Supplementary Materials S1. Guidelines of air pollutant concentrations

Table S1. Ambient air quality standard in China (Source: Adapted by the Authors, data extracted from the Chinese Environmental protection Agency).

Category	Concentration Limit Level-1	Concentration Limit Level-2
Air quality index	50*	100*
PM2.5	35 μg/m^3	75 μg/m^3
PM10	50 μg/m^3	150 μg/m^3
Ozone (O_3)	100 μg/m^3	160 μg/m^3
Nitrogen dioxide (NO_2)	40 μg/m^3	80 μg/m^3
Sulfur dioxide (SO_2)	50 μg/m^3	150 μg/m^3
Carbon monoxide (CO)	2 mg/m^3	4 mg/m^3

*The criteria value is from MEEC (Ministry of Ecology and Environment of China), 2012.

Table S2. WHO Guidelines value for air pollution (WHO, 2000)

Category	WHO Guidelines value	WHO Interim target-1
Air quality index	50*	100*
PM2.5	10 μg/m^3	35 μg/m^3
PM10	20 μg/m^3	70 μg/m^3
Ozone (O3)	120 μg/m^3	160 μg/m^3
Nitrogen dioxide (NO2)	40 μg/m^3	/
Sulfur dioxide (SO2)	20 μg/m^3	50 μg/m^3

Supplementary Materials S2. The mean level of air parameters

- In low-level districts

Table S3. Mean level of air indicators in low-level districts

District	Air quality parameters	Closure period	After closure	Increase percentage
Shangcheng district	O_3	78.35$\mu g/m^3$	96.97$\mu g/m^3$	23.77%
	PM10	26.57 $\mu g/m^3$	52.44 $\mu g/m^3$	97.41%
	CO	0.84 mg/m^3	0.81 mg/m^3	-3.64%
	NO_2	7.87 $\mu g/m^3$	28.41 $\mu g/m^3$	261.07%
	PM2.5	21.30 $\mu g/m^3$	27.07 $\mu g/m^3$	27.07%
	SO_2	6.78 $\mu g/m^3$	7.08 $\mu g/m^3$	4.36%
	AQI (air quality index)	39.26	57.43	46.27%

District	Air quality parameters	Closure period	After closure	Increase percentage
Xiacheng district	O_3	86.65$\mu g/m^3$	111.32$\mu g/m^3$	28.47%
	PM10	43.30 $\mu g/m^3$	66.59 $\mu g/m^3$	53.78%
	CO	0.93 mg/m^3	0.79 mg/m^3	-15.64%
	NO_2	20.57 $\mu g/m^3$	52.64 $\mu g/m^3$	155.95%
	PM2.5	33.43 $\mu g/m^3$	33.86 $\mu g/m^3$	1.28%
	SO_2	6.74 $\mu g/m^3$	7.56 $\mu g/m^3$	12.14%
	AQI (air quality index)	52.48	70.98	35.24%

- In mid-level districts

Table S4. Mean level of air indicators in mid-level districts

District	Air quality parameters	Closure period	After closure	Increase percentage
Xihu district	O_3	91.32$\mu g/m^3$	117.32$\mu g/m^3$	28.48%
	PM10	36.44 $\mu g/m^3$	53.12 $\mu g/m^3$	45.80%

	CO	0.59 mg/m^3	1.07 mg/m^3	82.14%
	NO_2	11.82 $\mu g/m^3$	34.32 $\mu g/m^3$	190.39%
	PM2.5	27.28 $\mu g/m^3$	28.60 $\mu g/m^3$	4.86%
	SO_2	4.51 $\mu g/m^3$	5.54 $\mu g/m^3$	22.79%
	AQI (air quality index)	52.51	64.12	22.11%
Jianggan district	O_3	74.37 $\mu g/m^3$	94.08 $\mu g/m^3$	26.50%
	PM10	37.98 $\mu g/m^3$	58.81 $\mu g/m^3$	54.85%
	CO	0.97 mg/m^3	0.75 mg/m^3	-22.71%
	NO_2	13.20 $\mu g/m^3$	38.41 $\mu g/m^3$	191.11%
	PM2.5	29.56 $\mu g/m^3$	31.03 $\mu g/m^3$	4.95%
	SO_2	5.02 $\mu g/m^3$	4.85 $\mu g/m^3$	-3.42%
	AQI (air quality index)	47.80	61.79	29.26%
Binjiang district	O_3	82.96 $\mu g/m^3$	105.11 $\mu g/m^3$	26.70%
	PM10	35.13 $\mu g/m^3$	54.55 $\mu g/m^3$	55.28%
	CO	0.73 mg/m^3	0.74 mg/m^3	-0.29%
	NO_2	10.70 $\mu g/m^3$	35.51 $\mu g/m^3$	232.04%
	PM2.5	26.93 $\mu g/m^3$	29.5 $\mu g/m^3$	9.52%
	SO_2	5.54 $\mu g/m^3$	5.51 $\mu g/m^3$	-0.66%
	AQI (air quality index)	45.72	59.97	31.18%
Gongshu district	O_3	86.28 $\mu g/m^3$	111.61 $\mu g/m^3$	29.36%
	PM10	44.43 $\mu g/m^3$	71.04 $\mu g/m^3$	59.88%
	CO	0.56 mg/m^3	0.74 mg/m^3	30.73%
	NO_2	10.07 $\mu g/m^3$	33.36 $\mu g/m^3$	231.43%
	PM2.5	33.28 $\mu g/m^3$	34.62 $\mu g/m^3$	4.02%
	SO_2	6.07 $\mu g/m^3$	8.14 $\mu g/m^3$	34.25%
	AQI	52.15	66.57	27.65%

- In high-level district

Table S5. Mean level of air indicators in high-level districts

District	Air quality parameters	Closure period	After closure	Increase percentage
Yuhang district	O_3	90.89$\mu g/m^3$	114.99$\mu g/m^3$	26.51%
	PM10	43.39 $\mu g/m^3$	84.41 $\mu g/m^3$	99.11%
	CO	0.89 mg/m^3	0.88 mg/m^3	-1.12%
	NO_2	13.43 $\mu g/m^3$	40.80 $\mu g/m^3$	203.70%
	PM2.5	32 $\mu g/m^3$	36.74 $\mu g/m^3$	14.80%
	SO_2	5.26 $\mu g/m^3$	6.31 $\mu g/m^3$	20.02%
	AQI (air quality index)	53.33	71.34	33.79%
Xiaoshan district	O_3	86.35 $\mu g/m^3$	109.65 $\mu g/m^3$	26.99%
	PM10	45.22 $\mu g/m^3$	66.06 $\mu g/m^3$	46.10%
	CO	0.57 mg/m^3	0.64 mg/m^3	12.72%
	NO_2	16.22 $\mu g/m^3$	42.89 $\mu g/m^3$	164.49%
	PM2.5	36.63 $\mu g/m^3$	37.20 $\mu g/m^3$	1.56%
	SO_2	6.35 $\mu g/m^3$	5.56 $\mu g/m^3$	-12.34%
	AQI	56.09	66.09	17.84%

Supplementary Materials S3. Pearson Correlations Coefficients

- In the lockdown period:

Table S6. Pearson correlation coefficient of Xiacheng district in lockdown

		O_3	PM10	CO	NO_2	PM2.5	SO_2	AQI
Construction site number	Pearson Correlation	0.306	0.129	-0.473	-0.323	0.080	-0.682	0.154
	Sig. (2-tailed)	0.217	0.609	0.048**	0.192	0.753	0.002*	0.541
	N	18	18	18	18	18	18	18

Table S7. Pearson correlative coefficient of Gongshu district in lockdown

		O_3	PM10	CO	NO_2	PM2.5	SO_2	AQI
Construction site number	Pearson Correlation	0.037	0.285	0.289	0.478	0.333	0.567	0.282
	Sig. (2-tailed)	0.884	0.252	0.245	0.045**	0.177	0.014*	0.257
	N	18	18	18	18	18	18	18

Table S8. Pearson correlative coefficient of Xiaoshan district in lockdown

		O_3	PM10	CO	NO_2	PM2.5	SO_2	AQI
Construction site number	Pearson Correlation	0.635	0.662	0.723	-0.051	0.668	0.635	0.702
	Sig. (2-tailed)	0.005*	0.003*	0.001*	0.841	0.002*	0.005*	0.001*
	N	18	18	18	18	18	18	18

- After the lockdown

Table S9. Pearson correlative coefficient of Xiacheng district after the lockdown

		O_3	PM10	CO	NO_2	PM2.5	SO_2	AQI
Construction site number	Pearson Correlation	-0.004	0.061	-0.039	0.400	-0.002	-0.103	0.180

	Sig. (2-tailed)	0.972	0.633	0.759	0.001*	0.985	0.422	0.158
	N	63	63	63	63	63	63	63

Table S10. Pearson correlative coefficient of Gongshu district after the lockdown

		O_3	PM10	CO	NO_2	PM2.5	SO_2	AQI
Construction site number	Pearson Correlation	-0.291	-0.098	-0.040	-0.560	0.212	-0.330	-0.211
	Sig. (2-tailed)	0.021**	0.446	0.753	0.000*	0.095	0.008*	0.098
	N	63	63	63	63	63	63	63

Table S11. Pearson correlative coefficient of Xiaoshan district after the lockdow

		O_3	PM10	CO	NO_2	PM2.5	SO_2	AQI
Construction site number	Pearson Correlation	-0.430	-0.370	-0.075	-0.439	0.134	-0.222	-0.237
	Sig. (2-tailed)	0.000*	0.773	0.558	0.000*	0.295	0.080	0.062
	N	63	63	63	63	63	63	63

*Correlation is significant at the 0.01 level (2-tailed).

**Correlation is significant at the 0.05 level (2-tailed).

Supplementary Materials S4. Scatter plots

- In the lockdown period

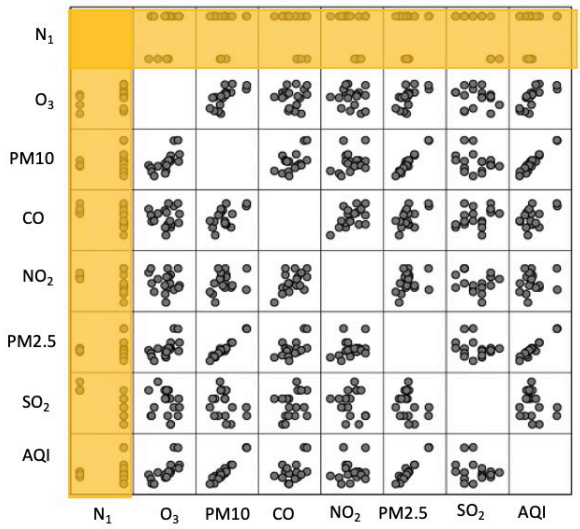

Figure S1. Correlative scatter plot of XiaCheng district

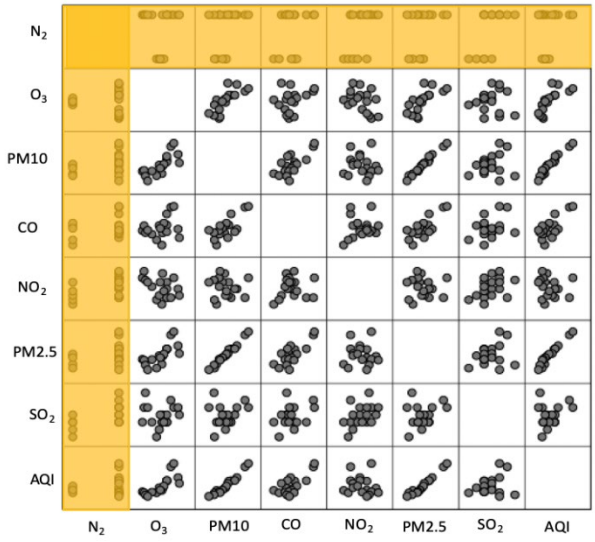

Figure S2. Correlative scatter plot of Gongshu district

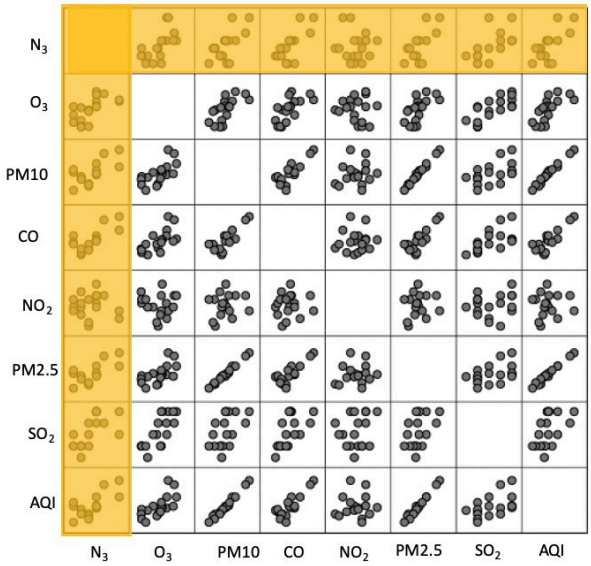

Figure S3. Correlative scatter plot of Xiaoshan district

- After the lockdown

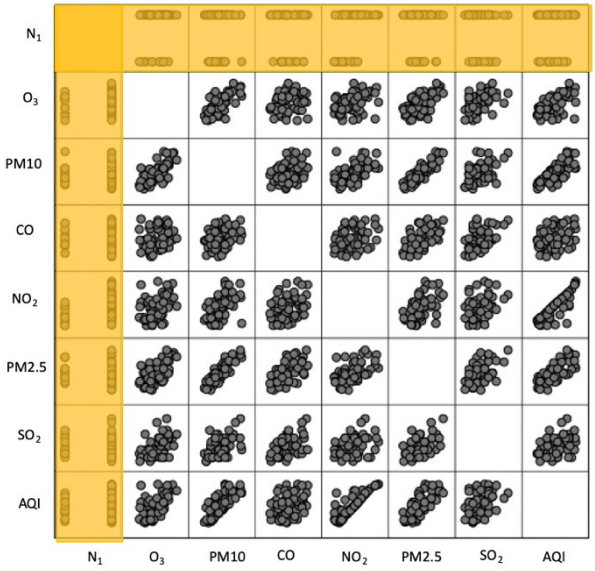

Figure S4. Correlative scatter plot of XiaCheng district

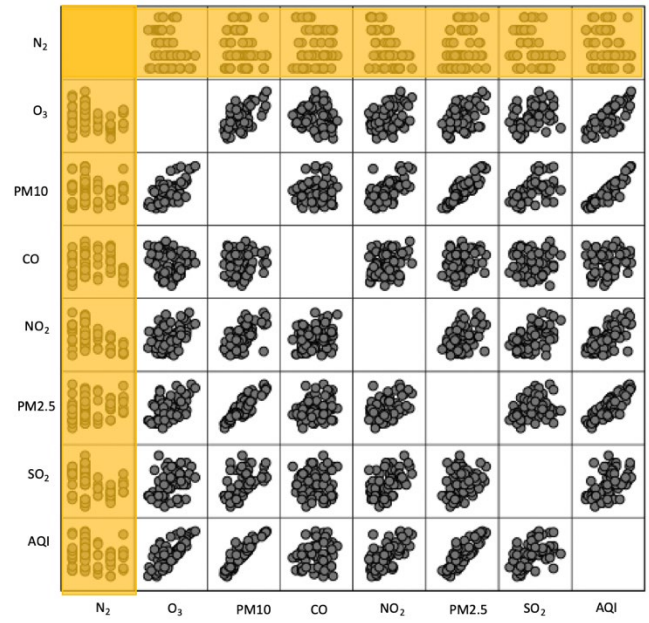

Figure S5. Correlative scatter plot of Gongshu district

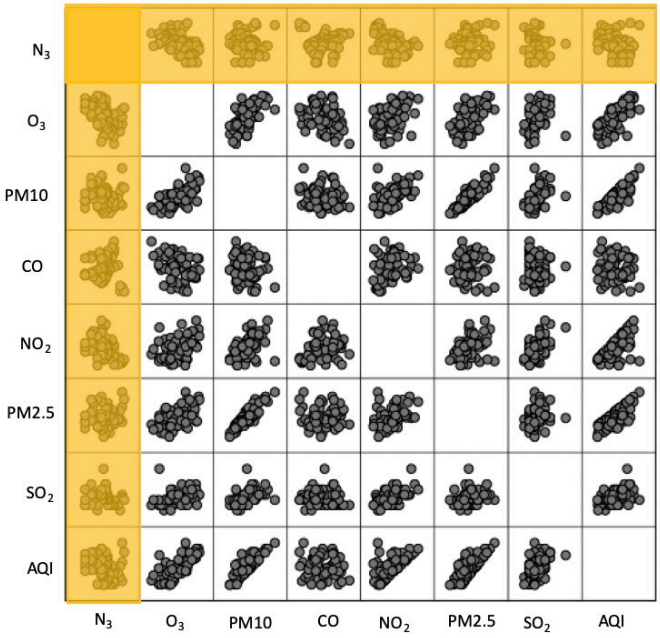

Figure S6. Correlative scatter plot of Xiaoshan district

***Note:** N_1, N_2, N_3 are the number of the construction sites in Xiacheng, Gongshu, Xiaoshan district respectively.

Supplementary Materials S5. Modelling Abstruct

- In the lockdown period

Table S12. Model summary of Xiacheng district in the lockdown period

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.814[1]	0.662	0.617	0.265
2	0.829[2]	0.687	0.469	0.312
3	0.815[3]	0.664	0.643	0.256
4	1.000[4]	1.000	/	/

1: Predictors: (Constant), SO_2, NO_2.
2: Predictors: (Constant), O_3, PM10, CO, NO_2, PM2.5, SO_2, AQI.
3: Predictors: (Constant), NO_2*SO_2.
4: Predictors: (Constant), AQI, CO*SO_2, NO_2^2, O_3*SO_2, CO, O_3*NO_2, PM10*SO_2, $O3^2$, PM2.5*SO_2, NO_2*PM2.5, AQI^2, NO_2*SO_2, SO_2*AQI, SO_2^2, NO_2, CO*NO_2, SO_2.

Table S13. Model summary of Gongshu district in the lockdown period

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.567[1]	0.321	0.279	0.39134
1	0.703[2]	0.495	0.141	0.42709
2	0.567[3]	0.321	0.279	0.39134
3	0.995[4]	0.990	0.832	0.18915

1: Predictors: (Constant), SO_2.
2: Predictors: (Constant), O_3, PM10, CO, NO_2, PM2.5, SO_2, AQI.
3: Predictors: (Constant), SO_2.
4: Predictors: (Constant), SO_2*AQI, NO_2, $SO2^2$, CO, O_3^2, CO^2, PM10*NO_2, O_3*NO_2, CO*NO_2, PM2.5, NO_2*AQI, $PM10^2$, CO*PM2.5, SO_2, O_3*PM2.5, NO_2*SO_2.

Table S14. Model summary of Xiaoshan district in the lockdown period

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.723[1]	0.523	0.493	1.288
2	0.923[2]	0.853	0.750	0.905

3	0.779[3]	0.607	0.582	1.169
4	1.000[4]	1.000	/	/

1: Predictors: (Constant), CO.

2: Predictors: (Constant), O_3, PM10, CO, NO_2, PM2.5, SO_2, AQI.

3: Predictors: (Constant), CO*SO_2.

4: Predictors: (Constant), AQI, NO_2^2, SO_2, O_3^2, CO, $PM10^2$, O_3*NO_2, PM10*NO_2, NO_2, PM2.5, CO^2, O_3, PM10*SO_2, NO_2*SO_2, O_3*PM2.5, SO_2^2, O_3*CO.

- After the lockdown

Table S15. Model summary of Xiacheng district after the lockdown

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.494[1]	0.244	0.219	0.361
2	0.540[2]	0.291	0.201	0.365
3	0.496[3]	0.246	0.221	0.360
1	0.885[4]	0.784	0.521	0.282

1: Predictors: (Constant), NO_2, AQI.

2: Predictors: (Constant), O_3, PM10, CO, NO_2, PM2.5, SO_2, AQI.

3: Predictors: (Constant), NO_2, CO*AQI.

4: Predictors: (Constant), O_3, PM10, CO, NO_2, PM2.5, SO_2, AQI, O_3^2, $PM10^2$, CO^2, NO_2^2, $PM2.5^2$, SO_2^2, AQI^2, O_3*PM10, O_3*CO, O_3*NO_2, O_3*PM2.5, O_3*SO_2, O_3*AQI, PM10*CO, PM10*NO_2, PM10*PM2.5, PM10*SO_2, PM10*AQI, CO*NO_2, CO*PM2.5, CO*SO_2, CO*AQI, NO_2*PM2.5, NO_2*SO_2, PM2.5*SO_2, PM2.5*AQI, SO_2*AQI.

Table S16. Model summary of Gongshu district after the lockdown

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.789[1]	0.622	0.603	0.81460
2	0.794[2]	0.631	0.584	0.83347
3	0.811[3]	0.657	0.640	0.77589
4	0.958[4]	0.918	0.830	0.53243

1: Predictors: (Constant), NO_2, PM2.5, AQI.

2: Predictors: (Constant), O_3, PM10, CO, NO_2, PM2.5, SO_2, AQI.

3: Predictors: (Constant), NO_2, PM2.5, PM2.5*AQI.

4: Predictors: (Constant), O_3, PM10, CO, NO_2, PM2.5, SO_2, AQI, O_3^2, $PM10^2$, CO^2, $NO2^2$, $PM2.5^2$, SO_2^2, AQI^2, O_3*PM10, O_3*CO, O_3*NO2, O_3*PM2.5, O_3*SO_2, O_3*AQI, PM10*CO, PM10*NO_2, PM10*SO_2, CO*NO_2, CO*PM2.5, CO*SO_2, CO*AQI, NO_2*PM2.5, NO_2*SO_2, NO_2*AQI, PM2.5*SO_2, SO_2*AQI.

Table S17. Model summary of Xiaoshan district after the lockdown

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.740[1]	0.548	0.516	3.225
2	0.753[2]	0.567	0.512	3.240
3	0.811[3]	0.657	0.621	2.857
4	0.922[4]	0.850	0.679	2.629

1: Predictors: (Constant), NO_2, PM2.5, O_3, CO.

2: Predictors: (Constant), O_3, PM10, CO, NO_2, PM2.5, SO_2, AQI.

3: Predictors: (Constant), O_3*CO, PM2.5, AQI, NO_2*PM2.5, NO_2^2, NO_2.

4: Predictors: (Constant), O_3, PM10, CO, NO_2, PM2.5, SO_2, AQI, O_3^2, $PM10^2$, CO^2, NO_2^2, $PM2.5^2$, SO_2^2, AQI^2, O_3*PM10, O_3*CO, O_3*NO_2, O_3*PM2.5, O_3*SO_2, O_3*AQI, PM10*CO, PM10*NO_2, PM10*SO_2, CO*NO_2, CO*PM2.5, CO*SO_2, CO*AQI, NO_2*PM2.5, NO_2*SO_2, NO_2*AQI, PM2.5*SO_2, PM2.5*AQI, SO_2*AQI, O_3, PM10, CO, NO_2, PM2.5, SO_2, AQI.

Supplementary Materials S6. Correlative Coefficient

- In the lockdown period

For Xiacheng district:

Table S18. Correlative coefficients of XiaCheng district

Model		Unstandardised Coefficients	
		B	Std. Error
4	(Constant)	-3.509	0.000
	O_3	0.025	0.000
	CO	9.975	0.000
	NO_2	1.035	0.000
	SO_2	1.692	0.000
	NO_2^2	-0.006	0.000
	SO_2^2	-0.064	0.000
	O_3*NO_2	-0.002	0.000
	O_3*SO_2	0.003	0.000
	PM10*SO_2	-0.001	0.000
	CO*NO_2	0.548	0.000
	NO_2*PM2.5	0.004	0.000
	NO_2*SO_2	-0.043	0.000
	PM2.5*SO_2	-0.007	0.000
	SO_2*AQI	0.001	0.000

* Dependent Variable: construction sites number of Xiacheng district

For Gongshu district:

Table S19. Correlative coefficients of Gongshu district

Model		Unstandardised Coefficients	
		B	Std. Error
4	(Constant)	82.219	7.877
	CO	7.725	5.387

	NO_2	-2.210	1.091
	PM2.5	0.117	0.150
	SO_2	2.186	1.704
	O_3^2	-4.375E-5	0.000
	CO^2	-1.279	1.348
	SO_2^2	-0.730	0.176
	O_3*NO_2	-0.003	0.003
	O_3*PM2.5	0.001	0.001
	PM10*NO_2	-0.019	0.009
	CO*NO_2	-1.943	0.567
	CO*PM2.5	0.013	0.052
	NO_2*SO_2	0.667	0.206
	NO_2*AQI	0.010	0.004

* Dependent Variable: construction sites number of Gongshu district

For Xiaoshan district:

Table S20. Correlative coefficients of Xiaoshan district

Model		Unstandardised Coefficients	
		B	Std. Error
4	(Constant)	294.222	0.000
	O_3	0.005	0.000
	CO	-57.723	0.000
	NO_2	-1.607	0.000
	PM2.5	0.249	0.000
	SO_2	-4.927	0.000
	AQI	-0.287	0.000
	O_3^2	-0.001	0.000
	CO^2	15.398	0.000
	NO_2^2	0.045	0.000

	$PM2.5^2$	-0.004	0.000
	O_3*PM10	0.003	0.000
	O_3*CO	0.690	0.000
	O_3*NO_2	-0.018	0.000
	PM10*CO	-0.253	0.000
	PM10*NO_2	-0.004	0.000
	NO_2*SO_2	0.221	0.000
	SO_2*AQI	0.047	0.000

* Dependent Variable: construction sites number of Xiaoshan district

- After the lockdown

For Xiacheng district:

Table S21. Correlative coefficients of XiaCheng district

Model		Unstandardised Coefficients	
		B	Std. Error
4	(Constant)	14.725	3.217
	O_3	-0.005	0.021
	PM10	0.016	0.053
	CO	9.206	8.497
	NO_2	0.006	0.062
	PM2.5	-0.234	0.115
	SO_2	0.051	0.369
	AQI	0.072	0.076
	O_3^2	1.006E-5	0.000
	CO^2	-7.026	6.348
	$PM2.5^2$	-0.001	0.002
	SO_2^2	-0.029	0.019
	O_3*CO	0.038	0.028
	O_3*NO_2	-0.001	0.001

	O_3*PM2.5	-0.001	0.001
	O_3*SO_2	-0.001	0.001
	O_3*AQI	0.001	0.001
	PM10*CO	-0.024	0.076
	PM10*NO_2	-4.310E-5	0.001
	PM10*SO_2	0.003	0.003
	PM10*AQI	-0.001	0.001
	CO*NO_2	0.196	0.100
	CO*PM2.5	0.254	0.162
	CO*SO_2	0.511	0.554
	CO*AQI	-0.334	0.106
	NO_2*SO_2	-0.004	0.008
	PM2.5*SO_2	-0.003	0.007
	PM2.5*AQI	0.003	0.002
	SO_2*AQI	0.002	0.008

* Dependent Variable: construction sites number of Xiacheng district

For Gongshu district:

Table S22. Correlative coefficients of Gongshu district

Model		Unstandardised Coefficients	
		B	Std. Error
4	(Constant)	91.825	8.218
	O_3	-0.054	0.075
	PM10	0.062	0.140
	CO	-10.688	7.850
	NO_2	-0.271	0.176
	PM2.5	0.509	0.198
	SO_2	-0.356	0.993
	AQI	-0.316	0.227

$PM10^2$	1.194E-5	0.000
CO^2	-0.958	0.779
NO_2^2	-0.005	0.002
$PM2.5^2$	0.002	0.001
SO_2^2	-0.037	0.043
AQI^2	-0.001	0.001
O_3*PM10	-0.001	0.001
O_3*CO	0.023	0.081
O_3*NO_2	0.001	0.001
O_3*PM2.5	-0.001	0.001
O_3*SO_2	-0.010	0.005
O_3*AQI	0.003	0.001
PM10*CO	-0.132	0.143
PM10*NO_2	0.007	0.002
PM10*SO_2	-0.004	0.012
CO*NO_2	0.825	0.241
CO*PM2.5	0.286	0.263
CO*SO_2	0.749	0.734
CO*AQI	-0.394	0.272
NO_2*PM2.5	-0.012	0.003
NO_2*SO_2	-0.005	0.012
NO_2*AQI	-0.002	0.003
PM2.5*SO_2	-0.033	0.021
SO_2*AQI	0.048	0.016

* Dependent Variable: construction sites number of Gongshu district

For Xiaoshan district:

Table S23. Correlative coefficients of Xiaoshan district

Model		Unstandardised Coefficients	
		B	Std. Error
4	(Constant)	252.375	18.422
	O_3	-0.208	0.226
	PM10	-0.117	0.499
	CO	7.083	37.720
	NO_2	-1.652	0.642
	PM2.5	0.583	0.821
	SO_2	4.943	5.000
	AQI	0.417	0.659
	$PM10^2$	-0.002	0.001
	CO^2	-25.430	27.422
	NO_2^2	0.012	0.008
	$PM2.5^2$	0.005	0.008
	SO_2^2	-0.185	0.550
	AQI^2	-0.016	0.011
	O_3*PM10	0.003	0.003
	O_3*CO	0.102	0.207
	O_3*NO_2	-0.007	0.005
	O_3*PM2.5	-0.005	0.005
	O_3*SO_2	-0.005	0.026
	O_3*AQI	0.006	0.006
	PM10*CO	-0.665	0.489
	PM10*NO_2	0.004	0.009
	PM10*SO_2	0.050	0.075
	CO*NO_2	0.795	0.736
	CO*PM2.5	1.328	0.807

$CO*SO_2$	-2.082	3.989
CO*AQI	-0.215	0.713
NO_2*PM2.5	-0.031	0.016
NO_2*SO_2	0.087	0.099
NO_2*AQI	0.018	0.013
PM2.5*SO_2	-0.081	0.122
PM2.5*AQI	0.013	0.014
SO_2*AQI	-0.078	0.094

* Dependent Variable: construction sites number of Xiaoshan district.