



COVID-19 and air pollution and meteorology-an intricate relationship: A review

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Abstract:

Corona virus is highly uncertain and complex in space and time. Atmospheric parameters such as type of pollutants and local weather play an important role in COVID-19 cases and mortality. Many studies were carried out to understand the impact of weather on spread and severity of COVID-19 and vice-versa. A review study is conducted to understand the impact of weather and atmospheric pollution on morbidity and mortality.

Studies show that aerosols containing corona virus generated by sneezes and coughs are major route for spread of virus. Viability and virulence of SARS-CoV-2 stuck on the surface of particulate matter is not yet confirmed. Studies found that an increase in particulate matter concentration causes more COVID-19 cases and mortality. Gaseous pollutant and COVID-19 cases are positively correlated.

Local meteorology plays crucial role in the spread of corona virus and thus mortality. Decline in number of cases with rising temperature observed. Few studies also find that lowest and highest temperatures were related to lesser number of cases. Similarly humidity shows negative or no relationship with COVID-19 cases. Rainfall was not related whilst wind-speed plays positive role in spread of COVID-19. Solar radiation threats survival of virus, areas with lower solar radiation showed high exposure rate.

Air quality tremendously improved during lockdown. A significant reduction in PM10, PM2.5, BC, NO_x, SO₂, CO and VOCs concentration were observed. Lockdown had a healing effect on ozone; significant increase in its concentration was observed. Aerosols Optical Depths were found to decrease up to 50%.



Biography:

Arun Srivastava is an Assistant Professor of Environmental Sciences by profession and works in India's premiere university, JNU at New Delhi. He holds a Ph.D. degree in the field of Air Pollution from JNU and Master's in Applied Geology from Allahabad University. Dr. Srivastava has around 20 years research experience in the different aspects of air pollution such as Indoor Air Pollution, Source Apportionment, Physical and Chemical characterisation of Aerosols, Bioaerosols and Health implications due to Air Pollution. He has also been involved in investigations of impact of air pollution on various important human organs.

Publication of speakers:

1. Arun Srivastava et al., Air quality changes during the COVID-19 lockdown over the Yangtze River Delta Region: An insight into the impact of human activity pattern changes on air pollution variation; *j.scitotenv.2020.139282*. Epub 2020 May 11.
2. Arun Srivastava et al., Asymmetric nexus between temperature and COVID-19 in the top ten affected provinces of China: A current application of quantile-on-quantile approach; *j.scitotenv.2020.139115*. Epub 2020 May 1.

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