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Supplemental Material

The Role of Humidity in Associations of High Temperature with Mortality: A Multiauthor, Multicity Study

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Additional File- SupplementalMaterial_CodeAndData.zip

Table S1 Summary of data sources

COUNTRY	TYPE OF LOCATION	MORTALITY DATA	METEOROLOGICAL DATA
Argentina	City	Non-external (Ministerio de Salud de la Nación)	Weather station located within the location (Servicio Meteorológico Nacional)
Australia	City	Non-external causes only (Australian Bureau of Statistics)	Met stations located within ≤30 km of each city's (Australian Bureau of Meteorology)
Brazil	City	Non-external causes only (Ministry of Health)	Met station located within the urban area (National Institute of Meteorology of Brazil)
Canada	City	All causes (Canadian Mortality Database)	Met station located closest to the location centre (Environment Canada)
Chile	City	All causes (Ministerio de Salud, Departamento de Estadísticas e Información de Salud)	11 stations (Ministerio del Medio Ambiente, Sistema de Información Nacional de Calidad del Aire)
China	City	Non-external (National Statics Office of China)	Weather station located within each city. (China Meteorological Data Sharing Service System; http://data.cma.cn/)
Czech Republic	City (+1 region)	Czech Statistical Office and the Institute of Health Information and Statistics	Airport station for cities, for the rural area, 4 stations (Czech Hydrometeorological Institute)
Estonia	City	All causes (Estonian Causes of Death Registry)	Met station close to the city (Estonian Environment Agency)
France	City	All causes(National Institute of Health and Medical Research - CepiDC)	Nearest station, usually the airport (Meteo France)
Ireland (island of)	regions	Non-external (Irish Central Statistics Office; Northern Ireland Social Research Agency)	Two weather stations for each of the four ROI regions and two weather stations for the two NI regions (Met Eireann, and the United Kingdom Meteorological Office for ROI and NI)
Italy	City	All causes (Ministry of Health, Labour and Welfare)	Airport monitoring station located closest to the city centre (Meteorological Service of the Italian Air Force)
Japan	prefecture	All causes (Ministry of Health, Labour and Welfare)	Weather station located within the urban area of the prefecture capital city (Japan Meteorology Agency)
South Korea	City	All causes (Korea Bureau of Statistics)	Weather station located within the location (Korea Meteorological Administration)
Mexico	City	All causes (National Institute of Statistics, Geography and Informatics)	Weather station located within the urban area or at a near airport (Primarily Servicio Meteorológico Nacional (SMN) Estaciones Sinópticas Meteorológicas (ESIMES), Estaciones Meteorológicas Automáticas (EMAS)* and Observatories. Otherwise (i) Instituto Nacional de Ecología y Cambio Climático (INECC). (ii) Red de Meteorología y Radiación Solar (REDMET) from the Sistema de Monitoreo Atmosférico de la Ciudad de México (SIMAT). (iii) WMO stations from the Weather Underground.)
Philippines	City	All causes (Philippine Statistics Authority - National Statistics Office)	Station in or near location (Philippine Atmospheric Geophysical and Astronomical Services Administration)
Spain	City	All causes (Spain National Institute of Statistics)	Weather station in the location or at a near airport (Spain National Meteorology Agency)
Sweden	City	All causes (Swedish National Board of Health and Welfare)	Weather station in the location or at a near airport (Environment and Health Administration)

<i>Switzerland</i>	City	All causes (Federal Office of Statistics)	Weather station in the location or at a near airport (Federal Office of Meteorology and Climatology)
<i>Taiwan</i>	City	Non-external (National Health Insurance Dataset)	1-15 stations/location (Taiwan Environmental Protection Administration)
<i>Thailand</i>	City	Ministry of Public Health	(Meteorological Department, Ministry of Information and Communication Technology)
<i>UK</i>	Regions	All causes (Office of National Statistics)	29 stations on average per location (British Atmospheric Data Centre)
<i>USA</i>	City	Non-external (National Center for Health Statistics)	Weather station closest to the city centre (National Climatic Data Center)
<i>Vietnam</i>	City	Non-external (Community health centers data from the A6 mortality reporting system)	Weather station at city airport (National Oceanic and Atmospheric Administration's National Climate Data Center)

Meteorological data comprised means calculated in all except 4 countries from hourly measures. The exceptions were: Czech Rep: 7am, 2 and 9pm; Italy: 6-hourly; Thailand: min and max; UK: hourly for temperature; 9am and 3pm for RH.

Table S2 Distribution of key variables by country: including dewpoint and specific humidity

Country	Distribution of all humidity variables: mean(min,max) of location means			Mean (min,max) partial (w.r.t. temp) correlations between humidity variables		
	Relative humidity (RH) (%)	Dewpoint (DP, °C)	Specific humidity (SH, g/kg)	RH:DP	RH:SH	DP:SH
Argentina	68.4 (67.5,69.9)	11.9 (11.2,13.1)	17.1 (16.9,17.4)	0.99 (0.99,0.99)	0.98 (0.98,0.98)	0.99 (0.99,0.99)
Australia	69.0 (65.7,70.7)	10.2 (8.5,11.4)	16.0 (13.1,18.4)	0.99 (0.98,0.99)	0.98 (0.96,0.99)	0.99 (0.99,0.99)
Brazil	78.0 (70.0,87.5)	7.7 (5.1,12.3)	21.3 (17.1,24.2)	1.00 (0.99,1.00)	1.00 (0.99,1.00)	1.00 (0.99,1.00)
Canada	71.8 (62.8,81.8)	10.8 (7.4,13.8)	11.7 (7.0,14.9)	0.99 (0.99,1.00)	0.97 (0.96,0.99)	0.98 (0.97,0.99)
Chile	67.9 (52.0,74.4)	10.0 (8.2,11.0)	11.8 (10.4,13.8)	0.99 (0.98,1.00)	0.98 (0.97,0.99)	0.98 (0.97,0.99)
China	71.6 (60.1,80.4)	11.4 (7.4,15.6)	19.1 (9.2,24.6)	0.99 (0.99,1.00)	0.99 (0.98,0.99)	0.99 (0.97,1.00)
Czech Rep	71.1 (67.1,73.8)	11.6 (11.0,12.2)	11.8 (11.3,12.5)	0.99 (0.99,0.99)	0.97 (0.97,0.97)	0.99 (0.99,0.99)
Estonia	77.8 (77.7,78.0)	9.5 (9.2,9.8)	11.5 (11.1,11.9)	1.00 (1.00,1.00)	0.97 (0.97,0.97)	0.98 (0.98,0.98)
France	70.1 (57.9,78.4)	10.3 (8.8,15.5)	13.5 (12.3,16.3)	0.99 (0.99,1.00)	0.98 (0.97,0.99)	0.99 (0.99,0.99)
Ireland	82.2 (80.9,84.0)	6.8 (5.7,8.4)	11.1 (10.9,11.8)	1.00 (1.00,1.00)	0.99 (0.98,0.99)	0.99 (0.99,0.99)
Italy	68.0 (58.9,77.8)	11.3 (8.5,15.5)	16.6 (14.8,19.7)	0.99 (0.98,1.00)	0.98 (0.97,0.99)	0.99 (0.98,0.99)
Japan	75.2 (67.9,82.0)	9.2 (6.7,11.5)	19.4 (14.5,23.9)	1.00 (0.99,1.00)	0.98 (0.98,0.99)	0.99 (0.98,0.99)
Mexico	64.6 (42.2,75.2)	10.8 (7.3,17.0)	14.1 (9.4,19.5)	0.99 (0.99,1.00)	0.99 (0.98,0.99)	0.98 (0.98,0.99)
Philippines	81.5 (78.5,82.8)	5.1 (3.2,6.4)	25.0 (24.8,25.1)	0.98 (0.95,0.99)	0.99 (0.98,1.00)	0.99 (0.98,1.00)
South Korea	74.4 (69.4,78.3)	10.6 (9.7,11.7)	18.7 (18.0,19.3)	1.00 (1.00,1.00)	1.00 (1.00,1.00)	1.00 (1.00,1.00)
Spain	60.9 (42.5,82.9)	11.1 (6.8,15.9)	13.8 (7.7,18.7)	0.99 (0.97,1.00)	0.98 (0.97,0.99)	0.99 (0.98,0.99)
Sweden	73.5 (70.5,77.2)	9.3 (8.0,11.1)	11.1 (10.2,12.0)	0.99 (0.99,1.00)	0.98 (0.97,0.98)	0.99 (0.98,0.99)
Switzerland	71.7 (67.7,75.2)	10.4 (9.0,13.2)	12.5 (11.0,14.2)	1.00 (0.99,1.00)	0.98 (0.98,0.98)	0.99 (0.98,0.99)
Taiwan	76.7 (74.4,79.8)	7.2 (6.4,8.2)	23.8 (23.4,24.7)	1.00 (0.98,1.00)	1.00 (1.00,1.00)	1.00 (0.99,1.00)
Thailand	79.6 (72.5,86.9)	5.2 (3.7,7.5)	24.4 (23.1,25.6)	1.00 (1.00,1.00)	0.99 (0.99,1.00)	1.00 (1.00,1.00)
UK	69.2 (60.9,74.8)	11.0 (9.5,12.2)	9.9 (8.5,11.1)	0.99 (0.99,1.00)	0.98 (0.98,0.99)	0.99 (0.99,0.99)
USA	67.1 (21.5,81.4)	10.0 (4.9,15.4)	16.5 (5.0,23.2)	0.99 (0.96,1.00)	0.98 (0.96,1.00)	0.98 (0.96,1.00)
Vietnam	75.5 (72.1,78.8)	9.7 (5.2,14.1)	23.7 (23.2,24.3)	0.99 (0.98,1.00)	1.00 (1.00,1.00)	0.99 (0.99,1.00)
All	70.7 (21.5,87.5)	9.4 (3.2,17.0)	17.1 (5.0,25.6)	0.99 (0.95,1.00)	0.98 (0.96,1.00)	0.99 (0.96,1.00)

Table S3 Distribution of key variables by location

Country	Location	Period	Total deaths (1000s)	Distribution of temperature and humidity: mean and standard deviations(SDs) across days				
				Temp. mean	% missing	RH.% mean	% missing	RH% SD
Argentina	Cordoba	2005-2015	37	23.6	0	67.5	0	13.1
Argentina	Buenos Aires	2005-2015	131	23.6	0	67.9	0	11.2
Argentina	Rosario	2005-2015	38	23.4	0	70	0	11.4
Australia	Brisbane	1988-2009	59	24.2	0	70.6	0	8.5
Australia	Melbourne	1988-2009	140	20.1	0	65.7	0	11.4
Australia	Sydney	1988-2009	161	22.2	0	70.7	0	10.7
Brazil	Belem	1997-2011	44	26.5	0.3	87.5	0.3	5.1
Brazil	Belo Horizonte	1997-2011	153	23.5	0.2	70	0.2	12.3
Brazil	Brasilia	1997-2011	37	21.8	0.2	75.8	0.3	11.4
Brazil	Cuiaba	1998-2011	13	27.2	15.2	80.8	14.9	7.4
Brazil	Curitiba	1997-2011	44	20.8	5.2	80.9	6.9	7.8
Brazil	Fortaleza	1997-2011	61	27.4	0.1	78.6	7.5	6.3
Brazil	Goiania	1997-2011	44	24.7	0.2	73.1	0.2	10.4
Brazil	Joao Pessoa	1997-2011	20	28.1	1	74.3	8.6	5.3
Brazil	Maceio	1997-2011	24	26.2	13.2	75.5	14	5.5
Brazil	Manaus	1997-2011	32	26.6	0.1	86.2	0.4	6.5
Brazil	Porto Alegre	1997-2011	63	24.1	5.2	74	5.2	8.8
Brazil	Recife	1997-2011	85	27.2	0.1	74.3	0.2	6.2
Brazil	Salvador	1997-2011	73	27	0.1	79.8	0.1	5.4
Brazil	Sao Luis	1997-2011	27	26.9	0	83.5	0	6
Brazil	Sao Paulo	1997-2011	279	22.8	0.4	75.4	1.2	9.6
Brazil	Teresina	1997-2011	19	27	4.3	79.5	12.3	9.7
Brazil	Vitoria	1997-2009	13	26.8	0.9	76.5	11.7	7.3
Canada	Abbotsford	1986-2009	8	17	0.6	71.9	0	8.8
Canada	Calgary	1986-2009	38	14.4	0.5	62.8	0	13.8
Canada	Edmonton	1986-2009	44	15.4	0.5	69.8	0	10.9
Canada	Halifax	1986-2009	21	16.9	0	78.1	0	12
Canada	Hamilton	1986-2009	33	18.8	0.1	70	0	11.5
Canada	Kingston	1986-2009	11	18.8	4	71.3	0.1	10.9
Canada	Kitchener-Waterloo	1986-2009	20	17.9	0.1	70	0.2	11
Canada	London Ontario	1986-2009	28	18.8	0	73.9	0	9.8
Canada	Montreal	1986-1999	76	18.6	0.6	70.7	0	10.4
Canada	Ottawa	1986-2009	39	18.6	0.1	70.8	0	11.2
Canada	Regina	1986-2009	15	16.2	0.1	65.9	0	13
Canada	Saint John NB	1986-2009	12	15.3	1.4	78.6	0	11.3
Canada	Saskatoon	1986-2009	17	15.8	0.3	67.6	0.1	13.4
Canada	St. John's NFL	1986-2009	15	13.9	1.1	81.8	0	10.4
Canada	Sudbury	1986-2009	12	16.7	0.4	71.5	0	11.8
Canada	Thunder Bay	1986-2009	10	15.3	1.1	77	0	10

Canada	Toronto	1986-2009	196	19.4	0.5	69	0	10.8
Canada	Vancouver	1986-2009	93	16.8	0.3	74.6	0	7.4
Canada	Victoria	1986-2009	24	15.8	0.1	72.1	0	8.5
Canada	Windsor	1986-2009	18	21	0.7	69.1	0	10.2
Canada	Winnipeg	1986-2009	48	17.1	0.5	71.3	0	10.5
Chile	Chillan	2008-2013	1	18.6	17.7	74.4	29.2	10.3
Chile	Santiago	2008-2014	72	21	2.4	52	2	10.3
Chile	Temuco	2004-2013	4	15.5	5.9	72.8	7.4	8.2
Chile	Valparaiso	2004-2013	11	17.5	11.5	72.7	14.8	11
China	Anshan	2004-2006	9	24.2	0	65.3	0	12.4
China	Fuzhou	2004-2006	5	28	0	70.1	0	9.7
China	Hangzhou	2002-2004	5	26.7	5.2	74.6	5.2	12.4
China	Hong Kong	1996-2002	67	28.4	0	80.4	0	7.4
China	Lanzhou	2004-2008	11	17.6	0	60.1	0	15.1
China	Shanghai	2001-2004	51	27.1	0	75.7	0	8.4
China	Shenyang	2005-2008	30	21.6	0	75.4	0	10.1
China	Suzhu	2005-2008	15	27	0	79.5	0	8.1
China	Taiyuan	2004-2008	13	22	0	64.9	0	13.8
China	Tangshan	2006-2008	5	24.3	0	71.1	0	12.9
China	Tianjin	2005-2008	5	25.1	0	69.9	0	11.7
China	Wuhan	2003-2005	18	27.6	0	73.2	0	10.3
China	Xian	2004-2008	14	23.4	0	71.2	0	15.6
Czech Rep.	Brno	1994-2015	28	18.5	0	67.1	0	12.2
Czech Rep.	Ostrava	1994-2015	24	17.5	0	73.8	0	11.3
Czech Rep.	Prague	1994-2015	91	16.9	0	70.7	0	11.7
Czech Rep.	South Bohemia	1994-2015	81	16.4	0	72.7	0	11
Estonia	Kohtla-Järve linn	1997-2015	5	15	0	78	0	9.7
Estonia	Narva linn	1997-2015	5	15	0	78	0	9.7
Estonia	Pärnu linn	1997-2015	4	15.9	0	77.7	0	9.2
Estonia	Tallinn	1997-2015	26	15.4	0	77.7	0	9.8
Estonia	Tartu linn	1997-2015	6	15.9	0	77.7	0	9.2
France	Bordeaux	2000-2010	17	20.2	0	69.8	0	10.3
France	Clermont-Ferrand	2000-2010	6	18.9	0	68.8	0	10.3
France	Dijon	2000-2010	6	18.8	0	70.2	0	11
France	Grenoble	2000-2010	10	19.9	0	73.5	0.1	9.2
France	Le Havre	2000-2010	8	16.9	0	78.4	0	9.6
France	Lens-Douai	2000-2010	11	17.3	0	75.2	0	9.4
France	Lille	2000-2010	28	17.3	0	75.2	0	9.4
France	Lyon	2000-2010	25	20.6	0	62.8	0	12.1
France	Marseille	2000-2010	29	23.2	0.1	57.9	0	10.4
France	Montpellier	2000-2010	9	22.6	0	61.6	0	15.5
France	Nancy	2000-2010	9	18.1	0	71.5	0	9.9
France	Nantes	2000-2010	14	18.4	0	74.2	0	10.7
France	Nice	2000-2010	16	22.9	0	67.3	0	9.5

France	Paris	2000-2010	144	19.1	0	65.9	0.1	10.5
France	Rennes	2000-2010	5	18	0	74.1	0	8.8
France	Rouen	2000-2010	13	16.6	0.8	77.5	0.1	9.2
France	Strasbourg	2000-2010	11	18.6	0	72.4	0.2	9.5
France	Toulouse	2000-2010	16	21	0	64.9	0	11.1
Ireland	E N Ireland	1984-2007	66	13.7	0	84	0	8.4
Ireland	NE Irish rep.	1984-2007	34	14.4	0	80.9	0	6.4
Ireland	NW Irish Rep	1984-2007	22	13.8	0	82.9	0	5.7
Ireland	SE Irish rep.	1984-2007	74	14.2	0	81.1	0	6.4
Ireland	SW Irish rep.	1984-2007	81	14.6	0	83.1	0	6.1
Ireland	W N Ireland	1984-2007	39	14.3	0	81.2	0	7.6
Italy	Bari	1996-2007	9	23.4	0.7	67.1	0.9	11.7
Italy	Bologna	1996-2010	17	23.8	1.1	61.3	1.1	12.9
Italy	Genoa	1999-2007	19	23.1	1.3	73.8	3.3	11.8
Italy	Palermo	1997-2001	8	24.9	1	58.9	1	12.8
Italy	Rome	1987-2010	158	23.2	0.2	68.7	0.2	10.8
Italy	Turin	1991-1999	20	20.6	0.4	75.8	0.4	10.3
Italy	Brescia	1993-2003	6	22.3	0.8	68.6	0.8	10.2
Italy	Civitavecchia	1996-2006	1	23.9	1.9	77.8	1.9	8.5
Italy	Frosinone	1995-2006	1	23.4	2.7	66.3	2.7	9.7
Italy	Latina	1995-2006	2	23.6	0.6	74	1	9.1
Italy	Rieti	1995-2006	1	23.8	36.3	59.6	37	15.5
Italy	Viterbo	1995-2006	2	22.4	0.1	64.3	0.1	12
Japan	Fukuoka	1972-2012	434	25.6	0	73.7	0	9
Japan	Osaka	1972-2012	698	26.1	0	67.9	0	9.2
Japan	Tokyo	1972-2012	931	24.7	0	72	0.1	9.4
Japan	Aichi	1972-2012	507	25.1	0	72.3	0	10.8
Japan	Akita	1972-2012	138	21.8	0	76.6	0	9.1
Japan	Aomori	1972-2012	153	20.2	0.1	78.5	0.1	8.3
Japan	Chiba	1972-2012	397	24.1	0	78.2	0.1	8.1
Japan	Ehime	1972-2012	160	25.2	0	71.2	0.1	9.4
Japan	Fukui	1972-2012	81	24.3	0	74.8	0	9.1
Japan	Fukushima	1972-2012	210	22.6	0	75.4	0	10.2
Japan	Gifu	1972-2012	185	25.3	0	72	0	11
Japan	Gunma	1972-2012	182	23.8	0	73.5	0.1	11.5
Japan	Hiroshima	1972-2012	263	25.2	0.1	73.7	0.1	9.9
Japan	Hokkaido	1972-2012	522	19.4	0	74.2	0	9.1
Japan	Hyogo	1972-2012	477	25.3	0	72.6	0	9.7
Japan	Ibaraki	1972-2012	253	22.5	0	82	0	7.6
Japan	Ishikawa	1972-2012	110	24.1	0	74.3	0.1	9
Japan	Iwate	1972-2012	146	20.6	0.1	78.7	0.1	8.7
Japan	Kagawa	1972-2012	105	25.4	0	73.4	0	9.5
Japan	Kagoshima	1972-2012	204	26.5	0	75.2	0	8
Japan	Kanagawa	1972-2012	543	24.1	0	77.3	0.1	8.8

Japan	Kochi	1972-2012	99	25.4	0	76.5	0.1	9.3
Japan	Kumamoto	1972-2012	187	25.9	0	74.4	0	10
Japan	Kyoto	1972-2012	232	25.5	0.1	68.1	0.1	9.6
Japan	Mie	1972-2012	173	24.9	0	75.8	0	10.3
Japan	Miyagi	1972-2012	190	21.4	0	80.6	0	10.1
Japan	Miyazaki	1972-2012	115	25.6	0	79.7	0.1	8.2
Japan	Nagano	1972-2012	219	22.4	0	72.9	0	8.8
Japan	Nagasaki	1972-2012	162	25.5	0	76.9	0.1	9
Japan	Nara	1972-2012	116	24.3	0.1	76.1	0.1	9
Japan	Niigata	1972-2012	253	23.5	0	74.7	0.1	8.7
Japan	Oita	1972-2012	132	24.9	0	76.5	0	9.4
Japan	Okayama	1972-2012	193	25.5	0	72.1	0	9.9
Japan	Okinawa	1973-2012	88	27.9	0	79.3	0	6.7
Japan	Saga	1972-2012	91	25.6	0.1	75.1	0.2	10
Japan	Saitama	1972-2012	432	24.1	0	75.3	0.2	10.4
Japan	Shiga	1972-2012	105	24.3	0	75.5	0	8.3
Japan	Shimane	1972-2012	91	24	0	79.1	0.1	8.2
Japan	Shizuoka	1972-2012	312	24.7	0	76.4	0	8.4
Japan	Tochigi	1972-2012	176	23	0	78	0.1	8.7
Japan	Tokushima	1972-2012	92	25.3	0	73.9	0.1	9.6
Japan	Tottori	1972-2012	67	24.2	0	75.9	0	8.8
Japan	Toyama	1972-2012	116	23.6	0	79	0	9.3
Japan	Wakayama	1972-2012	119	25.6	0	71.8	0.1	8.8
Japan	Yamagata	1972-2012	136	22	0.1	75.7	0.1	9.2
Japan	Yamaguchi	1972-2012	171	24.7	0.1	76.1	0.1	8.6
Japan	Yamanashi	1972-2012	84	24.1	0	72.7	0.1	9.2
Mexico	Guadalajara	1998-2010	76	21.5	0.8	75.2	0.8	11.1
Mexico	Leon	1998-2014	33	21.5	1.3	64.1	1.2	14.2
Mexico	Ciudad Juarez	2002-2009	12	27.7	1.9	42.2	2	17
Mexico	Comarca Lagunera	1998-2009	16	28.2	11.1	52.2	11.1	11.2
Mexico	Monterrey	2004-2009	32	27	0	64.5	0	10.1
Mexico	Puebla-Tlaxcala	1998-2009	39	17.6	1.5	69.8	1	8.7
Mexico	San Luis Potosi	1998-2010	5	20	4.2	68.9	33	9.1
Mexico	Tijuana	1998-2014	29	21.1	1.2	74.4	1.2	7.3
Mexico	Toluca de Lerdo	1998-2008	24	14.8	0.2	70.7	0.1	8.4
Mexico	Valley of Mexico	1998-2014	459	17.3	0	63.5	2.2	10.7
Philippines	Cebu	2006-2010	15	28.5	0	82.2	0	4.6
Philippines	Davao	2006-2010	15	28.1	0	82.8	0	3.2
Philippines	Manila	2006-2010	32	29	0	78.5	0	6
Philippines	Quezon	2006-2010	31	28.4	0	82.5	0	6.4
South Korea	Busan	1992-2010	108	23.4	0	78.3	0	10.8
South Korea	Daegu	1992-2010	66	24.4	0	69.4	0	11
South Korea	Daejeon	1992-2010	33	23.6	0	74.6	0	10.3
South Korea	Gwangju	1992-2010	34	24.2	0	74.8	0	9.7

South Korea	Incheon	1992-2010	62	23	0	76.9	0	10.7
South Korea	Seoul	1992-2010	227	23.7	0.1	71.7	0.1	11.7
South Korea	Ulsan	1997-2010	18	23.6	0.1	75	0.1	10.2
Spain	Vitoria	1990-2014	12	18.1	0	75.1	0	8.8
Spain	A Coruna	1990-2014	16	18.9	0	77.8	0	7.9
Spain	Albacete	1990-2014	7	23.1	0	53.4	3.5	13.9
Spain	Alicante	1990-2014	18	24.8	0	68.8	0	10.2
Spain	Almeria	1990-2014	9	25.2	0.1	64.5	0.7	13.3
Spain	Avila	1990-2014	3	19	0	50.3	0	13.3
Spain	Badajoz	1990-2014	7	24.7	0	53	0	10.7
Spain	Barcelona	1990-2014	108	23.3	0	69	1.2	8.5
Spain	Bilbao	1990-2014	26	19.8	0	74.7	0	8.6
Spain	Burgos	1990-2014	11	18.1	0	64.6	0	10.7
Spain	Caceres	1990-2014	5	24.5	0	44.5	0	13.6
Spain	Cadiz	1990-2014	8	23.8	7.3	71.1	7.6	10.6
Spain	Castellon	1990-2014	9	24.4	0	67	0	10.3
Spain	Ceuta	2006-2014	1	23.8	0	68.7	5.6	15.9
Spain	Ciudad Real	1990-2014	4	24.7	0	45	0.3	12.5
Spain	Cordoba	1990-2014	18	26.4	0	46.9	0.1	12.6
Spain	Cuenca	1990-2014	3	21.7	0	49	0.5	13.2
Spain	Girona	1990-2014	5	22.1	0.3	68.2	0	10.6
Spain	Granada	1990-2014	15	23.7	0	47	0	11.6
Spain	Guadalajara	1990-2013	2	21.9	9.3	52	9.1	12.4
Spain	Huelva	1990-2014	8	24.6	0.1	59.5	0.1	12.3
Spain	Huesca	1990-2014	3	22.3	1.2	54.5	1.9	11.7
Spain	Jaen	1990-2014	6	25.2	2.2	45.9	3.6	12.9
Spain	Leon	1990-2013	9	18.2	0	58.6	0.7	11.1
Spain	Lleida	1990-2014	8	23.5	0	59.7	0	10.4
Spain	Logrono	1990-2014	8	21.4	0	62.1	0	10.5
Spain	Lugo	1990-2014	6	17.5	2	77.6	2	6.8
Spain	Madrid	1990-2014	195	23.7	0	45.8	0	11.5
Spain	Malaga	1990-2014	32	24.9	0	61.9	0	13.3
Spain	Melilla	1990-2014	3	24.6	0	70.3	0	13.5
Spain	Murcia	1990-2014	20	26.1	0	58.7	0	11
Spain	Ourense	1990-2014	7	21.5	0	64.2	0	8.3
Spain	Oviedo	1990-2014	15	18.1	0	81.5	0	7.9
Spain	Palma Mallorca	1990-2014	21	23.7	0	68.5	0	9.2
Spain	Pamplona	1990-2014	12	20.1	0	62.9	0	10.2
Spain	Pontevedra	1990-2014	5	19.6	0	73.5	0.1	11.4
Spain	Salamanca	1990-2014	11	19.8	0	55.6	0	10.6
Spain	San Sebastian	1990-2014	13	18.5	0	82.9	0	10
Spain	Santander	1990-2014	13	19.3	0.2	77.7	0.2	7.4
Spain	Segovia	1990-2014	4	20.3	0	46.3	0	13.5
Spain	Sevilla	1990-2014	42	26.9	0	51.4	0	12.3

Spain	Soria	1990-2014	2	18.7	1.6	57.5	1.8	12.2
Spain	Tarragona	1990-2014	7	25.1	0	64	0	12.7
Spain	Tenerife	1990-2014	12	24.7	0	62.1	0	7.9
Spain	Teruel	1990-2014	2	20.4	0	60.9	0	11.6
Spain	Toledo	1990-2014	4	24.8	0	42.5	0	13.3
Spain	Valencia	1990-2011	43	24.8	0	70	0.2	10.8
Spain	Valladolid	1990-2014	19	20.7	0	53.4	0.1	11.4
Spain	Zamora	1990-2014	5	21.1	0	53.3	0	10.7
Spain	Zaragoza	1990-2014	42	23.8	0	53.4	0	10.5
Sweden	Stockholm	1998-2005	19	15.8	3.7	70.5	4.6	11.1
Sweden	Gothenburg	1999-2005	10	16.3	12.5	72.7	14.6	8.8
Sweden	Skane	1998-2005	24	16.1	0.5	77.2	1.9	8
Switzerland	Basel	1995-2013	12	18.2	0	72.4	0	9.5
Switzerland	Bern	1995-2013	9	17	0	73.7	0	9
Switzerland	Geneve	1995-2013	8	18.6	0	67.7	0	10
Switzerland	Lausanne	1995-2013	6	18.7	0	67.8	0	10
Switzerland	Lugano	1995-2013	9	20.6	0	68.3	0	13.2
Switzerland	Luzern	1995-2013	5	17.5	0	75.2	0	9.8
Switzerland	St. Gallen	1995-2013	4	15.8	0	74.5	0	11.3
Switzerland	Zürich	1995-2013	23	17.1	0	74.2	0	10.8
Taiwan	Kaohsiung	1994-2007	69	28.6	0	79.8	0	6.4
Taiwan	Taichung	1994-2007	52	28.1	0	76	0	7
Taiwan	Taipei	1994-2007	124	28.5	0	74.4	0	8.2
Thailand	Amnat Charoen	1999-2008	3	27.3	7.1	86.5	0	4.5
Thailand	Ayutthaya	1999-2008	8	28.9	4.3	79.6	2.5	5
Thailand	Bangkok	1999-2008	72	29.6	2.5	73.2	8.2	5.4
Thailand	Buri Ram	1999-2008	4	28.1	20	80.9	0	5
Thailand	Chachoengsao	1999-2008	7	27.6	0	78.3	0	6.7
Thailand	Chaiyaphum	1999-2008	10	28.4	0	77.9	0	6.3
Thailand	Chanthaburi	1999-2008	7	27.9	0.4	78.9	0	4.8
Thailand	Chiang Mai	1999-2005	18	27.6	0	78.8	3.9	4.8
Thailand	Chiang Rai	1999-2008	17	27.1	4.7	82.3	2.5	4.8
Thailand	Chon Buri	2000-2008	13	28.8	19.8	77.4	2.5	4.9
Thailand	Chumphon	1999-2008	4	28.8	0	82.4	0	4.4
Thailand	Kalasin	1999-2008	10	28.7	0	80.6	0	6.7
Thailand	Kamphaeng Phet	1999-2008	4	27.7	2.6	84	2.5	5.6
Thailand	Kanchanaburi	1999-2008	7	29.3	0	73.5	2.5	5.5
Thailand	Khon Kaen	1999-2008	20	28.2	1.2	79.1	1.6	6.2
Thailand	Krabi	1999-2008	2	27.9	13.5	86.9	2.7	4.4
Thailand	Lampang	1999-2008	13	28.6	0	83.9	0	5
Thailand	Lamphun	1999-2008	5	27.3	2.5	83.5	2.5	3.8
Thailand	Lop Buri	1999-2008	10	28	0	79.4	0.2	4.6
Thailand	Maha Sarakham	1999-2008	8	29.3	0	73.1	2.7	6.5
Thailand	Mukdahan	1999-2008	3	27.4	5.4	84.2	0	4.8

Thailand	Nakhon Pathom	1999-2008	9	28.6	0	79	0	5.1
Thailand	Nakhon Phanom	1999-2008	6	28.4	0	79.7	0	4.2
Thailand	Nakhon Ratchasima	1999-2008	24	28.1	0	76.2	0.9	5.8
Thailand	Nakhon Sawan	1999-2008	11	28.9	0	77.4	8.7	5.1
Thailand	Nan	1999-2008	6	28	0	79.3	0	6.7
Thailand	Narathiwat	1999-2008	5	28.2	0	77.4	9.9	6.6
Thailand	Nong Bua Lam Phu	1999-2008	4	28.9	0	81.1	0.1	5.3
Thailand	Nong Khai	1999-2008	7	28.9	2.5	76.7	5.2	4.4
Thailand	Nonthaburi	1999-2008	10	28.4	0	82.2	0	4.5
Thailand	Pathum Thani	1999-2008	8	28.2	0	83.8	0	5.7
Thailand	Pattani	2000-2008	4	27.7	19.6	85.1	0	4.9
Thailand	Phayao	1999-2008	8	28.3	0	81.3	0	5
Thailand	Phetchaburi	1999-2008	5	27.7	0	82.5	0	4.2
Thailand	Phichit	1999-2008	4	28	0.4	81.8	7.5	3.7
Thailand	Phitsanulok	1999-2008	10	28.8	0	75.3	2.5	5.5
Thailand	Phrae	1999-2008	7	28.9	6.6	74	2.7	5.6
Thailand	Prachin Buri	1999-2008	5	28.4	2.7	80.6	2.5	4.9
Thailand	Prachuap Khiri Khan	1999-2008	4	28.3	2.5	75.8	7.4	5.4
Thailand	Ratchaburi	1999-2008	9	28	0	78.9	7.3	5.4
Thailand	Rayong	1999-2008	6	26.4	0	82	2.5	4.6
Thailand	Roi Et	1999-2008	12	28.3	3.3	78.7	4.8	5.6
Thailand	Sa Kaeo	1999-2008	4	28.4	1.3	76.8	0.2	4.5
Thailand	Sakon Nakhon	1999-2008	8	27.9	7.9	80.5	18.6	5.9
Thailand	Samut Sakhon	1999-2008	5	29.1	3.3	76.8	0	5.7
Thailand	Samutprakan	1999-2008	10	28.7	0	72.5	0	4.6
Thailand	Saraburi	1999-2007	6	28.7	2.7	80.6	14.4	4.4
Thailand	Si Sa Ket	1999-2008	12	28.3	1.4	77.9	3.4	5.9
Thailand	Songkhla	1999-2008	7	28.3	0	78.7	0	4.3
Thailand	Sukhothai	2000-2008	6	28.7	0	82.8	0	4.8
Thailand	Suphanburi	1999-2008	7	28.7	2.7	75.5	10.1	5.8
Thailand	Surat Thani	2003-2008	5	28.6	0	79.2	0	7.5
Thailand	Surin	1999-2008	11	28.5	1.4	79.5	1.4	5
Thailand	Tak	1999-2008	3	28.4	12	77.7	20.1	5.2
Thailand	Trang	1999-2008	5	29.1	0	77.7	2.5	4.6
Thailand	Ubon Ratchathani	1999-2008	16	28.1	4.2	78.6	4.7	5.6
Thailand	Udon Thani	1999-2008	16	28.4	0	80	0	6.6
Thailand	Uttaradit	1999-2008	7	28.3	0	82.4	0	6.2
Thailand	Yala	1999-2008	2	27.6	16.7	82.7	16.7	4.3
Thailand	Yasothon	1999-2008	5	27.5	0	82.2	0	5.3
UK	East	1993-2006	226	16.3	0	68.2	0	10.5
UK	East Midlands	1993-2006	183	15.6	0	68.5	0	11.8
UK	London	1993-2006	256	17.5	0	60.9	0	12.2
UK	North East	1993-2006	123	14.6	0	68	0	11.9
UK	North West	1993-2006	323	15.4	0	70.5	0	11

UK	South East	1993-2006	342	16.3	0	70.1	0	10.5
UK	South West	1993-2006	233	15.8	0	74.1	0	9.8
UK	Wales	1993-2006	143	15.4	0	74.8	0	9.5
UK	West Midlands	1993-2006	233	15.6	0	66.9	0	11.8
UK	Yorkshire & Humber	1993-2006	225	15.3	0	69.5	0	11.1
USA	Akron, OH	1985-2006	33	20.3	0	72.2	0.1	10.1
USA	Albuquerque, NM	1985-2006	22	23.8	0	37.3	0.1	14.1
USA	Allentown-Bethlehem, PA	1985-2006	18	21.2	0	70.6	0.8	10.9
USA	Atlanta, GA	1985-2006	96	25.4	0	67.9	0	10.6
USA	Atlantic City, NJ	1985-2006	14	22.1	0	74.6	1.6	10.6
USA	Austin, TX	1985-2006	21	28.4	0	62.4	1	10.4
USA	Bakersfield, CA	1985-2006	26	26.4	0	39	1.4	9.1
USA	Baltimore, MD	1985-2006	99	23.2	0	69.8	0.1	11.1
USA	Barnstable-Yarmouth, MA	1997-2006	7	19.7	0.4	79.8	1.6	12.2
USA	Baton Rouge, LA	1985-2006	19	27.2	0	73.1	0	7.8
USA	Bergen-Passaic, NJ	1985-2006	73	23.4	0	64.4	0.1	13.1
USA	Birmingham, AL	1985-2006	53	25.6	0	69.8	0.1	9.8
USA	Boston, MA	1985-2006	145	20.9	0	69.1	0.1	13.7
USA	Brownsville, TX	1985-2006	11	28.9	0	71.6	0.5	6.2
USA	Buffalo, NY	1985-2006	66	19.8	0	70.2	0	10.2
USA	Canton-Massillon, OH	1985-2006	24	20.3	0	72.2	0.1	10.1
USA	Charleston, WV	1985-2006	15	22.3	0	73.4	0.3	9
USA	Charlotte, NC	1985-2006	25	24.8	0	68.4	0	10.2
USA	Chattanooga, TN	1985-2006	19	25	0	70.1	0.2	8.9
USA	Chicago, IL	1985-2006	347	21.1	0	68.9	0	10.9
USA	Cincinnati, OH	1999-2006	18	22.4	0	73.6	0.8	9
USA	Cleveland, OH	1985-2006	125	20.7	0	71.2	0	9.4
USA	Columbia, SC	1985-2006	24	26.2	0	67.8	0	9.4
USA	Columbus, OH	1985-2006	49	22	0	68.4	0.2	9.8
USA	Dallas, TX	1985-2006	82	28.1	0	59.9	0	11.4
USA	Dayton, OH	1985-2006	33	21.6	0	68.9	0.3	10.4
USA	Daytona Beach, FL	1985-2006	33	27.1	0	75.9	0.4	6
USA	Denver, CO	1985-2006	56	20.7	0	45.1	0.1	15.4
USA	Des Moines, IA	1985-2006	17	22	0	69.1	0.2	10.4
USA	Detroit, MI	1985-2006	227	21	0	68.3	0.2	10
USA	Dutchess County, NY	1985-2006	12	20.1	4.3	71.1	4.3	12.4
USA	El Paso, TX	1985-2006	22	26.8	0	40.6	0	14.9
USA	Erie, PA	1985-2006	16	20.3	0	71.5	0.8	9.8
USA	Flint, MI	1985-2006	24	19.6	0	72.1	0.1	9.9
USA	Fort Myers-Cape Coral, FL	1985-2006	23	28.2	0.1	73.2	2	6.2

USA	Fort Pierce-Port St. Lucie, FL	1985-2006	15	27.2	0	77.2	7.4	5.3
USA	Fort Worth-Arlington, TX	1999-2006	21	28.2	0	57.2	0.8	12.1
USA	Fresno, CA	1985-2006	30	26.2	0	40.4	1.4	8.3
USA	Ft. Lauderdale, FL	1985-2006	72	27.4	0	76.6	7.4	4.9
USA	Galveston, TX	1991-2006	10	27.1	1.6	74.3	1.6	8.8
USA	Gary, IN	1985-2006	28	20.9	0	69.7	0	11.5
USA	Grand Rapids, MI	1985-2006	24	19.9	0	71.1	0.1	10.5
USA	Greensboro, NC	1985-2006	20	23.7	0	70.9	0	9.8
USA	Greenville, SC	1985-2006	18	24.5	0	69.9	0.2	10.3
USA	Hamilton, OH	1999-2006	6	22.4	0	73.6	0.8	9
USA	Harrisburg-Carlisle, PA	1992-2006	7	22.6	0	71.2	7.9	10.9
USA	Hartford, CT	1985-2006	47	20.8	0	69.5	0.6	11.4
USA	Honolulu, HI	1985-2000	24	27.5	0	62.8	0.1	5.2
USA	Houston, TX	1985-2006	116	28	0	70	0	8.5
USA	Indianapolis, IN	1985-2006	47	22.2	0	70.5	0	10.2
USA	Jacksonville, FL	1985-2006	39	27	0	74.8	0.1	6.7
USA	Jersey City, NJ	1985-2006	32	23.4	0	64.4	0.1	13.1
USA	Kansas City, MO-KS	1985-2006	67	23.4	0	69.7	0.1	10.9
USA	Knoxville, TN	1985-2006	25	24.1	0	71	0.1	8.9
USA	Lakeland-Winter Haven, FL	1985-2006	29	27.9	1.6	74	1.6	6.3
USA	Lancaster, PA	1992-2006	12	21.9	0	74.1	7.9	11.4
USA	Lansing, MI	1985-2006	11	19.4	0	72.6	0.3	10.1
USA	Las Vegas, NV-AZ	1985-2006	56	30.7	0	21.5	0.3	10.4
USA	Little Rock, AR	1985-2006	17	26.3	0	68.3	3.8	9.7
USA	Los Angeles, CA	1985-2006	380	20.4	0	74.2	0.3	6.9
USA	Louisville, KY	1985-2006	42	24.2	0.2	67.7	0.4	9.8
USA	Lubbock, TX	1985-2006	11	25.3	0	53.8	0.1	14.4
USA	Madison, WI	1985-2006	15	19.7	0	72.2	0.1	9.9
USA	McAllen-Edinburg-Mission, TX	1999-2006	7	29.9	0	63.5	1.1	8.1
USA	Melbourne- Titusville-Palm Bay, FL	1985-2006	19	27.1	2.9	77.8	10.2	5.2
USA	Memphis, TN	1985-2006	47	26.5	0	65.8	1.2	9.8
USA	Miami, FL	1985-2006	119	28.5	0	73.2	0	5.9
USA	Middlesex, NJ	1985-2006	33	21.8	1.1	71	1.2	14.6
USA	Milwaukee, WI	1985-2006	72	20.3	0	70.7	0	11.3
USA	Minneapolis-St. Paul, MN	1985-2006	74	20.4	0	66.8	0	11.2
USA	Mobile, AL	1985-2006	23	26.8	0	73.1	0.2	8.2
USA	Monmouth-Ocean, NJ	1992-2006	40	21.7	7.6	66.8	13.3	12.1
USA	Myrtle Beach, SC	1985-2006	8	25.6	5.9	75.8	6.4	8.6

USA	Naples, FL	1985-2006	9	28.1	5.1	73.8	6.9	5.5
USA	Nashua, NH	1985-2006	14	19.4	6.1	69	6.5	12.5
USA	Nashville, TN	1985-2006	30	24.9	0	67.9	0	9.4
USA	Nassau-Suffolk, NY	1985-2006	120	21.2	0	74	7.6	11.9
USA	New Haven-Meriden, CT	1985-2006	47	20.8	0	69.5	0.6	11.4
USA	New London, CT	1985-2006	11	20.7	1.6	70.2	2.2	12.8
USA	New York, NY	1985-2006	425	23.4	0	64.5	0	13
USA	Newark, NJ	1985-2006	68	23.4	0	64.4	0.1	13.1
USA	Newburgh, NY	1985-2006	15	20.5	0.3	70.4	0.9	11.4
USA	Oakland, CA	1985-2006	84	18.1	9.5	67.3	9.6	9
USA	Ocala, FL	1985-2006	17	27.2	0.6	73.1	0.9	6.4
USA	Oklahoma City, OK	1985-2006	36	25.8	0	63.3	0.2	11.9
USA	Omaha, NE	1985-2006	22	22.3	0	69.4	0.1	10.5
USA	Orange County, CA	1985-2006	96	22.3	0	65.7	2.5	7.8
USA	Orlando, FL	1985-2006	49	27.8	0	73.2	0.2	6
USA	Pensacola, FL	1985-2006	14	27.3	0	73.8	4.6	9
USA	Philadelphia, PA-NJ	1985-2006	280	23.6	0	66.9	0	11.6
USA	Phoenix, AZ	1985-2006	118	33.2	0	27.3	0	12
USA	Pittsburgh, PA	1985-2006	97	20.9	0	69.7	0.1	10.4
USA	Portland, ME	1985-2006	14	18.5	0	73.7	0.4	12.2
USA	Portland, OR	1985-2006	65	19.4	0	61.9	0.2	10.4
USA	Providence-Fall River, RI-MA	1985-2006	11	20.9	0.1	71.5	0.3	12.6
USA	Punta Gorda, FL	1985-2006	10	28.1	1.3	73.9	3.1	5.6
USA	Raleigh, NC	1985-2006	18	24.5	0	71.6	0.1	9.2
USA	Reading, PA	1985-2006	22	24.5	0	71.6	0.1	9.2
USA	Riverside-San Bernardino, CA	1998-2006	55	25.3	0.2	49.4	7.8	10
USA	Rochester, NY	1985-2006	40	19.6	0	72.1	0.1	9.7
USA	Rockford, IL	1985-2006	14	20.7	0	70.6	0.2	10.5
USA	Sacramento, CA	1985-2006	47	23	0	50.3	6.4	9.7
USA	Saginaw, MI	1985-2006	12	19.6	0.8	70.6	0.8	10.8
USA	Salinas, CA	1998-2006	4	17.1	0	70.7	20.8	8.3
USA	Salt Lake City, UT	1985-2006	27	22.8	0	37	0.4	12.3
USA	San Antonio, TX	1985-2006	58	28.4	0	61.7	0	9.8
USA	San Diego, CA	1985-2006	115	20.9	0	73.5	0	6.5
USA	San Francisco, CA	1985-2006	77	17.6	0	69.4	0.1	8.1
USA	San Jose, CA	1985-2006	50	21	3.3	56.2	3.4	8.1
USA	Sarasota-Bradenton, FL	1985-2006	38	28	2.9	73.6	2.9	6
USA	Scranton--Wilkes-Barre--Hazleton, PA	1985-2006	45	20	0	70.9	0.7	10.9
USA	Seattle, WA	1985-2006	70	17.5	0	66.4	0	10.8
USA	Shreveport, LA	1985-2006	16	27.2	0	67.4	0.1	9.8
USA	Spokane, WA	1985-2006	21	18.3	0	46.8	0.2	14.4

USA	Springfield, MA	1985-2006	28	20.8	0	69.5	0.6	11.4
USA	St. Louis, MO-IL	1985-2006	96	24.5	0	65.5	0.2	10.7
USA	Stamford-Norwalk, CT	1985-2006	42	21.4	0	71.6	0.7	12.3
USA	Stockton-Lodi, CA	1985-2006	17	23.6	0	48.1	12.5	10.1
USA	Syracuse, NY	1985-2006	26	19.8	0	71.1	0.2	9.4
USA	Tacoma, WA	1985-2006	26	17.8	8.1	64.9	8.1	8.8
USA	Tampa-St. Petersburg-Clearwater, FL	1985-2006	50	28	0	73.7	0	6.1
USA	Toledo, OH	1985-2006	28	20.8	0	70.4	0.8	10.2
USA	Trenton, NJ	1985-2006	18	21.6	0	75.3	0	13.8
USA	Tucson, AZ	1985-2006	39	29.5	0	33.7	0.5	14.7
USA	Tulsa, OK	1985-2006	30	26.1	0	64.7	0.1	11.2
USA	Utica-Rome, NY	2001-2006	4	19.3	0	74.6	1	8.9
USA	Ventura County, CA	1985-2006	25	18.9	4.5	81.4	4.8	6.9
USA	Virginia Beach, VA	1985-2006	57	24.9	0	72.2	0.3	9.6
USA	Washington, DC-MD-VA	1985-2006	44	24.4	0	67.2	0.2	11.3
USA	West Palm Beach-Boca Raton, FL	1985-2006	72	28	0	75.2	0.1	5.1
USA	Wichita, KS	1985-2006	21	24.9	0	62.6	0	12.4
USA	Wilmington, DE	1985-2006	23	22.8	0	70.9	0.8	11.1
USA	Worcester, MA	1985-2006	38	19	0.1	71.2	2.6	13.1
USA	York, PA	1992-2006	9	22.1	0	73.3	7.9	10.4
USA	Youngstown-Warren, OH	1985-2006	26	19.6	0	73.7	0.1	9.9
Vietnam	Ho Chi Minh City	2010-2013	34	28.4	0	78.8	0	5.2
Vietnam	Hue	2009-2013	2	29.1	1.1	72.1	1.1	14.1

Argentina	Cordoba	2005-2015	37	23.6	0	67.5	0	13.1
Argentina	Buenos Aires	2005-2015	131	23.6	0	67.9	0	11.2
Argentina	Rosario	2005-2015	38	23.4	0	70	0	11.4
Australia	Brisbane	1988-2009	59	24.2	0	70.6	0	8.5
Australia	Melbourn	1988-2009	140	20.1	0	65.7	0	11.4
Australia	Sydney	1988-2009	161	22.2	0	70.7	0	10.7
Brazil	Belem	1997-2011	44	26.5	0.3	87.5	0.3	5.1
Brazil	Belo Horizonte	1997-2011	153	23.5	0.2	70	0.2	12.3
Brazil	Brasilia	1997-2011	37	21.8	0.2	75.8	0.3	11.4
Brazil	Cuiaba	1998-2011	13	27.2	15.2	80.8	14.9	7.4
Brazil	Curitiba	1997-2011	44	20.8	5.2	80.9	6.9	7.8
Brazil	Fortaleza	1997-2011	61	27.4	0.1	78.6	7.5	6.3
Brazil	Goiania	1997-2011	44	24.7	0.2	73.1	0.2	10.4
Brazil	Joao Pessoa	1997-2011	20	28.1	1	74.3	8.6	5.3
Brazil	Maceio	1997-2011	24	26.2	13.2	75.5	14	5.5
Brazil	Manaus	1997-2011	32	26.6	0.1	86.2	0.4	6.5
Brazil	Porto Alegre	1997-2011	63	24.1	5.2	74	5.2	8.8
Brazil	Recife	1997-2011	85	27.2	0.1	74.3	0.2	6.2
Brazil	Salvador	1997-2011	73	27	0.1	79.8	0.1	5.4
Brazil	Sao Luis	1997-2011	27	26.9	0	83.5	0	6
Brazil	Sao Paulo	1997-2011	279	22.8	0.4	75.4	1.2	9.6
Brazil	Teresina	1997-2011	19	27	4.3	79.5	12.3	9.7
Brazil	Vitoria	1997-2009	13	26.8	0.9	76.5	11.7	7.3
Canada	Abbotsford	1986-2009	8	17	0.6	71.9	0	8.8
Canada	Calgary	1986-2009	38	14.4	0.5	62.8	0	13.8
Canada	Edmonton	1986-2009	44	15.4	0.5	69.8	0	10.9
Canada	Halifax	1986-2009	21	16.9	0	78.1	0	12
Canada	Hamilton	1986-2009	33	18.8	0.1	70	0	11.5
Canada	Kingston	1986-2009	11	18.8	4	71.3	0.1	10.9
Canada	Kitchener	1986-2009	20	17.9	0.1	70	0.2	11
Canada	London Ontario	1986-2009	28	18.8	0	73.9	0	9.8
Canada	Montreal	1986-1999	76	18.6	0.6	70.7	0	10.4
Canada	Ottawa	1986-2009	39	18.6	0.1	70.8	0	11.2
Canada	Regina	1986-2009	15	16.2	0.1	65.9	0	13
Canada	Saint John's	1986-2009	12	15.3	1.4	78.6	0	11.3

Table S4. Further detail of model fit statistics summarised on Figure 1.

Name on Figure	Weather variables		Functional form of variable 2	df of weather terms	deviance (mean)	qAIC (mean)
	1*	2				
1 Null		0		0	2464	2653.6
2 RH	RH			12	2432	2645.3
3 Dewpoint	dewpoint			12	2424.4	2636.7
4 Temperature	tmean			12	2387.1	2595.9
5 App temp	app temp			12	2389.3	2598.3
6 RH A	tmean	RH	linear	15	2379.4	2593.6
7 RH B	tmean	RH	quadratic	18	2375.9	2596.4
8 RH C	tmean	RH	cubic	21	2372.2	2598.7
9 Dewpoint A	tmean	dewpoint	linear	15	2379.5	2593.7
10 Dewpoint B	tmean	dewpoint	quadratic	18	2375.5	2595.8
11 Dewpoint C	tmean	dewpoint	cubic	21	2371.3	2597.5
Interaction models						
12 linear	tmean	RH	linear	18	2374.9	2594.9
13 3groups A	tmean	RH	linear	21	2372.4	2599.1
14 3groups B	tmean	RH	linear	21	2372.2	2598.8
15 3groups C	tmean	RH	linear	21	2371.3	2597.8
16 3groups D	tmean	RH	linear	21	2373.2	2597.8
17 3groups E	tmean	RH	linear	21	2371.5	2596.4
18 3groups F	tmean	RH	linear	21	2372	2597

Notes: Abbreviations: RH=relative humidity, temp=temperature, app temp=apparent temperature, qAIC=quasi Akaike Information Criterion. All weather terms are included as distributed lag linear models (DLNMs) with stratified lag structure over lags 0,1,2-3. The first weather variable listed is included in all models as a 4df natural cubic spline. All models from 6 include temperature (4 df natural cubic spline) plus a range of humidity terms. Models 6-8 include RH as linear(A), quadratic(B) and cubic (C) polynomials, and 9-11 the same for dewpoint. Models 12-18 include, in addition to a linear term for RH, a range of forms of interaction between temperature (temp) and linear RH: linear temperature (12); separate RH slopes for each of three groups of temperature with cutpoints defined by location-specific (13-15) and global (16-18) percentiles.

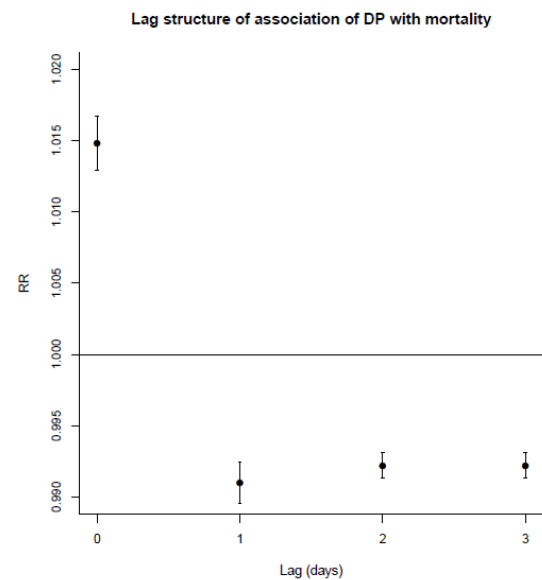
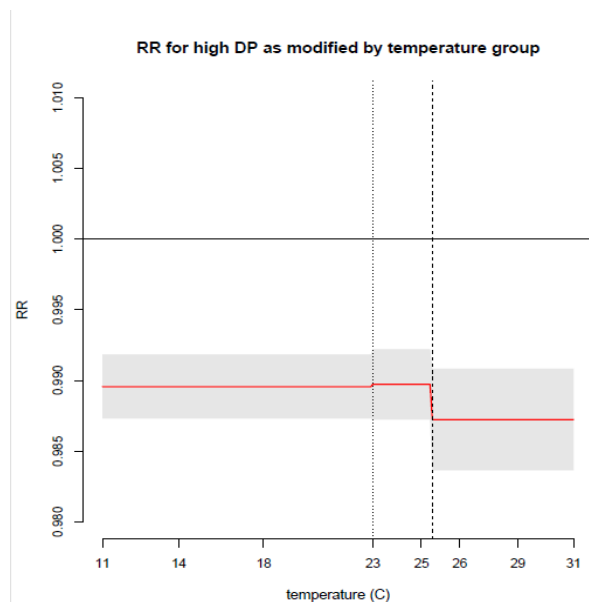
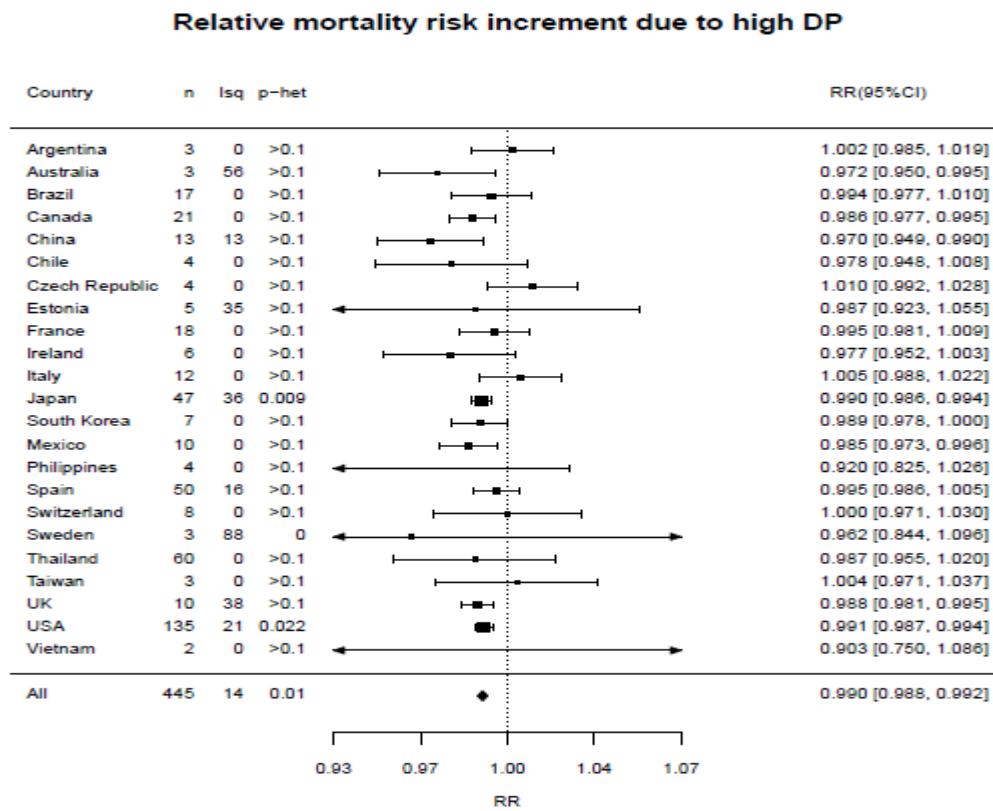
Table S5: Distribution of same and cross-lag correlations of daily temperature (T) and relative humidity (RH) measurements.

	correlation of TI0 with:			correlation of RH10 with:		
	mean	10%ile	90%ile	mean	10%ile	90%ile
TI0	1.00	1.00	1.00	-0.40	-0.78	-0.01
TI1	0.60	0.48	0.71	-0.17	-0.40	0.08
TI2	0.28	0.17	0.40	-0.07	-0.18	0.05
TI3	0.11	0.00	0.21	-0.02	-0.09	0.04
RHI0	-0.40	-0.78	-0.01	1.00	1.00	1.00
RHI1	-0.21	-0.50	0.08	0.46	0.34	0.59
RHI2	-0.12	-0.27	0.04	0.16	0.06	0.28
RHI3	-0.06	-0.15	0.02	0.05	-0.02	0.12

Notes: Abbreviations: TI_i=temperature lagged to i days, RH_i = relative humidity lagged to i days, Correlations were partial with respect to time trends as modelled in the epidemiological study.

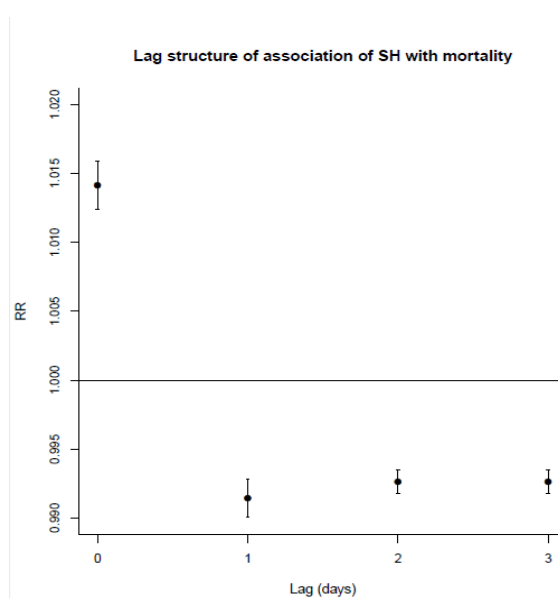
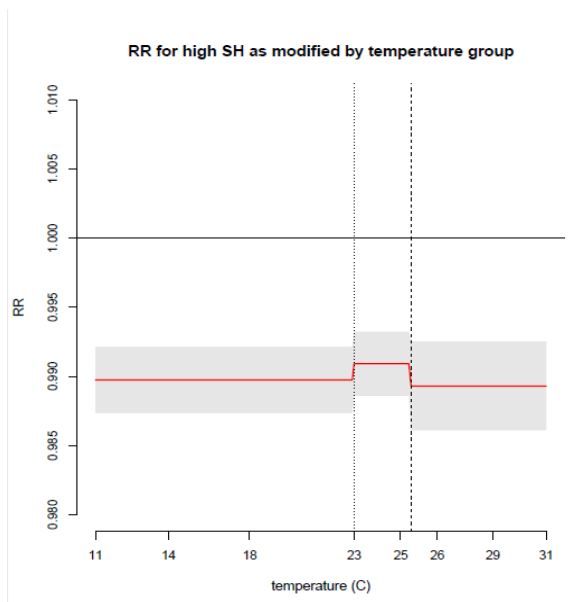
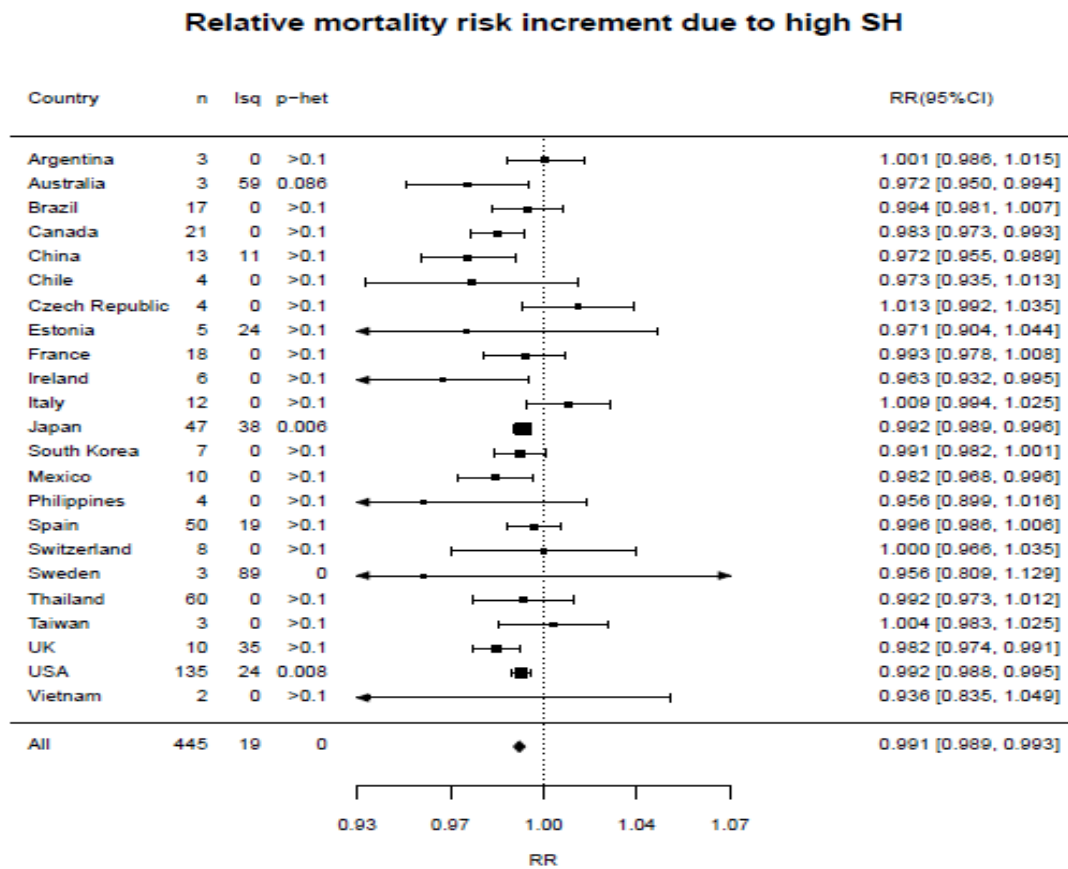
Figure S1: Detailed results replacing relative humidity by dewpoint or specific humidity

Figure S1: A) Detailed results replacing relative by dewpoint (DP)



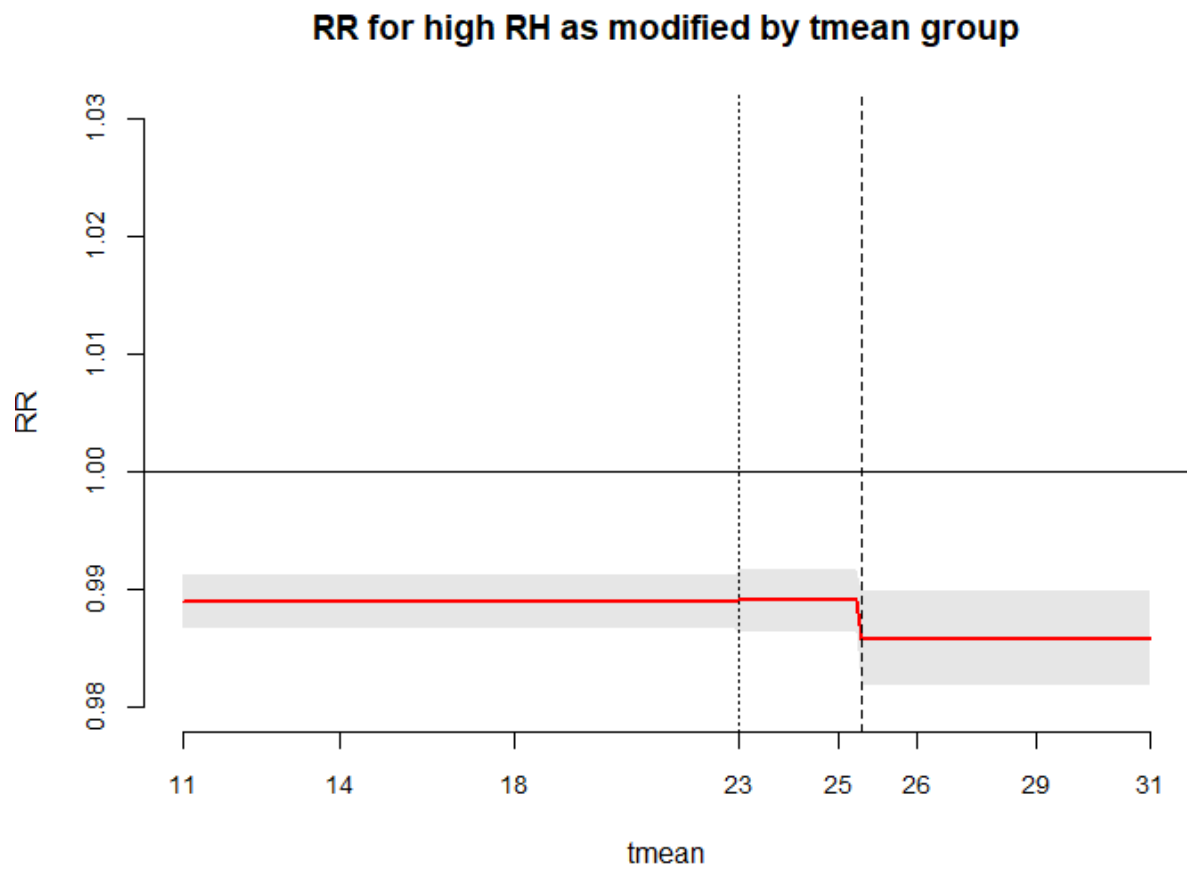
Notes: Abbreviations: DP=dewpoint, RR=rate ratio; Isq= I^2 , the percentage of variation across studies that is due to true heterogeneity rather than chance; p-het is the p value for Cochran's test for heterogeneity between locations. RR is given for the 99th centile of DP anomaly: 5.2 deg C

Figure S1: B) Detailed results replacing relative by specific humidity (SH)



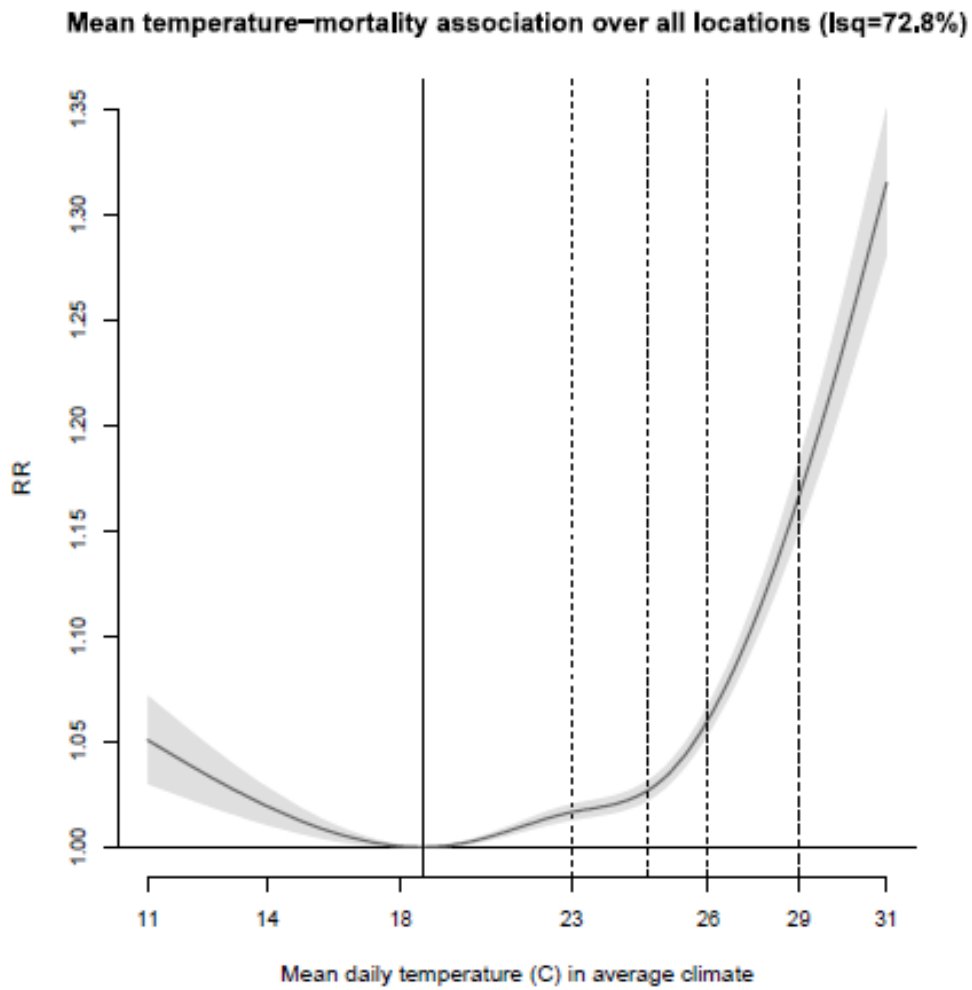
Note: Abbreviations: SH=Specific Humidity, RR=rate ratio; Isq= I^2 , the percentage of variation across studies that is due to true heterogeneity rather than chance; p-het is the p value for Cochran's test for heterogeneity between locations. RR is given for the 99th centile of SH anomaly: 3.6 g/kg.

Figure S2: Modification of Relative humidity (RH)-mortality association by temperature



Notes: RR=rate ratio; Significance of interaction: $p > 0.10$; $I^2 = 30.8\%$, $p\text{-het} < 0.001$

Figure S3: Mean temperature-mortality association adjusting for relative humidity (RH)



Note: Abbreviations: RR=rate ratio; I², the percentage of variation across studies that is due to true heterogeneity rather than chance.