Web Appendix

Seasonal Variation of Chemical Constituents Associated With Short-term Mortality Effects of $PM_{2.5}$ in Xi'an, A Central City in China

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Web Table 1. Spearman Correlations of $PM_{2.5}$ Mass and Elements in Xi'an, China, 2006-2008.

	$PM_{2.5}$	OC	EC	S	Cl	Br	K	Ca	Cr	Mn	Fe	Ni	Zn	Cd	Pb
$PM_{2.5}$	1.00	0.80	0.73	0.76	0.67	0.60	0.73	0.25	0.44	0.65	0.53	0.23	0.58	0.19	0.77
OC		1.00	0.74	0.56	0.78	0.68	0.73	0.31	0.48	0.67	0.51	0.23	0.62	0.20	0.72
EC			1.00	0.58	0.73	0.69	0.61	0.29	0.44	0.66	0.53	0.25	0.68	0.21	0.74
S				1.00	0.41	0.39	0.51	-0.09	0.29	0.38	0.18	0.07	0.42	0.16	0.66
Cl					1.00	0.76	0.70	0.42	0.42	0.76	0.59	0.21	0.79	0.21	0.73
Br						1.00	0.55	0.25	0.35	0.61	0.45	0.25	0.62	0.12	0.63
K							1.00	0.60	0.46	0.75	0.75	0.27	0.52	0.16	0.65
Ca								1.00	0.27	0.64	0.87	0.30	0.38	0.13	0.27
Cr									1.00	0.49	0.39	0.25	0.34	0.15	0.39
Mn										1.00	0.84	0.26	0.74	0.23	0.69
Fe											1.00	0.31	0.56	0.20	0.53
Ni												1.00	0.14	0.08	0.26
Zn													1.00	0.28	0.73
Cd														1.00	0.30
Pb															1.00

$PM_{2.5}$: particulate matter less than 2.5 μm in aerodynamic diameter.

Web Table 2. Spearman Correlations of $PM_{2.5}$ Mass and Anions in Xi'an, China, 2006.

	$PM_{2.5}$	ammonium	sulfate	nitrate
$PM_{2.5}$	1.00	0.66	0.69	0.76
ammonium		1.00	0.96	0.89
Sulfate			1.00	0.85
nitrate				1.00

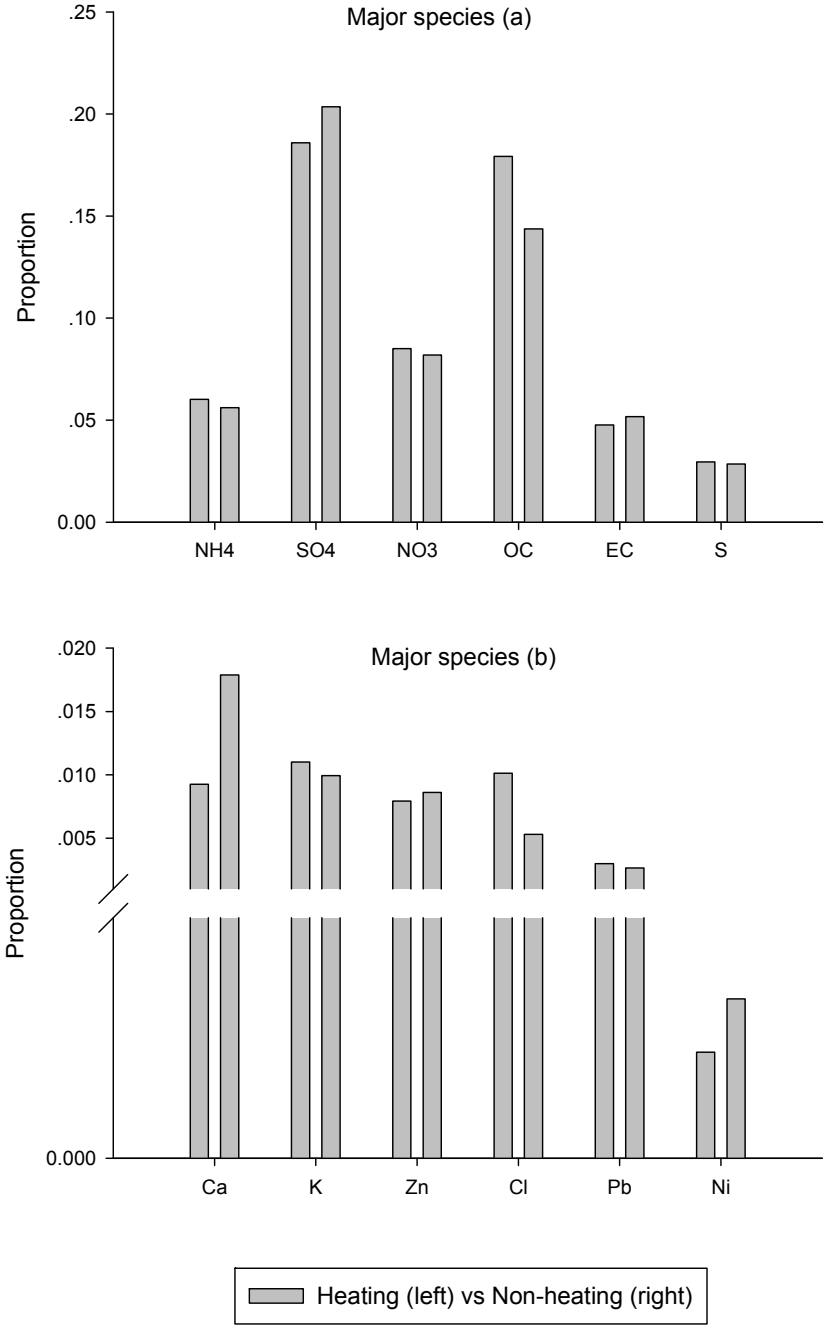
$PM_{2.5}$: particulate matter less than 2.5 μm in aerodynamic diameter.

Web Table 3. Sensitivity Analysis of Excess Relative Risk for All-Cause All-Age Mortality per 10μg/m^3 Increase in $PM_{2.5}$ Concentration Averaged over Lag 1-2 Days.

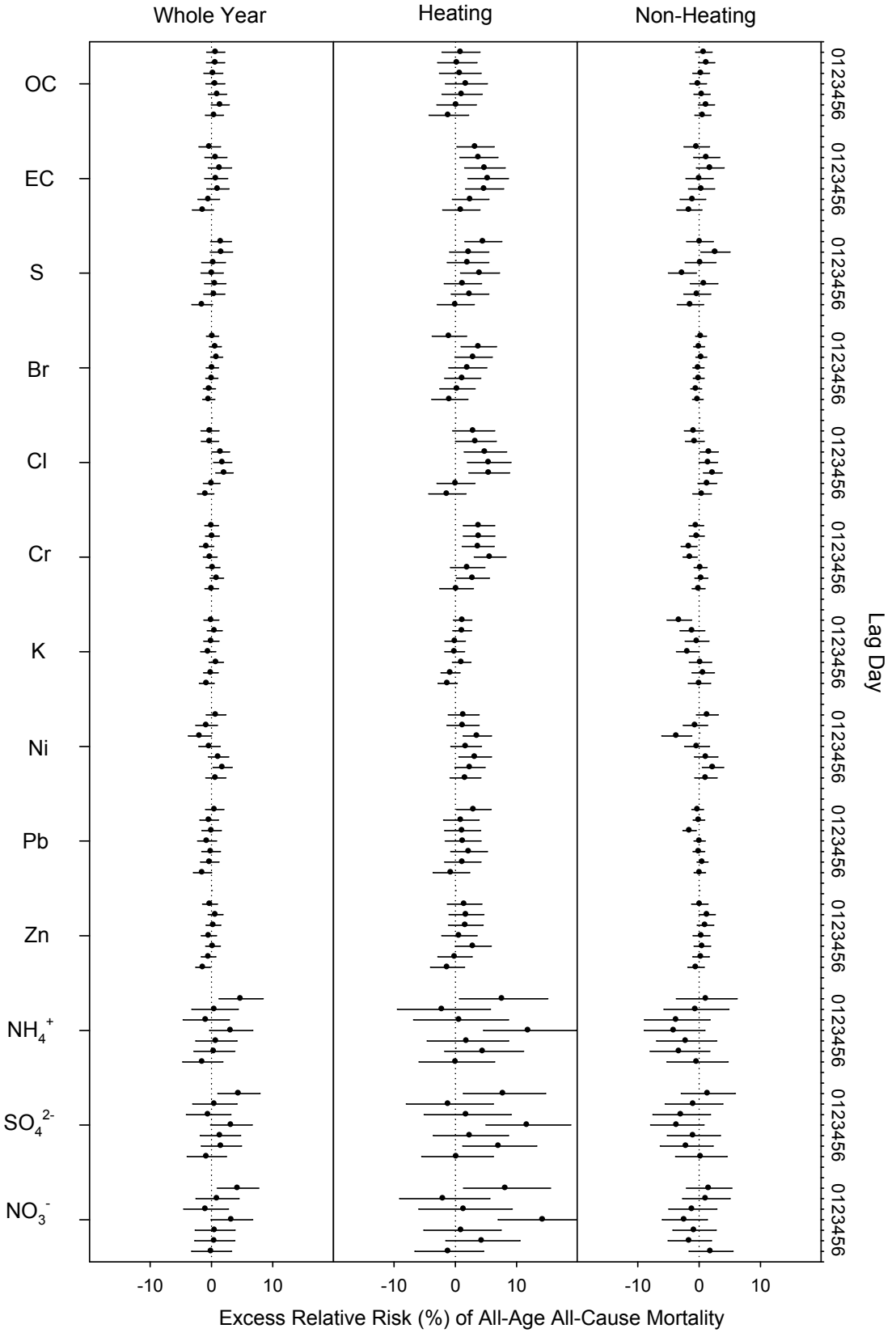
All-age all-cause mortality whole year	ER[a]	95% CI
Omit $PM_{2.5}$ > 95 percentile	0.17	0.00, 0.33
Omit $PM_{2.5}$ > 75 percentile	0.06	0.23, 0.35
Omit $PM_{2.5}$ > 300 μg/m^3	0.20	0.00, 0.39
Natural spline with (8,3,4) df	0.19	0.06, 0.31
Natural spline with (7,4,4) df	0.20	0.07, 0.33

CI: confidence interval. $PM_{2.5}$: particulate matter less than 2.5 μm in aerodynamic diameter. df: degree of freedom. [a]: Adjusted for temperature, RH, DOW and time trend.

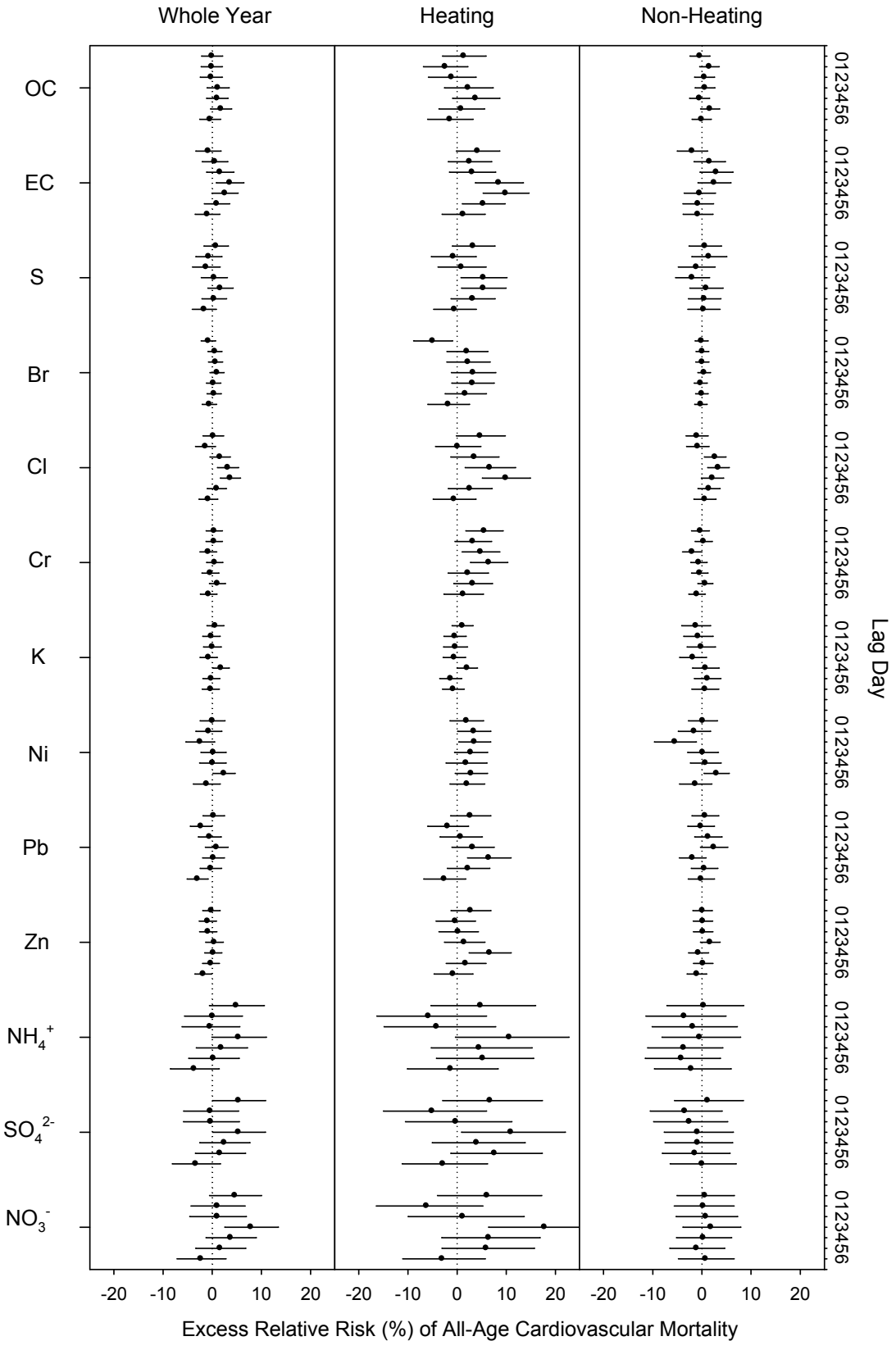
Web Figure 1. Proportions of major species in $PM_{2.5}$ measured in Xi'an, China, 2006. $PM_{2.5}$: particulate matter less than 2.5 μm in aerodynamic diameter.



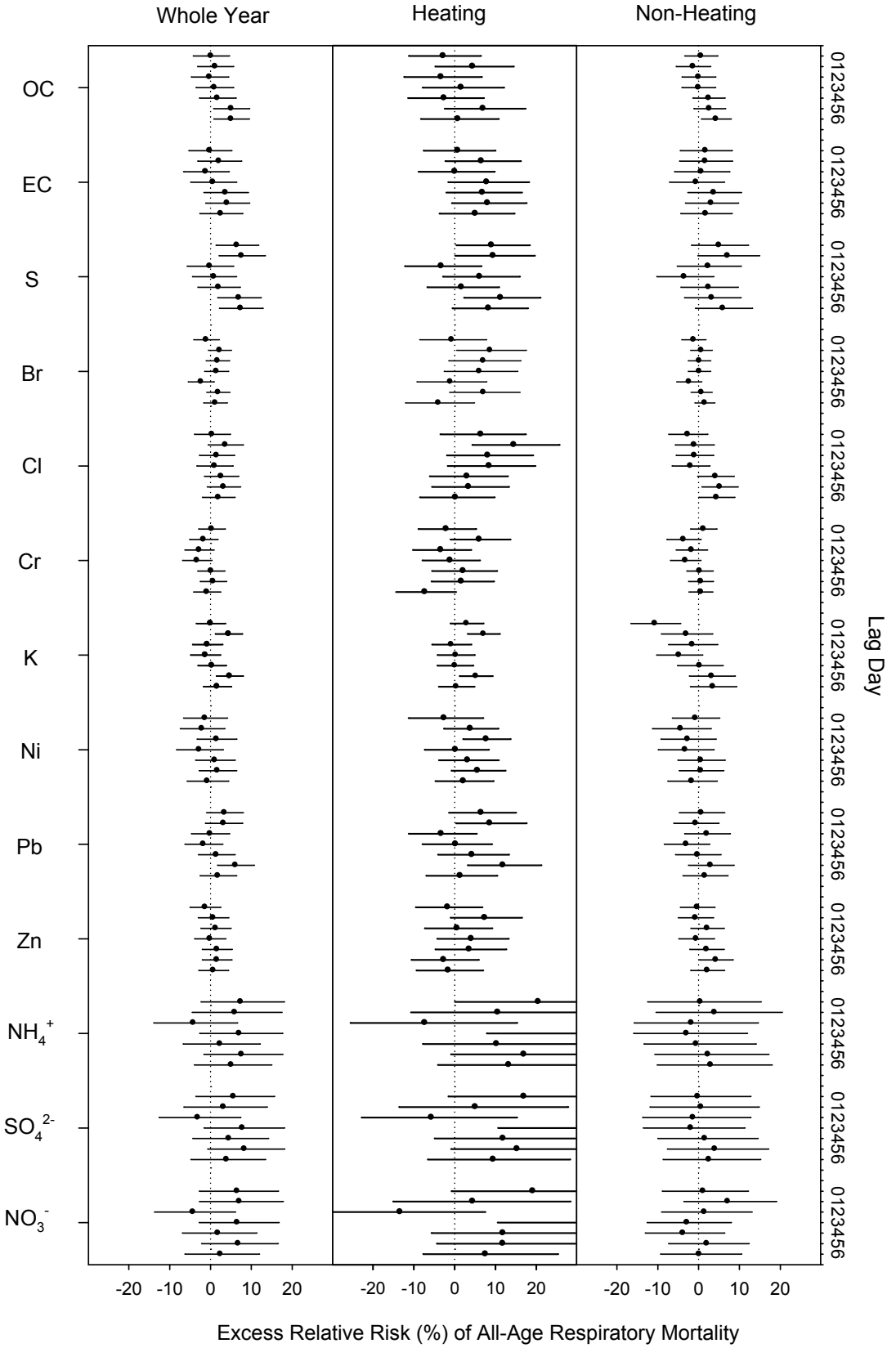
Web Figure 2. Excess relative risk[a] (%) of all-age all-cause mortality per IQR increases in selected $PM_{2.5}$ species estimated by individual-lag model, in Xi'an, China, 2006-2008. IQR: interquartile range. $PM_{2.5}$: particulate matter less than 2.5 μm in aerodynamic diameter. [a]: Adjusted for temperature, RH, DOW and time trend. Bar: 95% confidence interval.



Web Figure 3. Excess relative risk[a] (%) of all-age cardiovascular mortality per IQR increases in selected $PM_{2.5}$ species estimated by individual-lag model, in Xi'an, China, 2006-2008. IQR: interquartile range. $PM_{2.5}$: particulate matter less than 2.5 μm in aerodynamic diameter. [a]: Analysis adjusted for temperature, RH, DOW and time trend. Bar: 95% confidence interval.



Web Figure 4. Excess relative risk[a] (%) of all-age respiratory mortality per IQR increases in selected $PM_{2.5}$ species estimated by individual-lag model, in Xi'an, China, 2006-2008. IQR: interquartile range. $PM_{2.5}$: particulate matter less than 2.5 μm in aerodynamic diameter. [a]: Adjusted for temperature, RH, DOW and time trend. Bar: 95% confidence interval.



Web Figure 5. Excess relative risk[a] (%) of all-age coronary mortality per IQR increases in selected $PM_{2.5}$ species estimated by individual-lag model, in Xi'an, China, 2006-2008. IQR: interquartile range. $PM_{2.5}$: particulate matter less than 2.5 μm in aerodynamic diameter. [a]: Adjusted for temperature, RH, DOW and time trend. Bar: 95% confidence interval.