

# SARS-COV-2: THE 2019 NOVEL CORONAVIRUS

Amit Gahlot, Rakhi A.P<sup>2</sup>, Department of Electronics and Communication Engineering, HMRITM, New Delhi, India

> Md. Ehsan Asgar A.P, Department of Mechanical Engineering, HMRITM, New Delhi, India

Abstract-The Nationwide Lockdown has been a major part of the planning of government to overcome the pandemic COVID -19 which includes complete shutdown of businesses, disrupted food supply chains, extended limits of time slots and terminated contacts. This pandemic leads to unorganized economic sector with loss at its peak. There has been a total shutdown in all the areas, leaving individuals who are most adversely affected with few or no legal options. On the other hand, the lockdown has assisted in reducing the disease's transmission throughout the society while allowing for a legal and legislative examination of this action that has thus far escaped scrutiny. In the seventh week of the lockdown, it was crucial and appropriate that we assessed the overall legality of the lockdown as well as all the actions the Indian government has taken to combat COVID-19. According the Laws governing this lockdown, it is well known that the State governments and district authorities have implemented a lockdown in accordance with instructions from the Union Ministry of Home Affairs under the Disaster Management Act of 2005whose intentions were "to provide for the effective management of disasters and for the matters which are connected there with incidental thereto". On March 24, 2020, the NDMA (National Disaster Management Authority) and NEA (National Executive Committee) which were established at the direction of the Prime Minister and chaired by the Home Secretary respectively, they issued orders and guidelines to Union Ministers. To prevent the spread of COVID-19, state governments and relevant authorities should take appropriate, lawful action. They should also follow any instructions that specify which businesses should be closed and which services should be discontinued during this lockdown period. The government issued instructions to impose "social distancing" and the isolation measures to remain "under strict home quarantine" and people to "stay at home and come out only when it is necessary for basic necessities and essential services while following social distancing norms".

Index Terms - COVID-19, SARS, MERS, NDMA, NEA, LOCKDOWN

## I. INTRODUCTION

The 2019 Novel Coronavirus (2019- nCoV) officially named as COVID-19 global pandemic by the WHO, has been an enormous outbreak for the massive population. Protective measures were applied on January 21, when India began thermal screening of passengers who were arriving from China. It was initially carried out at 7 airports and expanded to around 20 airports by the end of the month. In midst of February, the thermal screening was also expanded for passengers who were arriving from Thailand, Singapore, Hong Kong, Japan and South Korea. By the end of February some other countries like Nepal, Vietnam, Indonesia and Malaysia in the list. But a major drawback was that the asymptomatic and also infectious persons were able to slip through the screening because the testing infrastructure was inappropriate at that time. The ICMR (Indian Council of Medical Research) also admitted that airport screening alone was insufficient for this. India has experienced its first ever confirmed case due to coronavirus infection on January 30, 2020 in the state of Kerala. It is known that the affected had a travel history from Wuhan, China, unfortunately the city where the evolution of this virus took place. This pandemic has spread to more than 180 countries. The rapid increase of coronavirus cases at the rate of ten-fold took place in not less than a month.

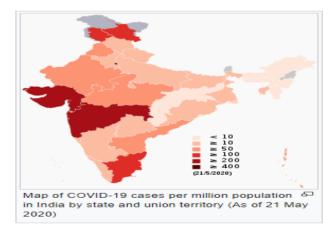


FIGURE 1: COVID -19 in INDIA



Eighty cities including Delhi, Mumbai, Kolkata, Chennai and Bengaluru are going into complete lockdown this month as India fights to contain the spread of coronavirus. The states going into lockdown till March 31 include those where coronavirus cases have been reported - Maharashtra, Kerala, Delhi, Gujarat, Uttar Pradesh, Haryana, Karnataka, Telangana, Rajasthan, Andhra Pradesh, Tamil Nadu, Punjab, Jammu and Kashmir, Ladakh, West Bengal, Chandigarh, Chhattisgarh, Himachal Pradesh, Madhya Pradesh, Odisha, Puducherry and Uttarakhand.

Trains, metros and inter-state buses have been suspended across the country. Markets, malls, cinemas, schools, colleges and gyms are already shut in most of the states. Many have also imposed Section 144, a law that bans more than five people from gathering. A list of cities on lockdown was released after the Cabinet Secretary had a meeting with Chief Secretaries of all states Sunday morning. Delhi has shut all markets and sealed its borders, said Chief Minister Arvind Kejriwal, announcing a lockdown from 6 am on Monday to March 31. He also said all flights in and out of Delhi would be suspended, but the central government has overruled this.

During the lockdown, no cabs, taxis, auto-rickshaws will be allowed to operate in the national capital. Private vehicles will also be banned. Vehicles linked to the personnel of 24 essential services - including police, health, fire, prisons, electricity, water, chemists, petrol pumps - will be exempted.

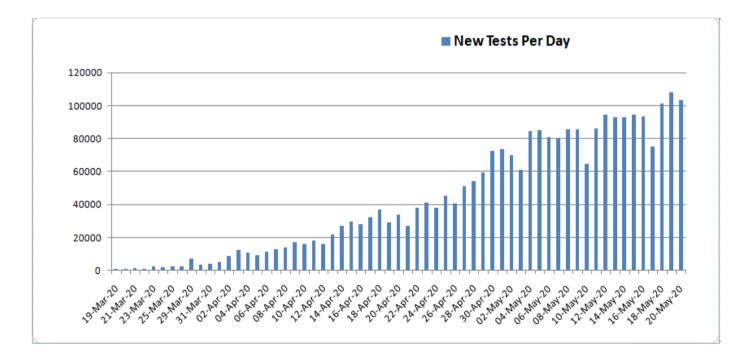
"Extraordinary times call for extraordinary measures," Mr Kejriwal tweeted. What will be allowed are essential services including water, power, civic services, groceries, milk, petrol pumps, medicine stores, takeaway and ATMs. Karnataka says it will allow groceries, food, milk, fish, meat and vegetables. Telangana has closed its borders and banned public transport. Goa, a holiday hot-spot, has banned tourist buses and groups of visitors.

Andhra Pradesh has asked everyone to continue their home quarantine till March 31. Public and private transport will be banned and essential commodities will be home delivered, says the state government. Parts of Gujarat and Uttar Pradesh will also go into lockdown. More and more restrictions are being put in place amid a spike in the number of coronavirus cases in India. There are nearly 350 COVID-19 patients across the country and seven have died. Three deaths were reported on Sunday. Worldwide , as many as 13,049 people have died and the deadly virus has infected 3.7 lakh people.

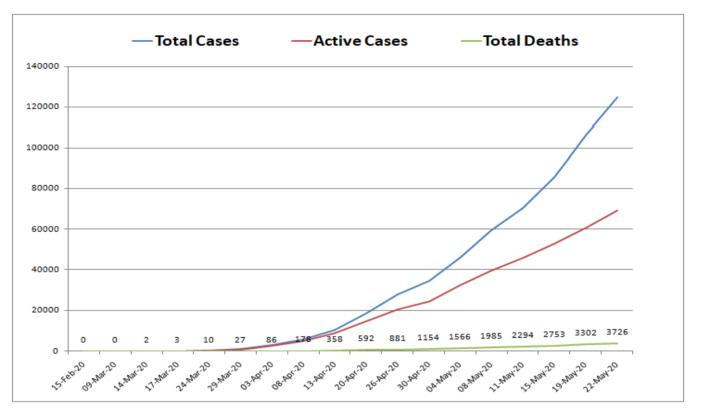
A group of scholars and data scientists from Johns Hopkins University, Michigan University and DSE, called the COV-IND-19 Study Group, has said in a report that without such intervention by state governments, India could have an explosion of cases by mid-May. However, the cases will drastically reduce with the most severe form of intervention, which includes social distancing, travel bans and lockdown.

The report says "the epidemiologic and mathematical calculations make a convincing case for enforcing severe interventions, they come at a tremendous price to the social and economic health of the people of India.

The experts also express concern that there is a "critical missing or unknown component" that depends on the extent and frequency of testing. "We conclude that it is highly appropriate to adopt draconian measures for the largest democracy in the world, acting early, before the growth of COVID-19 infections in India starts to accelerate," says the group.







## II. IMPACT OF COVID 19

## **Commercial establishments**

On March 19, 2020, Arvind Kejriwal, the chief minister of Delhi announced the closure of all the restaurants till March 31, 2020, due to the increase in the cases of coronavirus. Although, the food deliveries were not suspended. The gathering of 20 or more was prohibited strictly. And in accordance with this on March 20, 2020, Lucknow also announced the closures till March 31.

On March 20, 2020, the closure of malls took place with only essential opened like medicine shops, groceries and vegetables. On March 22,2020, Amarinder Singh, the chief minister of Punjab announced the lockdown till March 31, with all the essential services to be continued.

Ashok Gehlot, the chief minister of Rajasthan banned the public vehicles till March 31, and locked down all the shops and malls.

## Education

On March 16, 2020, the Union Government declared the lockdown of schools and colleges all over the countries which were not having exams at that time.

On March 18, 2020, CBSE released some guidelines regarding the examinations and rules including the social distancing between children, classes not having more than 24 students at a time during examination. On March 19, 2020, CBSE and JEE main examinations were postponed till March 31, as a safety concern for each candidate.

On March 20, 2020, the government of Maharashtra cancelled examination for class 1 to 8 and also promoted them to the next classes, on the other hand for the classes 9 to 11, the exams were postponed till April 15, 2020. Also, classes 10<sup>th</sup> and 12<sup>th</sup> board examinations were postponed by the Madhya Pradesh Board of Secondary Examination and promoted classes 5 to 8. The same procedures took place in Kerala. All the examinations were cancelled by the Assam government. SSC exams and all the interviews for the Civil Services Examination were postponed till April 15, 2020.

## Economy

A major part of the losses, which is Indian Economy, has been degraded to the extent due to the outbreak.

A trade impact of US\$348 million was estimated by the UN in India due to the outbreak which eventually made India, one of the 15 worst affected countries in the economy sector all over the world.

On March 9, 2020, the BSE SENSEX closed 1,942 points lower at 35,635 on the other hand the NSE NIFTY 50 was down by 538 points to 10,451.

On March 12, 2020, there was a worst crash in the Indian stock market due to the outbreak which took place in this pandemic. The BSE SENSEX dropped to 8.18% or 2,919 points which



was its lowest since 23 months. On the other hand, the NSE NIFTY 50 dropped to 9% or 950 points.

On account of all this, The Indian Space Research Organization's GISAT-1 mission onboard GSLV which was scheduled to be launched in April was also postponed due to this pandemic.

Then, on April 1, 2020, in Telangana, the coal mining operations of Singareni Collieries Company were halted due to the same.

## Entertainment

The International Indian Film Academy Award were to be held on March 27, 2020, but due to the pandemic, it was cancelled. Not only this, but the film productions, cinema halls, TV shows and web series also got at a pause till March 31.

On March 25, 2020, all the video streaming services decided to provide only SD quality content on cellular networks and also lowered the resolution to 480p for relaxation in the stress on telecom networks throughout the lockdown. The IBF (Indian Broadcasting Foundation), an organization that promotes the Indian Television Industry till date, announced that four major broadcasting networks have decided to waive all the fees for all the four channels for a duration of 2 months. Some offers for all DTH and cable networks were stated which included the availability of the channels free of cost for next 2 months. The channels are as follow:

- Sony Pal, run by Sony
- Star Utsav, run by Star India
- Viacom18's Colors Rishtey, run by Colors
- Zee Anmol, run by ZeeTV

#### **Events**

On March 6, 2020, the Border Security Force announced that the Wagah-Attari border ceremony would be conducted without any spectators as a precautionary measure from March 7 onwards due to the covid-19 pandemic and not only this, but the Pandma Awards ceremony that was to be held on April 3, 2020, was also postponed.

#### Religion

On March 17, 2020, the closure of Mumbai's Siddhivinayak Temple took place and the next day after this, Mata Vaishno Devi pilgrimage entered the same list. All the buses en route Jammu and Kashmir were halted. A consultation was issued for the foreigners not to visit the temple until 28 days after their arrival to India. Even the aarti held at the Ganges Ghat in Varanasi, held some restrictions and the organization was asked to complete the rituals of aarti in a very simple way, not gathering population anymore.

#### III. SITUATION

## Tablighi Jamaat Event

In March, a religious congregational program was held by Nizamuddin Faction of Tablighi Jamaat in Nizamuddin, West

Delhi. They ignored the orders from Delhi's Government about the stoppage of various activities which demanded gathering of 200 or more people. Due to this, it resulted to be a major hotspot for Coronavirus in India. The entire Nizamuddin West was cordoned off by the police by March 30, 2020 and various medical camps were set up.

On April 18, 2020 the Central Government stated that 4,291 cases from the total confirmed cases were linked to Tablighi jamaat and not only this, but these cases were spread across 23 States and Union Territories.

Hence, about 22,000 people who came in contact with Tablighi Jamaat, had to be quarantined.

#### **Panic Buying**

Throughout March 20 and 21, the panic buying of milk and other daily essential products were on its peak. PM Narendra Modi's address to the nation about quarantine resulted the rush to buy the essentials and the respected firms experience the increase in their average daily sales more than double in that period. In response to all this, Modi assured everyone that there is enough food and ration stock, so everyone can stay calm and do not panic for buying each and every essential item.

#### Escaping of suspected people

During this hard quarantine period, several cases who came in contact with the virus tried to escape from the zone of quarantine and hospitals.

A 35- yr 0ld man, in Tagapani, Chattisgarh, committed suicide when he was put under isolation home by health department on his return from Tamil Nadu. A total of 93 people have broken self-isolation in Gujrat for 10 days. FIRs were filed against the same.

In Kerala, two expats were subjected to punitive measures and the cancellation of their Indian passports took place.

On March 13, 2020, a woman who came from Singapore, was missing. While a man who came from Doha, went somewhere without telling hospital staff about the same.

On March 26, 2020, a 26-yr old woman fled from a hospital in Punjab. She recently came from US and was brought to a government hospital in Chandigarh.

#### IV. CLOSEDOWN AND CURFEWS

Over the month of March, multiple states across the country began to shut down schools, colleges, public facilities such as malls, gyms, cinema halls and other public places.

• On 5 March, amidst a surge in fresh cases being confirmed in Delhi NCR, the Government of Delhi announced that all primary schools across Delhi would be shut until 31 March as a precaution.

• On 7 March, primary schools in Jammu district and Samba district were closed down until 31 March after two suspected cases with "high viral load" were reported in Jammu.

• On 9 March, collector and district magistrate of Pathanamthitta district of Kerala declared three days long



holidays for all educational institutions in the district. Karnataka declared indefinite holiday for all kindergarten and pre-primary schools in Bangalore. The holiday was extended to all primary schools up to fifth grade after a confirmed case was reported in the city.

• On 10 March, Kerala announced closure of all schools and colleges across the state, with effect from 11 March.

• On 12 March, New Delhi closed all schools, colleges and cinema halls and announced that all public places would be disinfected. Karnataka shut all educational institutions and public places for a week and issued prohibitory orders on public events. Odisha closed educational institutions and cinema halls, and prohibited non-essential official gatherings. Maharashtra declared the outbreak to be an epidemic in the cities of Mumbai, Navi Mumbai, Nagpur, Pune and Pimpri Chinchwad.

• On 13 March, the Punjab, Chhattisgarh and Manipur governments closed educational institutions till 31 March.

• On 14 March, Himachal Pradesh closed educational institutions and theatres until 31 March. West Bengal shut all educational institutions till 31 March, but planned to conduct the Board examinations. Maharashtra government closed all public facilities in urban areas till 31 March 2020. Government of Rajasthan closed all educational institutions, gyms, and cinema halls till 30 March, however ongoing school and college exams would continue.

• On 15 March, in Goa, chief minister Pramod Sawant declared that all educational institutions would remain closed until 31 March, but planned to conduct the Board examinations. Brihanmumbai Municipal Corporation shut down Jijamata Udyaan till further orders. Gujarat government closed schools, colleges and cinema halls till 31 March, but planned to conduct the Board examinations. Bihar Public Service Commission (BPSC) postponed all the recruitment exams till 31 March. Vaishno Devi Shrine Board asked non-resident Indians and foreigners not to visit the temple for 28 days after landing in India. The Tamil Nadu and Telangana governments declared closure of schools, malls and theatres till 31 March. Ministry of Culture shut down all monuments and museums under Archaeological Survey of India till 31 March.

• On 17 March, schools, colleges and multiplexes in Uttar Pradesh were shut down till 2 April and on-going examinations were postponed. BMC ordered private firms in Mumbai to function "only at 50% of their staff capacity or face action under section 188 of the IPC". Rajasthan government banned the gathering of more than 50 people in public places till 31 March. Important tourist destinations in Tamil Nadu were locked down. Authorities in Nilgiris district ordered the closure of tourist sites including Ooty and the tourists staying in hotels and resorts were given 24 hours to leave the city. In Maharashtra, government offices were closed down for seven days. Chandigarh administration ordered the closure of public facilities till 31 March. It also banned gatherings of more than a 100 people and census work was postponed. At the same time, Dera chiefs were asked to postpone all religious events till 31 March. The GoM also directed that no more than 50 people are allowed to gather at any place other than weddings. Pondicherry shut down schools, colleges, cinemas and gyms till 31 March. Mumbai Police ordered the closure of pubs, bars and discotheques till 31 March.

• On 18 March, Jammu and Kashmir banned entry of all foreign tourists. On the other hand, the Directorate of Floriculture, Parks and Horticulture of the state extended the Bagh-e-Bahu Garden to the general public from 18 to 31 March to keep the situation under control in the Union Territory. Government of Andhra Pradesh announced closure of all educational institutions till 31 March.

• On 23 March, Chief Minister of Maharashtra announced that borders of all the districts would be closed, and a strict curfew would be implemented statewide

# Lockdown

On 22 March, the Government of India decided to completely lockdown 82 districts in 22 states and Union Territories of country where confirmed cases have been reported till 31 March. At 6 am on 23 March, Delhi was put under lockdown. 80 cities including major cities such as Bengaluru, Chennai, Mumbai, Chandigarh and Kolkata were also put under lockdown. Inter-state movements were allowed during the lockdown period. However, some states had closed their borders. On 23 March, union and state governments announced the lockdown of 75 districts where cases were reported.

On 24 March, PM Narendra Modi announced a complete nationwide lockdown, starting from midnight for 21 days. By 6 April, the growth rate of the pandemic had slowed to one of doubling every six days, from a rate of doubling every three days earlier. As the end of the lockdown period approached, several state governments recommended extending the lockdown. On 14 April, PM Narendra Modi extended the nationwide lockdown till 3 May, with a conditional relaxation from 20 April for the areas that have been able to contain the spread. On 1 May, the Government of India extended nationwide lockdown further by two weeks until 17 May. On 17 May, NDMA extended the lockdown till 31 May in all Indian states which is now extended to 30 June,2020 as lockdown 5 also known as un-lockdown 1.

## Zonal classification

The Government Divided the entire nation into three zones – Green Zone, Red Zone, Orange Zone, relaxation will be allowed accordingly.

- Red zone (Hotspots) districts with high doubling rate and high number of active cases
- Orange zone (Non-hotspots) districts with fewer cases
- $\bullet$  Green zone districts without confirmed cases or without new cases in last 21 days



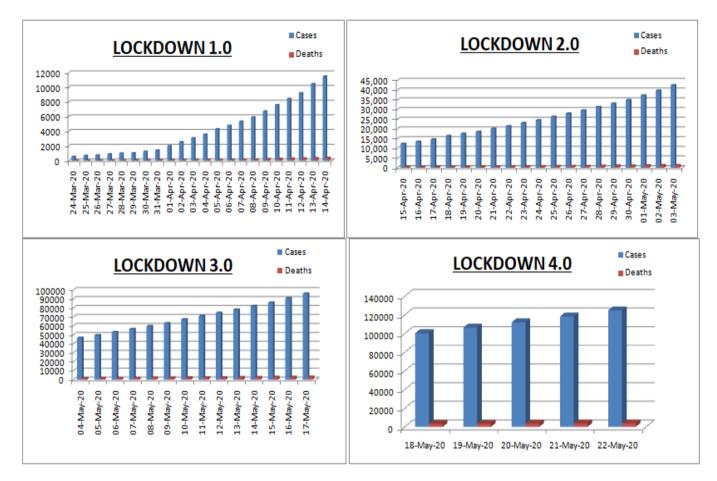
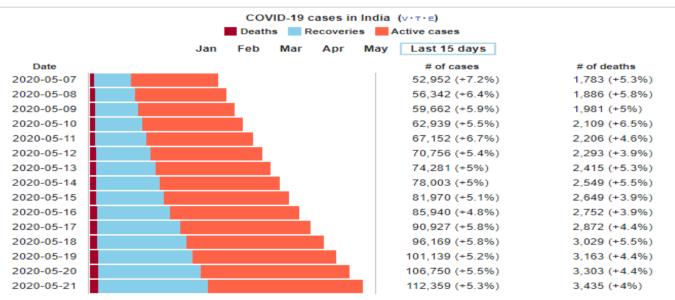


Figure: Numbers of cases and deaths during Lockdowns







# VI. REFERENCES

- [1]. Prabakaran, P. et al. Potent human monoclonal antibodies against SARS CoV, Nipah and Hendra viruses. Expert Opin. Biol. Ther 9, 355–368 (2009).
- [2]. Saphire, E. O., Schendel, S. L., Gunn, B. M., Milligan, J. C. & Alter, G. Antibody-mediated protection against Ebola virus. Nat. Immunol. 19,1169–1178 (2018).
- [3]. Reguera, J. et al. Structural bases of coronavirus attachment to host aminopeptidase N and its inhibition by neutralizing antibodies. PLoS Pathog. 8, e1002859 (2012).
- [4]. Yu, X. et al. Structural basis for the neutralization of MERS-CoV by a human monoclonal antibody MERS-27. Sci. Rep. 5, 13133 (2015).
- [5]. Fan Z, Chen L, Li J,Tian C, Zhang Y, Huang S, et al. Clinical features of COVID-19 related liver damage. 2020.
- [6]. Yang M, Hon KL, Li K, Fok TF, Li CK. The effect of SARS coronavirus on blood system: its clinical findings and the pathophysiologic hypothesis. Zhongguo Shi Yan Xue Ye Xue Za Zhi. 2003;11:217–21.
- [7]. Franks TJ, Chong PY, Chui P, Galvin JR, Lourens RM, Reid AH, et al. Lung pathology of severe acute respiratory syndrome (SARS): a study of 8 autopsy cases from Singapore. Hum Pathol. 2003;34:743–8.
- [8]. Hwang DM, Chamberlain DW, Poutanen SM, Low DE, Asa SL, Butany J. Pulmonary pathology of severe acute respiratory syndrome in Toronto. Mod Pathol. 2005;18:1–10.
- [9]. Chan JF, Yuan S, Kok KH, To KK, Chu H, Yang J, et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-toperson transmission: a study of a family cluster. Lancet. 2020;395:514–23.
- [10]. Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, et al. A novel coronavirus from patients with pneumonia in China, 2019. N Engl J Med. 2020;382:727–33.
- [11]. Wu A, Peng Y, Huang B, Ding X, Wang X, Niu P, et al. Genome composition and divergence of the novel coronavirus (2019-nCoV) originating in China. Cell Host Microbe. 2020; 27:325–8.
- [12]. Li F. Structure, function, and evolution of coronavirus spike proteins. Annu Rev Virol. 2016;3:237–61.