

Social and travel lock down impact considering coronavirus disease (COVID-19) on air quality in megacities of India: Present benefits, future challenges and way forward

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Supporting Information

Contents	Page No.
S1: Questionnaire for expert opinion survey to collect perspective of experts related to current scenario, possible challenges that India might face in near future when lockdown is over and also the probable solutions to the identified challenges.....	S3-S4
S2: Paired t-test results explaining the statistical significance of variations in the levels of air pollutants in five cities under different time period analysis.....	S5
S3: Meteorology and air quality in megacities	S6
Figures	
Fig. S1: Time series variation in the concentrations of PM _{2.5} , PM ₁₀ , NO ₂ , CO and O ₃ w.r.t. AT, WS and RH in Borivali East, Mumbai	S6
Fig. S2: Time series variation in the concentrations of PM _{2.5} , PM ₁₀ , NO ₂ , CO and O ₃ w.r.t AT, WS and RH in Manali, Chennai.....	S7
Fig S3: Time series variation in the concentrations of PM _{2.5} , PM ₁₀ , NO ₂ , CO and O ₃ w.r.t AT, WS and RH in Ballygunge, Kolkata.....	S8
Fig. S4: Time series variation in the concentrations of PM _{2.5} , PM ₁₀ , NO ₂ , CO and O ₃ w.r.t AT, WS and RH in Silk Board, Bangalore.....	S9
Tables	
Table S1: Paired t-test results explaining the statistical significance of variations in the levels of air pollutants in five cities under different time period analysis.....	S5

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COVID-19 LOCKDOWN AND AIR QUALITY EXPERT OPINION SURVEY TO UNDERSTAND THE FUTURE CHALLENGES AND POSSIBLE SOLUTIONS FOR SUSTAINABLE DEVELOPMENT

Presently, the entire country is under a lockdown situation because of COVID-19, it is observed that air quality in most of the cities is drastically improved. However, this may not continue more as soon as the lockdown will end, and business activities will start as usual, which results in poor air quality in most of the cities again. This may be worsening if committed mitigation measures will not be implemented as proposed due to a shortage of financial resources.

Expert Name: **Designation and Organization:**

Email Id/Contact Information:

1. Have you observed a significant improvement in air quality in most of the cities in India during the lockdown period in comparison to business-as-usual scenario?
 Yes No
2. If yes, what are the most critical sources/sectors which contributed to improvement in air quality? Rank the following sources as per their contribution in air quality improvement during lock down (1 = Highest contribution and 5 = Least contribution):
 Transport
 Industries
 Thermal Power Plants
 Construction and Demolition
 Road dust
 Biomass burning
 Others
3. Do you think as a result of slowdown in the economy, there will be a reduction in financial commitments (existing budget allotted) made for improving the air quality through the national clean air programme and other measures in urban and rural environments?
 Yes No
4. What aspect(s) do you feel the most important while making decisions after the lockdown period is over?
 Economy
 Environment
 Economy and Environment together

5. What according to you will be the major challenges that India can face after the lockdown period is over?

6. What are your suggestions to overcome such challenges in the future after lockdown will over to improve overall air quality in India?

7. What policy measures you will suggest for managing air quality in most of the cities even after the financial support will not be the same as earlier committed due to the economic slowdown?

8. Do you think some learnings can be drawn from the outcomes of the COVID-19 lockdown for managing the extreme air pollution events or increased levels of air pollution during winters in India?

9. Can partial lockdowns/conditional lockdowns be incorporated into the policy framework as a control measure for managing the air pollution challenges in India?

S1: Paired t-test results explaining the statistical significance of variations in the levels of air pollutants in five cities under different time period analysis

Table S1 represents the paired t-test results explaining the statistical significance of variations in the levels of air pollutants in five cities under different time period analysis.

Cities	BEFORE LOCKDOWN vs DURING LOCKDOWN' 2020					MARCH-APRIL 2019 vs MARCH-APRIL 2020				
	PM _{2.5}	PM ₁₀	NO ₂	CO	O ₃	PM _{2.5}	PM ₁₀	NO ₂	CO	O ₃
Delhi	3.2E-06	4.8E-06	1.5E-06	1.4E-04	4.9E-01	2.2E-05	2.1E-07	1.3E-06	6.5E-06	1.8E-05
Mumbai	3.4E-02	1.3E-03	1.5E-10	3.8E-03	8.4E-02	1.0E-03	4.0E-04	4.4E-01	4.0E-15	9.4E-06
Chennai	8.6E-02	DNA	1.3E-02	8.7E-04	4.7E-01	9.2E-09	DNA	2.5E-06	1.1E-04	7.0E-02
Bangalore	9.4E-05	9.3E-08	1.4E-08	2.2E-04	4.9E-02	6.2E-10	2.5E-09	1.5E-10	3.1E-05	1.1E-07
Kolkata	2.5E-02	1.2E-03	1.7E-06	9.6E-05	1.7E-02	1.7E-03	3.1E-04	1.3E-06	4.4E-03	1.9E-08
*p<0.05										

S2: Meteorology and air quality in megacities

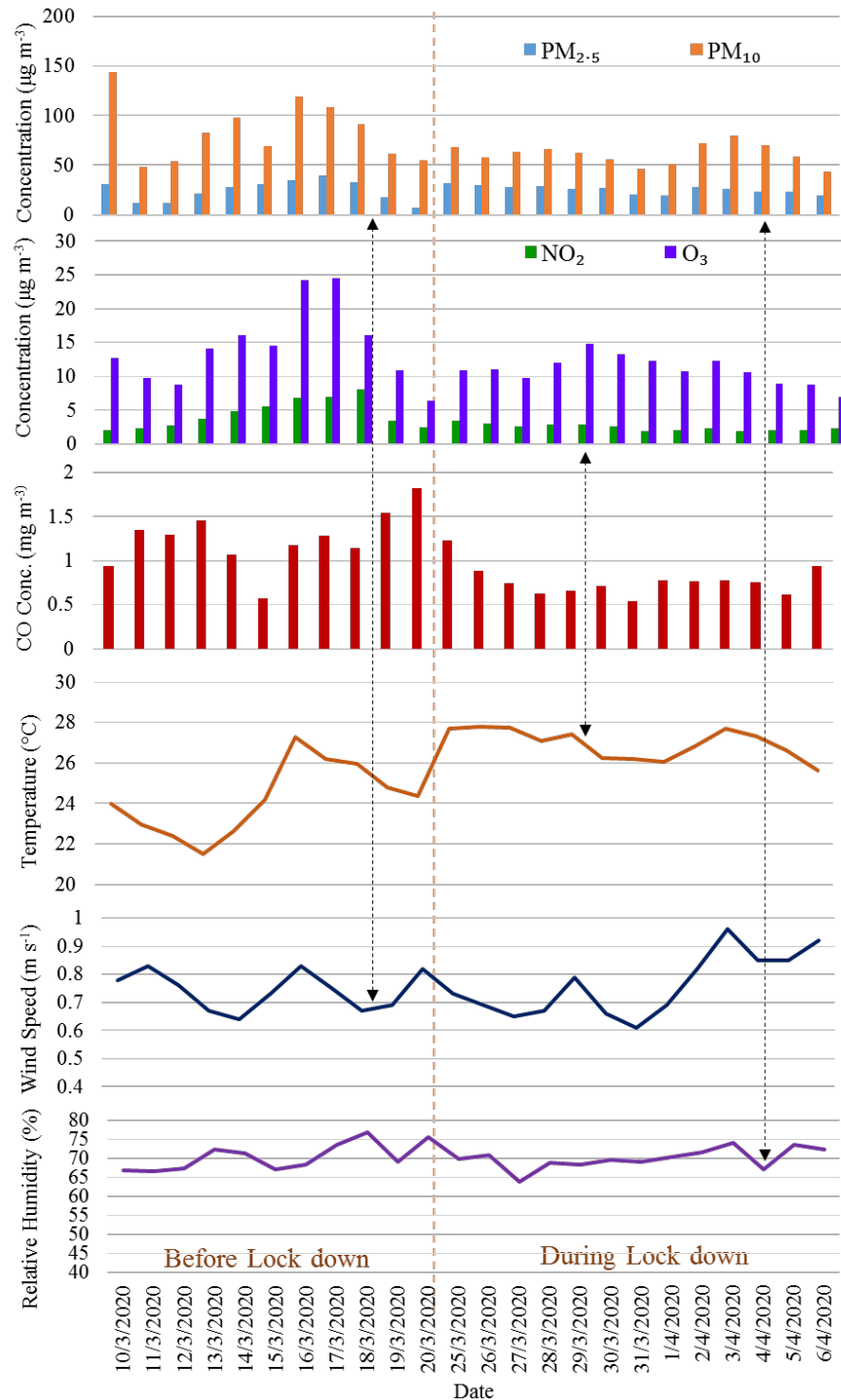


Figure S1: Time series variation in the concentrations of PM_{2.5}, PM₁₀, NO₂, CO and O₃ w.r.t. AT, WS and RH in Borivali East, Mumbai

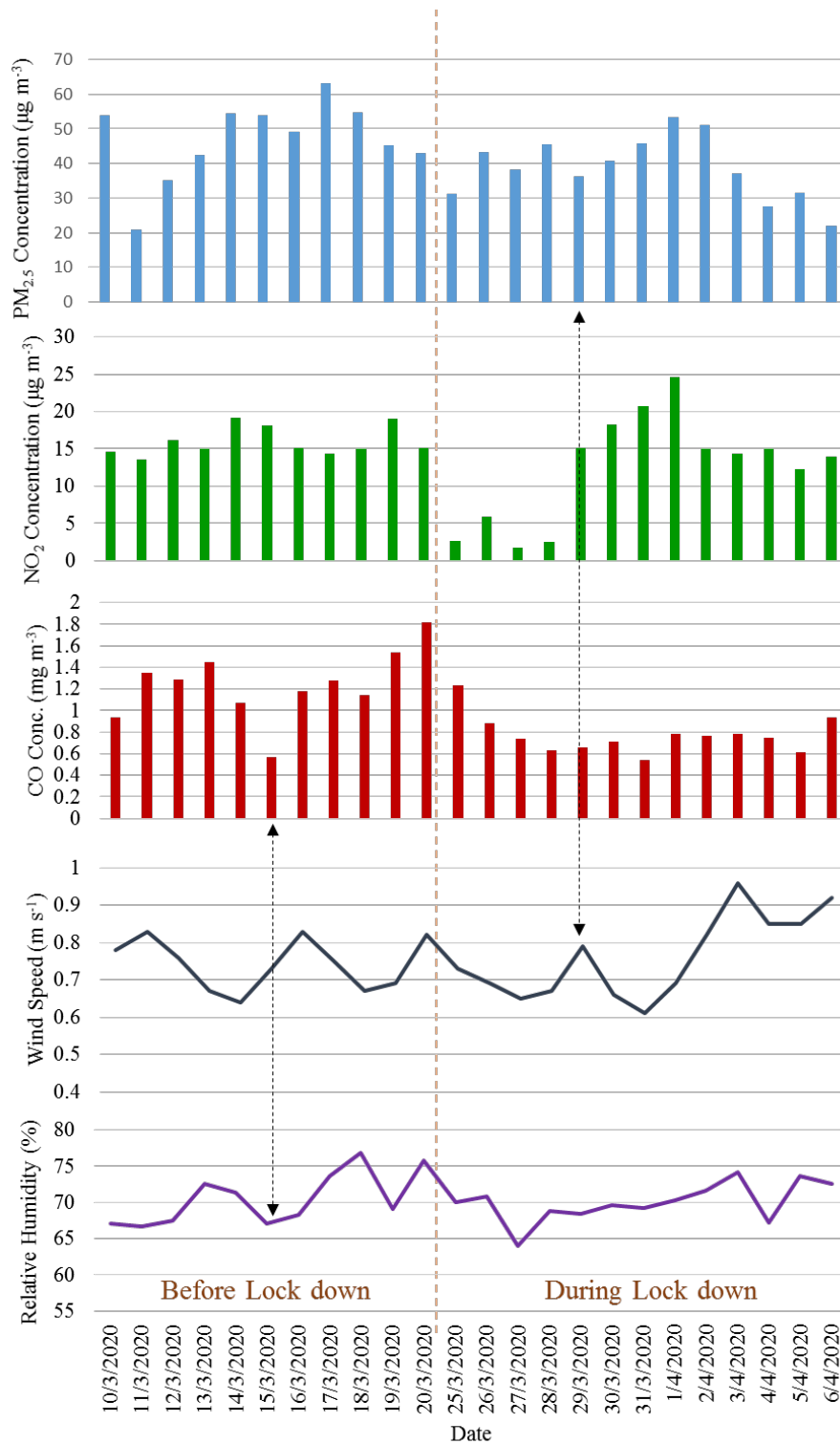


Figure S2: Time series variation in the concentrations of PM_{2.5}, PM₁₀, NO₂, CO and O₃ w.r.t AT, WS and RH in Manali, Chennai

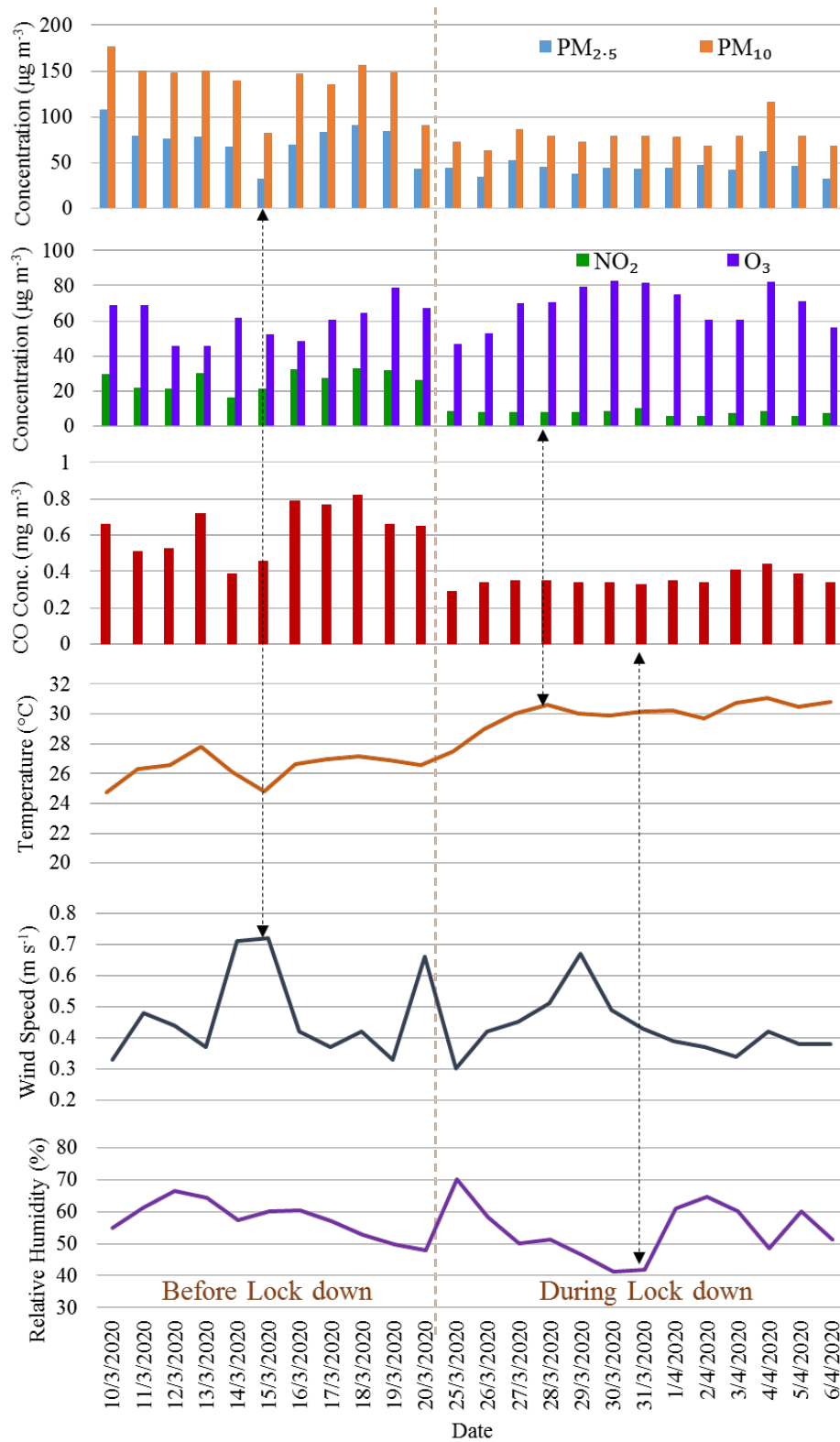


Figure S3: Time series variation in the concentrations of PM_{2.5}, PM₁₀, NO₂, CO and O₃ w.r.t. AT, WS and RH in Ballygunge, Kolkata

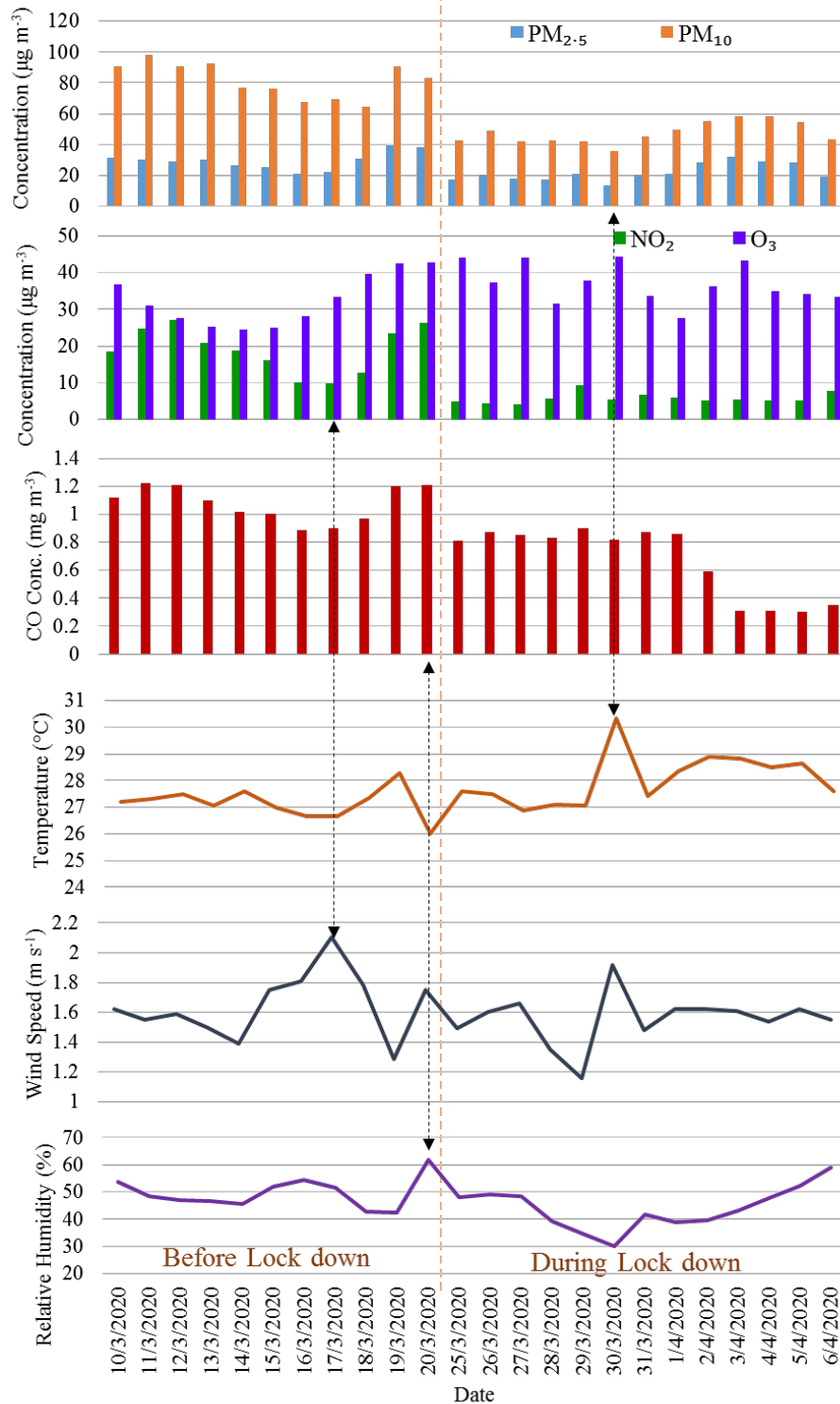


Figure S4: Time series variation in the concentrations of PM_{2.5}, PM₁₀, NO₂, CO and O₃ w.r.t. AT, WS and RH in Silk Board, Bangalore