How to Cite:
Yadav, A., & Alam, S. (2022). Literature review on health benefits due to good quality of air during lockdown. *International Journal of Health Sciences*, *6*(S6), 6157–6166.
https://doi.org/10.53730/ijhs.v6nS6.10948

Literature review on health benefits due to good quality of air during lockdown

Anamika Yadav
BPT, Researcher student, Department of Physiotherapy, Galgotias University, Delhi NCR, India

Dr. Sajjad Alam
PhD, Professor, Department of Physiotherapy, Galgotias University, Delhi NCR, India

***Abstract*---**The epidemic caused by COVID-19 triggered a terrible situation that spread over the whole world. Since the third week of March 2020, all forms of industrialization, including hospitality, education, the corporate world, and entertainment, are subject to restrictions as a result of this. Please provide research analyzing the effect of the lockout on habitats throughout the whole country of India or beyond. The findings not only show a reduction in potentially hazardous air pollutants such as SO2, NO2, PM10, and PM2.5, but they also show an increase in levels of O3, which in turn leads to the repair of our ozone layer, which is essential for maintaining human health. These studies demonstrate the significant consequences of air quality affects across 46 cities located across the whole country of India.

***Keywords*---**COVID, pollution, health, air quality.

Introduction

In developing countries like India faced the biggest environmental issues like "Air Pollution" it remained one of the many health issues throughout the World. In COVID-19 lockdown, scientists noticed an enormous difference in air pollution during this time span (April – August) 2019 to (2009-19)[1].The Gard stick of Air Quality Index (AQI) nitrogen dioxide, Sulphur dioxide, Aerosol index and Aerosol optical depth data are retrieved from the Ozone Monitoring Instruments (OMI), TROPO spheric monitoring instrument (TROPOMI), and MODIS (moderate resolution pictures Spectroradiometer sensor on the Terra and Aqua satellites, respectively shown that in India. The moderate reduction of 16% and 20%. Due to lockdown this effect was seen in March 2020.The WHO believes that each and every year 2.4 million people loses their lifes from increasing Air pollution. Many

International Journal of Health Sciences ISSN 2550-6978 E-ISSN 2550-696X © 2022.
Manuscript submitted: 9 April 2022, Manuscript revised: 27 June 2022, Accepted for publication: 18 July 2022

studies proved that but (Short term- long period) effects of air pollution leads to many health problems and also increased fatality rate, overestimate hospital stay etc. Many studies in Delhi examined the effects of air pollution, a respiratory system and their associated morbidity[2].These are many extensive studies conducted by the Central Pollution Control board in 2008 WHO recognize remarkable associated with all relevant conflicted Health outcome. Inflammation or oppression was recognized as the main result of Air pollution due to damage of the cardo-pulmonary system [3].

Phases	Timeline	Duration	Activities restricted/permitted
Phase 1	March 25, 2020 to April 14, 2020	21 days	Except for very necessary services, all businesses and services have been shut down.
Phase 2	April 15, 2020 to May 3, 2020	19 days	The COVID-contained areas will be granted a conditional relaxation on April 20. Regions are categorized into red, orange, and green zones based on colour. With a degree of social distance, agribusinesses and public work programmers may be re-opened. Trucks, railroads, and aircraft were used for the first time to convey goods. Many of the city's minor businesses, including banks and boutiques, have reopened. stranded travelers may now travel beyond state lines.
Phase 3	May 4, 2020 to May 17, 2020	14 days	Zones will be divided into three categories on May 1st: red (130 districts), orange (284 districts), and green (319 districts)
Phase 4	May 18, 2020 to May 31, 2020	14 days	States are in charge of defining the green, orange, and red zones of the United States. Containment and buffer zones are further subdivided into red zones.
Unlock			
Unlock 1.0	June 1, 2020 to June 30, 2020	30 days	Begin reopening retail malls, religious sites and hotels and restaurants in this first stage There were no limits on interstate travel or large gatherings. Curfews will be enforced at night.
Unlock 2.0	July 1, 2020 to July 31, 2020	31 days	Containment zones were subjected to lockdown tactics. The vast majority of activities were allowed in every other place. Curfews will be implemented at night. a small number of Vande Bharat Mission-approved trips abroad

India air quality scenario during lockdown

PM2.5 and PM10 are two of the most frequent air pollutants, and they have a substantial influence on the overall quality of the air that we breathe. In some nations, detention has had a significant influence on air quality. As part of the detention, industrial and transportation networks may be shut down. the 2019 novel corona virus (COVID-19) was named on February 11, 2020, after an infectious sickness was discovered in Wuhan, China at the end of December.[3] The WHO found in January 2020 (WHO, 2020) a respiratory droplet transmission of COVID-19, which eventually spread throughout China and led the outbreak to become an epidemic. On January 30, 2020, the World Health Organization (WHO) declared the COVID-19 pandemic [4]. Thus, the World Health Organization (WHO) has recognised that pandemic COVID-19 may be transmitted by air. COVID-19, like SARS-CoV and MERS-CoV, is a well-known zoonotic disease of the twenty-first century. As the virus continues to spread, lockdowns have been put in place in almost every nation. As carbon emissions decreased, the world economy came to a halt, and stock values dropped[5]. There was a worldwide industrial shutdown as a result of the government's order.

Most governments imposed a lockdown on the informal sector and transportation, which resulted in a major drop in the latter's activity. As the world's industrial and transportation sectors were placed on hold for some time, demand for fossil fuels decreased drastically throughout the world. COVID-19 was originally found in India on January 30, 2020, and travel restrictions were imposed on a number of countries on March 11, 2020, just after the number of cases increased on March 4, 2020[6]. On March 16th, all public gathering locations in India were shut down for the duration of the strike. For 21 days commencing March 22, 2020, the whole nation of India will be shut down as a trial phase by the Central Government of India. India's lockout and unlock phases are shown in Table 1. Global shutdowns may have a substantial impact on the quality of the atmosphere[7]. A correlation between COVID-19 urbanisation and air pollution and lockdown policy implementation has been found using data on air pollution and meteorological parameters. The World Air Quality Index (WAQI) Project (https://aqicn.org/data-platform/covid19/) was used to obtain the daily average (and median) of each air pollutant and meteorological parameter, as well as their minimum, maximum, and standard deviation, for the period of January 1 to June 30 of four years (2017–2020)[8]. Data from monitoring stations in each city have been averaged to provide daily averages of air contaminants and weather conditions. Additionally, this research assessed climatic variables [relative humidity (RH)], near surface air temperature, and other air pollution species such as PM2.5 and PM10 particulate matter, nitrogen dioxide (NO2), sulphur dioxide (SO2), carbon monoxide (CO), and tropospheric ozone (O3)[9].

NAQI Images of satellite visual maps of AOD, NO2, CO, and SO2 may be seen in Figure 2. (a, b, c, and d, respectively). Its ability to quantify PM contamination makes the AOD a useful instrument for predicting PM2.5 surface concentration. In 2020, the Indo-Gangetic Plain (IGP) had a significant amount of AOD in January and February[10]. The AOD throughout central and northern India, except for the eastern portion of India, was very low in March 2020 and extremely low again in April 2020. There is a significant amount of NO2 emissions coming from the burning of fossil fuels in the transportation sector, the industrial sector, the commercial sector, and the residential sector. As seen in Fig. 5(b), NO2 concentrations are notably high in the metropolitan regions of India. Delhi, Haryana, Punjab, Western Uttar Pradesh and the eastern provinces of Bihar, Jharkhand, West Bengal, and Odisha were the areas with the highest concentrations of NO2 hotspots[11]. A large portion of India's NO2 emissions came from densely populated and industrialised areas such as Delhi and the surrounding states of Haryana, Punjab, Uttar Pradesh, Bihar and Jharkhand. Pollutants may build up in the atmosphere along the IGP corridor, which covers seven states. NO2 hotspots in the north and east of India have been discovered since January and February, respectively[12].

Some hot spots lingered in the east of India until April 2020, at which point they disappeared from the remainder of India save for a few isolated regions (Fig. 2(b)). The lack of NO2 hotspots may be due to a decrease in NO2 emissions from both transportation and industry during the national shutdown in March and April 2020[13]. Similar to nitrogen dioxide satellite images, carbon monoxide (CO) emissions exhibited a similar pattern (NO2). SO2 emission hotspots have been discovered in the eastern states of Odisha, West Bengal, Maharashtra, and Gujarat, all along the IGP corridor. The major sources of SO2 are coal-fired power plants and businesses that use coal in their boilers. In January and February of 2020, the intensity of Indian SO2 emission hotspots was almost same. March 2020 (Fig.2(a)) is still clearly visible in April 2020 (Fig.2(d), despite the nationwide lockdown) [14]. While the statewide lockdown was in effect, coal-fired power facilities were able to continue providing energy. However, in April 2020, large AOD and NO2, CO, and SO2 emission hotspots remained in Odisha and Jharkhand (Figs. 5a-5d). Figures 1(a) and 1(b) illustrate that these locations have a relatively low NAQI. Large-scale coal mining can be found in Jharkhand and Odisha, and it is possible that these mines were operating during the country's lockdown to meet the need for coal to create energy [15]. Asian emission inventory (REAS, version 3.1, by Kurokawa and Ohara 2020) indicated that the eastern part of India, notably states like Jharkhand and Odisha, emitted considerable amounts of NO2, CO and SO2[16].

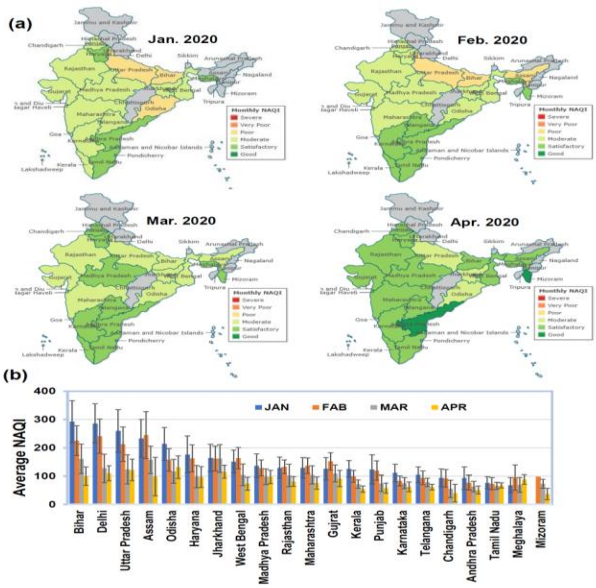

Fig 1. Pollutiuon levels of different states

Satellite Visual Maps

AOD, NO2, CO, and SO2 satellite visual maps are shown in Figure 2. (a, b, c, and d, respectively). Due to its ability to quantify PM contamination, the AOD is an efficient method for determining surface PM2.5 concentrations [17]. The Indo-Gangetic Plain (IGP) had a lot of AOD in January and February of 2020, same as NAQI (Fig. 1(a)). Central and northern India, save for the eastern side, had a relatively small AOD in March 2020 and even smaller in April 2020. The burning of fossil fuels in the transportation, industrial, commercial, and residential sectors, as well as in households, is the principal source of NO2 emissions. – EPA. FIG. 5(b) shows India's metropolitan regions, which have the highest amounts of NO2. NO2 hotspots were most widespread in Delhi, Haryana, Punjab, Western Uttar Pradesh, and the eastern provinces of Bihar, Jharkhand, West Bengal, and Odisha. India's NO2 emissions were dominated by Delhi, Haryana and Punjab, as well as Delhi, Haryana and Punjab, Punjab, Uttar Pradesh, Bihar, Jharkhand, West Bengal, and Odisha.

Stagnant meteorological conditions that allow pollutants to build in the atmosphere are common throughout the IGP corridor (seven states)[18]. In January 2020 and February 2020, a few NO2 hotspots were discovered in India's north and eastern areas. There were a few hot spots in the east of India until April 2020, when NO2 hotspots disappeared from the rest of India save for a few isolated regions. The lack of NO2 hotspots may be due to a decrease in NO2 emissions from traffic and industries during the national lockdown in March and April 2020[19]. Carbon monoxide (CO) satellite images exhibited a similar pattern to nitrogen dioxide (NO2) satellite maps (NO2). Hotspots for SO2 emissions have been identified in the IGP corridor, which includes Delhi, Uttar Pradesh, Bihar, and Jharkhand as well as the eastern states of Odisha, West Bengal, Maharashtra, and Gujarat[20]. Sulfur dioxide is mostly produced by coal-fired power plants and industrial boilers. January and February 2020 had almost identical levels of Indian SO2 emission hotspot intensity.

Despite the nationwide lockdown, the fall from March 2020 (Fig.2(a)) can still be seen in April 2020 (Fig.2(d))[21]. As a result of the statewide lockout, coal-fired power facilities were able to continue delivering energy. It was estimated that in April of 2020, Odisha and Jharkhand still had considerable AOD and emission hot areas associated with the greenhouse gases NO2, CO, and SO2. According to the figures shown in (a) and (b), there is an extremely low NAQI level in these areas. As a result, it is possible that large-scale coal mines in Jharkhand and Odisha operated during the country's shutdown in order to meet the need for coal in power generation. Eastern India's states of Jharkhand and Odisha were identified to be large emitters of NO2, CO, and SO2 in Kurokawa and Ohara's newly published regional emission inventory for Asia (REAS, version 3.1)[22].

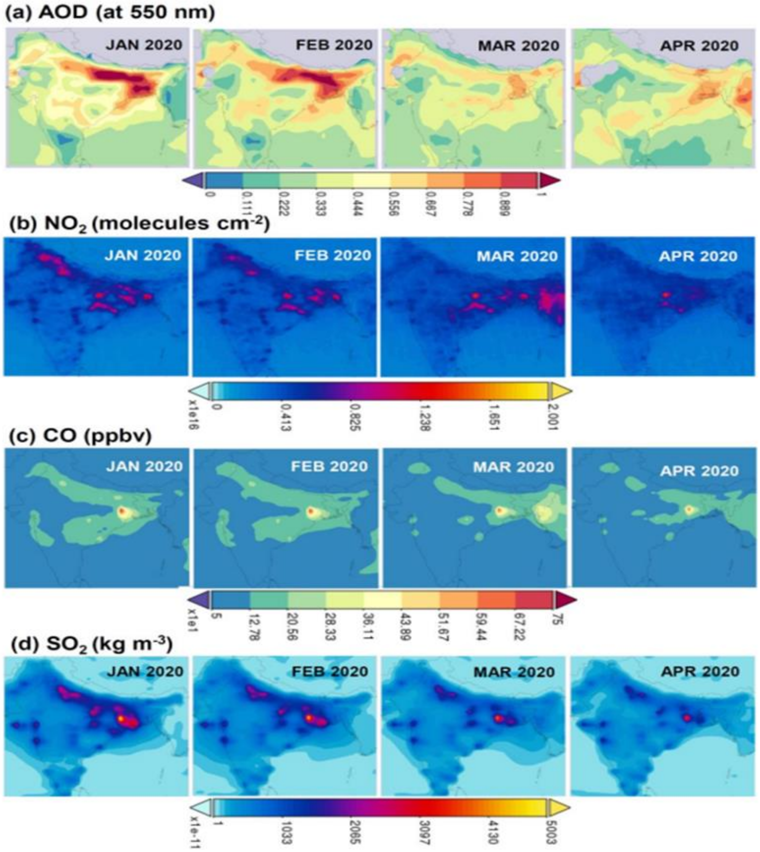

Fig 2. Satellite visual maps [23]

Policy Relevance

AOD, NO2, CO, and SO2 satellite visual maps are shown in figure 2. (a, b, c, and d, respectively). Its ability to quantify PM contamination makes the AOD a useful instrument for assessing PM2.5 surface concentrations. There was a lot of AOD over the Indo-Gangetic Plain (IGP) in the first two months of 2020, same as NAQI (Fig. 1(a)) [24]. The AOD throughout central and northern India, except for the eastern portion of India, was very low in March 2020 and extremely low in April 2020. The burning of fossil fuels in the transportation, industrial, commercial, and residential sectors, as well as in households, is the principal source of NO2 emissions [25]. In Fig. 5(b), the urban regions of India can be clearly seen, where NO2 concentrations are very high. NO2 hotspots were most common in Delhi, Haryana, Punjab, Western Uttar Pradesh, and the eastern provinces of Bihar, Jharkhand, West Bengal, and Odisha. India's NO2 emissions were dominated by Delhi, Haryana and Punjab, as well as Delhi, Haryana and Punjab, Punjab, Uttar Pradesh, Bihar, Jharkhand, West Bengal, and Odisha [26]. Stagnant meteorological conditions that allow pollutants to build in the atmosphere are common throughout the IGP corridor (which covers seven states).

NO2 hotspots in the north and east of India have been discovered since January and February, respectively, in the last year [27]. A few hot spots lingered in the east of India until April 2020, when NO2 hotspots disappeared from the remainder of India save for a few isolated regions. The lack of NO2 hotspots might be due to a decrease in NO2 emissions from traffic and industries during the national lockdown in March and April 2020. carbon dioxide (NO2) satellite maps revealed a similar pattern to those of carbon monoxide (CO) satellite maps (NO2). Hotspots for SO2 emissions have been identified in the eastern states of Odisha and West Bengal, as well as in Maharashtra and Gujarat along the IGP corridor [28]. Companies that burn coal in their boilers or in their electric power plants are the principal emitters of SO2. January and February 2020 Indian SO2 emission hotspot intensity was practically same. March 2020 (Fig.2(a)) is still clearly visible in April 2020 (despite the nationwide lockdown) [29]. As a result of the statewide lockout, coal-fired power facilities were able to continue supplying energy. By the end of April 2020, both Odisha and Jharkhand still had large AOD and emission hotspots for NO2, CO, and SO2 (Fig. 5a–5d). A low NAQI level may be seen in Figures 1(a) and 1(b)[30]. These massive coal mines in Jharkhand and Odisha, both of which have been shut down, may still continue producing coal to meet demand during the nationwide blackout. Eastern India's states of Jharkhand and Odisha were found to be large emitters of NO2, CO, and SO2 in Kurokawa and Ohara's newly published regional emission inventory for Asia (REAS, version 3.1), according to their findings [31-37].

Conclusion and Discussion

The impact of the COVID-19 on Indian air quality was thoroughly investigated using more than 200 CAAQMS. On March 25, 2020, a countrywide lockdown was imposed, with the exception of crucial services and transportation, lasting for a few months. We referred to the period from March 25 to April 30 as 'during lockdown' for the period from February 25 to March 24, 2020. AOD and emission hotspots of CO, NO2, and SO2 were gradually reduced as a consequence, and throughout the lockout, the monthly NAQI showed a consistently declining trend from poor to outstanding or good. As a proportion of pre-lockdown values, pollution levels of PM10, PM2.5, CO, NO2, and SO2 decreased by 33, 34, 21, and 47 percent during the lockdown. When compared to April 2019 measurements, the average concentrations of PM10, PM2.5, CO, NO2, and SO2 during the lockdown period were 53, 45, 27, 54, and 35% lower. During the shutdown, there was an increase in O3. The COVID-19 has given India the opportunity to collect air pollution baseline data that might be utilised to design pollution-reduction plans.

References

1. Berman, J. D., and Ebisu, K. (2020). Changes in US air pollution during the COVID-19 pandemic. Sci. Total Environ. 739:139864. doi: 10.1016/j.scitotenv.2020.139864
2. Bhaskar, M. S., Verma, P., and Kumar, A. (2013). Indian textile industries towards energy efficiency movement. Int. J. Envir. Sci. Deve. Mon. 4, 36–39.
3. Bishoi, B., Prakash, A., and Jain, V. K. (2009). A comparative study of air quality index based on factor analysis and US-EPA methods for an urban

environment. Aerosol Air Qual. Res. 9, 1–17. doi: 10.4209/aaqr.2008.02.0007

4. Chen, H., Guo, J., Wang, C., Luo, F., Yu, X., Zhang, W., et al. (2020). Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records. Lancet 395, 809–815. doi: 10.1016/S0140-6736(20)30360-3
5. Dai, Q., Liu, B., Bi, X., Wu, J., Liang, D., Zhang, Y., et al. (2020). Dispersion normalized PMF provides insights into the significant changes in source contributions to PM2. 5 after the COVID-19 outbreak. Environ. Sci. Technol. 54, 9917–9927. doi: 10.1021/acs.est.0c02776
6. Dandotiya, B., Jadon, N., and Sharma, H. K. (2019). Effects of meteorological parameters on gaseous air pollutant concentrations in urban area of Gwalior City, India. Environ. Claims J. 31, 32–43. doi: 10.1080/10406026.2018.1507508 Dumka, U. C., Kaskaoutis, D. G., Verma, S., Ningombam, S. S., Kumar, S., and Ghosh, S. (2021). Silver linings in the dark clouds of COVID-19: improvement
7. Dutheil, F., Baker, S. J., and Navel, V. (2020). COVID-19 as a factor influencing air pollution? Environ. Pollut. 263:114466. doi: 10.1016/j.envpol.2020.114466
8. Falocchi, M., Zardi, D., and Giovannini, L. (2021). Meteorological normalization of NO2 concentrations in the Province of Bolzano (Italian Alps). Atmosp. Environ. 246:118048. doi: 10.1016/j.atmosenv.2020.118048
9. Hersbach, H., Bell, B., Berrisford, P., Hirahara, S., Horányi, A., Muñoz-Sabater, J., et al. (2020). The ERA5 global reanalysis. Quart. J. R. Meteorol. Soc. 146, 1999–2049. doi: 10.1002/qj.3803
10. Jain, C. D., Madhavan, B. L., Singh, V., Prasad, P., Krishnaveni, A. S., Kiran, V. R., et al. (2021). Phase-wise analysis of the COVID-19 lockdown impact on aerosol, radiation and trace gases and associated chemistry in a tropical rural environment. Environ. Res. 194:110665. doi: 10.1016/j.envres.2020.110665
11. Jani, J. R., Bajamal, A. H., Utomo, S. A., Parenrengi, M. A., Fauzi, A. A., Utomo, B., & Dwihapsari, Y. (2021). Correlation between magnetic resonance imaging (MRI) and dynamic mechanical analysis (DMA) in assessing consistency of brain tumor. International Journal of Health & Medical Sciences, 4(2), 260-266. https://doi.org/10.31295/ijhms.v4n2.1737
12. Kitex Garments ltd. (2020). Available online at: http://www.kitexgarments.com/ wp-content/uploads/2020/07/KGL_CoVID_19_FY20.pdf (accessed August 20, 2021).
13. Kumar, P., Hama, S., Omidvarborna, H., Sharma, A., Sahani, J., Abhijith, K. V., et al. (2020). Temporary reduction in fine particulate matter due to 'anthropogenic emissions switch-off'during COVID-19 lockdown in Indian cities. Sustain. Cities Soc. 62:102382. doi: 10.1016/j.scs.2020.102382
14. Kumar, S. (2020). Effect of meteorological parameters on spread of COVID-19 in India and air quality during lockdown. Sci. Total Environ. 745:141021. doi: 10.1016/j.scitotenv.2020.141021
15. Lakshmanan, R., and Nayyar, M. (2020). Personal Protective Equipment in India: An INR 7,000 Cr industry in the making. Strategic Investment Research Unit, Invest India. Available online at: https://www.investindia.gov.in/siru/personal- protective-equipment-india-

INR-7000-cr-industry-in-the-making (accessed August 20, 2021).
16. M. H. (2020). Impact of Covid-19 lockdown on PM10, SO2 and NO2 concentrations in Salé City (Morocco). Sci. Total Environ. 735:139541. doi: 10.1016/j.scitotenv.2020.139541
17. Mahato, S., Pal, S., and Ghosh, K. G. (2020). Effect of lockdown amid COVID-19 pandemic on air quality of the megacity Delhi, India. Sci. Total Environ. 730:139086. doi: 10.1016/j.scitotenv.2020.139086
18. Mintz, D. (2018). Technical Assistance Document for the Reporting of Daily Air Quality-the Air Quality Index (AQI): US Environmental Protection Agency. Office of Air Quality Planning and Standards, Research Triangle Park, NC: Air Quality Assessment Division. Publication No. EPA-454/B-18-007.
19. Mor, S., Kumar, S., Singh, T., Dogra, S., Pandey, V., and Ravindra, K. (2021). Impact of COVID-19 lockdown on air quality in Chandigarh, India: understanding the emission sources during controlled anthropogenic activities. Chemosphere 263:127978. doi: 10.1016/j.chemosphere.2020.127978
20. Nakada, L. Y. K., and Urban, R. C. (2020). COVID-19 pandemic: impacts on the air quality during the partial lockdown in São Paulo state, Brazil. Sci. Total Environ. 730:139087. doi: 10.1016/j.scitotenv.2020.139087
21. Nandi, J. (2020). Spring Colder Than Usual This Year, Shows IMD Data. New Delhi: Hindustan Times.
22. Nigam, R., Pandya, K., Luis, A. J., Sengupta, R., and Kotha, M. (2021). Positive effects of COVID-19 lockdown on air quality of industrial cities (Ankleshwar and Vapi) of Western India. Sci. Rep. 11, 1–12. doi: 10.1038/s41598-021-83393-9
23. Niinimäki, K., Peters, G., Dahlbo, H., Perry, P., Rissanen, T., and Gwilt, A. (2020). The environmental price of fast fashion. Nat. Rev. Earth Environ. 1, 189–200. doi: 10.1038/s43017-020-0039-9
24. of air quality over India and Delhi metropolitan area from measurements and WRF-CHIMERE model simulations. Atmospher. Pollut. Res. 12, 225–242. doi: 10.1016/j.apr.2020.11.005
25. Otmani, A., Benchrif, A., Tahri, M., Bounakhla, M., El Bouch, M., and Krombi,
26. Pathakoti, M., Muppalla , A., Hazra, S., Venkata , M. D., Lakshmi, K. A., Sagar, V. K., et al. (2020). An assessment of the impact of a nation-wide lockdown on air pollution-a remote sensing perspective over India. Atmosp. Chem. Phys. Discus. 21, 1–16. doi: 10.5194/acp-2020-621
27. Petetin, H., Bowdalo, D., Soret, A., Guevara, M., Jorba, O., Serradell, K., et al. (2020). Meteorology-normalized impact of the COVID-19 lockdown upon NO2 pollution in Spain. Atmosph. Chem. Phys. 20, 11119–11141. doi: 10.5194/acp-20-11119-2020
28. Rabbi, M. A. (2018). Assessment of nitrogen oxides and sulphur dioxide content in the ambient air near the garments industries of Bangladesh. J. Environ. Soc. Sci. 5, 1–4.
29. Saha, J., and Chouhan, P. (2021). Lockdown and unlock for the COVID-19 pandemic and associated residential mobility in India. Intern. J. Infect. Dis. 104, 382–389. doi: 10.1016/j.ijid.2020.11.187
30. Sarfraz, M., Shehzad, K., and Shah, S. G. M. (2020). The impact of COVID-19 as a necessary evil on air pollution in India during the lockdown. Environ. Pollut. 266:115080. doi: 10.1016/j.envpol.2020.115080

31. Sharma, S., Zhang, M., Gao, J., Zhang, H., and Kota, S. H. (2020). Effect of restricted emissions during COVID-19 on air quality in India. Sci. Total Environ. 728:138878. doi: 10.1016/j.scitotenv.2020.138878
32. Sillman, S. (1999). The relation between ozone, NOx and hydrocarbons in urban and polluted rural environments. Atmos. Environ. 33, 1821–1845. doi: 10.1016/S1352-2310(98)00345-8
33. Soni, P. (2021). Effects of COVID-19 lockdown phases in India: an atmospheric perspective. Environ. Dev. Sustainab. 1–12. doi: 10.1007/s10668-020-01156-4
34. The News Minute. (2020). Available online at: https://www.thenewsminute.com/ article/bengaluru-emerges-hub-ppe-manufacturing-50-kits-india-centre- 123408 (accessed August 20, 2021).
35. The Tribune. (2021). Available online at: https://www.tribuneindia.com/news/ punjab/punjab-emerges-as-manufacturing-hub-for-covid-protective-kits- 82757 (accessed August 20, 2021).
36. Tosepu, R., Gunawan, J., Effendy, S. D., Ahmad, A. I., Lestari, H., Bahar, H., et al. (2020). Correlation between weather and Covid-19 pandemic in Jakarta, Indonesia. Sci. Total Environ. 725:138436. doi: 10.1016/j.scitotenv.2020.138436 Venter, Z. S., Aunan, K., Chowdhury, S., and Lelieveld, J. (2020). COVID-19 lockdowns cause global air pollution declines. Proc. Natl. Acad. Sci. 117, 18984–18990. doi: 10.1073/pnas.2006853117
37. WHO (2020) Novel Coronavirus (2019-nCoV) Situation Report - 10. Available online at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019
38. Widana, I.K., Sumetri, N.W., Sutapa, I.K., Suryasa, W. (2021). Anthropometric measures for better cardiovascular and musculoskeletal health. *Computer Applications in Engineering Education*, *29*(3), 550–561. https://doi.org/10.1002/cae.22202