

## **Covid-19 – Impact across Nations and Sectors**

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Type of Article: Review

Conflict of Interest: None

Funding: DMIMS

Ethical Approval: IEC, DMIMS, Wardha.

### **ABSTRACT**

### **BACKGROUND**

The COVID-19 or the coronavirus disease 2019 is raging across the world and recently crossed the unfortunate mark of hundred million in case infections all over the world.

### **SUMMARY**

The COVID-19 has multifaceted impact on human lives. Almost all the world came at standstill after novel coronavirus started raging its effects. Be it economy or the health care infrastructure, almost all the sectors crumbled before the rage of the novel coronavirus. Some positive impacts were also seen such as improvement in air quality and over all environment and reduction in road traffic accidents.

### **CONCLUSION**

The positives impact is the boon in disguise and must be maintained at the current levels. Lacunae which highlighted by COVID-19 pandemic such as fragile health care infrastructure must be addressed in order to make them more resilient.

**KEYWORDS:** Covid-19, Economic Impact, Infodemic, Psychological Distress, Pandemic, Health Infrastructure.

## INTRODUCTION

Coronavirus disease 2019 or COVID-19 is the disease caused by novel coronavirus or SARS-COV-2 which is the successor of SARS-COV which was the virus behind the severe acute respiratory syndrome (SARS) outbreak. The high virulent nature and capacity of producing extremely lethal clinical outcomes is what makes the novel coronavirus the most feared one. As of January 29, 2021, 101,567,466 people are infected with the COVID-19 from across the world crossing the unfortunate mark of one hundred million and 2,193,577 people lost their lives due to COVID-19 related complications(1). The World Health Organization (WHO) was compelled to upgrade its status from public health emergency of international concern (PHEIC) to pandemic which was never done before since the inception of the organization(2). United States of America, India, Brazil, Russian federation, United Kingdom, and France are the top hardest hit countries more than half of the case infection load and case fatalities of the world(3). The new mutated strain of the novel coronavirus reported from United Kingdom and South Africa is a serious cause of concern as it supposedly said to be seventy percent more virulent than the current strain(4). Multifaceted impact of the novel coronavirus has been seen from the day one when it entered the lives of human being. Mostly adverse impact was seen but some unexpected pleasant impact was also observed as pandemic progressed. The environment and research and innovation especially experienced the positive side of the unexpected impacts while health care infrastructure and psychological status were facing downside of the pandemic. Many other associated aspects were also seen and over all comprehensive overview has been taken on these points in this article.

## IMPACT OF COVID-19 ON ENVIRONMENT AS A WHOLE

The coronavirus disease 2019 or COVID-19 is the unprecedented pandemic that world is facing.(5) World was taken aback by the spreading ability of the coronavirus and its lethal nature. No other even was as deadly as COVID-19 is proving in almost past hundred years in the history of human civilization. In the month of March 2020, many countries resorted to the coercive and blanket measure of containment that is lockdown. Around last week of the March every major country were experiencing spurt of cases and then decided to curb the spread. But as there was no precedent available of the coronavirus disease 2019, governments and health care authorities were in catch, which measure to be implemented in order to curb the spread. Naturally the lockdown seems the better option than others and it was imposed across the countries. Many huge countries implemented the lockdown such as India, China and so on. The idea behind the lockdown was that it will stop the spread of the virus and already arrived positive patients from abroad can be treated also it can buy some time to ramp up the health care infrastructure as the prediction of huge cases was already made(6). But as the lockdown completes one week several unexpected changes followed the lockdown many of which were only dreamed of and some of them were actually pleasant. The lockdown made people confined at home and no person were allowed to go out except the essential services providers like health care professionals and law enforcement agencies. No vehicles were on the road and this reduces the pollution levels drastically. Major of chunk of the vehicle owners and drivers were made to seat at home. The less vehicles on road decreased the emissions in the air through vehicles. Also, as the lockdown was announced the factories and industries were also

made to close down and workers were laid off. The emissions and effluents from the factories were also reduced and this improved the air quality of the severely affected metro cities across the world. The overall air felt more pleasant and the ambience was maintained at good level. The cities affected by pollution more gravely are mostly from developing countries like China, India, Bangladesh and other south Asian nations. It was a big relief to these countries as a whole as unexpected decrease in air pollution helped them to achieve the reduction in pollution targets. In fact, according to World Air Quality report published in 2019, top five polluted countries in the list belong to Asia. Ghaziabad, a satellite town of the Indian capital of New Delhi ranked first among most polluted cities. But as the lockdown was announced the same Ghaziabad noticed tremendous decrease in pollutants like particulate matter of size 2.5 micrometer (PM 2.5), particulate matter of size 10 micrometer (PM 10), nitrogen dioxide, carbon monoxide, carbon dioxide, Sulphur dioxide and so on. There was a massive decrease of PM 2.5 pollutant by almost 85 percent after the lockdown was announced in the city of Ghaziabad. Also other pollutants like PM 10, NO<sub>1</sub>, SO<sub>2</sub> were decreased by 50.8, 48.7 and 14.3 percent respectively(7). All these pollutants are extremely hazardous and are capable of creating many medical complications. This decrease was measured as compared to the month of January when there was no lockdown in place. The year on year decrease also of considerable amount. Dhualadhar mountain range was visible from the city of Punjab in the Indian state which was not visible due to huge smog and pollution. Many of the people never saw such scenario in their lifetime. Also, there was considerable amount of improvement in water quality in rivers as the effluents were less in quantity due to lockdown. Poaching and hunting activities which are detrimental to the ecosystem of the environment was stopped for some time. Many wild animals were found to be roaming around the streets and taking casual strolls like they are reclaiming what humans stole from them(8).

## **IMPACT ON ROAD TRAFFIC ACCIDENTS**

The lockdown which was primarily introduced for the containment of the COVID-19 was also noticed to be doing some other beneficial work which was almost unexpected. As the lockdown made people sit at home, the vehicles on the road were reduced drastically and this resulted in to lesser accidents on roads. As the vehicles were absent from the roads the essential traffic like movement of essentials and other security related aspects were more freely and experienced hassle-free commute. In an ordinary year almost 1.40 million people lose their lives in road traffic accidents and it is therefore important to raise awareness about road safety. Pandemic induced lockdown gave some breather and reduced these numbers and we have to make efforts that these numbers remain low. A study was conducted in European country of Spain where there was a reduction in overall traffic accident reporting. The road traffic accidents fell by 74.3 percent which is huge and unexpected. The year on year fall for the same was even more and stands at 76 percent(9).

## **IMPACT OF COVID-19 ON ECONOMIC FRONT**

The pandemic has affected almost all aspect of human being and economic impact is one of the gravest among all these. The high virulent nature and capacity of producing lethal clinical outcomes made it difficult to continue the work until some concrete treatment or vaccine is developed. Therefore, the lockdown was announced to control the spread and strategize the

mitigation plan. This forced the industries and economic unit to close down. Widespread losses of jobs and livelihood was reported and almost all the economic activities were closed. The whole world was at stoppage and the future looked grim and uncertain. The demand fell as the uncertain and crisis situation insinuates the saving tendency and people spends less and save more for the future scenario. The demand supply cycle broke and the wheel of the economy came to a stop. The International Monetary Fund and World Bank which are the Bretton woods institution designed to shape the global economies forecasted the negative growth for the world gross domestic product (GDP). Initially the forecasted world GDP growth was negative 2.4 percent but the situation was so grim and the late starting of the economies compels the forecast to be revisited and now it stands at -4.5 percent which is a serious cause of concern. It is in fact the contraction in the major economies around the world. The stock markets which shows the investor sentiments and gives the mood of the investor and the nation's growth fell drastically all over the world(10). The Dow Jones industrial average which is the premier index of the world fell by almost 3000 points which was never happened before in a single day on March 16, 2020. Various sectors were severely hurt and are still bearing the brunt of the COVID-19 economic fallout. Travel and tourism sector were among the worst hit sector. It is the sector which employs millions of people and upon which various other allied economic activities thrives. This sector was hit so badly that literally zero travel was taking place after lockdown was announced in the month of March 2020. A whopping United States dollar (USD) 810.7 billion of loss was seen in travel sectors alone. Almost no passenger and commercial flights flew after lockdown and this impacted badly on airline industry as standstill aero plane and aircraft requires more maintenance while revenue was practically zero. Several other sectors were also hit as the world came to standstill. Retail, automobiles, restaurants are some of the most impacted industrial sectors due to COVID-19. Millions of people were laid off as there was no work for them and industries found it difficult to pay them their salaries and incentives. Economic front was almost completely ruined by the COVID-19 pandemic and it needs revival efforts on urgent basis(11).

## **IMPACT ON HEALTH INFRASTRUCTURE AROUND THE WORLD**

The pandemic made no concessions among certain countries and affecting the whole world with same potential. From its declaration by World Health Organization (WHO) as pandemic, 100 million cases are registered all across the world and two million case fatalities has been reported. No other disease outbreak was so successful in creating such menace in health and medical sector. Naturally the super-fast increase in huge numbers overwhelmed the present health care infrastructure and it was collapsed under immense case infection pressure. The developed countries which harbor sophisticated and state of the art infrastructure were also taken aback and could not handle the patient influx. The grim pictures which came out of European countries like Spain and Italy were establishing that even advance health care infrastructure is not capable of handling the pandemic pressure(12). The developing and least developed countries also suffer huge pressure on their already crumbling health care infrastructure. But there was certain degree of comfort among the least and developing nations as they were showing less case fatality rate as compared to their developed counterparts. This is may be due to the less healthy lifestyle followed by the citizens of advanced countries as they are having more spending capacity. On the contrary countries like India where Health care infrastructure is not so good, the case fatality rate and deaths per million population is extremely low indicating towards lifestyle change and

other immunity factors. Although the lack of beds and equipment's was severely felt during pandemic. The capacity was full and alternative arrangements of beds in train coaches, in stadiums, and several other make shift facilities were made to cater the overwhelming case demands. The need for critical care infrastructure was rose tremendously particularly for ventilators and oxygen support system. The vulnerable groups such as comorbid patients, old aged people, pregnant women and infants and children are more prone to developing severe clinical outcomes when infected than their normal counterparts. Already the ventilators, oxygen support systems and other sophisticated systems were limited in numbers and pandemic made the situation worse. The contagious disease like COVID-19 NEEDs some special equipment's like face masks and personal and protective equipment's (PPE) kits which were lacking initially as the production was limited to the demand which was low (13). This made doctors and allied health care professionals work without protective equipment's which left them more vulnerable. Basically, the resources were diverted to health care infrastructure so that the pandemic is mitigated in time. This has impact on several other diseases. Pregnant women and other comorbid patients which needed regular care and medical interventions were finding it difficult to consult with their doctor as almost all the manpower was dedicated to containment of COVID-19. Also, there was a fear about contracting the disease infection if someone go out for any routine checkup so people preferred to sit at home.

The COVID-19 has impacted the health care professionals disproportionately and which are also the part of health care infrastructure. The working hours of the health care workers were increased and they were giving service to more patients. Keeping in mind the contagious nature, the health care professionals and persons associated with them has to wear the personal protective equipment (PPE) kit throughout the day and till the end of duty hours. It is extremely uneasy to work in PPE kits for hours. Also, no leave was granted to any individual giving essential services like health care providers as already there is lack of health care professional. Besides that, they are the first point of contact while treating the COVID-19 infected patients. Naturally they were worried that they would be infected by the novel coronavirus and unknowingly it would be transmitted to family members and loved ones. This created a psychological distress among health care givers. Also fellow doctors and nurses getting infected and fatal consequences attached to them created further distress (14).

## **IMPACT OF COVID-19 ON MENTAL HEALTH**

The abrupt nature of the arrival and the huge uncertainty attached to it made the coronavirus disease 2019 or COVID-19 more adversely impacting disease. As the figures of infection rose all across the world, various governments resorted to mitigation measures like lockdown and movement restrictions. This made people to sit at home or wherever they were at that time. It made them helpless as the circumstances were not in their hand and the microscopic virus is now dictating their daily schedule. Heart wrenching and grim pictures coming out from the hardest hit countries were deceased member's family of COVID-19 infected person were not even allowed to perform last rites due to high contagiousness made people more worries. Also safety of loved ones and family members especially those suffering from any underlying chronic illness made people anxious (15). There was no peak in site and virus was raging all over the world wreaking havoc in almost all parts of the world. Front line workers like health care professional and law

enforcement agencies personals were more vulnerable and their family members more worried. Rising case fatality numbers and various rumors circulating on social media networks were only adding to the woes. The spread of the misinformation was so huge that World Health Organization (WHO) has to categorically mention and condemned the pandemic of misinformation which it named as Infodemic(16). The Infodemic was creating the disturbances at par with the COVID-19, as the circulation of any such information takes place with the speed of lightening. Many messages claiming the cure of the disease which is not found officially, spreading scare about treatment and question the treatment of the doctors led to very grievous consequences such as attacks on health care workers and self-medication which can prove fatal. Also as the vaccine rollout is in the last phase, many messages are spreading the rumors about vaccine inefficiency and perceived threats which is giving rise to vaccine hesitancy which can halt the entire process as it is essential to vaccinate all the people to restart the normal life(17).

## **IMPACT ON RESEARCH AND INNOVATION**

One thing COVID-19 accelerated on massive scale is the quest of the vaccine which can stop the spread of the virus spread. No vaccine for any disease was developed as fast as the vaccine of COVID-19. Not only one but several vaccine candidates got approvals from respective drug controller agencies around the world and showed their efficacy. Also, all the innovation whether it was cheap testing kits of COVID-19 or use of three-dimensional printing technology in producing face shield on mass levels. Point of contact testing where the result of the COVID-19 test is known in few minutes were extremely beneficial in restarting economy as one can know if he or she is positive for COVID-19 or not. The speed at which the innovation was happening was remarkable(18). The lack of ventilators was solved by cheap and low-cost mechanical ventilators which were developed by some engineering students. Portable testing labs which test samples from far fetched areas and portable and resurrect able hospitals were also the result of accelerated brainstorming in such times of crisis. Finally, there were some grey areas too that overshadowed these achievements. As all focus was on the containment of the COVID-19, all other chronic disease got little to no attention. The vaccination drive of other diseases was completely ignoring as the resources were used up in mitigation of the coronavirus. But as the normalcy situation is coming up we can expect resumption of all these activities for the betterment of the affected people(19). There are a number of articles reflecting on impact of COVID on different contexts of different countries. Adhit et. al. reported on clinical features, effects on gastrointestinal system and possibility of faecal transmission (20). Agrawal et. al. reported its financial effects on the dental fraternity and health-care workers(21). Anjekar et. al. reported on positive aspects of COVID-19 and also impact on Medical Education System (22,23). Bakshi et. al assessed the awareness and psychosocial effects of covid-19 pandemic on health care professionals and medical students across the state of Maharashtra (24). Balsara et. al reported on detection, response, preparedness and readiness measures for covid-19 pandemic (25). Similar studies were also reported by Bawari et. al. (26) and Bawiskar et. al.(27) and Khatib et. al.(28).

## **CONCLUSION**

COVID-19 is an unprecedented disease outbreak and it needs unprecedented and innovative measures to contain. The multispectral impact has been mostly adverse in nature but can be tackled with collective human effort and wisdom. The economic revival must prioritize as it has

trickle down approach and benefits the most hit section of the society. Job creation and opening up of activities along with stimulus packages must announced to boost the spending creating demand supply chain. The health care infrastructure was hardest hit but saw massive expenditure therefore should be made resilient for future such scenario to cater all the demands. Psychological distress was widely seen and positive atmosphere can cure this trend. All the neglected areas in health care sector like other chronic illnesses which were neglected to contain the spread of COVID-19 must be relooked and attention should now be given to them too. Finally, after the arrival of the vaccine there is some positive atmosphere and people are hoping for quick revival of the situation and want their pre COVID-19 era lifestyle back.

## REFERENCES

1. COVID-19 Map [Internet]. Johns Hopkins Coronavirus Resource Center. [cited 2021 Jan 29]. Available from: <https://coronavirus.jhu.edu/map.html>
2. WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020.pdf.
3. WHO Coronavirus Disease (COVID-19) Dashboard [Internet]. [cited 2021 Jan 29]. Available from: <https://covid19.who.int>
4. Wise J. Covid-19: New coronavirus variant is identified in UK. BMJ [Internet]. 2020 Dec 16 [cited 2020 Dec 23];371:m4857. Available from: <https://www.bmj.com/content/371/bmj.m4857>
5. Dushyant Bawiskar, Pratik Phansopkar, Ayurva Vilas Gotmare. COVID-19 Facets: Pandemics, Curse and Humanity. Int J Res Pharm Sci. 2020 Aug 6;11(SPL1):385–90.
6. Sarmadi M, Marufi N, Kazemi Moghaddam V. Association of COVID-19 global distribution and environmental and demographic factors: An updated three-month study. Environ Res [Internet]. 2020 Sep 1 [cited 2020 Oct 26];188:109748. Available from: <http://www.sciencedirect.com/science/article/pii/S0013935120306411>
7. Chauhan A, Singh RP. Decline in PM2.5 concentrations over major cities around the world associated with COVID-19. Environ Res [Internet]. 2020 Aug 1 [cited 2020 Oct 26];187:109634. Available from: <http://www.sciencedirect.com/science/article/pii/S0013935120305272>
8. Verma A, Prakash S. IMPACT OF COVID-19 ON ENVIRONMENT AND SOCIETY. 2020 Jul 2;
9. Saladié Ò, Bustamante E, Gutiérrez A. COVID-19 lockdown and reduction of traffic accidents in Tarragona province, Spain. Transp Res Interdiscip Perspect [Internet]. 2020 Nov 1 [cited 2020 Nov 9];8:100218. Available from: <http://www.sciencedirect.com/science/article/pii/S2590198220301299>
10. Roy S. ECONOMIC IMPACT OF COVID-19 PANDEMIC. Tech Rep. 2020;21.

11. Pak A, Adegboye OA, Adekunle AI, Rahman KM, McBryde ES, Eisen DP. Economic Consequences of the COVID-19 Outbreak: the Need for Epidemic Preparedness. *Front Public Health* [Internet]. 2020 [cited 2021 Jan 14];8. Available from: <https://www.frontiersin.org/articles/10.3389/fpubh.2020.00241/full>
12. Kim G, Wang M, Pan H, H Davidson G, Roxby AC, Neukirch J, et al. A Health System Response to COVID-19 in Long-Term Care and Post-Acute Care: A Three-Phase Approach. *J Am Geriatr Soc*. 2020 Jun;68(6):1155–61.
13. Chu DK, Akl EA, Duda S, Solo K, Yaacoub S, Schünemann HJ, et al. Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and COVID-19: a systematic review and meta-analysis. *The Lancet* [Internet]. 2020 Jun 27 [cited 2020 Dec 16];395(10242):1973–87. Available from: [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)31142-9/abstract](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31142-9/abstract)
14. Blake H, Bermingham F, Johnson G, Tabner A. Mitigating the Psychological Impact of COVID-19 on Healthcare Workers: A Digital Learning Package. *Int J Environ Res Public Health*. 2020 26;17(9).
15. Tee ML, Tee CA, Anlacan JP, Aligam KJG, Reyes PWC, Kuruchittham V, et al. Psychological impact of COVID-19 pandemic in the Philippines. *J Affect Disord*. 2020 Dec 1;277:379–91.
16. COVID-19 Facets: Pandemics, Curse and Humanity | *International Journal of Research in Pharmaceutical Sciences* [Internet]. [cited 2020 Oct 17]. Available from: <https://pharmascope.org/ijrps/article/view/2731>
17. Serafini G, Parmigiani B, Amerio A, Aguglia A, Sher L, Amore M. The psychological impact of COVID-19 on the mental health in the general population. *QJM Mon J Assoc Physicians*. 2020 Jun 22;
18. Health Technologies and Innovations to Effectively Respond to the COVID-19 Pandemic | *Frontiers Research Topic* [Internet]. [cited 2021 Jan 29]. Available from: <https://www.frontiersin.org/research-topics/16023/health-technologies-and-innovations-to-effectively-respond-to-the-covid-19-pandemic>
19. SCTIMST & IIT Madras start-up set up portable hospital infrastructure for COVID -19 | *Department Of Science & Technology* [Internet]. [cited 2021 Jan 29]. Available from: <https://dst.gov.in/sctimst-iit-madras-start-set-portable-hospital-infrastructure-covid-19>
20. Adhit, K.K., P. Anjankar Ashish, and K. Siddhaarth. “COVID-19: A Review of Its Clinical Features, Effects on Gastrointestinal System and Possibility of Faecal Transmission.” *International Journal of Research in Pharmaceutical Sciences* 11, no. Special Issue 1 (2020): 623–27. <https://doi.org/10.26452/ijrps.v11iSPL1.2881>.
21. Agrawal, D., N. Khara, B. Mundada, N. Bhola, and R. Borle. “COVID-19 and Its Financial Effects on the Dental Fraternity and Health-Care Workers: A Literature Review.” *International Journal of Research in Pharmaceutical Sciences* 11, no. Special Issue 1 (2020): 628–31. <https://doi.org/10.26452/ijrps.v11iSPL1.2883>.
22. Anjankar Ashish, P., P. Anjankar Vaibhav, J. Anjankar Anil, and K. Lata. “Positive Aspects of Covid 19 Pandemic: A Blessing in Disguise.” *International Journal of Research in*



- Pharmaceutical Sciences 11, no. Special Issue 1 (2020): 187–91. <https://doi.org/10.26452/ijrps.v11iSPL1.2371>.
23. Anjankar, V.P., A.P. Anjankar, and A.J. Anjankar. “Review of the Impact of COVID-19 on Medical Education System.” *International Journal of Current Research and Review* 12, no. 20 (2020): 183–86. <https://doi.org/10.31782/IJCRR.2020.122025>.
24. Bakshi, S., V. Toshniwal, A. Agrawal, S. Acharya, and S. Shukla. “Awareness and Psychosocial Effects of Covid-19 Pandemic on Health Care Professionals and Medical Students across the State of Maharashtra.” *International Journal of Current Research and Review* 12, no. 22 Special Issue (2020): S-122-S-125. <https://doi.org/10.31782/IJCRR.2020.SP74>.
25. Balsara, K., and D. Shukla. “Stepping up Detection, Response, Preparedness and Readiness Measures for ‘Covid-19’-a Pandemic.” *International Journal of Research in Pharmaceutical Sciences* 11, no. Special Issue 1 (2020): 1042–47. <https://doi.org/10.26452/ijrps.v11iSPL1.3442>.
26. Bawari, H., and J.N. Chaple. “Covid-19 and the Aching World.” *International Journal of Research in Pharmaceutical Sciences* 11, no. Special Issue 1 (2020): 253–58. <https://doi.org/10.26452/ijrps.v11iSPL1.2709>.
27. Bawiskar, D., P. Phansopkar, and A.V. Gotmare. “Covid-19 Facets: Pandemics, Curse and Humanity.” *International Journal of Research in Pharmaceutical Sciences* 11, no. Special Issue 1 (2020): 385–90. <https://doi.org/10.26452/ijrps.v11iSPL1.2731>.
28. Khatib, M.N., S. Gaidhane, M. Khatib, M. Ahmed, A. Gaidhane, and Z.Q. Syed. “SARS-CoV and SARS-CoV-2: Similar Viruses with Different Trajectories.” *WutanHuatanJisuanJishu* 16, no. 5 (2020): 544–48.