

Supplementary Materials

Long-Term (2003-2019) Air Quality, Climate Variables, and Human Health Consequences in Dhaka Bangladesh

Md Riad Sarkar Pavel¹, Shahid Uz Zaman¹, Farah Jeba¹, Md Safiqul Islam¹, and Abdus Salam^{1*}

Supplementary Table 1. S/N ratios of all the air pollutants used in the PMF modelling.

Species	Category	S/N	Min	25th	Median	75th	Max	Modeled Samples (%)	Raw Samples (%)	R ² values	KS Test (P Value)
PM _{2.5}	Strong	0.71	73.14	82.10	89.88	96.34	105.56	100.00	100.00	0.99	2.02E-07
PM ₁₀	Strong	0.68	102.78	115.08	126.38	133.23	147.48	100.00	100.00	0.99	2.89E-15
CO	Strong	10.00	580.00	650.50	702.00	748.00	797.00	100.00	100.00	1	7.99E-15
NO ₂	Strong	1.47	10.90	13.05	14.60	16.90	19.20	100.00	100.00	0.99	0
SO ₂	Strong	0.62	5.02	7.08	9.19	10.50	12.00	100.00	100.00	1	0

Supplementary Table 2. The summary table of the Q values for the 20 base runs.

Run #	Q(Robust)	Q(True)	Converged	# Steps
1	5.04429	5.0346	Yes	1740
2	5.04578	5.04383	Yes	2907
3	5.04146	5.03382	Yes	1494
4	5.0369	5.03371	Yes	1829
5	5.04069	5.03417	Yes	1671
6	5.03778	5.03394	Yes	2333
7	5.05869	5.0368	Yes	1647
8	5.03883	5.0339	Yes	1527
9	5.05191	5.03522	Yes	1746
10	5.04638	5.03858	Yes	2670
11	5.03509	5.03489	Yes	1794
12	5.03619	5.03387	Yes	2949
13	5.03978	5.03395	Yes	1787
14	5.03407	5.03392	Yes	1880
15	5.03555	5.03549	Yes	2495
16	5.03446	5.03368	Yes	2381
17	5.03599	5.03363	Yes	2770
18	5.03636	5.03433	Yes	1637
19	5.03843	5.03371	Yes	2685
20	5.03998	5.03992	Yes	2042

Supplementary Table 3. The description of the pollutants with their chemical identifications, affecting organs, and used RfC values.

Pollutant	Chemical Abstracts Service (CAS) No.	Critical organs/ systems	Reference concentrations for chronic inhalation exposure (RfC) ^{A,B,C} mg m ⁻³
PM _{2.5}		Respiratory system, mortality	0.015
PM ₁₀		Respiratory system, mortality, cardiovascular system, development	0.05
CO	630-08-0	Blood, cardiovascular system, development, CNS	3
O ₃	7446-09-5	Respiratory system	0.03
NO ₂	10102-44-0	Respiratory system, blood, formation of MetHb	0.04
SO ₂	7446-09-5	Respiratory system, mortality	0.05

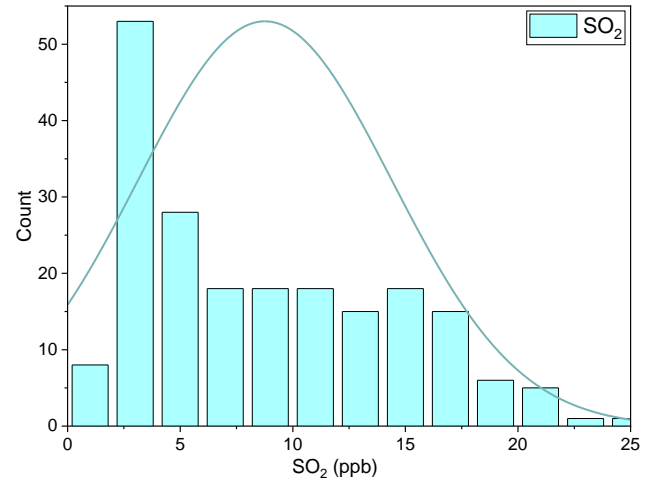
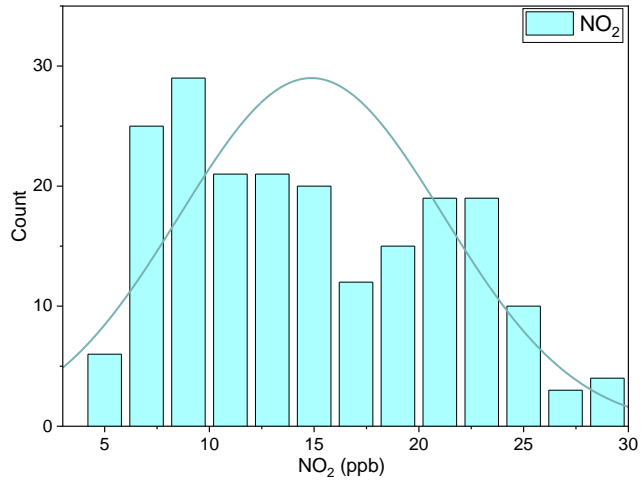
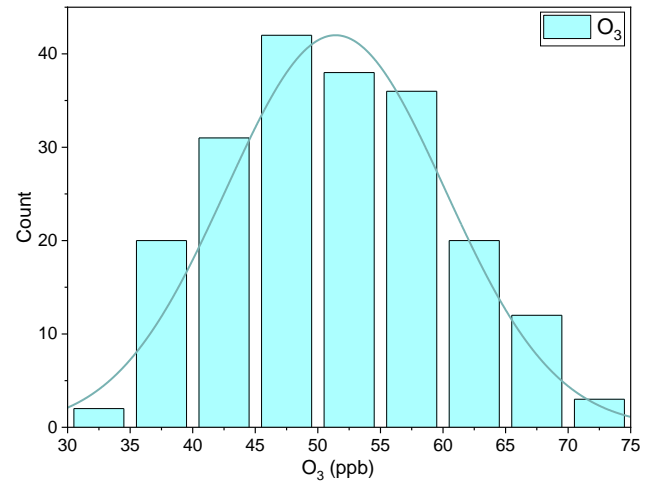
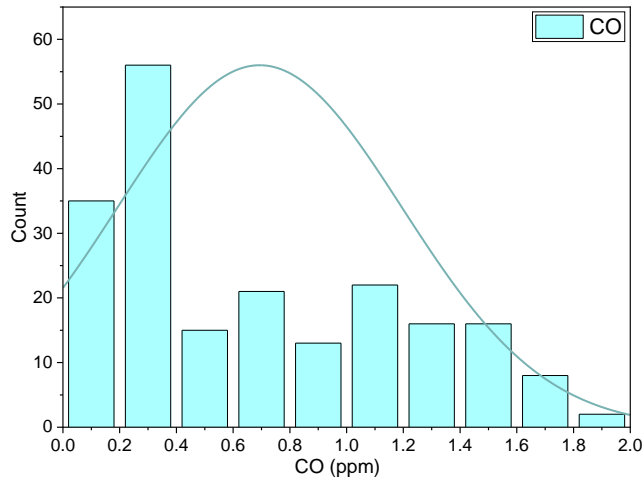
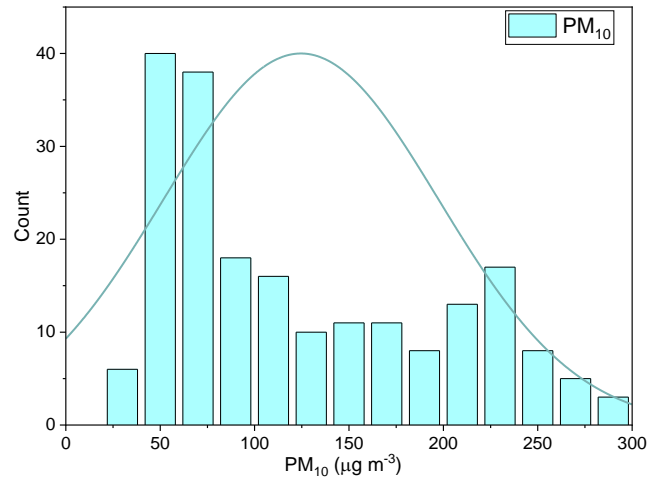
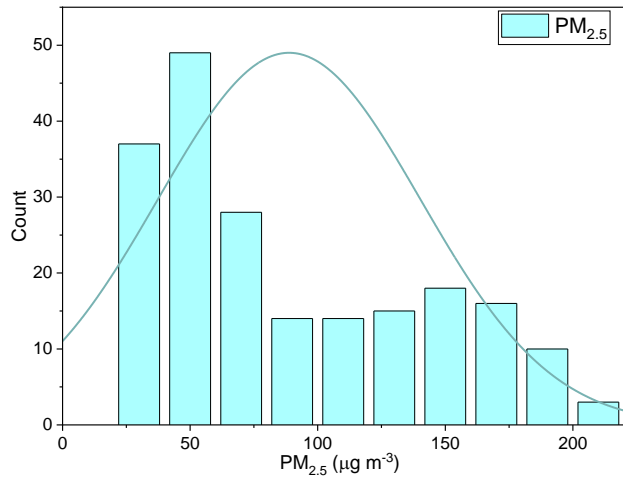
^AIntegrated Risk Information System (IRIS) by US EPA (<http://www.epa.gov.iris>)

^BAgency for Toxic Substance and Disease Registry (ATSDR) (1998)

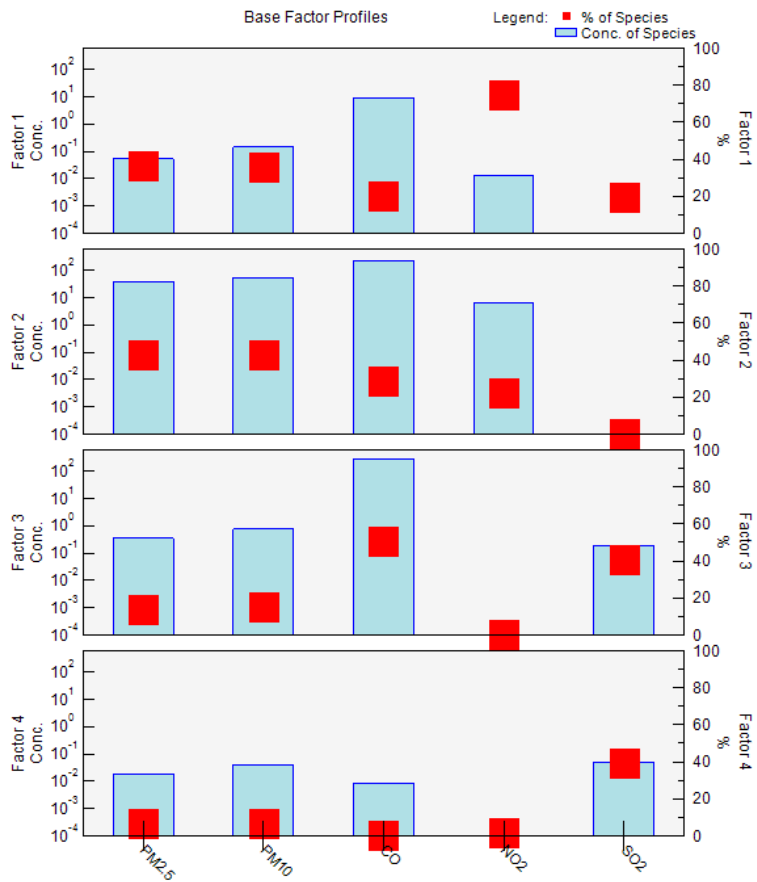
^CRfC estimated from oral RfD

Supplementary Table 4. Statistics for monthly variations of the ambient air pollutants and meteorological variables in Dhaka, Bangladesh.

Species	Mean (Standard deviation)	Minimum	Median	Maximum
PM _{2.5} (µg/m ³)	88.80 (51.42)	21.63	72.28	206.89
PM ₁₀ (µg/m ³)	124.57 (72.92)	30.25	100.4	292
CO (ppm)	693.70 (501.86)	130.00	572.50	1890.00
O ₃ (ppb)	51.41 (8.75)	32.90	50.60	73.30
NO ₂ (ppb)	14.87 (6.29)	5.39	14.00	29.80
SO ₂ (ppb)	8.76 (5.64)	1.22	7.43	24.29
Temperature (°C)	25.89 (2.89)	18.94	26.99	30.13
Pressure (hPa)	1006.46 (5.24)	996.48	1006.85	1015.05
RH (%)	71.51 (12.27)	46.68474	74.08556	87.55692



Supplementary Figure 1. Distribution of the air pollutants (PM_{2.5}, PM₁₀, O₃, CO, NO₂, and SO₂).



Supplementary Figure 2. Factor profiles of the air pollutants (PM_{2.5}, PM₁₀, CO, NO₂, and SO₂) obtained from PMF modeling.