

## **Supplemental Material;**

### ***GSTM1, GSTT1, and GSTP1* Polymorphisms and Associations between Air**

### **Pollutants and Markers of Insulin Resistance in Elderly Koreans**

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**Supplemental Material, T able S1.** Correlation among PM<sub>10</sub>, SO<sub>2</sub>, O<sub>3</sub>, and NO<sub>2</sub> exposure levels in the health examination day. Correlation coefficient and *p*-value were presented.

	<b>PM<sub>10</sub></b>	<b>SO<sub>2</sub></b>	<b>O<sub>3</sub></b>	<b>NO<sub>2</sub></b>
<b>PM<sub>10</sub></b>	1	0.61	-0.12	0.65
		<.0001	<.0001	<.0001
<b>SO<sub>2</sub></b>		1	-0.30	0.56
			<.0001	<.0001
<b>O<sub>3</sub></b>			1	-0.35
				<.0001
<b>NO<sub>2</sub></b>				1

**Supplemental Material, Table S2.** Associations of PM<sub>10</sub>, SO<sub>2</sub>, O<sub>3</sub>, and NO<sub>2</sub> with glucose, insulin, and HOMA indices according to lag day.

	Lag day	Glucose			Insulin			HOMA		
		Estimate	95% CI	<i>p</i> -Value	Estimate	95% CI	<i>p</i> -Value	Estimate	95% CI	<i>p</i> -Value
PM <sub>10</sub>	Lag 0	0.01	-0.05, 0.08	0.6706	-0.01	-0.46, 0.44	0.9586	-0.03	-0.18, 0.13	0.7404
	Lag 1	0.002	-0.07, 0.07	0.9581	0.07	-0.43, 0.57	0.7794	0.04	-0.13, 0.21	0.6560
	Lag 2	0.08	0.004, 0.15	0.0401	0.24	-0.28, 0.77	0.3631	0.14	-0.04, 0.32	0.1270
	Lag 3	0.09	0.02, 0.15	0.0087	0.26	-0.20, 0.73	0.2698	0.12	-0.04, 0.28	0.1472
	Lag 4	0.11	0.05, 0.17	0.0005	0.21	-0.22, 0.64	0.3439	0.14	-0.003, 0.29	0.0549
	Lag 5	0.05	-0.01, 0.10	0.1236	0.11	-0.30, 0.52	0.6082	0.08	-0.07, 0.22	0.2924
	Lag 6	0.06	0.01, 0.11	0.0166	0.17	-0.18, 0.52	0.3490	0.06	-0.06, 0.19	0.2982
	Lag 7	0.07	0.02, 0.12	0.0099	0.02	-0.36, 0.40	0.9264	0.03	-0.10, 0.16	0.6728
	Lag 8	0.10	0.05, 0.16	0.0002	0.06	-0.34, 0.46	0.7758	0.07	-0.07, 0.20	0.3447
	Lag 9	0.02	-0.03, 0.07	0.4418	-0.15	-0.52, 0.22	0.4352	-0.03	-0.16, 0.10	0.6596
Lag 10	0.05	-0.01, 0.11	0.0866	0.22	-0.20, 0.63	0.3057	0.08	-0.06, 0.22	0.2594	
SO <sub>2</sub>	Lag 0	-0.05	-0.11, 0.01	0.1314	0.04	-0.40, 0.47	0.8752	-0.03	-0.18, 0.12	0.6829
	Lag 1	-0.04	-0.10, 0.02	0.1825	0.13	-0.30, 0.56	0.5457	0.04	-0.11, 0.18	0.6223
	Lag 2	0.02	-0.04, 0.08	0.5099	0.09	-0.34, 0.53	0.6707	0.08	-0.07, 0.23	0.2801
	Lag 3	0.07	0.01, 0.13	0.0259	0.34	-0.10, 0.78	0.1342	0.15	-0.003, 0.30	0.0552
	Lag 4	0.06	-0.003, 0.12	0.0647	0.30	-0.13, 0.73	0.1689	0.15	0.001, 0.29	0.0490
	Lag 5	-0.002	-0.06, 0.06	0.9614	0.005	-0.42, 0.43	0.9825	0.02	-0.12, 0.17	0.7764
	Lag 6	0.02	-0.04, 0.08	0.4556	0.19	-0.23, 0.60	0.3714	0.06	-0.08, 0.20	0.4029
	Lag 7	0.10	0.03, 0.16	0.0026	0.30	-0.14, 0.74	0.1825	0.13	-0.02, 0.28	0.0907
	Lag 8	0.08	0.02, 0.15	0.0148	0.17	-0.30, 0.64	0.4800	0.09	-0.07, 0.25	0.2860
	Lag 9	0.06	-0.02, 0.13	0.1338	0.29	-0.21, 0.79	0.2540	0.10	-0.07, 0.27	0.2391
Lag 10	0.04	-0.04, 0.11	0.3469	0.38	-0.14, 0.91	0.1505	0.11	-0.07, 0.29	0.2364	
O <sub>3</sub>	Lag 0	0.11	-0.01, 0.22	0.0756	-0.05	-0.87, 0.78	0.9138	-0.01	-0.30, 0.27	0.9235
	Lag 1	0.19	0.09, 0.29	0.0002	0.42	-0.31, 1.14	0.2592	0.22	-0.03, 0.47	0.0858
	Lag 2	0.08	-0.02, 0.18	0.1009	0.42	-0.27, 1.12	0.2297	0.17	-0.07, 0.40	0.1677
	Lag 3	0.09	-0.004, 0.19	0.0607	0.36	-0.35, 1.06	0.3196	0.12	-0.12, 0.36	0.3367
	Lag 4	0.11	0.02, 0.21	0.0211	0.78	0.10, 1.46	0.0252	0.25	0.02, 0.48	0.0375
	Lag 5	0.19	0.09, 0.28	0.0001	0.70	0.02, 1.39	0.0439	0.30	0.06, 0.53	0.0139
	Lag 6	0.10	-0.002, 0.20	0.0549	-0.02	-0.76, 0.72	0.9612	-0.02	-0.27, 0.24	0.8948
	Lag 7	0.01	-0.10, 0.11	0.9026	-0.57	-1.31, 0.18	0.1353	-0.22	-0.47, 0.04	0.0966
	Lag 8	0.09	-0.01, 0.19	0.0838	0.30	-0.41, 1.01	0.4102	0.09	-0.15, 0.34	0.4500
	Lag 9	0.07	-0.02, 0.16	0.1480	0.35	-0.31, 1.02	0.2994	0.16	-0.07, 0.39	0.1699
Lag 10	0.03	-0.06, 0.13	0.5055	0.51	-0.20, 1.22	0.1583	0.15	-0.09, 0.39	0.2224	
NO <sub>2</sub>	Lag 0	0.03	-0.03, 0.09	0.3734	0.49	0.04, 0.94	0.0342	0.15	0.0002, 0.31	0.0503

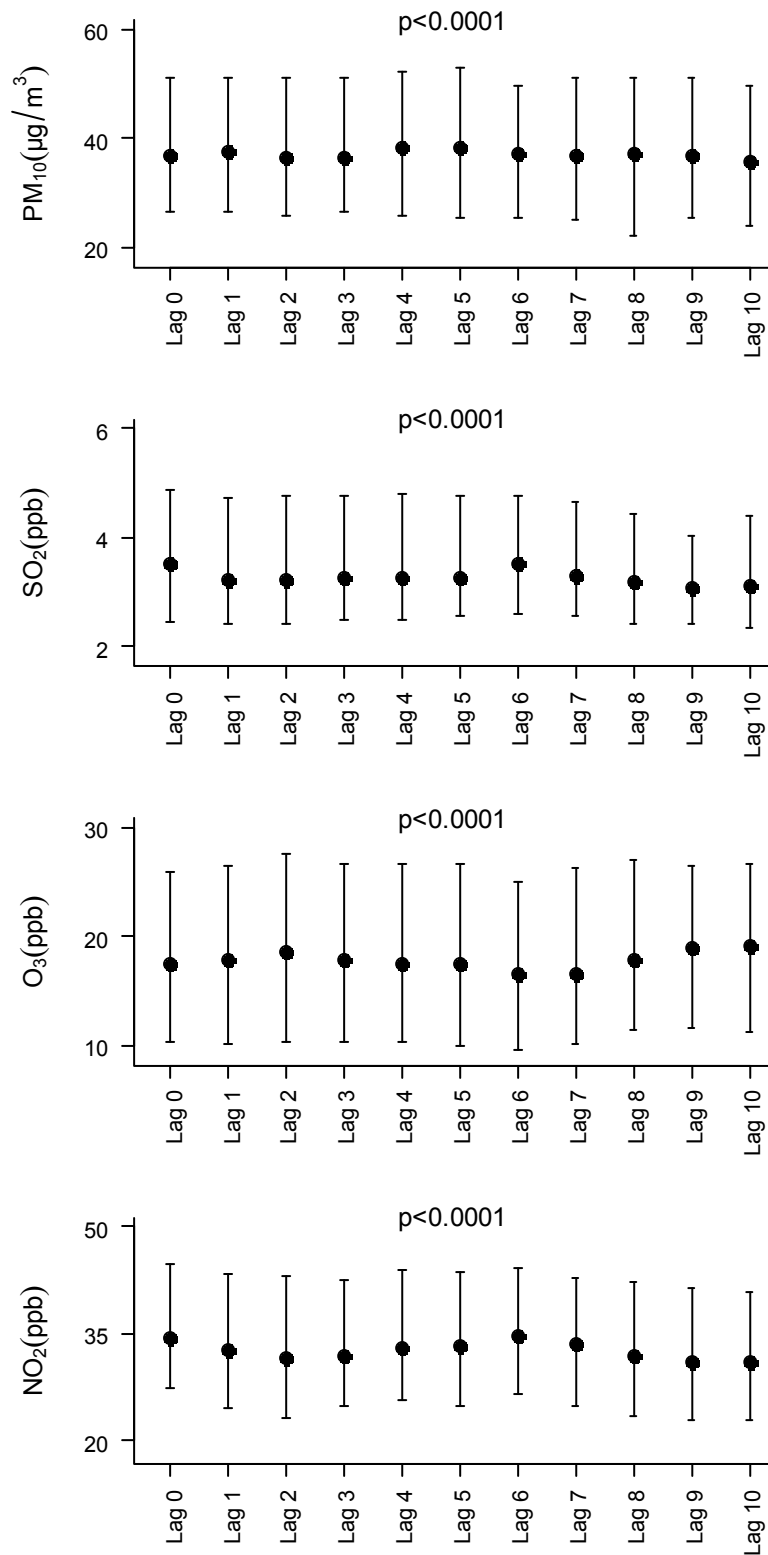
Lag 1	0.01	-0.05, 0.08	0.7364	0.33	-0.14, 0.79	0.1675	0.13	-0.03, 0.29	0.1005
Lag 2	0.05	-0.02, 0.12	0.1329	0.47	0.005, 0.94	0.0483	0.20	0.04, 0.36	0.0126
Lag 3	0.07	0.01, 0.13	0.0310	0.23	-0.21, 0.66	0.3090	0.13	-0.02, 0.28	0.0937
Lag 4	0.08	0.02, 0.14	0.0078	0.07	-0.34, 0.47	0.7554	0.09	-0.05, 0.23	0.2154
Lag 5	0.04	-0.02, 0.10	0.1765	0.001	-0.41, 0.41	0.9977	0.03	-0.11, 0.17	0.6619
Lag 6	0.05	-0.01, 0.11	0.1121	0.41	-0.02, 0.84	0.0628	0.15	0.004, 0.30	0.0452
Lag 7	0.11	0.05, 0.17	0.0004	0.71	0.29, 1.14	0.0010	0.28	0.13, 0.42	0.0002
Lag 8	0.08	0.02, 0.14	0.0124	0.35	-0.10, 0.79	0.1307	0.16	0.01, 0.32	0.0354
Lag 9	0.03	-0.03, 0.10	0.3184	0.34	-0.13, 0.81	0.1543	0.08	-0.08, 0.25	0.3039
Lag 10	-0.02	-0.08, 0.04	0.5795	0.26	-0.18, 0.70	0.2508	0.03	-0.12, 0.18	0.6573

Changes in glucose, insulin, and HOMA indices by an IQR-change of PM<sub>10</sub> (20.8 µg/m<sup>3</sup>), SO<sub>2</sub> (1.6 ppb), O<sub>3</sub> (15.1 ppb), and NO<sub>2</sub> (10.8 ppb) were estimated in linear mixed-effect models after weighting follow-up observations and adjusting for age, sex, BMI, cotinine level, and outdoor temperature and dew point in the day. CI, Confidence Interval.

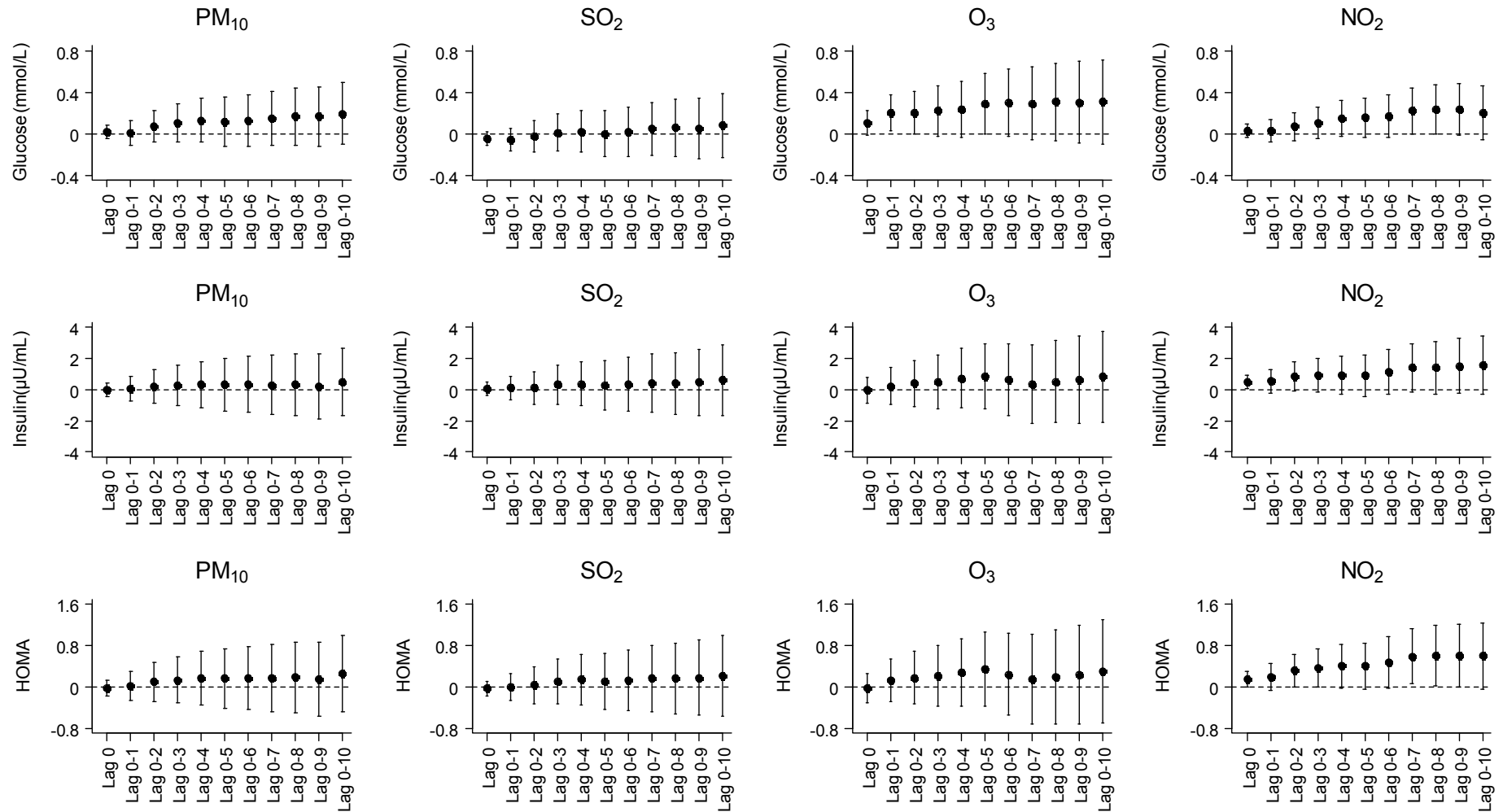
**Supplemental Material, Table S3.** Associations of PM<sub>10</sub>, O<sub>3</sub>, and NO<sub>2</sub> with glucose, insulin, and HOMA indices in multiple pollutant models.

	Glucose			Insulin			HOMA		
	Estimate	95% CI	<i>p</i> -Value	Estimate	95% CI	<i>p</i> -Value	Estimate	95% CI	<i>p</i> -Value
<b>Two pollutant model</b>									
PM <sub>10</sub>	0.08	0.01, 0.14	0.0178	0.07	-0.38, 0.52	0.7579	0.09	-0.06, 0.25	0.2345
O <sub>3</sub>	0.15	0.05, 0.25	0.0036	0.67	-0.06, 1.39	0.0711	0.25	-0.001, 0.49	0.0518
PM <sub>10</sub>	0.08	0.02, 0.15	0.0074	0.03	-0.41, 0.47	0.8955	0.08	-0.07, 0.23	0.2989
NO <sub>2</sub>	0.08	0.02, 0.15	0.0068	0.71	0.27, 1.14	0.0016	0.26	0.11, 0.41	0.0007
O <sub>3</sub>	0.16	0.06, 0.25	0.0011	0.49	-0.20, 1.19	0.1649	0.21	-0.02, 0.45	0.0787
NO <sub>2</sub>	0.09	0.03, 0.15	0.0049	0.65	0.22, 1.08	0.0031	0.25	0.10, 0.40	0.0009
<b>Three pollutant model</b>									
PM <sub>10</sub>	0.06	-0.005, 0.12	0.0695	-0.07	-0.53, 0.39	0.7758	0.04	-0.11, 0.20	0.5799
O <sub>3</sub>	0.13	0.03, 0.23	0.0094	0.52	-0.20, 1.25	0.1582	0.19	-0.06, 0.44	0.1280
NO <sub>2</sub>	0.07	0.01, 0.14	0.0179	0.67	0.23, 1.11	0.0032	0.24	0.09, 0.39	0.0016

*p*-Values obtained after weighting follow-up observations of PM<sub>10</sub>, O<sub>3</sub>, and NO<sub>2</sub> on lag day 4, lag day 5, and lag day 7, respectively. Changes in glucose, insulin, and HOMA indices by an IQR-change of PM<sub>10</sub> (20.8 μg/m<sup>3</sup>), O<sub>3</sub> (15.1 ppb), and NO<sub>2</sub> (10.8 ppb) were estimated after adjustment for age, sex, BMI, cotinine level, and outdoor temperature and dew point in the day. CI, Confidence Interval.



**Supplemental Material, Figure e S1.** Variation of air pollutant levels over 11 days including the health examination day. Median values of each pollutants and ranges between 25<sup>th</sup> and 75<sup>th</sup> percentiles were presented.



**Supplemental Material, Figure S2.** Associations of PM<sub>10</sub>, SO<sub>2</sub>, O<sub>3</sub>, and NO<sub>2</sub> with glucose, insulin, and HOMA indices by distributed lag days in total subjects. Changes in glucose, insulin, and HOMA indices by an IQR-change of PM<sub>10</sub> (20.8 μg/m<sup>3</sup>), SO<sub>2</sub> (1.6 ppb), O<sub>3</sub> (15.1 ppb), and NO<sub>2</sub> (10.8 ppb) were estimated after adjustment for age, sex, BMI, cotinine level, and outdoor temperature and dew point in the day.