

Table 7. Impact of Selected Ecologic Covariates on the Relative Risks of Mortality Associated with an increase in Sulfate or Fine Particles Using Spatial Analytic Methods (Two-Stage Regressions) and the ACS Study Data^a

Ecologic Covariate ^b	Sulfate				Fine Particles		
	Independent Observations	Random Effects			Independent Observations	Random Effects	
		Independent Cities	Regional Adjustment	Spatial Filtering ^c		Independent Cities	Regional Adjustment
All-Cause Mortality							
Pollutant alone	1.17 (1.07-1.27)	1.25 (1.13-1.37)	1.19 (1.06-1.34)	1.09 (1.01-1.19)	1.18 (1.03-1.35)	1.29 (1.12-1.48)	1.16 (0.99-1.37)
SO ₂	1.05 (0.98-1.12)	1.13 (1.02-1.25)	1.10 (0.97-1.24)	1.05 (0.97-1.14)	1.03 (0.95-1.13)	1.14 (0.98-1.32)	1.11 (0.93-1.33)
Gaseous copollutants	1.06 (0.98-1.14)	1.05 (0.93-1.18)	1.06 (0.90-1.26)	1.05 (0.96-1.14)	1.06 (0.95-1.18)	1.11 (0.95-1.29)	1.09 (0.92-1.29)
Socioeconomic status	1.10 (1.02-1.18)	1.17 (1.05-1.31)	1.21 (1.06-1.38)	1.11 (1.01-1.21)	1.15 (1.03-1.27)	1.23 (1.02-1.48)	1.15 (0.96-1.39)
25% ^d	1.18 (1.07-1.30)	1.10 (0.99-1.22)	1.10 (0.97-1.24)	1.09 (0.94-1.26)	1.12 (0.96-1.31)	1.06 (0.89-1.26)	1.05 (0.85-1.30)
Cardiopulmonary Disease Mortality							
Pollutant alone	1.25 (1.12-1.39)	1.29 (1.15-1.46)	1.19 (1.06-1.34)	1.13 (1.01-1.27)	1.30 (1.11-1.53)	1.38 (1.17-1.62)	1.24 (1.01-1.52)
SO ₂	1.13 (1.03-1.24)	1.18 (1.04-1.34)	1.12 (0.96-1.32)	1.10 (0.99-1.22)	1.17 (1.03-1.33)	1.25 (1.05-1.49)	1.23 (0.97-1.55)
Gaseous copollutants	1.11 (0.99-1.24)	1.11 (0.97-1.27)	1.15 (0.93-1.42)	1.10 (0.99-1.23)	1.22 (1.05-1.42)	1.28 (1.05-1.49)	1.26 (0.96-1.66)
Socioeconomic status	1.15 (1.04-1.28)	1.18 (1.02-1.37)	1.21 (1.01-1.44)	1.12 (0.99-1.27)	1.16 (1.00-1.35)	1.19 (0.98-1.45)	1.13 (0.91-1.40)
25% ^e	1.02 (0.84-1.25)	1.07 (0.93-1.24)	1.12 (0.96-1.32)	1.20 (1.01-1.43)	1.18 (1.00-1.40)	1.10 (0.91-1.34)	1.23 (0.97-1.55)
Lung Cancer Mortality							
Pollutant alone	1.31 (1.05-1.65)	1.39 (1.09-1.75)					
SO ₂	1.37 (1.08-1.73)	1.39 (1.08-1.81)					
Gaseous copollutants	1.61 (1.21-2.15)	1.63 (1.19-2.23)					
Socio-economic status	1.14 (0.89-1.45)	1.23 (0.90-1.68)					
25% ^f	1.39 (0.98-1.99)	1.39 (0.97-2.01)					

a Relative risks were calculated for a change in the pollutant of interest equal to the difference in mean concentrations between the most-polluted city and the least-polluted city; in the ACS Study, this difference for fine particles was 24.5 g/m³, and for sulfate was 19.9 g/m³.

b The models for rows marked 25% incorporated all the ecologic covariates that, when analyzed individually in a bivariate model, were found to produce a change of 25% or more in the relative risk associated with the pollutant of interest. The covariates included in each model are reported in HEI, 2000

c Used Filtered Both Sides Model.

d HEI, 2000, Tables 40 and 41 for sulfates; Tables 46 and 47 for fine particles.

e HEI, 2000, Tables 42 and 43 for sulfates; Tables 48 and 49 for fine particles.

f HEI 2000, Tables 44 and 45.