

# We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

5,500

Open access books available

137,000

International authors and editors

170M

Downloads

Our authors are among the

154

Countries delivered to

TOP 1%

most cited scientists

12.2%

Contributors from top 500 universities



WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index  
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?  
Contact [book.department@intechopen.com](mailto:book.department@intechopen.com)

Numbers displayed above are based on latest data collected.  
For more information visit [www.intechopen.com](http://www.intechopen.com)



# A Journey through and beyond the COVID-19 Pandemic in Indian Setup-Lessons Learnt So Far

*Divyesh Kumar*

## Abstract

World over life was going at its normal pace when an outbreak occurred in Hubei province of China in the later part of the year 2019. This outbreak was soon found to be caused by a virus named coronavirus (COVID-19). Rapidly the virus spread globally leading to a pandemic. The mortality rate was increasing day by day and helplessly everyone was wondering what actually could be done to prevent the spread. Lessons from the past epidemic made it possible to think that maintaining social distancing and adequate hygiene might help to combat the ailment. In India, majorly affected were the people from poor strata and the businessmen who were earning their daily bread by selling things of daily need. The health sector too witnessed an alarming ratio of patients suffering from COVID-19. The second wave, which soon followed the first wave, caused much more havoc. Overall, the COVID-19 pandemic, exposed and challenged the health security system of every country. As the danger of pandemic still prevails, steps to curtail the spread of disease and future management strategies should be formulated from the lessons learnt through the COVID-19 phase.

**Keywords:** COVID-19, Lessons, India

## 1. Introduction

The year 2019 started with a bang and happiness, with colourful crackers exploding in the sky. Everything throughout the year went at its normal rhythm with the later part of the year bringing some bad news from the Hubei region in China. There was news of a spread of a deadly virus, which was found to be caused by the coronavirus. It was sooner found to affect people from other parts of the world, suggesting human-to-human transmission [1]. WHO declared it a public health emergency on March 11, 2020 [2].

The coronavirus disease (COVID-19) was found to affect the respiratory tract and also was found to affect the gastrointestinal tract and other parts of the body. Although symptoms vary from person to person, the major symptoms were found to be cough, fever, headache, sore throat, and diarrhoea [3]. Besides symptomatic patients majority of the spread was due to the asymptomatic carriers, which without any symptoms harboured the disease and were the major culprit in the spread of the disease.

Ever since there has been an outbreak of the COVID-19 from China, besides a lot many casualties, the economic front has also been shattered due to lockdown, worldwide. The COVID-19 disease not only affected the healthcare sector but also has had a deep impact on the tourism and trade sector worldwide [4], which has made the economy take a backseat.

Hence, urgent steps need to be taken to bring back life to new normal; also, the lessons learned from the COVID-19 pandemic propels us to formulate guidelines to tackle future untoward events.

## 2. Journey through the COVID-19 pandemic phases in India and its impact on various sectors

### 2.1 The initial impact

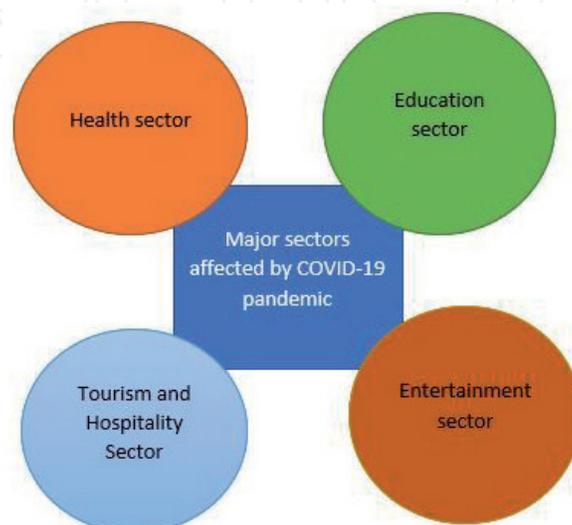
Although the initial impact of the virus was seen majorly in the developed countries, India got affected during January when the first case of it was reported from the Kerala province in southern India [5].

Further, lockdown and curfew were imposed in different countries, which eventually dwindled the economy globally affecting the poor and middle-class earners, maximally. In India, the daily wagers were forced to flee from their working place to go back to their native places. Since transportation was at standstill due to lockdown these workers along with their family members had to cover their long distances on foot only. Sooner or later, many social activists took the initiative to help these sufferers. At this point, the blame game of the politicians towards each other started pouring in.

Over time, the COVID-19 pandemic has affected many sectors which majorly include health, education, hospitality, and entertainment sectors. Diagrammatic representation as documented in **Figure 1**.

### 2.2 Impact on the health sector

The situation on the other hand, in the hospital sector, was far more frightening as more and more casualties were happening due to limited beds and a greater number of patients requiring hospitalisation. Urgent steps were thought of and many



**Figure 1.**  
*Various sectors affected by the COVID-19 pandemic.*

places like hotels, train bogies, etc. were soon made as alternatives to hospital beds. Health care workers despite all the stress of contracting the disease themselves took the front seat to take care of the sufferers, but to their very surprise many people, by this time, had become prey to different myths and false beliefs and had to face the resistance from these society members. The situation was grave in certain parts of the country and police had to take some harsh steps to control the nuisance.

Amongst the patients, the effect was seen majorly in elderlies and in patients suffering from cancer and with comorbidities. In their article published by Wang et al., concluded that patients above 70 years of age had a faster progression of disease in the elderlies [6]. Similarly, a study was done by Liang et al. documented that case-fatality rates were higher in elderlies and also the pulmonary complication requiring resuscitation were higher in those suffering from cancer [7]. Besides its impact on these patients treatment delays due to the lockdown became a major issue. Various modifications in the treatment guidelines were framed by this time by various eminent treating societies to make the treatment continued and minimise the delays. Also, working protocols of different departments were modified and policies to screen the COVID-19 patients were formulated.

Though modified protocols were important from the clinical point of view, the psychological effect of the suffering had a deep impact on society. Effective health-related communication has thus remained a need of the hour. An article published by A. Finset et al. concluded that effective health communication is important in fighting the COVID-19 pandemic [8]. Similar importance of health communication has been documented by Reddy et al. in their article [9]. Amongst the various modes of communication, telecommunication with patients has also proved to a boom during the pandemic. As the majority of the patients who had queries related to the disease and treatment-related queries were also taken care of. Also, scheduling of all appointments further made things organised both for the patients as well as the treating physicians.

From a treatment point of view the rat race to treat and cure the ailment was soon catching the pace by this time. Many different permutation and combinations of drugs were thought of during this phase, with not much success to it. Alternative medicines like homoeopathy and ayurvedic soon joined the race and tried their best to come up with a possible solution. Since the disease was due to the virus, the only hope for it was thought of by generating an appropriate vaccine. Research on making the vaccine soon began. Different countries to the very best of their capabilities are trying till date, to make an effective vaccine. In India, Bharat Biotech took the initiative and completed the initial phases of the trials.

Covaxin and Covishield are the two vaccines that were developed and brought forward for mass vaccination. The Government decided to carry out the vaccination in a phased manner with age group 45 and above along with health care workers and patients with comorbidities receiving the initial jab. Although a majority of people have got vaccinated, a lot many still doubt the efficacy of the vaccine and remain concerned with its side effects. The false rumours regarding the vaccine have further added to it and have prevented a lot of many to refrain from getting vaccinated. While people were being told about the advantages and necessity of getting the vaccination done, the second wave of the pandemic came into existence.

### **2.3 Impact of the COVID-19 on the education sector**

The very initial phase of the COVID-19 pandemic deeply impacted the education front, as the lockdown and curfew forced all the schools, colleges, and universities to shut down. The digital model was soon implemented and the majority of the teaching soon began through online mode. An article published by Pravat Kumar

Jena, has highlighted the various initiatives taken by the Govt. Of India on the education sector. Also various positive and negative effects have been emphasised [10].

Although the effect of this form of education can only be assessed with time as of now, the digital mode has surely taken care of the education front.

## **2.4 Impact of the COVID-19 on the tourism and hospitality sector**

Besides the health and the education sector, the hospitality industry has also been affected badly by the pandemic. The hospitality industry accounts for 10% of the global GDP. The travel restrictions have not only led to revenue losses also the jobs of various workers have come to stake. As per United Nations World Tourism Organisation that international tourists will be down by 20–30%

In India, the hospitality industry is likely to be hit hard. Experts suggest that domestic hotel companies faced a weak FY20 and a much weaker FY21. The challenges and learnings from the COVID-19 pandemic in the Indian setting have been elaborated in the article published by V. Kaushal et al. [11].

Other than India, the major impact of the COVID-19 pandemic can also be seen in countries whose economy depends largely on the tourism and hospitality sector.

## **2.5 Impact of the COVID-19 on the entertainment sector**

Music and film plays a very important role in one's life and is not only a source of entertainment but is also a major revenue generator for the country. The lockdown and curfew have led to the downfall in film production and indirectly to revenue collection. G. Nhamo et al. in their study found that the pandemic has led to the cancellation of productions, films, and music festivals leading to multibillionaire losses which furthermore has led to a devastating impact on the livelihood of artists [12].

## **2.6 COVID-19 and international health security**

United Nations brought the concept of health security during the year 1994 [13]. Some of the alternative terms include global public health security, public health security, and global health security [14–18]. Global Health Security is defined as the activities required, both proactive and reactive, to minimise the danger and impact of acute public health events that endanger people's health across geographical regions and international boundaries [19]. Four well-known international organisations that takes care of the health security issues are- World Health Organisation (WHO), the United Nations (UN), the European Union (EU), and the Asia-Pacific Economic Cooperation (APEC).

A well-developed Health security system is the backbone of a strong infrastructure of every country. The ongoing COVID-19 pandemic has shown how segregated and poorly funded health systems are worldwide. In a simplified form, it could be said that it has exposed the ground realities of the health security systems of all countries, revealing that no country is safe. Even countries like the USA, UK which receives top ratings for pandemic preparedness in the Global Health Security Index, have reported a significant number of COVID-19 cases and deaths [20]. India on the other hand, ranks at 57th position, with a cumulative score of 46.5, and fairs poor in the Global Health security index [21]. Compared to other countries, though the COVID-19 outbreak occurred late in India, the impact of it was much more severe. Further, the effect was seen in a wavy fashion with the first wave soon followed by the second wave. The impact of the second wave was much more severe than the first wave and majorly affected the younger population. Although India shares with

the United Nations the Global Health Security Agenda (GHSA), still a lot many steps are needed to be taken to improvise the Health security status.

Furthermore, not always security concerns are overlapped with health issues. Recently, both bioterrorism and emerging infectious diseases have raised alarming bells on health security issues [22–24]. An international cooperation is thus highly solicited in containing the spread of infectious diseases and enforcing a strong health security system. Also, establishing a global centralised Disaster Management Society and developing a comprehensive Global Disaster Rescue Plan could be possible measures for curtailing future pandemics.

### **3. The second wave of COVID-19 pandemic**

Although unlocking in phases was being attempted to resume the work situation as before, the casual attitude of people of not wearing a mask and maintaining proper hygiene once more has brought the second wave of the pandemic into the picture. The second wave although started gradually but sooner has spread at a great speed throughout the country, with the majority of the cases being reported from Maharashtra, Uttar Pradesh, and New Delhi.

A decline of the active cases was noticed until Feb-March 2021 when a sudden rise of cases began to be noticed. So, who actually can be blamed for this sudden sprout of the diseases for the second time? Crowded election rallies, religious and other social gatherings, and early opening of public places are being considered as the causative factors for the spread of the disease. India is a country of diversity and is highly populated with a variation of people ranging from very poor to very rich. The most affected group is the lower strata of people.

Hence complete lockdown probably was never an answer. The casual attitude of the countrymen towards the disease is the only factor that probably has led to this second wave. The situation has worsened this time as the rate of casualties has taken a steep rise, hospital facilities are full, and demand for oxygen and medications has increased from before.

A new double mutant variant of the coronavirus has been detected from the collected samples from different states of the country. B.1.617 lineage is known as the 'double mutant' virus. An increase in the fraction of samples with the E484Q and L452R mutations he been found by the Indian SARS-CoV-2 Consortium on Genomics (INSACOG) group. Besides.

India some other countries like the US, UK, Denmark, and Switzerland have also come across similar mutant strains. A new lineage of the SARS-CoV-2 virus, called B.1.618, has been identified in West Bengal, India.

Since the vaccine has remained the only hope of tackling the virus, scientists world over are trying their level best to develop an effective vaccine. Sputnik V vaccine is the latest one and has shown effective results in the trials done, so far. In their interim analysis report, Denis Logunov and colleagues reported a consistent strong protective effect across all participant age groups [25]. Sputnik V vaccine is also known as Gam-COVID-Vac. It utilises adenovirus 26 (Ad26) and adenovirus 5 (Ad5) as vectors. The other two vaccines utilising the adenovirus vector approach are the Oxford–AstraZeneca vaccine, which uses a chimpanzee adenovirus (ChAdOx) [26], and the Johnson & Johnson vaccine that uses the only Ad26 [27].

Although vaccines are being evolved and clinical trials are being performed at a rapid speed, the sad part of the picture is that a lot many people who are already vaccinated have got affected by the coronavirus. Probably the mutation has caused a change in the spike of the protein which is the target area of the vaccine. Although

it's a hypothetical note only as of now, if it's true, then the antibodies may not be able to recognise and neutralise the virus effectively.

Although the journey till now has remained a roller coaster ride for many, it is important to be patient and calm till the time the scientific reasons for the mutations and further effective vaccines and medicine become available. Further, people should strictly maintain hand hygiene and social distancing norms besides swearing masks all the time.

#### **4. Lessons learnt so far**

The COVID-19 pandemic has made us learn certain lessons.

1. The pandemic has reminded us of the theory proposed by Charles Darwin, which emphasised the concept of the survival of the fittest. The same concept could be applied to the COVID-19 pandemic also, as people with decreased immunity are more prone to getting COVID infection and vice versa. Hence, every possible attempt to maintain and enhance our immunity should be emphasised upon. Although there is no scientific data to suggest that a boosted immunity prevents getting COVID-19 infection, every possible effort to keep healthy and fit should be sought.

Besides, taking a healthy diet every possible attempt should be made to do physical activities like jogging, exercise, yoga, etc. Smoking and drinking should be avoided as much as possible. Junk foods should refrain.

2. No country in this world is powerful. This pandemic has made even the superpowers standstill and has shattered their economy too. Hence, it can be inferred that no country in this country is powerful. Even the smallest of the smallest nonvisible virus can be dangerous.

3. More and more trees are being cut and every effort is being made by mankind to infiltrate the wildlife sector leading to various calamities and environmental imbalance. We should thus try to maintain a balance by planting more and more trees and try to restore the imbalance being created. Thus it can be said that whatever we do we are still not beyond nature and any disturbances made within nature give reciprocating results.

4. Work can be managed from home. The exclusive usage of the digital platform during this pandemic has taught us that work can still be managed from a distant place. The development of various software are applications have made things handy. The usage of these latest technologies should further be explored and its applications should further be studied.

Furthermore, we can manage with a smaller number of vehicles. Means of travel such as subway and metros should further be developed. Emphases on cycling for small distance travel can also be propagated.

5. The pandemic has also made us realised the importance of a healthy relationship with each other and helping the persons in need. Earlier all the family members used to live together, eat, drink and leisure together. But with time with the growing social and its ever-changing rules, more and more families started moving towards nuclear family-based approach. This has led to weaker

relationships with each other. The lockdown and imposition of curfew have led family members to interact. Also, people have started helping each other in this time of need of each other.

6. The second wave seems to be the result of the casual and ignorant behaviour of the people towards the given instructions of maintaining social distancing and wearing masks. People should understand the need to maintain social distancing and hand hygiene practices. The brunt of this form of casual approach falls on people of every section of society. The second wave of the pandemic has been more devastating. Hence healthy practices like social distancing and hand wash must be regularly and strictly followed.

## **5. Future recommendations**

1. The health care system should be revolutionised. Every effort to upgrade the health sector and strategies to tackle the pandemics should be redefined.
2. A separate front should be formulated that will take necessary urgent steps at the time of need
3. Proper allocation of places for managing affected patients should be ready beforehand.
4. Strategies for entry and exit of patients should be redefined to make minimal contact with each other
5. Guidelines for lockdown should be formulated to be crystal clear regarding the strategies to be adopted in case of any pandemic
6. Also, guidelines for the elderly and patients with immunocompromised states should be made
7. Red flag signals should be generated to timely communicate and curtail the spread of disease
8. Steps to expedite more and more speedy clinical trials should also be designed
9. As lockdown like situation affects the business domain and poor strata people majorly, upfront crucial steps should also be taken to keep the economy front balanced during the pandemic phase.

## **6. Conclusion**

The journey through the COVID-19 pandemic has been full of major ups and downs so far.

Furthermore, though efforts are being put into the development of an effective vaccine, a big question regarding its effectiveness and side effects still prevails. Till the time effective treatment comes in the market every possible effort to maintain social distancing and hand hygiene should be practiced and followed sincerely.

IntechOpen

IntechOpen

### **Author details**

Divyesh Kumar  
Department of Radiotherapy and Oncology, Post Graduate Institute of Medical  
Education and Research (PGIMER), Chandigarh, India

\*Address all correspondence to: divyeshanand1@gmail.com

### **IntechOpen**

---

© 2021 The Author(s). Licensee IntechOpen. This chapter is distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. 

## References

- [1] Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet*. 2020 Feb 15;395(10223):497-506.
- [2] Cucinotta D, Vanelli M. WHO Declares COVID-19 a Pandemic. *Acta Biomed*. 2020;91:157-160.
- [3] Singhal T. A Review of Coronavirus Disease-2019 (COVID-19). *Indian J Pediatr*. 2020 Apr;87(4):281-286.
- [4] Chaudhary M, Sodani PR, Das S. Effect of COVID-19 on Economy in India: Some Reflections for Policy and Programme. *Journal of Health Management*. 2020;22(2):169-180.
- [5] S J, Sreedharan S. Analysing the Covid-19 Cases in Kerala: a Visual Exploratory Data Analysis Approach. *SN Compr Clin Med*. 2020 Aug 14:1-12.
- [6] Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, Wang B, Xiang H, Cheng Z, Xiong Y, Zhao Y, Li Y, Wang X, Peng Z. Clinical Characteristics of 138 Hospitalized Patients With 2019 Novel Coronavirus-Infected Pneumonia in Wuhan, China. *JAMA*. 2020 03 17;323(11):1061.
- [7] Liang W, Guan W, Chen R, Wang W, Li J, Xu K, Li C, Ai Q, Lu W, Liang H, Li S, He J. Cancer patients in SARS-CoV-2 infection: a nationwide analysis in China. *The Lancet Oncology*. 2020 03;21(3):335-337.
- [8] Finset A, Bosworth H, Butow P, Gulbrandsen P, Hulsman RL, Pieterse AH, Street R, Tschoetschel R, van Weert J. Effective health communication - a key factor in fighting the COVID-19 pandemic. *Patient Educ Couns*. 2020 May;103(5):873-876.
- [9] Reddy B, Gupta A. Importance of effective communication during COVID-19 infodemic. *J Fam Med Prim Care*. 2020;9(8):3793-3796.
- [10] Jena, Pravat Kumar, Impact of Pandemic COVID-19 on Education in India (July 30, 2020). *International Journal of Current Research (IJCR)*, Vol-12, Issue-7, Page-12582-12586 (2020).
- [11] Kaushal V, Srivastava S. Hospitality and tourism industry amid COVID-19 pandemic: Perspectives on challenges and learnings from India. *Int J Hosp Manag*. 2021 Jan;92:102707. doi: 10.1016/j.ijhm.2020.102707. Epub 2020 Oct 1. PMID: 33024348; PMCID: PMC7528873.
- [12] Nhamo G, Dube K, Chikodzi D. Implications of COVID-19 on Gaming, Leisure and Entertainment Industry. Counting the Cost of COVID-19 on the Global Tourism Industry. 2020 Jul 15:273-95.
- [13] United Nations Development Programme. Human development report 1994. New York: Oxford University Press; 1994.
- [14] Aldis W. Health security as a public health concept: a critical analysis. *Health Policy Plan*. 2008;23:369-375.
- [15] Fukuda-Parr S. New threats to human security in the era of globalization. *J Hum Dev*. 2003;4: 167-179.
- [16] Hardiman M. The revised International Health Regulations: a framework for global health security. *Int J Antimicrob Agents*. 2003;21: 207-211.
- [17] Wilson K, von Tigerstrom B, McDougall C. Protecting global health security through the International Health Regulations: requirements and challenges. *CMAJ*. 2008;179: 44-48.

- [18] Wilson K, McDougall C, Forster A. The responsibility of healthcare institutions to protect global health security. *Healthc Q.* 2009;12:56-60.
- [19] Heymann DL, Chen L, Takemi K, Fidler DP, Tappero JW, Thomas MJ, et al. Global health security: the wider lessons from the west African Ebola virus disease epidemic. *The Lancet.* 2015;385(9980):1884-1901.
- [20] Fragmented health systems in COVID-19: rectifying the misalignment between global health security and universal health coverage. Lal, Arush et al. *The Lancet*, Volume 397, Issue 10268, 61-67.
- [21] Garg S, Bhatnagar N, Arora E, Aggarwal P. Revisiting Global Health Security Measures in COVID 19 Pandemic. *Indian J Comm Health.* 2021;33(2):407-410.
- [22] Scharoun K, van Caulil K, Liberman A. Bioterrorism vs. health security — crafting a plan of preparedness. *Health Care Manag.* 2002;21:74-92.
- [23] Katz R, Singer DA. Health and security in foreign policy. *Bull World Health Organ.* 2007;85:233-234.
- [24] Commission on Human Security. *Human security now.* New York: Commission on Human Security; 2003.
- [25] Logunov DY, Dolzhikova IV, Shcheblyakov DV et al. Safety and efficacy of an rAd26 and rAd5 vector-based heterologous prime-boost COVID-19 vaccine: an interim analysis of a randomised controlled phase 3 trial in Russia. *Lancet.* 2021; S0140-6736(21)00234-00238.
- [26] Voysey M, Clemens SAC, Madhi SA et al. Safety and efficacy of the ChAdOx1 nCoV-19 vaccine (AZD1222) against SARS-CoV-2: an interim analysis of four randomised controlled trials in Brazil, South Africa, and the UK. *Lancet.* 2021; 397: 99-111.
- [27] Sadoff J, Le Gars M, Shukarev G et al. Safety and immunogenicity of the Ad26.COV2.S COVID-19 vaccine candidate: interim results of a phase 1/2a, double-blind, randomized, placebo-controlled trial. *medRxiv.* 2020; (published online Sept 25.)