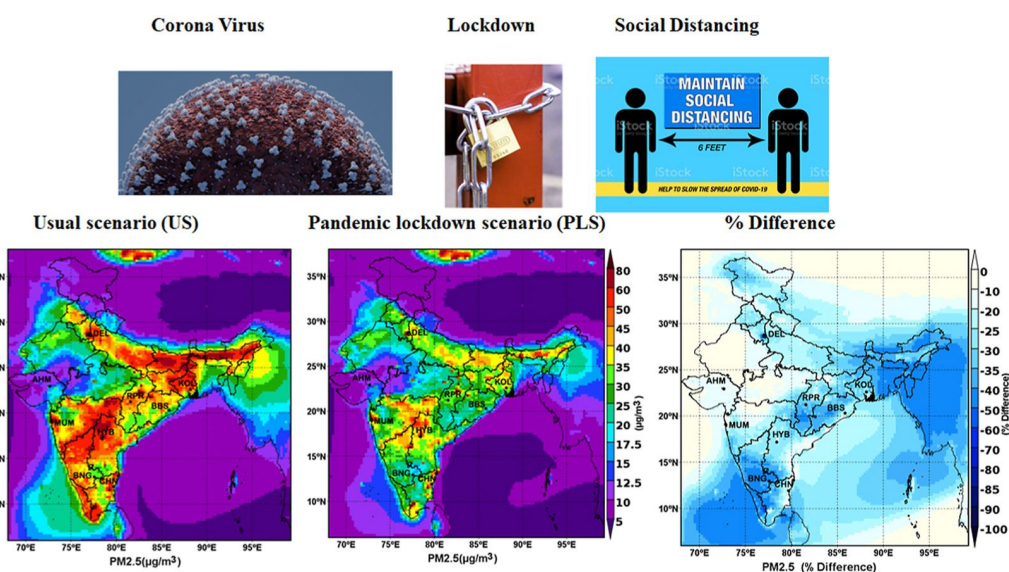


Impacts of COVID lockdown on air quality over Delhi and India

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Key highlights:

- COVID-19 lockdown drastically reduced PM and NO₂ concentrations by more than 50% in Delhi-NCR.
- Reduction in AOD is higher over the polluted northern India
- Largest reduction of NO₂ over northern and eastern parts of the Indian subcontinent
- Remarkable variability in pollution changes between stations of different characteristics
- WRF-CHIMERE model simulations are in good agreement with measurements.

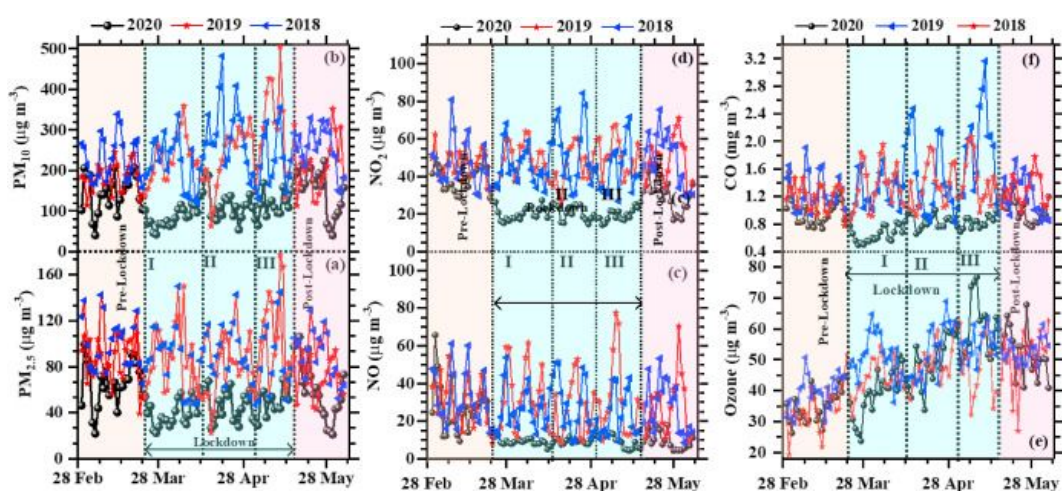
Summary of your Research:

The study examines the impact of the COVID-19 lockdown period in particulate matter (PM) concentrations and air pollutants (NO_x, SO₂, CO, NH₃, and O₃) at 63 stations located in Delhi, Uttar Pradesh and Haryana states within the Delhi-NCR, India. Large average reductions are recorded between the stations in each state such as PM₁₀ (− 46 to − 58%), PM_{2.5} (− 49 to − 55%), NO₂ (− 27 to − 58%), NO (− 54% to − 59%), CO (− 4 to − 44%), NH₃ (− 2 to − 38%), while a slight increase is observed for O₃ (+4 to +6%) during the lockdown period compared

to same periods in previous years. Furthermore, PM and air pollutants are significantly reduced during lockdown compared to the respective period in previous years, while a significant increase in pollution levels is observed after the reopening of economy. The meteorological changes were rather marginal between the examined periods in order to

justify such large reductions in pollution levels, which are mostly attributed to traffic-related pollutants (NO_x, CO road-dust PM). The WRF-CHIMERE model simulations reveal a remarkable reduction in PM_{2.5}, NO₂ and SO₂ levels over whole Indian subcontinent and mostly over urban areas, due to limitation in emissions from the traffic and industrial sectors

<https://doi.org/10.1016/j.apr.2020.11.005>



Take away/conclusion :

- Significant reductions mostly in the range of - 30% to - 50% compared to the pre-lockdown period are observed at all stations, especially for NO (- 64%), but also for NO₂ (- 47%)
- In contrast, O₃ concentrations increased during the lockdown period at nearly all the examined stations (mean increase of +37%)
- Results indicate that the re-opening of the economy and the termination of the restrictions in transportation around Delhi-NCR led to an increase in NO₂ levels

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