

Supporting Information

Zanobetti et al. 10.1073/pnas.1113070109

Table S1. Total population and summer temperature standard deviation (SD) in the 135 study cities, 1985–2006

City	Total year 2000 population per 1,000	Region	Summer temperature SD, °C			Ozone, ppb			Heat waves		
			5%	Mean	95%	Min	Mean	Max	Min	Mean	Max
Akron, OH	543	2	4.9	6.3	6.8	31.6	45.2	54.6	0	3.9	17
Albuquerque, NM	557	2	3.3	5.9	4.9	34.4	41.6	47.4	0	3.8	22
Allentown-Bethlehem, PA	579	2	5.0	4.3	6.7	29.7	40.0	48.5	0	3.7	13
Atlanta, GA	2,090	4	3.0	5.7	5.1	38.9	48.4	58.1	0	4.0	23
Atlantic City, NJ	253	3	5.0	4.0	7.7	36.0	41.1	46.1	0	3.8	13
Austin, TX	812	5	2.8	3.4	3.8	34.2	39.1	44.4	0	3.8	17
Bakersfield, CA	662	4	4.9	6.2	7.6	49.5	54.0	59.9	0	4.0	11
Baltimore, MD	2,114	3	4.8	5.7	7.0	35.2	41.0	46.0	0	3.9	14
Barnstable-Yarmouth, MA	163	2	4.4	5.7	6.7	40.3	45.2	52.2	0	3.6	14
Bergen-Passaic, NJ	1,373	5	5.1	2.9	7.3	24.5	32.1	47.2	0	4.0	14
Birmingham, AL	662	2	3.0	6.0	4.9	37.5	42.5	49.9	0	4.3	18
Boston, MA	3,206	4	5.6	3.9	8.4	30.0	34.8	40.1	0	3.7	14
Baton Rouge, LA	413	2	2.3	6.7	3.7	36.0	40.4	45.1	0	4.3	19
Brownsville, TX	335	5	1.7	2.2	2.7	14.7	30.0	34.5	0	4.4	23
Buffalo, NY	950	1	4.9	5.9	6.5	28.0	35.3	43.1	0	3.8	15
Canton-Massillon, OH	378	2	4.9	5.9	6.8	37.1	46.9	53.3	0	3.9	17
Charleston, WV	200	3	4.2	5.0	5.8	20.6	40.3	55.0	0	4.3	20
Charlotte, NC	695	4	3.3	4.3	5.6	42.1	51.1	60.0	0	4.0	22
Chattanooga, TN	308	3	3.4	4.0	5.2	37.8	45.6	57.9	0	4.2	26
Chicago, IL	8,092	2	5.9	6.6	7.7	26.8	31.2	35.4	0	3.9	21
Cincinnati, OH	2,524	3	4.5	5.4	6.2	34.6	44.5	50.7	0	3.9	17
Cleveland, OH	1,906	2	5.4	6.2	7.1	31.6	41.4	48.3	0	4.1	19
Columbia, SC	321	4	3.0	4.1	5.6	36.0	41.0	44.8	0	4.0	16
Columbus, OH	1,069	2	4.8	5.6	6.6	29.9	44.1	51.2	0	4.1	16
Dallas, TX	2,219	5	3.5	4.4	5.1	31.4	37.8	43.7	0	4.0	29
Daytona Beach, FL	443	5	1.8	5.7	2.7	34.8	38.2	41.5	0	3.8	26
Dayton, OH	559	3	4.9	2.2	6.4	33.5	45.3	52.5	0	4.2	22
Denver, CO	1,082	1	4.7	6.2	8.1	31.8	36.5	41.2	0	3.9	12
Des Moines, IA	375	1	5.3	6.1	7.0	5.3	26.3	43.0	0	4.1	22
Detroit, MI	4,043	2	5.0	5.9	6.9	24.7	39.0	46.9	0	4.0	17
Dutchess County, NY	280	2	4.9	5.9	6.8	14.3	33.6	41.6	0	3.6	12
El Paso, TX	680	5	3.3	4.2	5.1	33.5	39.8	45.0	0	3.8	24
Erie, PA	281	1	5.3	6.1	6.8	32.9	41.4	52.3	0	4.2	13
Flint, MI	436	2	5.3	6.3	7.8	36.2	42.8	51.2	0	3.9	16
Fresno, CA	799	4	4.6	1.9	7.4	45.1	51.4	59.5	0	3.8	13
Ft. Lauderdale, FL	1,623	5	1.5	1.9	2.3	28.9	32.7	35.8	0	4.3	17
Fort Myers-Cape Coral, FL	441	5	1.5	4.4	2.9	35.0	37.4	39.8	0	4.0	17
Fort Pierce-Port St. Lucie, FL	319	5	1.5	5.9	2.3	30.8	36.3	39.6	0	4.4	17
Fort Worth-Arlington, TX	1,446	5	3.2	2.0	5.3	37.5	42.8	46.7	0	2.4	14
Galveston, TX	250	5	1.7	2.6	3.4	31.2	36.0	44.0	0	2.9	17
Gary, IN	485	2	5.4	6.2	7.7	35.5	44.1	51.9	0	3.7	28
Grand Rapids, MI	574	2	5.4	6.1	7.1	36.1	43.6	50.2	0	3.7	15
Greensboro, NC	421	4	3.5	4.8	6.3	42.1	53.3	65.4	0	3.7	9
Greenville, SC	380	4	3.0	4.2	5.6	—	—	—	0	4.0	18
Hamilton, OH	333	3	4.5	5.4	6.2	34.5	46.1	53.9	0	3.9	17
Harrisburg-Carlisle, PA	465	2	3.7	5.6	6.9	32.4	41.3	51.5	0	2.6	14
Hartford, CT	855	2	5.1	6.2	7.8	31.7	39.8	47.2	0	4.0	12
Honolulu, HI	876	5	1.0	1.4	1.8	3.5	18.7	29.7	0	5.4	32
Houston, TX	3,401	5	2.1	3.1	3.8	34.2	37.9	43.6	0	4.4	16
Indianapolis, IN	860	2	4.6	5.4	6.2	43.1	49.3	55.7	0	3.7	23
Jacksonville, FL	779	5	2.0	2.9	3.9	35.6	40.1	43.8	0	4.2	16
Jersey City, NJ	609	2	5.1	6.0	7.3	27.7	32.8	37.2	0	4.0	14
Kansas City, MO-KS	1,106	2	5.1	6.0	7.1	27.4	39.4	47.8	0	4.0	17

Table S1. Cont.

City	Total year 2000 population per 1,000	Region	Summer temperature SD, °C			Ozone, ppb			Heat waves		
			5%	Mean	95%	Min	Mean	Max	Min	Mean	Max
Knoxville, TN	382	3	3.2	4.2	5.3	34.6	47.9	64.1	0	3.9	16
Lakeland-Winter Haven, FL	484	5	1.8	2.1	2.6	34.8	39.1	43.2	0	4.6	22
Lancaster, PA	471	3	4.8	5.7	6.6	31.3	43.1	54.9	0	3.7	15
Lansing, MI	279	2	5.5	6.4	7.6	34.7	43.2	50.9	0	3.8	17
Las Vegas, NV-AZ	1,531	5	4.1	5.6	7.5	36.7	42.5	47.1	0	4.0	12
Los Angeles, CA	9,519	4	1.9	4.5	4.4	34.8	43.9	55.3	0	3.7	12
Louisville, KY	694	3	4.2	3.1	6.2	28.3	41.0	52.0	0	4.1	15
Little Rock, AR	361	4	3.3	5.1	5.5	35.9	39.4	42.6	0	3.7	17
Lubbock, TX	243	4	4.0	5.0	6.1	—	—	—	0	4.1	14
Madison, WI	427	1	5.5	6.4	7.7	34.8	42.3	51.5	0	4.0	19
McAllen-Edinburg-Mission, TX	569	5	2.2	2.8	3.4	31.8	33.7	35.5	0	3.6	11
Melbourne-Titusville-Palm Bay, FL	476	5	1.5	1.9	2.6	34.2	38.1	42.4	0	4.3	36
Memphis, TN	897	4	3.4	4.4	5.2	42.0	51.1	60.4	0	3.7	15
Miami, FL	2,253	5	1.8	2.1	2.7	31.1	34.1	37.8	0	5.0	19
Middlesex, NJ	750	3	5.2	6.0	7.1	30.5	37.0	43.7	0	3.6	14
Milwaukee, WI	1,301	1	6.1	7.0	7.9	33.3	41.1	49.0	0	3.7	14
Minneapolis-St. Paul, MN	1,627	1	5.6	6.3	7.4	—	—	—	0	3.7	16
Mobile, AL	400	5	2.1	2.8	3.7	29.6	41.5	51.8	0	4.1	25
Monmouth-Ocean, NJ	1,126	3	4.2	6.2	7.5	36.1	44.0	53.9	0	2.9	18
Myrtle Beach, SC	197	4	2.9	4.0	5.7	—	—	—	0	3.9	32
Naples, FL	251	5	1.3	1.8	2.6	—	—	—	0	4.5	23
Nashua, NH	191	1	4.8	6.3	8.0	28.1	39.2	46.1	0	3.7	19
Nashville, TN	570	4	3.4	4.5	5.7	24.3	34.1	44.3	0	3.7	15
Nassau-Suffolk, NY	2,754	3	4.9	5.8	7.0	30.4	35.4	39.6	0	3.8	14
Newark, NJ	1,786	2	5.1	6.2	7.3	29.4	34.4	39.7	0	4.0	14
Newburgh, NY	341	2	4.8	5.9	6.6	41.7	45.8	50.7	0	4.3	16
New Haven-Meriden, CT	523	2	5.1	5.9	7.8	36.2	42.2	51.5	0	4.0	12
New London, CT	233	2	4.6	6.0	7.5	39.0	46.5	51.9	0	3.7	13
New York, NY	8,932	3	4.9	5.8	7.2	24.7	29.2	33.2	0	3.9	11
Oakland, CA	2,393	4	2.8	3.7	4.6	26.3	29.7	34.0	0	3.5	11
Ocala, FL	259	5	1.8	2.3	2.9	—	—	—	0	4.3	32
Oklahoma City, OK	660	4	3.9	5.1	5.9	34.8	40.9	45.6	0	4.0	24
Omaha, NE	464	2	5.3	6.4	7.2	26.6	32.6	41.6	0	3.7	14
Orange County, CA	2,846	4	2.8	3.8	4.8	34.2	40.0	45.7	0	3.9	14
Orlando, FL	1,472	5	1.6	2.1	2.9	33.9	40.0	44.0	0	3.8	16
Pensacola, FL	294	5	2.1	2.8	3.6	38.0	42.1	45.9	0	3.7	18
Philadelphia, PA-NJ	5,037	3	4.7	5.7	6.8	32.8	37.4	41.7	0	4.0	14
Phoenix, AZ	3,072	5	3.3	4.8	6.4	30.5	45.2	49.7	0	4.1	11
Pittsburgh, PA	1,855	2	4.7	5.7	6.4	28.1	37.3	43.9	0	4.0	20
Portland, ME	220	1	5.0	6.1	7.8	29.2	39.5	49.0	0	3.8	17
Portland, OR	1,444	3	4.8	5.7	6.5	26.5	33.2	37.4	0	4.0	12
Providence-Fall River, RI-MA	855	2	4.7	6.1	8.0	36.8	41.7	49.0	0	3.7	15
Punta Gorda, FL	142	5	1.7	2.0	2.6	—	—	—	0	4.8	22
Raleigh, NC	628	4	3.8	4.9	6.6	40.6	51.5	63.4	0	4.2	16
Reading, PA	374	3	3.8	4.9	6.6	31.7	40.8	50.2	0	4.2	16
Riverside-San Bernardino, CA	3,255	4	4.0	5.2	6.4	48.2	53.5	60.9	0	3.8	18
Rochester, NY	735	1	5.2	6.1	7.0	27.1	32.3	37.7	0	4.4	12
Rockford, IL	278	2	5.1	6.1	7.5	30.1	33.9	43.8	0	3.7	19
Sacramento, CA	1,223	3	4.0	5.4	6.5	37.5	42.1	49.1	0	4.0	12
Saginaw, MI	210	1	5.5	6.3	7.4	—	—	—	0	3.9	17
Salinas, CA	402	4	2.3	3.1	3.8	31.1	34.6	39.2	0	3.6	11
Salt Lake City, UT	898	2	5.5	7.0	9.0	36.1	48.7	57.8	0	4.0	20
San Antonio, TX	1,393	5	2.7	3.3	4.0	31.7	38.0	42.9	0	4.1	16
Sarasota-Bradenton, FL	590	5	1.6	3.1	3.2	31.2	38.6	42.2	0	3.6	34
Scranton-Wilkes-Barre-Hazleton, PA	533	2	5.1	3.5	6.4	32.3	40.7	48.0	0	3.7	16
San Diego, CA	2,814	4	2.4	4.5	4.1	38.4	44.6	50.7	0	4.0	13
Seattle, WA	1,737	3	4.3	2.1	5.7	25.8	31.6	37.2	0	3.9	11
San Francisco, CA	1,484	4	2.6	5.8	4.6	18.9	23.2	27.8	0	3.7	10
Shreveport, LA	252	5	2.7	5.1	4.4	40.1	44.1	49.0	0	4.2	23
San Jose, CA	1,683	4	3.1	3.7	5.7	28.3	32.1	39.7	0	3.7	9

Table S1. Cont.

City	Total year 2000 population per 1,000	Region	Summer temperature SD, °C			Ozone, ppb			Heat waves		
			5%	Mean	95%	Min	Mean	Max	Min	Mean	Max
Spokane, WA	418	1	5.7	7.4	8.4	36.0	44.0	50.9	0	3.9	12
Springfield, MA	444	2	5.1	6.2	7.8	29.0	37.0	45.2	0	4.0	12
Stamford-Norwalk, CT	354	2	4.6	6.0	6.9	38.0	45.3	51.5	0	4.3	11
St. Louis, MO-IL	1,880	3	5.2	5.7	6.8	32.3	37.2	42.1	0	4.2	18
Stockton-Lodi, CA	564	4	4.3	5.5	6.8	34.0	39.3	48.5	0	3.9	13
Syracuse, NY	458	1	5.3	6.1	7.3	21.9	33.3	38.4	0	4.0	15
Tacoma, WA	701	3	3.4	4.2	5.0	26.9	33.2	38.6	0	3.5	15
Tampa-St. Petersburg-Clearwater, FL	2,396	5	1.7	2.1	2.5	34.9	39.4	43.1	0	4.5	21
Toledo, OH	455	2	5.3	6.1	6.9	30.1	40.6	49.0	0	4.0	15
Trenton, NJ	351	3	5.4	6.2	7.2	35.8	39.5	45.3	0	3.8	13
Tucson, AZ	844	3	3.3	4.4	5.4	38.8	43.2	45.6	0	4.3	20
Tulsa, OK	563	4	4.4	5.6	6.6	37.9	42.2	46.5	0	4.4	15
Utica-Rome, NY	235	1	5.2	6.1	7.0	31.5	35.4	42.6	0	4.0	11
Ventura County, CA	753	4	2.2	3.0	4.0	42.5	49.0	55.8	0	3.5	17
Virginia Beach, VA	425	4	4.1	5.3	6.4	—	—	—	0	3.7	13
Washington, DC-MD-VA	3,217	3	4.4	5.5	7.1	33.8	37.3	42.3	0	3.7	13
Wichita, KS	453	3	4.9	2.0	7.3	29.2	35.2	42.3	0	4.1	17
Wilmington, DE	500	3	4.9	6.1	7.0	32.4	37.9	45.4	0	3.8	11
Worcester, MA	500	2	5.2	5.7	8.1	35.5	41.0	47.0	0	3.7	18
West Palm Beach-Boca Raton, FL	1,131	5	1.6	6.2	2.5	16.0	31.8	36.8	0	4.7	21
York, PA	382	2	4.7	5.5	6.4	31.6	41.6	50.8	0	3.9	17
Youngstown-Warren, OH	483	2	5.2	6.2	7.0	31.0	44.0	51.3	0	4.0	18

—, no measurements of ozone available.

Table S2. Main effects of the geographic variables at the zip code level across 135 US cities: Hazard ratio (HR) and 95% confidence interval (CI) for an interquartile range (IQR) increase in each geographic variable

	HR	95% CI	IQR
Population density (per km ²)			
Diabetes	1.00	1.00–1.01	351.9
Chronic obstructive pulmonary disease	1.01	1.00–1.01	351.9
Myocardial infarction	1.01	1.00–1.01	351.9
Congestive heart failure	1.00	1.00–1.01	351.9
Proportion of the population below poverty level			
Diabetes	1.02	1.01–1.03	0.04
Chronic obstructive pulmonary disease	1.02	1.01–1.02	0.04
Myocardial infarction	1.03	1.02–1.04	0.04
Congestive heart failure	1.01	1.00–1.02	0.04
Proportion of green surface			
Diabetes	0.99	0.98–1.00	0.15
Chronic obstructive pulmonary disease	0.99	0.98–1.00	0.15
Myocardial infarction	0.99	0.97–1.00	0.15
Congestive heart failure	1.00	0.99–1.01	0.15
Proportion of black population			
Diabetes	1.02	1.01–1.03	0.14
Chronic obstructive pulmonary disease	1.02	1.01–1.04	0.14
Myocardial infarction	1.03	1.01–1.05	0.14
Congestive heart failure	1.01	1.00–1.02	0.14
Proportion of the population aged > 25 y who completed college			
Diabetes	0.98	0.97–0.99	0.09
Chronic obstructive pulmonary disease	0.99	0.98–1.00	0.09
Myocardial infarction	0.97	0.95–0.99	0.09
Congestive heart failure	1.00	0.98–1.01	0.09