



## **APPENDIX AVAILABLE ON REQUEST**

### **Research Report 97**

#### **Identifying Subgroups of the General Population That May Be Susceptible to Short-Term Increases in Particulate Air Pollution: A Time-Series Study in Montreal, Quebec**

#### **Appendix M. Results of Analyses: Particulate Effects on Defined Health Conditions**

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This document was reviewed by the HEI Health Review Committee but did not undergo the HEI scientific editing and production process.

**Table M.1.** Summary Estimates of Mean Percent Change in Daily Nonaccidental Mortality for Selected Subgroups Defined using Billing and Prescription Data Obtained from the Quebec Health Insurance Plan for their Respective Time Period Prior to Death, across the Interquartile Range of Lagged Exposure to Coefficient of Haze, Montreal, 1984-1993<sup>a</sup>

Subgroup	Lag 0		Lag 1		3-day mean	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>No billings</b>	2.89	-0.44 - 6.32	-0.68	-3.98 - 2.73	0.84	-3.47 - 5.33
<b>Cancer</b>	1.27	0.09 - 2.46	1.39	0.21 - 2.59	2.42	0.87 - 4.00
<b>Respiratory indices</b>						
Acute upper respiratory disease	1.66	-4.79 - 8.54	3.72	-2.87 - 10.76	4.57	-4.06 - 13.98
Chronic upper respiratory disease	-0.33	-4.99 - 4.57	2.92	-1.86 - 7.94	2.39	-3.78 - 8.97
Acute lower respiratory disease	1.04	-0.90 - 3.02	4.38	2.38 - 6.41	5.09	2.47 - 7.79
Definite airways disease	0.61	-0.83 - 2.08	1.44	-0.03 - 2.94	1.53	-0.39 - 3.49
<b>Cardiovascular indices</b>						
Definite acute coronary artery disease	1.51	-0.95 - 4.03	2.31	-0.19 - 4.87	2.35	-0.91 - 5.70
Definite chronic coronary artery disease	1.76	0.18 - 3.37	1.98	0.38 - 3.61	2.62	0.53 - 4.75
Congestive heart failure	2.88	0.97 - 4.83	4.17	2.23 - 6.15	4.99	2.44 - 7.60
Hypertension	1.65	-1.08 - 4.45	1.99	-0.77 - 4.83	3.35	-0.27 - 7.10
Cerebrovascular disease	0.69	-1.64 - 3.07	1.71	-0.66 - 4.13	1.73	-1.35 - 4.91
Any coronary artery disease	1.40	-0.01 - 2.82	2.56	1.13 - 4.00	2.99	1.13 - 4.88
Any cardiovascular disease	1.82	0.75 - 2.89	2.95	1.87 - 4.04	3.65	2.23 - 5.09

<sup>a</sup> The statistical model was  $E(\log(Y_i)) = \alpha + \text{loess}(t, \text{span}=2.49\%) + \text{loess}(\text{year}) + \text{loess}(\text{Mean temperature}_0)$ . Change in barometric pressure from the previous 24 hours<sub>0</sub> +  $\beta$  \* pollutant, where  $y_i$  is the number of nonaccidental deaths on day  $i$  for subjects included in each subgroup. CI, confidence interval.

<sup>b</sup> MPCs calculated for an increase of exposure equal to the interquartile range.



**Table M.2.** Mean Percent Change in Daily Nonaccidental Mortality for the Coefficient of Haze, Adjusted for Sulfur Dioxide and Ozone Separately, according to Subgroups Defined using Billing and Prescription Data from the Quebec Health Insurance Plan, by Age Group, Montreal, 1984-1993<sup>a</sup>

Subgroup	Age <65 years		Age ≥ 65 years		Total	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>LAG 0</b>						
<b>Cancer</b>						
Unadjusted	0.96	-1.01 - 2.97	1.34	-0.09 - 2.79	1.27	0.09 - 2.46
SO <sub>2</sub>	0.39	-2.03 - 2.86	0.91	-0.85 - 2.70	0.76	-0.69 - 2.22
O <sub>3</sub>	0.98	-1.06 - 3.06	2.05	0.57 - 3.55	1.69	0.48 - 2.92
<b>Respiratory groups</b>						
Acute lower respiratory disease						
Unadjusted	1.52	-2.68 - 5.90	0.90	-1.30 - 3.14	1.04	-0.90 - 3.02
SO <sub>2</sub>	-0.42	-5.53 - 4.97	0.58	-2.13 - 3.37	0.39	-2.01 - 2.84
O <sub>3</sub>	2.54	-1.86 - 7.13	1.01	-1.26 - 3.34	1.34	-0.68 - 3.40
Definite airways disease						
Unadjusted	0.50	-3.63 - 4.81	0.62	-0.92 - 2.18	0.61	-0.83 - 2.08
SO <sub>2</sub>	-1.62	-6.64 - 3.67	0.19	-1.68 - 2.10	0.00	-1.77 - 1.79
O <sub>3</sub>	0.29	-3.97 - 4.74	0.10	-1.48 - 1.71	0.12	-1.36 - 1.63
Definite airways disease excluding subjects taking drugs						
Unadjusted	N/A		2.28	-1.53-6.24	N/A	
SO <sub>2</sub>	N/A		2.79	-2.09-7.91	N/A	
O <sub>3</sub>	N/A		2.64	-1.34-6.77	N/A	
Definite airways disease excluding only systemic corticosteroids						
Unadjusted	N/A		0.44	-1.21 - 2.12	N/A	
SO <sub>2</sub>	N/A		0.21	-1.81 - 2.26	N/A	
O <sub>3</sub>	N/A		-0.06	-1.76 - 1.66	N/A	
<b>Cardiovascular groups</b>						
Definite chronic coronary artery disease						
Unadjusted	-1.71	-5.41 - 2.13	2.47	0.69 - 4.28	1.76	0.18 - 3.37
SO <sub>2</sub>	-1.31	-5.89 - 3.49	1.88	-0.32 - 4.13	1.32	-0.64 - 3.33
O <sub>3</sub>	-1.72	-5.56 - 2.28	2.47	0.64 - 4.34	1.73	0.09 - 3.40
Congestive heart failure						
Unadjusted	N/A		3.47	1.41 - 5.57	2.88	0.97 - 4.83
SO <sub>2</sub>	N/A		1.97	-0.55 - 4.55	1.56	-0.78 - 3.95
O <sub>3</sub>	N/A		4.33	2.19 - 6.51	3.57	1.58 - 5.58
Cerebrovascular disease						
Unadjusted	N/A		-0.51	-3.01 - 2.05	0.69	-1.64 - 3.07
SO <sub>2</sub>	N/A		-0.41	-3.48 - 2.77	0.62	-2.25 - 3.57
O <sub>3</sub>	N/A		-0.58	-3.16 - 2.06	0.68	-1.72 - 3.14
Any coronary artery disease						
Unadjusted	-1.20	-4.46-2.18	1.92	0.35-3.51	1.40	-0.01-2.82
SO <sub>2</sub>	-1.08	-5.12-3.13	1.24	-0.69-3.20	0.82	-0.92-2.59
O <sub>3</sub>	-1.10	-4.49-2.40	2.41	0.79-4.06	1.79	0.33-3.27
Any cardiovascular disease						
Unadjusted	0.60	-1.94 - 3.22	2.07	0.90 - 3.26	1.82	0.75 - 2.89
SO <sub>2</sub>	0.29	-2.85 - 3.54	1.39	-0.06 - 2.86	1.20	-0.12 - 2.54
O <sub>3</sub>	0.50	-2.13 - 3.20	2.47	1.25 - 3.70	2.13	1.03 - 3.25

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**Table M.2. continued**

Subgroup	Age <65 years		Age ≥ 65 years		Total	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>LAG 1</b>						
<b>Cancer</b>						
Unadjusted	0.22	-1.76 - 2.24	1.90	0.45 - 3.37	1.39	0.21 - 2.59
SO <sub>2</sub>	-0.08	-2.17 - 2.05	1.72	0.19 - 3.27	1.16	-0.09 - 2.42
O <sub>3</sub>	0.08	-1.92 - 2.12	2.08	0.61 - 3.56	1.44	0.24 - 2.65
<b>Respiratory groups</b>						
Acute lower respiratory disease						
Unadjusted	2.46	-1.80 - 6.91	4.84	2.58 - 7.15	4.38	2.38 - 6.41
SO <sub>2</sub>	1.83	-2.62 - 6.48	4.92	2.53 - 7.36	4.30	2.20 - 6.44
O <sub>3</sub>	2.81	-1.51 - 7.32	5.01	2.72 - 7.35	4.58	2.56 - 6.64
Definite airways disease						
Unadjusted	2.07	-2.14 - 6.46	1.34	-0.22 - 2.93	1.44	-0.03 - 2.94
SO <sub>2</sub>	1.50	-2.91 - 6.12	1.25	-0.39 - 2.91	1.28	-0.26 - 2.85
O <sub>3</sub>	2.00	-2.24 - 6.43	1.11	-0.46 - 2.71	1.22	-0.25 - 2.73
Definite airways disease excluding subjects taking drugs						
Unadjusted	N/A		1.81	-2.03-5.80	N/A	
SO <sub>2</sub>	N/A		1.70	-2.38-5.95	N/A	
O <sub>3</sub>	N/A		1.73	-2.15-5.78	N/A	
Definite airways disease excluding only systemic corticosteroids						
Unadjusted	N/A		1.08	-0.58 - 2.77	N/A	
SO <sub>2</sub>	N/A		1.00	-0.76 - 2.78	N/A	
O <sub>3</sub>	N/A		0.84	-0.84 - 2.55	N/A	
<b>Cardiovascular groups</b>						
Definite chronic coronary artery disease						
Unadjusted	-3.17	-6.88 - 0.68	3.04	1.24 - 4.88	1.98	0.38 - 3.61
SO <sub>2</sub>	-2.91	-6.82 - 1.18	2.72	0.84 - 4.64	1.72	0.03 - 3.44
O <sub>3</sub>	-3.14	-6.88 - 0.76	2.91	1.11 - 4.75	1.85	0.23 - 3.49
Congestive heart failure						
Unadjusted	N/A		4.40	2.32 - 6.53	4.17	2.23 - 6.15
SO <sub>2</sub>	N/A		3.66	1.48 - 5.89	3.58	1.54 - 5.66
O <sub>3</sub>	N/A		4.50	2.40 - 6.65	4.26	2.30 - 6.25
Cerebrovascular disease						
Unadjusted	N/A		0.78	-1.77 - 3.38	1.71	-0.66 - 4.13
SO <sub>2</sub>	N/A		1.02	-1.66 - 3.77	1.75	-0.74 - 4.30
O <sub>3</sub>	N/A		0.75	-1.81 - 3.38	1.63	-0.75 - 4.07
Any coronary artery disease						
Unadjusted	-1.62	-4.91-1.79	3.48	1.89-5.09	2.56	1.13-4.00
SO <sub>2</sub>	-1.41	-4.88-2.20	3.20	1.53-4.90	2.40	0.90-3.92
O <sub>3</sub>	-1.53	-4.85-1.91	3.55	1.95-5.18	2.64	1.20-4.10
Any cardiovascular disease						
Unadjusted	1.41	-1.17 - 4.05	3.27	2.08 - 4.47	2.95	1.87 - 4.04
SO <sub>2</sub>	1.32	-1.40 - 4.12	2.94	1.69 - 4.21	2.66	1.52 - 3.81
O <sub>3</sub>	1.34	-1.26 - 4.01	3.30	2.09 - 4.51	2.97	1.87 - 4.07

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**Table M.2. continued**

Subgroup	Age <65 years		Age ≥ 65 years		Total	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>3-DAY MEAN</b>						
<b>Cancer</b>						
Unadjusted	1.26	-1.32 - 3.92	2.87	0.97 - 4.81	2.42	0.87 - 4.00
SO <sub>2</sub>	0.72	-2.12 - 3.64	2.64	0.54 - 4.77	2.07	0.36 - 3.81
O <sub>3</sub>	1.12	-1.51 - 3.82	3.44	1.50 - 5.42	2.71	1.13 - 4.32
<b>Respiratory groups</b>						
Acute lower respiratory disease						
Unadjusted	4.02	-1.59 - 9.95	5.32	2.35 - 8.38	5.09	2.47 - 7.79
SO <sub>2</sub>	2.95	-3.16 - 9.45	5.74	2.45 - 9.14	5.19	2.29 - 8.18
O <sub>3</sub>	5.02	-0.74 - 11.13	5.83	2.79 - 8.96	5.71	3.02 - 8.46
Definite airways disease						
Unadjusted	2.24	-3.23 - 8.02	1.41	-0.63 - 3.49	1.53	-0.39 - 3.49
SO <sub>2</sub>	1.07	-4.91 - 7.43	1.17	-1.06 - 3.45	1.18	-0.92 - 3.32
O <sub>3</sub>	2.18	-3.38 - 8.05	0.93	-1.13 - 3.04	1.09	-0.85 - 3.07
Definite airways disease excluding subjects taking drugs						
Unadjusted	N/A		5.46	0.36-10.83	N/A	
SO <sub>2</sub>	N/A		5.70	-0.05-11.78	N/A	
O <sub>3</sub>	N/A		5.73	0.49-11.24	N/A	
Definite airways disease excluding only systemic corticosteroids						
Unadjusted	N/A		0.93	-1.23 - 3.15	N/A	
SO <sub>2</sub>	N/A		0.70	-1.69 - 3.14	N/A	
O <sub>3</sub>	N/A		0.40	-1.80 - 2.65	N/A	
<b>Cardiovascular groups</b>						
Definite chronic coronary artery disease						
Unadjusted	-5.63	-10.30 - -0.73	4.45	2.09 - 6.85	2.62	0.53 - 4.75
SO <sub>2</sub>	-5.71	-10.85 - -0.27	3.81	1.22 - 6.47	2.09	-0.21 - 4.45
O <sub>3</sub>	-5.89	-10.64 - -0.89	4.25	1.85 - 6.69	2.44	0.31 - 4.61
Congestive heart failure						
Unadjusted	N/A		5.65	2.90 - 8.47	4.99	2.44 - 7.60
SO <sub>2</sub>	N/A		4.17	1.17 - 7.26	3.77	0.98 - 6.64
O <sub>3</sub>	N/A		6.14	3.33 - 9.01	5.45	2.85 - 8.11
Cerebrovascular disease						
Unadjusted	N/A		0.70	-2.60 - 4.12	1.73	-1.35 - 4.91
SO <sub>2</sub>	N/A		1.17	-2.47 - 4.95	1.78	-1.61 - 5.29
O <sub>3</sub>	N/A		0.73	-2.62 - 4.19	1.66	-1.47 - 4.88
Any coronary artery disease						
Unadjusted	-2.97	-7.17-1.41	4.33	2.25-6.45	2.99	1.13-4.88
SO <sub>2</sub>	-2.88	-7.51-1.99	3.86	1.57-6.21	2.68	0.63-4.77
O <sub>3</sub>	-2.98	-7.25-1.49	4.68	2.56-6.85	3.29	1.39-5.22
Any cardiovascular disease						
Unadjusted	0.49	-2.84 - 3.93	4.31	2.75 - 5.90	3.65	2.23 - 5.09
SO <sub>2</sub>	0.13	-3.53 - 3.94	3.77	2.05 - 5.52	3.13	1.57 - 4.72
O <sub>3</sub>	0.27	-3.11 - 3.77	4.57	2.97 - 6.19	3.83	2.38 - 5.30

<sup>a</sup> The statistical model was  $E(\log(y_i)) = \alpha + \text{loess}(i, \text{span}=2.49\%) + \text{loess}(\text{year}) + \text{loess}(\text{Mean temperature}_0, \text{Change in barometric pressure from the previous 24 hours}_0) + \text{loess}(\text{gaseous pollutant}_0) + \beta * \text{particle pollutant}$ , where  $i$  is an indicator for day. CI, confidence interval. N/A, not analysed.

<sup>b</sup> MPCs calculated for an increase of exposure equal to the interquartile range.

**Table M.3.** Summary Estimates of Mean Percent Change in Daily Nonaccidental Mortality for Selected Subgroups Defined using Billing and Prescription Data Obtained from the Quebec Health Insurance Plan for their Respective Time Period Prior to Death, across the Interquartile Range of Lagged Exposure to Extinction Coefficient, Montreal, 1984-1993<sup>a</sup>

Subgroup	Lag 0		Lag 1		3-day mean	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>No billings</b>	1.19	-1.83 - 4.30	2.78	-0.18 - 5.83	1.82	-2.30 - 6.11
<b>Cancer</b>	1.48	0.44 - 2.52	0.79	-0.26 - 1.85	1.52	0.09 - 2.97
<b>Respiratory indices</b>						
Acute upper respiratory disease	-1.58	-7.62 - 4.85	0.68	-5.18 - 6.90	-0.95	-8.82 - 7.59
Chronic upper respiratory disease	-4.15	-8.39 - 0.28	-2.32	-6.45 - 2.00	-2.38	-7.83 - 3.40
Acute lower respiratory disease	1.42	-0.28 - 3.14	0.59	-1.11 - 2.33	1.71	-0.63 - 4.09
Definite airways disease	1.24	-0.03 - 2.53	1.41	0.15 - 2.68	2.08	0.34 - 3.86
<b>Cardiovascular indices</b>						
Definite acute coronary artery disease	1.06	-1.17 - 3.34	0.70	-1.52 - 2.98	1.30	-1.75 - 4.44
Definite chronic coronary artery disease	1.11	-0.32 - 2.57	0.25	-1.19 - 1.71	1.59	-0.36 - 3.58
Congestive heart failure	2.98	1.35 - 4.64	1.58	-0.08 - 3.27	3.24	0.96 - 5.58
Hypertension	1.53	-0.91 - 4.02	0.57	-1.83 - 3.04	1.36	-1.94 - 4.76
Cerebrovascular disease	0.53	-1.56 - 2.67	0.96	-1.12 - 3.09	0.32	-2.52 - 3.25
Any coronary artery disease	0.66	-0.62 - 1.96	0.35	-0.93 - 1.65	1.10	-0.64 - 2.86
Any cardiovascular disease	1.10	0.14 - 2.07	1.14	0.18 - 2.11	1.65	0.34 - 2.98

<sup>a</sup> The statistical model was  $E(\log(Y_i)) = \alpha + \text{loess}(t, \text{span}=2.49\%) + \text{loess}(\text{year}) + \text{loess}(\text{Mean temperature}_0)$ . Change in barometric pressure from the previous 24 hours<sub>0</sub> +  $\beta$  \* pollutant, where  $y_i$  is the number of nonaccidental deaths on day  $i$  for subjects included in each subgroup. CI, confidence interval.

<sup>b</sup> MPCs calculated for an increase of exposure equal to the interquartile range.

**Table M.4.** Mean Percent Change in Daily Nonaccidental Mortality for the Extinction Coefficient, Adjusted for Sulfur Dioxide and Ozone Separately, according to Subgroups Defined using Billing and Prescription Data from the Quebec Health Insurance Plan, by Age Group, Montreal, 1984-1993<sup>a</sup>

Subgroup	Age <65 years		Age ≥ 65 years		Total	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>LAG 0</b>						
<b>Cancer</b>						
Unadjusted	0.96	-0.82 - 2.76	1.67	0.41 - 2.95	1.48	0.44 - 2.52
SO <sub>2</sub>	0.67	-1.20 - 2.58	1.67	0.34 - 3.02	1.37	0.27 - 2.47
O <sub>3</sub>	0.71	-1.07 - 2.53	1.68	0.42 - 2.96	1.38	0.34 - 2.43
<b>Respiratory groups</b>						
Acute lower respiratory disease						
Unadjusted	1.89	-1.73 - 5.64	1.26	-0.65 - 3.22	1.42	-0.28 - 3.14
SO <sub>2</sub>	1.71	-2.13 - 5.70	1.33	-0.70 - 3.41	1.43	-0.36 - 3.26
O <sub>3</sub>	2.36	-1.27 - 6.12	1.09	-0.83 - 3.04	1.37	-0.32 - 3.10
Definite airways disease						
Unadjusted	0.56	-3.03 - 4.29	1.33	-0.03 - 2.70	1.24	-0.03 - 2.53
SO <sub>2</sub>	0.03	-3.78 - 3.98	1.17	-0.26 - 2.61	1.03	-0.31 - 2.39
O <sub>3</sub>	-0.21	-3.81 - 3.52	0.81	-0.54 - 2.18	0.69	-0.58 - 1.98
Definite airways disease excluding subjects taking drugs						
Unadjusted	N/A		1.56	-1.72-4.95	N/A	
SO <sub>2</sub>	N/A		1.41	-2.07-5.02	N/A	
O <sub>3</sub>	N/A		1.22	-2.07-4.61	N/A	
Definite airways disease excluding only systemic corticosteroids						
Unadjusted	N/A		1.30	-0.14 - 2.76	N/A	
SO <sub>2</sub>	N/A		1.22	-0.30 - 2.76	N/A	
O <sub>3</sub>	N/A		0.82	-0.62 - 2.28	N/A	
<b>Cardiovascular groups</b>						
Definite chronic coronary artery disease						
Unadjusted	0.15	-3.39 - 3.82	1.25	-0.35 - 2.87	1.11	-0.32 - 2.57
SO <sub>2</sub>	0.29	-3.44 - 4.17	0.95	-0.73 - 2.67	0.89	-0.64 - 2.43
O <sub>3</sub>	0.50	-3.05 - 4.18	0.89	-0.71 - 2.51	0.88	-0.56 - 2.35
Congestive heart failure						
Unadjusted	N/A		3.05	1.30 - 4.82	2.98	1.35 - 4.64
SO <sub>2</sub>	N/A		2.37	0.52 - 4.25	2.40	0.68 - 4.16
O <sub>3</sub>	N/A		2.78	1.04 - 4.56	2.63	1.00 - 4.29
Cerebrovascular disease						
Unadjusted	N/A		-0.06	-2.32 - 2.25	0.53	-1.56 - 2.67
SO <sub>2</sub>	N/A		-0.02	-2.40 - 2.42	0.41	-1.79 - 2.66
O <sub>3</sub>	N/A		-0.48	-2.74 - 1.84	0.14	-1.95 - 2.28
Any coronary artery disease						
Unadjusted	0.32	-2.78-3.51	0.68	-0.74-2.12	0.66	-0.62-1.96
SO <sub>2</sub>	0.52	-2.76-3.90	0.49	-1.00-2.01	0.49	-0.86-1.87
O <sub>3</sub>	0.53	-2.58-3.73	0.49	-0.93-1.94	0.54	-0.74-1.85
Any cardiovascular disease						
Unadjusted	1.56	-0.77 - 3.93	1.01	-0.05 - 2.08	1.10	0.14 - 2.07
SO <sub>2</sub>	1.56	-0.91 - 4.08	0.77	-0.35 - 1.90	0.90	-0.12 - 1.93
O <sub>3</sub>	1.50	-0.83 - 3.89	0.88	-0.18 - 1.95	0.98	0.02 - 1.96

Continued...



**Table M.4. continued**

Subgroup	Age <65 years		Age ≥ 65 years		Total	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>LAG 1</b>						
<b>Cancer</b>						
Unadjusted	1.18	-0.59 - 2.98	0.54	-0.73 - 1.83	0.79	-0.26 - 1.85
SO <sub>2</sub>	1.14	-0.65 - 2.96	0.51	-0.77 - 1.82	0.75	-0.31 - 1.83
O <sub>3</sub>	1.13	-0.64 - 2.93	0.52	-0.75 - 1.81	0.74	-0.31 - 1.80
<b>Respiratory groups</b>						
Acute lower respiratory disease						
Unadjusted	-0.61	-4.31 - 3.23	0.87	-1.07 - 2.84	0.59	-1.11 - 2.33
SO <sub>2</sub>	-0.40	-4.14 - 3.48	0.96	-1.00 - 2.96	0.71	-1.02 - 2.47
O <sub>3</sub>	-0.58	-4.28 - 3.27	0.83	-1.10 - 2.80	0.57	-1.14 - 2.30
Definite airways disease						
Unadjusted	0.68	-2.91 - 4.41	1.49	0.15 - 2.86	1.41	0.15 - 2.68
SO <sub>2</sub>	0.80	-2.84 - 4.58	1.44	0.08 - 2.82	1.37	0.10 - 2.66
O <sub>3</sub>	0.60	-2.99 - 4.33	1.41	0.07 - 2.77	1.32	0.07 - 2.60
Definite airways disease excluding subjects taking drugs						
Unadjusted	N/A		0.30	-3.02-3.72	N/A	
SO <sub>2</sub>	N/A		0.07	-3.29-3.55	N/A	
O <sub>3</sub>	N/A		0.21	-3.10-3.64	N/A	
Definite airways disease excluding only systemic corticosteroids						
Unadjusted	N/A		1.49	0.06 - 2.94	N/A	
SO <sub>2</sub>	N/A		1.47	0.02 - 2.93	N/A	
O <sub>3</sub>	N/A		1.39	-0.03 - 2.84	N/A	
<b>Cardiovascular groups</b>						
Definite chronic coronary artery disease						
Unadjusted	-4.55	-8.17 - -0.80	1.13	-0.46 - 2.74	0.25	-1.19 - 1.71
SO <sub>2</sub>	-4.56	-8.21 - -0.76	1.00	-0.61 - 2.64	0.14	-1.32 - 1.62
O <sub>3</sub>	-4.58	-8.19 - -0.82	1.06	-0.53 - 2.68	0.19	-1.25 - 1.66
Congestive heart failure						
Unadjusted	N/A		1.77	0.00 - 3.57	1.58	-0.08 - 3.27
SO <sub>2</sub>	N/A		1.32	-0.46 - 3.13	1.16	-0.51 - 2.86
O <sub>3</sub>	N/A		1.70	-0.07 - 3.49	1.51	-0.14 - 3.20
Cerebrovascular disease						
Unadjusted	N/A		0.58	-1.67 - 2.87	0.96	-1.12 - 3.09
SO <sub>2</sub>	N/A		0.74	-1.54 - 3.07	1.11	-1.01 - 3.26
O <sub>3</sub>	N/A		0.55	-1.69 - 2.85	0.93	-1.15 - 3.06
Any coronary artery disease						
Unadjusted	-2.78	-5.94-0.48	0.93	-0.48-2.37	0.35	-0.93-1.65
SO <sub>2</sub>	-2.53	-5.73-0.77	0.93	-0.50-2.37	0.35	-0.94-1.67
O <sub>3</sub>	-2.78	-5.94-0.49	0.95	-0.46-2.38	0.33	-0.95-1.63
Any cardiovascular disease						
Unadjusted	-0.54	-2.91 - 1.89	1.47	0.42 - 2.53	1.14	0.18 - 2.11
SO <sub>2</sub>	-0.47	-2.87 - 2.00	1.45	0.40 - 2.52	1.14	0.17 - 2.12
O <sub>3</sub>	-0.57	-2.95 - 1.86	1.45	0.40 - 2.50	1.12	0.16 - 2.08

Continued...

**Table M.4. continued**

Subgroup	Age <65 years		Age ≥ 65 years		Total	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>3-DAY MEAN</b>						
<b>Cancer</b>						
Unadjusted	0.90	-1.52 - 3.38	1.70	-0.03 - 3.47	1.52	0.09 - 2.97
SO <sub>2</sub>	0.83	-1.67 - 3.39	1.56	-0.23 - 3.38	1.38	-0.09 - 2.88
O <sub>3</sub>	0.77	-1.65 - 3.25	1.66	-0.07 - 3.43	1.41	-0.02 - 2.86
<b>Respiratory groups</b>						
Acute lower respiratory disease						
Unadjusted	0.93	-4.01 - 6.13	1.87	-0.78 - 4.59	1.71	-0.63 - 4.09
SO <sub>2</sub>	1.22	-3.87 - 6.58	1.94	-0.79 - 4.75	1.81	-0.59 - 4.28
O <sub>3</sub>	1.16	-3.80 - 6.37	1.73	-0.92 - 4.44	1.64	-0.69 - 4.02
Definite airways disease						
Unadjusted	1.94	-2.89 - 7.00	2.08	0.22 - 3.98	2.08	0.34 - 3.86
SO <sub>2</sub>	1.98	-3.01 - 7.22	1.95	0.03 - 3.90	1.96	0.16 - 3.79
O <sub>3</sub>	1.69	-3.14 - 6.75	1.70	-0.15 - 3.60	1.72	-0.02 - 3.49
Definite airways disease excluding subjects taking drugs						
Unadjusted	N/A		1.38	-3.09-6.06	N/A	
SO <sub>2</sub>	N/A		1.12	-3.51-5.97	N/A	
O <sub>3</sub>	N/A		1.10	-3.36-5.77	N/A	
Definite airways disease excluding only systemic corticosteroids						
Unadjusted	N/A		2.23	0.25 - 4.25	N/A	
SO <sub>2</sub>	N/A		2.17	0.11 - 4.26	N/A	
O <sub>3</sub>	N/A		1.84	-0.13 - 3.86	N/A	
<b>Cardiovascular groups</b>						
Definite chronic coronary artery disease						
Unadjusted	-2.05	-6.74 - 2.88	2.24	0.07 - 4.46	1.59	-0.36 - 3.58
3SO <sub>2</sub>	-1.74	-6.59 - 3.36	1.94	-0.31 - 4.23	1.38	-0.63 - 3.44
O <sub>3</sub>	-1.80	-6.50 - 3.14	1.96	-0.21 - 4.18	1.42	-0.53 - 3.41
Congestive heart failure						
Unadjusted	N/A		3.34	0.90 - 5.84	3.24	0.96 - 5.58
SO <sub>2</sub>	N/A		2.47	-0.03 - 5.03	2.50	0.15 - 4.90
O <sub>3</sub>	N/A		3.11	0.68 - 5.60	3.02	0.74 - 5.34
Cerebrovascular disease						
Unadjusted	N/A		-0.12	-3.18 - 3.04	0.32	-2.52 - 3.25
SO <sub>2</sub>	N/A		0.16	-3.00 - 3.42	0.45	-2.48 - 3.48
O <sub>3</sub>	N/A		-0.33	-3.38 - 2.82	0.12	-2.72 - 3.04
Any coronary artery disease						
Unadjusted	-0.94	-5.07-3.37	1.44	-0.49-3.40	1.10	-0.64-2.86
SO <sub>2</sub>	-0.36	-4.65-4.12	1.29	-0.69-3.31	1.06	-0.73-2.89
O <sub>3</sub>	-0.72	-4.87-3.60	1.38	-0.54-3.34	1.03	-0.71-2.80
Any cardiovascular disease						
Unadjusted	0.80	-2.38 - 4.08	1.83	0.39 - 3.29	1.65	0.34 - 2.98
SO <sub>2</sub>	1.00	-2.29 - 4.39	1.66	0.18 - 3.16	1.55	0.19 - 2.92
O <sub>3</sub>	0.79	-2.39 - 4.07	1.71	0.28 - 3.17	1.56	0.25 - 2.88

<sup>a</sup> The statistical model was  $E(\log(y_i)) = \alpha + \text{loess}(i, \text{span}=2.49\%) + \text{loess}(\text{year}) + \text{loess}(\text{Mean temperature}_0, \text{Change in barometric pressure from the previous 24 hours}_0) + \text{loess}(\text{gaseous pollutant}_0) + \beta * \text{particle pollutant}$ , where  $i$  is an indicator for day. CI, confidence interval. N/A, not analysed.

<sup>b</sup> MPCs calculated for an increase of exposure equal to the interquartile range.

**Table M.5.** Summary Estimates of Mean Percent Change in Daily Nonaccidental Mortality for Selected Subgroups Defined using Billing and Prescription Data Obtained from the Quebec Health Insurance Plan for their Respective Time Period Prior to Death, across the Interquartile Range of Lagged Exposure to Total Suspended Particles, Montreal, 1984-1993<sup>a</sup>

Subgroup	Lag 0		Lag 1	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>No billings</b>	-1.93	-10.13 - 7.02	9.20	-0.38 - 19.70
<b>Cancer</b>	1.43	-1.67 - 4.63	0.74	-2.40 - 3.97
<b>Respiratory indices</b>				
Acute upper respiratory disease	24.22	7.77 - 43.19	3.17	-12.08 - 21.05
Chronic upper respiratory disease	5.94	-5.99 - 19.37	2.77	-9.74 - 17.00
Acute lower respiratory disease	3.81	-1.16 - 9.03	4.91	-0.41 - 10.52
Definite airways disease	-0.40	-4.33 - 3.69	6.60	2.50 - 10.86
<b>Cardiovascular indices</b>				
Definite acute coronary artery disease	7.43	0.95 - 14.32	-5.14	-11.19 - 1.32
Definite chronic coronary artery disease	2.14	-2.28 - 6.75	4.09	-0.20 - 8.57
Congestive heart failure	5.45	0.42 - 10.73	0.94	-4.30 - 6.47
Hypertension	0.12	-6.84 - 7.61	-0.76	-7.81 - 6.84
Cerebrovascular disease	-1.19	-7.30 - 5.31	8.09	1.75 - 14.82
Any coronary artery disease	3.76	-0.19 - 7.88	2.37	-1.22 - 6.09
Any cardiovascular disease	1.30	-1.53 - 4.21	2.75	-0.07 - 5.66

<sup>a</sup> The statistical model was  $E(\log(Y_i)) = \alpha + \text{loess}(t, \text{span}=2.49\%) + \text{loess}(\text{year}) + \text{loess}(\text{Mean temperature}_0)$ . Change in barometric pressure from the previous 24 hours<sub>0</sub> +  $\beta$  \* pollutant, where  $y_i$  is the number of nonaccidental deaths on day  $i$  for subjects included in each subgroup. CI, confidence interval.

<sup>b</sup> MPCs calculated for an increase of exposure equal to the interquartile range.

**Table M.6.** Summary Estimates of Mean Percent Change in Daily Nonaccidental Mortality for Selected Subgroups Defined using Billing and Prescription Data Obtained from the Quebec Health Insurance Plan for their Respective Time Period Prior to Death, across the Interquartile Range of Lagged Exposure to PM<sub>10</sub>, Montreal, 1984–1993<sup>a</sup>

Subgroup	Lag 0		Lag 1	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>No billings</b>	-3.02	-10.82 - 5.46	N/C	
<b>Cancer</b>	2.67	-0.38 - 5.80	-0.79	-3.71 - 2.22
<b>Respiratory indices</b>				
Acute upper respiratory disease	N/C		N/C	
Chronic upper respiratory disease	11.51	0.07 - 24.26	0.04	-10.51 - 11.82
Acute lower respiratory disease	1.42	-3.12 - 6.18	3.74	-1.11 - 8.82
Definite airways disease	-0.89	-4.51 - 2.87	2.29	-1.33 - 6.04
<b>Cardiovascular indices</b>				
Definite acute coronary artery disease	2.94	-3.02 - 9.26	-0.33	-6.09 - 5.79
Definite chronic coronary artery disease	0.41	-3.92 - 4.94	3.50	-0.62 - 7.80
Congestive heart failure	0.90	-3.66 - 5.68	3.78	-0.93 - 8.73
Hypertension	-2.07	-8.57 - 4.90	2.70	-4.11 - 9.98
Cerebrovascular disease	1.23	-4.51 - 7.31	3.85	-2.08 - 10.15
Any coronary artery disease	1.59	-2.22 - 5.55	1.90	-1.49 - 5.40
Any cardiovascular disease	0.86	-1.84 - 3.64	2.70	0.00 - 5.46

<sup>a</sup> The statistical model was  $E(\log(Y_i)) = \alpha + \text{loess}(t, \text{span}=2.49\%) + \text{loess}(\text{year}) + \text{loess}(\text{Mean temperature}_0)$ . Change in barometric pressure from the previous 24 hours<sub>0</sub> +  $\beta$  \* pollutant, where  $y_i$  is the number of nonaccidental deaths on day  $i$  for subjects included in each subgroup. CI, confidence interval. N/C, no convergence.

<sup>b</sup> MPCs calculated for an increase of exposure equal to the interquartile range.

**Table M.7.** Summary Estimates of Mean Percent Change in Daily Nonaccidental Mortality for Selected Subgroups Defined using Billing and Prescription Data Obtained from the Quebec Health Insurance Plan for their Respective Time Period Prior to Death, across the Interquartile Range of Lagged Exposure to PM<sub>2.5</sub>, Montreal, 1984-1993<sup>a</sup>

Subgroup	Lag 0		Lag 1	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>No billings</b>	-7.38	-14.03 - -0.20	-0.81	-8.32 - 7.31
<b>Cancer</b>	2.19	-0.44 - 4.90	0.66	-1.87 - 3.26
<b>Respiratory indices</b>				
Acute upper respiratory disease	N/C		N/C	
Chronic upper respiratory disease	7.24	-2.70 - 18.18	N/C	
Acute lower respiratory disease	1.26	-2.78 - 5.47	3.53	-0.76 - 8.01
Definite airways disease	-1.28	-4.42 - 1.96	4.24	1.09 - 7.49
<b>Cardiovascular indices</b>				
Definite acute coronary artery disease	1.73	-3.41 - 7.14	0.48	-4.55 - 5.77
Definite chronic coronary artery disease	2.33	-1.48 - 6.28	3.08	-0.46 - 6.75
Congestive heart failure	2.13	-1.87 - 6.28	4.08	-0.04 - 8.36
Hypertension	0.60	-5.11 - 6.64	2.54	-3.33 - 8.78
Cerebrovascular disease	1.36	-3.64 - 6.61	1.70	-3.42 - 7.10
Any coronary artery disease	1.66	-1.65 - 5.07	2.00	-0.92 - 5.00
Any cardiovascular disease	1.19	-1.16 - 3.61	2.51	0.20 - 4.87

<sup>a</sup> The statistical model was  $E(\log(Y_i)) = \alpha + \text{loess}(t, \text{span}=2.49\%) + \text{loess}(\text{year}) + \text{loess}(\text{Mean temperature}_0)$ . Change in barometric pressure from the previous 24 hours<sub>0</sub>) +  $\beta$  \* pollutant, where  $y_i$  is the number of nonaccidental deaths on day  $i$  for subjects included in each subgroup. CI, confidence interval. N/C, no convergence.

<sup>b</sup> MPCs calculated for an increase of exposure equal to the interquartile range.

**Table M.8.** Summary Estimates of Mean Percent Change in Daily Nonaccidental Mortality for Selected Subgroups Defined using Billing and Prescription Data Obtained from the Quebec Health Insurance Plan for their Respective Time Period Prior to Death, across the Interquartile Range of Lagged Exposure to Predicted PM<sub>2.5</sub>, Montreal, 1984-1993<sup>a</sup>

Subgroup	Lag 0		Lag 1		3-day mean	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>No billings</b>	4.68	1.06 - 8.43	2.94	-0.63 - 6.65	4.70	0.32 - 9.26
<b>Cancer</b>	1.72	0.48 - 2.97	1.31	0.07 - 2.58	1.84	0.33 - 3.37
<b>Respiratory indices</b>						
Acute upper respiratory disease	4.08	-2.69 - 11.31	5.14	-1.65 - 12.40	7.28	-1.12 - 16.40
Chronic upper respiratory disease	-0.08	-4.96 - 5.04	1.39	-3.56 - 6.60	3.81	-2.19 - 10.17
Acute lower respiratory disease	2.12	0.10 - 4.17	3.27	1.22 - 5.36	4.72	2.23 - 7.28
Definite airways disease	1.47	0.00 - 2.96	1.11	-0.36 - 2.61	1.33	-0.45 - 3.15
<b>Cardiovascular indices</b>						
Definite acute coronary artery disease	1.94	-0.66 - 4.61	2.38	-0.23 - 5.05	2.27	-0.88 - 5.52
Definite chronic coronary artery disease	1.66	-0.04 - 3.39	1.82	0.11 - 3.55	2.20	0.14 - 4.31
Congestive heart failure	3.44	1.46 - 5.45	2.81	0.82 - 4.85	4.02	1.61 - 6.48
Hypertension	1.97	-0.89 - 4.91	0.34	-2.50 - 3.26	1.88	-1.56 - 5.44
Cerebrovascular disease	1.72	-0.69 - 4.20	1.77	-0.66 - 4.27	1.53	-1.40 - 4.55
Any coronary artery disease	1.74	0.23 - 3.26	1.60	0.09 - 3.13	1.85	0.03 - 3.70
Any cardiovascular disease	2.05	0.92 - 3.19	2.49	1.36 - 3.64	2.76	1.40 - 4.15

<sup>a</sup> The statistical model was  $E(\log(Y_i)) = \alpha + \text{loess}(t, \text{span}=2.49\%) + \text{loess}(\text{year}) + \text{loess}(\text{Mean temperature}_0)$ . Change in barometric pressure from the previous 24 hours<sub>0</sub> +  $\beta$  \* pollutant, where  $y_i$  is the number of nonaccidental deaths on day  $i$  for subjects included in each subgroup. CI, confidence interval.

<sup>b</sup> MPCs calculated for an increase of exposure equal to the interquartile range.

**Table M.9.** Mean Percent Change in Daily Nonaccidental Mortality for the Predicted PM<sub>2.5</sub>, Adjusted for Sulfur Dioxide and Ozone Separately, according to Subgroups Defined using Billing and Prescription Data from the Quebec Health Insurance Plan, by Age Group, Montreal, 1984-1993<sup>a</sup>

Subgroup	Age <65 years		Age ≥ 65 years		Total	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>LAG 0</b>						
<b>Cancer</b>						
Unadjusted	1.35	-0.73 - 3.47	1.88	0.38 - 3.40	1.72	0.48 - 2.97
SO <sub>2</sub>	0.77	-1.65 - 3.26	2.33	0.57 - 4.13	1.82	0.37 - 3.29
O <sub>3</sub>	1.10	-0.99 - 3.23	1.87	0.37 - 3.39	1.62	0.38 - 2.87
<b>Respiratory groups</b>						
Acute lower respiratory disease						
Unadjusted	2.68	-1.63 - 7.17	1.85	-0.43 - 4.17	2.12	0.10 - 4.17
SO <sub>2</sub>	0.63	-4.38 - 5.90	2.25	-0.45 - 5.03	2.00	-0.39 - 4.44
O <sub>3</sub>	2.59	-1.73 - 7.10	1.49	-0.78 - 3.80	1.80	-0.21 - 3.85
Definite airways disease						
Unadjusted	2.25	-1.95 - 6.64	1.31	-0.25 - 2.90	1.47	0.00 - 2.96
SO <sub>2</sub>	0.60	-4.29 - 5.74	1.29	-0.56 - 3.17	1.23	-0.51 - 3.00
O <sub>3</sub>	-0.08	-4.23 - 4.25	0.29	-1.26 - 1.86	0.31	-1.14 - 1.79
Definite airways disease excluding subjects taking drugs						
Unadjusted	N/A		2.22	-1.88-6.49	N/A	
SO <sub>2</sub>	N/A		2.37	-2.48-7.47	N/A	
O <sub>3</sub>	N/A		1.89	-2.20-6.14	N/A	
Definite airways disease excluding only systemic corticosteroids						
Unadjusted	N/A		1.03	-0.66 - 2.74	N/A	
SO <sub>2</sub>	N/A		1.16	-0.84 - 3.20	N/A	
O <sub>3</sub>	N/A		0.09	-1.58 - 1.78	N/A	
<b>Cardiovascular groups</b>						
Definite chronic coronary artery disease						
Unadjusted	1.80	-2.34 - 6.12	1.61	-0.26 - 3.52	1.66	-0.04 - 3.39
SO <sub>2</sub>	2.33	-2.57 - 7.47	1.19	-1.01 - 3.45	1.36	-0.64 - 3.40
O <sub>3</sub>	3.83	-0.39 - 8.22	0.58	-1.28 - 2.47	1.10	-0.60 - 2.82
Congestive heart failure						
Unadjusted	N/A		3.75	1.63 - 5.92	3.44	1.46 - 5.45
SO <sub>2</sub>	N/A		3.08	0.58 - 5.64	3.21	0.88 - 5.60
O <sub>3</sub>	N/A		3.36	1.24 - 5.53	2.72	0.76 - 4.73
Cerebrovascular disease						
Unadjusted	N/A		0.36	-2.23 - 3.01	1.72	-0.69 - 4.20
SO <sub>2</sub>	N/A		-0.46	-3.48 - 2.65	0.68	-2.14 - 3.58
O <sub>3</sub>	N/A		-0.57	-3.14 - 2.06	0.78	-1.62 - 3.24
Any coronary artery disease						
Unadjusted	3.48	-0.20-7.30	1.41	-0.25-3.10	1.74	0.23-3.26
SO <sub>2</sub>	3.86	-0.49-8.39	1.05	-0.90-3.04	1.50	-0.27-3.31
O <sub>3</sub>	4.60	0.88-8.46	0.88	-0.78-2.56	1.49	-0.01-3.02
Any cardiovascular disease						
Unadjusted	3.75	0.94 - 6.64	1.62	0.39 - 2.86	2.05	0.92 - 3.19
SO <sub>2</sub>	3.31	0.00 - 6.72	1.43	-0.02 - 2.90	1.80	0.48 - 3.15
O <sub>3</sub>	3.65	0.83 - 6.54	1.40	0.17 - 2.65	1.85	0.72 - 2.99

Continued...

**Table M.9. continued**

Subgroup	Age <65 years		Age ≥ 65 years		Total	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>LAG 1</b>						
<b>Cancer</b>						
Unadjusted	0.92	-1.17 - 3.05	1.48	-0.03 - 3.01	1.31	0.07 - 2.58
SO <sub>2</sub>	0.87	-1.28 - 3.06	1.58	0.02 - 3.16	1.36	0.07 - 2.66
O <sub>3</sub>	0.79	-1.30 - 2.92	1.32	-0.19 - 2.84	1.16	-0.09 - 2.42
<b>Respiratory groups</b>						
Acute lower respiratory disease						
Unadjusted	2.65	-1.70 - 7.20	3.37	1.05 - 5.74	3.27	1.22 - 5.36
SO <sub>2</sub>	2.34	-2.15 - 7.03	3.54	1.14 - 6.00	3.33	1.21 - 5.49
O <sub>3</sub>	2.30	-2.05 - 6.84	3.24	0.93 - 5.61	3.09	1.05 - 5.18
Definite airways disease						
Unadjusted	2.99	-1.31 - 7.49	0.80	-0.77 - 2.40	1.11	-0.36 - 2.61
SO <sub>2</sub>	2.87	-1.56 - 7.51	1.00	-0.62 - 2.65	1.26	-0.27 - 2.82
O <sub>3</sub>	2.61	-1.69 - 7.10	0.44	-1.13 - 2.02	0.72	-0.75 - 2.21
Definite airways disease excluding subjects taking drugs						
Unadjusted	N/A		1.61	-2.49-5.87	N/A	
SO <sub>2</sub>	N/A		1.72	-2.50-6.14	N/A	
O <sub>3</sub>	N/A		1.38	-2.71-5.64	N/A	
Definite airways disease excluding only systemic corticosteroids						
Unadjusted	N/A		0.77	-0.91 - 2.48	N/A	
SO <sub>2</sub>	N/A		1.07	-0.67 - 2.85	N/A	
O <sub>3</sub>	N/A		0.43	-1.24 - 2.14	N/A	
<b>Cardiovascular groups</b>						
Definite chronic coronary artery disease						
Unadjusted	-2.41	-6.50 - 1.85	2.64	0.77 - 4.55	1.82	0.11 - 3.55
SO <sub>2</sub>	-2.33	-6.54 - 2.08	2.53	0.59 - 4.50	1.72	-0.03 - 3.51
O <sub>3</sub>	-1.76	-5.87 - 2.54	2.25	0.38 - 4.16	1.58	-0.12 - 3.31
Congestive heart failure						
Unadjusted	N/A		2.88	0.74 - 5.07	2.81	0.82 - 4.85
SO <sub>2</sub>	N/A		2.42	0.22 - 4.67	2.42	0.37 - 4.52
O <sub>3</sub>	N/A		2.58	0.44 - 4.77	2.42	0.43 - 4.45
Cerebrovascular disease						
Unadjusted	N/A		1.25	-1.37 - 3.93	1.77	-0.66 - 4.27
SO <sub>2</sub>	N/A		1.24	-1.45 - 4.01	1.64	-0.87 - 4.21
O <sub>3</sub>	N/A		1.07	-1.55 - 3.75	1.54	-0.89 - 4.04
Any coronary artery disease						
Unadjusted	-0.99	-4.63-2.80	2.15	0.49-3.84	1.60	0.09-3.13
SO <sub>2</sub>	-0.77	-4.53-3.14	2.11	0.40-3.85	1.64	0.08-3.22
O <sub>3</sub>	-0.62	-4.28-3.18	1.94	0.28-3.62	1.50	-0.01-3.03
Any cardiovascular disease						
Unadjusted	1.67	-1.15 - 4.57	2.57	1.34 - 3.82	2.49	1.36 - 3.64
SO <sub>2</sub>	1.51	-1.39 - 4.49	2.69	1.41 - 3.98	2.48	1.32 - 3.66
O <sub>3</sub>	1.64	-1.18 - 4.54	2.45	1.21 - 3.70	2.37	1.24 - 3.52

Continued...



**Table M.9. continued**

Subgroup	Age <65 years		Age ≥ 65 years		Total	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>3-DAY MEAN</b>						
<b>Cancer</b>						
Unadjusted	0.98	-1.55 - 3.57	2.21	0.39 - 4.06	1.84	0.33 - 3.37
SO <sub>2</sub>	0.60	-2.09 - 3.35	2.32	0.38 - 4.30	1.78	0.17 - 3.41
O <sub>3</sub>	0.76	-1.78 - 3.36	1.99	0.17 - 3.84	1.60	0.09 - 3.14
<b>Respiratory groups</b>						
Acute lower respiratory disease						
Unadjusted	4.35	-0.96 - 9.94	4.73	1.91 - 7.63	4.72	2.23 - 7.28
SO <sub>2</sub>	3.42	-2.20 - 9.35	5.02	2.00 - 8.13	4.74	2.07 - 7.47
O <sub>3</sub>	4.16	-1.15 - 9.76	4.73	1.91 - 7.63	4.68	2.19 - 7.24
Definite airways disease						
Unadjusted	2.47	-2.66 - 7.87	1.07	-0.82 - 3.00	1.33	-0.45 - 3.15
SO <sub>2</sub>	1.94	-3.49 - 7.68	1.18	-0.85 - 3.24	1.35	-0.56 - 3.28
O <sub>3</sub>	1.76	-3.35 - 7.15	0.43	-1.45 - 2.35	0.60	-1.17 - 2.40
Definite airways disease excluding subjects taking drugs						
Unadjusted	N/A		4.12	-0.90-9.38	N/A	
SO <sub>2</sub>	N/A		4.31	-1.04-9.95	N/A	
O <sub>3</sub>	N/A		3.87	-1.13-9.12	N/A	
Definite airways disease excluding only systemic corticosteroids						
Unadjusted	N/A		1.25	-0.79 - 3.34	N/A	
SO <sub>2</sub>	N/A		1.58	-0.61 - 3.81	N/A	
O <sub>3</sub>	N/A		0.64	-1.39 - 2.71	N/A	
<b>Cardiovascular groups</b>						
Definite chronic coronary artery disease						
Unadjusted	-2.84	-7.71 - 2.28	3.16	0.88 - 5.49	2.20	0.14 - 4.31
SO <sub>2</sub>	-2.84	-8.02 - 2.63	2.75	0.33 - 5.23	1.85	-0.34 - 4.09
O <sub>3</sub>	-1.47	-6.40 - 3.72	2.42	0.15 - 4.73	1.76	-0.29 - 3.86
Congestive heart failure						
Unadjusted	N/A		4.24	1.65 - 6.89	4.02	1.61 - 6.48
SO <sub>2</sub>	N/A		3.34	0.60 - 6.15	3.48	0.92 - 6.10
O <sub>3</sub>	N/A		3.77	1.19 - 6.41	3.50	1.10 - 5.95
Cerebrovascular disease						
Unadjusted	N/A		0.80	-2.34 - 4.05	1.53	-1.40 - 4.55
SO <sub>2</sub>	N/A		0.60	-2.74 - 4.06	0.92	-2.19 - 4.12
O <sub>3</sub>	N/A		0.38	-2.76 - 3.62	1.05	-1.87 - 4.06
Any coronary artery disease						
Unadjusted	-0.41	-4.77-4.15	2.34	0.33-4.39	1.85	0.03-3.70
SO <sub>2</sub>	-0.21	-4.86-4.66	2.04	-0.10-4.22	1.70	-0.23-3.68
O <sub>3</sub>	0.41	-3.98-5.01	1.91	-0.10-3.95	1.65	-0.16-3.50
Any cardiovascular disease						
Unadjusted	1.29	-2.07 - 4.77	2.91	1.41 - 4.42	2.76	1.40 - 4.15
SO <sub>2</sub>	0.75	-2.81 - 4.43	2.87	1.28 - 4.49	2.52	1.07 - 3.99
O <sub>3</sub>	1.32	-2.04 - 4.80	2.72	1.22 - 4.24	2.60	1.23 - 3.99

<sup>a</sup> The statistical model was  $E(\log(y_i)) = \alpha + \text{loess}(i, \text{span}=2.49\%) + \text{loess}(\text{year}) + \text{loess}(\text{Mean temperature}_0, \text{Change in barometric pressure from the previous 24 hours}_0) + \text{loess}(\text{gaseous pollutant}_0) + \beta * \text{particle pollutant}$ , where  $i$  is an indicator for day. CI, confidence interval. N/A, not analysed.

<sup>b</sup> MPCs calculated for an increase of exposure equal to the interquartile range.

**Table M.10.** Summary Estimates of Mean Percent Change in Daily Nonaccidental Mortality for Selected Subgroups Defined using Billing and Prescription Data Obtained from the Quebec Health Insurance Plan for their Respective Time Period Prior to Death, across the Interquartile Range of Lagged Exposure to Sulfate measured at the Sutton Acid Rain Monitoring Station, Montreal, 1984-1993<sup>a</sup>

Subgroup	Lag 0		Lag 1		3-day mean	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>No billings</b>	2.17	-0.14 - 4.54	1.61	-0.66 - 3.93	3.18	0.28 - 6.17
<b>Cancer</b>	1.08	0.28 - 1.89	0.54	-0.25 - 1.34	0.89	-0.12 - 1.92
<b>Respiratory indices</b>						
Acute upper respiratory disease	3.30	-1.18 - 7.98	3.73	-0.68 - 8.33	6.36	0.58 - 12.47
Chronic upper respiratory disease	0.56	-2.64 - 3.87	1.64	-1.52 - 4.89	4.34	0.32 - 8.51
Acute lower respiratory disease	1.09	-0.25 - 2.44	1.83	0.50 - 3.17	2.25	0.56 - 3.98
Definite airways disease	0.14	-0.83 - 1.12	0.60	-0.36 - 1.57	0.51	-0.72 - 1.75
<b>Cardiovascular indices</b>						
Definite acute coronary artery disease	0.43	-1.28 - 2.17	0.68	-1.02 - 2.40	0.99	-1.17 - 3.19
Definite chronic coronary artery disease	0.41	-0.70 - 1.54	0.66	-0.44 - 1.77	0.63	-0.77 - 2.06
Congestive heart failure	1.67	0.39 - 2.97	1.18	-0.10 - 2.47	1.91	0.28 - 3.56
Hypertension	0.23	-1.62 - 2.12	0.14	-1.70 - 2.02	0.53	-1.80 - 2.92
Cerebrovascular disease	0.42	-1.16 - 2.03	1.03	-0.53 - 2.62	0.63	-1.37 - 2.66
Any coronary artery disease	0.73	-0.25 - 1.73	0.30	-0.68 - 1.29	0.69	-0.55 - 1.95
Any cardiovascular disease	0.72	-0.01 - 1.46	1.11	0.39 - 1.84	1.16	0.23 - 2.09

<sup>a</sup> The statistical model was  $E(\log(y_i)) = \alpha + \text{loess}(t, \text{span}=2.49\%) + \text{loess}(\text{year}) + \text{loess}(\text{Mean temperature}_0)$ . Change in barometric pressure from the previous 24 hours<sub>0</sub> +  $\beta$  \* pollutant, where  $y_i$  is the number of nonaccidental deaths on day  $i$  for subjects included in each subgroup. CI, confidence interval.

<sup>b</sup> MPCs calculated for an increase of exposure equal to the interquartile range.

**Table M.11.** Mean Percent Change in Daily Nonaccidental Mortality for the Sulfate Measured at the Sutton Acid Rain Station, Adjusted for Sulfur Dioxide and Ozone Separately, according to Subgroups Defined using Billing and Prescription Data from the Quebec Health Insurance Plan, by Age Group, Montreal, 1984-1993<sup>a</sup>

Subgroup	Age <65 years		Age ≥ 65 years		Total	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>LAG 0</b>						
<b>Cancer</b>						
Unadjusted	0.19	-1.17 - 1.56	1.49	0.53 - 2.47	1.08	0.28 - 1.89
SO <sub>2</sub>	-0.11	-1.52 - 1.32	1.50	0.49 - 2.51	0.98	0.14 - 1.82
O <sub>3</sub>	-0.02	-1.47 - 1.45	1.02	-0.01 - 2.06	0.68	-0.17 - 1.55
<b>Respiratory groups</b>						
Acute lower respiratory disease						
Unadjusted	0.32	-2.55 - 3.27	1.19	-0.32 - 2.73	1.09	-0.25 - 2.44
SO <sub>2</sub>	-0.53	-3.50 - 2.54	1.13	-0.45 - 2.73	0.84	-0.55 - 2.26
O <sub>3</sub>	0.40	-2.65 - 3.54	0.95	-0.65 - 2.58	0.88	-0.54 - 2.32
Definite airways disease						
Unadjusted	0.30	-2.45 - 3.12	0.08	-0.95 - 1.13	0.14	-0.83 - 1.12
SO <sub>2</sub>	-0.29	-3.14 - 2.65	0.08	-1.01 - 1.17	0.05	-0.96 - 1.08
O <sub>3</sub>	-0.81	-3.74 - 2.21	-0.91	-2.00 - 0.19	-0.87	-1.89 - 0.17
Definite airways disease excluding subjects taking drugs						
Unadjusted	N/A		0.31	-2.43-3.12	N/A	
SO <sub>2</sub>	N/A		0.25	-2.60-3.18	N/A	
O <sub>3</sub>	N/A		-0.59	-3.45-2.36	N/A	
Definite airways disease excluding only systemic corticosteroids						
Unadjusted	N/A		-0.26	-1.37 - 0.88	N/A	
SO <sub>2</sub>	N/A		-0.24	-1.41 - 0.94	N/A	
O <sub>3</sub>	N/A		-1.23	-2.40 - -0.04	N/A	
<b>Cardiovascular groups</b>						
Definite chronic coronary artery disease						
Unadjusted	1.75	-0.98 - 4.55	0.08	-1.16 - 1.32	0.41	-0.70 - 1.54
SO <sub>2</sub>	2.05	-0.80 - 4.99	-0.16	-1.44 - 1.13	0.20	-0.96 - 1.38
O <sub>3</sub>	3.02	0.11 - 6.01	-0.80	-2.09 - 0.52	-0.16	-1.34 - 1.04
Congestive heart failure						
Unadjusted	N/A		1.76	0.39 - 3.16	1.67	0.39 - 2.97
SO <sub>2</sub>	N/A		1.30	-0.13 - 2.75	1.36	0.02 - 2.72
O <sub>3</sub>	N/A		1.16	-0.30 - 2.64	0.81	-0.55 - 2.19
Cerebrovascular disease						
Unadjusted	N/A		-0.13	-1.85 - 1.61	0.42	-1.16 - 2.03
SO <sub>2</sub>	N/A		-0.39	-2.18 - 1.43	0.04	-1.61 - 1.72
O <sub>3</sub>	N/A		-1.12	-2.93 - 0.73	-0.49	-2.17 - 1.21
Any coronary artery disease						
Unadjusted	3.14	0.76-5.58	0.17	-0.92-1.27	0.73	-0.25-1.73
SO <sub>2</sub>	3.30	0.81-5.85	-0.08	-1.21-1.07	0.49	-0.54-1.52
O <sub>3</sub>	3.79	1.24-6.40	-0.65	-1.80-0.52	0.17	-0.88-1.22
Any cardiovascular disease						
Unadjusted	2.13	0.31 - 3.98	0.38	-0.43 - 1.19	0.72	-0.01 - 1.46
SO <sub>2</sub>	1.88	-0.02 - 3.81	0.19	-0.65 - 1.03	0.47	-0.30 - 1.24
O <sub>3</sub>	2.10	0.16 - 4.08	-0.07	-0.92 - 0.79	0.34	-0.44 - 1.13

Continued...

**Table M.11. continued**

Subgroup	Age <65 years		Age ≥ 65 years		Total	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>LAG 1</b>						
<b>Cancer</b>						
Unadjusted	0.42	-0.92 - 1.77	0.56	-0.40 - 1.53	0.54	-0.25 - 1.34
SO <sub>2</sub>	0.47	-0.87 - 1.83	0.66	-0.30 - 1.64	0.60	-0.19 - 1.41
O <sub>3</sub>	0.36	-1.00 - 1.75	0.37	-0.60 - 1.36	0.37	-0.44 - 1.19
<b>Respiratory groups</b>						
Acute lower respiratory disease						
Unadjusted	1.95	-0.88 - 4.86	1.77	0.27 - 3.29	1.83	0.50 - 3.17
SO <sub>2</sub>	2.06	-0.78 - 4.99	1.81	0.30 - 3.34	1.88	0.55 - 3.23
O <sub>3</sub>	1.95	-0.94 - 4.93	1.65	0.12 - 3.21	1.73	0.38 - 3.11
Definite airways disease						
Unadjusted	2.34	-0.37 - 5.13	0.34	-0.69 - 1.37	0.60	-0.36 - 1.57
SO <sub>2</sub>	2.39	-0.34 - 5.20	0.40	-0.63 - 1.44	0.66	-0.31 - 1.64
O <sub>3</sub>	2.20	-0.58 - 5.06	0.07	-0.97 - 1.13	0.34	-0.63 - 1.33
Definite airways disease excluding subjects taking drugs						
Unadjusted	N/A		0.64	-2.05-3.41	N/A	
SO <sub>2</sub>	N/A		0.56	-2.14-3.33	N/A	
O <sub>3</sub>	N/A		0.34	-2.40-3.15	N/A	
Definite airways disease excluding only systemic corticosteroids						
Unadjusted	N/A		0.41	-0.70 - 1.52	N/A	
SO <sub>2</sub>	N/A		0.50	-0.61 - 1.62	N/A	
O <sub>3</sub>	N/A		0.17	-0.95 - 1.30	N/A	
<b>Cardiovascular groups</b>						
Definite chronic coronary artery disease						
Unadjusted	-0.07	-2.77 - 2.72	0.79	-0.42 - 2.01	0.66	-0.44 - 1.77
SO <sub>2</sub>	0.06	-2.66 - 2.86	0.80	-0.41 - 2.03	0.69	-0.42 - 1.81
O <sub>3</sub>	0.26	-2.50 - 3.09	0.51	-0.72 - 1.75	0.47	-0.66 - 1.60
Congestive heart failure						
Unadjusted	N/A		1.15	-0.22 - 2.54	1.18	-0.10 - 2.47
SO <sub>2</sub>	N/A		1.06	-0.31 - 2.46	1.11	-0.17 - 2.41
O <sub>3</sub>	N/A		0.96	-0.44 - 2.37	0.91	-0.39 - 2.23
Cerebrovascular disease						
Unadjusted	N/A		1.03	-0.66 - 2.75	1.03	-0.53 - 2.62
SO <sub>2</sub>	N/A		1.08	-0.63 - 2.81	1.06	-0.51 - 2.66
O <sub>3</sub>	N/A		0.80	-0.93 - 2.55	0.83	-0.76 - 2.46
Any coronary artery disease						
Unadjusted	0.95	-1.43-3.38	0.19	-0.89-1.27	0.30	-0.68-1.29
SO <sub>2</sub>	1.17	-1.22-3.62	0.23	-0.85-1.32	0.40	-0.58-1.39
O <sub>3</sub>	1.08	-1.34-3.56	-0.08	-1.17-1.03	0.11	-0.88-1.12
Any cardiovascular disease						
Unadjusted	0.89	-0.93 - 2.73	1.16	0.36 - 1.95	1.11	0.39 - 1.84
SO <sub>2</sub>	0.98	-0.85 - 2.83	1.22	0.42 - 2.02	1.21	0.48 - 1.94
O <sub>3</sub>	0.91	-0.94 - 2.80	1.02	0.21 - 1.84	1.01	0.27 - 1.75

Continued...

**Table M.11. continued**

Subgroup	Age <65 years		Age ≥ 65 years		Total	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>3-DAY MEAN</b>						
<b>Cancer</b>						
Unadjusted	0.01	-1.69 - 1.75	1.39	0.17 - 2.63	0.89	-0.12 - 1.92
SO <sub>2</sub>	-0.06	-1.79 - 1.69	1.42	0.18 - 2.67	0.94	-0.08 - 1.98
O <sub>3</sub>	-0.12	-1.89 - 1.68	0.97	-0.29 - 2.25	0.58	-0.47 - 1.64
<b>Respiratory groups</b>						
Acute lower respiratory disease						
Unadjusted	1.74	-1.88 - 5.50	2.29	0.36 - 4.25	2.25	0.56 - 3.98
SO <sub>2</sub>	1.57	-2.09 - 5.37	2.32	0.37 - 4.30	2.23	0.50 - 3.98
O <sub>3</sub>	1.93	-1.83 - 5.82	2.15	0.16 - 4.17	2.14	0.38 - 3.93
Definite airways disease						
Unadjusted	0.23	-3.23 - 3.81	0.50	-0.80 - 1.82	0.51	-0.72 - 1.75
SO <sub>2</sub>	0.09	-3.41 - 3.72	0.54	-0.78 - 1.88	0.48	-0.76 - 1.74
O <sub>3</sub>	-0.13	-3.72 - 3.60	-0.10	-1.44 - 1.26	-0.10	-1.36 - 1.18
Definite airways disease excluding subjects taking drugs						
Unadjusted	N/A		0.50	-2.94-4.06	N/A	
SO <sub>2</sub>	N/A		0.34	-3.14-3.94	N/A	
O <sub>3</sub>	N/A		-0.10	-3.63-3.56	N/A	
Definite airways disease excluding only systemic corticosteroids						
Unadjusted	N/A		0.63	-0.78 - 2.06	N/A	
SO <sub>2</sub>	N/A		0.66	-0.77 - 2.12	N/A	
O <sub>3</sub>	N/A		0.08	-1.36 - 1.55	N/A	
<b>Cardiovascular groups</b>						
Definite chronic coronary artery disease						
Unadjusted	-0.26	-3.71 - 3.32	0.84	-0.71 - 2.41	0.63	-0.77 - 2.06
SO <sub>2</sub>	-0.20	-3.70 - 3.43	0.71	-0.85 - 2.30	0.58	-0.84 - 2.03
O <sub>3</sub>	0.30	-3.27 - 4.00	0.24	-1.35 - 1.86	0.25	-1.20 - 1.72
Congestive heart failure						
Unadjusted	N/A		1.91	0.17 - 3.69	1.91	0.28 - 3.56
SO <sub>2</sub>	N/A		1.69	-0.07 - 3.49	1.72	0.08 - 3.40
O <sub>3</sub>	N/A		1.49	-0.31 - 3.33	1.31	-0.37 - 3.01
Cerebrovascular disease						
Unadjusted	N/A		0.56	-1.60 - 2.76	0.63	-1.37 - 2.66
SO <sub>2</sub>	N/A		0.51	-1.67 - 2.75	0.49	-1.53 - 2.55
O <sub>3</sub>	N/A		-0.01	-2.23 - 2.27	0.11	-1.95 - 2.21
Any coronary artery disease						
Unadjusted	0.98	-2.06-4.11	0.57	-0.80-1.96	0.69	-0.55-1.95
SO <sub>2</sub>	1.11	-1.98-4.29	0.59	-0.79-2.00	0.70	-0.55-1.98
O <sub>3</sub>	1.09	-2.06-4.33	0.09	-1.32-1.52	0.26	-1.02-1.55
Any cardiovascular disease						
Unadjusted	0.30	-2.00 - 2.65	1.33	0.32 - 2.35	1.16	0.23 - 2.09
SO <sub>2</sub>	0.20	-2.12 - 2.58	1.36	0.33 - 2.40	1.17	0.23 - 2.12
O <sub>3</sub>	0.16	-2.22 - 2.59	1.05	0.00 - 2.11	0.90	-0.05 - 1.87

<sup>a</sup> The statistical model was  $E(\log(y_i)) = \alpha + \text{loess}(i, \text{span}=2.49\%) + \text{loess}(\text{year}) + \text{loess}(\text{Mean temperature}_0, \text{Change in barometric pressure from the previous 24 hours}_0) + \text{loess}(\text{gaseous pollutant}_0) + \beta * \text{particle pollutant}$ , where  $i$  is an indicator for day. CI, confidence interval. N/A, not analysed.

<sup>b</sup> MPCs calculated for an increase of exposure equal to the interquartile range.

**Table M.12.** Summary Estimates of Mean Percent Change in Daily Nonaccidental Mortality for Selected Subgroups Defined using Billing and Prescription Data Obtained from the Quebec Health Insurance Plan for their Respective Time Period Prior to Death, across the Interquartile Range of Lagged Exposure to Sulfates estimated from Total Suspended Particles, Montreal, 1984-1993 <sup>a</sup>

Subgroup	Lag 0		Lag 1	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>No billings</b>	6.62	-0.37 - 14.10	12.01	4.65 - 19.90
<b>Cancer</b>	3.29	0.75 - 5.89	-0.23	-2.70 - 2.31
<b>Respiratory indices</b>				
Acute upper respiratory disease	6.71	-6.27 - 21.48	-4.33	-17.96 - 11.55
Chronic upper respiratory disease	4.36	-5.52 - 15.27	-5.22	-15.08 - 5.80
Acute lower respiratory disease	2.75	-1.41 - 7.07	4.97	0.66 - 9.47
Definite airways disease	-2.01	-5.15 - 1.25	3.96	0.76 - 7.26
<b>Cardiovascular indices</b>				
Definite acute coronary artery disease	0.20	-4.89 - 5.56	1.19	-3.96 - 6.62
Definite chronic coronary artery disease	2.30	-1.35 - 6.09	3.14	-0.32 - 6.72
Congestive heart failure	2.42	-1.62 - 6.63	2.53	-1.72 - 6.95
Hypertension	3.89	-2.09 - 10.23	4.64	-1.26 - 10.88
Cerebrovascular disease	1.46	-3.63 - 6.82	3.73	-1.30 - 9.02
Any coronary artery disease	2.38	-0.85 - 5.70	3.03	0.11 - 6.03
Any cardiovascular disease	1.88	-0.44 - 4.25	3.77	1.49 - 6.10

<sup>a</sup> The statistical model was  $E(\log(Y_i)) = \alpha + \text{loess}(t, \text{span}=2.49\%) + \text{loess}(\text{year}) + \text{loess}(\text{Mean temperature}_0)$  Change in barometric pressure from the previous 24 hours<sub>0</sub>) +  $\beta$  \* pollutant, where  $y_i$  is the number of nonaccidental deaths on day  $i$  for subjects included in each subgroup. CI, confidence interval.

<sup>b</sup> MPCs calculated for an increase of exposure equal to the interquartile range.

**Table M.13.** Summary Estimates of Mean Percent Change in Daily Nonaccidental Mortality for Selected Subgroups Defined using Billing and Prescription Data Obtained from the Quebec Health Insurance Plan for their Respective Time Period Prior to Death, across the Interquartile Range of Lagged Exposure to Sulfates estimated from PM<sub>10</sub>, Montreal, 1984-1993<sup>a</sup>

Subgroup	Lag 0		Lag 1	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>No billings</b>	N/C		N/C	
<b>Cancer</b>	4.08	1.53 - 6.70	0.62	-1.84 - 3.13
<b>Respiratory indices</b>				
Acute upper respiratory disease	N/C		N/C	
Chronic upper respiratory disease	N/C		N/C	
Acute lower respiratory disease	-1.15	-5.16 - 3.02	4.77	0.70 - 9.01
Definite airways disease	-1.18	-4.41 - 2.15	2.36	-0.77 - 5.60
<b>Cardiovascular indices</b>				
Definite acute coronary artery disease	-0.06	-5.24 - 5.41	0.14	-4.78 - 5.31
Definite chronic coronary artery disease	2.73	-1.13 - 6.75	1.77	-1.77 - 5.44
Congestive heart failure	-0.71	-4.83 - 3.60	3.40	-0.65 - 7.63
Hypertension	0.61	-4.98 - 6.54	6.66	0.96 - 12.69
Cerebrovascular disease	-0.76	-5.81 - 4.55	1.94	-3.11 - 7.26
Any coronary artery disease	2.37	-1.09 - 5.96	1.08	-1.81 - 4.07
Any cardiovascular disease	0.89	-1.55 - 3.39	2.54	0.28 - 4.85

<sup>a</sup> The statistical model was  $E(\log(Y_i)) = \alpha + \text{loess}(t, \text{span}=2.49\%) + \text{loess}(\text{year}) + \text{loess}(\text{Mean temperature}_0)$ . Change in barometric pressure from the previous 24 hours<sub>0</sub> +  $\beta$  \* pollutant, where  $y_i$  is the number of nonaccidental deaths on day  $i$  for subjects included in each subgroup. CI, confidence interval. N/C, no convergence.

<sup>b</sup> MPCs calculated for an increase of exposure equal to the interquartile range.

**Table M.14.** Summary Estimates of Mean Percent Change in Daily Nonaccidental Mortality for Selected Subgroups Defined using Billing and Prescription Data Obtained from the Quebec Health Insurance Plan for their Respective Time Period Prior to Death, across the Interquartile Range of Lagged Exposure to Sulfates estimated from PM<sub>2.5</sub>, Montreal, 1984-1993<sup>a</sup>

Subgroup	Lag 0		Lag 1	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>No billings</b>	-2.31	-8.67 - 4.49	N/C	
<b>Cancer</b>	3.72	1.33 - 6.16	0.89	-1.40 - 3.23
<b>Respiratory indices</b>				
Acute upper respiratory disease	N/C		N/C	
Chronic upper respiratory disease	N/C		N/C	
Acute lower respiratory disease	-0.13	-3.96 - 3.86	4.61	0.79 - 8.57
Definite airways disease	-1.39	-4.41 - 1.72	2.65	-0.27 - 5.66
<b>Cardiovascular indices</b>				
Definite acute coronary artery disease	-0.61	-5.46 - 4.50	-0.29	-4.93 - 4.58
Definite chronic coronary artery disease	2.95	-0.70 - 6.73	1.42	-1.88 - 4.84
Congestive heart failure	0.09	-3.81 - 4.13	2.91	-0.94 - 6.91
Hypertension	N/C		N/C	
Cerebrovascular disease	-1.48	-6.21 - 3.49	1.23	-3.52 - 6.21
Any coronary artery disease	2.19	-1.06 - 5.55	0.97	-1.74 - 3.76
Any cardiovascular disease	0.78	-1.49 - 3.11	2.31	0.20 - 4.47

<sup>a</sup> The statistical model was  $E(\log(Y_i)) = \alpha + \text{loess}(t, \text{span}=2.49\%) + \text{loess}(\text{year}) + \text{loess}(\text{Mean temperature}_0)$ . Change in barometric pressure from the previous 24 hours<sub>0</sub> +  $\beta$  \* pollutant, where  $y_i$  is the number of nonaccidental deaths on day  $i$  for subjects included in each subgroup. CI, confidence interval. N/C, no convergence.

<sup>b</sup> MPCs calculated for an increase of exposure equal to the interquartile range.



**Table M.15.** Summary Estimates of Mean Percent Change in Daily Nonaccidental Mortality for Selected Subgroups Defined using Billing and Prescription Data Obtained from the Quebec Health Insurance Plan for their Respective Time Period Prior to Death, across the Interquartile Range of Lagged Exposure to Predicted Sulfates from PM<sub>2.5</sub>, Montreal, 1984-1993<sup>a</sup>

Subgroup	Lag 0		Lag 1		3-day mean	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>No billings</b>	2.76	0.07 - 5.53	2.51	-0.13 - 5.23	3.30	0.01 - 6.70
<b>Cancer</b>	1.51	0.58 - 2.44	0.81	-0.11 - 1.74	1.14	0.00 - 2.30
<b>Respiratory indices</b>						
Acute upper respiratory disease	3.64	-1.52 - 9.08	4.11	-0.98 - 9.46	6.56	0.10 - 13.44
Chronic upper respiratory disease	-0.08	-3.76 - 3.74	0.63	-3.05 - 4.44	3.41	-1.09 - 8.12
Acute lower respiratory disease	1.52	-0.02 - 3.08	1.86	0.33 - 3.42	2.90	0.99 - 4.84
Definite airways disease	0.90	-0.22 - 2.03	0.95	-0.16 - 2.07	1.02	-0.35 - 2.41
<b>Cardiovascular indices</b>						
Definite acute coronary artery disease	0.95	-1.03 - 2.97	1.09	-0.87 - 3.09	1.30	-1.12 - 3.78
Definite chronic coronary artery disease	0.85	-0.45 - 2.16	0.98	-0.29 - 2.28	1.28	-0.30 - 2.89
Congestive heart failure	2.61	1.13 - 4.12	1.53	0.04 - 3.04	2.64	0.81 - 4.51
Hypertension	1.12	-1.04 - 3.32	0.23	-1.89 - 2.41	0.87	-1.75 - 3.56
Cerebrovascular disease	0.88	-0.95 - 2.74	1.13	-0.68 - 2.98	0.70	-1.54 - 2.99
Any coronary artery disease	1.02	-0.13 - 2.17	0.61	-0.52 - 1.75	0.98	-0.42 - 2.39
Any cardiovascular disease	1.19	0.33 - 2.05	1.52	0.68 - 2.37	1.53	0.48 - 2.58

<sup>a</sup> The statistical model was  $E(\log(Y_i)) = \alpha + \text{loess}(t, \text{span}=2.49\%) + \text{loess}(\text{year}) + \text{loess}(\text{Mean temperature}_0)$ . Change in barometric pressure from the previous 24 hours<sub>0</sub>) +  $\beta$  \* pollutant, where  $y_i$  is the number of nonaccidental deaths on day  $i$  for subjects included in each subgroup. CI, confidence interval.

<sup>b</sup> MPCs calculated for an increase of exposure equal to the interquartile range.

**Table M.16.** Mean Percent Change in Daily Nonaccidental Mortality for the Predicted Sulfate from PM<sub>2.5</sub>, Adjusted for Sulfur Dioxide and Ozone Separately, according to Subgroups Defined using Billing and Prescription Data from the Quebec Health Insurance Plan, by Age Group, Montreal, 1984-1993<sup>a</sup>

Subgroup	Age <65 years		Age ≥ 65 years		Total	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>LAG 0</b>						
<b>Cancer</b>						
Unadjusted	0.55	-1.02 - 2.13	1.95	0.83 - 3.09	1.51	0.58 - 2.44
SO <sub>2</sub>	0.13	-1.55 - 1.84	2.13	0.92 - 3.36	1.48	0.48 - 2.49
O <sub>3</sub>	0.29	-1.34 - 1.96	1.63	0.47 - 2.81	1.20	0.23 - 2.17
<b>Respiratory groups</b>						
Acute lower respiratory disease						
Unadjusted	1.39	-1.90 - 4.78	1.45	-0.29 - 3.21	1.52	-0.02 - 3.08
SO <sub>2</sub>	0.21	-3.32 - 3.88	1.50	-0.38 - 3.42	1.30	-0.36 - 3.00
O <sub>3</sub>	1.41	-2.00 - 4.94	1.15	-0.64 - 2.97	1.27	-0.32 - 2.89
Definite airways disease						
Unadjusted	0.78	-2.38 - 4.04	0.87	-0.32 - 2.08	0.90	-0.22 - 2.03
SO <sub>2</sub>	-0.29	-3.69 - 3.23	0.77	-0.52 - 2.08	0.66	-0.55 - 1.89
O <sub>3</sub>	-0.93	-4.20 - 2.44	-0.13	-1.35 - 1.11	-0.19	-1.34 - 0.98
Definite airways disease excluding subjects taking drugs						
Unadjusted	N/A		1.01	-2.11-4.23	N/A	
SO <sub>2</sub>	N/A		0.82	-2.56-4.32	N/A	
O <sub>3</sub>	N/A		0.33	-2.88-3.64	N/A	
Definite airways disease excluding only systemic corticosteroids						
Unadjusted	N/A		0.51	-0.78 - 1.81	N/A	
SO <sub>2</sub>	N/A		0.46	-0.94 - 1.87	N/A	
O <sub>3</sub>	N/A		-0.46	-1.78 - 0.88	N/A	
<b>Cardiovascular groups</b>						
Definite chronic coronary artery disease						
Unadjusted	1.82	-1.35 - 5.09	0.60	-0.83 - 2.05	0.85	-0.45 - 2.16
SO <sub>2</sub>	2.03	-1.40 - 5.57	0.30	-1.24 - 1.86	0.56	-0.84 - 1.98
O <sub>3</sub>	3.31	0.00 - 6.73	-0.36	-1.82 - 1.13	0.24	-1.10 - 1.60
Congestive heart failure						
Unadjusted	N/A		2.72	1.13 - 4.34	2.61	1.13 - 4.12
SO <sub>2</sub>	N/A		2.18	0.46 - 3.93	2.31	0.70 - 3.94
O <sub>3</sub>	N/A		2.20	0.55 - 3.87	1.78	0.25 - 3.34
Cerebrovascular disease						
Unadjusted	N/A		0.00	-1.97 - 2.01	0.88	-0.95 - 2.74
SO <sub>2</sub>	N/A		-0.44	-2.57 - 1.73	0.22	-1.74 - 2.23
O <sub>3</sub>	N/A		-1.06	-3.09 - 1.01	-0.15	-2.04 - 1.77
Any coronary artery disease						
Unadjusted	3.24	0.46-6.10	0.50	-0.76-1.79	1.02	-0.13-2.17
SO <sub>2</sub>	3.29	0.28-6.39	0.24	-1.12-1.63	0.74	-0.50-1.99
O <sub>3</sub>	3.91	1.00-6.90	-0.32	-1.62-1.01	0.46	-0.72-1.66
Any cardiovascular disease						
Unadjusted	2.83	0.72 - 4.99	0.86	-0.07 - 1.80	1.19	0.33 - 2.05
SO <sub>2</sub>	2.39	0.11 - 4.72	0.63	-0.38 - 1.65	0.95	0.03 - 1.88
O <sub>3</sub>	2.70	0.51 - 4.95	0.47	-0.50 - 1.45	0.83	-0.05 - 1.73

Continued...

**Table M.16. continued**

Subgroup	Age <65 years		Age ≥ 65 years		Total	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>LAG 1</b>						
<b>Cancer</b>						
Unadjusted	0.84	-0.71 - 2.42	0.74	-0.38 - 1.87	0.81	-0.11 - 1.74
SO <sub>2</sub>	0.89	-0.68 - 2.49	0.85	-0.28 - 2.00	0.89	-0.05 - 1.84
O <sub>3</sub>	0.77	-0.80 - 2.37	0.58	-0.55 - 1.73	0.65	-0.29 - 1.59
<b>Respiratory groups</b>						
Acute lower respiratory disease						
Unadjusted	1.92	-1.36 - 5.30	1.80	0.06 - 3.57	1.86	0.33 - 3.42
SO <sub>2</sub>	2.02	-1.30 - 5.44	1.87	0.11 - 3.67	1.93	0.38 - 3.51
O <sub>3</sub>	1.77	-1.53 - 5.19	1.64	-0.12 - 3.43	1.70	0.15 - 3.28
Definite airways disease						
Unadjusted	2.16	-1.01 - 5.44	0.74	-0.44 - 1.94	0.95	-0.16 - 2.07
SO <sub>2</sub>	2.21	-1.00 - 5.53	0.83	-0.36 - 2.05	1.03	-0.09 - 2.17
O <sub>3</sub>	1.92	-1.29 - 5.23	0.46	-0.73 - 1.67	0.66	-0.46 - 1.79
Definite airways disease excluding subjects taking drugs						
Unadjusted	N/A		1.02	-2.07-4.20	N/A	
SO <sub>2</sub>	N/A		0.95	-2.17-4.17	N/A	
O <sub>3</sub>	N/A		0.73	-2.38-3.94	N/A	
Definite airways disease excluding only systemic corticosteroids						
Unadjusted	N/A		0.77	-0.50 - 2.05	N/A	
SO <sub>2</sub>	N/A		0.92	-0.37 - 2.23	N/A	
O <sub>3</sub>	N/A		0.51	-0.77 - 1.81	N/A	
<b>Cardiovascular groups</b>						
Definite chronic coronary artery disease						
Unadjusted	-1.13	-4.28 - 2.13	1.38	-0.02 - 2.80	0.98	-0.29 - 2.28
SO <sub>2</sub>	-1.03	-4.22 - 2.26	1.37	-0.05 - 2.81	0.98	-0.31 - 2.29
O <sub>3</sub>	-0.76	-3.94 - 2.54	1.09	-0.33 - 2.52	0.78	-0.51 - 2.09
Congestive heart failure						
Unadjusted	N/A		1.58	-0.01 - 3.20	1.53	0.04 - 3.04
SO <sub>2</sub>	N/A		1.35	-0.26 - 2.98	1.35	-0.15 - 2.87
O <sub>3</sub>	N/A		1.32	-0.29 - 2.96	1.22	-0.28 - 2.74
Cerebrovascular disease						
Unadjusted	N/A		1.07	-0.89 - 3.07	1.13	-0.68 - 2.98
SO <sub>2</sub>	N/A		1.12	-0.86 - 3.14	1.12	-0.71 - 3.00
O <sub>3</sub>	N/A		0.86	-1.12 - 2.88	0.93	-0.91 - 2.80
Any coronary artery disease						
Unadjusted	-0.11	-2.89-2.75	0.77	-0.47-2.03	0.61	-0.52-1.75
SO <sub>2</sub>	0.14	-2.68-3.04	0.82	-0.44-2.10	0.72	-0.43-1.88
O <sub>3</sub>	0.05	-2.76-2.95	0.53	-0.73-1.80	0.45	-0.70-1.60
Any cardiovascular disease						
Unadjusted	0.68	-1.43 - 2.84	1.63	0.71 - 2.55	1.52	0.68 - 2.37
SO <sub>2</sub>	0.70	-1.44 - 2.88	1.70	0.77 - 2.64	1.57	0.72 - 2.43
O <sub>3</sub>	0.67	-1.47 - 2.86	1.49	0.56 - 2.43	1.40	0.54 - 2.26

Continued...

**Table M.16. continued**

Subgroup	Age <65 years		Age ≥ 65 years		Total	
	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI	Mean percent change <sup>b</sup>	95% CI
<b>3-DAY MEAN</b>						
<b>Cancer</b>						
Unadjusted	0.33	-1.60 - 2.29	1.62	0.24 - 3.01	1.14	0.00 - 2.30
SO <sub>2</sub>	0.18	-1.80 - 2.20	1.67	0.26 - 3.11	1.20	0.03 - 2.39
O <sub>3</sub>	0.17	-1.79 - 2.17	1.24	-0.15 - 2.66	0.85	-0.31 - 2.03
<b>Respiratory groups</b>						
Acute lower respiratory disease						
Unadjusted	2.25	-1.82 - 6.48	3.00	0.84 - 5.21	2.90	0.99 - 4.84
SO <sub>2</sub>	1.99	-2.18 - 6.33	3.03	0.81 - 5.30	2.88	0.92 - 4.88
O <sub>3</sub>	2.27	-1.87 - 6.57	2.81	0.62 - 5.05	2.74	0.81 - 4.72
Definite airways disease						
Unadjusted	0.98	-2.90 - 5.02	0.96	-0.50 - 2.44	1.02	-0.35 - 2.41
SO <sub>2</sub>	0.78	-3.21 - 4.93	1.00	-0.50 - 2.53	1.03	-0.38 - 2.46
O <sub>3</sub>	0.51	-3.44 - 4.62	0.36	-1.11 - 1.86	0.39	-1.00 - 1.79
Definite airways disease excluding subjects taking drugs						
Unadjusted	N/A		1.75	-2.08-5.73	N/A	
SO <sub>2</sub>	N/A		1.60	-2.33-5.69	N/A	
O <sub>3</sub>	N/A		1.24	-2.63-5.25	N/A	
Definite airways disease excluding only systemic corticosteroids						
Unadjusted	N/A		1.17	-0.41 - 2.77	N/A	
SO <sub>2</sub>	N/A		1.32	-0.31 - 2.97	N/A	
O <sub>3</sub>	N/A		0.61	-0.98 - 2.23	N/A	
<b>Cardiovascular groups</b>						
Definite chronic coronary artery disease						
Unadjusted	-1.00	-4.86 - 3.02	1.68	-0.05 - 3.45	1.28	-0.30 - 2.89
SO <sub>2</sub>	-0.93	-4.89 - 3.21	1.47	-0.31 - 3.29	1.11	-0.52 - 2.76
O <sub>3</sub>	-0.20	-4.14 - 3.90	1.06	-0.70 - 2.85	0.85	-0.75 - 2.48
Congestive heart failure						
Unadjusted	N/A		2.77	0.81 - 4.77	2.64	0.81 - 4.51
SO <sub>2</sub>	N/A		2.30	0.29 - 4.35	2.34	0.46 - 4.25
O <sub>3</sub>	N/A		2.28	0.29 - 4.31	2.05	0.20 - 3.94
Cerebrovascular disease						
Unadjusted	N/A		0.50	-1.92 - 2.98	0.70	-1.54 - 2.99
SO <sub>2</sub>	N/A		0.42	-2.07 - 2.97	0.42	-1.88 - 2.77
O <sub>3</sub>	N/A		-0.01	-2.47 - 2.50	0.20	-2.07 - 2.52
Any coronary artery disease						
Unadjusted	0.33	-3.08-3.85	1.14	-0.40-2.70	0.98	-0.42-2.39
SO <sub>2</sub>	0.53	-2.98-4.17	1.01	-0.57-2.62	0.96	-0.47-2.42
O <sub>3</sub>	0.64	-2.83-4.24	0.60	-0.96-2.18	0.60	-0.81-2.04
Any cardiovascular disease						
Unadjusted	0.37	-2.21 - 3.02	1.76	0.62 - 2.91	1.53	0.48 - 2.58
SO <sub>2</sub>	0.18	-2.47 - 2.90	1.77	0.60 - 2.96	1.51	0.44 - 2.59
O <sub>3</sub>	0.28	-2.34 - 2.98	1.49	0.33 - 2.66	1.29	0.23 - 2.36

<sup>a</sup> The statistical model was  $E(\log(y_i)) = \alpha + \text{loess}(i, \text{span}=2.49\%) + \text{loess}(\text{year}) + \text{loess}(\text{Mean temperature}_0, \text{Change in barometric pressure from the previous 24 hours}_0) + \text{loess}(\text{gaseous pollutant}_0) + \beta * \text{particle pollutant}$ , where  $i$  is an indicator for day. CI, confidence interval. N/A, not analysed.

<sup>b</sup> MPCs calculated for an increase of exposure equal to the interquartile range.

**Table M.17.** Synthesis of Results of the Mean Percent Change for the Different Subgroups of Disease Status for Selected Measures of Particulates Evaluated at the Interquartile Range, Montreal, 1984-1993<sup>a</sup>

Subgroup	COH	Extinction	TSP	Lag 0				Sulfate from Sulfate	Sulfate from PM <sub>2.5</sub>	Predicted sulfate from PM <sub>2.5</sub>
				PM <sub>10</sub>	PM <sub>2.5</sub>	Predicted PM <sub>2.5</sub>	Sulfate from PM <sub>2.5</sub>			
<b>No billings</b>	2.89	1.19	-1.93	-3.02	-7.38*	4.68*	2.17	-2.31	2.76*	
<b>Cancer</b>	1.27*	1.48*	1.43	2.67	2.19	1.72*	1.08*	3.72*	1.51*	
<b>Respiratory indices</b>										
Acute upper respiratory disease	1.66	-1.58	24.22*	N/C	N/C	4.08	3.30	N/C	3.64	
Chronic upper respiratory disease	-0.33	-4.15	5.94	11.51*	7.24	-0.08	0.56	N/C	-0.08	
Acute lower respiratory disease	1.04	1.42	3.81	1.42	1.26	2.12*	1.09	-0.13	1.52	
Definite airways disease	0.61	1.24	-0.40	-0.89	-1.28	1.47*	0.14	-1.39	0.90	
<b>Cardiovascular indices</b>										
Definite acute coronary artery disease	1.51	1.06	7.43*	2.94	1.73	1.94	0.43	-0.61	0.95	
Definite chronic coronary artery disease	1.76*	1.11	2.14	0.41	2.33	1.66	0.41	2.95	0.85	
Congestive heart failure	2.88*	2.98*	5.45*	0.90	2.13	3.44*	1.67*	0.09	2.61*	
Hypertension	1.65	1.53	0.12	-2.07	0.60	1.97	0.23	N/C	1.12	
Cerebrovascular disease	0.69	0.53	-1.19	1.23	1.36	1.72	0.42	-1.48	0.88	
Any coronary artery disease	1.40	0.66	3.76	1.59	1.66	1.74*	0.73	2.19	1.02	
Any cardiovascular disease	1.82*	1.10*	1.30	0.86	1.19	2.05*	0.72	0.78	1.19*	

Continued...

**Table M.17, continued.**

Subgroup	COH	Extinction	TSP	PM <sub>10</sub>	PM <sub>2.5</sub>	Sulfate		Sulfate from PM <sub>2.5</sub>	Predicted sulfate from PM <sub>2.5</sub>
						Predicted PM <sub>2.5</sub>	from Sulfate		
<b>No billings</b>	-0.68	2.78	9.20	N/C	-0.81	2.94	1.61	N/C	2.51
<b>Cancer</b>	1.39*	0.79	0.74	-0.79	0.66	1.31*	0.54	0.89	0.81
<b>Respiratory indices</b>				<b>Lag 1</b>					
Acute upper respiratory disease	3.72	0.68	3.17	N/C	N/C	5.14	3.73	N/C	4.11
Chronic upper respiratory disease	2.92	-2.32	2.77	0.04	N/C	1.39	1.64	N/C	0.63
Acute lower respiratory disease	4.38*	0.59	4.91	3.74	3.53	3.27*	1.83*	4.61*	1.86*
Definite airways disease	1.44	1.41*	6.60*	2.29	4.24*	1.11	0.60	2.65	0.95
<b>Cardiovascular indices</b>									
Definite acute coronary artery disease	2.31	0.70	-5.14	-0.33	0.48	2.38	0.68	-0.29	1.09
Definite chronic coronary artery disease	1.98*	0.25	4.09	3.50	3.08	1.82*	0.66	1.42	0.98
Congestive heart failure	4.17*	1.58	0.94	3.78	4.08	2.81*	1.18	2.91	1.53*
Hypertension	1.99	0.57	-0.76	2.70	2.54	0.34	0.14	N/C	0.23
Cerebrovascular disease	1.71	0.96	8.09*	3.85	1.70	1.77	1.03	1.23	1.13
Any coronary artery disease	2.56*	0.35	2.37	1.90	2.00	1.60*	0.30	0.97	0.61
Any cardiovascular disease	2.95*	1.14*	2.75	2.70*	2.51*	2.49*	1.11*	2.31*	1.52*

Continued...

**Table M.17, continued.**

Subgroup	COH	Extinction	Predicted		
			PM <sub>2.5</sub>	Sulfate from Sutton	sulfate from PM <sub>2.5</sub>
<b>No billings</b>	0.84	1.82	<b>3-day mean</b>		
<b>Cancer</b>	2.42*	1.52*	4.70*	3.18*	3.30*
<b>Respiratory indices</b>			1.84*	0.89	1.14*
Acute upper respiratory disease	4.57	-0.95	7.28	6.36*	6.56*
Chronic upper respiratory disease	2.39	-2.38	3.81	4.34*	3.41
Acute lower respiratory disease	5.09*	1.71	4.72*	2.25*	2.90*
Definite airways disease	1.53	2.08*	1.33	0.51	1.02
<b>Cardiovascular indices</b>					
Definite acute coronary artery disease	2.35	1.30	2.27	0.99	1.30
Definite chronic coronary artery disease	2.62*	1.59	2.20*	0.63	1.28
Congestive heart failure	4.99*	3.24*	4.02*	1.91*	2.64*
Hypertension	3.35	1.36	1.88	0.53	0.87
Cerebrovascular disease	1.73	0.32	1.53	0.63	0.70
Any coronary artery disease	2.99*	1.10	1.85*	0.69	0.98
Any cardiovascular disease	3.65*	1.65*	2.76*	1.16*	1.53*

\* , corrected t-value > 1.96.

<sup>a</sup> The statistical model was  $E(\log(Y_i)) = \alpha + \text{loess}(i, \text{span}=2.49\%) + \text{loess}(\text{year}) + \text{loess}(\text{Mean temperature}_0, \text{Change in barometric pressure from the previous 24 hours}_0) + \beta * \text{pollutant}$ , where  $Y_i$  is the number of nonaccidental deaths on day  $i$  for subjects included in each subgroup. CI, confidence interval. N/C, convergence of model not attained.