



APPENDIX AVAILABLE ON REQUEST

Research Report 142

**Air Pollution and Health: A European and North American Approach
(APHENA)**

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**Appendix E. Effect Modifier Tables for Canada, Europe,
and the United States**

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APPENDIX TABLE E.1. Effect modifiers: Canada

City	Population 1991	Population 1996	% Unemployed	% Over 65 yrs	% Over 75 yrs	% Under 15 yrs	% w/Edu Over 12 yrs	region	PM method	Num PM	Num O₃
Calgary	710,795	768,082	8.1	0.08	0.03	0.22	0.71	NA	NA	2	3
Edmonton	616,741	616,306	9.2	0.10	0.04	0.21	0.66	NA	NA	1	3
Halifax	231,160	233,178	9.21	0.11	0.05	0.18	0.7	NA	NA	3	4
Hamilton	318,499	322,352	10.9	0.14	0.06	0.18	0.57	NA	NA	1	5
Montreal	1,775,871	1,775,846	13.2	0.14	0.06	0.16	0.64	NA	NA	5	19
Ottawa	879,683	938,745	7.26	0.10	0.04	0.20	0.73	NA	NA	1	3
Quebec	539,518	555,616	9.5	0.12	0.05	0.17	0.7	NA	NA	3	6
Saint John	102,912	101,577	11.26	0.13	0.06	0.20	0.62	NA	NA	2	5
Toronto	2,275,771	2,385,421	9.61	0.13	0.05	0.17	0.65	NA	NA	5	17
Vancouver	1,831,665	1,602,590	9.2	0.12	0.05	0.18	0.7	NA	NA	3	23
Windsor	191,435	197,694	13	0.14	0.06	0.19	0.61	NA	NA	2	2
Winnipeg	615,215	618,477	8.8	0.13	0.06	0.20	0.62	NA	NA	1	2

APPENDIX TABLE E.1. continued – Effect modifiers: Canada

City	PM ₁₀ mean	PM ₁₀ SD	PM ₁₀ CV	NO ₂ mean	NO ₂ SD	NO ₂ CV	O ₃ mean	O ₃ SD	O ₃ CV	SO ₂ mean	SO ₂ SD	SO ₂ CV
Calgary	24.06	13.06	0.54	43.79	15.47	0.35	33.81	11.37	0.34	8.69	7.34	0.84
Edmonton	23.17	13.01	0.56	44.19	16.54	0.37	31.65	13.04	0.41	7.10	8.09	1.14
Halifax	17.07	9.54	0.56	27.24	14.54	0.53	31.13	10.45	0.34	28.43	20.93	0.74
Hamilton	30.26	19.03	0.63	38.06	13.12	0.34	34.86	18.54	0.53	26.79	15.43	0.58
Montreal	26.66	15.78	0.59	37.59	13.43	0.36	28.06	14.01	0.50	18.49	12.94	0.70
Ottawa	20.40	12.69	0.62	35.43	13.56	0.38	28.69	12.41	0.43	10.00	9.55	0.96
Quebec	21.34	12.99	0.61	34.90	19.62	0.56	27.90	12.67	0.45	24.47	47.63	1.95
Saint John	13.58	9.01	0.66	24.11	20.04	0.83	33.53	12.03	0.36	29.70	30.09	1.01
Toronto	26.32	14.69	0.56	43.04	13.55	0.31	34.88	17.11	0.49	14.00	11.61	0.83
Vancouver	19.89	10.13	0.51	36.20	12.29	0.34	27.00	11.47	0.42	13.20	8.23	0.62
Windsor	31.01	16.80	0.54	43.52	16.82	0.39	36.16	21.72	0.60	24.61	15.85	0.64
Winnipeg	25.52	15.54	0.61	28.28	12.51	0.44	30.99	12.27	0.40	4.38	6.87	1.57

APPENDIX TABLE E.1. continued: Effect modifiers: Canada

City	NO ₂ PM ₁₀	Temp	Minimum Temp	Maximum Temp	Temp Var	Rel humidity	% Cardio Resp	Crude Mort	Age StandMort	PM densPop	PM densArea	O ₃ densPop	O ₃ densArea
Calgary	2.13	4.468	-28.02	22.34	113.83	60.76	0.50	838.01	513.02	2.70E-06	0.0029	4.06E-06	0.0043
Edmonton	2.30	2.90	-30.92	22.09	144.62	68.95	0.50	755.27	489.86	1.62E-06	0.0015	4.87E-06	0.0045
Halifax	1.91	6.11	-18.54	24.43	98.35	77.58	0.48	783.89	478.05	1.29E-05	0.0088	1.72E-05	0.0117
Hamilton	1.65	7.69	-17.51	26.71	109.16	73.43	0.50	892.88	543.35	3.12E-06	0.0081	1.56E-05	0.0407
Montreal	1.63	6.41	-24.17	27.13	144.35	69.79	0.47	870.22	536.29	2.82E-06	0.0101	1.07E-05	0.0385
Ottawa	2.32	6.11	-24.85	27.45	149.52	69.09	0.50	902.52	512.64	1.10E-06	0.0003	5.50E-06	0.0010
Quebec	1.78	4.41	-26.59	25.55	153.31	70.81	0.50	795.85	504.30	5.48E-06	0.0055	1.10E-05	0.0110
Saint John	2.04	4.98	-21.54	22.67	101.96	75.31	0.53	946.40	560.47	1.96E-05	0.0045	4.89E-05	0.0112
Toronto	1.95	7.81	-18.2	27.76	111.98	72.09	0.46	1,006.53	511.30	2.15E-06	0.0079	7.29E-06	0.0270
Vancouver	2.16	10.49	-6.31	22.73	34.36	79.42	0.51	796.40	486.74	1.75E-06	0.0012	1.34E-05	0.0093
Windsor	1.80	9.61	-15.9	28.96	110.11	70.99	0.54	775.47	485.28	1.03E-05	0.0166	1.03E-05	0.0166
Winnipeg	1.57	2.66	-31.96	27.42	211.56	72.04	0.50	901.66	555.37	1.62E-06	0.0017	3.24E-06	0.0035

APPENDIX TABLE E.2. Effect modifiers: Europe

City	Number of PM monitors	Number of O ₃ monitors	Density per popul PM	Density per popul O ₃	PM ₁₀ mean	PM ₁₀ SD	PM ₁₀ CV	O ₃ 1h mean	O ₃ SD	O ₃ CV	SO ₂ 24h mean	SO ₂ SD	SO ₂ CV
Athens	2	8	1,536,461	384,115	42.7	12.9	0.3	87.1	36.4	0.4	53.4	33.7	0.6
Barcelona	3	3	547,838	547,838	63.5	26.4	0.4	71.9	31.8	0.4	12.1	2.3	0.2
Basel	1	2	360,000	180,000	31.2	18.9	0.6	64.0	39.9	0.6	12.3	10.2	0.8
Birmingham	1	1	2,300,000	2,300,000	24.5	13.9	0.6	55.7	25.8	0.5	22.5	15.4	0.7
Budapest	8	2	241,324	965,296	41.0	9.1	0.2	83.8	36.3	0.4	42.6	15.1	0.4
Cracow	8	-	93,251	-	59.0	21.2	0.4	-	-	-	56.4	36.4	0.7
Erfurt	1	1	215,978	215,978	56.4	38.4	0.7	76.2	43.3	0.6	52.9	72.8	1.4
Geneva	1	5	317,000	63,400	39.7	25.3	0.6	67.3	41.9	0.6	11.8	9.2	0.8
Helsinki	1	2	827,851	413,926	27.7	17.5	0.6	58.0	20.0	0.3	7.7	7.5	1.0
Liubljana	-	1	-	321,599	-	-	-	80.0	63.2	0.8	35.8	31.9	0.9
London	1	2	6,904,800	3,452,400	28.8	13.7	0.5	44.9	13.5	0.6	24.1	11.4	0.5
Lyon	5	3	83,096	138,493	41.8	19.2	0.5	66.6	40.7	0.6	25.7	15.4	0.6
Madrid	12	3	251,004	1,004,015	37.8	17.7	0.5	56.0	33.2	0.6	35.5	27.2	0.8
Milan	2	1	671,345	1,342,689	53.0	26.3	0.5	52.7	48.7	0.9	35.0	39.1	1.1
Netherlands	8	12	1,925,000	1,283,333	40.1	23.8	0.6	69.8	37.0	0.5	9.7	7.6	0.8
Paris	4	5	1,675,000	1,340,000	26.8	17.5	0.7	43.4	32.3	0.7	18.9	13.7	0.7
Prague	11		110,241	-	76.2	45.7	0.6	85.3	47.8	0.6	47.8	43.2	0.9
Rome	3	3	925,083	925,083	58.7	17.5	0.3	47.5	33.4	0.7	12.9	8.5	0.7
Stockholm	1	1	1,125,806	1,125,806	15.6	7.9	0.5	65.0	21.0	0.3	5.2	4.1	0.8
Tel Aviv	2	3	570,500	380,333	50.3	57.5	1.1	36.7	16.0	0.4	22.2	14.1	0.6
Teplice	5	1	125,081	625,403	47.9	29.8	0.6	55.5	34.9	0.6	62.2	61.0	1.0
Turin	3	1	308,670	926,010	74.5	40.1	0.5	88.6	54.1	0.6	32.6	30.2	0.9
Valencia	-	2	-	376,455	-	-	-	59.1	22.9	0.4	25.6	11.3	0.4
Zurich	2	3	270,000	180,000	31.3	18.6	0.6	66.8	42.0	0.6	13.3	11.7	0.9

APPENDIX TABLE E.2. (continued) Effect modifiers: Europe

City	NO ₂ 24h mean	NO ₂ 24h SD	NO ₂ 24h CV	NO ₂ /PM ₁₀	Temp mean	Temp Var	Temp-min Mean	Temp-max Mean	Humidity mean	Humidity Var
Athens	80.7	30.3	0.4	1.9	17.8	54.7	14.5	22.2	61.7	184.5
Barcelona	51.4	15.2	0.3	0.8	16.4	30.6	13.8	19.4	74.9	63.9
Basel	39.9	16.0	0.4	1.3	10.7	51.6	7.0	14.8	75.6	112.0
Birmingham	47.0	17.5	0.4	1.9	9.6	27.1	5.9	13.2	78.2	105.0
Budapest	81.9	44.9	0.3	2.0	12.8	78.0	6.8	19.3	70.1	159.8
Cracow	48.4	27.5	0.6	0.8	8.3	71.2	3.9	13.2	79	98.1
Erfurt	39.5	24.5	0.6	0.7	8.7	59.9	4.7	12.7	76.5	142.7
Geneva	47.2	15.2	0.3	1.2	10.9	51.8	6.9	15.0	73.2	120.7
Helsinki	34.4	13.7	0.4	1.2	5.9	65.4	3.0	9.0	78.2	146.1
Liubljana	49.7	21.2	0.4		10.8	66.4	6.6	15.6	74.1	171.4
London	63.3	19.9	0.3	2.2	11.8	29.1	8.7	14.9	69.4	126.9
Lyon	66.6	33.9	0.3	1.6	12.4	51.3	8.1	16.8	72.3	129.6
Madrid	76.3	44.6	0.4	2.0	14.5	54.3	7.9	21.2	61.8	278.0
Milan	100.7	34.3	0.3	1.9	13.7	58.1	10.4	17.4	68.8	250.3
Netherlands	33.0	17.2	0.3	0.8	10.2	37.8	6.3	13.8	82.6	90.7
Paris	54.0	17.3	0.3	2.0	12.0	42.5	8.7	15.8	75.9	152.0
Prague	60.7	24.5	0.4	0.8	9.9	69.8	6.0	14.1	70.3	196.6
Rome	91.8	35.5	0.2	1.6	16.8	44.5	12.9	20.9	61.6	142.6
Stockholm	26.3	9.6	0.4	1.7	7.4	57.5	4.6	10.7	70.9	225.5
Tel Aviv	86.8	99.7	0.7	1.7	20.4	29.5	16.5	24.3	66	119.2
Teplice	34.1	11.9	0.4	0.7	9.0	62.0	-	-	74.2	148.6
Turin	80.4	30.9	0.4	1.1	14.3	56.3	10.9	18.1	65.6	357.1
Valencia	66.8	26.6	0.4		18.6	28.8	14.0	23.2	63.2	190.9
Zurich	42.2	14.7	0.4	1.4	9.6	54.2	6.4	13.2	77.3	139.9

APPENDIX TABLE E.2. (continued) Effect modifiers: Europe

City	% cardio-respiratory deaths/total	Crude mortality rate	Age-stand mortality rate	% populat. >65 yrs	% populat. >75 yrs	% children <15	Unemployment rate
Athens	55.5	8.8	784.4	12.9	5.3	18.2	12.7
Barcelona	47.8	10.5	740.2	17.1	7.3	14.4	11.4
Basel	53.3	10.5	678.0	16.5	7.6	14.6	
Birmingham	60.8	10.6	894.9	15.3	6.5	19.8	10.4
Budapest	54.0	10.2	1136.0	17.6	6.6	15.0	
Cracow	58.9	9.8	1008.7	11.5	7.1	18.6	9.3
Erfurt		10.8	971.6	13.0	5.5	15.8	
Geneva	46.7	8.3	608.0	13.7	6.4	15.7	
Helsinki	56.7	8.9	915.0	11.3	5.0	17.5	6.4
Liubljana	45.7	8.6	823.0	12.9	4.5	17.0	
London	59.4	9.6	850.7	13.9	6.5	18.8	7.5
Lyon	42.2	8.3	579.2	16.3	8.5	15.3	10.2
Madrid	45.6	7.6	636.2	15.0	6.1	15.2	13.0
Milan	45.5	11.1	623.3	21.4	9.6	10.2	5.6
Netherlands	50.1	8.7	757.0	12.9	5.5	18.4	
Paris	38.2	7.1	644.0	8.6	3.9	15.5	12.1
Prague	62.4	12.5	984.4	15.9	5.7	15.9	4.0
Rome	47.0	7.3	584.9	14.5	6.2	13.9	11.6
Stockholm	57.3	10.3	665.5	16.7	11.0	16.1	3.9
Tel Aviv	48.9	4.7	429.5	14.1	5.9	23.6	
Teplice	60.0	10.9	1172.6	11.3	3.5	19.4	
Turin	50.0	10.6	723.6	18.3	7.8	9.7	9.0
Valencia	48.1	9.0	820.0	14.0	5.5	17.8	15.3
Zurich	50.8	9.3	666.0	14.5	7.2	15.6	

APPENDIX TABLE E.3. – Effect modifiers: US

City	city.abb	population	% Unemployed	% Over 65	% Over 75	% Under 15	%Edu Over 12yrs	Region	PM method	Num PM	Num O ₃
Akron	akr	542,899	5.02	14.1	6.8	21	85.70	Industrial Midwest	NA	2	1
Albuquerque	albu	556,678	5.74	11.5	5.4	21.1	84.43	South West	NA	6	4
Anchorage	anch	260,283	6.36	5.3	2	24.3	90.29	Other	NA	5	NA
Atlanta	atla	1,481,871	7.32	8.3	3.9	20.7	84.48	South East	NA	3	2
Austin	aust	812,280	4.09	6.7	3	20.1	84.68	South West	NA	1	2
Bakersfield	bake	661,645	11.84	9.4	4.2	26.7	68.47	Southern California	NA	3	6
Baltimore	balt	651,154	10.69	13.2	6.3	20.8	68.37	North East	NA	7	2
Baton Rouge	batr	412,852	6.28	9.9	4.5	21.5	83.89	South East	NA	1	4
Birmingham	birm	662,047	6.30	13.7	6.5	20.6	80.89	South East	NA	7	5
Boston	bost	689,807	7.04	11.1	5.5	17.1	78.14	North East	NA	5	1
Buffalo	buff	950,265	7.26	16	7.9	20.2	82.89	Industrial Midwest	NA	5	1
Charlotte	char	695,454	5.17	8.5	3.8	21.4	86.23	South East	NA	4	2
Chicago	chic	5,376,741	7.54	11.7	5.6	21.8	77.70	Industrial Midwest	NA	16	14
Cincinnati	cinc	845,303	5.00	13.5	6.5	21.5	82.75	Industrial Midwest	NA	4	3
Cleveland	clev	1,393,978	6.17	15.6	7.8	20.9	81.63	Industrial Midwest	NA	8	3
Columbus, OH	clmo	1,068,978	4.21	9.8	4.4	21.3	85.74	Industrial Midwest	NA	4	3
Colorado Springs	colo	516,929	4.26	8.6	3.8	23.1	91.25	North West	NA	3	2
Corpus Christi	corp	313,645	7.50	11.2	4.8	23.6	74.37	South West	NA	2	2
Dayton	dayt	559,062	5.27	13.7	6.3	20.6	83.49	Industrial Midwest	NA	3	1
Washington	dc	572,059	10.68	12.3	5.9	17.1	77.83	North East	NA	3	4
Denver	denv	1,406,460	4.54	9.5	4.4	21.2	82.95	North West	NA	7	5
Des Moines	desm	374,601	4.74	11.1	5.4	21.6	88.33	Upper Midwest	NA	2	2
Detroit	det	2,061,162	8.50	12.1	5.8	23.8	76.98	Industrial Midwest	NA	6	4
Dallas/Fort Worth	dlft	4,199,873	4.84	7.8	3.4	23.8	79.31	South East	NA	6	6
El Paso	elpa	679,622	9.18	9.8	3.9	26.7	65.77	South West	NA	4	4

APPENDIX TABLE E.3. (continued) – Effect modifiers: US

City	city.abb	population	% Unemployed	% Over 65	% Over 75	% Under 15	%Edu Over 12yrs	Region	PM method	Num PM	Num O ₃
Fresno	fres	799,407	11.80	9.9	4.7	26.7	67.52	Southern California	NA	4	5
Fort Wayne	ftwa	331,849	4.69	11.4	5.4	23.2	85.69	Industrial Midwest	NA	1	3
Grand Rapids	gdrp	574,335	4.42	10.4	5.1	23.6	84.61	Industrial Midwest	NA	2	1
Greensboro	grnb	421,048	5.47	11.7	5.4	20.1	82.97	South East	NA	2	1
Honolulu	hono	876,156	5.70	13.5	6.3	19.9	84.85	Other	NA	4	1
Houston	hous	3,400,578	6.43	7.4	3.1	24.4	74.63	South East	NA	5	12
Huntsville	hunt	276,700	5.68	10.8	4.4	21.5	85.42	South East	NA	5	1
Indianapolis	indi	860,454	5.37	11.1	5.3	21.8	81.64	Industrial Midwest	NA	11	4
Jackson	jcks	250,800	7.85	11	5.2	23.1	80.38	South East	NA	1	1
Jacksonville	jckv	778,879	4.77	10.4	4.7	22.1	82.72	South East	NA	3	2
Jersey City	jers	608,975	8.65	11.5	5.4	19	70.53	North East	NA	5	1
Kansas City, MO	kan	912,667	4.89	11.9	5.6	21.6	85.16	Upper Midwest	NA	5	5
Knoxville	knox	382,032	4.80	12.6	5.8	18.6	82.55	South East	NA	3	2
Los Angeles	la	9,519,338	8.22	9.7	4.5	23.8	69.90	Southern California	NA	7	15
Las Vegas	lasv	1,375,765	6.49	10.7	4.1	21.9	79.45	South West	NA	4	4
Lexington	lex	260,512	5.36	10	4.6	18	85.80	Industrial Midwest	NA	2	2
Lincoln	linc	250,291	3.62	10.4	5	19.4	90.50	Upper Midwest	NA	NA	1
Louisville	loui	693,604	5.04	13.5	6.3	20.3	81.85	Industrial Midwest	NA	6	3
Little Rock	ltrk	361,474	5.20	11.5	5.5	21	84.37	South East	NA	2	2
Madison	madi	426,526	3.82	9.3	4.7	18.7	92.16	Industrial Midwest	NA	2	2
Memphis	memp	897,472	6.80	10	4.6	23.7	80.78	South East	NA	2	2
Miami	miam	2,253,362	8.73	13.3	6.1	20.6	67.87	South East	NA	4	2
Milwaukee	milw	940,164	6.89	12.9	6.5	22.1	80.25	Industrial Midwest	NA	2	5
Minneapolis/St. Paul	minn	1,627,235	3.97	11.1	5.7	20.6	89.73	Upper Midwest	NA	8	NA
Mobile	mobi	399,843	7.55	12	5.4	23	76.72	South East	NA	5	1

APPENDIX TABLE E.3. (continued) – Effect modifiers: US

City	city.abb	population	% Unemployed	% Over 65	% Over 75	% Under 15	%Edu Over 12yrs	Region	PM method	Num PM	Num O ₃
Modesto	mode	446,997	11.64	10.4	5	26.1	70.36	North West	NA	1	2
Nashville	nash	569,891	5.19	11.2	5.2	18.8	81.52	South East	NA	5	2
New Orleans	no	484,674	9.45	11.7	5.7	22.1	74.69	South East	NA	2	1
Newark	nwk	793,633	9.28	11.9	5.7	22	75.58	North East	NA	3	1
New York	ny	8,931,737	8.99	12	5.6	20.5	73.48	North East	NA	13	7
Oakland	oakl	1,443,741	5.49	10.2	4.9	20.8	82.36	North West	NA	1	5
Oklahoma City	okla	660,448	5.10	12.2	5.7	21.3	82.52	South West	NA	2	2
Omaha	oma	463,585	3.92	11	5.2	22.1	87.30	Upper Midwest	NA	4	3
Orlando	orla	896,344	5.02	10	4.5	21.2	81.78	South East	NA	7	2
Philadelphia	phil	1,517,550	10.90	14.1	7	21.3	71.22	North East	NA	7	5
Phoenix	phoe	3,072,149	4.72	11.7	5.5	22.9	82.50	South West	NA	6	9
Pittsburgh	pitt	1,281,666	6.08	17.8	9	18.2	86.33	Industrial Midwest	NA	24	4
Portland	port	998,877	5.95	11.1	5.7	19.7	86.74	North West	NA	NA	4
Providence	prov	621,602	6.23	14.6	7.7	20.1	72.46	North East	NA	3	2
Raleigh	ral	627,846	3.89	7.3	3.2	21.4	89.32	South East	NA	1	4
Riverside	rive	1,545,387	7.50	12.6	5.9	25.6	74.95	Southern California	NA	7	9
Rochester	roch	735,343	6.02	13	6.7	21.4	84.85	North East	NA	3	1
Sacramento	sacr	1,223,499	6.64	11.1	5.3	23.2	83.27	North West	NA	6	6
Salt Lake City	salt	898,387	4.55	8.1	3.8	25.2	86.83	North West	NA	4	4
San Antonio	sana	1,392,931	5.63	10.4	4.7	23.9	76.93	South West	NA	2	2
San Bernardino	sanb	1,709,434	8.14	8.5	3.7	27.3	74.21	Southern California	NA	9	8
San Diego	sand	2,813,833	5.56	11.1	5.4	21.7	82.58	Southern California	NA	7	9
San Francisco	sanf	776,733	4.59	13.8	6.7	12.1	81.19	North West	NA	1	NA
San Jose	sanj	1,682,585	3.89	9.5	4.3	21	83.40	North West	NA	3	6
Seattle	seat	1,737,034	4.47	10.5	5.3	18.8	90.26	North West	NA	6	4

APPENDIX TABLE E.3. (continued) – Effect modifiers: US

City	city.abb	population	area	% Unemployed	% Over 65	% Over 75	% Under 15	%Edu Over 12yrs	Region	PM method	Num PM	Num O ₃
Shreveport	shr	350,471	4,458,002,544	8.00	12.8	5.9	22.4	79.87	South East	NA	1	2
Spokane	spok	417,939	4,567,796,041	7.85	12.5	6.4	21	89.10	North West	NA	6	1
Santa Ana/Anaheim	staa	2,846,289	2,044,547,652	5.03	9.8	4.6	23	79.46	Southern California	NA	2	5
St. Louis	stlo	348,189	160,381,752	11.25	13.7	7.1	21.6	71.29	Industrial Midwest	NA	4	4
Stockton	stoc	563,598	3,624,124,428	10.34	10.6	5.1	25.8	71.23	North West	NA	1	3
St. Petersburg	stpe	921,482	724,980,947	4.25	22.6	12	16.1	84.01	South East	NA	4	3
Syracuse	syra	458,336	2,020,950,659	5.39	13.8	6.7	21.5	85.67	North East	NA	4	2
Tacoma	taco	700,820	4,348,366,146	6.15	10.2	4.8	22.7	86.87	North West	NA	3	3
Tampa	tamp	998,948	2,721,840,817	5.61	12	5.5	21.3	80.76	South East	NA	11	4
Toledo	tole	455,054	881,799,074	6.32	13.1	6.4	22	82.92	Industrial Midwest	NA	3	3
Tucson	tucs	843,746	23,792,316,898	5.26	14.2	6.7	20.6	83.43	South West	NA	8	6
Tulsa	tuls	563,299	1,477,070,950	4.77	11.8	5.5	21.9	85.06	South East	NA	4	1
Wichita	wich	452,869	2,588,371,255	4.79	11.4	5.4	23.6	85.09	Upper Midwest	NA	4	2
Worcester	wor	750,963	3,918,817,426	4.25	13	6.8	21.5	83.46	North East	NA	2	2

APPENDIX TABLE E.3. (continued) – Effect modifiers: US

City	PM ₁₀ mean	PM ₁₀ SD	PM ₁₀ CV	NO ₂ mean	NO ₂ SD	NO ₂ CV	O ₃ mean	O ₃ SD	O ₃ CV	SO ₂ mean	SO ₂ SD	SO ₂ CV
Akron	27.98	12.14	0.43	NA	NA	NA	30.98	12.90	0.42	11.95	7.82	0.65
Albuquerque	27.53	14.42	0.52	NA	NA	NA	27.49	9.75	0.35	NA	NA	NA
Anchorage	19.20	19.93	1.04	NA	NA	NA	NA	NA	NA	NA	NA	NA
Atlanta	33.42	15.89	0.48	20.94	7.70	0.37	24.77	10.26	0.41	6.53	6.12	0.94
Austin	23.28	11.85	0.51	NA	NA	NA	27.85	10.56	0.38	0.90	2.63	2.93
Bakersfield	46.80	28.76	0.61	17.55	6.90	0.39	37.55	15.96	0.43	3.19	2.72	0.85
Baltimore	32.91	16.30	0.50	25.97	9.57	0.37	32.94	13.29	0.40	8.59	5.52	0.64
Baton Rouge	27.32	11.33	0.41	17.39	6.69	0.38	23.48	10.07	0.43	5.84	4.08	0.70
Birmingham	32.63	20.79	0.64	NA	NA	NA	24.13	9.05	0.38	4.02	4.76	1.18
Boston	26.46	12.20	0.46	25.27	8.37	0.33	19.72	12.20	0.62	9.23	6.24	0.68
Buffalo	21.98	12.47	0.57	19.39	6.93	0.36	24.16	12.74	0.53	9.37	6.31	0.67
Charlotte	28.11	12.11	0.43	17.63	6.37	0.36	32.56	11.43	0.35	NA	NA	NA
Chicago	34.22	18.46	0.54	25.33	7.98	0.31	20.27	10.45	0.52	5.39	3.22	0.60
Cincinnati	34.00	16.42	0.48	25.25	7.52	0.30	26.01	9.97	0.38	11.05	7.74	0.70
Cleveland	40.45	20.13	0.50	24.90	8.47	0.34	28.43	12.38	0.44	10.46	6.55	0.63
Columbus, OH	29.96	14.29	0.48	NA	NA	NA	26.70	11.58	0.43	6.91	6.17	0.89
Colorado Springs	25.12	15.03	0.60	NA	NA	NA	23.43	9.57	0.41	NA	NA	NA
Corpus Christi	28.23	13.45	0.48	NA	NA	NA	25.57	11.16	0.44	1.50	2.47	1.65
Dayton	28.89	14.30	0.50	NA	NA	NA	27.30	11.60	0.42	5.27	4.59	0.87
Washington	28.18	12.67	0.45	25.60	9.41	0.37	20.88	12.33	0.59	10.58	5.53	0.52
Denver	28.10	16.14	0.57	24.79	11.24	0.45	20.49	10.10	0.49	5.64	4.10	0.73
Des Moines	32.48	19.56	0.60	NA	NA	NA	14.46	9.77	0.68	NA	NA	NA
Detroit	35.42	21.06	0.59	22.78	8.31	0.36	23.45	10.94	0.47	7.45	4.56	0.61
Dallas/Fort Worth	26.19	12.81	0.49	14.22	6.63	0.47	27.73	11.52	0.42	2.41	2.41	1.00
El Paso	37.58	22.04	0.59	17.82	9.03	0.51	26.34	9.95	0.38	9.40	10.38	1.10

APPENDIX TABLE E.3. (continued) – Effect modifiers: US

City	PM ₁₀ mean	PM ₁₀ SD	PM ₁₀ CV	NO ₂ mean	NO ₂ SD	NO ₂ CV	O ₃ mean	O ₃ SD	O ₃ CV	SO ₂ mean	SO ₂ SD	SO ₂ CV
Fresno	23.88	12.56	0.53	NA	NA	NA	32.99	11.38	0.34	4.70	3.87	0.82
Fort Wayne	25.48	14.27	0.56	14.93	9.11	0.61	29.12	13.34	0.46	3.11	2.52	0.81
Grand Rapids	27.49	13.18	0.48	NA	NA	NA	34.17	10.90	0.32	4.88	3.27	0.67
Greensboro	16.02	5.37	0.34	NA	NA	NA	14.40	10.54	0.73	0.51	0.78	1.53
Honolulu	26.74	16.34	0.61	16.33	8.29	0.51	22.73	10.55	0.46	3.21	1.97	0.61
Houston	24.44	11.87	0.49	13.33	5.43	0.41	30.03	11.45	0.38	4.33	2.17	0.50
Huntsville	30.85	14.80	0.48	20.40	6.95	0.34	31.82	11.18	0.35	7.81	5.12	0.66
Indianapolis	25.34	12.51	0.49	NA	NA	NA	24.94	9.68	0.39	2.69	2.08	0.77
Jackson	29.21	11.92	0.41	15.33	6.33	0.41	25.92	10.20	0.39	2.20	2.04	0.93
Jacksonville	29.62	15.80	0.53	28.85	11.43	0.40	20.84	14.00	0.67	10.84	6.92	0.64
Jersey City	26.96	11.94	0.44	9.19	5.37	0.59	29.18	11.51	0.39	1.82	2.14	1.18
Kansas City, MO	33.34	14.57	0.44	NA	NA	NA	30.71	10.42	0.34	NA	NA	NA
Knoxville	43.46	20.14	0.46	39.98	14.09	0.35	23.05	12.10	0.52	2.18	1.98	0.91
Los Angeles	36.08	21.92	0.61	28.81	15.69	0.54	31.24	12.55	0.40	NA	NA	NA
Las Vegas	24.79	12.04	0.49	16.70	7.16	0.43	33.03	11.89	0.36	6.66	4.76	0.71
Lexington	NA	NA	NA	NA	NA	NA	27.33	9.24	0.34	NA	NA	NA
Lincoln	31.37	14.10	0.45	22.83	8.56	0.37	21.81	11.76	0.54	7.73	5.54	0.72
Louisville	29.72	12.88	0.43	9.98	5.02	0.50	28.19	10.71	0.38	2.85	2.51	0.88
Little Rock	23.37	13.25	0.57	NA	NA	NA	30.68	11.12	0.36	2.96	2.77	0.94
Madison	29.39	12.72	0.43	26.69	10.27	0.38	35.76	10.41	0.29	6.86	4.12	0.60
Memphis	25.74	10.18	0.40	11.81	6.58	0.56	27.18	10.08	0.37	NA	NA	NA
Miami	28.96	13.87	0.48	19.71	7.97	0.40	30.63	12.67	0.41	4.36	3.90	0.89
Milwaukee	24.87	14.82	0.60	19.33	7.62	0.39	NA	NA	NA	3.29	2.28	0.69
Minneapolis/St. Paul	27.49	12.31	0.45	NA	NA	NA	27.22	9.00	0.33	NA	NA	NA
Mobile	23.88	12.56	0.53	NA	NA	NA	32.99	11.38	0.34	4.70	3.87	0.82

APPENDIX TABLE E.3. (continued) – Effect modifiers: US

City	PM ₁₀ mean	PM ₁₀ SD	PM ₁₀ CV	NO ₂ mean	NO ₂ SD	NO ₂ CV	O ₃ mean	O ₃ SD	O ₃ CV	SO ₂ mean	SO ₂ SD	SO ₂ CV
Modesto	45.15	27.74	0.61	23.87	9.33	0.39	27.24	11.34	0.42	2.36	2.77	1.17
Nashville	32.55	15.08	0.46	13.05	7.32	0.56	19.88	10.04	0.51	10.62	6.56	0.62
New Orleans	25.49	12.62	0.49	21.37	8.19	0.38	21.34	9.98	0.47	NA	NA	NA
Newark	35.31	16.60	0.47	34.03	12.09	0.36	16.39	11.66	0.71	9.92	7.09	0.71
New York	28.22	13.26	0.47	35.32	10.65	0.30	19.17	11.00	0.57	13.77	8.68	0.63
Oakland	27.34	16.46	0.60	21.91	9.74	0.44	17.76	7.51	0.42	NA	NA	NA
Oklahoma City	24.94	12.58	0.50	13.35	7.01	0.53	29.69	12.16	0.41	3.30	2.86	0.87
Omaha	33.73	17.23	0.51	NA	NA	NA	23.00	10.32	0.45	1.16	3.57	3.07
Orlando	20.74	9.27	0.45	11.72	5.40	0.46	24.91	10.15	0.41	1.58	1.51	0.96
Philadelphia	39.00	15.05	0.39	32.95	9.68	0.29	21.75	13.44	0.62	10.73	7.75	0.72
Phoenix	44.22	16.86	0.38	22.78	10.10	0.44	24.79	9.83	0.40	3.00	1.94	0.65
Pittsburgh	31.54	21.33	0.68	28.02	8.36	0.30	20.87	11.86	0.57	15.41	9.32	0.60
Portland	NA	NA	NA	NA	NA	NA	21.10	7.94	0.38	2.93	1.82	0.62
Providence	30.88	14.07	0.46	18.94	7.77	0.41	28.59	12.49	0.44	9.44	7.23	0.77
Raleigh	24.40	10.72	0.44	14.30	7.17	0.50	34.96	10.39	0.30	NA	NA	NA
Riverside	40.12	21.94	0.55	19.82	10.02	0.51	34.66	16.21	0.47	0.81	1.46	1.80
Rochester	20.95	11.64	0.56	NA	NA	NA	23.90	12.60	0.53	11.09	7.08	0.64
Sacramento	27.24	19.80	0.73	15.74	7.24	0.46	26.17	10.23	0.39	2.25	3.04	1.35
Salt Lake City	35.24	22.77	0.65	27.87	13.68	0.49	31.47	10.54	0.33	7.35	7.60	1.03
San Antonio	23.59	11.41	0.48	8.88	7.10	0.80	24.04	10.13	0.42	NA	NA	NA
San Bernardino	40.85	21.75	0.53	24.54	11.09	0.45	37.66	16.67	0.44	1.41	1.42	1.01
San Diego	32.74	13.56	0.41	24.27	10.64	0.44	30.27	10.39	0.34	2.64	2.08	0.79
San Francisco	29.59	17.44	0.59	23.25	11.72	0.50	NA	NA	NA	NA	NA	NA
San Jose	31.90	22.16	0.69	27.61	13.22	0.48	18.27	7.91	0.43	NA	NA	NA
Seattle	26.61	16.69	0.63	20.41	7.01	0.34	21.65	7.95	0.37	3.03	3.27	1.08

APPENDIX TABLE E.3. (continued) – Effect modifiers: US

City	PM ₁₀ mean	PM ₁₀ SD	PM ₁₀ CV	NO ₂ mean	NO ₂ SD	NO ₂ CV	O ₃ mean	O ₃ SD	O ₃ CV	SO ₂ mean	SO ₂ SD	SO ₂ CV
Shreveport	25.08	12.42	0.50	NA	NA	NA	28.62	9.75	0.34	2.26	2.16	0.95
Spokane	32.50	22.41	0.69	NA	NA	NA	32.53	8.00	0.25	NA	NA	NA
Santa Ana/Anaheim	41.76	17.65	0.42	32.77	16.77	0.51	24.34	11.72	0.48	1.72	1.82	1.06
St. Louis	30.96	13.31	0.43	21.51	7.47	0.35	25.29	9.24	0.37	9.80	5.99	0.61
Stockton	39.71	24.05	0.61	19.21	8.99	0.47	24.83	9.87	0.40	2.28	3.01	1.32
St. Petersburg	23.68	10.25	0.43	12.16	7.24	0.59	25.48	10.53	0.41	3.27	4.47	1.37
Syracuse	26.59	12.94	0.49	NA	NA	NA	23.49	12.32	0.52	3.96	3.13	0.79
Tacoma	27.78	18.69	0.67	NA	NA	NA	18.38	8.37	0.46	4.96	4.53	0.91
Tampa	26.49	10.05	0.38	12.30	6.23	0.51	26.76	10.44	0.39	5.27	4.01	0.76
Toledo	26.50	13.02	0.49	NA	NA	NA	28.19	11.93	0.42	5.94	5.17	0.87
Tucson	24.23	14.83	0.61	21.24	6.89	0.32	27.62	9.25	0.33	1.90	1.34	0.71
Tulsa	25.14	13.33	0.53	16.83	7.67	0.46	31.59	11.79	0.37	7.93	9.00	1.13
Wichita	27.75	14.24	0.51	NA	NA	NA	25.01	10.55	0.42	4.83	2.43	0.50
Worcester	22.48	11.23	0.50	25.14	11.46	0.46	31.79	12.70	0.40	6.65	5.07	0.76

APPENDIX TABLE E.3. (continued) – Effect modifiers: US

City	NO ₂ PM ₁₀	Temp	Minimum Temp	Maximum Temp	Temp Var	Relative humidity	% CardioResp	Crude Mort	AgeStand Mort	PM densPop	PM densArea
Akron	NA	10.09	5.30	14.87	104.45	69.45	46.87	0.08	0.07	271,450	534,474,193
Albuquerque	NA	14.19	7.33	21.04	79.90	36.90	46.93	0.06	0.06	92,780	503,335,971
Anchorage	NA	2.70	-0.67	6.07	97.58	71.10	12.34	0.07	0.12	52,057	879,153,256
Atlanta	0.63	17.30	12.27	22.34	67.38	61.26	46.17	0.06	0.07	493,957	687,955,725
Austin	NA	20.61	15.16	26.06	59.51	61.08	48.81	0.04	0.05	812,280	2,562,287,673
Bakersfield	0.37	19.02	12.64	25.39	61.20	46.96	57.88	0.05	0.06	220,548	7,028,333,451
Baltimore	0.79	13.29	8.19	18.39	92.26	66.56	46.06	0.12	0.11	93,022	29,897,492
Baton Rouge	0.64	19.90	14.52	25.27	52.62	73.88	54.93	0.06	0.07	412,852	1,179,553,107
Birmingham	NA	17.02	11.20	22.84	68.79	69.14	49.22	0.10	0.08	94,578	411,662,735
Boston	0.96	10.85	6.87	14.83	90.74	65.58	48.09	0.07	0.07	137,961	30,311,139
Buffalo	0.88	9.18	4.83	13.53	105.88	68.97	56.78	0.10	0.08	190,053	540,898,402
Charlotte	0.63	16.42	11.23	21.61	71.17	59.69	49.69	0.05	0.06	173,864	340,761,493
Chicago	0.74	9.93	5.10	14.75	118.88	68.94	52.60	0.08	0.08	336,046	153,081,300
Cincinnati	0.74	12.29	7.22	17.36	100.91	66.39	53.30	0.09	0.08	211,326	263,767,456
Cleveland	0.62	10.41	5.84	14.98	103.36	69.47	53.13	0.10	0.08	174,247	148,435,185
Columbus, OH	NA	11.56	6.41	16.71	102.17	66.24	48.74	0.06	0.07	267,245	349,563,341
Colorado Springs	NA	9.49	2.71	16.26	88.15	52.13	43.19	0.04	0.06	172,310	1,835,825,684
Corpus Christi	NA	22.26	17.41	27.10	42.02	74.25	43.38	0.07	0.07	156,823	1,082,377,682
Dayton	NA	11.31	6.33	16.28	108.16	67.43	51.16	0.08	0.07	186,354	398,578,383
Washington	0.91	12.72	6.91	18.53	93.27	67.12	41.46	0.11	0.10	190,686	53,011,231
Denver	0.88	10.64	0.09	20.13	98.17	51.23	51.67	0.05	0.05	200,923	794,913,535
Des Moines	NA	10.18	5.03	15.33	134.91	66.09	56.47	0.07	0.07	187,301	737,300,273
Detroit	0.64	10.06	5.42	14.69	110.65	66.56	54.66	0.08	0.08	343,527	265,107,741
Dallas/Fort Worth	0.54	18.98	13.10	24.77	76.05	57.85	52.13	0.05	0.06	699,979	1,173,851,846
El Paso	0.47	18.09	10.81	25.36	69.22	35.48	46.71	0.05	0.05	169,906	655,983,185

APPENDIX TABLE E.3. (continued) – Effect modifiers: US

City	NO ₂ PM ₁₀	Temp	Minimum Temp	Maximum Temp	Temp Var	Relative humidity	% CardioResp	Crude Mort	AgeStand Mort	PM densPop	PM densArea
Fresno	0.43	17.97	11.20	24.74	59.08	53.67	52.07	0.06	0.06	199,852	3,860,846,810
Fort Wayne	NA	10.40	5.30	15.50	112.81	69.81	46.66	0.08	0.07	331,849	1,702,268,870
Grand Rapids	0.59	8.85	4.07	13.63	112.62	69.03	55.13	0.06	0.06	287,168	1,108,741,384
Greensboro	NA	14.79	9.39	20.19	76.62	64.39	55.04	0.06	0.06	210,524	840,998,881
Honolulu	NA	25.53	21.83	29.23	4.94	67.66	51.97	0.05	0.05	219,039	388,346,906
Houston	0.61	20.71	15.33	26.09	54.18	70.43	48.52	0.04	0.06	680,116	895,527,240
Huntsville	0.55	16.07	10.54	21.59	74.54	69.41	43.21	0.06	0.07	55,340	416,947,901
Indianapolis	0.66	11.69	6.64	16.74	107.98	67.38	51.16	0.08	0.08	78,223	93,298,169
Jackson	NA	18.17	12.19	24.15	65.51	73.52	52.57	0.09	0.09	250,800	2,251,177,952
Jacksonville	0.52	20.39	14.80	25.97	45.09	75.49	52.14	0.07	0.07	259,626	667,929,977
Jersey City	0.97	13.14	8.71	17.56	97.73	61.78	48.65	0.07	0.07	121,795	24,184,056
Kansas City, MO	0.34	12.44	7.10	17.79	117.71	65.41	53.21	0.07	0.07	182,533	736,346,277
Knoxville	NA	14.95	9.39	20.51	78.27	66.72	45.00	0.07	0.07	127,344	438,970,662
Los Angeles	0.92	17.87	13.14	23.31	13.42	71.38	56.86	0.06	0.06	1,359,905	1,502,515,322
Las Vegas	0.80	20.13	13.77	26.49	89.24	27.91	51.03	0.04	0.04	343,941	5,121,918,398
Lexington	0.67	13.07	8.03	18.11	94.78	66.90	40.11	0.07	0.07	130,256	368,445,654
Lincoln	NA	10.89	4.69	17.08	132.65	64.53	62.07	0.07	0.07	NA	NA
Louisville	0.73	14.15	9.09	19.22	96.76	63.22	51.93	0.09	0.08	115,601	166,228,760
Little Rock	0.34	16.96	9.23	23.19	82.14	67.29	50.40	0.08	0.08	180,737	998,208,396
Madison	NA	8.24	2.95	13.53	131.39	69.18	51.96	0.05	0.05	213,263	1,556,446,597
Memphis	0.91	17.05	12.06	22.03	83.86	64.84	53.45	0.08	0.08	448,736	977,116,092
Miami	0.46	25.09	21.46	28.72	15.18	70.99	52.74	0.07	0.07	563,341	1,260,070,473
Milwaukee	0.68	9.12	5.00	13.24	117.34	70.00	54.06	0.09	0.08	470,082	312,818,042
Minneapolis/St. Paul	0.78	7.64	2.83	12.45	155.90	64.22	48.98	0.06	0.06	203,404	230,636,546
Mobile	NA	19.45	14.17	24.72	51.01	75.88	50.27	0.08	0.08	79,969	638,738,125

APPENDIX TABLE E.3. (continued) – Effect modifiers: US

City	NO ₂ PM ₁₀	Temp	Minimum Temp	Maximum Temp	Temp Var	Relative humidity	% CardioResp	Crude Mort	AgeStand Mort	PM densPop	PM densArea
Modesto	0.53	17.29	8.86	25.45	48.59	54.18	53.73	0.06	0.06	446,997	3,868,899,889
Nashville	0.40	15.46	9.97	20.95	85.85	65.68	52.39	0.07	0.07	113,978	260,171,864
New Orleans	0.84	20.44	15.66	25.21	47.10	75.50	45.95	0.09	0.09	242,337	233,819,282
Newark	0.96	13.14	8.71	17.56	97.73	61.78	44.99	0.09	0.08	264,544	109,009,880
New York	1.25	12.71	8.48	17.16	87.68	64.67	54.98	0.08	0.08	687,057	146,660,093
Oakland	0.80	15.47	7.82	25.29	12.91	73.42	53.23	0.06	0.06	1,443,741	1,910,302,974
Oklahoma City	0.54	15.67	10.05	21.30	91.49	61.80	53.88	0.08	0.07	330,224	918,271,222
Omaha	NA	11.10	3.95	16.86	129.93	64.67	52.95	0.07	0.07	115,896	214,307,454
Orlando	0.57	22.71	17.66	27.75	27.97	72.58	50.38	0.05	0.05	128,049	335,754,736
Philadelphia	0.84	13.35	8.68	18.02	95.13	64.54	48.32	0.11	0.09	216,793	49,983,107
Phoenix	0.52	23.91	17.66	30.16	71.30	28.81	52.46	0.05	0.05	512,025	3,972,669,413
Pittsburgh	0.89	11.02	6.00	16.04	101.31	64.48	54.00	0.11	0.08	53,403	78,797,127
Portland	NA	12.62	7.98	17.25	41.44	69.04	51.58	0.07	0.07	NA	NA
Providence	0.61	10.78	6.06	15.51	89.70	68.80	52.58	0.09	0.07	207,201	356,785,561
Raleigh	0.59	15.65	10.07	21.24	74.04	66.83	56.44	0.04	0.06	627,846	2,154,672,822
Riverside	0.49	19.58	3.59	33.71	32.68	59.93	59.71	0.05	0.05	220,770	2,666,714,174
Rochester	NA	8.97	4.23	13.71	107.35	70.42	51.45	0.08	0.07	245,114	569,187,831
Sacramento	0.58	17.11	8.84	25.36	44.65	59.14	52.97	0.05	0.06	203,917	416,837,681
Salt Lake City	0.79	11.77	5.81	17.72	107.52	53.00	49.50	0.04	0.05	224,597	477,449,954
San Antonio	0.38	20.91	15.15	26.67	59.66	58.41	50.12	0.05	0.06	696,466	1,614,629,962
San Bernardino	0.60	18.44	10.40	29.00	23.53	59.93	56.46	0.05	0.06	189,937	5,770,635,972
San Diego	0.74	17.67	14.37	20.96	11.33	73.94	53.10	0.06	0.06	401,976	1,553,952,416
San Francisco	0.79	14.54	10.46	18.62	12.34	74.37	45.47	0.09	0.08	776,733	120,938,107
San Jose	0.87	15.07	5.76	24.78	14.12	68.96	52.86	0.04	0.05	560,862	1,114,288,430
Seattle	0.77	11.69	7.72	15.65	33.36	71.17	50.52	0.06	0.06	289,506	917,738,240

APPENDIX TABLE E.3. (continued) – Effect modifiers: US

City	NO ₂ PM ₁₀	Temp	Minimum Temp	Maximum Temp	Temp Var	Relative humidity	% CardioResp	Crude Mort	AgeStand Mort	PM densPop	PM densArea
Shreveport	NA	18.65	12.96	24.35	66.61	68.41	49.08	0.09	0.08	350,471	4,458,002,544
Spokane	NA	8.79	3.44	14.13	81.37	62.17	49.04	0.08	0.08	69,657	761,299,340
Santa Ana/Anaheim	0.78	18.16	9.75	25.94	15.37	68.75	55.59	0.04	0.05	1,423,145	1,022,273,826
St. Louis	0.69	14.00	9.24	18.76	112.13	60.84	52.43	0.12	0.10	87,047	40,095,438
Stockton	0.48	17.27	6.29	25.58	48.06	54.18	54.78	0.06	0.06	563,598	3,624,124,428
St. Petersburg	0.51	22.85	18.02	27.67	28.53	72.95	55.81	0.12	0.07	230,371	181,245,237
Syracuse	NA	8.94	3.98	13.91	112.30	69.54	50.28	0.09	0.07	114,584	505,237,665
Tacoma	NA	11.69	7.72	15.65	33.36	71.17	54.35	0.06	0.06	233,607	1,449,455,382
Tampa	0.46	22.85	18.02	27.67	28.53	72.95	51.69	0.07	0.06	90,813	247,440,074
Toledo	NA	10.08	4.93	15.22	111.04	68.80	55.77	0.09	0.08	151,685	293,933,025
Tucson	0.88	21.19	13.50	28.88	61.19	32.78	53.64	0.06	0.05	105,468	2,974,039,612
Tulsa	0.67	15.91	10.52	21.29	96.70	60.56	53.40	0.07	0.07	140,825	369,267,738
Wichita	NA	13.79	7.96	19.63	112.06	62.18	51.25	0.06	0.06	113,217	647,092,814
Worcester	1.12	8.50	-0.75	16.50	100.52	66.35	52.23	0.08	0.07	375,482	1,959,408,713

APPENDIX TABLE E.3. (continued) – Effect modifiers: US

City	O ₃ densPop	O ₃ densArea	Complete PM ₁₀	Complete O ₃
Akron	542,899	1,068,948,386	No	No
Albuquerque	139,170	755,003,956	Yes	Yes
Anchorage	NA	NA	Yes	No
Atlanta	740,936	1,031,933,588	No	No
Austin	406,140	1,281,143,836	No	Yes
Bakersfield	110,274	3,514,166,726	No	Yes
Baltimore	325,577	104,641,221	No	No
Baton Rouge	103,213	294,888,277	No	Yes
Birmingham	132,409	576,327,829	No	No
Boston	689,807	151,555,693	No	Yes
Buffalo	950,265	2,704,492,010	No	Yes
Charlotte	347,727	681,522,986	No	No
Chicago	384,053	174,950,057	Yes	Yes
Cincinnati	281,768	351,689,942	Yes	No
Cleveland	464,659	395,827,160	Yes	No
Columbus, OH	356,326	466,084,454	No	No
Colorado Springs	258,465	2,753,738,526	Yes	Yes
Corpus Christi	156,823	1,082,377,682	No	Yes
Dayton	559,062	1,195,735,149	No	No
Washington	143,015	39,758,423	No	Yes
Denver	281,292	1,112,878,948	Yes	Yes
Des Moines	187,301	737,300,273	No	Yes
Detroit	515,291	397,661,612	Yes	No
Dallas/Fort Worth	699,979	1,173,851,846	No	Yes
El Paso	169,906	655,983,185	Yes	Yes

APPENDIX TABLE E.3. (continued) – Effect modifiers: US

City	O ₃ densPop	O ₃ densArea	Complete PM ₁₀	Complete O ₃
Fresno	159,881	3,088,677,448	No	Yes
Fort Wayne	110,616	567,422,957	No	No
Grand Rapids	574,335	2,217,482,769	No	No
Greensboro	421,048	1,681,997,762	No	No
Honolulu	876,156	1,553,387,626	No	Yes
Houston	283,382	373,136,350	No	Yes
Huntsville	276,700	2,084,739,506	No	No
Indianapolis	215,114	256,569,964	No	No
Jackson	250,800	2,251,177,952	No	No
Jacksonville	389,440	1,001,894,966	No	Yes
Jersey City	608,975	120,920,280	No	Yes
Kansas City, MO	182,533	736,346,277	No	No
Knoxville	191,016	658,455,994	No	No
Los Angeles	634,623	701,173,817	No	Yes
Las Vegas	343,941	5,121,918,398	No	Yes
Lexington	130,256	368,445,654	No	No
Lincoln	250,291	2,172,691,291	No	No
Louisville	231,201	332,457,520	No	No
Little Rock	180,737	998,208,396	No	Yes
Madison	213,263	1,556,446,597	No	No
Memphis	448,736	977,116,092	No	No
Miami	1,126,681	2,520,140,946	No	Yes
Milwaukee	188,033	125,127,217	No	No
Minneapolis/St. Paul	NA	NA	Yes	No
Mobile	399,843	3,193,690,623	No	No

APPENDIX TABLE E.3. (continued) – Effect modifiers: US

City	O ₃ densPop	O ₃ densArea	Complete PM ₁₀	Complete O ₃
Modesto	223,499	1,934,449,944	No	Yes
Nashville	284,946	650,429,659	Yes	Yes
New Orleans	484,674	467,638,563	No	Yes
Newark	793,633	327,029,640	No	Yes
New York	1,275,962	272,368,745	No	Yes
Oakland	288,748	382,060,595	No	Yes
Oklahoma City	330,224	918,271,222	No	Yes
Omaha	154,528	285,743,272	No	No
Orlando	448,172	1,175,141,575	No	Yes
Philadelphia	303,510	69,976,350	No	Yes
Phoenix	341,350	2,648,446,276	No	Yes
Pittsburgh	320,417	472,782,764	Yes	Yes
Portland	249,719	1,491,447,670	No	No
Providence	310,801	535,178,341	No	No
Raleigh	156,962	538,668,206	No	No
Riverside	171,710	2,074,111,025	No	Yes
Rochester	735,343	1,707,563,493	No	Yes
Sacramento	203,917	416,837,681	No	Yes
Salt Lake City	224,597	477,449,954	Yes	No
San Antonio	696,466	1,614,629,962	No	Yes
San Bernardino	213,679	6,491,965,469	No	Yes
San Diego	312,648	1,208,629,657	No	Yes
San Francisco	NA	NA	No	No
San Jose	280,431	557,144,215	No	Yes
Seattle	434,259	1,376,607,359	Yes	No

APPENDIX TABLE E.3. (continued) – Effect modifiers: US

City	O ₃ densPop	O ₃ densArea	Complete PM ₁₀	Complete O ₃
Shreveport	175,236	2,229,001,272	No	Yes
Spokane	417,939	4,567,796,041	Yes	No
Santa Ana/Anaheim	569,258	408,909,530	No	Yes
St. Louis	87,047	40,095,438	No	No
Stockton	187,866	1,208,041,476	No	Yes
St. Petersburg	307,161	241,660,316	No	Yes
Syracuse	229,168	1,010,475,330	No	Yes
Tacoma	233,607	1,449,455,382	No	No
Tampa	249,737	680,460,204	No	Yes
Toledo	151,685	293,933,025	No	No
Tucson	140,624	3,965,386,150	No	Yes
Tulsa	563,299	1,477,070,950	No	Yes
Wichita	226,435	1,294,185,628	No	Yes
Worcester	375,482	1,959,408,713	No	No