



# Effect Of Novel Coronavirus (Covid-19) On Air Pollution at Shahdol District (M.P.)

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**Abstract:** Pandemic of the Coronicalperiod, corona viruses including HCov-229E, HCov-OC43, HCov-NL63, HCov-HKU1 are casually known to cause symptoms of common cold flu with only moderate clinical effect. Although corona-viruses are known to cause disease in birds and pigs. Recent studies indicate the agent responsible for the severe acute respiratory syndrome (SARS) belongs to this genus. (SARS) is a serious life-threatening viral infection that is responsible for a human transmissible from the mortality rate of this disease is higher than another respiratory failure after symptoms of the hypoxia, cough, and labored breathing, and the same as pneumonia.

After declaration of lockdown. Pollution of the environment including air pollution and water pollution in rivers has witnessed substantial determination of pollutants. In order to minimize the movement and social contact of the people and reduce the movement of vehicles and the closing of restaurants, industries, administrative centers, shops, and many others. This caused drastic and good effects and improvement of air quality particularly the primary dominated one like PM10 and PM2.5, NO<sub>2</sub>, CO, NH<sub>3</sub> and other pollutants etc.

**Index Terms:** Corona-viruses, Lockdown Effect, Effect of Covid on pollutants criteria, Air Quality index, AQI in SHAHDOL District, Change of air quality index.

## I. INTRODUCTION

Corona Coronavirus belong to the coronaviridae ( foroviruses) family.They have a unique extracellular -C shape or open torus morphology. 1-9

Division of viral diseases, National Centre for immunization and respiratory diseases, and disease control and prevention. The coronaviridae contain two Subfamilies, the Coronaviridae and Toro Virinae.

Toro Viruses penetrate the mucus layer in respiratory and digestive tracts .Toro Viruses infect vertebrates and mammals with gastroenteritis. Humans, cattle, sheep, pigs, goats and

horses.

Corona viruses, their size (20nm long) club-shaped spike shape protein (peplomer, composed of trimer of the spike protein) have icosahedral structure composed of viral member protein. Some coronaviruses also have a second fringe shorter (5nm long).

HCOV-viruses treatment depends on identifying effective antivirals for viral load suppression. The first and fastest approach to drug discovery was to test drugs with broad spectrum antiviral activity that used to treat covid- associated human infection. And the second drug discovery approach to identify antiviral for (SARS) involved screening of chemical libraries that comprised numerous existing compounds.

WHO reported the first human covid-19 case reported officially in Wuhan city china in December 2019. Environmental samples taken from this market in Dec -2019 tested positive for (SARS)-cov-2, the market was closed on Jan 2020. WHO is utilizing an international network of expert laboratories to provide support in detection of covid -19 virus globally.An authentic news on novel-coronavirus-19 began in Wuhan China and describes the identification, diagnosis, clinical course of the case including the patients. Initial, mild symptoms at presentation with progression to pneumonia on day 9 of illness.

The novel coronavirus caused by a unknown pathogen emerged in wuhan central china. The initial cases were linked to exposure in a seafood market. January 27 2020, reported 81 death chinese authority cases in january 2020.

After declaration of lockdown starting FROM 24TH MARCH 2020. Pollution of the environment including air pollution and water pollution in rivers has witnessed substantial determination of pollutants 10-13. Especially during the study periods. PM10 and PM2.5, NO<sub>2</sub>, CO, NH<sub>3</sub> concentrations have shown significant declining trends.

In order to minimize the movement and social contact of the people and reduce the movement of vehicles and the closing of

Table I. Criteria for AQI Scale (0-500) 24hrs (µg/m<sup>3</sup>)

CRITERIA pollutant	PM10	PM2.5	NO2	SO2	O3
Good(0-50)	0-5	0-30	0-40	0-40	0-50
Satisfactory (51-100)	51-100	31-60	41-80	41-80	51-100
Moderately (101-250)	101-250	61-90	81-180	81-380	100-160
Poor( 201-300)	251-350	91-120	181-280	381-800	161-205
Very poor and severe (301-400 (400-500)	350-450+	121-250+	280-400+	801-1600+	205-745+

Good (0-50)- minimal impact

Satisfactory (51-100)- may cause breathing difficulties.

Moderately polluted (101-200)- may causes lung disease

Poor (201-300) – prolonged exposure.

Very poor (301-400)- lung and heart disease.

Severe (401-500) – difficulties may be experienced even during light physical activity and serious health issues.

industries, restaurants, shops, and administrative centres and many others 14. This caused drastic improvement of air quality, particularly the primary dominated one like PM10 and PM2.5, NO<sub>2</sub>, CO, NH<sub>3</sub> etc.

nitrogen dioxide (NO<sub>2</sub>), NH<sub>3</sub> Ammonia, lead (Pb), CO, O<sub>3</sub>, benzo a pyrene (BaP), C<sub>6</sub>H<sub>6</sub> benzene, arsenic (As), and Nickel (Ni).

Formulation of sub indices( I<sub>1</sub> I<sub>2</sub> I<sub>3</sub> I<sub>4</sub> .....I<sub>n</sub> ) for n pollutants (X<sub>1</sub> X<sub>2</sub> X<sub>3</sub> X<sub>4</sub> .....X<sub>n</sub>) every sub index associated between pollutants concentration and health impact scientifically.

$$I_i = f(X_i) (i = 1, 2, 3, \dots, n)$$

## II. METHODOLOGY

The air quality index (AQI) is usually based on pollutants criteria 15. Where the deliberation of an individual pollutant is transformed into a sole index using appropriate aggregation methods. In recent times IITM, pune has come up with a new AQI. Five point scale namely-very unhealthy, very poor, moderate and good.

The Indian National Air Quality Standard (INAQS) have twelve parameters, PM (Particulates matter) of PM10 means >10µm size, PM2.5 >2.5µm size, sulphur dioxide (SO<sub>2</sub>),

## CONCLUSION

From an environmental perspective, the lockdown system is very beneficial and healthy. It means the alternative sustainable management technique should be implemented to keep the purity of the environment of shahdol district during lockdown period. Ultimately, the lockdown system retrieves the sparkle of

Table 2. AQI (Air Quality index)

	PM10	PM2.5	NO2	So2	O3
PM10	1				
PM2.5	.875 .740	1			
NO2	.460 .350	.550 .340	1		
SO2	.200 .330	.225 .350	.105 .130	1	
O3	.050 .240	.061 .215	.002 .003	0.040 0.840	1

Correlation is significant at 0.01 level (BL) before Lockdown and (AL) After lockdown.

the environment by means of improving air quality standards all over the city where the urban ecological forms.

#### REFERENCES

1) Cho, K. O., & Hoet, A. E. (2014). Toroviruses (Coronaviridae). Reference Module in Biomedical Sciences, B978-0-12-801238-3.02674-X.

2) Killerby, M. E., Link-Gelles, R., Haight, S. C., et al. (2020). Characteristics Associated with Hospitalization Among Patients with COVID-19 — Metropolitan Atlanta, Georgia, March–April 2020. *Morbidity and Mortality Weekly Report*, 69, 790–794.

3) Payen, S. (2017). *Viruses*. Academic Press, Cambridge, Massachusetts, USA.

4) MacLachlan, N. J., & Dubovi, E. J. (Ed.). (2017). *Fenner's Veterinary Virology (Fifth Edition)*, Academic Press, Cambridge, Massachusetts, USA.

5) Li, X., Luk, H., Lau, S., & Woo, P. (2019). Human Coronaviruses: General Features. Reference Module in Biomedical Sciences, B978-0-12-801238-3.95704-0.

6) Gaurav, A., & Al-Nema, M. (2019). Polymerases of Coronaviruses: Structure, Function, and Inhibitors. *Viral Polymerases*, 271–300.

7) WHO world health organization 2019. (2019). Retrieved from [https://www.who.int/emergencies/diseases/novel-coronavirus2019?gclid=CjwKCAjwz5iMBhAEEiwAMEAwGjGJQp40aYGrNPL40f0174ueVcLCmLDol6G9gKjTWY\\_uAjbpbZfIRoCl\\_IQAvD\\_BwE](https://www.who.int/emergencies/diseases/novel-coronavirus2019?gclid=CjwKCAjwz5iMBhAEEiwAMEAwGjGJQp40aYGrNPL40f0174ueVcLCmLDol6G9gKjTWY_uAjbpbZfIRoCl_IQAvD_BwE).

8) Holshue, M. L., DeBolt, C., Lindquist, S., Lofy, K. H., Wiesman, J., Bruce, H., Spitters, C., Ericson, K., Wilkerson, S., Tural, A., Diaz, G., et al. (2020). Washington State 2019-nCoV Case Investigation Team. First Case of 2019 Novel Coronavirus in the United States. *The New England Journal of Medicine*, 5(382), 929-936.

9) Huang, C., Wang, Y., Li, X., Ren, L., Zhao, J., Hu, Y., Zhang, L., Fan, G., Xu, J., Gu, X., et al. (2020). Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet*, 15(10223), 497-506.

10) Bashir, M. F., Ma, B., Bilal, Komal, B., Bashir, M. A., Tan, D., Bashir, M. (2020). Correlation between climate indicators and COVID-19 pandemic in New York, USA. *Science of the Total Environment*, 728(138835), 1-4.

11) Singh, R. P., & Chauhan, A. (2020). Impact of lockdown on air quality in India during COVID-19 pandemic. *Air quality, atmosphere, & health*, 1–8.

12) Gautam, S. (2020). The Influence of COVID-19 on Air Quality in India: A Boon or Inutile. *Bulletin of Environmental Contamination and Toxicology*, 104(6), 724-726.

13) World Health Organization. Occupational and Environmental Health Team. (2006). WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and

sulfur dioxide: global update 2005: summary of risk assessment. World Health Organization. Retrieved from <https://apps.who.int/iris/handle/10665/69477>.

14) WHO (2020). Coronavirus disease (COVID-19) pandemic. Retrieved from [https://www.who.int/emergencies/diseases/novel-coronavirus-2019?gclid=CjwKCAjwz5iMBhAEEiwAMEAwGLNKaFGX0OsjnuLja2UchIY-ulIeO8J7CAv3jegGYSk0D2scxbqX1xoC-0wQAvD\\_BwE](https://www.who.int/emergencies/diseases/novel-coronavirus-2019?gclid=CjwKCAjwz5iMBhAEEiwAMEAwGLNKaFGX0OsjnuLja2UchIY-ulIeO8J7CAv3jegGYSk0D2scxbqX1xoC-0wQAvD_BwE).

15) Srivastava, S., Kumar, A., Baudh, K., Gautam, A.S., & Kumar, S. (2020). 21-Day Lockdown in India Dramatically Reduced Air Pollution Indices in Lucknow and New Delhi, India. *Bulletin of Environmental Contamination and Toxicology*, 105(1), 9-17.

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