

Supplementary Material

Implications of the Improvement in Atmospheric Fine Particles: A Case Study of COVID-19 Pandemic in Northern Taiwan

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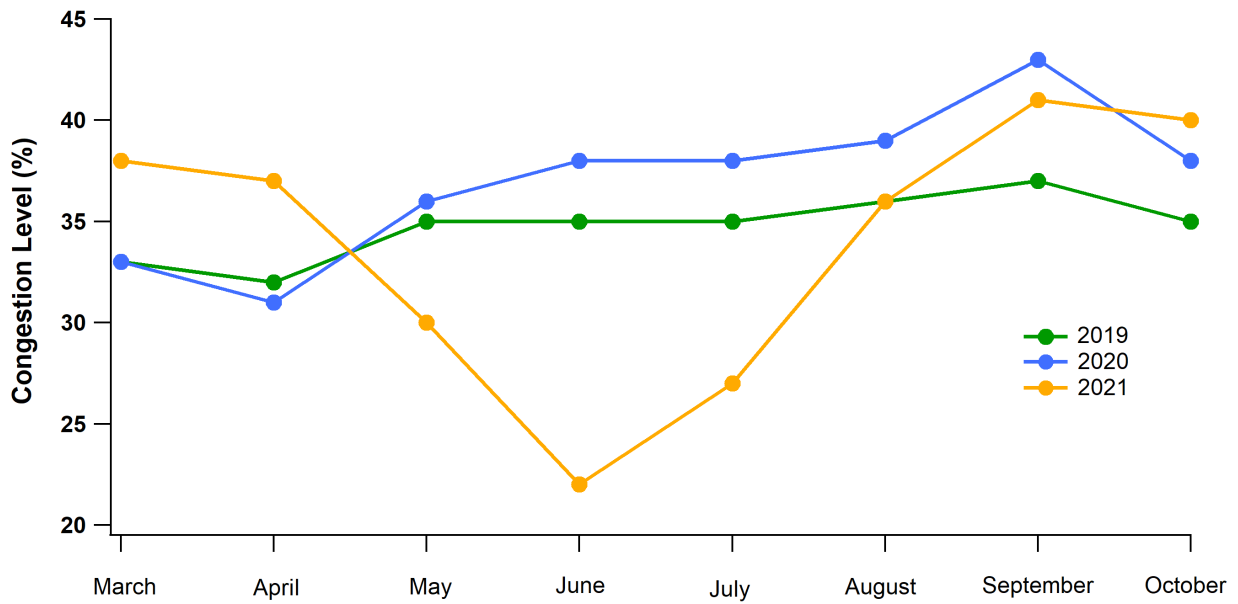
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(Data obtained from TomTom International BV, redrawn by this study.)

Fig. S1. Congestion level of 2019 to 2021 in Taipei. If the congestion level is 30%, it means that the travel times were 30% longer than during the baseline non-congested conditions.

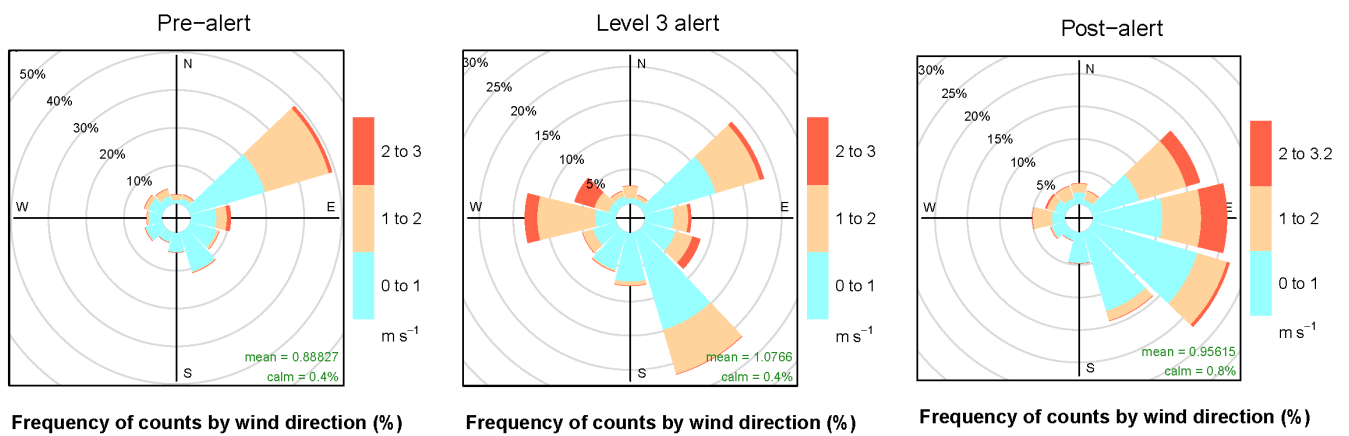


Fig. S2. Wind rose plots for the three sampling periods.

Table S1. Volume concentrations of gaseous pollutants and mass concentrations of PM_{2.5} and its components. Mean $\pm \sigma$ has been shown in each field.

	Pre-alert (n = 21)	Level 3 alert (n = 21)	Post-alert (n = 21)
($\mu\text{g m}^{-3}$)			
PM _{2.5}	23.9 \pm 13.1	12.1 \pm 4.1	13.3 \pm 3.4
NH ₄ ⁺	2.01 \pm 1.71	0.59 \pm 0.40	0.92 \pm 0.56
Na ⁺	0.40 \pm 0.21	0.30 \pm 0.17	0.37 \pm 0.23
K ⁺	0.08 \pm 0.06	0.03 \pm 0.02	0.03 \pm 0.02
Mg ²⁺	0.05 \pm 0.02	0.02 \pm 0.02	0.02 \pm 0.02
Ca ²⁺	0.14 \pm 0.09	0.06 \pm 0.03	0.07 \pm 0.04
Cl ⁻	0.22 \pm 0.26	0.08 \pm 0.27	0.03 \pm 0.10
NO ₃ ⁻	2.35 \pm 2.63	0.23 \pm 0.13	0.16 \pm 0.08
SO ₄ ²⁻	4.61 \pm 2.49	2.22 \pm 1.21	3.06 \pm 1.45
OC	2.61 \pm 1.38	1.67 \pm 0.95	1.42 \pm 0.58
SOC	1.11 \pm 0.83	0.75 \pm 0.50	0.72 \pm 0.34
POC	1.57 \pm 0.74	0.96 \pm 0.53	0.74 \pm 0.36
EC	1.23 \pm 0.58	1.07 \pm 0.42	1.22 \pm 0.48
(ppb)			
NO _x	19.5 \pm 11.1	10.3 \pm 2.7	11.5 \pm 3.1
CO	437 \pm 169	215 \pm 70	258 \pm 61
SO ₂	1.87 \pm 0.95	1.63 \pm 0.83	0.81 \pm 0.41
O ₃	33.6 \pm 13.1	25.8 \pm 5.4	25.2 \pm 7.1
(ng m ⁻³)			
Al	80.0 \pm 118	134 \pm 94.6	57.3 \pm 42.4
K	87.9 \pm 58.6	42.6 \pm 29.5	82.6 \pm 64.9
Ti	7.97 \pm 6.95	5.71 \pm 2.36	6.05 \pm 2.22
V	0.968 \pm 0.968	0.509 \pm 0.305	0.609 \pm 0.355
Cr	2.15 \pm 2.00	1.65 \pm 2.16	1.09 \pm 0.65
Mn	5.00 \pm 4.02	2.64 \pm 1.38	2.70 \pm 1.22
Fe	126 \pm 85.3	73.2 \pm 32.5	85.5 \pm 26.2
Co	0.068 \pm 0.055	0.063 \pm 0.037	0.049 \pm 0.021
Ni	1.38 \pm 1.77	1.62 \pm 1.19	4.26 \pm 2.62
Cu	11.9 \pm 3.98	9.27 \pm 3.80	10.8 \pm 3.65
Zn	26.8 \pm 18.0	21.2 \pm 10.5	20.0 \pm 7.74
As	0.524 \pm 0.319	0.264 \pm 0.138	0.368 \pm 0.199
Se	0.528 \pm 0.320	0.363 \pm 0.259	0.456 \pm 0.242
Sr	0.651 \pm 0.541	0.254 \pm 0.241	0.263 \pm 0.180
Cd	0.138 \pm 0.093	0.072 \pm 0.057	0.121 \pm 0.075
Sb	0.670 \pm 0.388	0.505 \pm 0.183	0.683 \pm 0.262
Ba	4.92 \pm 3.20	3.60 \pm 1.57	5.91 \pm 2.11
Pb	4.39 \pm 2.58	2.26 \pm 1.26	3.14 \pm 2.33

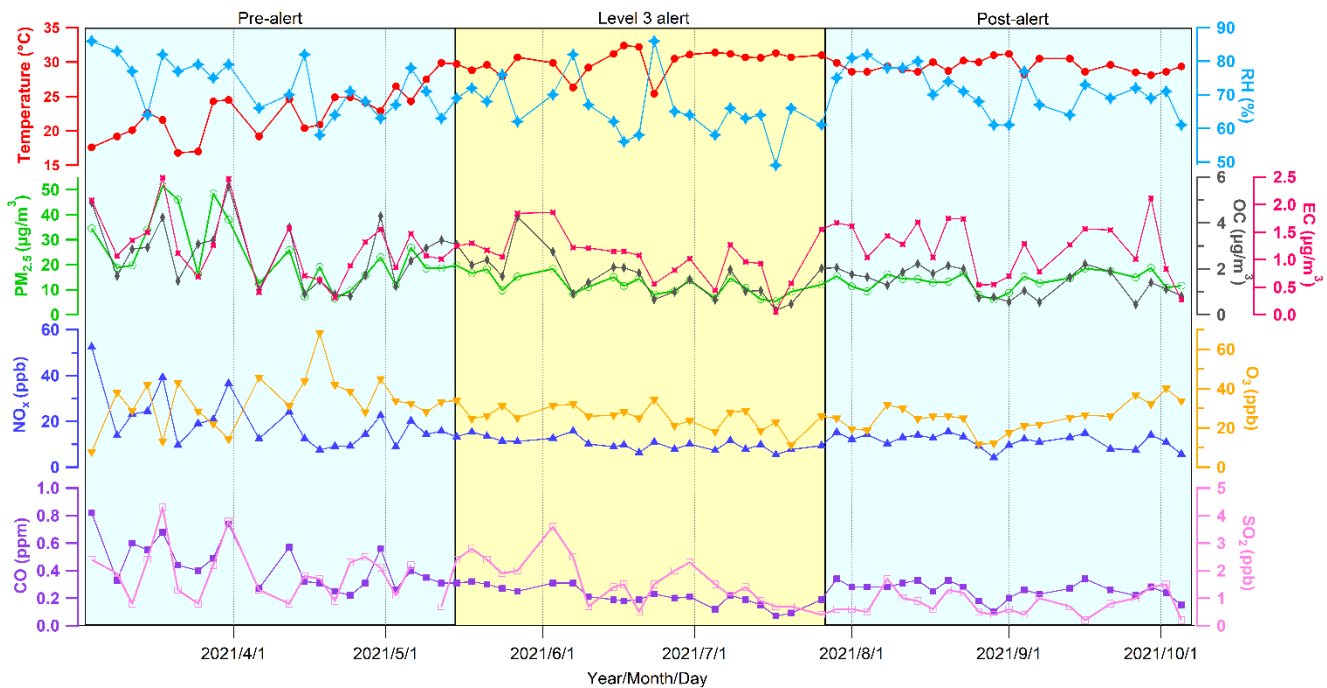


Fig. S3. Time series of the three sampling periods.

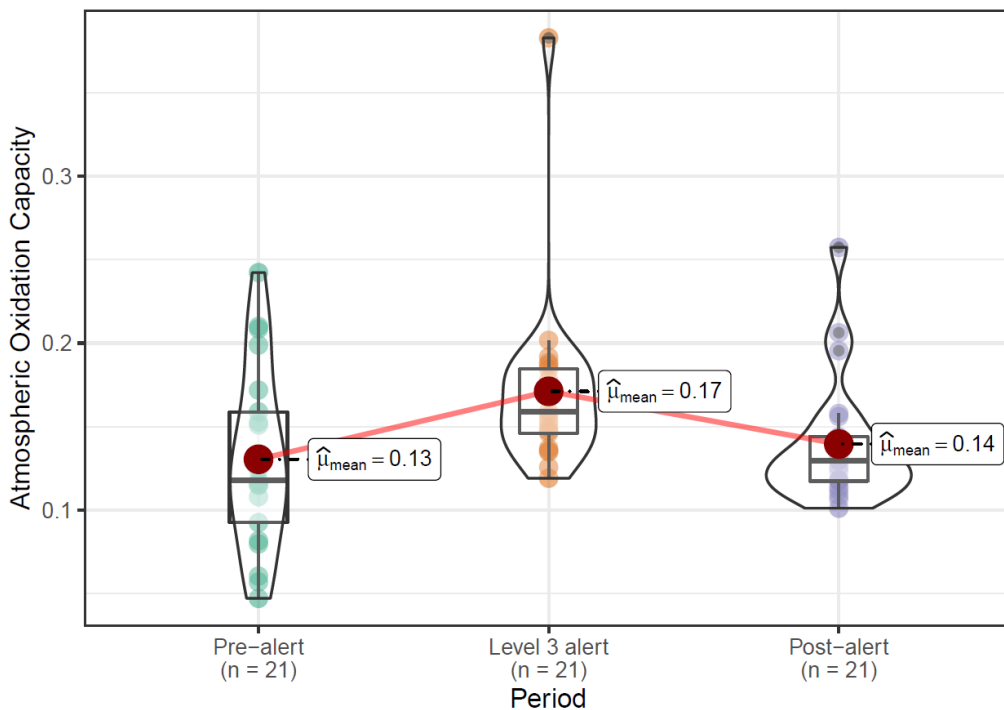


Fig. S4. Boxplots of AOC of the three periods. Box elements present the median, lower (25th) and upper (75th) quartiles, curves outside the box show the distribution of the raw data and brown dots display the mean values.

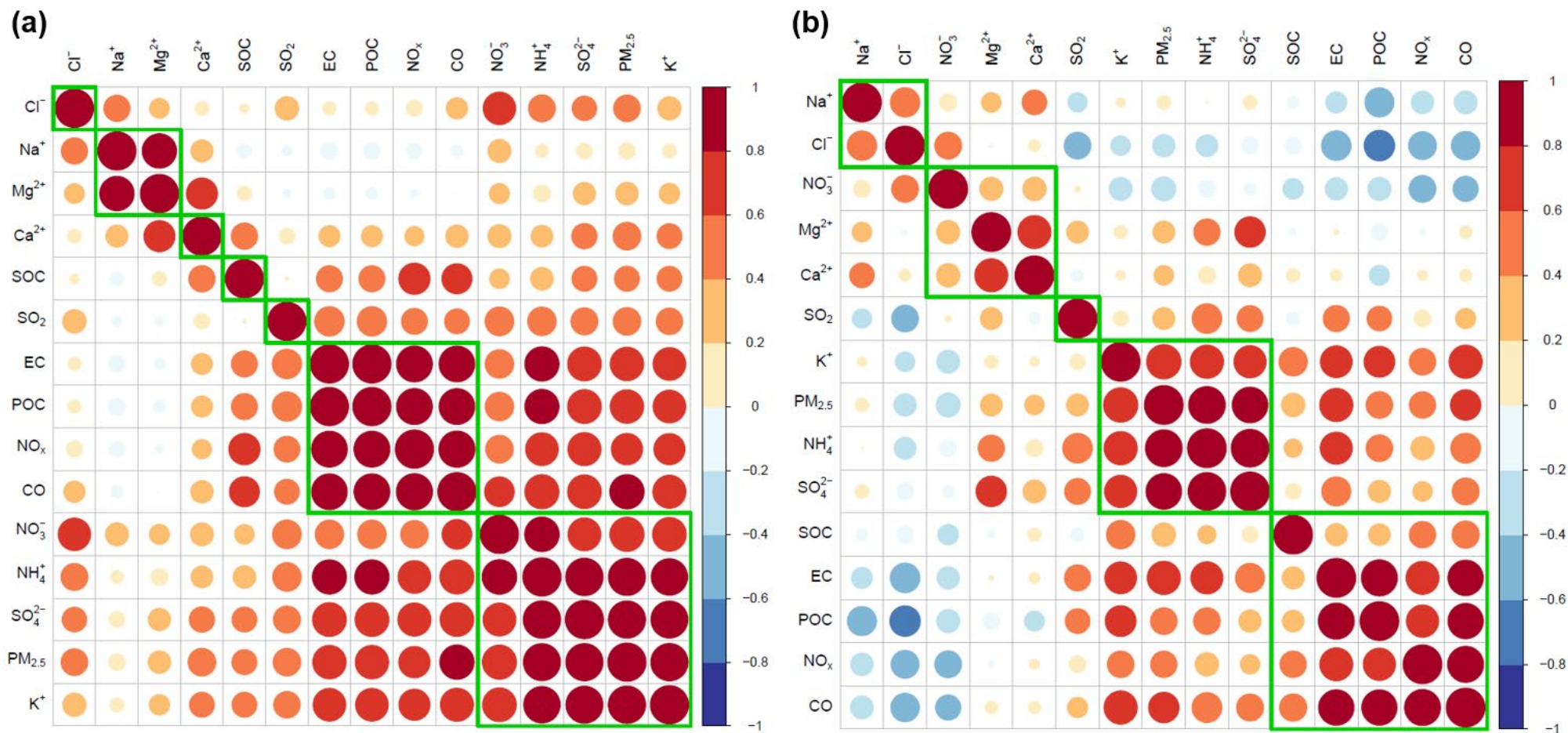


Fig. S5. Spearman's correlation matrix with the hierarchical clustering analysis for (a) pre-alert and (b) post-alert period. Species framed within same green square mean that they are in the same cluster.

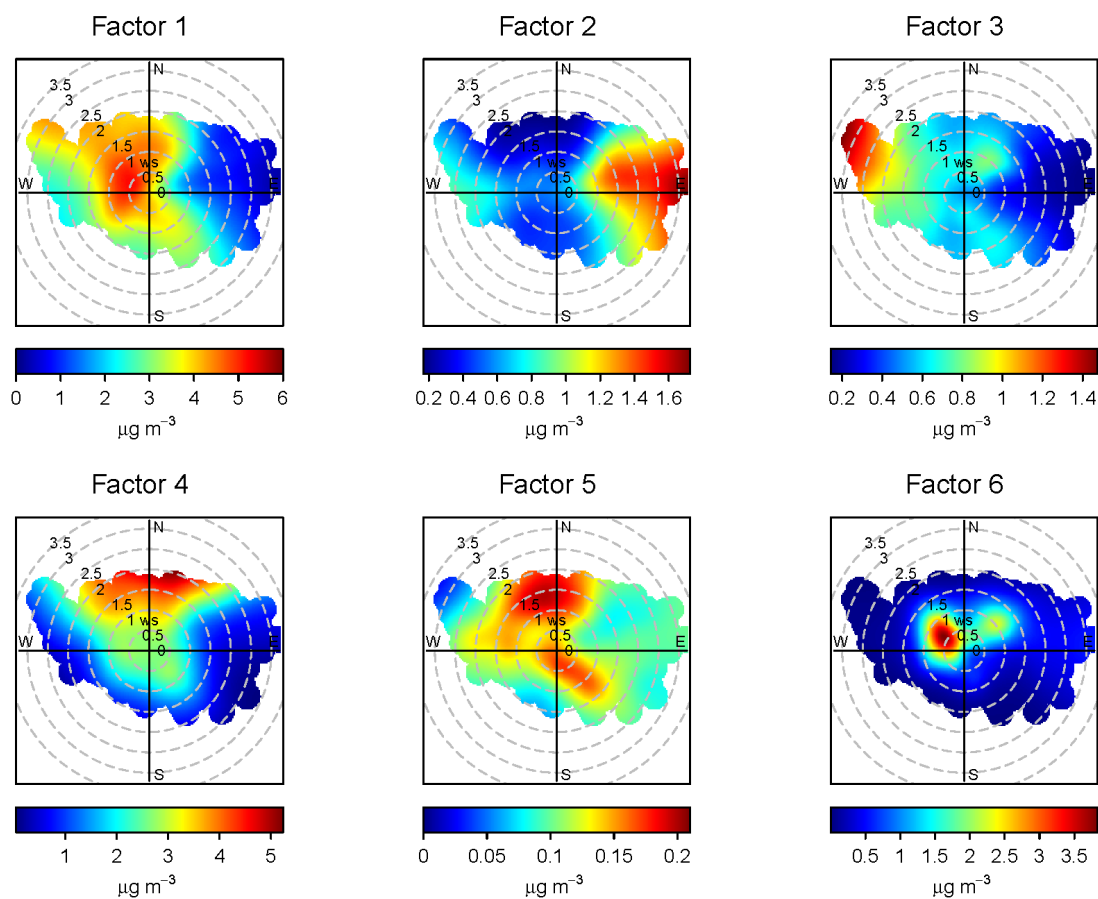


Fig. S6. Bivariate polar plot for 6 factors from PMF results.

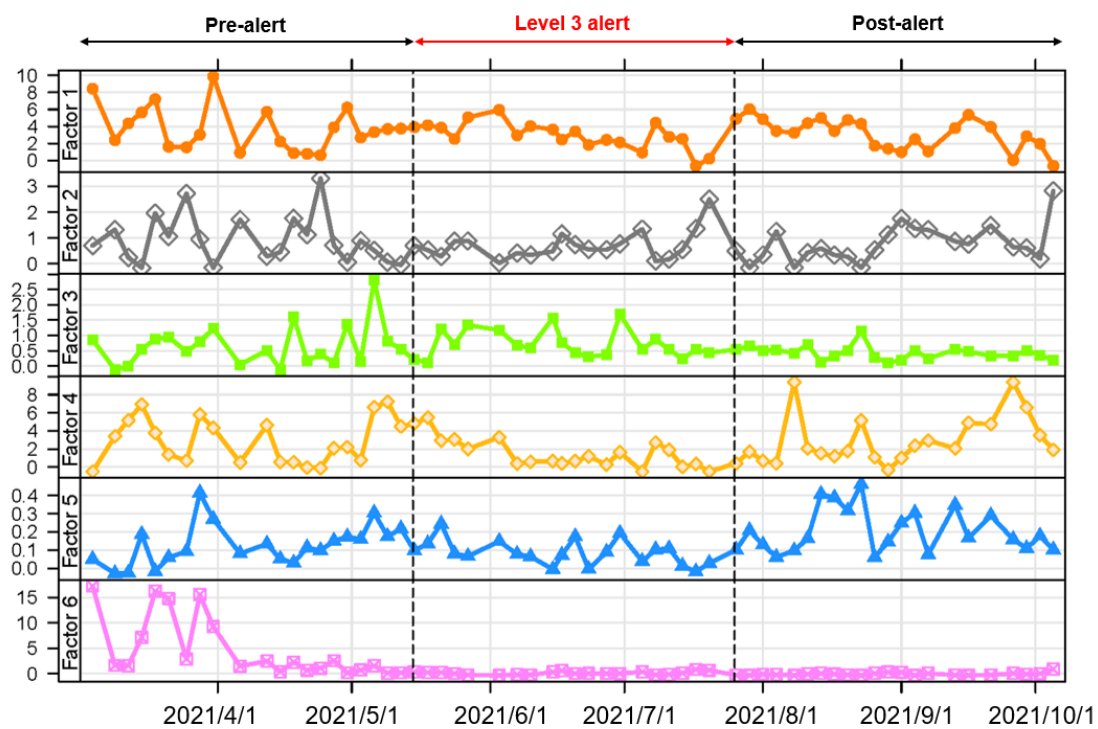


Fig. S7. Time series of the contributions from different sources. Each y-axis represents the $\text{PM}_{2.5}$ concentration ($\mu\text{g m}^{-3}$)