to 36155 in 2011. Population density of Central district was 25855 in 2011 and increased to 27730 in 2011. Similarly, there was an increase in the districts of East, west, north, south, northwest

and south-west. In contrast, the population density of New Delhi was 5117 in 2001 and 4057 in 2011 (figure 3). In the year 2000, the population of Delhi was 12.4 Million, 22.7 million in 2011 and the projected population of Delhi in 2025 would be around 32.9 million. Based on the comparison which consists of 10 major cities in the world (Tokyo, Mexico City, New York, Sao Paulo, Mumbai, Shanghai, Kolkata, Delhi, Buenos Aires and Los angles), among all these cities, Delhi was in 8th place in 2000, second place in 2011 and possibly Delhi may retain the second position in 2025 too (Table 1)

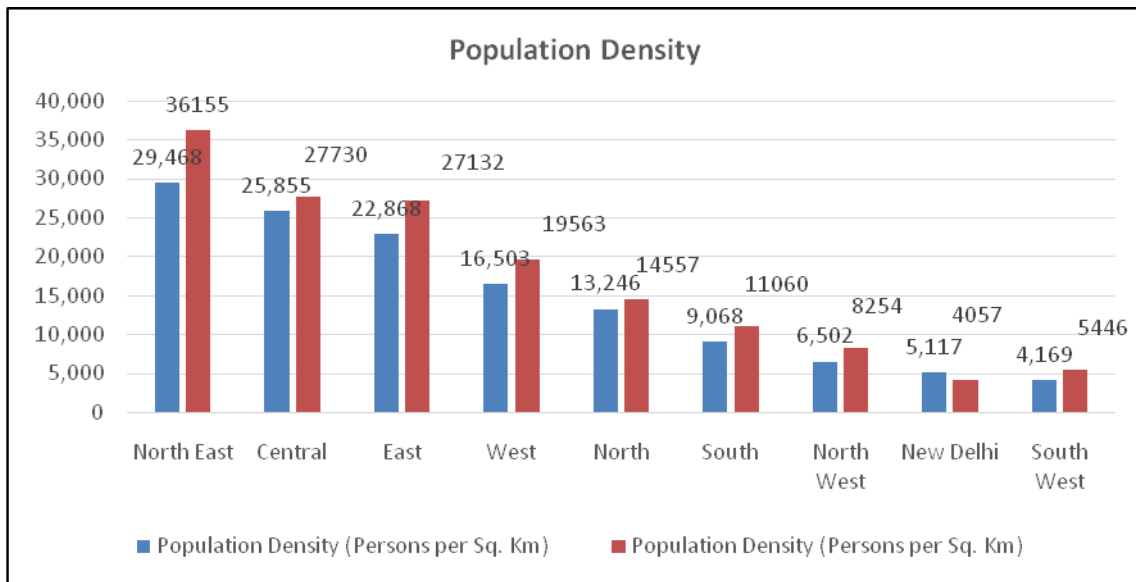


Figure 3. Population density of districts in Delhi<sup>5</sup>

Population in Millions						
S No	2000		2011		2025 (projected)	
	Cities	Population	Cities	Population	Cities	Population
1	Tokyo	34.5	Tokyo	37.2	Tokyo	38.7
2	Mexico City	18	Delhi	22.7	Delhi	32.9
3	New York	17.9	Mexico City	20.4	Shanghai	28.4
4	Sao Paolo	17.1	New York	20.4	Mumbai	26.6
5	Mumbai	16.1	Shanghai	20.2	Mexico City	24.6
6	Shanghai	13.2	Sao Paolo	19.9	New York	23.6
7	Kolkata	13.1	Mumbai	19.7	Sao Paolo	23.2
8	Delhi	12.4	Beijing	15.6	Dhaka	22.9
9	Buenos Aires	11.9	Dhaka	15.4	Beijing	22.6
10	Los Angels	11.8	Kolkata	14.4	Karachi	20.2

Table 1. The population of world cities in 2000, 2011 and 2025 projection<sup>5</sup>

## 2. COVID-19 Situation

COVID-19 is a highly<sup>6</sup> infectious respiratory disease caused by the SARS-CoV-2 virus. SARS-CoV-2 can easily spread from person to person through droplets released when an infected person coughs, sneezes, or talks. It can quickly spread when someone is touching a surface with the virus on it and further touching one's mouth, nose, or eyes. Known symptoms of COVID-19 are fever, cough, and challenges in breathing. The symptoms usually appear two to fourteen days after exposure to the COVID-19. Some people may be

asymptomatic, but they can spread the virus. Most of the affected people with COVID-19 can recover without any special treatment. However, aged people and others who have serious medical problems, such as cardio, respiratory, diabetes, cancer and a weak immune system can affect severely. There have been 16,341,920 confirmed<sup>7</sup> cases of COVID-19, including 650,805 deaths, reported to WHO, as on 28 July 2020. The USA, Brazil, India, Russia, South Africa, Mexico, Peru, Chile, the UK and Iran are the Top 10 COVID-19 affected countries globally.

State/UT	Confirmed	Active	Recovered	Deceased
Maharashtra	357117	144018	199967	13132
Tamil Nadu	199749	53132	143297	3320
Delhi	128389	13681	110931	3777
Karnataka	85870	52799	31347	1724
Andhra Pradesh	80858	39990	39935	933
Uttar Pradesh	60771	21711	37712	1348
West Bengal	53973	19154	33529	1290
Gujarat	53545	12418	38849	2278
Telangana	52466	11677	40334	455
Rajasthan	34178	9029	24547	602
Bihar	33926	11363	22343	220
Assam	29921	8084	21761	76
Haryana	29755	6420	22953	382
Madhya Pradesh	26210	7553	17866	791
Odisha	22693	7372	15201	120
Kerala	16995	9379	7562	54
Jammu and Kashmir	16782	7269	9217	296
Punjab	12216	3838	8096	282
Jharkhand	7493	4116	3307	70
Chhattisgarh	6731	2128	4567	36
Uttarakhand	5445	1986	3399	60
Goa	4540	1646	2865	29
Tripura	3759	1617	2131	11
Puducherry	2515	997	1483	35
Manipur	2146	655	1491	0
Himachal Pradesh	1954	798	1145	11
Ladakh	1246	209	1035	2
Nagaland	1239	701	537	1
Arunachal Pradesh	1056	661	392	3
Chandigarh	823	275	535	13
Dadra and Nagar Haveli and Daman	815	301	512	2
Meghalaya	588	496	87	5
Sikkim	477	335	142	0
Mizoram	361	178	183	0
Andaman and Nicobar	259	85	174	0
Daman and Diu	0	0	0	0
Lakshadweep	0	0	0	0

**Table 2.** Confirmed, active, recovered death cases in various states of India<sup>8</sup>

Maharashtra<sup>8</sup>, Tamil Nadu, Delhi, Karnataka, Andhra Pradesh, Uttar Pradesh, West Bengal, Gujarat, Telangana and Rajasthan are the topmost affected states in India (Table 2). Nagaland, Arunachal Pradesh, Chandigarh, Dadra and Nagar Haveli and Daman, Meghalaya, Sikkim, Mizoram, Andaman and Nicobar, Daman and Diu and Lakshadweep are the least

affected states in India. Maharashtra is in first place with 357117, Tamil Nadu is in second place with 199749 (figure 5) and Delhi is in 3rd place with 128389 confirmed cases. Table 2 shows the Confirmed, Active, Recovered and instances of death for all the states. Figure4 indicates the trend of the confirmed, active and death cases for all the states.

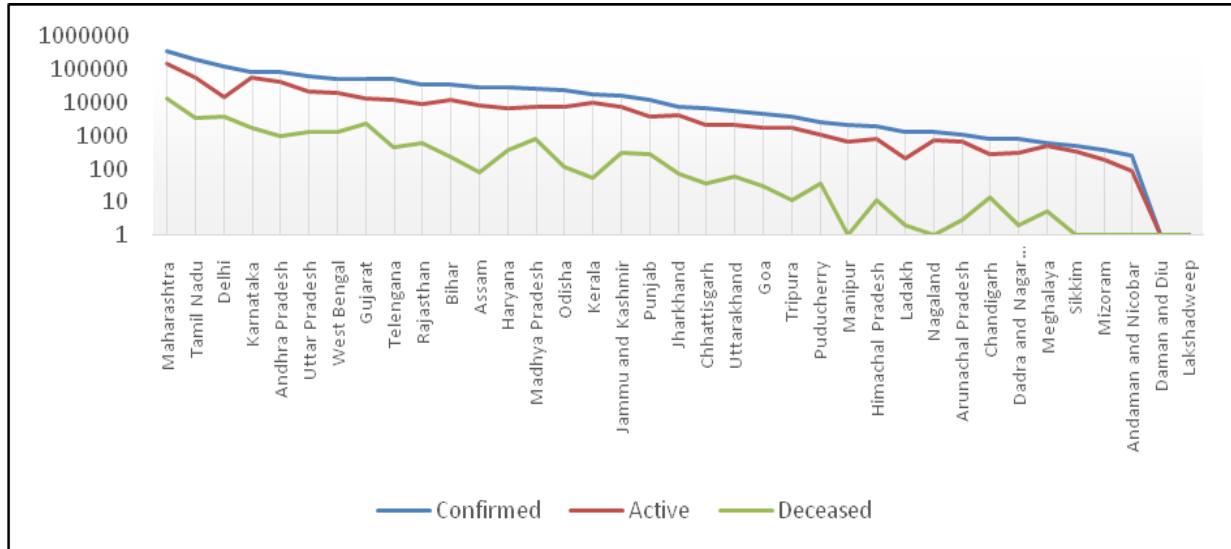


Figure 4. Pattern of confirmed, active and deceased cases in India<sup>8</sup>

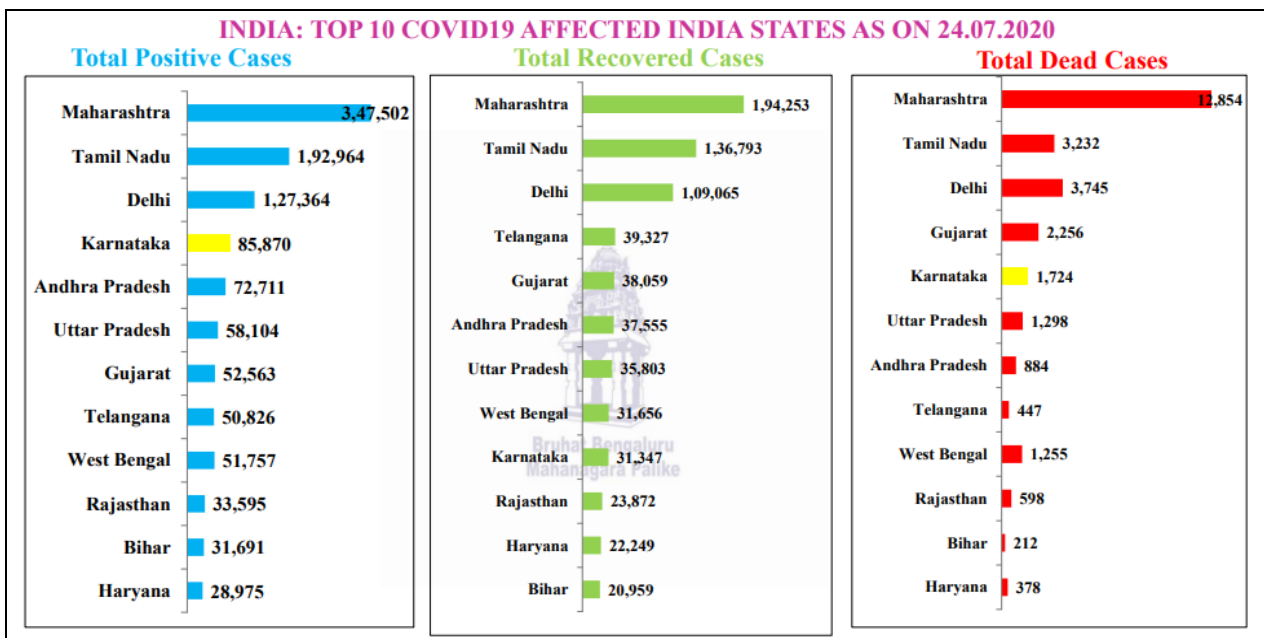


Figure 5. Top 10 COVID-19 affected stated in India<sup>9</sup>

Figure 6 shows the comparison of various cities across the world. New York, Sao Paulo, Moscow, England, Madrid, Delhi, Mumbai, Chennai, Bengaluru have taken for review. Delhi is affected severely compare than other cities in India. The reason for the high numbers could be that it is not just a city, but Delhi consists of various districts as an NCT. In some

reviews, Delhi considered as a city for comparison, and in some research, it is considered as a state/UT and compared with other states. Also, Delhi has a greater number of embassies and hence an opportunity for more international travelers for tourism and business trips.

CITIES SCENARIO: INDIA & WORLD CITIES AS ON 24.07.2020

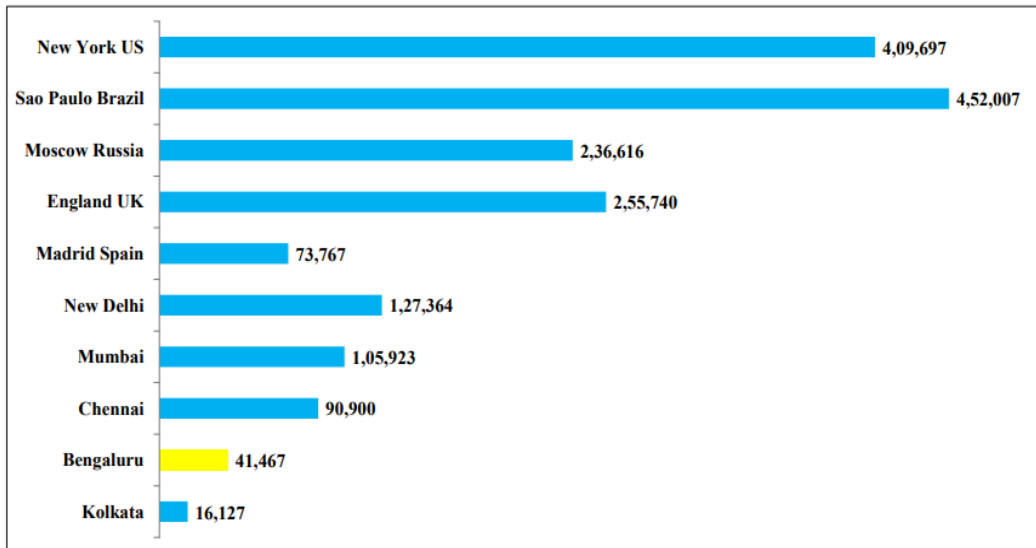


Figure 6. COVID-19 case comparison of Indian cities with world cities<sup>9</sup>

Figure 7 shows the positive, recovered and death cases of the major cities in India. Delhi<sup>9</sup> is in first place with 127363 cases (as on 24 July 2020), Mumbai is in second place with 105923 cases (figure 7), Chennai is in 3<sup>rd</sup> place with 90900 cases, Bengaluru is in 4<sup>th</sup> place with 41467 and Kolkata is in 5<sup>th</sup> place with 16127 cases. It is a fact that Delhi is in 1st place in terms of confirmed cases. However, Delhi is in 2nd place in

death cases with 3777 cases. When we calculate the Confirmed to the population, Delhi is in 3rd place with 0.424 % and again in 3rd place with 2.942 % when we estimate death cases to the confirmed cases. Delhi is in 3rd place with 0.012 % in terms of death cases to the population. (Table 3). Figure 8 shows the pattern and variation of various parameters mentioned above.

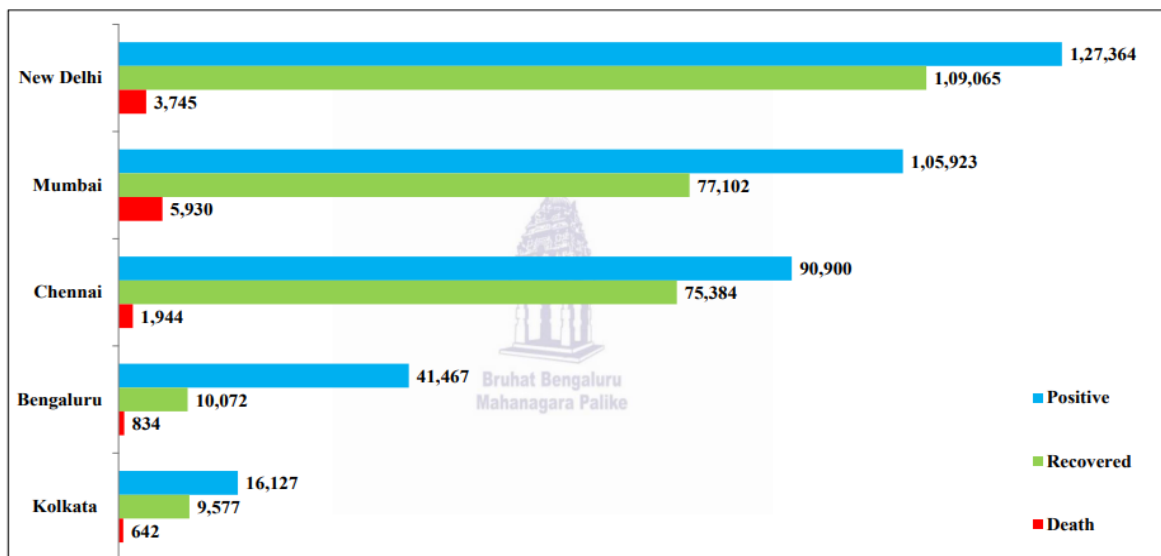


Figure 7. COVID-19 case comparison of Indian cities<sup>9</sup>

City	Population	Confirmed cases	Death cases	Confirmed to the population	Death cases to the confirmed cases	Death cases to the population
Delhi	30290936	128389	3777	0.424	2.942	0.012
Mumbai	20411274	105923	5930	0.519	5.598	0.029
Chennai	10971108	90900	1944	0.829	2.139	0.018
Bengaluru	12326532	41467	834	0.336	2.011	0.007
Kolkata	14850066	16127	642	0.109	3.981	0.004

Table 3. Comparison of various proportion for India's major cities

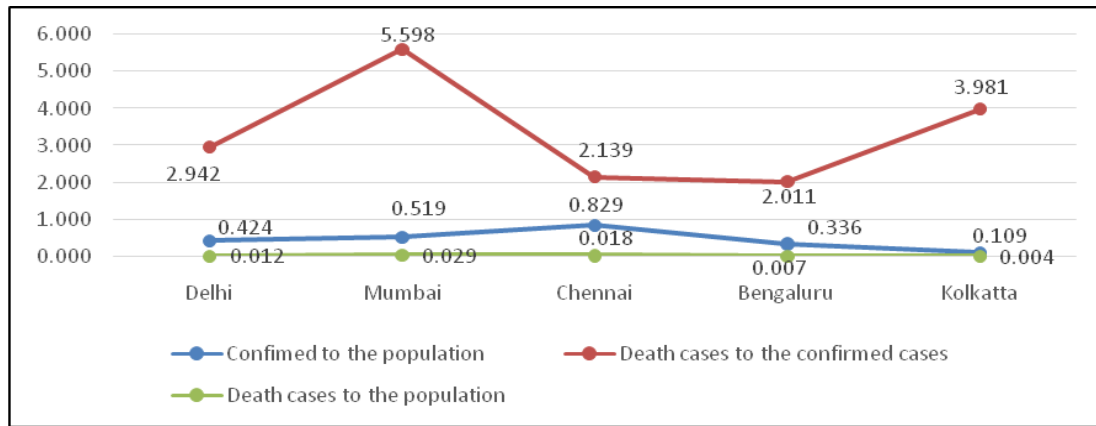


Figure 8. Comparison of various proportion for India's major cities

The first COVID-19 case in the Indian capital<sup>10</sup> Delhi was reported on 2 March 2020. The entire month of March, the number of cases per day was in single digit except on 29 (10 cases) and 20 March (48 cases). Throughout the April month, the number of cases per day varies between two and three-digit, max it went up to 356 cases on 13 April 2020. The number of cases per day varies between 300-800 for the first three weeks in May 2020, and last four days of the month, it was around 1100 on an average. In the entire June month, the number of cases varies from 2000 to 4000. In the third week of July 2020, the number of cases is between 1000-2000, on 23 July 2020, the number of cases was 1042. Even after 2-3

months since the confirmed cases count increased, it is not coming down below 1000 (figure 9). On 17 March 2020, the number of cases reached double-digit. i.e. 10 cases. By the end of March (31 March 2020), the number of cumulative cases is 97. On 11 April 2020, the number of cumulative cases is 1069. By 8 May 2020, the number of cases reached five digits (10054). within 15 days, i.e. on 1 June 2020, the number of cases is doubled (20834). It is increased by four-time by the end of June (87360 cases as on 30 June 2020). As on 23 July 2020, the number of cases is 127364. From the above pattern, it is understandable that the pattern of the confirmed cases is in the exponential growth. (figure 10).

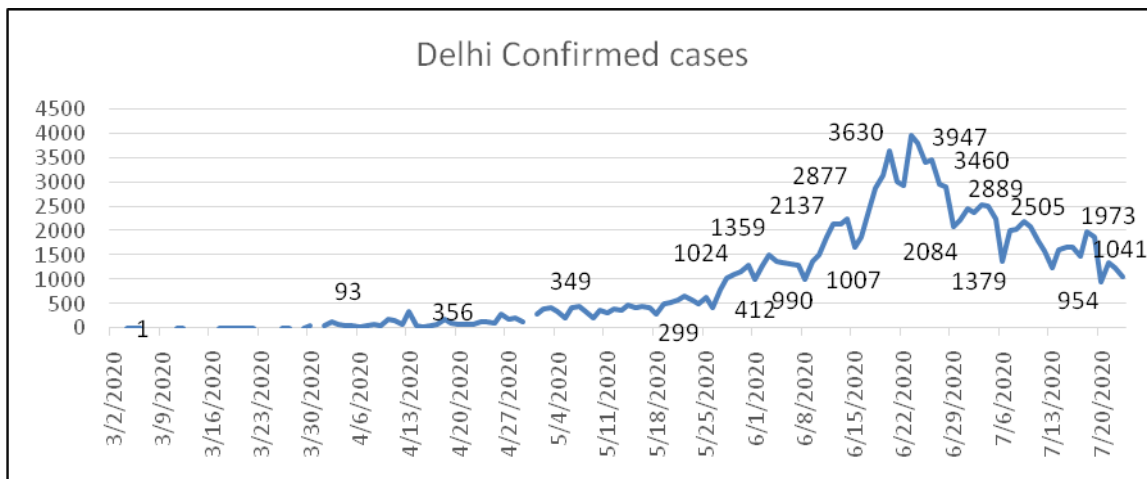


Figure 9. Confirmed cases in Delhi (Day-Wise)<sup>10</sup>

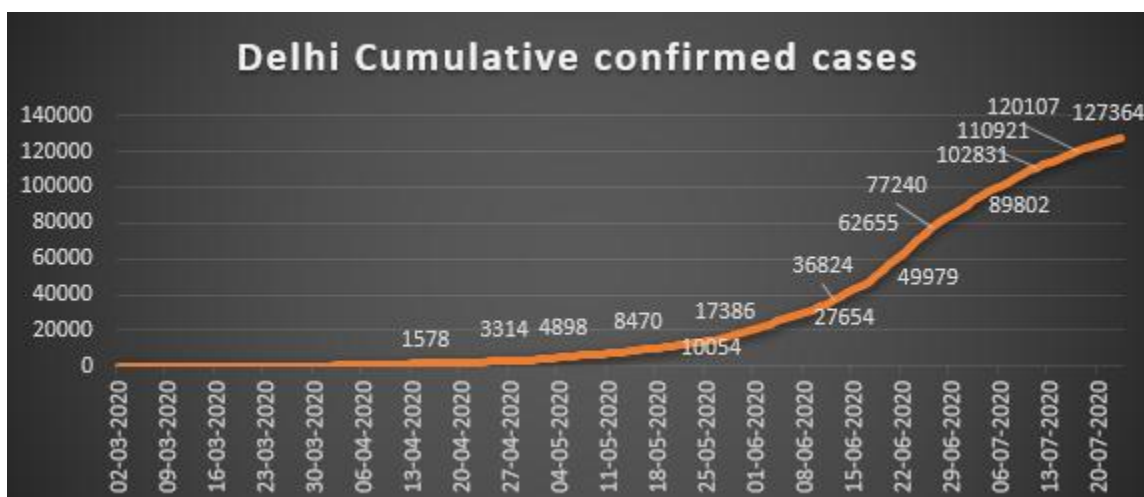


Figure 10. Cumulative confirmed cases in Delhi (Day-Wise)<sup>10</sup>

Till 12 May 2020, the number of death cases per day reported was in single-digit and on 13 May 2020, the number of deaths reported is 20. From 13 May to 10 June 2020, the number of death cases are constant and vary between 10-80 and on 11 June, there were 101 deaths reported. From 12 June till 23 July 2020, almost everyday death cases were reported, and the count varies between 30-80. However, on 16 June 2020, 437 deaths reported. This is huge in numbers, and it is due to reconciliation (figure 11). As on 1 April 2020, the number of cumulative death cases is 2. By 9 April, the count

increased to 12. As on 13 May 2020, the cumulative death count increased to triple-digit, i.e. 106 deaths. Within 17 days, i.e. as on 1 June 2020, the cumulative counts increased to 523. Within ten days from 1 June, the count increased to 1085 on 11 June 2020. Surprisingly within next eight days duration, the number of deaths doubled, and the count was 2035 on 19 June 2020. By the end of June, the cumulative deaths were 2742. As on 23 July 2020, the cumulative death cases reported is 3745 (figure 12).

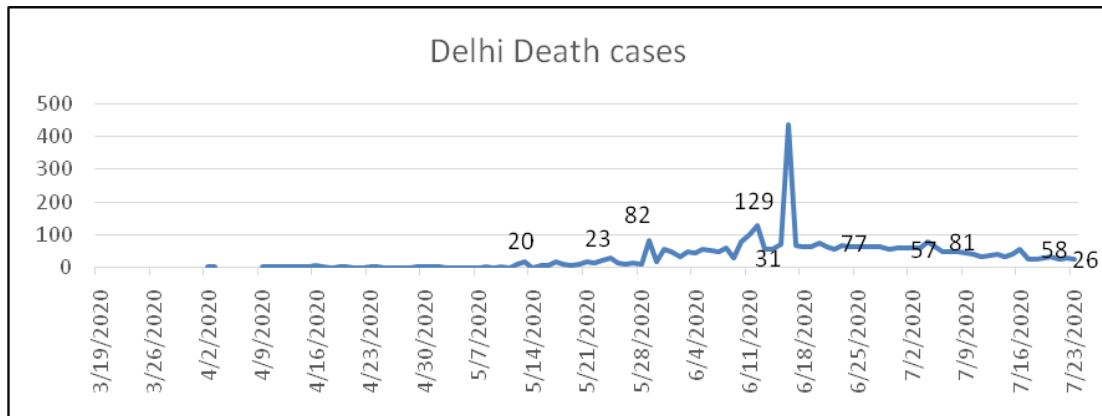


Figure 11. Death cases in Delhi (Day-Wise)<sup>10</sup>

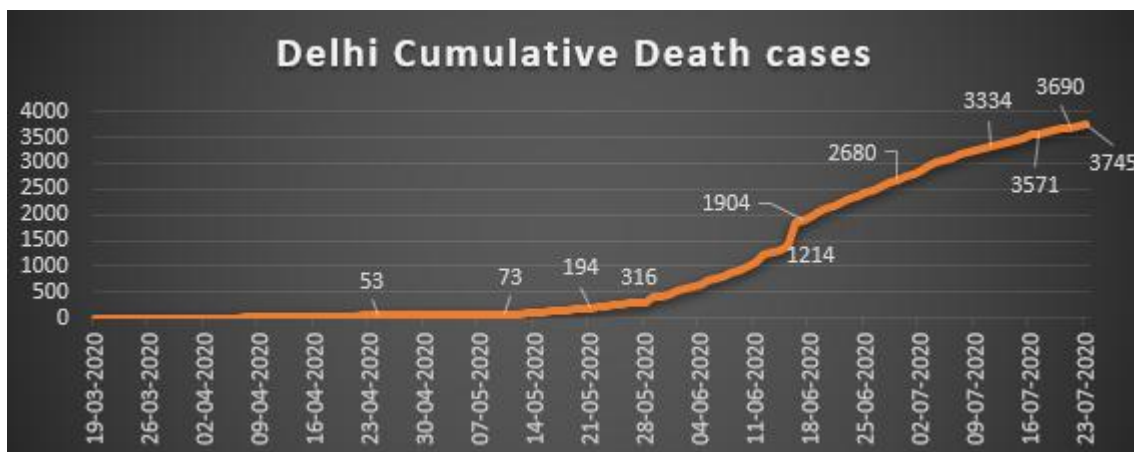


Figure 12. Cumulative death cases in Delhi (Day-Wise)<sup>10</sup>

There were 16910 tests performed per million as on 18 June 2020, and there were 33868 tests performed as on 5 July 2020. Forty-six thousand eight hundred twenty tests performed per million as on 23 July 2020. (figure 14 right side image). 321302 total tests performed as on 18 June 2020. 514573 total

tests performed as on 29 June 2020. 643504 tests performed as on 5 July 2020. 889597 tests performed as on 23 July 2020. (figure 13 left side image). Figure 14 shows the trend of total tests performed and tests per million in a single graph.

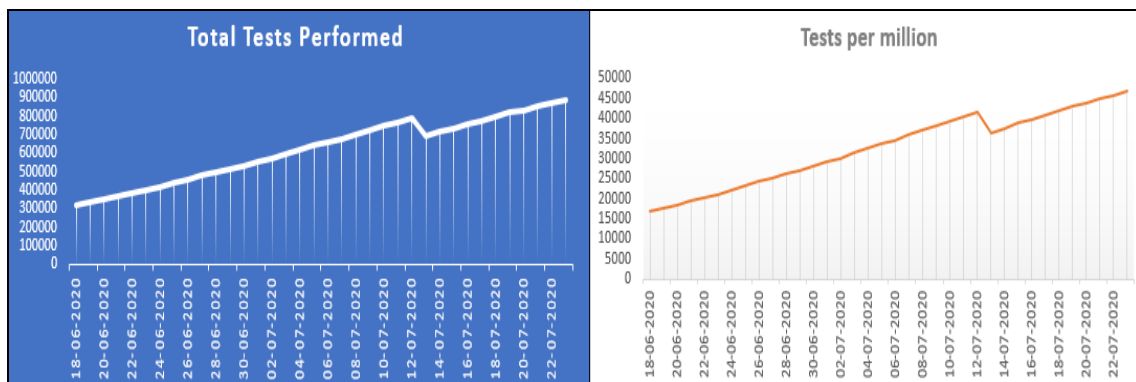


Figure 13. Total tests performed and tests per million<sup>10</sup>

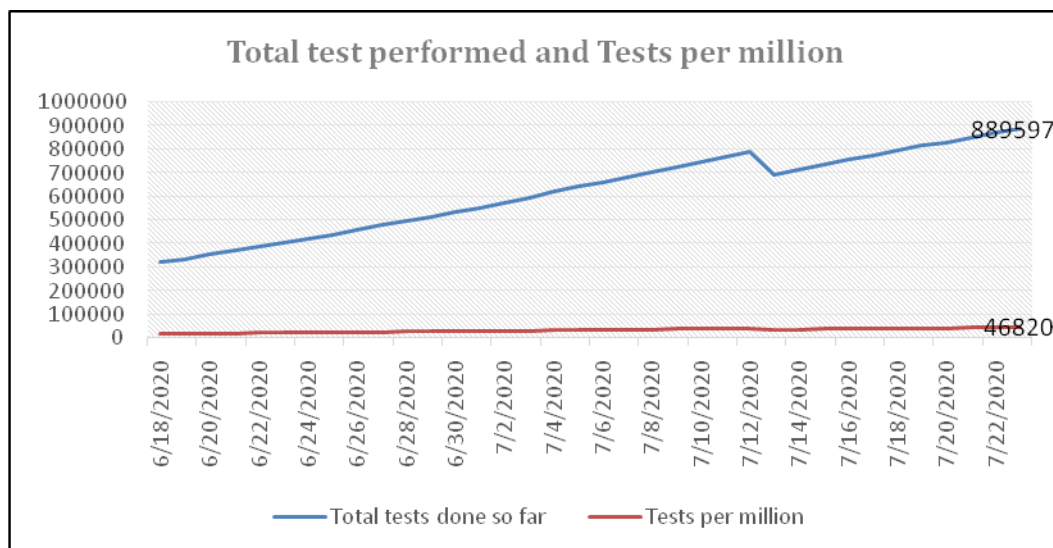


Figure 14. The trend of total test performed and tests per million<sup>10</sup>

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### Key events and efforts by the Government of Delhi<sup>10</sup>

- On 12 June 2020, Delhi government decided to fix the cost of treatment in private hospitals based on the input from private hospitals. The Delhi government also decided to set up a Death Audit Committee consists of senior doctors who can work untiringly towards assessing deaths caused by Coronavirus. On 13 June 2020, the Delhi government decided to consider the predictions made by the experts. Stadiums, halls, and schools are converted to COVID care centres, and beds arranged to accommodate more patients.
- As per the media news, on 15 June 2020, there was a meeting to discuss the situation of rising Coronavirus cases in the city between Union Home Minister Amit Shah, Delhi's Lieutenant Governor Anil Bajjal, CM Arvind Kejriwal. On the same day, health minister added as "The central government is extending his full support. Delhi is conducting maximum tests across the country, and it will continue to do so in the future with the help of the union government," he added. Shri Satyendar Jain said, "The decision to install 10-49 COVID beds in the nursing homes was taken by the Delhi government keeping in view that these beds might be required for COVID treatment. However, the season of other ailments like Dengue and Malaria is also approaching, and so this decision was revoked so that these nursing homes can be preserved for those treatments." Further, Shri Satyendar Jain added that imposing a penalty on people not wearing masks or following social distancing was necessary. He said, "People may feel it was not required, and they can spit anywhere, but they will realise only when they pay the penalty." Deputy CM Sisodia conducted a meeting with the managing directors of the hospitals and administrators to enhance the capacity of ICU beds on 20 June 2020. Also, the Delhi Government constructed another 700-bed hospital in Burari. Out of which, 400 beds to be reserved for Corona treatment.
- Together, CM and Deputy CM visited Shehnai Banquet Hall on 24 June 2020, to review COVID-19 preparation. Also, DJB VC Raghav Chadha visited 10,000 bed COVID-19 centre at Radha Soami Satsang Beas to inspect water

supply engineering works undertaken by the Jal board. On 20 June 2020, short meeting from DDMA meeting held on home isolation strategy and Price capping. COVID-19 positive patients no need to visit COVID Care Centres for clinical evaluation and will be handled differently " by Deputy Chief Minister on 26 June 2020. Chief Minister mentioned that "COVID-19 patients in LNJP can talk to the family members through virtual conferencing".

- "Increased number of beds, Increased Testing and Isolation, oximeters facilities to home Isolation Patients, plasma therapy trials & Survey and Screening are five major arms to battle the COVID-19" mentioned by CM Arvind Kejriwal on 27 June 2020. Further, he added as " We have sent pulse oximeters to the patients under home isolation which can act as their 'Suraksha Kawach". Also, Deputy Chief minister arranged a meeting with senior DoE officials to decide on reopening of schools in Delhi. Chief Minister of Delhi and Union Home Minister Amit Shah together inspected 10,000 bed Sardar Patel COVID Care Centre on 28 June 2020.
- On 6 July 2020, the chief minister Arvind Kejriwal and Deputy chief minister Manish Sisodia visited Rajiv Gandhi Super Specialty Hospital to review its preparedness to manage COVID patients. Also, CM had requested the recovered Corona patients to come forward and donate plasma. Delhi Corona App explored with the authorised helpline numbers for each hospital. Further, CM Arvind Kejriwal visited DRDO-built Sardar Vallabh Bhai Patel COVID-19 Hospital in Delhi. The number of ICU beds increased significantly in Delhi government COVID hospitals. On 8 July 2020, Chief Minister Arvind Kejriwal inaugurated 500-bedded COVID-19 Care Centre at Commonwealth Game Stadium in East Delhi through videoconferencing.
- On 11 July 2020, CM took a review meeting to discuss what measures need to be taken to reduce the mortality. The chief minister was felt that the systems in each hospital need to be examined in detail. Overall, the reducing positivity rate, the higher testing, reducing the number of deaths, high recovery rate, availability of a

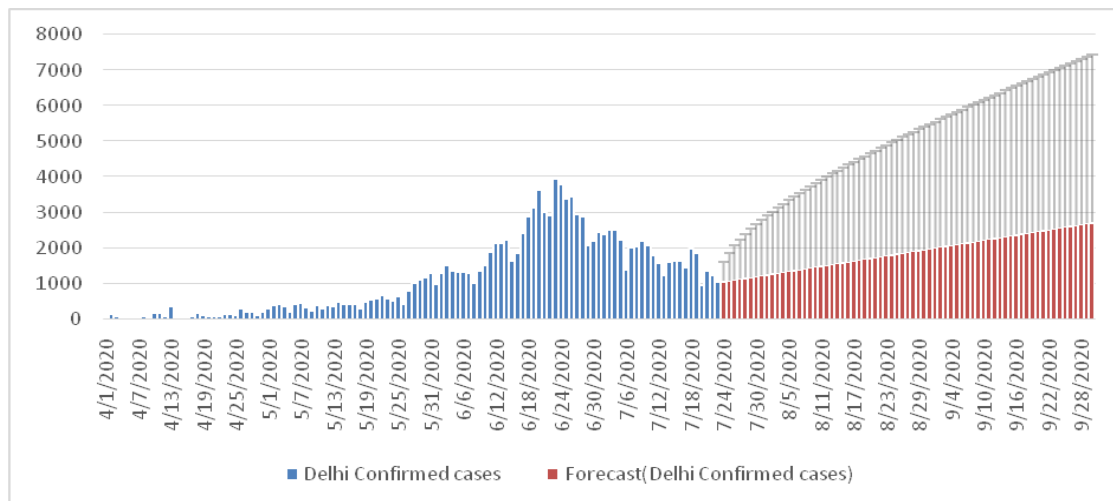
greater number of beds are the reasons for the improved situation in Delhi. On 10 July 2020, Listening to stories of plasma donors makes me very proud of my fellow Delhiites: CM Arvind Kejriwal. On 14 July 2020, CM Arvind Kejriwal inaugurates Delhi's second plasma bank at LNJP Hospital, After the success of India's first plasma bank at ILBS hospital. On 15 July 2020, CM Arvind Kejriwal discussed three principles include teamwork and collectively, correcting the lapses when pointed out, and not losing hope.

- On 17 July 2020, Chief Minister Arvind Kejriwal convened a virtual meeting with all Members of Parliament from Delhi, over the preparations being done to fight the Coronavirus pandemic in the state. CM Arvind Kejriwal said that Delhi is able to compete with Coronavirus was possible due to the various joint efforts and co-operation

from stakeholders such as political parties, MPs and MLAs. On 22 July 2020, the health minister Satyendra Jain mentioned that the Delhi govt has decided to conduct Sero Survey every month to formulate better policies for tackling Corona and the next survey to be held from 1 August to 5 August.

**4. Forecasting Analysis**

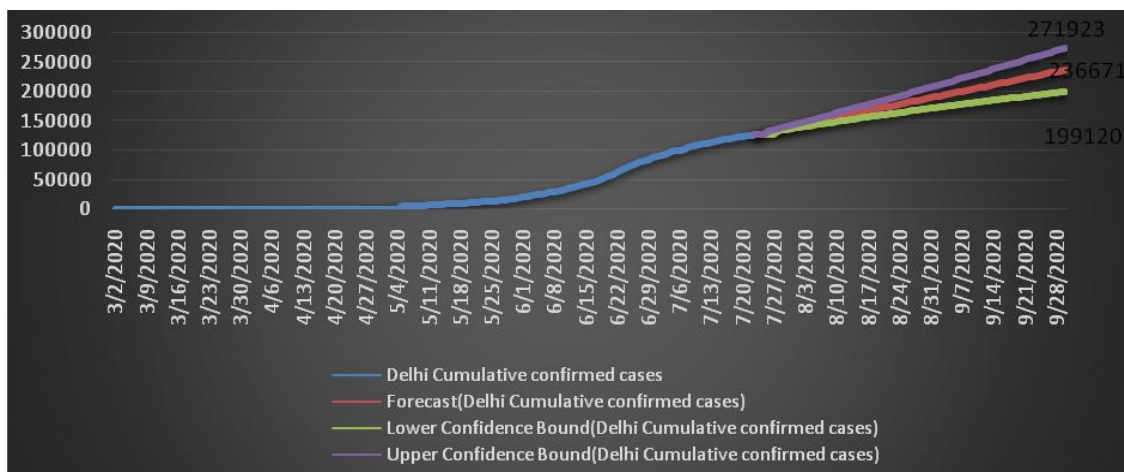
Forecasting analysis<sup>11</sup> option in Microsoft Excel is used for predicting the future state of the COVID-19 in the Delhi city. This prediction is purely based on past data. Other than the recent past data, there are various influential factors (lockdown approaches, speed of spread, advisories from health organizations, people's attitude in following practices, etc.) that can completely change the scenario which can lead to a drastic change to the lower level or upper level.



**Figure 15.** Forecasted confirmed cases – Delhi

Figure 15 shows the recent past data in blue color and orange color shows the forecasted data for confirmed cases day-wise till 30 September 2020. By using the forecasted data with 95% confidence level, the number of confirmed cases by 15 August would be around 1600, by 31 August it would be around 1900-2000 and by 30 September, it would be around 2500-2700. If the situation goes bad due to various reasons, then the confirmed cases count may raise between 2700-4700 cases. Figure 16 shows the recent past data in blue colour and

orange colour shows the forecasted data for cumulative confirmed cases. By 15 August 2020, the cumulative confirmed cases may go up to 163876, by 31 August 2020, it would be around 189196 and by 30 September 2020, it would be around 236671. With better control, the number of cumulative cases can be controlled at two lakhs, and it can reach up to 2.75 lakhs if the situation is going to be worst due to various reasons.



**Figure 16.** Forecasted cumulative confirmed cases – Delhi

Figure 17 shows the past data in blue colour and orange colour shows the forecasted data. By 15 August 2020, the cumulative death count would be 4388, and by 31 August 2020, the cumulative death count would be 4835, and by 30 September it would be 5672. So, the outcome indicates that there would be around 23% of the deaths will increase in the next month. If the situation is going worst due to various unpredicted reasons, even the cumulative death count may go up to 14753 by 30 September 2020 (figure 17) and. Figure 18

shows the past data in blue colour and orange colour shows the forecasted data. In June, the number of deaths was between 50-100. From the forecasting analysis, the number of deaths per day in the month of august may vary between 20-50, and it would be around 50-60 per day in the month of September 2020. However, if the situation is bad due to various reasons, then the death counts per day may go up to 100-200 (figure 18).

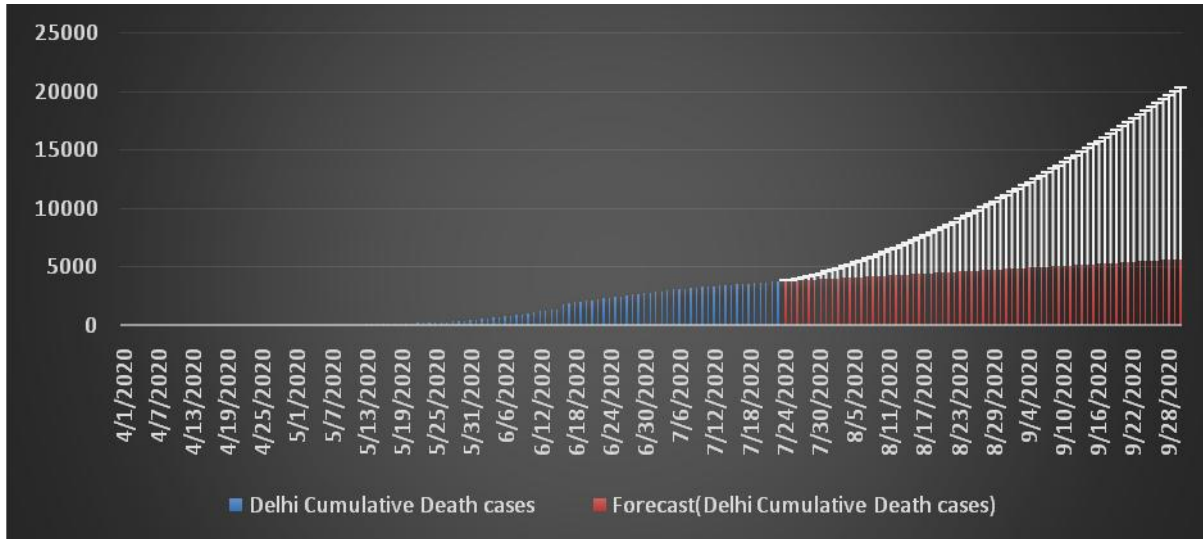


Figure 17. Forecasted cumulative Death cases - Delhi

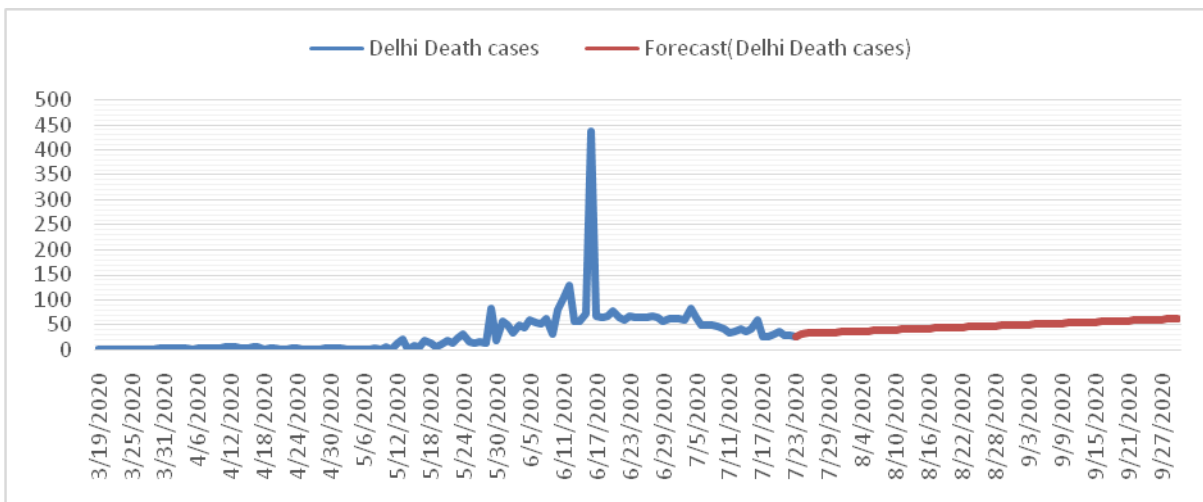


Figure 18. Forecasted Death cases (day wise) - Delhi

**5. Discussion**

The religious congregation in Nizamuddin happened on 8-10 March 2020, which seems to be a significant trigger for more cases in Delhi and 14 other states. It is the fact that there are many states that are not related to a religious congregation; however, they are also affected severely. But, the number of cases and severity could have been controlled in Delhi and other states, if there was no religious meeting conducted in Nizamuddin. The first COVID-19 case in the Indian capital<sup>10</sup> Delhi was reported on 2 March 2020. In the third week of July 2020, the number of cases is between 1000-2000, on 23 July 2020, the number of cases was 1042. Even after 2-3 months since the confirmed cases count increased, it is not coming down below 1000. As on 23 July 2020, the number of cases is

127364. From the pattern, it is understandable that the pattern of the confirmed cases is in the exponential growth. Till 12 May 2020, the number of death cases per day reported was in single-digit and on 13 May 2020, the number of deaths reported is 20. From 13 May to 10 June 2020, the number of death cases are constant and vary between 10-80 and on 11 June, there were 101 deaths reported. From 12 June till 23 July 2020, almost everyday death cases were reported, and the count varies between 30-80. By the end of June, the cumulative deaths were 2742. As on 23 July 2020, the cumulative death cases reported is 3745.

By using the forecasted data with 95% confidence level, the number of confirmed cases by 31 August would be around 1900-2000 per day. If the situation goes bad due to various

reasons, then the confirmed cases count may go up to 3486. By 31 August 2020, it would be around 189196 and by 30 September 2020, it would be around 236671. With better control, the number of cumulative cases can be controlled at two lakhs, and it can reach up to 2.75 lakhs if the situation is going to be worst due to various reasons. By 30 September 2020, the cumulative death count would be 5672. So, the outcome indicates that there would be an increase more

deaths in the coming months. If the situation is going worst due to various unpredicted reasons, even the cumulative death count may go up to 14k by 30 September 2020. From the forecasting analysis, the number of deaths per day in the month of August may vary between 20-50. However, if the situation is bad due to various reasons, then the death counts per day may go up to 150-200.

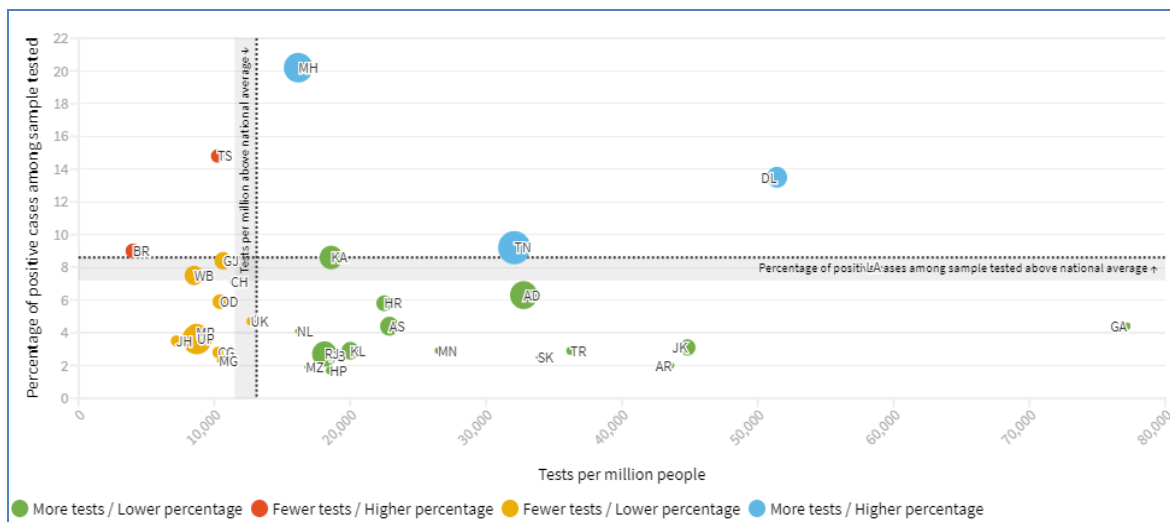


Figure 19. Delhi situation regarding the testing

State	Total test per million	Total test conducted	% of positive cases among sample tested
Maharashtra	16176	1972346	20.2
Delhi	32080	2475866	9.2
Tamilnadu	51411	976827	13.5

Table 4. Testing statistics of Maharashtra, Delhi and Tamilnadu

Tamilnadu, Maharashtra and Delhi are the states that have conducted a greater number of sample tests and found a higher number of positive cases among sample tested. There are a few other states that have performed more sample tests. However, they found a smaller number of positive cases (figure 19). Maharashtra has conducted 1972346 sample tests as on 29 July 2020 and found 20.2% positive cases. Delhi has conducted 2475866 and found 9.2% positive cases. Tamilnadu have conducted 976827 tested and found 13.5% positive cases. Compare then, Tamilnadu and Maharashtra, Delhi's COVID-19 Situation look better. Death cases to the confirmed cases in Delhi are in 3rd place, i.e. 2.942%. It appears that the initiatives and efforts that are taken by the Government of Delhi have helped to a great extent. However, even a lesser number of confirmed cases are also threatening to the community. Even a single death due to COVID-19 is not acceptable. But still, compared with New York, Sao Paulo, Moscow, England and Madrid, Delhi is in a better place. Tracing, more testing per million, containment strategy, ensure more ICU and ventilator, create more awareness to the people about the precautionary measure and social distancing are critical and they need to be enhanced for better disease control. There are a few nations that are affected severely even before India gets affected are still continuing to suffer badly. Multiple times, the World Health Organization also announced that the severity of the disease

might continue for a year or more. Parallely, there are efforts to develop vaccination and therapeutic medicine for COVID-19. It is a fact that there is no defined timeframe to get the tested medicines. Until such time, the efforts and measures from the government of Delhi need to be continued in a better manner.

6. Conclusion

Delhi is getting more attention in terms of COVID-19 situation since it is a capital of Indian subcontinent and hosting the embassies of various nations compare to other major cities in India. World Health Organization, Ministry of Health (Government of India), Government of Delhi has been taking various initiatives to control the COVID-19 situation so that infection and death rates can be controlled in a better manner. Efforts from government authorities alone cannot control the COVID-19 spread. Awareness and support from citizens of Delhi also play a vital role in controlling the spread. Lockdown is one of the powerful approaches to control diseases. However, the lockdown cannot be extended beyond a certain period as it may impact the economy of the individuals and the country as well. It is important for the citizens to understand the criticality of the disease, steps to be followed as a precautionary measure to avoid the spread, which can play a vital role in better disease control management.

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