

## INDIAN ADMINISTRATIVE RESPONSE TOWARDS COVID-19

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### 1. ABSTRACT

A big problem for all the governmental divisions of the countries concerned is the outbreak of COVID-19 in various parts of the world. India is also faced with this very challenging challenge of monitoring the outbreak of the virus and has controlled its growth rate by some strict steps. This report describes the current situation of the spread of coronavirus in India, along with the effects of the various steps that have been taken. This research presents different trends and patterns with the aid of data sources (until 7-8 April 2020) from various state units of India and the Ministry of Health and Family Welfare of the Government of India. In a systematic way, this thesis addresses six separate research questions. It was reported that with the assistance of National Lockout, the growth rate of infected cases was regulated, but certain unregulated mass level incidents had a negative effect on the infected cases. The estimates for up to 75000 cases were made by the end of April 2020 with the aid of exponential and polynomial regression modelling. It has also been shown that in the network of patients, there are several influential clusters and patient nodes that are the main influencers of COVID-19 distribution. Death incidence case forecasts have also been carried out with a precision of 60 percent by two-class classification models. In the end, methods for lockdown continuation have been explored and addressed. It seems that only the critical services for the people of India should be available and that the national lockdown should proceed for the next 2-4 weeks. This analysis would be beneficial for the Government of India, India's Governmental Divisions, India's Frontline Health Staff, researchers and scientists, and various states of India. This analysis would also be useful for other countries' administrative units to understand different factors relevant to the management of COVID-19 spread in their respective units.

### 2. INTRODUCTION

“COVID-19, or more generally referred to as the Novel Corona Virus, is associated with the human respiratory disease declared by the World Health Organisation as a worldwide

outbreak and pandemic in the first quarter of 2020.”<sup>1</sup> As per the latest data (7<sup>th</sup> April 2020) by John Hopkins University<sup>2</sup> more than 1.3 million individuals are reportedly afflicted with the Novel Corona virus worldwide and about 75,000 deaths have been reported from various parts of the world, as well as other monitoring websites. With the largest number of infected incidents, the United Kingdom, Turkey and Switzerland are the top 10 countries.

The top nations with the largest number of contaminated cases are the United States of America, Spain, Italy, Germany, France, China, Iran, the United Kingdom, Turkey and Switzerland.

The top nations with the largest number of recorded deaths are Italy, Spain, the United States of America, France and the UK. With regards to the list of recovered patients, China is at the top of the list, followed by Spain, Germany, Italy, Iran and the United States. India was easily put by immense margins out of the list of afflicted nations, but recent developments contributed to its increase to 27<sup>th</sup> spot (on April 7, 2020), which is a matter of concern. “Right now the mortality rate is regulated at less than 3%, which is better than the world's ~5.5% mortality rate, but the spread paradigm is increasingly shifting to an accelerating pattern that will contribute to significant loss of lives and facilities.”<sup>3</sup>

“India is now regarded by different nations as a global leader and also WHO has accepted that the world is looking at Indian policies to control the spread of this disease.”<sup>4</sup> “India makes up almost one fifth of the world's population and is the second largest country in terms of population in the world. India contributes substantially to the GDP of the world and is one of the world's most influential developed countries with relatively high economic growth

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<sup>1</sup>World Health Organization (2020). Coronavirus disease (COVID-19) Pandemic, WHO. Accessed from <https://www.who.int/emergencies/diseases/novel-coronavirus-2019> on 31<sup>st</sup> March 2020

<sup>2</sup>John Hopkins University (2020). Novel Coronavirus (COVID-19) Cases, provided by JHU CSSE. Accessed from <https://github.com/CSSEGISandData/COVID-19> on 6<sup>th</sup> April 2020

<sup>3</sup>(2020) <<https://www.mygov.in/covid-19/>> accessed 15 November 2020

<sup>4</sup>Sharma, N. (2020). India's swiftness in dealing with Covid-19 will decide the world's fu-ture, says WHO, Quartz India. Accessed from [https://qz.com/india/1824041/who-says-indias-action-on-coronavirus-critical-for-the-world/on25<sup>th</sup>March2020](https://qz.com/india/1824041/who-says-indias-action-on-coronavirus-critical-for-the-world/on25thMarch2020)

percentages.”<sup>5</sup>The strong camaraderie of India with most of the world's nations and its helpful disposition make it a great ally for other nations. The analysis of the COVID-19 outbreak in the Indian region is therefore closely monitored and monitored by the world, and there is a need for comprehensive analytical studies based on various strategies adopted from time to time by Indian administrators. Since 22 March 2020, India has been observing a countrywide lockdown, which was a one-day lockdown, followed by a 21-day lockdown after two days. Since then, every activity in India has been carried out with the permission of different administration units, and almost all domestic and international travel has either been banned or closely monitored. India is yet to enter the third phase of the outbreak of COVID-19, i.e. the community outbreak as seen by different countries around the world, but the cases have been steadily increasing. India's lockdown period has been impacted by two major events in the recent days which were related to the mass exodus of laborers and workers from one state to other states (especially from Delhi to neighboring states) and conduction of a religious event in Delhi which led to spike in the number of cases in various states of India. During this time, the Indian Prime Minister has been trying to connect with Indian citizens through innovative strategies and coming up with various engagement activities which are impacting the whole nation. With so much happening right now in India, it is imperative that through data analysis methods, we study the current situation and impact of various such events in India and come up with different future plans that can be helpful for Indian administrators and medical professionals.

The current study explores different aspects of the outbreak of COVID-19 in India and the different regions located in India. In this research, the specific research questions (RQ) discussed are as follows.

The findings of the various types of data analysis performed on different types of datasets are presented as follows in the current section.

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<sup>5</sup>Myers, J. (2020). India is now the world's 5th largest economy, World Economic Forum. Accessed from <https://www.weforum.org/agenda/2020/02/india-gdp-economy-growth-uk-france/on15thMarch2020>

### 3. IMPACT OF LOCKDOWN ON INFECTED CASES

On 22 March 2020, the central government of India declared the national one-day shutdown before the majority of schools, colleges, markets, cinema halls etc. have already been shut down by the respective state governments. After just two days of this one-day curfew, the central government announced a 21-day lockdown prohibiting the entire movement and restricting the Indians from staying at home. People were permitted to leave their homes only in emergencies and then with the municipal administration's prior approval. All these directions were issued in the hope of flattening the curve of infected patients and restricting the explosive patient growth in India.

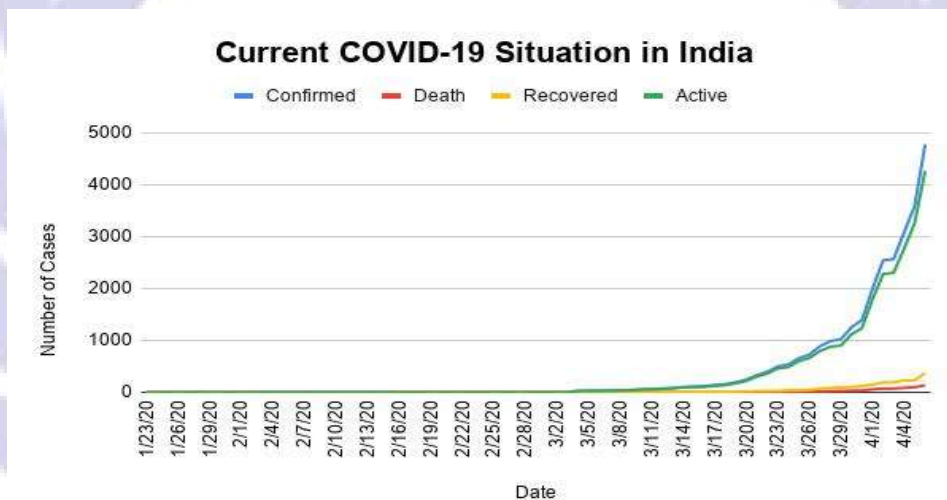
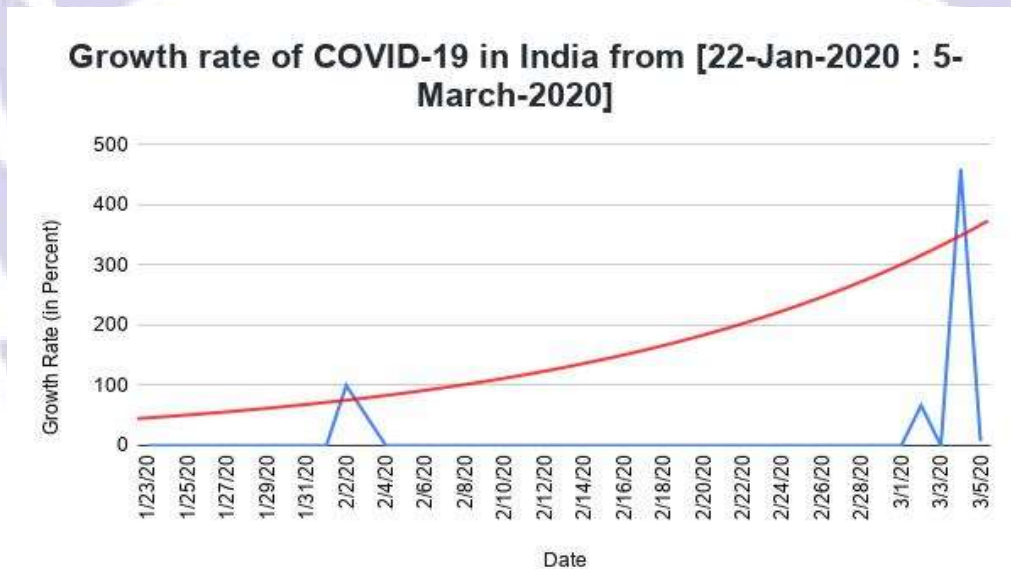


Illustration 2. The number of COVID-19 cases in India till 6<sup>th</sup> April 2020

Nearly 5000 confirmed cases have been registered in India as of the morning of 7 April 2020, with more than 90 percent of the cases active. The mortality rate has stayed below 3 percent in all the phases of the COVID-19 spread. Looking at the graph in Figure 2, it is clear that a spike has been recorded in India after 22 March 2020, i.e. the time when the lockdown was announced.

It clearly demonstrates that by announcing a rigid lockdown measure, the Indian authorities were prompt enough to sense the spread rate in the Indian area and to take appropriate measures to preserve social distance.

(a)



WORDS SPEAK

## Current COVID-19 Situation in India

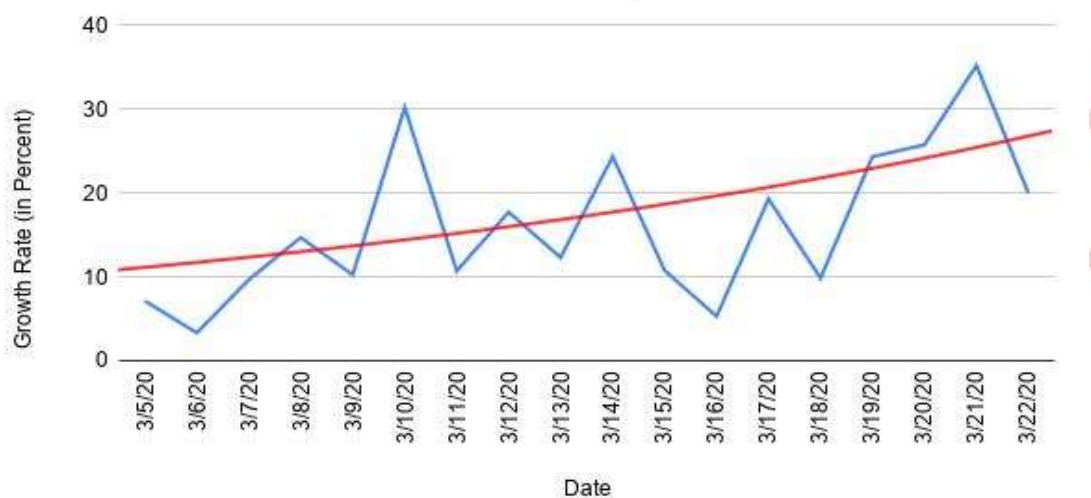


(b)



**Growth rate of COVID-19 in India from [5-March-2020 : 22-March-2020]**

(c)





**Growth Rate of COVID-19 in India after lockdown[22-March-2020]**

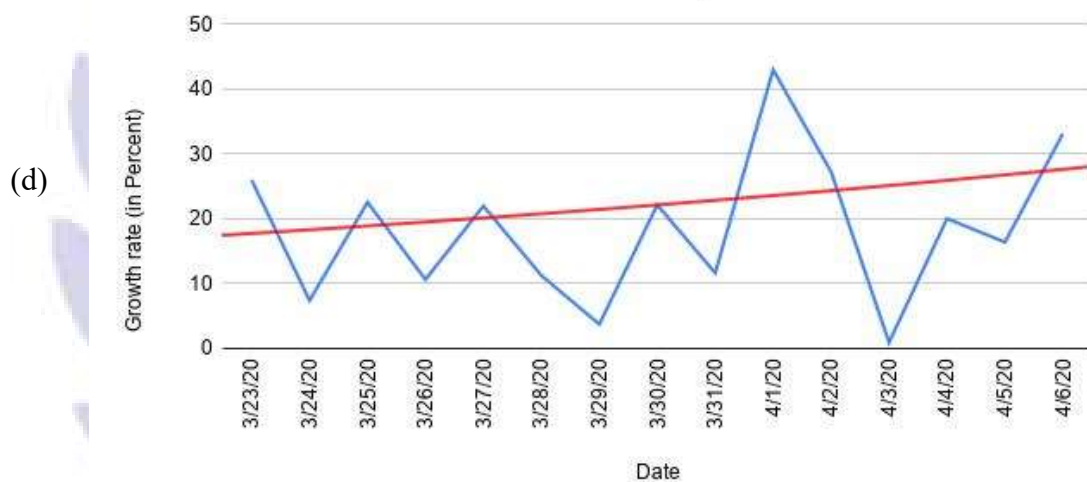


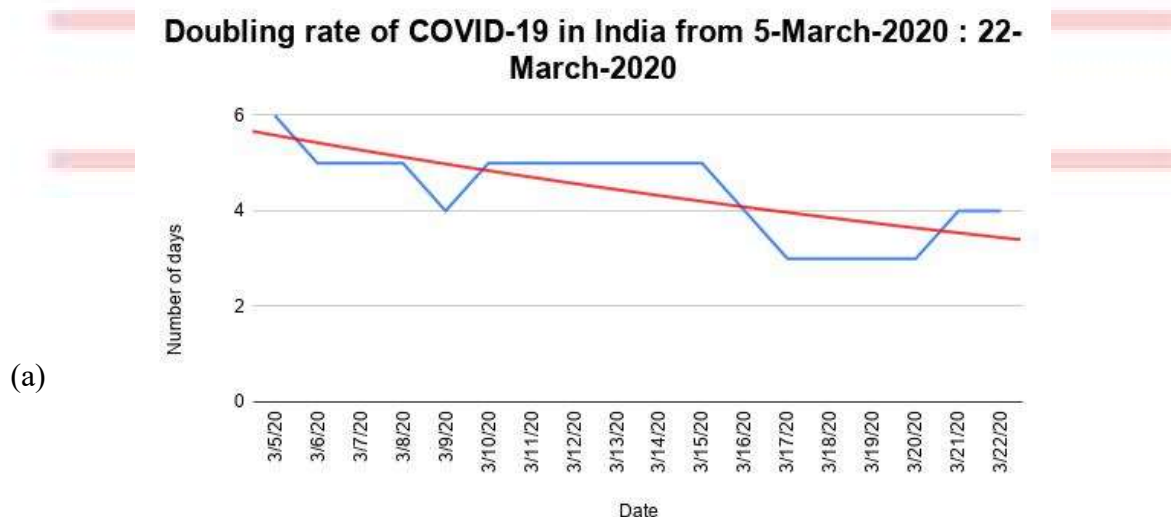
Illustration 3. Early phase: duration from 22 January to 4 March 2020 (a) Early phase: period from 22 January to 4 March 2020 (b) Prior to lockdown period: period from 5 March 2020 to 22 March 2020 (c) Post lockdown period: period from 22 March 2020 to 6 April 2020. Early phase: period from 22 January to 4 March 2020 (b) Pre-lockdown period: period from 5 March 2020 to 22 March 2020.

Looking at the normal growth rate of infected patients (blue line) and the expected growth trend line (red line) in Figure 3, it indicates that the growth rate was very high in the early days of the epidemic due to the low number of cases. The growth rate was defined as the

difference in the number of infections for two consecutive days, divided by the number of cases infected on the corresponding day, multiplied by 100 for the two days under consideration. While in the early days the count was in single digits, the growth rate was pretty high. Therefore, the growth rate hovered about 20%, taking into account the second stage of the period from 5 March to 22 March 2020, that is, specifically before the shutdown, with the trend line forecasting a peak of around 28%. However, for the period after lockdown, i.e. from 22 March 2020 onwards, the growth rate increased slightly, while it remained about a comparable 20 percent level. And the trend line also projected that the growth rate on a daily basis will be about 28 percent. Therefore, it can be said that the nationwide lockdown has prevented an increase in the number of COVID-19 patients' cases. In India, development may not have been restricted without lock-down, and may have reached the exponential region too easily. That allows all state and national level officials and health practitioners to be ready for the rising number of cases.

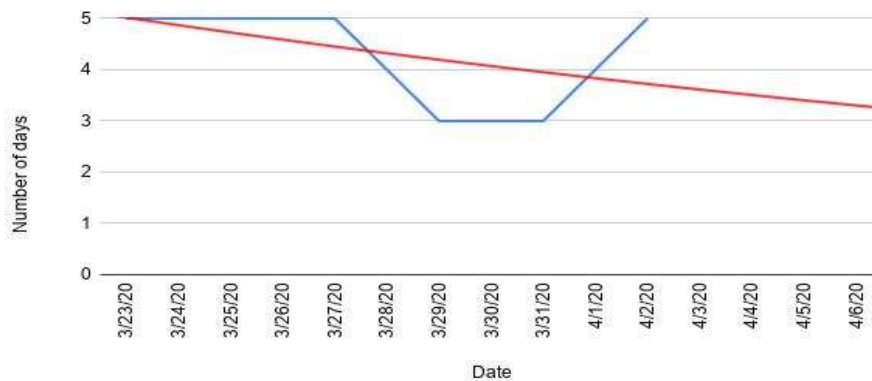
#### 4. PREDICTIONS FOR INFECTED CASES FROM SHORT TERM

Exponential modelling has been used at the national level to predict short-term predictions. Second, double-day growth has been estimated, i.e. the number of days has been calculated to double the number of cases infected. As seen from Figure 4, the first picture indicates that the average number of days to double the cases before the lockdown time was mostly above four, while the average period fell close to three after lockdown. The total number of days is continuously decreasing with the growing number of cases in India, as per the forecasts (trend line in red).





**Doubling rate of COVID-19 in India after lockdown[22  
March 2020]**



(b)

Illustration 4. And the trend line also projected that the growth rate on a daily basis will be about 28 percent. Therefore, it can be said that the nationwide lockout has prevented an increase in the number of COVID-19 patients' cases. In India, development may not have been restricted without lock-down, and may have reached the exponential region too easily. That allows all state and national level officials and health practitioners to be ready for the rising number of cases.

Centered on the exponential model, the predictions for the next 3 weeks were made for the polluted cases in India. Table 1 displays the number of predicted cases in India, given that the rate of doubling continues on the basis of historical evidence. The polynomial regression line was plotted with distinct degree values depending on the exponential growth of the number of cases of COVID-19 in India based on model-ling. A total of 5 degrees was evaluated from 2 and 6, and Root Mean Error (RME) was verified for both instances. For the model of degree 4, the lowest recorded RME was 237.58. The prediction model of degree 4 polynomial regression was subsequently developed and used for the prediction values. Data for 31 days from 3-March-2020 to 3-April-2020 was considered for the training package. This was attributed to the fact that only 5 cases were registered within 40 days in India prior to 3 March, which had an effect on the prediction model. The appraisal was based on data from the

brief timeframe from 4-April-2020 to 7-April-2020. There were also considered other planning variants and test sets, but the predictions were similar. With these estimated values, it is expected that polluted case values will increase to almost 75,000 in India by the end of the current month, which may not be a very good situation in India.

Table 1. Predicted number of Infected Cases in India based on Exponential Modelling for next few

days	
Date	Predicted Number of Infected Cases
4/07/2020	5245
4/08/2020	6111
4/09/2020	7088
4/10/2020	8187
4/11/2020	9416
4/12/2020	10786
4/13/2020	12308
4/14/2020	13993
4/15/2020	15851
4/16/2020	17895
4/17/2020	20137
4/18/2020	22589

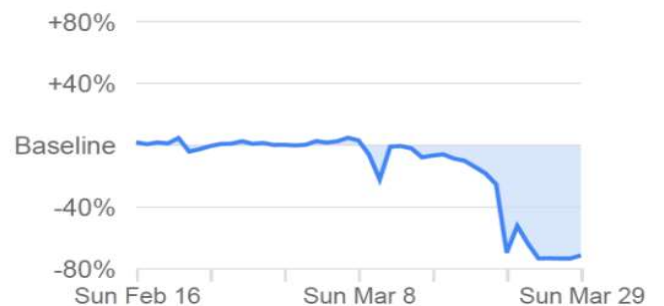
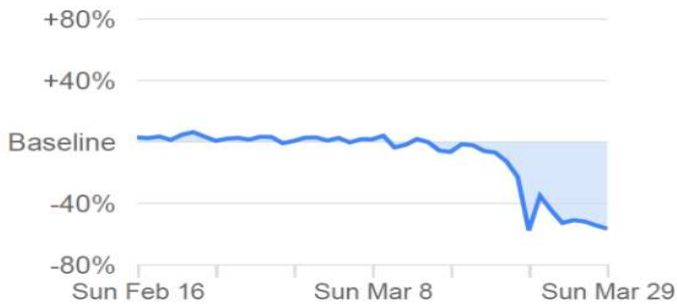
4/19/2020	25264
4/20/2020	28175
4/21/2020	31336
4/22/2020	34761
4/23/2020	38464
4/24/2020	42460
4/25/2020	46763
4/26/2020	51391
4/27/2020	56358
4/28/2020	61680
4/29/2020	67375
4/30/2020	73458
5/01/2020	79949
5/02/2020	86864

## 5. SOCIAL DISTANCING

The concept of social distancing was suggested by a lot of health experts around the world as it was important that the chain of physical interaction between humans must be broken. The major step in this direction was to announce lockdown at national level. Indian government took this suggestion seriously and started with the one-day implementation of lockdown on 22<sup>nd</sup> March 2020 and then announcing a 21-day lockdown till 14<sup>th</sup> April 2020. It was welcomed by a lot of citizens in India. The same was suggested by Google through its mobility report as shown in Figure 5.

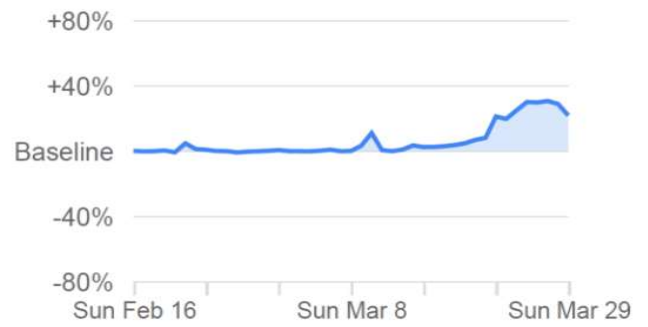
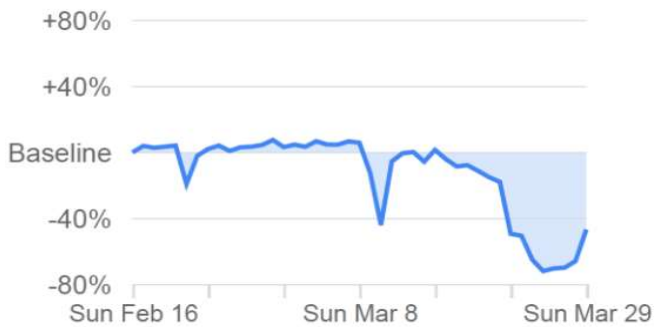


(a)(b)



(c)

(d)



(e)

(f)

Figure 5. “Mobility changes in India till 29<sup>th</sup> March 2020 (a) Graph showing 77% decline as compared to the baseline in the Retail and recreation places like restaurants, cafes, shopping centers, theme parks, movie theatres, etc. (b) Graph showing 65% decline as compared to the baseline in the Grocery & pharmacy like markets, food shops, farmer places, drug stores, pharmacies, etc. (c) Graph showing 57% decline as compared to the baseline in the Parks like public beaches, dog parks, marinas, national gardens, public gardens, etc. (d) Graph showing 71% decline as compared to the baseline in the transit stations like bus stations, public transports, metro stations, train stations, etc. (e) Graph showing 47% decline as compared to the baseline at the Workplaces like private and government offices (f) Graph showing 22% increase as compared to the baseline at the residential places”<sup>6</sup>

As per the Trend Reports’ method of calculation, “every day changes for the number of visits and length of stay at different places were compared the baseline values. The baseline value was considered as the median value for the corresponding day of the week. There were six different categories which were considered important for social distancing and there was a significant drop down seen in five of these categories. In Figure 5, Graph shows a 77% decline as compared to the baseline in the visits at Retail and recreation places like restaurants, cafes, shopping centers, theme parks, movie theatres, etc.; 65% decline as compared to the baseline in the visits to the Grocery & pharmacy places like markets, food shops, farmer places, drug stores, pharmacies, etc.; 57% decline as compared to the baseline in the visits to the Parks like public beaches, dog parks, marinas, national gardens, public gardens, etc.”<sup>7</sup> In transit stations such as bus stations, commuter rail, subway stations, railway stations, etc., 71% are down; 47% are down on the basic line in workplaces such as private and state authorities. In contrast with the baseline, it was seen to be a 22 per cent rise in accommodation, which suggests that more aboriginal people are now living in their homes. All these numbers cannot be 100% as a lot of frontline health workers, administrators, pharmacists, grocery store owners and people involved in other essential services were on duty during the lockdown as well. However, the basic purpose of lockdown to maintain social distancing has been achieved to good potential. Citizens are spending more time at their

<sup>6</sup>Mobility Trends Report, 2020.

<sup>7</sup>*Ibid.*

homes as compared to crowded places. So it can be said that Indian citizens have been able to follow the lockdown effectively.”<sup>8</sup>

## 6. IMPACT OF MASS EVENTS ON INFECTED CASES

“During the lockdown period, there were two mass events reported in India. One was related to the exodus of the laborers to their respective states in India<sup>9</sup> and the other was a religious event which happened in New Delhi at a mass level.”<sup>10</sup> There are around 25% citizens living below poverty line and have to depend on the daily wages to feed their families. Once the lockdown was announced, the fate of these 1.3 billion people was under scanner and that is why even the Government of India came up with a package of more than 22 billion USD to help these workers and laborers. “All the respective state governments also came up with the different infrastructural setup for providing food and money to the needy citizens. Some agencies reported that in providing food security, India and the neighboring nations depending on India may fall short of food while the others reported loss of millions of job during the lockdown due to such mass exodus.”<sup>11</sup> “However, the numbers of infected cases were not impacted much by this mass movement as majority of workers were not carrying any infection with them during their movements from their workplaces regions to their native place region.”<sup>12</sup>

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<sup>8</sup>*Ibid.*

<sup>9</sup>AlJazeera (2020). India: Coronavirus lockdown sees exodus from cities, Aljazeera News Channel, Accessed from <https://www.aljazeera.com/programmes/newsfeed/2020/04/india-coronavirus-lockdown-sees-exodus-cities-200406104405477.html> on 6<sup>th</sup> April 2020

<sup>10</sup>BBC News (2020). Coronavirus: Search for hundreds of people after Delhi prayer meet-ing, BBC News. Accessed from <https://www.bbc.com/news/world-asia-india-52104753> on 2<sup>nd</sup> April 2020

<sup>11</sup>Biswas, S. (2020). Will coronavirus lockdown cause food shortages in India? BBC News. Accessed from <https://www.bbc.com/news/world-asia-india-52176564> on 7<sup>th</sup> April 2020

<sup>12</sup>Yadav, Y. (2020). India lost more jobs due to coronavirus lockdown than US did during Depression, The Print. Accessed from <https://theprint.in/opinion/india-lost-more-jobs-due-to-coronavirus-lockdown-than-us-did-during-depression/397693/> on 8<sup>th</sup> April 2020



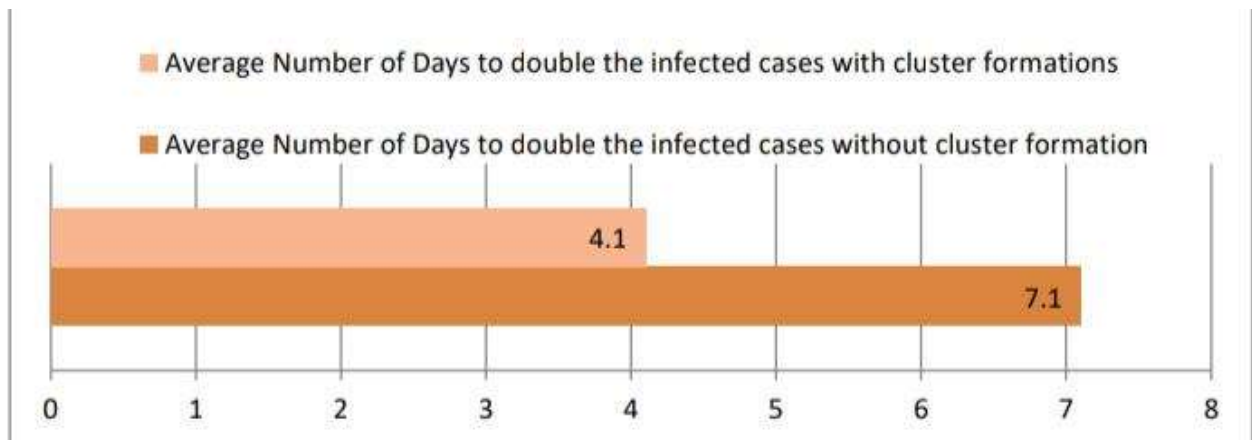


Figure 6. Graph showing the average number of days for the infected cases to double with or without cluster events

But there was a serious impact seen on infected cases due to conduction of a religious event in Delhi. “As seen from Figure 6, the average number of days to double the infected cases from corona virus without any cluster event was estimated to be 7.1 as per the health ministry, while it was 4.1 after Delhi’s religious event took place. This event resulted in formation of clusters in the whole country as many people who attended this event went to different parts of the country without following any rules of getting quarantined. Some of them who came from out of India to attend this event did not follow rules and advisories issued regarding COVID-19 protection.”<sup>13</sup> This resulted in a sharp spike in the number of infected cases after 31<sup>st</sup> March 2020.

<sup>13</sup>Garari, K. (2020). 4.1 days doubling time for Coronavirus worrisome, Deccan Chronicle. Accessed from <https://www.deccanchronicle.com/nation/current-affairs/070420/41-days-doubling-time-for-coronavirus-worrisome.html> on 7<sup>th</sup> April 2020

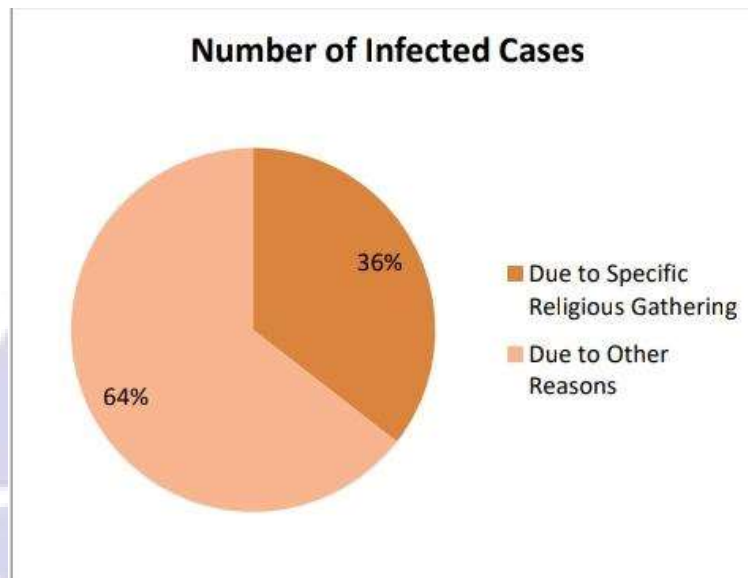


Figure 7. Percentage distribution of Infected Cases due to religious event in Delhi out of the total infected cases as per the data released by Ministry of Health, Government of India

“As per the Figure 7, at least 36% of the total infected cases reported on 6<sup>th</sup> April 2020 were linked to the religious event in Delhi. Out of over 4000 cases reported, a minimum of 1445 cases were suspected to be due to the religious event in Delhi. This event took the graph sky high in a week’s time with growth slowly moving towards exponential path and India entering into the third phase of community transmission for COVID-19 virus. Many regions of India which were totally isolated with the infection of Corona Virus, also reported their first case in the first 3-4 days of the conduction of the event. Therefore, it can be said that religious event that happened in Delhi has really pushed the bars high for the number of infected cases from coronavirus in India. It has far more serious consequences than it seems right now and authorities need to be really alert as people linked to this event have gone back to different parts of the nation.”<sup>14</sup>

<sup>14</sup>Press Trust of India (2020). Coronavirus: 1,445 cases linked to Tablighi Jamaat event, total

## 7. NETWORK ANALYSIS AND CLASSIFICATION OF INFECTED PATIENTS

Based on the data available from crowd sourced database at COVID-19-India dot org , network of the patients and their demographic detail was created. “The patient ID, the countries of travel, and any mass events were considered as the nodes and connection between each patient and their travelling history or event attending history was considered as edge in the network. Presenting the visualization of the network consisting of 551 valid nodes was out of scope for this paper; however, degree centrality of important nodes was calculated and is presented in Table 2. Degree centrality of the nodes is calculated as the number of connections with that particular node divided by the total number of edges present in the network.”<sup>15</sup>

Countries like United Kingdom, Mumbai, Saudi Arabia were it's first patient. It was found that these were the major hotspots responsible for the rapid spread of coronavirus in India.

Table 2. Degree Centrality Measure for top seven nodes in the network

Node Description	Degree Centrality Measure
Religious Event in Delhi	0.102775941
Italy	0.030072703
Gulf Countries	0.011566642
United Kingdom	0.007270324

crosses 4,000, India Today News. Accessed from <https://www.indiatoday.in/india/story/coronavirus-1-445-cases-liked-to-tablighi-jamaat-event-total-crosses-4-000-1663962-2020-04-06> on 7<sup>th</sup> April 2020

<sup>15</sup>Covid19India.org (2020a). India Covid-19 Tracker 2020. Accessed from <https://www.covid19india.org/> on 7<sup>th</sup> April 2020

Mumbai	0.005948447
Saudi Arabia	0.004296100
First Patient	0.000370921

A classification model was built on the basis of the patient database to verify if a patient would be likely to die on the basis of demographic characteristics. For the rules for COVID-19 patients, other trends were mined; however, the rules were not sufficiently relevant for positive cases as evidence for negative cases were not available in abundance. Based on the age range of patients infected with COVID-19, it was observed that the majority of cases in India were in the 31-40 age group, as seen in Figure 8. Most of the deceased patients were over 60 years of age and most of the infected persons either travelled back from Italy or attended a religious function in Delhi.

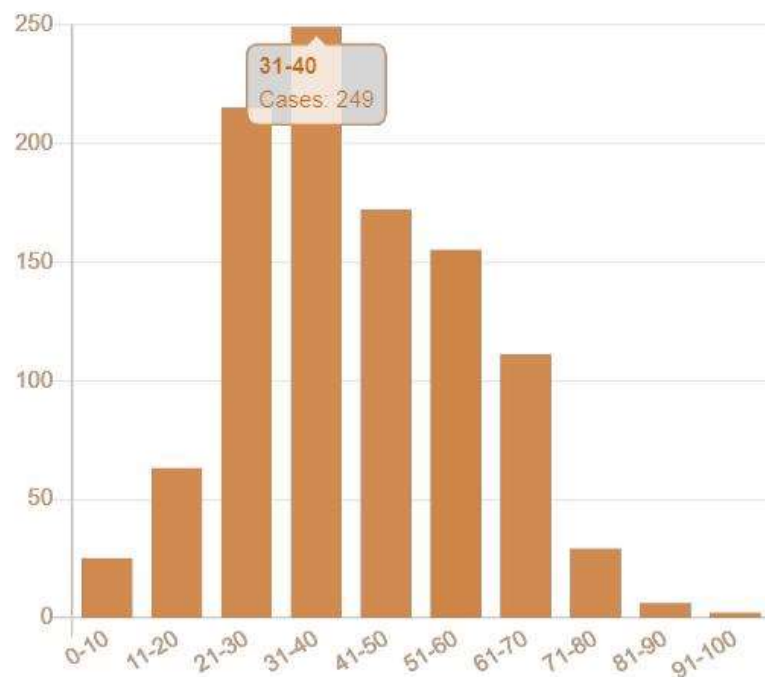


Figure 8. Age distribution of patients infected from COVID-19

A "classification model was developed around patients who lost their lives after coronavirus infection." The "Decision Tree Classification Model" was used to classify whether a patient would be reduced or not from the given COVID-19 infected patients." "Three characteristics were considered to be important, which were the patient's age, patient gender, and patient state/region. While a total of 5000 patients have so far been contaminated with COVID-19, demographic data of all patients are not known.

There were 912 living patients and 129 dead patients modelled from the dataset. "Of 129 patients, only 24 had absolute demographic statistics for simulation, but the data imputation technologies were used for the majority of the patients and the missing figures were statistically augmented. Accuracy and accuracy values were determined using the fusion matrix created by the Tree Classifier model of Judgment. The algorithm has reached a 60% precision because the data points are too limited to train and validate the model. In comparison, the three-variable approach was not satisfactory to make the study important. In the 60 year or older age demographic, though, fatalities have been more common and males have been more dominant. In comparison, in terms of life and death, babies were less affected by coronavirus. The state of Maharashtra and Madhya Pradesh were found to be the significant regions for the dead cases. Not major inferences could be drawn from the classification model as numbers of cases were low, but as per the records of de-ceased patients, a hint can be taken by the medical and administrative authorities"<sup>16</sup> as in which type of patients (based on their demographical features) need extra critical care.

## 8. FUTURE PLANS FOR LOCKDOWN AND OTHER STRATEGIES

Considering the numbers in previous sections, there are five major reasons due to which the national lockdown will be difficult to be abolished. Firstly, the growth rate of infected cases is continuously increasing. Secondly, the doubling time for number of infected cases in India is declining very fast making it a dynamic spread. Thirdly, majority of the Indians are

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<sup>16</sup>Tu, P. L., & Chung, J. Y. (1992, November). A new decision-tree classification algorithm for machine learning. In *Proceedings Fourth International Conference on Tools with Artificial Intelligence TAI'92* (pp. 370-377). IEEE.

cooperating and following the social distancing fairly well with mobility rates going down for public places in India. This is due to the combined efforts of the administrative authorities, engagement activities by the office of Prime Minister and citizen's will to stay away from social events. Fourthly, the sudden mass events are ruining the efforts of the Indian authorities to contain the spread of Coronavirus. And lastly, the penetration of the people infected from religious event has been really deep in India currently. There is a lot of tension created in India due to spread of infected people and the numbers are rising with each day. Thus, it is very difficult for India to completely ban the National Lockdown after 14<sup>th</sup> April.

In extreme conditions, the state wise rate of infection spread needs to be considered and then decision over lifting the lockdown may be taken. "Table 3 shows the current number of infected cases in different states of India and the associated growth rates for the last 7 days for each state, respectively. It can be seen that majority of the states have witnessed more than 200% of growth rate in last one week, which is worrisome situation for all the state authorities. In fact, the national growth has also been towards 180% mark which is very high number in the last seven days. The administrators for the regions with less than 50 infected cases can consider the uplifting of ban on lockdown in their respective regions, however uplifting national lockdown looks difficult."<sup>17</sup> The social distancing must be followed for next few weeks so that curve flattening process can continue for some more time.

With respect to transportation services, only "intra-state travel may be allowed in various states of India where population density is low and reported cases are less than 50 right now. No inter-state domestic travel should be allowed for the time being as it may result in transferring the COVID-19 carriers from one region to another region. International travel flights must not be activated as the number of cases in majority of the regions of the world is very high. European and US regions are already facing most of the turmoil, while other parts of the world are seeing rapid rise in number of infected cases. Starting inbound international flights to India may disturb the COVID-19 action plan in India."<sup>18</sup> Only essential services

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<sup>17</sup>Musil, C. M., Warner, C. B., Yobas, P. K., & Jones, S. L. (2002). A comparison of imputation techniques for handling missing data. *Western Journal of Nursing Research*, 24(7), 815-829.

<sup>18</sup>*Id*, At 15.



should be open for the citizens of India and lockdown should be carried on for next 2-4 weeks.



Table 3. Number of Infected Cases and last 1-week growth rates for different states of India

States	Number of Infected Cases as on 8 <sup>th</sup> April 2020	1-Week Growth Rate (1 <sup>st</sup> April – 7 <sup>th</sup> April'20)
MAHARASHTRA	1135	238.81

TAMIL NADU	738	215.38
DELHI	576	278.95
TELANGANA	453	256.69
RAJASTHAN	363	202.50
UTTAR PRADESH	361	208.55
ANDHRA PRADESH	348	213.51
KERALA	345	30.19
MADHYA PRADESH	290	195.92
GUJARAT	186	126.83
KARNATAKA	181	64.55
HARYANA	167	288.37
JAMMU AND KASHMIR	158	154.84
PUNJAB	106	140.91
WEST BENGAL	99	266.67
ODISHA	42	950.00
BIHAR	38	65.22
UTTARAKHAND	33	371.43
ASSAM	28	75.00
HIMACHAL PRADESH	27	575.00
CHANDIGARH	18	38.46
LADAKH	14	7.69
ANDAMAN AND NICOBAR ISLANDS	11	10.00

CHHATTISGARH	10	44.44
GOA	7	16.67
PUDUCHERRY	5	66.67
JHARKHAND	4	300.00
MANIPUR	2	100.00
ARUNACHAL PRADESH	1	NA
DADRA AND NAGAR HAVELI	1	NA
MIZORAM	1	NA
TRIPURA	1	NA
TOTAL	5749	180.85

Due to expected shortage of doctors, health workers and essential service providers, “the Government of India should rope in the military, BSF, corporate, NGOs, students and volunteers. Provisions should be made in parallel to train them online and prepare them for the worst. Meanwhile, the Government of India should also plan to arrange Personal Protective Equipment & other resources for their optimal participation in the national mission. Lockdown with more stringent controls should be enforced for the next few weeks by identifying hotspots and isolating them. Due to the population density of the country, customized region wise solutions should be exercised with relaxation to practice livelihood in safer identified regions. For this, central level administrative unit, state level administrative unit and local level administrative units need to communicate with each other efficiently.”<sup>19</sup> The disease can be better controlled in India due to massive stock of suitable medication available in the country, which is why India is also able to support other nations in terms of drug supply.

<sup>19</sup>Sucha Singh Gill, *Post-COVID-19 Economic Revival in India*, Challenges for the Indian Economy: Trade and Foreign Policy Effects, p265.

## 9. CONCLUSION

This study presented a comprehensive analysis of the COVID-19 outbreak situation in India. The rise in cases is very fast and there is an ardent need of aggressively controlling strategies from India's Administrative units. There are six different aspects covered up in this study and six re-search questions have been answered comprehensively. They are related to presenting the growth trends of infected cases in India, predictions for the number of infected cases for next few days, impact of social distancing on the citizens of India, impact of mass events on the number of infected cases in India, network analysis and mining of patterns on the patients suffering from coronavirus, and analyzing the strategies for uplifting lockdown in India. The current study implemented various techniques to present the data analysis and the results are in sync with few limited studies available in the literature. Various techniques were implemented to present the data analysis in the current study and the outcome is in sync with only a few limited studies that is available in the literature.

The Indian State's response – in any stage – to the Covid-19 pandemic exhibits a stark reality: in India, at this point, it is not important for the executive branch to claim a proper Emergency if you want to appropriate massive powers to itself. Under current laws – some of them of colonial vintage and some more recent – huge and vaguely-worded clauses have allowed government at both the kingdom and the critical stage to assume such powers (inside the case of the significant government, this has even concerned the power to override the federal distribution of energy). Because those powers have formal statutory backing, Parliament (the deliberative organ is bypassed); and the Courts, while persevering with, to feature at limited ability, do now not – at present – seem inclined or able to challenge the State's action to rigorous judicial overview.

Going forward, thus – and beyond Covid-19 – the project of civil rights and democracy activists in India seems to be two-fold: focusing on narrowing the scope of umbrella law that effectively authorizes rule by way of the decree without the felony safeguards and political duties of an Emergency announcement, and on articulating and contributing to a criminal way

of life geared towards restoring strong judicial assessment over govt movement purportedly for the greater public good.

It is thus concluded by way of noting that the response to the Covid outbreak so far has been a chaotic frame of regulations and orders, which raises troubles of criminal uncertainty, as doubts on the interpretation of poorly drafted policies and rapid amendments grow. This is further exacerbated by using loose and erroneous interpretations through the government.

