

Supplemental Material

**Markers of Inflammation and Coagulation after Long-Term
Exposure to Coarse Particulate Matter: A Cross-Sectional Analysis
from the Multi-Ethnic Study of Atherosclerosis**

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Correlations of PM_{10-2.5} mass and components are presented below in Table S1, overall and by study site. While the different chemical components of PM_{10-2.5} were highly correlated in Chicago (rho: 0.5 to 0.8), modest correlations were observed in St Paul (rho: 0.2 to 0.6), and generally low correlations were observed in Winston Salem (rho: 0.0 to 0.5). Endotoxin was generally weakly and negatively correlated with PM_{10-2.5} mass and species.

Table S1. Correlation matrix between exposure estimates.

Exposure	PM _{10-2.5}	Cu	Zn	Ph	Si	Endotox	PM _{2.5}	LAC	NO ₂	NO _x
Overall										
PM _{10-2.5}	1	0.52	0.45	-0.06	0.54	0.17	0.00	0.37	0.49	0.44
Cu	.	1	0.78	0.03	0.21	-0.27	0.45	0.78	0.89	0.91
Zn	.	.	1	0.11	0.14	-0.24	0.42	0.81	0.75	0.80
Ph	.	.	.	1	-0.04	-0.45	0.52	0.27	-0.08	0.08
Si	1	0.22	-0.27	0.07	0.20	0.12
Endotoxin	1	-0.59	-0.38	-0.23	-0.34
PM _{2.5}	1	0.66	0.49	0.60
LAC	1	0.81	0.89
NO ₂	1	0.95
NO _x	1
Chicago										
PM _{10-2.5}	1	0.75	0.71	0.76	0.81	-0.14	0.51	0.78	0.75	0.84
Cu	.	1	0.56	0.72	0.75	-0.25	0.46	0.68	0.74	0.85
Zn	.	.	1	0.64	0.54	-0.09	0.32	0.87	0.56	0.71
Ph	.	.	.	1	0.79	-0.35	0.58	0.72	0.64	0.77
Si	1	-0.35	0.58	0.71	0.73	0.81
Endotoxin	1	-0.31	-0.15	-0.22	-0.23
PM _{2.5}	1	0.46	0.59	0.61
LAC	1	0.70	0.85
NO ₂	1	0.88
NO _x	1
St.Paul										
PM _{10-2.5}	1	0.51	0.22	0.23	0.45	0.14	0.17	0.35	0.36	0.36
Cu	.	1	0.50	0.44	0.50	-0.03	0.36	0.65	0.63	0.71
Zn	.	.	1	0.36	0.36	-0.05	0.22	0.60	0.41	0.49
Ph	.	.	.	1	0.56	0.05	0.19	0.29	0.26	0.33
Si	1	-0.14	0.32	0.44	0.40	0.41
Endotoxin	1	-0.05	-0.01	-0.04	-0.05
PM _{2.5}	1	0.55	0.74	0.65
LAC	1	0.76	0.80
NO ₂	1	0.94
NO _x	1

Exposure	PM_{10-2.5}	Cu	Zn	Ph	Si	Endotox	PM_{2.5}	LAC	NO₂	NO_x
Winston-Salem										
PM _{10-2.5}	1	0.04	0.00	0.31	0.46	0.26	-0.30	-0.02	-0.11	-0.11
Cu	.	1	0.37	0.22	0.54	-0.28	0.42	0.61	0.67	0.66
Zn	.	.	1	0.21	0.27	-0.23	0.18	0.47	0.39	0.39
Ph	.	.	.	1	0.32	-0.16	-0.03	0.11	0.04	0.14
Si	1	-0.12	0.08	0.41	0.36	0.36
Endotoxin	1	-0.27	-0.22	-0.27	-0.32
PM _{2.5}	1	0.50	0.61	0.62
LAC	1	0.89	0.87
NO ₂	1	0.90
NO _x	1

Correlations of the inflammatory and coagulation markers evaluated in this analysis are presented below in Table S2. Only modest correlations were observed between the markers with the strongest relationships between IL-6, CRP, and fibrinogen (rho: 0.4 to 0.5).

Table S2. Correlation matrix between inflammation and coagulation markers.

Marker	IL-6	CRP	Fibrinogen	Hcsyt	Factor-VIII	d-dimer	PAP
IL-6	1	0.53	0.44	0.18	0.19	0.30	0.17
CRP	.	1	0.48	0.00	0.15	0.26	0.16
Fibrinogen	.	.	1	0.08	0.24	0.30	0.38
Homocyt	.	.	.	1	0.08	0.15	0.16
Factor-VIII	1	0.22	0.20
d-dimer	1	0.36
Plasmin antiplasmin	1

Single pollutant models of the associations for PM_{2.5} and LAC with the inflammatory and coagulatory markers are presented below in Table S2. These results indicate that PM_{2.5} and LAC were each independently associated with higher inflammation in site-adjusted models (0.39 per 3.8 µg/m³; 95% CI: 0.15, 0.63; p=0.001 and 0.14 per 0.2 10⁻⁵/m; 95% CI: -0.07, 0.36; p=0.18, respectively) (Figure S1).

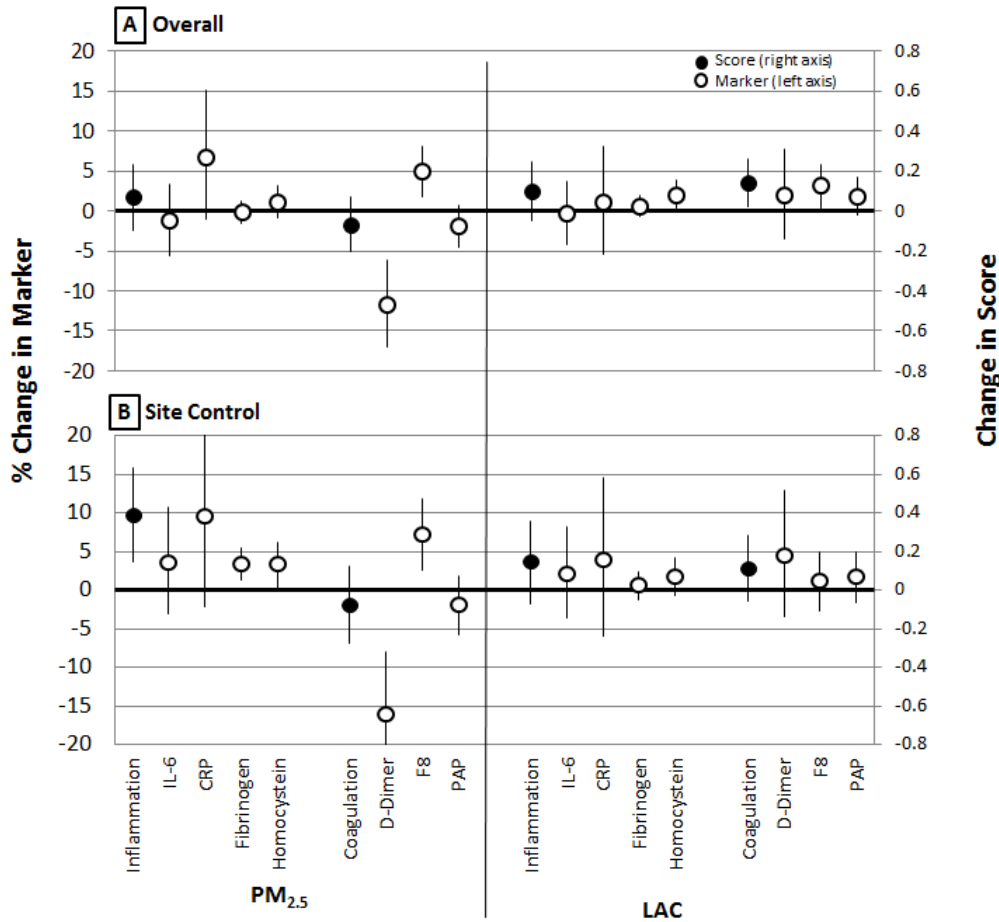


Figure S1. Associations between Long-Term Exposures to PM_{2.5} Mass and LAC and an Inflammation and Coagulation (A) Before and (B) After Site Adjustment. All associations adjusted for age, gender, race, city, marital status, education, employment, household size, home ownership, NSES, alcohol consumption, active and passive smoke, physical activity, family history of stroke or heart attack, body mass index, blood pressure, cholesterol, creatinine, diabetes, and anti-inflammatory and blood pressure medications. Associations scaled to IQR of 3.8 µg/m³ for PM_{2.5} and 0.2 x 10⁻⁵/m for LAC.

A comparison of results between our inflammation summary score derived by z-scores produced very similar results to an inflammation score derived using PCA. Again, the strongest relationships were identified with endotoxin. As in our main analyses, associations with the PCA-derived inflammation score were weakened and less precise after control for study site (Figure S2).

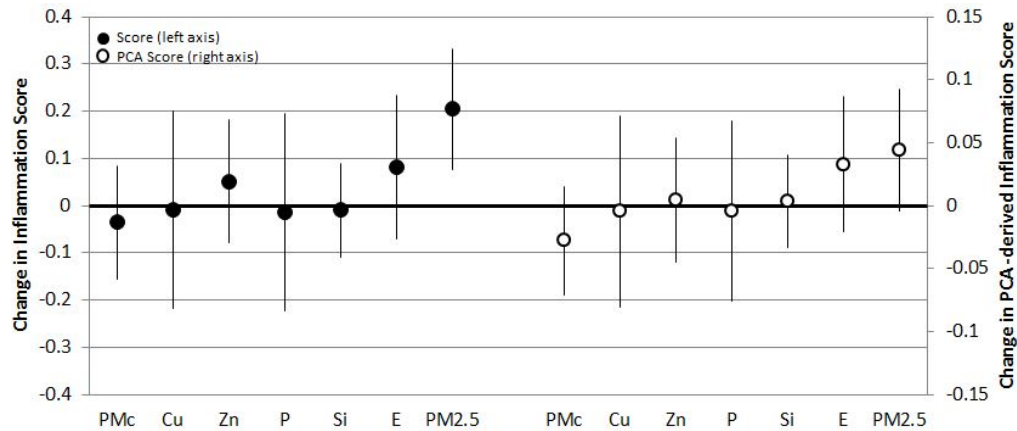


Figure S2. Site-Adjusted Associations between Long-Term Exposures to PM_{10-2.5} Mass and Components with Inflammation Score Derived Using Z-Scores and PCA. PMc: PM_{10-2.5} mass, Cu: copper, Zn: zinc, P: phosphorus, and Si: silicon. All associations adjusted for age, gender, race, city, marital status, education, employment, household size, home ownership, NSES, alcohol consumption, active and passive smoke, physical activity, family history of stroke or heart attack, body mass index, blood pressure, cholesterol, creatinine, diabetes, and anti-inflammatory and blood pressure medications. Associations scaled to IQR of 2 and 0.1 $\mu\text{g}/\text{m}^3$ for PM_{10-2.5} and silicon and 4, 11, and 6 ng/m^3 for copper, zinc, and phosphorous, respectively. Endotoxin scaled to 0.08 EU/ m^3 .