

## Impact of Covid-19 Pandemic on Indians: Interventions and Solutions

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### Abstract

COVID-19 is a new- age Pandemic. The medical authority in China, especially in Wuhan city, reported on December 2019 a large number of highly fatal, rapidly spreading viral pneumonia caused by an unknown coronavirus. The common history of all the patients was their visiting a Wuhan's whole food store, where live animals and seafood are sold. Irrespective of the efforts of the Chinese authorities, the virus spread rapidly all over the world by travelers, provoking widespread attention by the media and panic. Many previous coronavirus epidemics had been recorded, such as severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS), and the recently newly discovered epidemic is named coronavirus disease of 2019 (COVID-19). India may be successfully handling COVID-19 but at a significant cost. It is expected that lakhs of people will suffer from it, possibly thousands will die, but indeed 1.3 billion Indians will be affected directly or indirectly. It could have been avoided.

The objective of this research is to highlight the effect of a pandemic, the impact of interventions, to understand the basics of Biological aspect of Coronavirus and analyzing India's effort in fighting with COVID- 19. Also to come out with some of the suggestions and to propose a concrete and useful mitigation plan for India to fight for disasters. There is a need to re-assess our strategies, planning and available tools to fight with this pandemic and the crisis due to pandemic. This present study based on a literature review available for public reference as well as interviews conducted with different sections of society. Literatures were sourced from reliable public domain sources and official government data. We address current information about the new SARS Coronavirus-2 as well as the COVID-19 disease caused by it in this review.

**Keywords:** Coronavirus; COVID-19; India; Pandemic, Disease; SARS.

### Introduction

The epidemic is an outbreak of infectious diseases that spread rapidly in a given population within a short period of time. The global outbreak is termed as a "pandemic," and when it is restricted to a particular place, it is known as "endemic." All the pandemic diseases originate as endemic, and due to our social engagements and civilization, it spreads throughout the world and becomes a "pandemic."

This disease is caused by SARS Coronavirus-2 (SARS-CoV-2), and this virus is antigenically related to the SARS virus (SARS-CoV), which had been detected in 2002, depending on clinical, serological, and molecular findings. There is rapid competition among the researchers to discover the source of the virus, understand the mechanism of the disease development, establish

treatment strategies, and determine the factors affecting the incidence of infection and severity of the disease, and focus on the production of a vaccine. Coronaviruses are a group of single-stranded, positive-sense RNA genome viruses; its genome length varies from 26 to 32 kb. Coronavirus causes mild to severe respiratory disorders. In December 2019, several cases of pneumonia of unknown causes were found in Wuhan city, which is located in the Hubei province in China. Chinese health authorities investigated the problem and found that a new virus caused such infection and, using next-generation sequencing, found the 2019 novel coronavirus (2019-nCoV).

It has been transferred from humans to humans and animals to humans (zoonotic). Coronaviruses cause multiple respiratory problems, varying from common cold to severe infections such as SARS. General symptoms of infection include fatigue, cough, and breathing problems such as

shortness of breath, as described by World Health Organization. Serious cases may result in pneumonia, renal failure, and even death.

### History

Infectious diseases have been a constant companion of human beings throughout the history. Nothing has killed more humans than an infectious disease. From the earliest times to the present-day, epidemics have affected the human society in myriad ways: socially, culturally, politically, economically, and biologically. People had never known a period in history when epidemics did not pose a potential threat. This is as evident today as it ever might have been. Indeed, even in the cutting-edge period, outbreaks are nearly constant; however, very few of them reach the pandemic level like Coronavirus.<sup>[1]</sup>

### Origin Of Novel Coronavirus

(SARS-CoV-2) The Chinese government has told that the Wuhan seafood market is the place of origin of COVID19. A 55-year-old from Hubei Province may have been the first person to have contracted a viral infection on 17th November 2020, and cases have been on the rise since then<sup>[2]</sup>.

The incidence of unknown pneumonia was reported to WHO on 31st December 2019 by Chinese authorities, and on 1st January 2020, the Huanan seafood market was closed. On 7th January, the virus was recognized as a coronavirus with > 95% homology to the bat coronavirus and >70% similarity to the SARSCoV. Like earlier coronavirus SARS passed from bats to humans via civet cats and MERS via camels, in the case of 2012. The WHO has stated that the new Coronavirus may have its biological origin in Rhinolophus (horseshoe) bats, but that another intermediate animal is likely to be responsible for transmission to humans. Some scientists have found genetic links with pangolin coronaviruses, but they have yet to be confirmed.

In the next few days, it spread throughout the globe, by the time it was declared a pandemic on 12th March 2020 by WHO; it occupied 30% global population with 187 countries including India.

### Biology Of Corona Virus

It is a simple micro-size protein structure having crown-like spikes, enveloped single-stranded RNA virus, which is capable of reproducing faster and reviewing at different surfaces. It belongs to family Coronaviridae with many species like

HCoV-229E (Human coronavirus strain 229E), HCoV-NL6HCoV-NL6 (Human coronavirus strain NL63), SARS, and MERS<sup>[3,4]</sup>. Interestingly, this viral family has increased over the last few years as a result of the discovery of the newly appeared virus as a causative agent of severe acute respiratory syndrome (SARS). At the molecular level, coronaviruses use several unusual strategies to carry out a complex program of gene expression.

Coronavirus replication involves ribosome frame shifting during genomic translation, the synthesis of both genomic and multiple subgenomic RNA species, and the assembly of progeny virions by a mechanism that is exceptional among enveloped RNA viruses. Progress in the study and investigation of these processes has been boosted by the development of reverse genetic systems, a development that had previously been obstructed by the enormous size of the coronavirus genome<sup>[5]</sup>.

### Epidemiology Of Coronavirus

Coronavirus causes acute, mild upper respiratory infection (common cold). It affects different people in different ways. Most infected people developed mild to moderate symptoms. Common symptoms are fever, tiredness dry cough, and some people may experience pain, runny nose, nasal congestion, sore throat, and diarrhea. On average, it takes about 5–6 days for someone to show signs of the infection; however, it may take up to 14 days.

The virus enters into the host cell, and the uncoated genome is then transcribed and translated. The mRNAs form a unique "nested set" sharing a common 3' end. New virions develop by budding from host cell membranes<sup>[6,7]</sup>.

Infection is spread by large droplets generated by symptomatic patients while coughing and sneezing, but may also occur from asymptomatic people before the symptoms begin<sup>[8]</sup>. The virus replicates locally in cells of the ciliated epithelium, causing cell damage and inflammation. Laboratory diagnosis is made based on antibody titer in paired sera. It is hard to isolate the virus. Nucleic acid hybridization tests (including PCR) are now in operation. Treatment is mainly supportive and symptomatic; no vaccines or specific drugs are available. Social distancing, self-isolation, and

maintaining proper hygiene can only reduce the rate of transmission<sup>[9]</sup>.

**Impact on Animals:** We also have cases of transmission of COVID-19 from human to animal. Two pets (dogs) in Hong Kong and two pet cats (one in Belgium, the other in Hong Kong) incidentally exposed to COVID-19.

On 5th April, the USDA National Veterinary Services Laboratories reported a positive case of SARS-CoV-2 in samples collected from one tiger at the Bronx Zoo in New York City. It seems to be the first instance of a tiger being diagnosed with COVID-19<sup>[10]</sup>.

**Global Impact**

Despite modern age technology, COVID-19 has proved to be the fastest pandemic and has invaded 90% of the world's countries in just six months. The death toll has reached up to 200,000, and it continues. It shook the entire world and pulled down the global economy all the time. 80% of the global population will be affected in the near future, with an expected death toll of 5 million by the end of 2020.

Many countries have entirely shut down their activities and kept their people under lockdown. 20% of the world's population was under lockdown for more than two months. It triggered a massive uproar, and it is still going on. Fig. 2 shows the global spread of COVID-19<sup>[11]</sup>.

**Covid 19 in India**

**First Confirmed Case of COVID 19 in**

**India:** The first case of the coronavirus pandemic in India was registered on 30th January 2020 in the Kerala district of Thrissur, a student who had returned home on vacation from Wuhan University. That increased to three cases by 3 February; all of them were students who had returned from Wuhan, China<sup>[12,13]</sup>. There

was no substantial rise in incidents in the rest of February. Transmission intensified during March after multiple cases were identified around the country, several of which were related to individuals with a travel history to the affected countries. On 4th March, 22 new cases were detected, including those of the Italian Tourist group with 14 infected members.

**First Victim:** On 12 March, a 76-year-old man from Kalaburgi, Karnataka, who had a travel

history to Saudi Arabia, became the first victim of the virus in the country. Since then, it spread all over the country, occupying all the states and most of the cities<sup>[14]</sup>.

**India's Effort in Fighting with Covid 19:**

1. India initiated required preparedness and action at field level since 17th January itself, much before the advice from WHO.
2. National Institute of Virology, Pune, is the nodal Laboratory. As part of ICMR's preparedness for emerging/ re-emerging infectious disease, NIV, Pune has established capacity for molecular diagnosis of COVID-19.
3. The screening of passengers was initiated in the country since 18th January 2020 only for flights originating from china only at three airports. Later, from 4th March onwards, compulsory screening of all international passengers was initiated across all the airports.
4. The Government of India evacuated the Indian students and other professionals working in Wuhan and neighboring cities in the Hubei Province.
5. The Ministry has issued operating guidelines to support States on surveillance, contact tracing, surveillance at points of entry, and supervise laboratory sampling, packaging and transport, a clinical management protocol, and prevention and control of infections in healthcare facilities.
6. A 24x7 Control Room established
7. District Collector designated as the nodal officer at field level to lead containment operations.
8. States have been guided in terms of identifying containment zone, buffer zone, and preparation of micro plan to ensure effective active and passive surveillance and contact tracing through inter-disciplinary teams in the areas where cases were located<sup>[15]</sup>.
9. Declaration by WHO: The World Health Organization (WHO) on 11th March 2020, has declared the novel Coronavirus (COVID-19) outbreak a global pandemic.
10. The Lockdown: On the evening of 24th March 2020, Prime Minister Narendra Modi declared, with just four hours' notice, a 21-day lockdown from midnight onward to prevent the spread of Coronavirus. All the businesses and

government offices were shut down except essential services and commodities.

11. On 15th April 2020, the lockdown was extended for another 19 days till 3rd May 2020, which was later extended till 17th May 2020 due to the constant rise in new cases. There is still a possibility of some restrictions after the third lockdown, the objective of lockdown to stop community spread and get time for preparedness.
12. Testing: Till 08th May 2020, India claimed to have conducted more than 15,25,000 tests throughout the nation. States were given freedom in treatment. Testing was conducted at a substantial level for an asymptomatic person.
13. Awareness: Almost all media houses were involved in spreading awareness about Coronavirus, symptom, and its impact. Radio, TV, Celebrities and social media were tooled for awareness.
14. Relief Packages: Nirmala Sitharaman, the Minister of Finance, declared a 1.7 lakh crore Covid-19 mitigation economic relief package under the PM Garib Kalyan Yojana (PMGKY). In addition, the five crore families of MGNREGA workers will receive increased wage support of up to 2,000<sup>[16]</sup>. On 12th May 2020 government announced a 20-lakh crore relief package including earlier relief packages and loan facilities altogether.

**Treatment Of Covid-19 In India**

COVID-19 research is advancing at immense speed, and researchers are working at their full capacity to develop a treatment. However, no clinically proven antiviral agents for COVID-19 are available for its treatment. Since the virus is unknown and we lack immunity for the same. Following are the modes of clinical management of the disease-

**1. Boosting immunity:** Hygiene, Yoga, good sleep, meditation, and improved diet can be immunity boosters in the case of COVID 19. Diet supplements rich in omega 3 & 6 fatty acids should be used. Some natural immunity supplements include ginger, garlic, Basil leaves, Black cumin, gooseberries (amla), and turmeric.

**2. Convalescent Plasma Therapy (CPT):** In convalescent plasma therapy, plasma extracted from the blood of recovered patients, which has antibodies developed in response to successfully curing the disease, is transfused into severely ill patients to strengthen their immunity.

**3. Drugs to combat virus:** There is no such specific drug for COVID 19, patients are treated symptomatically. However, several drugs are in various stages of the trial around the globe for the treatment of COVID-19. An oral drug called EIDD-2801 has shown promising results in test-tube experiments with human lung and airway cells. EIDD-2801 introduces genetic mutations into the virus's RNA. As the RNA makes its copies, so many damaging mutations accumulate that the virus is no longer able to infect cells.

Favipiravir is expected to be an essential therapeutic agent for severe influenza, the next pandemic influenza strain, and other severe RNA virus infections for which standard treatments are not available<sup>[17]</sup>. Initially, FDA approved anti-malarial & rheumatoid arthritis management drugs Chloroquine and hydroxychloroquine for the treatment of COVID-19. However, further studies showed that they were ineffective in treating COVID-19 and caused severe side effects<sup>[18]</sup>.

**4. Vaccine and Vaccination:** Vaccine for COVID 19 is under development by around 75 different bio laboratories. Many of them have completed animal testing and are in the second phase of human trials.

Doses given	Fully vaccinated	% of population fully vaccinated	At least 1 dose
20.3Cr	4.26Cr	3.1%	11.8%

*Source: Govt. of India website updated till May 2021 ([https://ourworldindata.org/covid-vaccinations?country=OWID\\_WRL](https://ourworldindata.org/covid-vaccinations?country=OWID_WRL)).<sup>[19]</sup>*

India has so far given more than 100 million doses of two approved vaccines - Covishield and Covaxin. Covaxin is an inactivated vaccine which means that it is made up of killed coronaviruses, making it safe to be injected into the body. Covishield The vaccine is made from a weakened version of a common cold virus (known as an adenovirus) from chimpanzees. It has been modified

to look more like coronavirus - although it can't cause illness. A third coronavirus vaccine has been approved for use in India amid a deadly second wave of infections. <sup>[20]</sup>

Russia's Sputnik V has been deemed to be safe, and works in a way similar to the Oxford-AstraZeneca jab which is being made in India as Covishield. Sputnik V has been approved so far in 60 countries, including Argentina, Palestinian territories, Venezuela, Hungary, UAE and Iran. The Russian Direct Investment Fund (RDIF), which is marketing the vaccine, has signed deals to produce more than 750 million doses of Sputnik V in India with six domestic vaccine makers, according to reports. Hyderabad-based pharmaceutical major Dr Reddy's Laboratories will be importing the first batch of 125 million doses to India during this quarter. [20]

**REMARKABLE ACHIEVEMENTS**

1. **Less number of Cases in comparison of the population**
2. A state like Kerala, Delhi, and Maharashtra had innovated few things which were never existed earlier in India.
3. **Trials of Convalescent plasma therapy** in the treatment of COVID19 caused a very low mortality rate in Kerala, nearly 0.59%. It was initiated the very first time in India.
4. **5 T-plan:** Delhi government announces 5T Plan, i.e., Testing, Tracing, Treatment, Teamwork and tracking, and monitoring to fight with Covid-19.
5. **Extensive testing by Maharashtra government:** The biggest slums of Asia - Dharavi in Mumbai were sealed, and the entire area was tested.

**CAUSES OF MAJOR FAILURES OF INDIA:**

There are so many reasons for the failure in Controlling the Covid 19. Following are some of them:

1. Valuable time lost	5. Low Testing Rates	9. Untimely lockdown	13. Religious Gathering
2. Ignorance of Public Gathering	6. Open access to foreign travelers	10. The imposition of Janta Curfew	14. Lapses of Indian Government
3. Very late	7.	11. Largest	15. Lack of

<b>declaration of the state of emergency</b>	Educational Institutions remained open	migration of workers during the lockdown.	planning throughout the nation
<b>4. There are possibilities of widespread cases from one state to another.</b>	8. Extensive tracking and testing must complement the lockdown	12. India paid the price of one of the largest lockdowns of the world in terms of population.	16. No attempt to implement aggressive tracing and testing

**Review Of Literature**

On December 31, 2019, the China Health Authority alerted the World Health Organization (WHO) to several cases of pneumonia of unknown aetiology in Wuhan City in Hubei Province in central China. The cases had been reported since December 8, 2019, and many patients worked at or lived around the local Huanan Seafood Wholesale Market although other early cases had no exposure to this market [21]. On January 7, a novel coronavirus, originally abbreviated as 2019-nCoV by WHO, was identified from the throat swab sample of a patient [22].

SARS-CoV-2 is a member of the family Coronaviridae and order Nidovirales. The family consists of two subfamilies, Coronavirinae and Torovirinae and members of the subfamily Coronavirinae are subdivided into four genera: (a) Alphacoronavirus contains the human coronavirus (HCoV)-229E and HCoV-NL63; (b) Betacoronavirus includes HCoV-OC43, Severe Acute Respiratory Syndrome human coronavirus (SARS-HCoV), HCoV-HKU1, and Middle Eastern respiratory syndrome coronavirus (MERS-CoV); (c) Gammacoronavirus includes viruses of whales and birds and; (d) Deltacoronavirus includes viruses isolated from pigs and birds <sup>[23]</sup>. SARS-CoV-2 belongs to Betacoronavirus together with two highly pathogenic viruses, SARS-CoV and MERS-CoV. SARS-CoV-2 is an enveloped and positive-sense single-stranded RNA (+ssRNA) virus <sup>[24]</sup>.

SARS-CoV-2 is considered a novel human-infecting Betacoronavirus <sup>[25]</sup>. Phylogenetic analysis of the SARS-CoV-2 genome indicates that the virus is closely related (with 88% identity) to two bat-

derived SARS-like coronaviruses collected in 2018 in eastern China (bat-SL-CoVZC45 and bat-SL-CoVZXC21) and genetically distinct from SARS-CoV (with about 79% similarity) and MERS-CoV [25]. Using the genome sequences of SARS-CoV-2, RaTG13, and SARS-CoV [26], a further study found that the virus is more related to BatCoV RaTG13, a bat coronavirus that was previously detected in *Rhinolophus affinis* from Yunnan Province, with 96.2% overall genome sequence identity [26]. A study found that no evidence of recombination events detected in the genome of SARS-CoV-2 from other viruses originating from bats such as BatCoV RaTG13, SARS-CoV and SARSr-CoVs [26]. Altogether, these findings suggest that bats might be the original host of this virus [25], [26].

However, a study is needed to elucidate whether any intermediate hosts have facilitated the transmission of the virus to humans. Bats are unlikely to be the animal that is directly responsible for transmission of the virus to humans for several reasons [25]: (1) there were various non-aquatic animals (including mammals) available for purchase in Huanan Seafood Wholesale Market but no bats were sold or found; (2) SARS-CoV-2 and its close relatives, bat-SL-CoVZC45 and bat-SL-CoVZXC21, have a relatively long branch (sequence identity of less than 90%), suggesting those viruses are not direct ancestors of SARS-CoV-2; and (3) in other coronaviruses where bat is the natural reservoir such as SARS-CoV and MERS-CoV, other animals have acted as the intermediate host (civets and possibly camels, respectively). Nevertheless, bats do not always need an intermediary host to transmit viruses to humans. For example, Nipah virus in Bangladesh is transmitted through bats shedding into raw date palm sap [27].

**Objectives**

- To understand the basics of Biological aspect of Coronavirus.
- To understand and analyze India's effort in fighting with COVID- 19.
- To come out with some of the suggestions and to propose a concrete and useful mitigation plan for India to fight for disasters.

- To highlight the effect of a pandemic, the impact of interventions.

**Research Methodology**

The study based on literature reviews available for public reference as well as detailed interviews conducted with different sections of society. The literatures used for this study were based on public data provided by WHO, Government of India, as well as Governments of India. The online database was also used, i.e., Google Scholar, PubMed, and medRxiv. Some databases were taken into consideration from biomedical journals and white papers published during this year by different countries.

**Suggestions**

1. Lesson from Past Experience: Preparedness:
2. Integration of Authority for Central command
3. Use of Big data:
4. Use of Latest Technologies in reporting
5. Strict enforcement of quarantine rules:
- 6.Border Control, Case Identification and Containment:
7. Resource Allocation: Logistics & Operations:
8. Transparency in public reporting:
9. Alternative social etiquette and lifestyle changes
10. Identification and clarification of misinformation and disinformation:

**Recommendations**

India's Mitigation plan against any Future pandemic should include the following

- 1- Training the NDMA:** National Disaster Management Authority of India should be well trained, be proactive, and should have the ability to forecast and plan in advance.
- 2- Direct Communication** during a disaster should be transparent, frequent & direct from the head of authority to the people of the country.
- 3- Epidemics should not be allowed to be a Social Stigma in society:**
- 4- Media should not be allowed to create fear and uncertainty in society:**
- 5- Strategic planning of lockdown:**
- 6- Mobilization of resources:** Every state is acting independently. Planning should be in place to supply sufficient medical teams, protective equipment, and

supportive devices to save more lives. Sharing of resources between states will also help in quarantine efforts, tracking of cases, and on-demand distribution of health care systems in areas with a higher number of positive cases.

**7- Complete control on social media** to stop rumors, and for quick information flow. AI & Machine Learning could be implemented to detect fake news and block the same.

**8- Use of telemedicine: should be encouraged** and felicitated amongst people. Local private hospitals and clinics could implement telemedicine to cater to their localities.

**9- Awareness about Social Education about Disasters** must be spread to people right from school to specialized courses for the rest of the citizens.

**10- Awareness about special laws of emergencies** should be spread. Social Media could be used to spread awareness of such special laws applicable during the times of epidemics.

**11- Preparation of Manual:** Every disaster has different sets of mitigations, epidemic wise social isolation, lockdown, and quarantine. Every municipal council/ward/village should know the evacuation plan and safety procedures based on the disaster.

**12- Prediction of Hotspots:** Social, cultural, and economic behavior of the population will help us in understanding the hotspots of society. Religious congregations, public or private ceremonies or celebrations, can be screened on priority and with strictness.

Every time a disaster strikes, it will have different types of impacts on society. There is a need to Identify and classify our population to be prepared for every type of natural and manmade disaster that may strike in the future.

**13- Corner the High-risk Areas:** Hospitals, quarantine centers, and isolation centers should be away from the city or human population to reduce risks of an outbreak in the locality.

**16. Conversion of College research laboratories into the testing lab:** Every year, UGC funded millions of rupees to the colleges, especially those who have recognized research laboratories. These labs should organize specialized training for staff and install additional instruments that can be used

for testing during disasters. The designated authority can control accuracy and quality.

**17. Stopping of Spread of fake news** or false information, which may cause damage greater than the pandemic itself.

### Conclusion

This study concludes with scientific and social feedback to the government about their existing pandemic management program and helping them in building an innovative disaster management communication tool for the future. Our strategic, structured program, IFDM -Indian Firewall for Disaster Management, is the outcome of this research.

Not every city/ village was at risk of Coronavirus spread due to various factors like population dynamics, foreign contacts, and lifestyle. No zonation was done before lockdown. The entire country could have been divided into different Zones and as per the risk assessment report. Lockdown rules could have been stricter in high-risk areas and little relaxed in low-risk areas. The seasonal migration of Millions of laborers indifferent cities of India was hindered. Millions of migratory workers were about to move to their villages, and they remained jobless due to the lockdown. Preparedness plan during lockdown from day one to day 21st was neither properly designed by the government nor citizens were aware of it till the last moment.

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