Supplemental Material for Chapter 6 (Cardiovascular Effects) of the Integrated Science Assessment for Particulate Matter

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6.1.1.1.1 Contents

*Table in preparation

SUPPLEMENTAL TABLES FOR CHAPTER 6

(Cardiovascular Effects)

Table 6S-1: Corresponding risk estimates for studies presented in Figure 6-2

Study	Location	Age (yrs)	Avg Time	Outcome	Lag (days)	Effect Estimate (95% CI)
{Dominici, 2006, 88398@@author-year}	204 U.S. Urban Counties	65+	24-h avg	IHD	2	1.004 (1.00, 1.008)
{Barnett, 2006, 89770@@author-year}	4 Australian Cities	65+	24-h avg	IHD	0-1	1.043 (1.019, 1.064)
{Host, 2007, 155851@@author-year}	6 French Cities	65+	24-h avg	IHD	0-1	1.045 (1.023, 1.068)
†{Bell, 2015, 2854421@@author-year}	213 U.S. Counties	65+	24-h avg	IHD	0	1.002 (0.999, 1.005)
†{Kloog, 2014, 2332334@@author-year}	7 Mid-Atlantic States and Washington, D.C.	65+	2-d avg	IHD	0-1	1.01 (1.006,1.014)
{Zanobetti, 2006, 90195@@author-year}	Boston, Massachusetts	65+	24-h avg	MI	0	1.007 (1.003, 1.01)
†{Bell, 2015, 2854421@@author-year}	213 U.S. Counties	65+	24-h avg	IHD	0	1.001 (0.997, 1.005)
†{Zanobetti, 2009, 1254262@@author-year}	26 U.S. Cities	65+	2-d avg	MI	0-1	1.023 (1.011, 1.034)
†{Haley, 2009, 1078095@@author-year}	8 New York Cities		24-h avg	IHD	0	1.00456 (0.99677, 1.0124)
†{Hsu, 2017, 3456092@@author-year}	NYC, Long Island & Hudson		24-h avg	IHD	0	1.0103 (1.0049, 1.0158)
	Adirondack & North					1.0053 (0.9773, 1.0341)

Study	Location	Age (yrs)	Avg Time	Outcome	Lag (days)	Effect Estimate (95% CI)
	Mohawk Valley & Birmingham					0.998 (0.9724, 1.0244)
	Central & Western NY					1.0028 (0.9917, 1.0141)
†{Talbott, 2014, 2534723@@author-year}	Florida		24-hr avg	IHD	0-2	0.994 (0.983, 1.005)
	Massachusetts					1.001 (0.988, 1.015)
	New Jersey					1.016 (1.008, 1.025)
	New Hampshire					0.985 (0.943, 1.029)
	New Mexico					0.967 (0.903, 1.036)
	New York					1.01 (1.003, 1.016)
	Washington					0.999 (0.98, 1.018)
†{Ostro, 2016, 3420293@@author-year}	8 California Counties		24-h avg.	IHD	0	1.011 (0.995, 1.028)
†{Milojevic, 2014, 2348733@@author-year}	15 Conurbations in England and Wales		24-h avg	IHD	0−4	0.986 (0.975, 0.996)
†{Sarnat, 2015, 2772940@@author-year}	St. Louis, Missouri-Illinois Metropolitan		24-h avg	IHD	0−2	1.005 (0.977, 1.032)
†{Milojevic, 2014, 2348733@@author-year}	15 Conurbations in England and Wales		24-h avg	MI	0−4	0.997 (0.985, 1.01)
				STEMI		0.983 (0.965, 1.002)
				NSTEMI		1.007 (0.991,1.024)
†{Stieb, 2009, 195858@@author-year}	6 Canadian Cities		24-h avg	Angina/MI	0	1.024 (0.984,1.067)

Study	Location	Age (yrs)	Avg Time	Outcome	Lag (days)	Effect Estimate (95% CI)
†{Szyszkowicz, 2009, 191996@@author-year}	6 Canadian Cities		24-h avg	Angina	0	1.024 (1.012, 1.036)
†{Weichenthal, 2016, 3275174@@author-year}	16 cities in Ontario, Canada		24-h avg	MI	0-2	1.034 (0.999, 1.084)
†{Talbott, 2014, 2534723@@author-year}	Florida		24-h avg	MI	0-2	1.001 (0.985, 1.018)
	Massachusetts					0.994 (0.975, 1.012)
	New Jersey					1.007 (0.994, 1.02)
	New Hampshire					1.005 (0.948, 1.065)
	New Mexico					0.985 (0.896, 1.082)
	New York					1.002 (0.992, 1.012)
	Washington					1.011 (0.986, 1.036)
†{Ostro, 2016, 3420293@@author-year}	8 California Counties		Overall avg	MI	0	1.01 (0.982, 1.038)
†{Rich, 2010, 644122@@author-year}	New Jersey		0-23h	MI	0-23 hr	1.02 (0.98,1.07)
				Transmural MI		1.09 (1.01,1.18)
				Non-Transmural MI		0.99 (0.94,1.05)
†{Pope, 2015, 3254045@@author-year}	3 Utah Cities		24-h avg	STEMI	0	1.08(1.01, 1.16)
				NSTEMI		1(0.97, 1.03)
				Unstable Angina		1.04 (1, 1.09)
†{Gardner, 2014, 2333171@@author-year}	9 Belgium Provinces		1-h avg	STEMI	0-1	0.906 (0.6878,1.214)
				NSTEMI		1.0319 (0.7726, 1.3771)

Study	Location	Age (yrs)	Avg Time	Outcome	Lag (days)	Effect Estimate (95% CI)

† = studies publised since the 2008 SO_X Integraged Science Assessment (ISA).

avg = average; CI = confidence interval; NR = not reported.

[a]Time-series analysis results.

[b]Case-crossover analysis results.

Table 6S-2: Study details and mean and upper percentile concentrations of $PM_{2.5}$ from included short-term cardiovascular hospital admission and emergency department visit studies

Study	Exposure Assessment	Outcome Assessment	Mean (SD) and Upper Percentile Concentrations ($\mu g/m^3$)	Copollutant Examination
{Barnett, 2006, 89770@@author-year} Four Australian Cities (1998-2001)	Monitors in city averaged 3 monitors Sydney, 2 monitors Melbourne and Perth, 1 monitor Brisbane.	IHD, Heart Failure, CBVD, CVD, Cardiac Diseases Age ≥ 65 yr	24-h avg: 8.1 to 9.7 (NR) (across four cities) Max: 29.3 to 122.8 (across four cities)	No copollutant models examined Copollutant correlations NR.
{Bell, 2008, 156266@@author-year} 202 U.S. Counties (1999-2010)	Monitors in county averaged	CVD Age ≥ 65 yr	NR	No copollutant models examined Copollutant correlations NR.
{Burnett, 1999, 17269@@author-year} Toronto, Canada (1980-1994)	1 monitor $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$ values not available for full study period. Values estimated from single TSS monitor.	PVD	24-h avg: 18.0 (NR) 75^{th}: 22.0 Max: 90.0	No quantitative results presented. Authors state that there was a negative association.
{Dominici, 2006, 88398@@author-year} 204 U.S. Urban Counties (1999-2002)	Monitors in county averaged Number NR. Study population reside an average of 5.9 miles from monitor. Median pairwise correlation between same-county monitors 0.91.	IHD, Heart Failure, Arrhythmia, PVD, CBVD Age ≥ 65 yr	24-h avg: 13.4 (IQR 3.9) 75^{th}: 15.2	No copollutant models examined Copollutant correlations NR.
{Host, 2007, 155851@@author-year} Six French Cities (2000-2003)	Monitors in city averaged 4 monitors Paris, 1 monitor Toulouse, 2 monitors other cities. Residents within 20 km. Between-monitor r > 0.60.	IHD Age ≥ 65 yr	24-h avg: 13.8 to 18.6 (NR) (across six cities) 95th: 25.0 to 33.0 (across six cities)	No copollutant models examined r = 0.28-0.73 $PM_{10-2.5}$ across cities.
{Host, 2008, 155852@@author-year} Six French Cities (2000-2003)	Monitors in city averaged 4 monitors Paris, 1 Toulouse, 2 other cities. Residence within 20 km. Between-monitor r > 0.6	CVD, Cardiac Diseases	24-h avg: 13.8 to 18.6 (across six cities) 95^{th}: 25.0 to 33.0 (across six cities)	No copollutant models examined r = 0.28-0.73 $PM_{10-2.5}$ across cities
{Levy, 2001, 17171@@author-year} Seattle, Washington (1988-1994)	Monitors in city averaged 3 monitors R^2 to $PM_{2.5}$ = 0.85.	OHCA Age 25-75 yr Married and in-person interview	24-h avg: 18.4 (NR) 75^{th}: 23.0 Max: 96.0	No copollutant models examined. Copollutant correlations NR.
{Rosenthal, 2008, 156925@@author-year} Indianapolis, Indiana (2002-2006)	1 monitor 2002 data from separate monitor. R^2 = 0.87.	OHCA	24- avg Median: 13.9 75^{th}: 19.5 90^{th}: 25.8	No copollutant models examined. Copollutant correlations NR.
{Sullivan, 2003, 43156@@author-year}	Monitors in city averaged 3 monitorsR^2 to $PM_{2.5}$ = 0.85.	OHCA	24-h avg: 0.71 (x 10^{-1} km^{-1} bsp) IQR: 13.8 ($\mu g/m^3$)	No copollutant models examined.

Study	Exposure Assessment	Outcome Assessment	Mean (SD) and Upper Percentile Concentrations ($\mu g/m^3$)	Copollutant Examination
Seattle, Washington (1985-1994)				Copollutant correlations NR.
{Zanobetti, 2006, 90195@@author-year} Boston, Massachusetts (1995-1999)	1 monitor Data missing for 1998.	MI Age ≥ 65 yr	24-h avg Median: 11.1 (IQR 8.9) 75th: 16.1	No copollutant models examined r = 0.66 BC, 0.55 NO_2, 0.52 CO, 0.20 O_3, 0.74 PM non-traffic.
†{Basagaña, 2014, 2533224@@author-year} Four Cities in Spain and Italy (2003-2013)	1 monitor per city Madrid monitor urban, other 3 cities urban background	CVD	24-h avg: 20.7 to 27.6 (across four cities)	No copollutant models examined PM_{10} correlation NR. (PM_{10} and $PM_{2.5}$ monitors not available in same cities).
†{Bell, 2014, 2225815@@author-year} Four Counties in Massachusetts and Connecticut (2000-2004)	1 monitor per county for 3 counties, one CT county used populated weighted average of 2 monitors	CVD Age ≥ 65 yr	24-h avg: 14.0 (9.4) Median: 11.7	No copollutant models examined Copollutant correlations NR.
†{Bell, 2015, 2854421@@author-year} 213 U.S. Counties (1999-2010)	Monitors in county averaged	IHD, MI, Heart Failure, Heart Rhythm Disturbance, PVD, CBVD, CVD Age ≥ 65 yr	24-h avg: 12.3 (NR) Max: 20.2	No copollutant models examined Copollutant correlations NR.
†{Bravo, 2016, 3420336@@author-year} 708 U.S. Counties (2002-2006)	Fused-CMAQ Downscaler Model CMAQ combined with monitoring data, census tract estimates used to predict county level 24h PM2.5.	CVD Age ≥ 65 yr	Mean: 12.60 (NR)	No copollutant models examined Copollutant correlations NR.
†{Brook, 2015, 2826774@@author-year} Calgary and Edmonton, Canada (Jan. 2010-Dec. 2011)	Average of monitors in 35 km of patient zip code centroid	Hypertension	24-h avg Calgary: Median: 10.1 Max: 138.4 Edmonton: Median: 8.1 Max: 156.3	No copollutant models examined. Copollutant correlations NR.
†{Bunch, 2011, 1255150@@author-year} Wasatch Front, Utah 1994-2006	3 monitors	Atrial Fibrillation	24-h avg: 10.1-11.1 (across 3 monitors)	No copollutant models examined Copollutant correlations NR.
†{Caussin, 2015, 3013874@@author-year} Paris, France (2003-2008)	Monitors in city averaged. 22 monitors in metro Paris	MI	24-h avg: 15.2 (IQR 9.6) 75th: 18.6	No copollutant models examined. r = 0.61 NO_2, 0.43 SO_2, 0.51 CO, -0.09 O_3, 0.95 PM_{10}
†{Chang, 2015, 2826788@@author-year}	Monitors in city averaged 6 monitors	IHD, Heart Failure, Arrhythmia, Stroke	24-h avg: 45.88 (NR) 75^{th}: 61.88 Max: 144.37	$PM_{2.5}$ with SO_2, O_3, NO_2, and CO..

Study	Exposure Assessment	Outcome Assessment	Mean (SD) and Upper Percentile Concentrations ($\mu g/m^3$)	Copollutant Examination
Kaohsiung City, Taiwan (2006-2010)				*r* (Pearson) = 0.80 NO_2, 0.25 SO_2, 0.81 CO, 0.42 O_3
†{Chen, 2014, 2232006@@author-year} Edmonton, Canada (1998-2002)	Monitors in city averaged 3 monitors	Acute Ischemic Stroke Age ≥ 25 yr	1-h avg: 8.53 (8.66) 95^{th}: 22.00	No copollutant models examined *r* = 0.43 NO_2, 0.15 SO_2, 0.48 CO, -0.15 O_3, 0.79 PM_{10}
†{Chen, 2015, 3007799@@author-year}	See {Chang, 2015, 2826788@@author-year} above.			$PM_{2.5}$ with SO_2, NO_2, CO, O_3. *r* (Pearson) = 0.80 NO_2, 0.25 SO_2, 0.81 CO, 0.42 O_3
†{Chiu, 2013, 1895438@@author-year} Taipei, Taiwan (2006-2010)	Monitors in city averaged 6 monitors	Arrhythmia	24-h avg: 29.99 75^{th}: 36.92 Max: 140.54	$PM_{2.5}$ with SO_2, NO_2, O_3, CO. *r* (Pearson) = 0.61 SO_2, 0.54 NO_2, 0.54 CO, 0.31 O_3
†{Chiu, 2013, 2292186@@author-year} Taipei, Taiwan (2006-2010)	Monitors in city averaged 6 monitors	Ischemic Stroke	24-h avg: 29.99 75^{th}: 36.92 Max: 140.54	$PM_{2.5}$ with SO_2, NO_2, O_3, CO. *r* (Pearson) = 0.61 SO_2, 0.54 NO_2, 0.54 CO, 0.31 O_3
†{Chiu, 2014, 2524999@@author-year} Taipei, Taiwan (2006-2010)	Monitors in city averaged 6 monitos	Hemorrhagic Stroke	24-h avg: 29.99 75^{th}: 36.92 Max: 140.54	$PM_{2.5}$ with SO_2, NO_2, O_3, CO. *r* (Pearson) = 0.61 SO_2, 0.54 NO_2, 0.54 CO, 0.31 O_3
†{Claeys, 2015, 3215671@@author-year} All 9 Belgium Provinces (2006-2009)	Monitors in country averaged. 73 monitors	MI	24-h avg: 20.1 (14.5) Max = 112	No copollutant models examined. *r* = 0.93 PM_{10}, -0.35 O_3
†{Dales, 2010, 380249@@author-year} Santiago, Chile (Apr. 1998-Aug. 2005)	Monitor values assigned to central and adjacent municipalities. 6 monitors	VTE, PE	24-h avg: 32.99 IQR: 20.02	No copollutant models examined. Copollutant correlations varied regionally: *r* = 0.73-0.92 NO_2, 0.72-0.83 SO_2, 0.4-0.83 CO, -0.32 to -0.14 O_3, 0.85-0.92 PM_{10}
†{Dennekamp, 2010, 626767@@author-year} Melbourne, Australia (2003-2006)	1 monitor	OHCA Age ≥ 35 yr	24-h avg: 6.35 (NR) IQR: 4.26 75^{th}: 7.45	$PM_{2.5}$ with NO_2, O_3, CO (graphical only). *r* = 0.49 NO_2, 0.13 O_3, 0.55 CO

Study	Exposure Assessment	Outcome Assessment	Mean (SD) and Upper Percentile Concentrations ($\mu g/m^3$)	Copollutant Examination
†{Ensor, 2013, 1511288@@author-year} Houston, Texas (2004-2011)	Monitors in city averaged 12 monitors	OHCA Age ≥ 18 yr	1-h avg: 11.42 (5.98) 75th: 14.37 95th: 22.8 24-h avg: 11.42 (4.73) 75th: 13.71 95th: 20.96	No copollutant models examined. *r* (Pearson) = 0.24 NO_2, 0.05 SO_2, 0.34 CO, 0.01 O_3
†{Franck, 2011, 1256651@@author-year} Leipzig, Germany)Feb. 2002-Jan. 2003)	Monitors in city averaged Number monitors NR. City approx. 200 km^2	Hypertension	24-h avg: 20.61 (12.89) Max: 84.06	No copollutant models examined. Association with UFP *r* = -0.06 UFP
†{Gardner, 2014, 2333171@@author-year} Rochester, New York (2007-2010)	1 monitor 1,500m from interstate highway	MI	1-h avg: 8.0 (5.7) 75th: 10.2 Max: 43.0	No copollutant models examined Copollutant correlations NR.
†{Haley, 2009, 1078095@@author-year} Eight New York Cities (2001-2005)	Weighted averages across monitors in each city 39 monitors in total.	IHD, Heart Failure, Rhythm/Conduction, PVD, CBVD	24-h avg: 5.8 (IQR 5.9) 75th: 8.0 Max: 42.2	No copollutant models examined Copollutant correlations NR.
†{Hsieh, 2013, 1931111@@author-year} Taipei, Taiwan (2006-2010)	Monitors in city averaged 6 monitors	Heart Failure	24-h avg: 29.99 (NR) 75th: 36.92 Max: 140.54	$PM_{2.5}$ with SO_2, NO_2, O_3, CO. *r* (Pearson) = 0.61 SO_2, 0.54 NO_2, 0.54 CO, 0.31 O_3
†{Hsu, 2017, 3456092@@author-year} 4 New York Regions (1991-2006)	Adjusted CMAQ-simulated model (see {Hogrefe, 2009, 608058@@author-year}) 12x12 km grid resolution with patient residential address	IHD, Heart Failure, Arrhythmia, Hypertension, CBVD, CVD	Graphically reported only	No copollutant models examined Copollutant correlations NR.
†{Ito, 2010, 1640421@@author-year} New York City (2000-2006)	Monitors in city averaged 3 monitors	CVD Age ≥ 40 yr	24-h avg: 14.44 (8.53)	No copollutant models examined *r* cold= 0.80 NO_2, 0.66 SO_2, 0.77 CO, warm = 0.63 NO_2, 0.57 SO_2, 0.52 CO
†{Kim, 2012, 1255215@@author-year} Denver, Colorado (2003-2007)	1 monitor 90% of 5 county population within 25 km of monitor	IHD, Heart Failure, CBVD, CVD	24-h avg: 7.98 (5.08) Max: 59.41	No copollutant models examined. *r* = 0.30 O_3, 0.26 NO_2, 0.23 CO, 0.23 SO_2
†{Kloog, 2012, 1255201@@author-year} Six New England States	LUR modelling at 10 x 10 km spatial resolution using satellite-derived AOD measurements. Cross-validation R^2 = 0.85.	CVD Age ≥ 65 yr	24-h avg: 9.6 (4.9) 75th: 11.7 Max: 72.6	No copollutant models examined Copollutant correlations NR.

Study	Exposure Assessment	Outcome Assessment	Mean (SD) and Upper Percentile Concentrations ($\mu g/m^3$)	Copollutant Examination
(2000-2008)				
†{Kloog, 2014, 2332334@@author-year} Seven Mid-Atlantic States and Washington, D.C. (2000-2006)	LUR modelling at 10 x 10 km spatial resolution using satellite-derived AOD measurements. Cross-validation R^2 = 0.81.	IHD, Stroke, CVD Age ≥ 65 yr	2-d avg: 11.92 (5.68) 75^{th}: 14.65 Max: 95.85	No copollutant models examined Copollutant correlations NR.
†{Kloog, 2015, 3013745@@author-year} Northeastern U.S. (13 States) (2000-2008)	LUR modelling at 10 x 10 km spatial resolution using satellite-derived AOD measurements. Cross-validation R^2 using monitors within 10 km: 0.82.	DVT, PE Age ≥ 65 yr	2-d mvg avg: 12.6 (6.8) 75^{th}: 15.9 Max: 96.0	No copollutant models examined Copollutant correlations NR.
†{Lall, 2011, 709913@@author-year} New York City (2001-2002)	1 monitor	CVD	24-h avg: 17.26 (9.79)	No copollutant models examined Copollutant correlations NR.
†{Lisabeth, 2008, 155939@@author-year} Nueces County, Texas (2001-2005)	1 monitor	Ischemic Stroke Transient Ischemic Attacks Age ≥ 45 yr	24-h avg Median: 7.0 IQR: 4.8-10.0	$PM_{2.5}$ with O_3. Copollutant correlations NR.
†{Milojevic, 2014, 2348733@@author-year} 15 Conurbations in England and Wales (2003-2009)	Nearest monitor to patient's residence (50 km). Number NR.	IHD, MI, Heart Failure, Arrhythmia, Atrial Fibrillation, PE, CBVD, CVD	24-hr avg Median: 10.0 (IQR 8.0) 75^{th}: 15.0	No copollutant models examined. *r* = 0.48 CO, 0.53 NO_2, -0.10 O_3, 0.86 PM_{10}, 0.41 SO_2
†{O'donnell, 2011, 709973@@author-year} Eight Cities in Ontario, Canada (2003-2008)	Monitors in city averaged 7 monitors Toronto, 6 monitors Hamilton, 1 monitor London, Ottawa, Kingston, North Bay, Thunder Bay, Sudbury. Excluded if > 50, 40, or 20 km from monitor in analyses.	Acute Ischemic Stroke	24-h avg: 6.9 (6.3) (across eight cities)	No copollutant models examined Copollutant correlations NR.
†{Ostro, 2016, 3420293@@author-year} 8 California Counties (2005-2009)	Nearest monitor Within 20 km of population-weighted centroid of zip code	IHD, MI, Heart Failure, Arrhythmia, CVD	Overall mean: 16.5 (IQR: 11.4) (across 8 counties)	No copollutant models examined Copollutant correlations NR.
†{Peng, 2009, 191998@@author-year} 119 U.S. Counties (2000-2006)	Monitors in county averaged Most counties contain 2 monitors, 12 counties with 1. Within county *r* 0.85 (0.83-0.95)	CVD Age ≥ 65 yr	24-h avg: 11.79 Median: 9.4	No copollutant models examined Copollutant correlations NR.
†{Pope, 2015, 3254045@@author-year} Utah's Wasatch Front (1993-2014)	Nearest monitor to patient's residence (zip code metro area) 3 monitors. Missing data imputed. 3 monitors	Angina, MI	24-h avg Ogden: 9.9 (9.2) Max: 108	No copollutant models examined.

Study	Exposure Assessment	Outcome Assessment	Mean (SD) and Upper Percentile Concentrations (μg/m^3)	Copollutant Examination
	used correlated with surrounding monitor sites (R^2 = 0.74-0.94)		Salt Lake City: 10.6 (11.0) Max: 94 Provo/Orem: 10.0 (10.2) Max: 123	Copollutant correlations NR.
†{Qiu, 2013, 1563731@@author-year} Hong Kong, China (2000-2005)	1 monitor	IHD, CBVD, CVD	24-h avg: 39.4 75th: 50.1	$PM_{2.5}$ with $PM_{10-2.5}$. *r* = 0.68 $PM_{10-2.5}$, 0.79 NO_2, 0.46 SO_2, 0.47 O_3
†{Rappold, 2012, 2094454@@author-year} 40 Rural North Carolina Counties (2008)	Satellite-derived wildfire smoke emission estimates. HYSPLIT model, 13.5 km^2 grid of surface layer (lowest 100m estimates)	Heart Failure	24-h avg: NR Max. daily smoke related $PM_{2.5}$: 4 to 129	No copollutant models examined Copollutant correlations NR.
†{Raza, 2014, 2232000@@author-year} Stockholm, Sweden (2000-2010)	Monitors in city averaged Number NR.	OHCA	24-h avg: 8.1 (NR) IQR: 4.81 Max: 161.7	No copollutant models examined. *r* = 0.24 NO_2, 0.17 $O_{3\text{-urban}}$, 0.25 $O_{3\text{-rural}}$, 0.19 $PM_{10-2.5}$
†{Rich, 2010, 644122@@author-year} New Jersey (2004-2006)	Nearest monitor to patient's residence (10 km) 7 monitors	MI	Median: 7.6 to 12.3 (across seven monitors) 75th: 2.8 to 18.8 (across seven monitors)	$PM_{2.5}$ with SO_2, O_3, NO_2, CO. *r* = 0.44 SO_2, 0.44 NO_2, 0.33 CO, 0.19 O_3
†{Rodopoulou, 2014, 2333401@@author-year} Dona Ana County, New Mexico (2007-2010)	Monitors in county averaged 3 monitors	CVD Age ≥ 18 yr	24-h avg: 10.9 (NR) 75th: 13.0 Max: 55.6	No copollutant models examined *r* = -0.05 O_3, 0.41 PM_{10}
†{Rodopoulou, 2015, 2965674@@author-year} Little Rock, Arkansas (2002-2012)	1 monitor 60% residents within 10km	Heart Failure & Hypertensive Heart Disease, Arrhythmia, Hypertension, CVD	24-h avg: 12.4 (5.9) 75th: 15.6	$PM_{2.5}$ with O_3 Copollutant correlations NR.
{Rosenthal, 2008, 156925@@author-year} Indianapolis, Indiana (2002-2006)	1 monitor 2002 data from separate monitor. R^2 = 0.87.	OHCA	24- avg Median: 13.9 75th: 19.5 90th: 25.8	No copollutant models examined Copollutant correlations NR.
†{Samoli, 2016, 3260504@@author-year} London, UK (2011-2012)	1 monitor Urban background site	CVD	24-h avg: 12.2 (IQR: 8) 90th: 25.0	No copollutant models *r* = 0.28 O_3, 0.66 NO_2, 0.58 CO, 0.49 SO_2
†{Sarnat, 2015, 2772940@@author-year}	1 monitor	IHD, Heart Failure, Arrhythmia, CVD	24-h avg: 18.0 (8.3) 75th: 22.7 Max: 48.7	No copollutant models examined.

Study	Exposure Assessment	Outcome Assessment	Mean (SD) and Upper Percentile Concentrations ($\mu g/m^3$)	Copollutant Examination
St. Louis, MO (8 counties MO, 8 counties IL) (2001-2003)	3 km from city center. Between monitor correlations for 12 monitors in study area r = 0.45 – 0.96, median 0.84			r = 0.35 NO_2, 0.25 CO, 0.23 O_3, 0.08 SO_2
†{Shih, 2011, 690072@@author-year} 40 U.S. Cities (1993-1998)	National scale spatial interpolation by kriging using U.S. EPA AQS monitors $PM_{2.5}$ data 1999-2004 only	VTE Women, ages 50-79 yr	24-h avg: 13.5 (7.7)	No copollutant models examined Copollutant correlations NR.
†{Silverman, 2010, 647265@@author-year} New York, New York (2002-2006)	Monitors in city averaged 33 monitors located within 32 km radius of NYC center	OHCA	24-h avg Median: 12 IQR: 10 75^{th}: 18 95^{th}: 30	No copollutant models examined. r warm = 0.77 NO_2, 0.66 SO_2, 0.67 CO, -0.43 O_3 r cold = 0.54 NO_2, 0.51 SO_2, 0.40 CO, 0.61 O_3
†{Stafoggia, 2013, 1936019@@author-year} Eight European Cities (2001-2010)	Monitors in city averaged Number NR.	CVD Age ≥ 15 yr	24-h avg: 17.2 to 34.4 (across eight cities)	$PM_{2.5}$ with $PM_{10-2.5}$, O_3, NO_2. r close to 0 Barcelona, Marseille, Rome, ≥ 0.5 other cities $PM_{10-2.5}$. > 0.6 NO_2
†{Stieb, 2009, 195858@@author-year} Six Canadian Cities (1992-2003)	Monitors in city averaged. 1 monitor Halifax, Ottawa, Vancouver, 3 Edmonton, 7 Montreal, and Toronto	Angina/MI, Heart Failure, Arrhythmia	24-h avg: 6.7 to 9.8 75^{th}: 8.5 to 11.3	No copollutant models examined. r = -0.05 to 0.62 O_3, 0.27 to 0.51 NO_2, 0.01 to 0.55 SO_2, 0.01 to 0.42 CO.
†{Straney, 2014, 2234252@@author-year} Perth, Australia (2000-2010)	Nearest monitor to arrest location. 4 available $PM_{2.5}$ monitors.	OHCA Age ≥ 35 yr	1-h avg Median: 6.8 75^{th}: 9.8 95^{th}: 17.7	No copollutant models examined. Copollutant correlations NR.
†{Szyszkowicz, 2009, 191996@@author-year} Six Canadian Cities (1992-2003)	Monitors in city averaged Number NR.	Angina	24-h avg: 8.3 (5.6)	No copollutant models examined. Copollutant correlations NR.
†{Szyszkowicz, 2012, 1254276@@author-year} Edmonton, Canada (1992-2002)	Average of 3 monitors Max distance apart 10 km {Zemek, 2010, 664493}	Hypertension All ages	24-h avg: 8.5 (6.2) 75^{th}: 10.9	No copollutant models examined. r = 0.76 PM_{10}, 0.39 NO_2, 0.32 CO, 0.21 SO_2, 0.05 O_3

Study	Exposure Assessment	Outcome Assessment	Mean (SD) and Upper Percentile Concentrations ($\mu g/m^3$)	Copollutant Examination
†{Talbott, 2014, 2534723@@author-year} Seven U.S. States (2001-2009)	Fuse-CMAQ CMAQ model combined with monitoring data, downscaled to Census Tract resolution.	IHD, MI, Heart Failure, Arrhythmia, PVD, CBVD, CVD	24-h avg: 6.46 to 12.83 (2.55 to 7.66) (across seven states) 75^{th}: 7.64 to 16.55 (across seven states)	$PM_{2.5}$ results adjusted for O_3 and temperature. Non-adjusted results NR. Copollutant correlations NR.
†{Villeneuve, 2012, 1537455@@author-year} Edmonton, Canada (2003-2009)	Monitors in city averaged 3 monitors	Stroke Hemorrhagic Stroke Ischemic Stroke Transient Ischemic Attacks Ages ≥ 20 yr	24-h avg: 8.1 (5.8) 75^{th}: 10.2	$PM_{2.5}$ with SO_2, NO_2, CO, O_3.. Copollutant correlations NR.
†{Weichenthal, 2016, 3275174@@author-year} 16 cities in Ontario, Canada (2004-2011)	Nearest monitor to patient's population-weighted postal code centroid	MI All Ages	24-h avg: 6.91 (5.97) Max: 56.8	$PM_{2.5}$ with NO_2, O_3, or NO_2 + O_3 oxidative potential. r = 0.51 NO_2, -0.49 O_3.
†{Wellenius, 2012, 1255208@@author-year} Boston, Massachusetts (1999-2008)	1 monitor Patients excluded if > 40 km, sensitivity analysis at > 20 km	Acute Ischemic Stroke	24-h avg: 10.2 (6.0) 75^{th}: 12.5	No copollutant models examined. r = 0.46 NO_2, 0.35 CO, 0.24 O_3
†{Wichmann, 2013, 1521257@@author-year} Copenhagen, Denmark (2000-2010)	1 monitor Restricted to cases ~5 km of monitor.	OHCA	24-h avg: 10.16 (5.31) 75^{th}: 11.57	$PM_{2.5}$ with O_3. r (Spearman) = 0.37 NO_x, 0.40 NO_2, -0.11 O_3, 0.37 CO, 0.34 UFP, 0.10 $PM_{10-2.5}$
†{Wing, 2015, 3004790@@author-year} Nueces County, Texas (2000-2012)	1 monitor 85% cases within 20 km, median distance 6.9 km	Ischemic Stroke Age ≥ 45 yr	24-h avg: 7.7 (NR) IQR: 5.7-10.6	$PM_{2.5}$ with O_3. Copollutant correlations NR.
†{Yitshak Sade, 2015, 3200397@@author-year} Southern Israel (2005-2012)	Hybrid model at 1 x1 km spatial resolution using LUR and satellite-derived AOD. Out-of-sample cross-validation R^2 = 0.72	Ischemic Stroke Hemorrhagic Stroke	24-h avg Winter: 21.9 (9.9) Spring: 21.6 (8.4), Summer: 20.4 (4.1) Fall: 20.2 (6.2)	No copollutant models examined Copollutant correlations NR.
†{Zanobetti, 2009, 1254262@@author-year} 26 U.S. Cities (2000-2003)	Monitors in county averaged 1 to 4 monitors per county. Monitor data discarded if between-monitor correlation < 0.8	MI, Heart Failure, CVD Age ≥ 65 yr	2-d avg: 15.3 (8.2) (across 26 cities)	No copollutant models examined Copollutant correlations NR.

Note: studies marked with † indicate studies published since the 2009 PM ISA. Studies from the 2009 PM ISA are list first, followed by studies published since the 2009 PM ISA, which are then listed by alphabetical order, and then by year published. NR= not reported, RR = relative risk, OR = odds ratio, HR = hazard ratio, IQR = interquartile range, max = maximum, %ile = percentile, SD = standard deviation, $PM_{2.5}$ = particulate matter with mean aerodynamic diamter 2.5 µm, $PM_{10-2.5}$ = particulate matter with mean

aerodynamic diamter between 2.5 μm and 10 μm, PM_{10} = particulate matter with mean aerodynamic diamter 10 μm, CO = carbon monoxide, NO_2 = nitrogen dioxide, SO_2 = sulfur dioxide. IHD = Ischemic Heart Disease, MI = Myocardial Infarction, OHCA = Out of Hosptial Cardiac Arrest, CBVD = Cerebrovascular Disease, PVD = Peripheral Vascular Disease, VTE = Venous Thromboembolism, PE = Pulmonary Embolism, DVT = Deep Vein Thrombosis, CVD = Aggregated Cardiovascular Diseases

Table 6S-3 Corresponding risk estimates for studies presented in Figure 6-3.

Study	Location	Age (yrs)	Avg Time	Outcome	Lag (days)	Effect Estimate (95% CI)
{Dominici, 2006, 88398@@author-year}	204 U.S. Counties	65+	24-h avg	HF	0	1.013 (1.008, 1.018)
{Barnett, 2006, 89770@@author-year}	4 Australian Cities	14-64	24-h avg	HF	0-1	1.081 (0.997, 1.169)
		65+				1.098 (1.048, 1.148)
†{Bell, 2015, 2854421@@author-year}	213 U.S. Counties	65+	24-h avg	HF	0	1.011 (1.008, 1.015)
†{Zanobetti, 2009, 1254262@@author-year}	26 U.S. Cities	65+	2-d avg	HF	0-1	1.019 (1.012, 1.025)
†{Talbott, 2014, 2534723@@author-year}	Florida		24-h avg	HF	0-2	0.989 (0.976, 1.002)
	Massachusetts					1.015 (0.999, 1.031)
	New Jersey					1.008 (0.996, 1.021)
	New Hampshire					1.02 (0.966, 1.077)
	New Mexico					1.011 (0.973, 1.05)
	New York					1.027 (1.019, 1.034)
	Washington					0.991 (0.981, 1.002)
†{Hsu, 2017, 3456092@@author-year}	NYC, Long Island & Hudson		24-h avg	HF	0	1.0216 (1.0113, 1.0321)
	Adirondack & North					0.9646 (0.9245, 1.0064)
	Mohawk Valley & Binghamton					1.0043 (0.9701, 1.0398)
	Central & Western NY					1.0002 (0.9835, 1.0388)

Study	Location	Age (yrs)	Avg Time	Outcome	Lag (days)	Effect Estimate (95% CI)
†{Haley, 2009, 1078095@@author-year}	8 New York Cities		24-h avg	HF	0	1.015 (1.006, 1.024)
†{Ostro, 2016, 3420293@@author-year}	8 CA counties		Overall avg	HF	0	1.0017 (0.9877, 1.0148)
†{Stieb, 2009, 195858@@author-year}	6 Canadian Cities		24-h avg	HF	0	1.08 (1.001, 1.166)
†{Milojevic, 2014, 2348733@@author-year}	15 Conurbations in England and Wales		24-h avg	HF	0-4	1.005 (0.987, 1.022)
†{Rodopoulou, 2015, 2965674@@author-year}	Little Rock, AR		24-h avg	HF& HHD	1	0.987 (0.926, 1.052)
†{Sarnat, 2015, 2772940@@author-year}	St. Louis, MO		24-h avg	HF	0-2	1.014 (0.982, 1.046)

† = studies publised since the 2008 SO_X Integraged Science Assessment (ISA).

avg = average; CI = confidence interval; NR = not reported.

Table 6S-4 Corresponding risk estimates for studies presented in Figure 6-4.

Study	Location	Age (yrs)	Avg Time	Outcome	Lag (days)	% Increase (95% CI)
{Dominici, 2006, 88398@@author-year}	204 U.S. Counties	65+	24-h avg	Arrhythmia	0	0.6 (0.0, 1.2)
†{Bell, 2015, 2854421@@author-year}	213 U.S. Counties	65+	24-h avg	Arrhythmia	0	0.6 (0.3, 1.0)
†{Talbott, 2014, 2534723@@author-year}	Massachusetts		24-h avg	Arrhythmia	0	1.5 (0.0, 2.9)
	New Jersey					0.9 (-0.1, 1.9)
	New York					0.6 (-0.1, 1.3)
†{Hsu, 2017, 3456092@@author-year}	NYC, Long Island & Hudson		24-h avg	Arrhythmia	0	1.5 (0.7, 2.4)
	Central & Western NY					-0.4 (-3.0, 2.2)
†{Milojevic, 2014, 2348733@@author-year}	15 Conurbations in England and Wales		24-h avg	Arrhythmia	0-4	-1.3 (-3.0, 0.3)
				Atrial Fibrillation		-1.7 (-3.5, 0.1)
†{Stieb, 2009, 195858@@author-year}	6 Canadian Cities		24-h avg	Arrhythmia	0	-1.0 (-3.8, 1.8)
†{Haley, 2009, 1078095@@author-year}	8 New York Cities		24-h avg	Arrhythmia	0	-0.9 (-1.3, 0.9)
†{Ostro, 2016, 3420293@@author-year}	8 CA counties		Overall avg	Arrhythmia	0	0.7 (-0.8, 2.2)
†{Sarnat, 2015, 2772940@@author-year}	St. Louis, MO		24-h avg	Arrhythmia	0-2	-0.1 (-3.5, 3.5)
†{Rodopoulou, 2015, 2965674@@author-year}	Little Rock, AR		24-h avg	Arrhythmia	1 All	-0.7 (-6.7, 5.6)
					Cold	-3.5 (-12.3, 6.2)
					Warm	2.0 (-6.3, 11.0)

† = studies publised since the 2008 SO_X Integraged Science Assessment (ISA).

avg = average; CI = confidence interval; NR = not reported.

Table 6S-5 Corresponding risk estimates for studies presented in Figure 6-5.

Study	Location	Age (yrs)	Avg Time	Outcome	Lag (days)	% Increase (95% CI)
{Dominici, 2006, 88398@@author-year}	204 U.S. Counties	65+	24-h avg	CBVD	0	0.8 (0.3, 1.4)
†{Bell, 2015, 2854421@@author-year}	213 U.S. Counties	65+	24-h avg	CBVD	0	0.7 (0.3, 1.0)
†{Kloog, 2012, 1255201@@author-year}	6 New England States	65+	24-h avg	Stroke	0-1	0.1 (-0.4, 0.6)
†{Kloog, 2014, 2332334@@author-year}	7 Mid-Atlantic States	65+	2-d avg	Stroke	0-1	0.1 (-0.4, 0.6)
†{Haley, 2009, 1078095@@author-year}	8 New York Cities		24-h avg	CBVD	0	0.2 (-0.8, 1.2)
†{Milojevic, 2014, 2348733@@author-year}	15 Conurbations in England and Wales		24-h avg	Stroke	0-4	-0.9 (-1.8, -0.1)
†{Talbott, 2014, 2534723@@author-year}	Massachusetts		24-h avg	CBVD	0	0.0 (-1.4, 1.4)
	New Hampshire					-3.8 (-8.1, 0.7)
	New York					1.0 (0.3, 1.6)
†{Hsu, 2017, 3456092@@author-year}	NYC, Long Island & Hudson		24-h avg	CBVD	0	0.8 (0.1, 1.6)
	Central & Western NY					0.3 (-1.4, 1.9)
†{Villeneuve, 2012, 1537455@@author-year}	Denver, CO	20+	24-h avg	Stroke	0	2.0 (-3.0, 9.0)
				Hemorrhagic Stroke		5.0 (-3.0, 16.0)
				Ischemic Stroke		2.0 (-15.0, 20.0)
				Transient Ischemic Attacks		-2.0 (-10.0, 9.0)
†{Wellenius, 2012, 1255208@@author-year}	Boston, MA	45+	24-h avg	Acute Ischemic Stroke	0-24h	18.0 (5.0, 33.0)

Study	Location	Age (yrs)	Avg Time	Outcome	Lag (days)	% Increase (95% CI)
†{Lisabeth, 2008, 155939@@author-year}	Nueces County, TX	45+	24-h avg	Ischemic Stroke and	1	6.0 (0.0, 14.0)
†{Wing, 2015, 3004790@@author-year}	Nueces County, TX		24-h avg	Ischemic Stroke	0	11.0 (-4.0, 28.0)
†{O'donnell, 2011, 709973@@author-year}	8 Cities in Ontario		24-h avg		0-47h	-0.7 (-6.3, 5.1)

† = studies publised since the 2008 SO_X Integraged Science Assessment (ISA).

avg = average; CI = confidence interval; NR = not reported.

Table 6S-6 Corresponding risk estimates for studies presented in Figure 6-6

Study	Location	Age (yrs)	Avg Time	Outcome	Lag (days)	Effect Estimate (95% CI)
{Bell, 2008, 156266@@author-year}	202 U.S. Counties	65+	24-h avg	CVD	0	1.008 (1.006, 1.01)
{Host, 2008, 155852@@author-year}	6 French Cities	65+	24-h avg	CVD	0-1	1.009 (1.001, 1.018)
						1.019 (1.009, 1.03)
{Barnett, 2006, 89770@@author-year}	4 Australian Cities		24-h avg	CVD	0-1	1.002 (0.995, 1.009)
						1.013 (1.006, 1.02)
†{Kloog, 2012, 1255201@@author-year}	6 New England States	65+	24-h avg	CVD	0-1	1.01 (1.007, 1.015)
†{Kloog, 2014, 2332334@@author-year}	7 Mid-Atlantic States	65+	2-d avg	CVD	0-1	1.008 (1.005, 1.01)
†{Bravo, 2016, 3420336@@author-year}	708 US Counties	65+	24-h avg	CVD	0	1.0079 (1.0062, 1.0097)
†{Hsu, 2017, 3456092@@author-year}	NYC, Long Island & Hudson		24-h avg	CVD	0	1.0137 (1.009, 1.0184)
	Adirondack & North					0.9957 (0.9767, 1.0151)
	Mohawk Valley & Binghampton					1.0043 (0.9797, 1.0295)
	Central & Western NY					1.0013 (0.9936, 1.0091)
†{Bell, 2015, 2854421@@author-year}	213 U.S. Counties	65+	24-h avg	CVD	0	1.007 (1.005, 1.008)
†{Peng, 2009, 191998@@author-year}	119 U.S. Counties	65+	24-h avg	CVD	0	1.006, 1.001, 1.012)
†{Zanobetti, 2009, 1254262@@author-year}	26 U.S. Cities	65+	2-d avg	CVD	0-1	1.019 (1.013, 1.025)

Study	Location	Age (yrs)	Avg Time	Outcome	Lag (days)	Effect Estimate (95% CI)
†{Bell, 2014, 2225815@@author-year}	4 Counties, MA & CT	65+	24-h avg	CVD	0	1.018 (1.004, 1.031)
†{Ostro, 2016, 3420293@@author-year}	8 CA counties		Overall avg	CVD	0	1.001 (0.995, 1.008)
†{Talbott, 2014, 2534723@@author-year}	Florida		24-h avg	CVD	0-2	0.996 (0.99 1.002)
	Massachusetts					1.005 (0.998, 1.012)
	New Jersey					1.011 (1.007, 1.016)
	New Hampshire					0.988 (0.965, 1.013)
	New Mexico					1.011 (0.973, 1.05)
	New York					1.011 (1.008, 1.014)
	Washington					0.991 (0.981, 1.002)
†{Stafoggia, 2013, 1936019@@author-year}	8 European Cities	15+	24-h avg		0-1	1.005 (1.001, 1.009)
†{Basagaña, 2014, 2533224@@author-year}	4 Cities, Spain & Italy		24-h avg	CVD	0	1.018 (1.005, 1.035)
†{Milojevic, 2014, 2348733@@author-year}	15 Conurbations in England and Wales		24-h avg	CVD	0-4	0.989 (0.983, 0.995)
†{Kim, 2012, 1255215@@author-year}	Denver, CO		24-h avg	CVD	0-1	1.009(0.996, 1.036)
†{Rodopoulou, 2014, 2333401@@author-year}	Little Rock, AR	65+	24-h avg	CVD	1	0.9905 (0.9735, 1.0077)
						0.9788 (0.9372, 1.0201)
†{Rodopoulou, 2015,	Dona Ana County, NM	ED visit	24-h avg	CVD	1	1.045 (0.968, 1.129)

Study	Location	Age (yrs)	Avg Time	Outcome	Lag (days)	Effect Estimate (95% CI)
2965674@@author-year}		HA				0.986 (0.938, 1.036)
		65+, ED visit				1.083 (0.97, 1.209)
		65+, HA				0.984 (0.923, 1.048)
†{Sarnat, 2015, 2772940@@author-year}	St. Louis, MO		24-h avg	CVD	0-2	0.999 (0.983, 1.014)

† = studies publised since the 2008 SO_X Integraged Science Assessment (ISA).

avg = average; CI = confidence interval; NR = not reported.

Table 6S-7 to 6S12- In Preparation

Table 6S-13: Corresponding risk estimates for studies presented in Figure 6-17

Study	Cohort	Outcome	Years	Mean ($\mu g/m^3$)			
Miller et al. 2007	WHI-Women (post-menopause), 36 Urban sites, U.S.	CHD	1994-1998	13.4	1.10	1.02	1.19
†Hart et al. 2015	NHS-Women, 48 States, U.S.	CHD	1989-2006	13.4	1.01	0.96	1.07
†Lipsett et al. 2011	CTS -Women, Los Angeles. California, U.S.	MI	1999-2005	15.6	0.99	0.91	1.08
†Puett et al. 2011	HPFU, Men, 13 States, U.S.	Nonfatal MI	1988-2002	17.8	1.08	0.90	1.28
†Madrigano et al. 2013	Worcester Heart Attack, MA, U.S.	Confirmed MI	1995-2003	9.4	1.21	1.00	1.38
†Hartiala et al. 2016	Cardiac Patients, Ohio, U.S.	MI	1998-2010	15.5	1.91	1.05	3.48
†Hoffman et al. 2015	HNR study, Ruhr region Germany	Coronary Event	2008-2009	18.4	1.00	0.38	2.67
†Atkinson et al. 2013	GP Database, U.K.	MI	2003-2007	12.9	0.95	0.85	1.05
†Cesaroni et al. 2014	ESCAPE- 11 Cohorts Europe	IHD	2008-2011	7.3-31	1.13	0.98	1.30
†Tonne et al. 2015	MINAP, London, U.K.	Recurrent MI/death	2003-2010	14.6	1.21	0.93	1.55
†Koton et al. 2013	8 Treatment Centers, Israel	Recurrent MI	2003-2005	23.9	1.30	0.95	1.70

Table 6S-14: Corresponding risk estimates for studies presented in Figure 6-18

Study	Cohort	Outcome	Years	Mean ($\mu g/m^3$)			
Miller et al. 2007	WHI-Women (post-menopause) 36 Urban Sites, US	Stroke	1994-1998	13.4	1.13	1.01	1.27
†Hart et al. 2015	NHS- Women, 48 States, U.S.	Stroke	1989-2006	13.4	1.01	0.96	1.05
†Lipsett et al. 2011	CTS -Women, Los Angeles, California, U.S.	Stroke	1999-2005	15.6	1.07	0.99	1.15
†Puett et al. 2011	HPFU, Men, 13 States, U.S.	IS	1988-2002	17.8	0.80	0.61	1.08
†Puett et al. 2011	HPFU, Men, 13 States, U.S.	HS	1988-2002	17.8	1.18	0.74	1.87
†Hartiala et al. 2016	Cardiac Patients, Ohio, U.S.	Stroke	1998-2010	15.5	1.17	0.49	2.87
†Stafoggia et al. 2014	ESCAPE- 11 Cohorts Europe	Stroke	2008-2011	7.3-31	1.19	0.88	1.62
†Hoffmann et al. 2015	HNR study, Ruhr area, Germany	Stroke	2008-2009	18.4	5.24	1.39	19.65
†Atkinson et al. 2013	GP Database, U.K.	Stroke	2003-2007	12.9	0.95	0.87	1.03
†Koton et al. 2013	8 Centers, Israel	Post MI Stroke	2003-2005	23.9	1.05	0.71	1.58

Table 6S-15- In preparation

Table 6S-16: Corresponding risk estimates for studies presented in Figure 6-20

Study	Cohort	Outcome	Correlation			
†Puett et al. 2011	HPFU Study	MI	NR	1.03	0.96	1.10
				1.03	0.95	1.12
†Madrigano et al. 2013	Worcester Heart Attack	MI	NR	3.27	2.08	5.03
				3.52	2.24	5.39
†Puett et al. 2011	HPFU Study	Ischemic Stroke	NR	0.93	0.82	1.04
				0.87	0.76	0.99
		Hemorrhagic Stroke	NR	1.08	0.90	1.30
				1.16	0.93	1.45
†Zhang et al. 2016	NHS	Hypertension	0.37	1.02	1.00	1.03
				1.01	0.99	1.03
†Fuks et al. 2014	ESCAPE	Hypertension	0.19-0.88	1.07	0.95	1.21
				1.11	1.00	1.24

		BPLM		1.06	0.96	1.17
				1.09	0.98	1.23

Table 6S-17 to 6S-20- In preparation

Table 6S-21: Corresponding risk estimates for studies presented in Figure 6-34

Study	Cohort	Outcome	Years	Mean			
Miller et al. 2007	WHI- 36 Sites, U.S.	CVD Events	2000	NR	0.99	0.95	1.03
†Hart et al. 2015	NHS- 48 Contiguous, U.S.	CHD	1989-2006	8.7	1.06	1.01	1.11
†Puett et al. 2011	HPFU, 13 States, U.S.	MI	1988-2002	10.1	1.04	0.90	1.19
†Cesaroni et al. 2014	ESCAPE, Europe	IHD	2008-2011	NR	1.06	0.98	1.15
†Hoffmann et al. 2015	HNR Ruhr, Germany	Coronary event	2008-2009		1.00	0.56	0.08
†Tonne et al. 2015	MINAP, U.K.	MI Readmission	2003-2010	8.6	1.24	0.95	1.61
					0.99	0.95	1.03

Table 6S-22: Corresponding risk estimates for studies presented in Figure 6-35

Study	Cohort	Outcome	Years	Mean			
†Puett et al. 2011	HPFU, 13 States, U.S.	IS	1988-2002	10.1	1.10	0.88	1.37
†Puett et al. 2011	HPFU, 13 States, U.S.	HS	1988-2002	10.1	0.85	0.56	1.31
†Hart et al. 2015	NHS- 48 States, U.S.	Stroke	1989-2006	8.7	1.05	1.00	1.10
†Hoffmann et al. 2015	HNR Ruhr, Germany	Stroke	2008-2009		2.53	0.65	9.84
†Stafoggia et al. 2014	ESCAPE	Stroke	2008-2011	NR	1.02	0.90	1.16

Tables 6S-23 to 6S-25- In preparation