Supplementary Material

Contents

Details of studies excluded from meta-analysis for other causes or mortality (references refer to main manuscript)

CHD: Twelve studies were meta-analysed after exclusions of one study [53] included in ESCAPE [21] and 3 analysed in other publications [31, 43, 62].

Cerebrovascular: Seven studies were meta-analysed after exclusions of one study [53] included in ESCAPE [21]; one study reporting an abnormally high HR (>2.4) from the Shenyang Cohort [63] and 2 studies where the same cohorts were analysed in other publications [31, 62].

COPD: Only a single study [62] analysed in a subsequent publication was excluded.

eTable 1 Coding of categorise of cause of death

Mortality	Coded
All-causes	"All Causes" , "All Cause (after ACS)" , "All Causes (after stroke)" , "All causes" , "Natural Causes" , "Non Accidental"
Cardiovascular	"Cardiovascular" , "Circulatory"
Cerebrovascular	"Cerebrovascular"
CHD	"CHD" , "IHD"
Respiratory	"Respiratory" , "Pulmonary" , "Non-malignant Respiratory"
COPD	"COPD" , "COPD & allied conditions"
Pneumonia	"Pneumonia" , "Pneumonia & Influenza"
Lung cancer	"Lung Cancer" , "Trachea, bronchus and lung cancers"

eTable 2: Cohort and study characteristics (ordered by cohort/date of publication); citation numbers correspond with main paper

Cohort Name and brief description	**Country**	**Enrolment (baseline)**		**Publication and Date**	**Number of Subjects**	**Follow-up Dates / Length**	**Exposure Period**	**Exposure assessment**	**Covariate adjustment includes#:**	**Mortality Cause**
		Date	**Age**							
European Cohorts										
ESCAPE 22 population based cohorts from 13 European Countries	Europe	mainly 1990s	all ages	[21] Beelen R et al 2014b	367,251	Average 13.9 years	1 year Oct 2008-May 2011 with back-extrapolation to baseline	LUR + back-extrapolation: Address-level	Age, sex, smoking, BMI, occupational and educational factors	All-cause
				[22] Beelen R et al 2014a	367,383	Average 13.9 years	1 year Oct 2008-May 2011 with back-extrapolation to baseline	LUR + back-extrapolation: Address-level	Age, sex, smoking, BMI, occupational and educational factors	CV, CHD, MI, Cerebrovascular
				[33] Dimakopoulou K et al 2014	307,553 (16 cohorts)	16.3 to 18.6 years	Annual average (baseline)	LUR: Address-level	Age, sex, smoking, BMI, occupational and educational factors	Respiratory
Diet Cancer and Health cohort (DCH) Population based sample with no cancer history living in areas of Copenhagen and Aarhus.	Denmark	1993-1997	50-64	[54] Raaschou-Nielsen O et al 2012	52,061	to end 2009	1971 onwards: Annual mean exposure, time varying	DM: Address-level allowing for change of residence	Age, sex, smoking, BMI, employment status, length of school attendance	All-cause CV, CHD, Cerebrovascular
				[55] Raaschou-Nielsen O et al 2013	52,061	to end 2009	1971 onwards: Annual mean exposure, time varying	DM: Address-level allowing for change of residence	Age, sex, smoking, BMI, length of school attendance	Diabetes
				[19] Andersen ZI et al 2012	52,215	to June 27th 2006	1971 onwards: Annual mean exposure, time varying	DM: Address-level allowing for change of residence	Age, sex, smoking, BMI, educational level.	Fatal stroke (and sub-types)

				[58] Sorensen M et al 2014	51,569	1st July 1997 to 30th Nov 2009	1987-2009: 10-years exposure, time varying	DM: Address-level allowing for change of residence	Age, sex, smoking, BMI, length of school attendance	Fatal stroke
Clinical Practice Research Datalink (CPRD) Patients in GP practices participating in CPRD	England	2003	40-89	[25] Carey IM et al 2013	830,429	2003-2007	2002	DM: 1 km grid square-level	Age, sex, smoking, BMI, area-level income	All-cause, CV, CHD, MI, HF, Cerebrovascular, Stroke, Respiratory, COPD, Pneumonia, Lung Cancer
South London Stroke Register (SLSR) Patients in the South London Stroke Register who experienced their first ever stroke between 1995 and 2005.	England	1995-2005	Mean (SD) 70.4 (14.6)	[51] Maheswaren R et al 2010	3,320	to mid-2006	2002	Modelled: 20x20m grid level	Age, sex, smoking, social class but not BMI	All-cause
MINAP (Acute Coronary Syndrome survivors) Patients admitted to hospital in England and Wales with acute coronary syndrome and recorded in MINAP (Myocardial Ischaemia National Audit Project) who are still alive 28 days post admission.	England & Wales	2004-2007	Mean (SD) 68 (13) >25	[59] Tonne C et al 2013	154,204	3.7 years	2004-2010: Annual average, time varying	DM: 1km x 1km level	Age, sex, smoking, area-level income but not BMI	All-cause
	Greater London	2003-2007	>25	[65] Tonne C et al 2016	18,138	4.0 years	2003-2010	DM: 20m x 20m level	Age, area-level income deprivation, but not BMI. Smoking, and ethnicity in a sensitivity analysis after imputation of large number of missing values	All-cause

Pollution Atmosphérique et Affections Respiratoires Chroniques (PAARC) Adults from French family households resident in 24/18 areas of 7 Cities.	France	1974-1976	25-59	[35] Filleul L et al 2005	14,284	1974-2000	1974-1976 (August excluded)	Monitoring data: Area-level (areas 0.5 to 2.3 km in diameter)	Age, sex, smoking, BMI, educational level	All-cause, Cardio-pulmonary, Lung Cancer
GAZEL Cohort EDF-GDF workers	France	1989-2013	Mean (SD) 43.7 (3.5) 35-50	[23] Bentayeb et al, 2015	20,327	1989-2013	1989-2008	Chemistry Transport Model (resolution 2km) linked to ZIP code, allowing for change in residence	Age, sex, smoking, BMI, highest level of education, occupational level	All-cause, CV, Respiratory, Lung Cancer
German cohort Women sampled at random from cross-sectional studies conducted in North Rhine-Westphalia in the 1980s and 1990s.	Germany	1985-1994	50-59 (92% aged 53-55)	[39] Gehring U et al 2006	4,752	to May 2003	5-year average prior to baseline	Monitoring data: Area-level	Smoking, educational level but not BMI (all female cohort of similar age)	All-cause, Cardio-pulmonary
				[57] Schikowski T et al 2007	4,750	to May 2003	5-year average prior to baseline	Monitoring data: Area-level	Smoking, educational level but not BMI (all female cohort of similar age)	CV
				[41] Heinrich J et al 2013	4,752	to Oct 2008	1-year average (baseline)	Monitoring data: Nearest monitor to residence	Smoking, educational level but not BMI (all female cohort of similar age)	All-cause, Cardio-pulmonary Respiratory, Lung Cancer
CHD survivors cohort Population based cohort of CHD survivors (Rome)	Italy	1998-2000	35-84	[56] Rosenlund M et al 2008	6,513	29th day after event to end June 2005	1995/1996: Annual mean	LUR: Census block-level	Age, sex, area-based socioeconomic status but not smoking or BMI	All-cause

Rome longitudinal study Population based cohort of long-term (5+ years) residents of Rome.	Italy	2001	>=30	[26] Cesaroni G et al 2013	1,265,058	Oct 2001-Dec 2010	Oct 1996-Dec 2010: Cumulative mean exposure, time varying	LUR: Address-level allowing for change of residence	Age, sex, education, occupation but not smoking or BMI	All-cause, CV, CHD, Cerebrovascular, Respiratory, Lung Cancer
				[27] Cesaroni G et al 2012	684,204 (subset age 45-80 in 2001)	2001-2006	1995/1996: Annual mean	LUR: Address-level	Age, sex, education, occupation but not smoking or BMI	All-cause
Dutch Environmental Longitudinal Study DUELS Dutch inhabitants who had lived at the same address between 1/1/1999 and 1/1/2004	Nether-lands	2004	>=30	[36] Fisher PH et al 2015	7,218,363	2004-2010	2001	LUR: 100 x 100m level	Age, sex, standardised disposable household income but not smoking or BMI	All-cause, CV, Respiratory, Lung Cancer
Netherlands Cohort Study (NLCS-AIR) Subjects selected from 323 of the 714 municipalities of the Netherlands	Nether-lands	1986	55-69	[20] Beelen et al, 2009	117,528	1987-1996	1987-1996	LUR, Monitoring, GIS: Address-level (baseline address)	Age, sex, smoking, neighbourhood indicators of socioeconomic status but not BMI	CV, CHD, HF, Cerebrovascular, Cardiac Dysrhythmia
				[24] Brunekreef B et al 2009	117,528	1987-1996	1987-1996	LUR, Monitoring, GIS: Address-level (baseline address)	Age, sex, smoking, neighbourhood level and COROP area-level percentage of persons with high & low income but not BMI	All-cause, CV, Respiratory, Lung Cancer
				[42] Hoek et al 2002	Random sample: 4,492	Sept 1986-Oct 1994	1987-1990	LUR, Monitoring, GIS: Address-level (baseline address)	Age, sex, smoking, BMI, education, occupation	All-cause, Cardio-pulmonary
Oslo cohort Inhabitants of Oslo	Norway	1992	51-90	[53] Naess O et al 2007	143,842	1992-1998	1992-1995	DM: Neighbourhood level	Age, education, occupational class but not smoking or BMI	CV, COPD, Lung Cancer

									(sex-specific analyses)	
North American Cohorts										
Adventist Health Study on the Health Effects of Smog (AHSMOG) Sub-sample of the Adventist Health Survey. All subjects, Seventh Day Adventists, white, non-Hispanic and resident in California.	USA	1977	27-95	[29] Chen LH et al 2005	3,239 [1,149 M; 2090 F]	1977-1998	1973-1998: Annual mean, time varying (4-year window)	Monitor data: Interpolation to ZIP code centroid (<50km from monitor), allowing for change of residence	Age, sex, past smoking, BMI, years of education.	CHD
				[18] Abbey D et al 1999	5,652 [~3621 F; ~2031 M]	1977-1992	1973-1992: Cumulative monthly mean exposure, time varying	Monitor data: Interpolation to ZIP code centroid (<50km from monitor), allowing for change of residence	Age, sex, past smoking, BMI, years of education (sex-specific analyses)	All-cause, Cardio-pulmonary, Respiratory, Lung Cancer
American Cancer Society Prevention II Study (ACS CSP-II) Friends, neighbours, acquaintances of American Cancer Study (ACS) volunteers	USA	1982	>=30	[61] Turner et al, 2016	669,046	1982-2004	Annual average for 2006	LUR (~30 m): Address-level	Age, sex, smoking, BMI, occupational and educational factors	All-cause, CV, CHD, Cerebrovascular, Respiratory, COPD, Pneumonia, Diabetes, Lung Cancer
				[44] Jerrett M et al 2013	73,711 California	1982-2000	1988-2002	LUR: Address-level	Age, sex, smoking, BMI, occupational and educational factors.	All-cause, CV, CHD, Stroke, Respiratory, Lung Cancer
				[47] Krewski et al 2009	406,917	1982-2000	1980	Monitoring Data: MSA level	Age, sex, smoking, BMI, occupational and educational factors.	All-cause, Cardio-pulmonary, CHD, Lung Cancer

				[52] McKean-Cowen et al, 2009	527,123	1982-2000	1982-1998	Monitoring Data: MSA level	Age, sex, smoking, educational level but not BMI	Brain cancer
				[43] Krewski et al, 2000	552,138 (295,223 with $PM_{2.5}$)	1982-1989	1980	Monitoring data: City level	Age, sex, smoking, BMI, educational level	All-cause, Cardio-pulmonary, Lung Cancer
California Teachers Study (CTS) Prospective cohort of female public school professionals living in California.	USA	1995	>=30	[50] Lipset MJ et al 2011	12,336	June 1997-Dec 2005	June 1996-Dec 2005: Cumulative mean exposure, time varying	Monitor data & IDW: 250x250m grid level , allowing for change of residence	Age, smoking, BMI, ecological variables for income, education, unemployment	All-cause, CV, CHD, Cerebrovascular, Respiratory, Lung Cancer
Six Cities Random sample from white subjects in six communities	USA	1974-1977	25-74	[43] Krewski et al, 2000	8,111	1974-1989	1977-1985	Monitor data: City-level	Age, sex, smoking, BMI, education level	All-cause, Cardio-pulmonary, Lung Cancer
US trucking industry cohort Men employed in four trucking companies	USA	1985	15.3-84.9	[40] Hart JE et al 2011	53,814	1985-2000	1985-2000	LUR + spatial smoothing: Address-level	Age, years of work in each of 8 job groups but not smoking or BMI (all male cohort)	All-cause, CV, CHD, Respiratory, COPD, Lung Cancer
Washington University-EPRI Veterans cohort US male veterans with a diagnosis of hypertension	USA	1975-1976	Mean (SD) 51 (12)	[48] Lipfert et al 2006a	~15,200 survivors (1997)	1997-2001	1997-2001	Monitor data: County-level	Age, smoking, BMI, zip code and /or country-level education and income (male only cohort)	All-cause
				[49] Lipfert et al 2006b	28,635 survivors (1997)	1997-2001	1999-2001	Monitor data: County-level	Age, smoking, BMI, zip-code level: income, education and poverty status (male only cohort)	All-cause
Canadian Census Health and Environment Cohort (Can CHEC)	Canada	1991	25-89	[32] Crouse DL et al 2015a	735,590 [10 cities]	Jun 1991-Dec 2006	1984-2006: Annual mean exposure, time varying (7-year moving window)	LUR: Post-code level allowing for change in residence	Age, sex, education, employment status, occupational classification,	All-cause, CV, CHD, Cerebrovascular, Respiratory

Population based cohort of residents									household income but no direct adjustment for smoking or BMI	
				[31] Crouse DL et al 2015b	2,521,525	Jun 1991-Dec 2006	1984-2006: Annual mean exposure, time varying (7-year moving window)	LUR: Post-code level allowing for change in residence	Age, sex, education, employment status, occupational classification, household income but no direct adjustment for smoking or BMI	All-cause, CV, CHD, Cerebrovascular, Respiratory, COPD, Diabetes, Lung Cancer
Ontario tax cohort Retrospective cohort study. Random sample from federal family income tax database of subjects living in 3 cities in Ontario.	Canada	1982-1986	35-85	[28] Chen H et al 2013	205,440	1982-2004	1982-2004: 3-year moving average, time varying	LUR: Post-code level allowing for change of residence	Age, sex, annual household income, but not smoking or BMI	CV, CHD, Cerebrovascular
Toronto respiratory cohort Subjects treated at a respiratory disease clinic in Toronto	Canada	1992-1999	Median (IQR) 60 (49-69)	[45] Jerrett M et al 2009	2,360	1992-2002	Average (Autumn 2002 and Spring 2004)	LUR: Address-level	Age, sex, smoking, BMI, EA-level deprivation index	All-cause, CV, Respiratory
Vacouver cohort Long-term (5+ years) residents of Metropolitan	Canada	1999	45-85	[38] Gan WQ et al 2011	452,735	1999-2002	1994-1998	LUR (10m): Address-level allowing for change of residence	Age, sex, neighbourhood socioeconomic status but not smoking or BMI	CHD

Vancouver with no CHD history.				[37] Gan WQ et al 2013	467,994	1999-2002	1994-1998	LUR: Address-level allowing for change of residence	Age, sex, neighbourhood socioeconomic status but not smoking or BMI	COPD
Chinese Cohorts										
Shenyang cohort Population based retrospective cohort of family members living in 5 urban districts of Shenyang city.	China	2009	35-103	[64] Zhang P et al 2011	9,941	1998-2009	1998-2009: Annual mean exposure, time varying	Monitoring data: District-level	Age, sex, smoking, BMI, educational level, personal income	CV, Cerebrovascular
				[34] Dong G-H et al 2012	9,941	1998-2009	1998-2009: Annual mean exposure, time varying	Monitoring data: District-level	Age, sex, smoking, BMI, educational level, household income	Respiratory
Four northern Chinese cities Random sample of neighbourhoods within 1km of a monitor.	China	1998	23-89	[30] Chen et al, 2016	39,054	1998-2009	1998-2009 Annual average, time varying OR 1998 annual average	Monitor data: nearest monitor <1km.	Age, sex, BMI, household income, occupation	All-cause, Lung Cancer
Japanese Cohorts										

Shizuoka elderly cohort Age-sex - stratification random sample of residents from 74 municipalities of Shizuoka	Japan	Dec 1999	65-84	[63] Yorifuji T et al 2010	13,444	Dec 1999-Mar 2006	Apr 2000-Mar 2006	LUR: Address-level	Age, sex, smoking, BMI, financial capability	All-cause, CV, CHD, Cerebrovascular, Cardio-pulmonary, Respiratory, COPD, Pneumonia, Lung Cancer
				[62] Yorifuji T et al 2013	13,412	Dec 1999-Jan 2009	Apr 1996-March 2009: Annual mean exposure, time varying	LUR: Address-level	Age, sex, smoking, BMI, financial capability	All-cause, CV, CHD, Cerebrovascular (and sub-types), Cardio-pulmonary, Respiratory, COPD, Pneumonia, Lung Cancer
3 Japanese Prefectures Subjects living in 6 areas in 3 prefectures	Japan	1983-1985	>=40	[46] Katanoda K et al 2011	63,520	10 years (max to Oct 1995)	1974-1983	Monitor data: area-level	Age, sex, smoking, health insurance type / occupational exposure, but not BMI	Respiratory, COPD, Pneumonia, Lung Cancer
Taiwanese Cohort										
TCS Civil servants in Greater Taipei area	Taiwan	1989-1992	Employed Mean (SD) 41.3 (10.5)	[60] Tseng et al, 2015	43,227	1992-2008	2000-2008	Monitor data: District-level	Age, sex, smoking, BMI, income, educational level	CV

¶ lung cancer and for female all natural causes not adjusted for BMI;

This is not meant to be a complete list of covariates but focusses only on a few "key" variables.

References

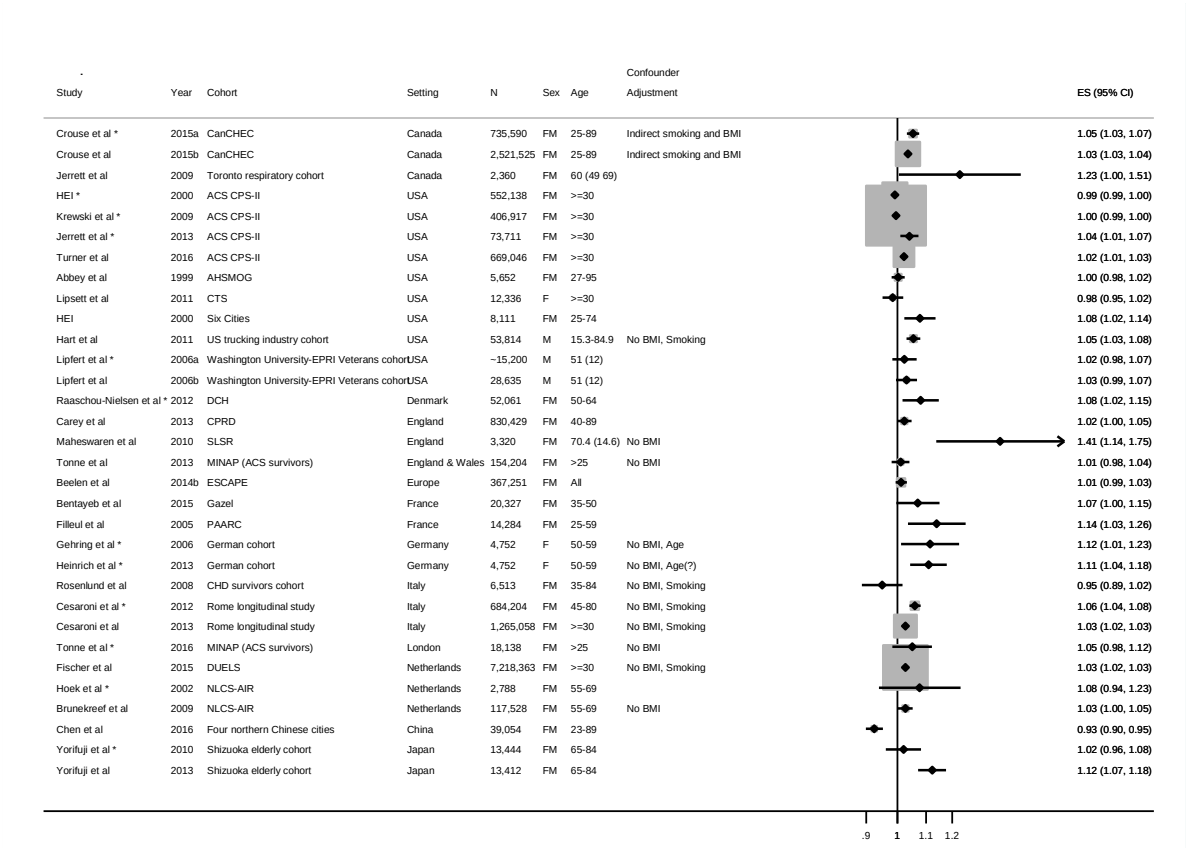
18. Abbey DE, Nishino N, McDonnell WF, Burchette RJ, Knutsen SF, Lawrence Beeson W, Yang JX. Long-term inhalable particles and other air pollutants related to mortality in nonsmokers. *Am J Respir Crit Care Med* 1999;**159**(2):373-82.
19. Andersen ZJ, Kristiansen LC, Andersen KK, Olsen TS, Hvidberg M, Jensen SS, Ketzel M, Loft S, Sorensen M, Tjonneland A, Overvad K, Raaschou-Nielsen O. Stroke and Long-Term Exposure to Outdoor Air Pollution From Nitrogen Dioxide A Cohort Study. *Stroke* 2012;**43**(2):320-325.
20. Beelen R, Hoek G, Houthuijs D, Van Den Brandt PA, Goldbohm RA, Fischer P, Schouten LJ, Armstrong B, Brunekreef B. The joint association of air pollution and noise from road traffic with cardiovascular mortality in a cohort study. *Occupational and Environmental Medicine* 2009;**66**(4):243-250.
21. Beelen R, Raaschou-Nielsen O, Stafoggia M, Andersen ZJ, Weinmayr G, Hoffmann B, Wolf K, Samoli E, Fischer P, Nieuwenhuijsen M, Vineis P, Xun WW, Katsouyanni K, Dimakopoulou K, Oudin A, Forsberg B, Modig L, Havulinna AS, Lanki T, Turunen A, Oftedal B, Nystad W, Nafstad P, De Faire U, Pedersen NL, Ostenson CG, Fratiglioni L, Penell J, Korek M, Pershagen G, Eriksen KT, Overvad K, Ellermann T, Eeftens M, Peeters PH, Meliefste K, Wang M, Bueno-De-Mesquita B, Sugiri D, Kramer U, Heinrich J, De Hoogh K, Key T, Peters A, Hampel R, Concin H, Nagel G, Ineichen A, Schaffner E, Probst-Hensch N, Kunzli N, Schindler C, Schikowski T, Adam M, Phuleria H, Vilier A, Clavel-Chapelon F, Declercq C, Grioni S, Krogh V, Tsai MY, Ricceri F, Sacerdote C, Galassi C, Migliore E, Ranzi A, Cesaroni G, Badaloni C, Forastiere F, Tamayo I, Amiano P, Dorronsoro M, Katsoulis M, Trichopoulou A, Brunekreef B, Hoek G. Effects of long-term exposure to air pollution on natural-cause mortality: An analysis of 22 European cohorts within the multicentre ESCAPE project. *The Lancet* 2014;**383**(9919):785-795.
22. Beelen R, Stafoggia M, Raaschou-Nielsen O, Andersen ZJ, Xun WW, Katsouyanni K, Dimakopoulou K, Brunekreef B, Weinmayr G, Hoffmann B, Wolf K, Samoli E, Houthuijs D, Nieuwenhuijsen M, Oudin A, Forsberg B, Olsson D, Salomaa V, Lanki T, Yli-Tuomi T, Oftedal B, Aamodt G, Nafstad P, De Faire U, Pedersen NL, Ostenson CG, Fratiglioni L, Penell J, Korek M, Pyko A, Eriksen KT, Tjonneland A, Becker T, Eeftens M, Bots M, Meliefste K, Wang M, Bueno-De-Mesquita B, Sugiri D, Kramer U, Heinrich J, de Hoogh K, Key T, Peters A, Cyrys J, Concin H, Nagel G, Ineichen A, Schaffner E, Probst-Hensch N, Dratva J, Ducret-Stich R, Vilier A, Clavel-Chapelon F, Stempfelet M, Grioni S, Krogh V, Tsai MY, Marcon A, Ricceri F, Sacerdote C, Galassi C, Migliore E, Ranzi A, Cesaroni G, Badaloni C, Forastiere F, Tamayo I, Amiano P, Dorronsoro M, Katsoulis M, Trichopoulou A, Vineis P, Hoek G. Long-term Exposure to Air Pollution and Cardiovascular Mortality An Analysis of 22 European Cohorts. *Epidemiology* 2014;**25**(3):368-378.
23. Bentayeb M, Wagner V, Stempfelet M, Zins M, Goldberg M, Pascal M, Larrieu S, Beaudeau P, Cassadou S, Eilstein D, Filleul L, Le Tertre A, Medina S, Pascal L, Prouvost H, Quenel P, Zeghnoun A, Lefranc A. Association between long-term exposure to air pollution and mortality in France: A 25-year follow-up study. *Environment International* 2015;**85**:5-14.
24. Brunekreef B, Beelen R, Hoek G, Schouten L, Bausch-Goldbohm S, Fischer P, Armstrong B, Hughes E, Jerrett M, van den Brandt P. Effects of long-term exposure to traffic-related air pollution on respiratory and cardiovascular mortality in the Netherlands: the NLCS-AIR study. *Research report (Health Effects Institute)* 2009(139):5-71; discussion 73-7189.
25. Carey IM, Atkinson RW, Kent AJ, Van Staa T, Cook DG, Anderson HR. Mortality associations with long-term exposure to outdoor air pollution in a national English cohort. *American Journal of Respiratory and Critical Care Medicine* 2013;**187**(11):1226-1233.
26. Cesaroni G, Badaloni C, Gariazzo C, Stafoggia M, Sozzi R, Davoli M, Forastiere F. Long-term exposure to urban air pollution and mortality in a cohort of more than a million adults in Rome. *Environmental Health Perspectives* 2013;**121**(3):324-331.

27. Cesaroni G, Porta D, Badaloni C, Stafoggia M, Eeftens M, Meliefste K, Forastiere F. Nitrogen dioxide levels estimated from land use regression models several years apart and association with mortality in a large cohort study. *Environmental Health: A Global Access Science Source* 2012;**11**:48.
28. Chen H, Goldberg MS, Burnett RT, Jerrett M, Wheeler AJ, Villeneuve PJ. Long-term exposure to traffic-related air pollution and cardiovascular mortality. *Epidemiology* 2013;**24**(1):35-43.
29. Chen LH, Knutsen SF, Shavlik D, Beeson WL, Petersen F, Ghamsary M, Abbey D. The association between fatal coronary heart disease and ambient particulate air pollution: Are females at greater risk? *Environmental Health Perspectives* 2005;**113**(12):1723-1729.
30. Chen X, Zhang LW, Huang JJ, Song FJ, Zhang LP, Qian ZM, Trevathan E, Mao HJ, Han B, Vaughn M, Chen KX, Liu YM, Chen J, Zhao BX, Jiang GH, Gu Q, Bai ZP, Dong GH, Tang NJ. Long-term exposure to urban air pollution and lung cancer mortality: A 12-year cohort study in Northern China. *Science of the Total Environment* 2016;**571**:855-861.
31. Crouse DL, Peters PA, Hystad P, Brook JR, van Donkelaar A, Martin RV, Villeneuve PJ, Jerrett M, Goldberg MS, Pope CA, 3rd, Brauer M, Brook RD, Robichaud A, Menard R, Burnett RT. Ambient PM2.5, O3, and NO2 Exposures and Associations with Mortality over 16 Years of Follow-Up in the Canadian Census Health and Environment Cohort (CanCHEC). *Environmental Health Perspectives* 2015;**123**(11):1180-6.
32. Crouse DL, Peters PA, Villeneuve PJ, Proux MO, Shin HH, Goldberg MS, Johnson M, Wheeler AJ, Allen RW, Atari DO, Jerrett M, Brauer M, Brook JR, Cakmak S, Burnett RT. Within- and between-city contrasts in nitrogen dioxide and mortality in 10 Canadian cities; a subset of the Canadian Census Health and Environment Cohort (CanCHEC). *Journal of Exposure Science & Environmental Epidemiology* 2015;**25**(5):482-9.
33. Dimakopoulou K, Samoli E, Beelen R, Stafoggia M, Andersen ZJ, Hoffmann B, Fischer P, Nieuwenhuijsen M, Vineis P, Xun W, Hoek G, Raaschou-Nielsen O, Oudin A, Forsberg B, Modig L, Jousilahti P, Lanki T, Turunen A, Oftedal B, Nafstad P, Schwarze PE, Penell J, Fratiglioni L, Andersson N, Pedersen N, Korek M, De Faire U, Eriksen KT, Tjonneland A, Becker T, Wang M, Bueno-De-Mesquita B, Tsai MY, Eeftens M, Peeters PH, Meliefste K, Marcon A, Kramer U, Kuhlbusch TAJ, Vossoughi M, Key T, De Hoogh K, Hampel R, Peters A, Heinrich J, Weinmayr G, Concin H, Nagel G, Ineichen A, Jacquemin B, Stempfelet M, Vilier A, Ricceri F, Sacerdote C, Pedeli X, Katsoulis M, Trichopoulou A, Brunekreef B, Katsouyanni K. Air pollution and nonmalignant respiratory mortality in 16 cohorts within the ESCAPE project. *American Journal of Respiratory and Critical Care Medicine* 2014;**189**(6):684-696.
34. Dong GH, Zhang P, Sun B, Zhang L, Chen X, Ma N, Yu F, Guo H, Huang H, Lee YL, Tang N, Chen J. Long-term exposure to ambient air pollution and respiratory disease mortality in Shenyang, China: A 12-year population-based retrospective cohort study. *Respiration* 2012;**84**(5):360-368.
35. Filleul L, Rondeau V, Vandentorren S, Le Moual N, Cantagrel A, Annesi-Maesano I, Charpin D, Declercq C, Neukirch F, Paris C, Vervloet D, Brochard P, Tessier JF, Kauffmann F, Baldi I. Twenty five year mortality and air pollution: results from the French PAARC survey. *Occupational and Environmental Medicine* 2005;**62**(7):453-460.
36. Fischer PH, Marra M, Ameling CB, Hoek G, Beelen R, de Hoogh K, Breugelmans O, Kruize H, Janssen NA, Houthuijs D. Air Pollution and Mortality in Seven Million Adults: The Dutch Environmental Longitudinal Study (DUELS). *Environ Health Perspect* 2015;**123**(7):697-704.
37. Gan WQ, FitzGerald JM, Carlsten C, Sadatsafavi M, Brauer M. Associations of ambient air pollution with chronic obstructive pulmonary disease hospitalization and mortality. *American Journal of Respiratory and Critical Care Medicine* 2013;**187**(7):721-727.
38. Gan WQ, Koehoorn M, Davies HW, Demers PA, Tamburic L, Brauer M. Long-term exposure to traffic-related air pollution and the risk of coronary heart disease hospitalization and mortality. *Environmental Health Perspectives* 2011;**119**(4):501-507.

39. Gehring U, Heinrich J, Kramer U, Grote V, Hochadel M, Sugiri D, Kraft M, Rauchfuss K, Eberwein HG, Wichmann HE. Long-term exposure to ambient air pollution and cardiopulmonary mortality in women. *Epidemiology* 2006;**17**(5):545-551.
40. Hart JE, Garshick E, Dockery DW, Smith TJ, Ryan L, Laden F. Long-Term Ambient Multipollutant Exposures and Mortality. *American Journal of Respiratory and Critical Care Medicine* 2011;**183**(1):73-78.
41. Heinrich J, Thiering E, Rzehak P, Kramer U, Hochadel M, Rauchfuss KM, Gehring U, Wichmann HE. Long-term exposure to NO2 and PM10 and all-cause and cause-specific mortality in a prospective cohort of women. *Occupational & Environmental Medicine* 2013;**70**(3):179-86.
42. Hoek G, Brunekreef B, Goldbohm S, Fischer P, Van Den Brandt PA. Association between mortality and indicators of traffic-related air pollution in the Netherlands: A cohort study. *Lancet* 2002;**360**(9341):1203-1209.
43. Institute HE. Reanalysis of the Harvard Six Cities Study and the American Cancer Society Study of Particulate Air Pollution and Mortality: A Special Report of the Institute's Particle Epidemiology Reanalysis Projec. 2000.
44. Jerrett M, Burnett RT, Beckerman BS, Turner MC, Krewski D, Thurston G, Martin RV, van Donkelaar A, Hughes E, Shi Y, Gapstur SM, Thun MJ, Pope CA, 3rd. Spatial analysis of air pollution and mortality in California. *Am J Respir Crit Care Med* 2013;**188**(5):593-9.
45. Jerrett M, Finkelstein MM, Brook JR, Arain MA, Kanaroglou P, Stieb DM, Gilbert NL, Verma D, Finkelstein N, Chapman KR, Sears MR. A cohort study of traffic-related air pollution and mortality in Toronto, Ontario, Canada. *Environmental Health Perspectives* 2009;**117**(5):772-777.
46. Katanoda K, Sobue T, Satoh H, Tajima K, Suzuki T, Nakatsuka H, Takezaki T, Nakayama T, Nitta H, Tanabe K, Tominaga S. An association between long-term exposure to ambient air pollution and mortality from lung cancer and respiratory diseases in Japan. *Journal of Epidemiology* 2011;**21**(2):132-143.
47. Krewski D, Jerrett M, Burnett RT, Ma R, Hughes E, Shi Y, Turner MC, Pope 3rd CA, Thurston G, Calle EE, Thun MJ, Beckerman B, DeLuca P, Finkelstein N, Ito K, Moore DK, Newbold KB, Ramsay T, Ross Z, Shin H, Tempalski B. Extended follow-up and spatial analysis of the American Cancer Society study linking particulate air pollution and mortality. *Research report (Health Effects Institute)* 2009(140):5-114; discussion 115-136.
48. Lipfert FW, Baty JD, Miller JP, Wyzga RE. PM2.5 constituents and related air quality variables as predictors of survival in a cohort of U.S. military veterans. *Inhalation Toxicology* 2006;**18**(9):645-57.
49. Lipfert FW, Wyzga RE, Baty JD, Miller JP. Traffic density as a surrogate measure of environmental exposures in studies of air pollution health effects: Long-term mortality in a cohort of US veterans. *Atmospheric Environment* 2006;**40**(1):154-169.
50. Lipsett MJ, Ostro BD, Reynolds P, Goldberg D, Hertz A, Jerrett M, Smith DF, Garcia C, Chang ET, Bernstein L. Long-term exposure to air pollution and cardiorespiratory disease in the California teachers study cohort. *American Journal of Respiratory and Critical Care Medicine* 2011;**184**(7):828-835.
51. Maheswaran R, Pearson T, Smeeton NC, Beevers SD, Campbell MJ, Wolfe CD. Impact of outdoor air pollution on survival after stroke: Population-based cohort study. *Stroke* 2010;**41**(5):869-877.
52. McKean-Cowdin R, Calle EE, Peters JM, Henley J, Hannan L, Thurston GD, Thun MJ, Preston-Martin S. Ambient air pollution and brain cancer mortality. *Cancer Causes and Control* 2009;**20**(9):1645-1651.
53. Naess O, Nafstad P, Aamodt G, Claussen B, Rosland P. Relation between concentration of air pollution and cause-specific mortality: Four-year exposures to nitrogen dioxide and

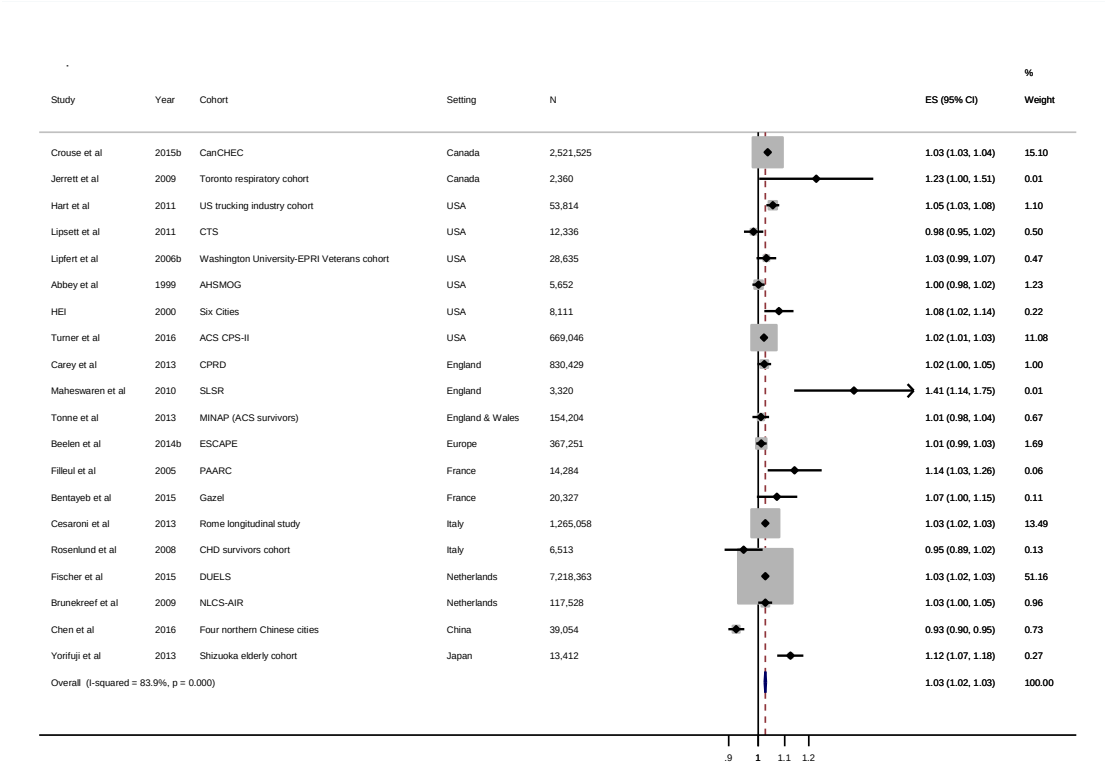
particulate matter pollutants in 470 neighborhoods in Oslo, Norway. *American Journal of Epidemiology* 2007;**165**(4):435-443.
54. Raaschou-Nielsen O, Andersen ZJ, Jensen SS, Ketzel M, Sorensen M, Hansen J, Loft S, Tjonneland A, Overvad K. Traffic air pollution and mortality from cardiovascular disease and all causes: a Danish cohort study. *Environmental Health: A Global Access Science Source* 2012;**11**:60.
55. Raaschou-Nielsen O, Sorensen M, Ketzel M, Hertel O, Loft S, Tjonneland A, Overvad K, Andersen ZJ. Long-term exposure to traffic-related air pollution and diabetes-associated mortality: a cohort study. *Diabetologia* 2013;**56**(1):36-46.
56. Rosenlund M, Picciotto S, Forastiere F, Stafoggia M, Perucci CA. Traffic-related air pollution in relation to incidence and prognosis of coronary heart disease. *Epidemiology* 2008;**19**(1):121-128.
57. Schikowski T, Sugiri D, Ranft U, Gehring U, Heinrich J, Wichmann HE, Kramer U. Does respiratory health contribute to the effects of long-term air pollution exposure on cardiovascular mortality? *Respiratory research* 2007;**8**:20.
58. Sorensen M, Luhdorf P, Ketzel M, Andersen ZJ, Tjonneland A, Overvad K, Raaschou-Nielsen O. Combined effects of road traffic noise and ambient air pollution in relation to risk for stroke? *Environmental Research* 2014;**133**:49-55.
59. Tonne C, Wilkinson P. Long-term exposure to air pollution is associated with survival following acute coronary syndrome. *European Heart Journal* 2013;**34**(17):1306-1311.
60. Tseng E, Ho WC, Lin MH, Cheng TJ, Chen PC, Lin HH. Chronic exposure to particulate matter and risk of cardiovascular mortality: cohort study from Taiwan. *BMC Public Health* 2015;**15**:936.
61. Turner MC, Jerrett M, Pope CA, Krewski D, Gapstur SM, Diver WR, Beckerman BS, Marshall JD, Su J, Crouse DL, Burnett RT. Long-Term Ozone Exposure and Mortality in a Large Prospective Study. *American Journal of Respiratory and Critical Care Medicine* 2016;**193**(10):1134-1142.
62. Yorifuji T, Kashima S, Tsuda T, Ishikawa-Takata K, Ohta T, Tsuruta K, Doi H. Long-term exposure to traffic-related air pollution and the risk of death from hemorrhagic stroke and lung cancer in Shizuoka, Japan. *Science of the Total Environment* 2013;**443**:397-402.
63. Yorifuji T, Kashima S, Tsuda T, Takao S, Suzuki E, Doi H, Sugiyama M, Ishikawa-Takata K, Ohta T. Long-term exposure to traffic-related air pollution and mortality in Shizuoka, Japan. *Occupational and Environmental Medicine* 2010;**67**(2):111-117.
64. Zhang PF, Dong GH, Sun BJ, Zhang LW, Chen X, Ma NN, Yu F, Guo HM, Huang H, Lee YL, Tang NJ, Chen J. Long-Term Exposure to Ambient Air Pollution and Mortality Due to Cardiovascular Disease and Cerebrovascular Disease in Shenyang, China. *Plos One* 2011;**6**(6).
65. Tonne C, Halonen JI, Beevers SD, Dajnak D, Gulliver J, Kelly FJ, Wilkinson P, Anderson HR. Long-term traffic air and noise pollution in relation to mortality and hospital readmission among myocardial infarction survivors. *International Journal of Hygiene & Environmental Health* 2016;**219**(1):72-8.

eFigure 1 All-cause mortality

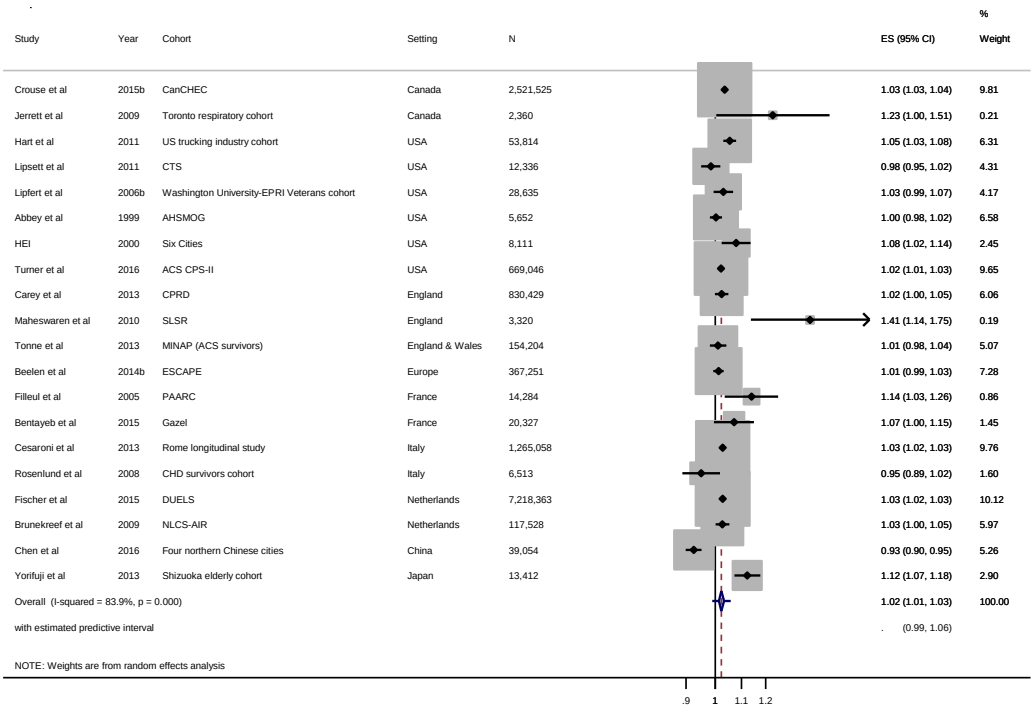


* indicates exclusion from meta-analysis. Refer to methods/results sections of manuscript.

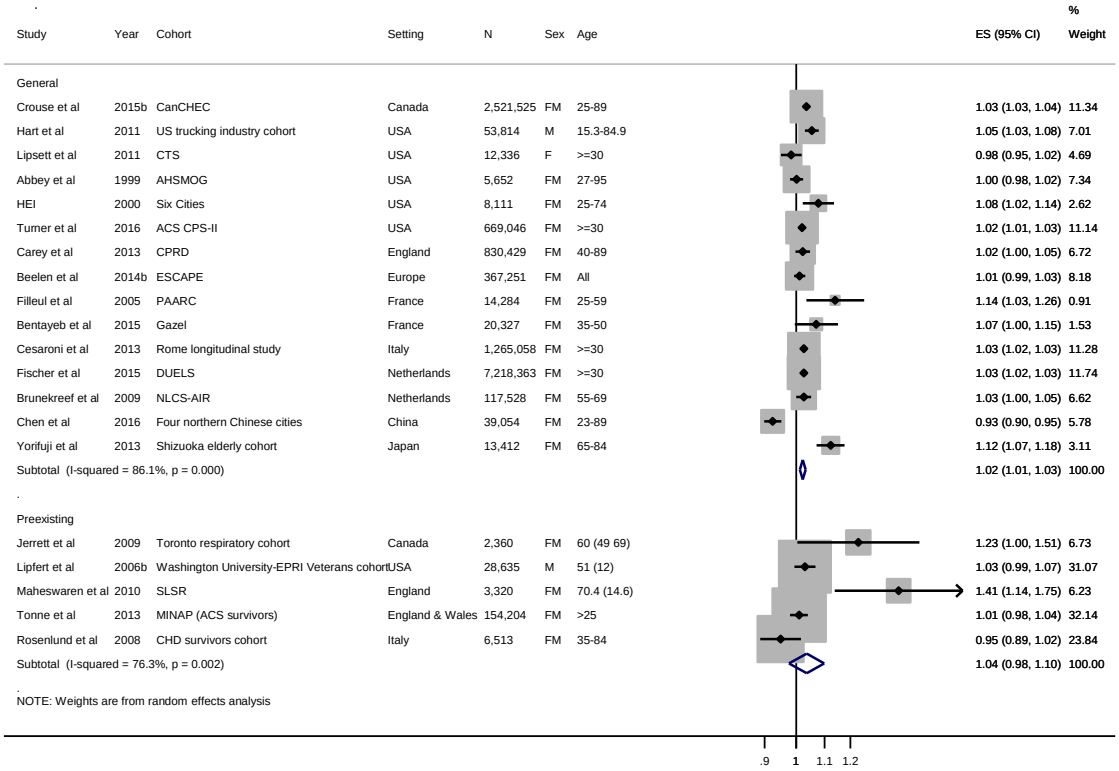
eFigure 2a All-cause mortality – fixed effects model



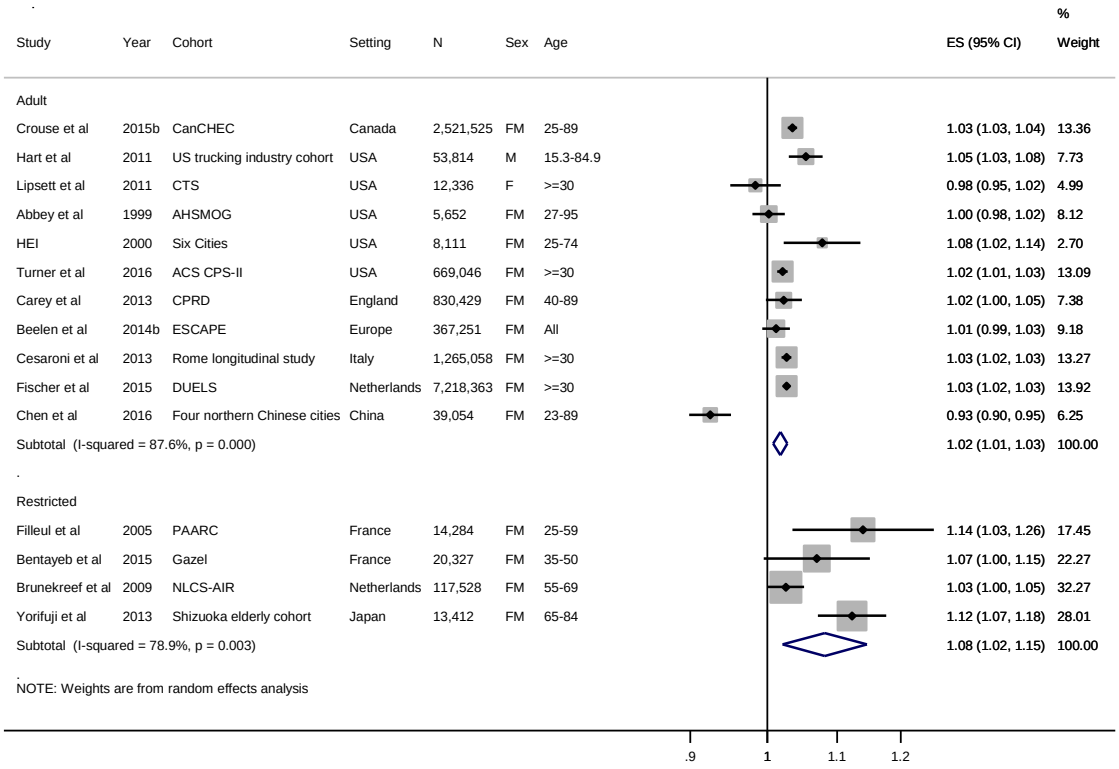
eFigure 2b All-cause mortality - random effects model



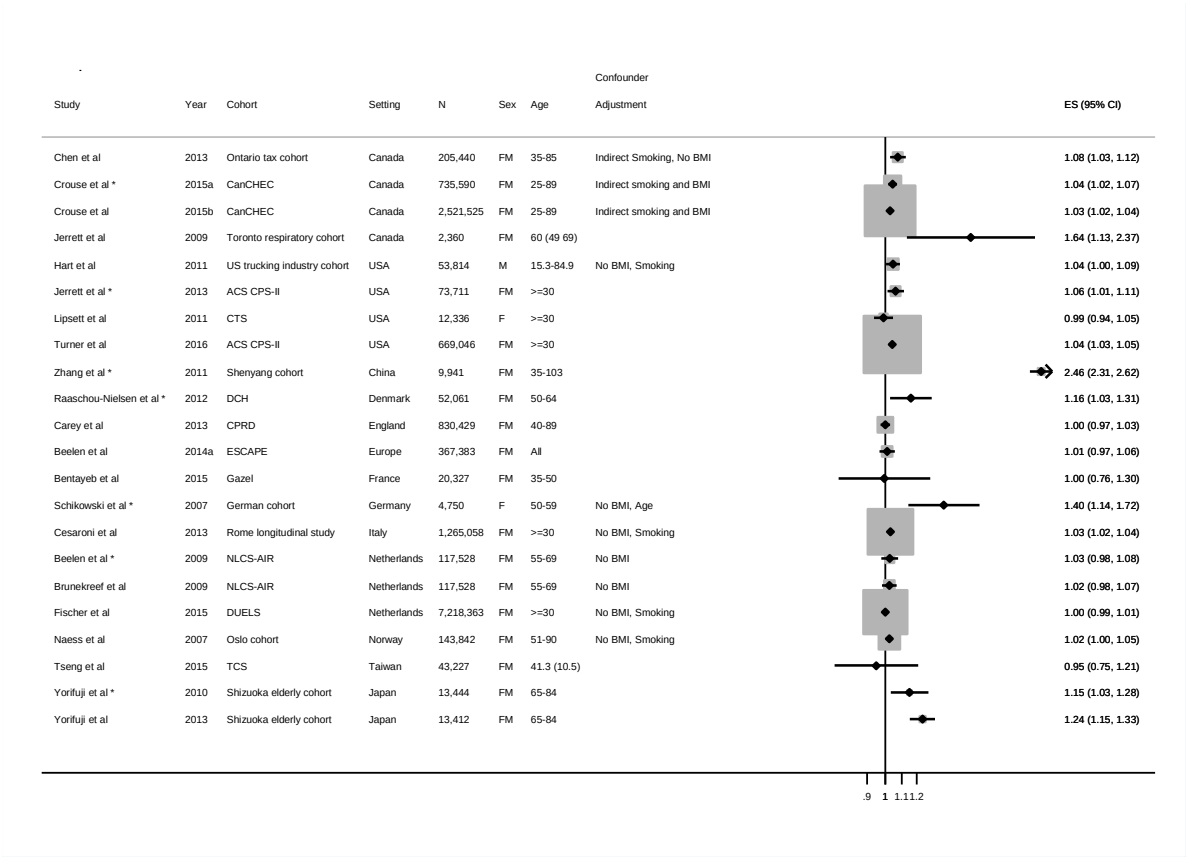
eFigure 3 All-cause mortality - stratification by pre-existing disease on recruitment



eFigure 4 All-cause mortality - stratification by age range at cohort recruitment

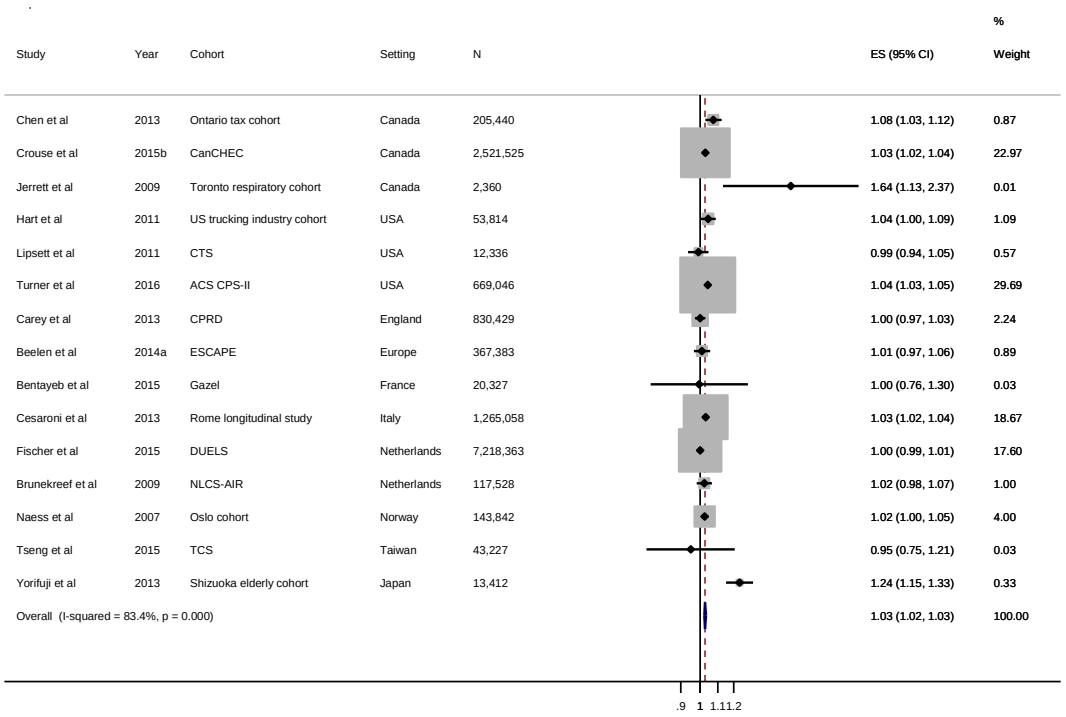


eFigure 5 Cardiovascular mortality

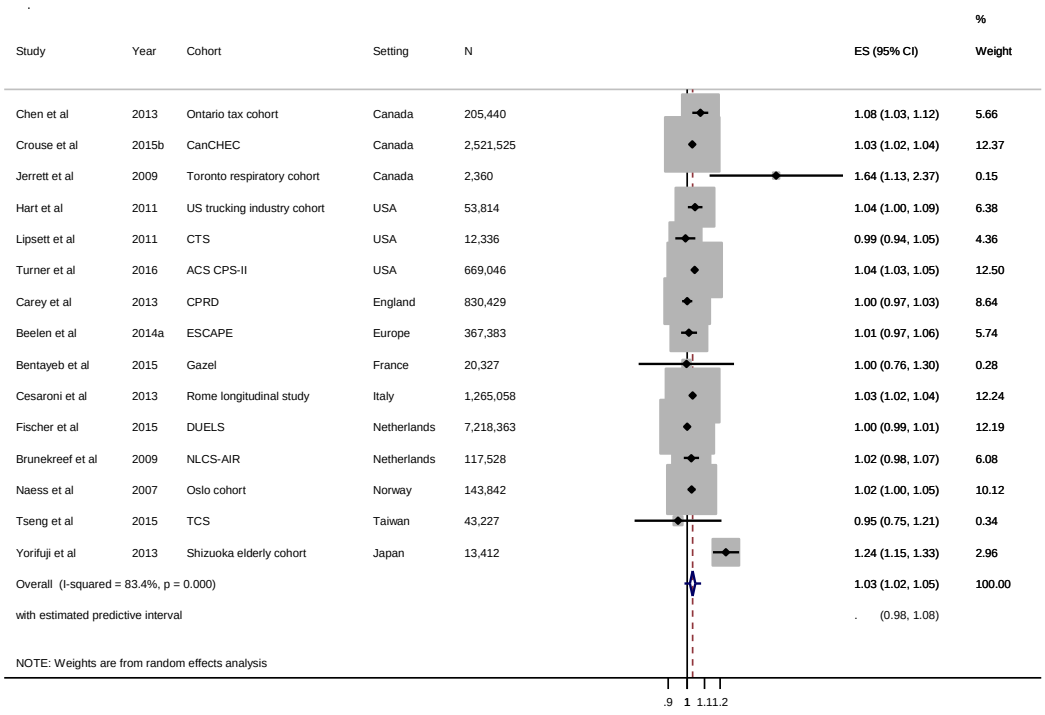


* indicates exclusion from meta-analysis. Refer to methods/results section of manuscript.

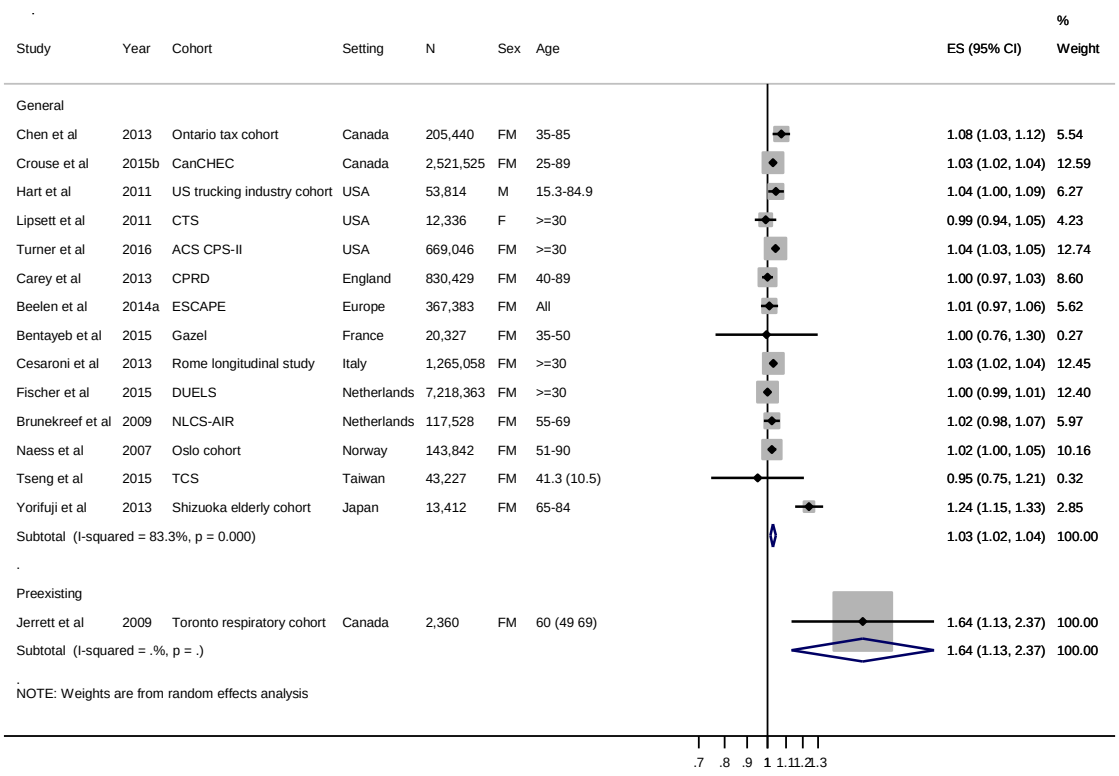
eFigure 6a Cardiovascular mortality – fixed effects model



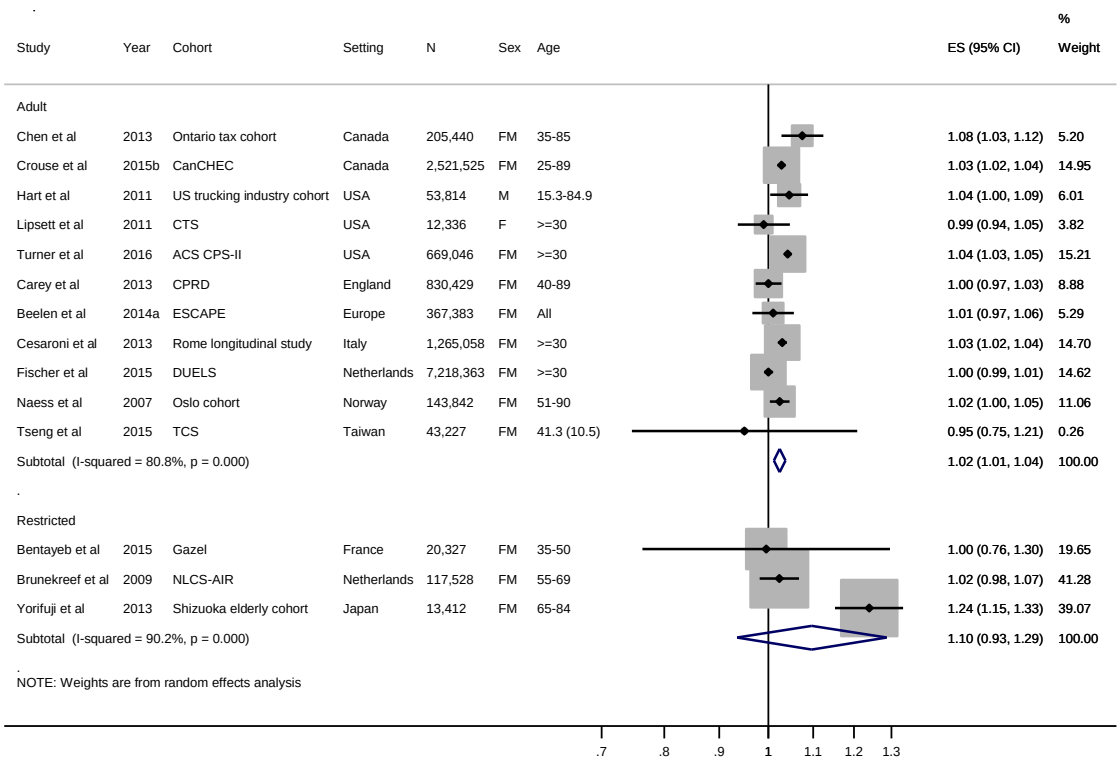
eFigure 6b Cardiovascular mortality – random effects model



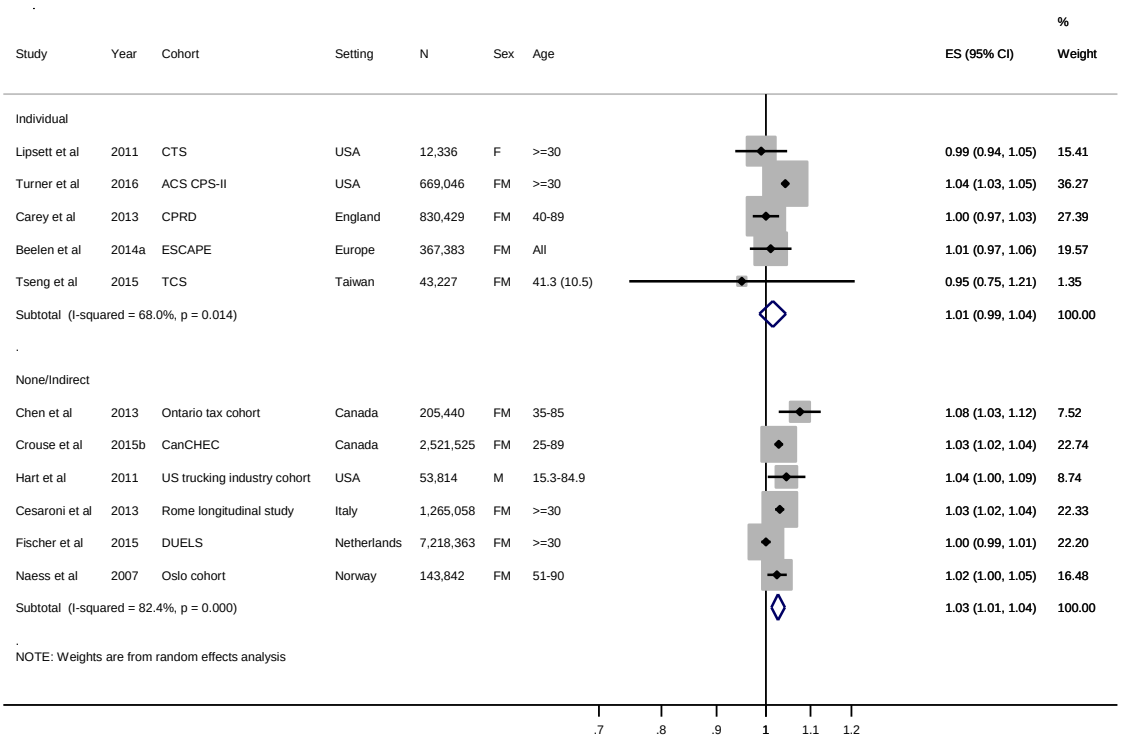
eFigure 7 Cardiovascular mortality - stratification by pre-existing disease on recruitment



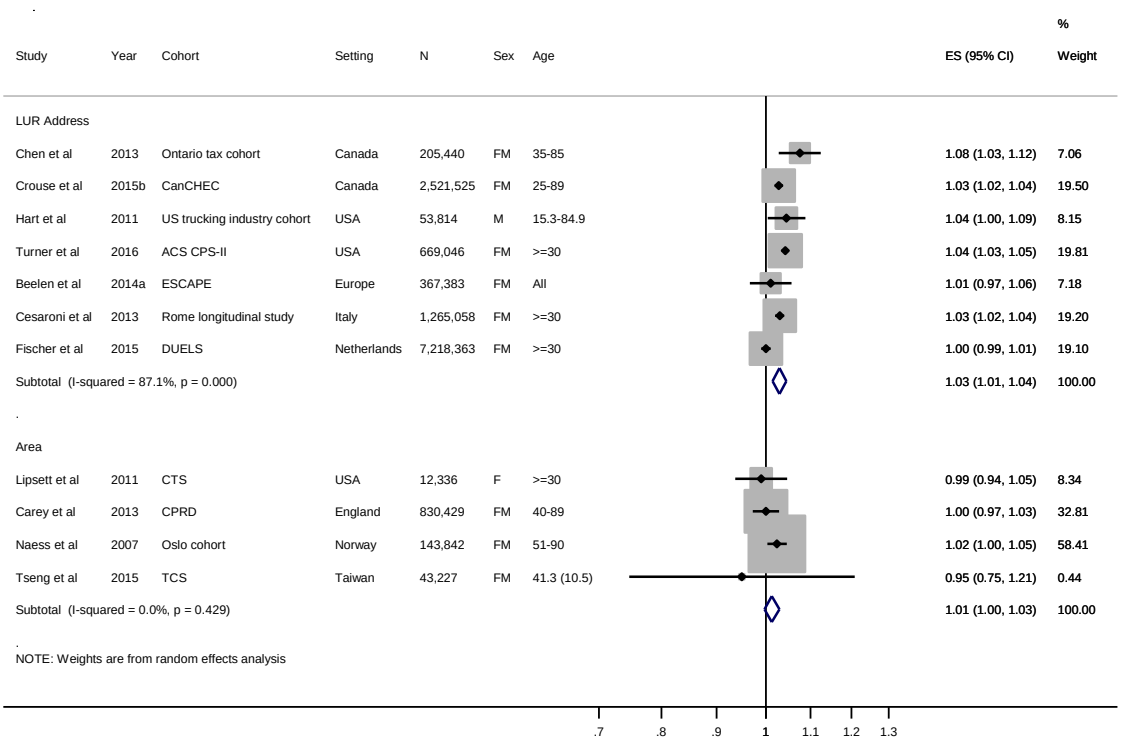
eFigure 8 Cardiovascular mortality - stratification by age range at cohort recruitment



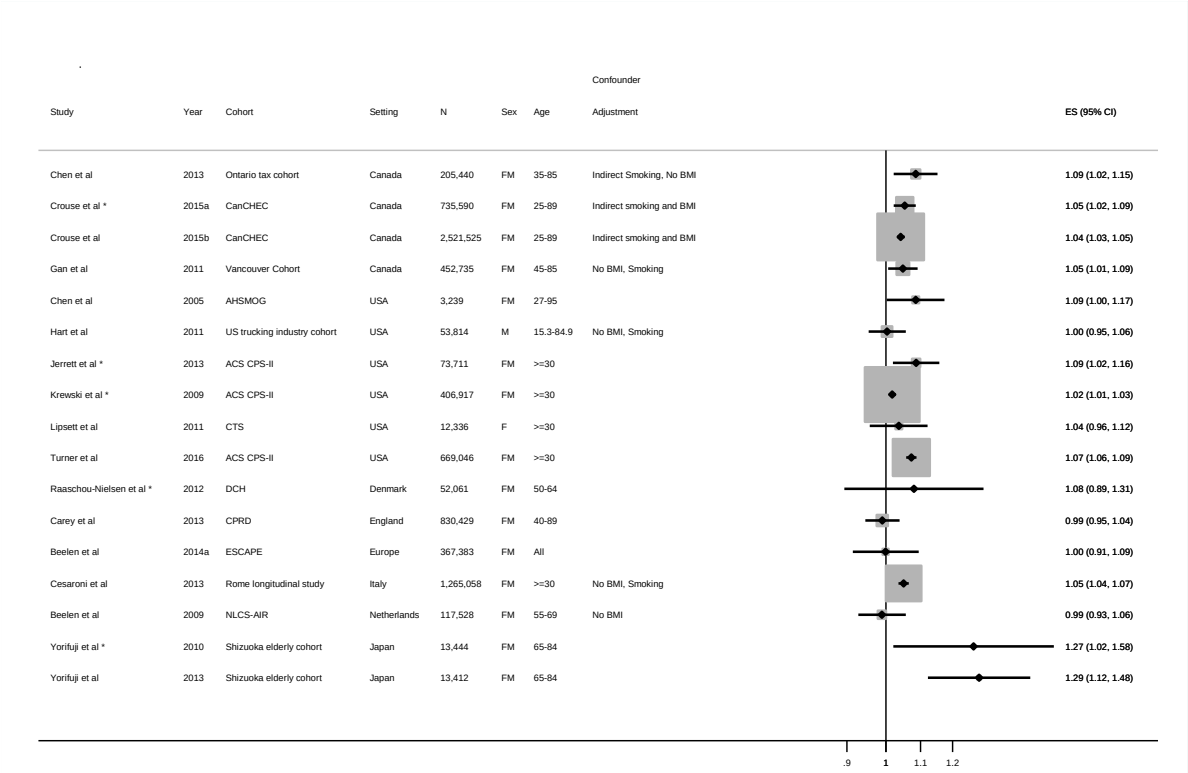
eFigure 9 Cardiovascular mortality - stratification by level of adjustment for smoking and BMI



eFigure 10 Cardiovascular mortality - stratification by spatial resolution of NO_2 concentration estimates

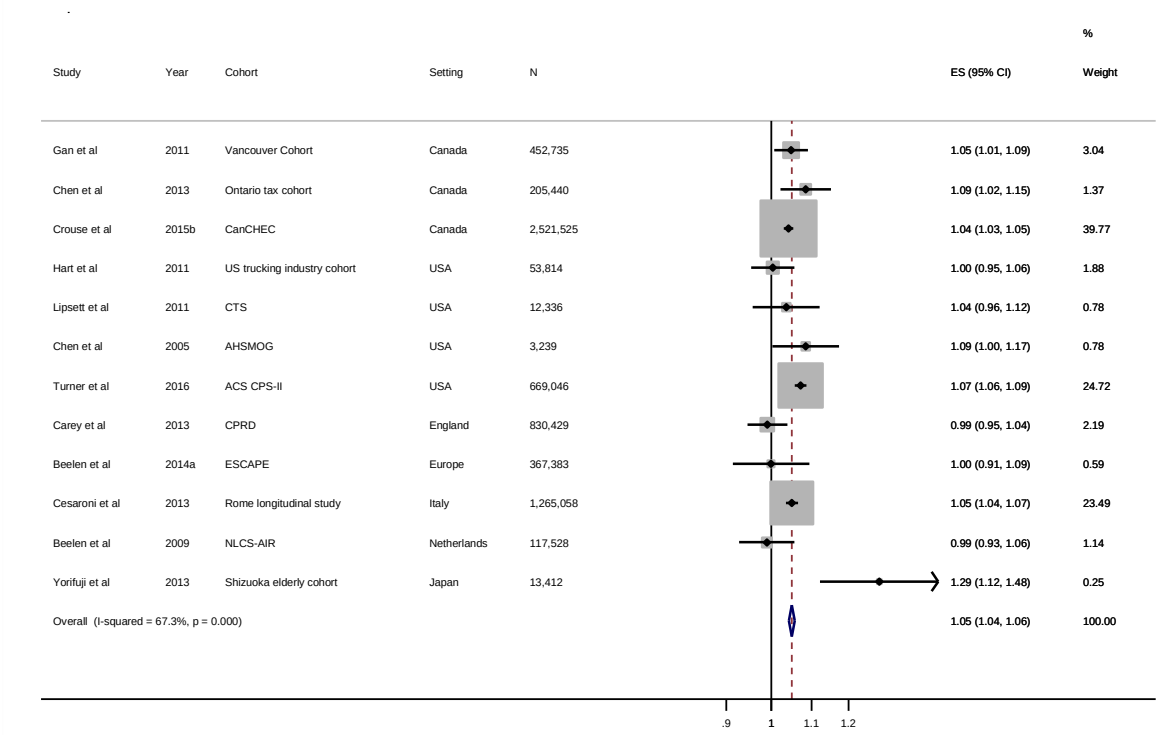


eFigure 11 CHD mortality

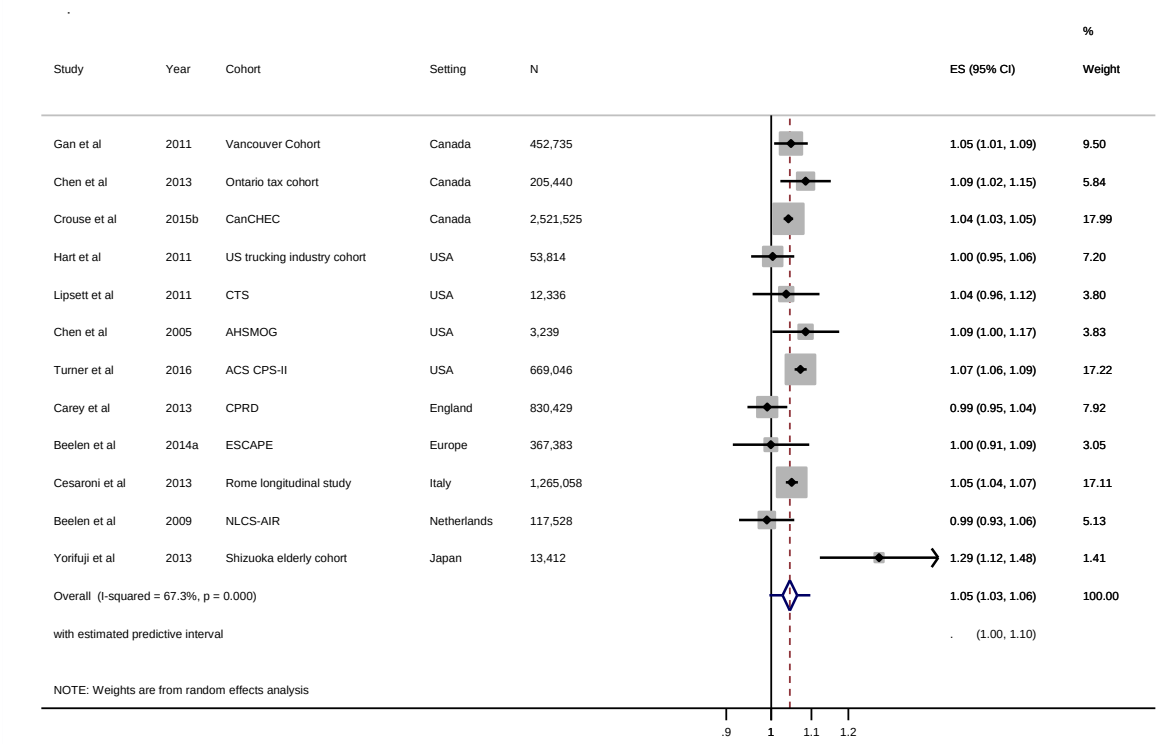


* indicates exclusion from meta-analysis. Refer to methods/results sections of manuscript.

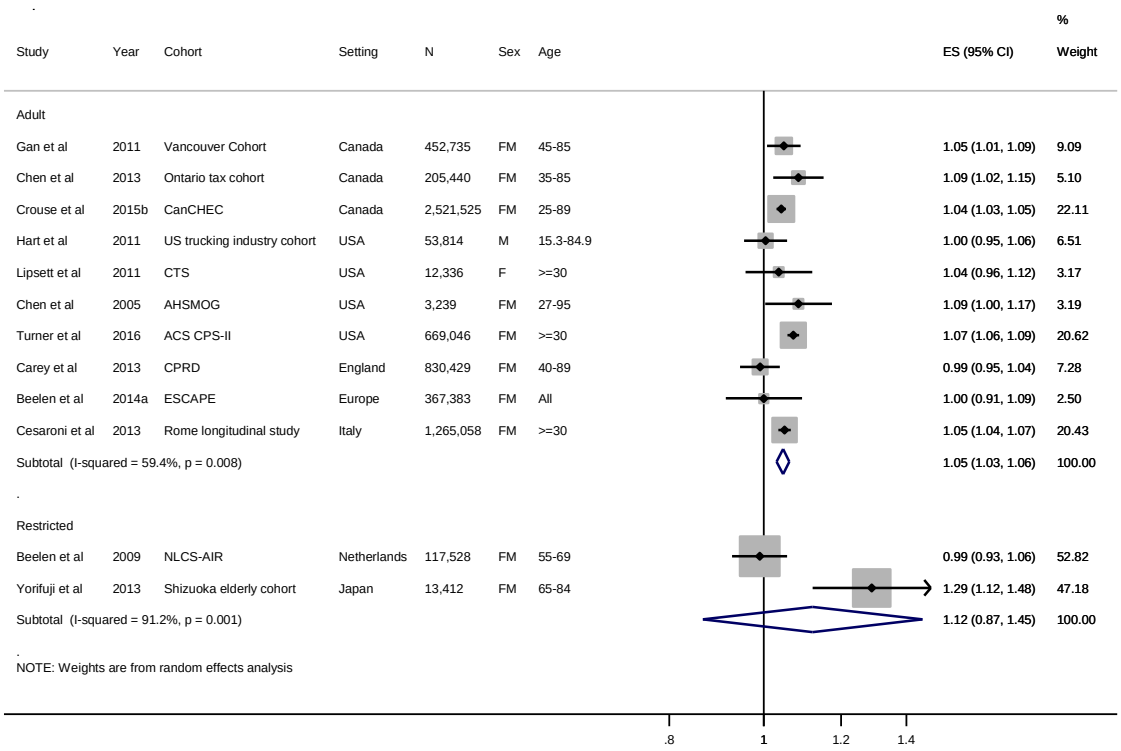
eFigure 12a CHD mortality - fixed effects model



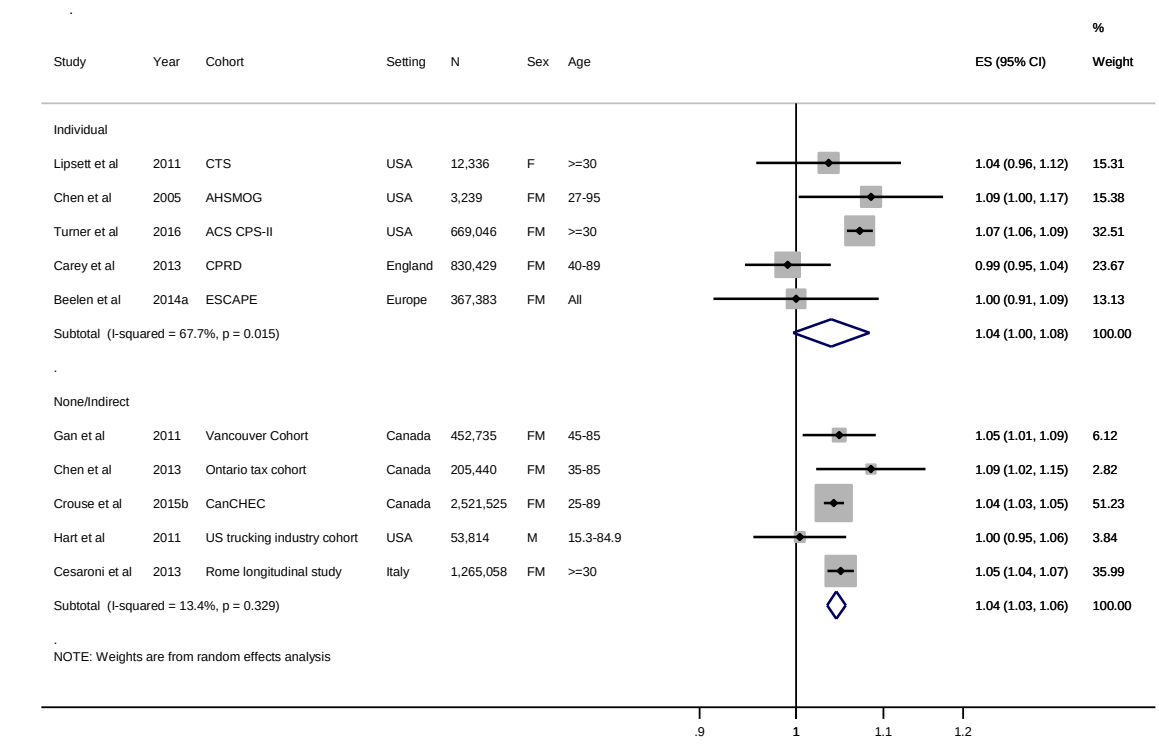
eFigure 12b CHD mortality - random effects model



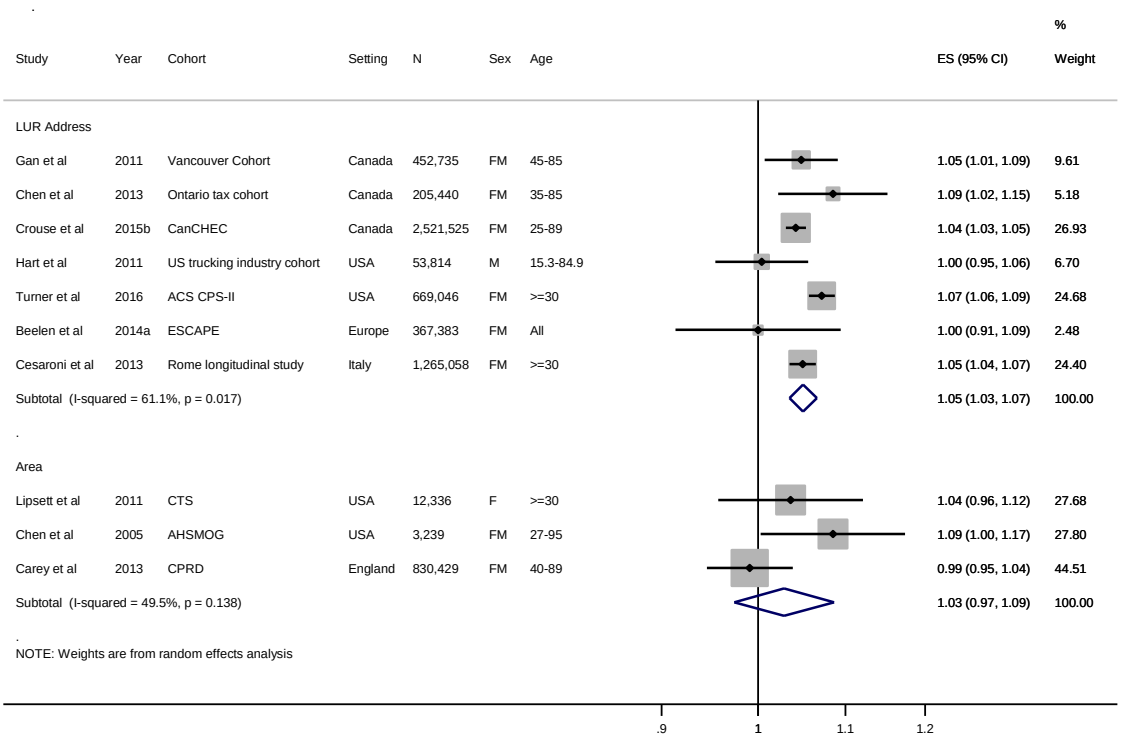
eFigure 13 CHD mortality - stratification by age range at cohort recruitment



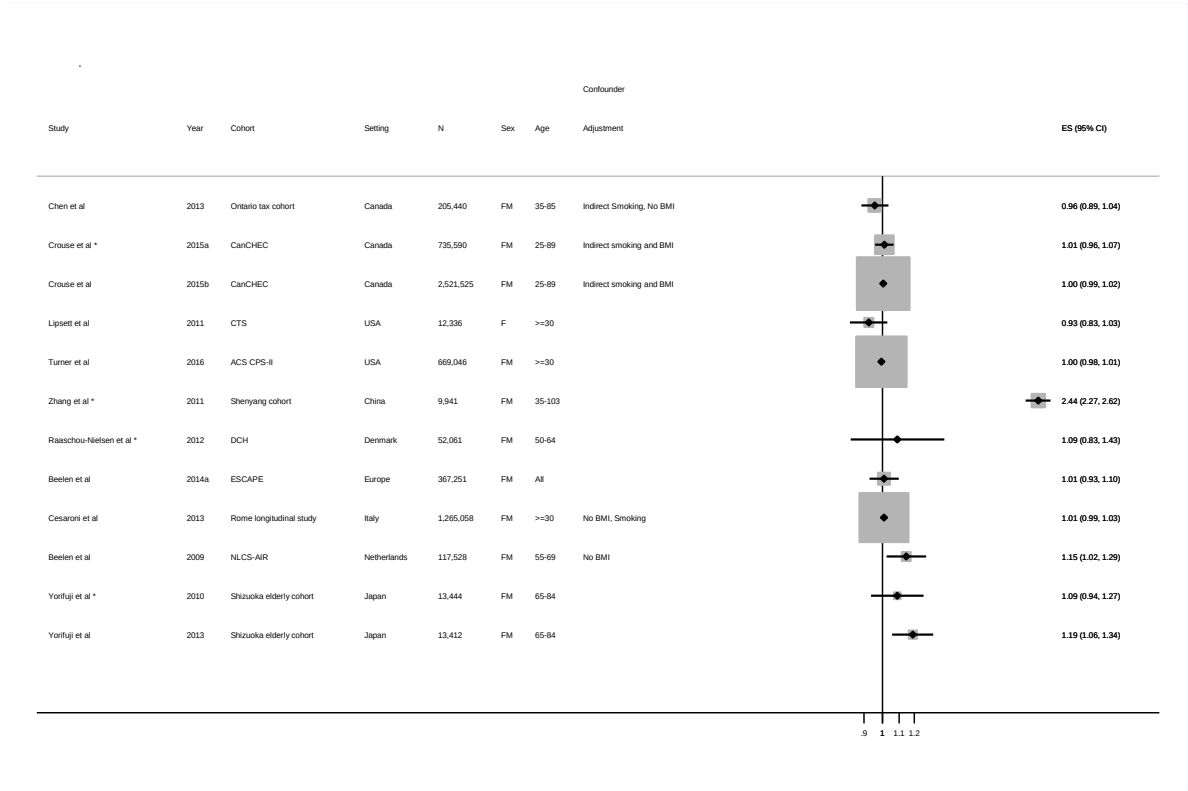
eFigure 14 CHD mortality - stratification by level of adjustment for smoking and BMI



eFigure 15 CHD mortality - stratification by spatial resolution of NO_2 concentration estimates

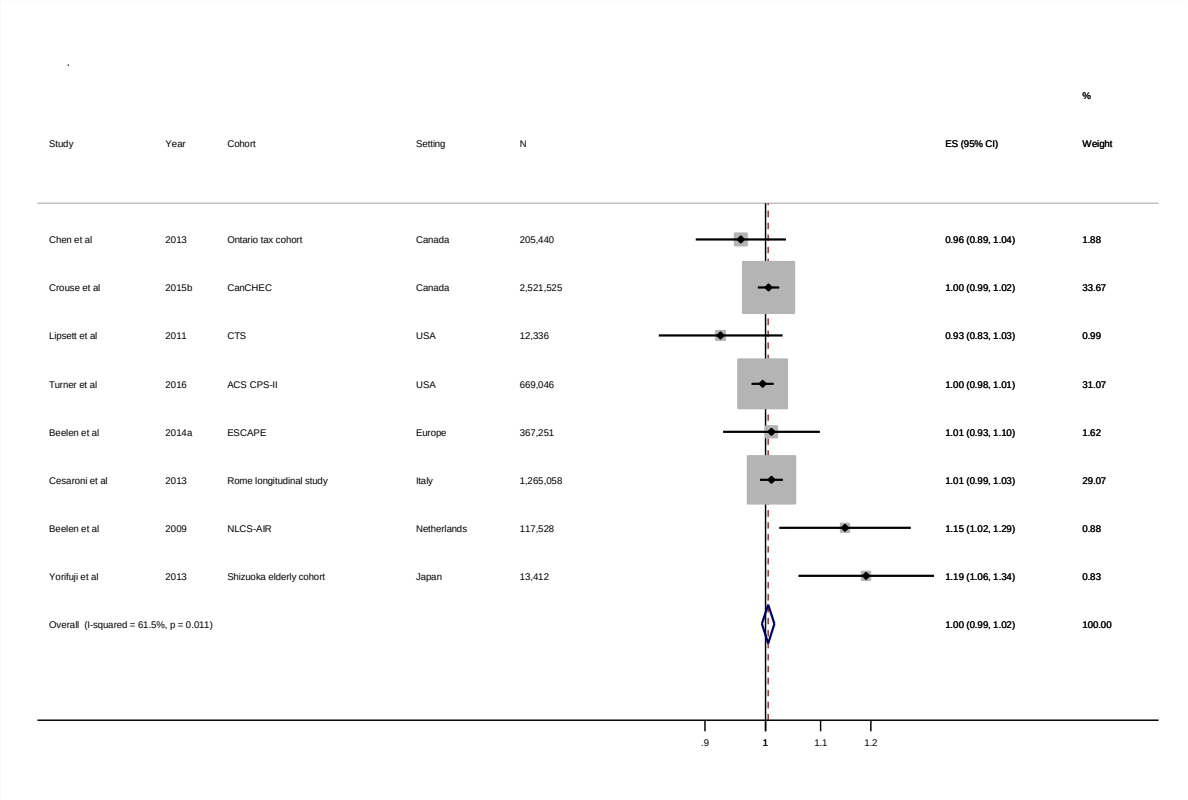


eFigure 16 Cerebrovascular mortality

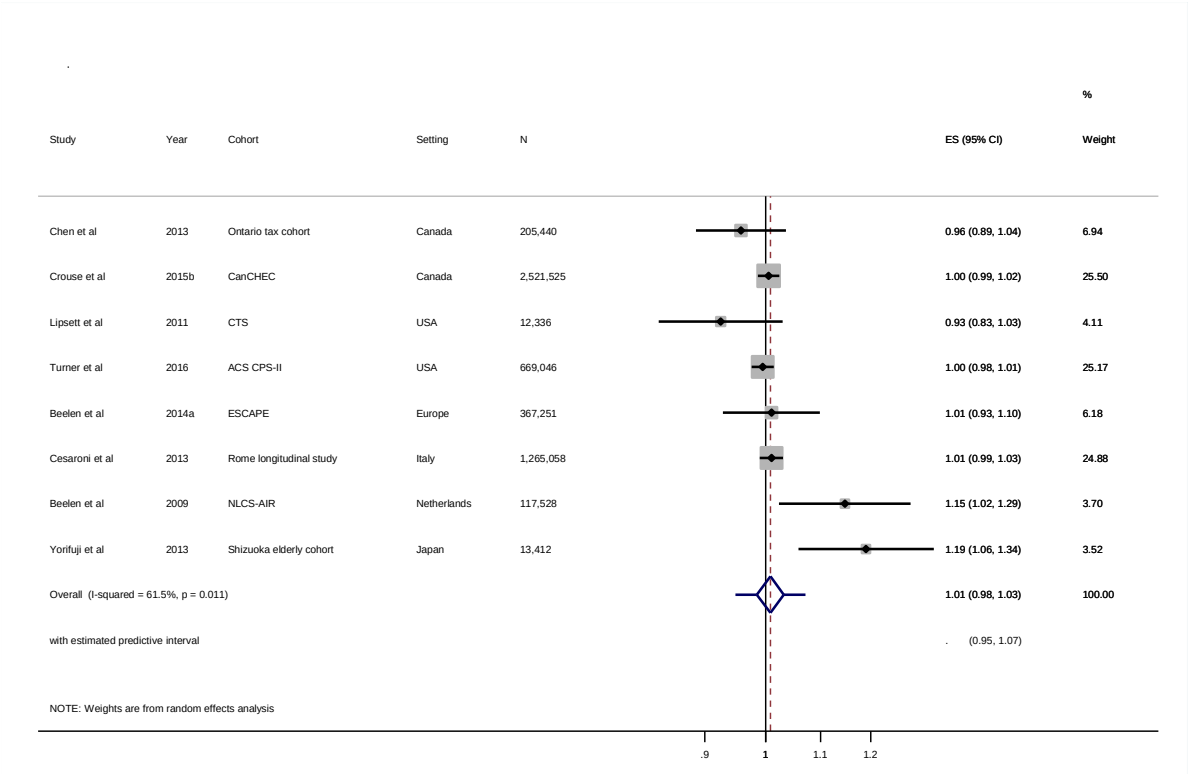


* indicates exclusion from meta-analysis. Refer to methods/results sections of manuscript.

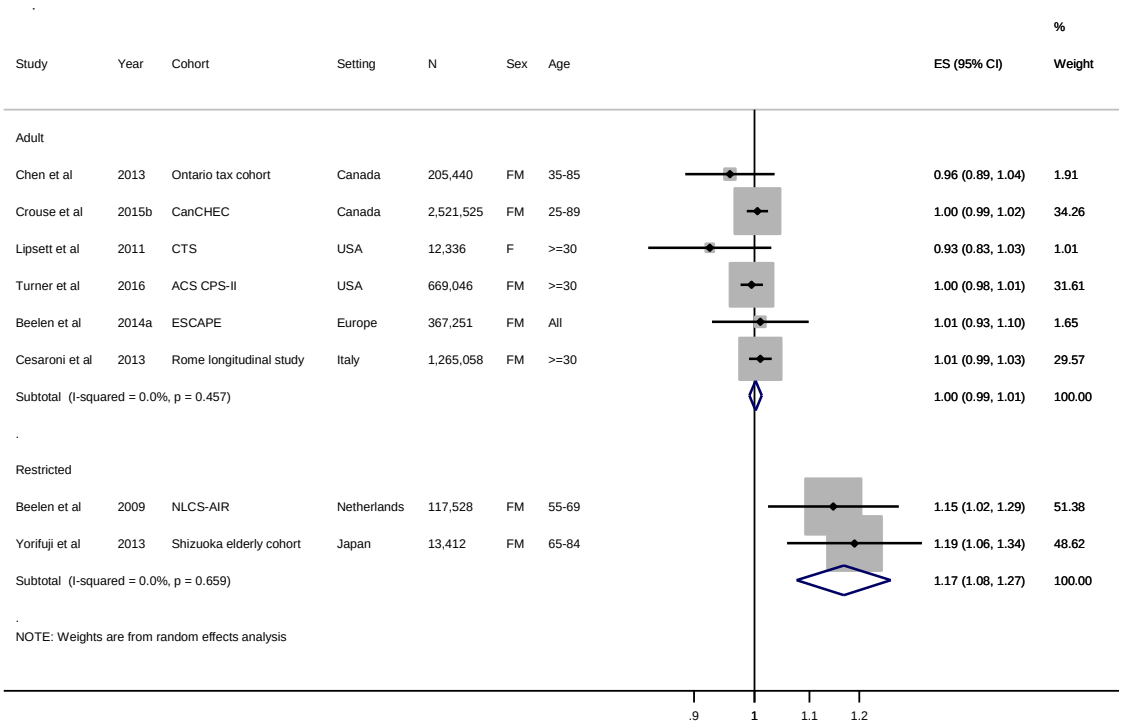
eFigure 17a Cerebrovascular mortality - fixed effects model



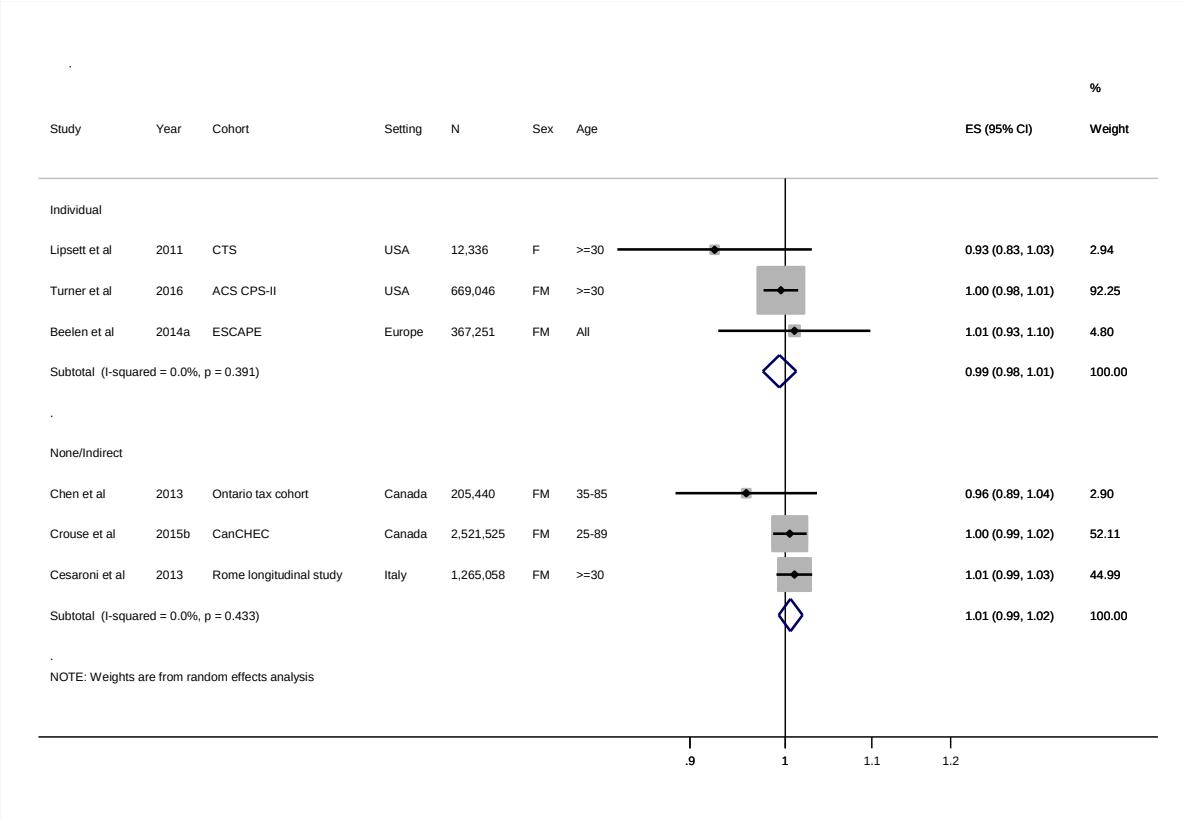
eFigure 17b Cerebrovascular mortality - random effects model



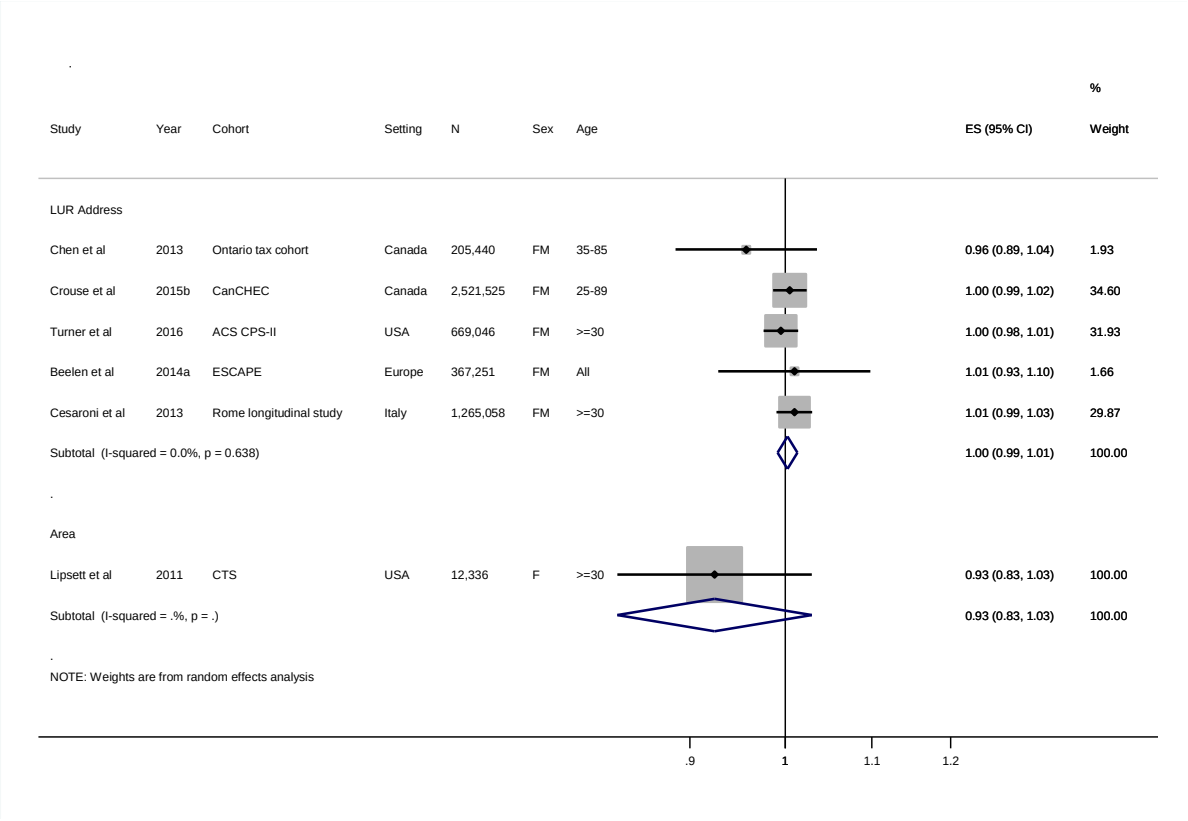
eFigure 18 Cerebrovascular mortality - stratification by age range at cohort recruitment



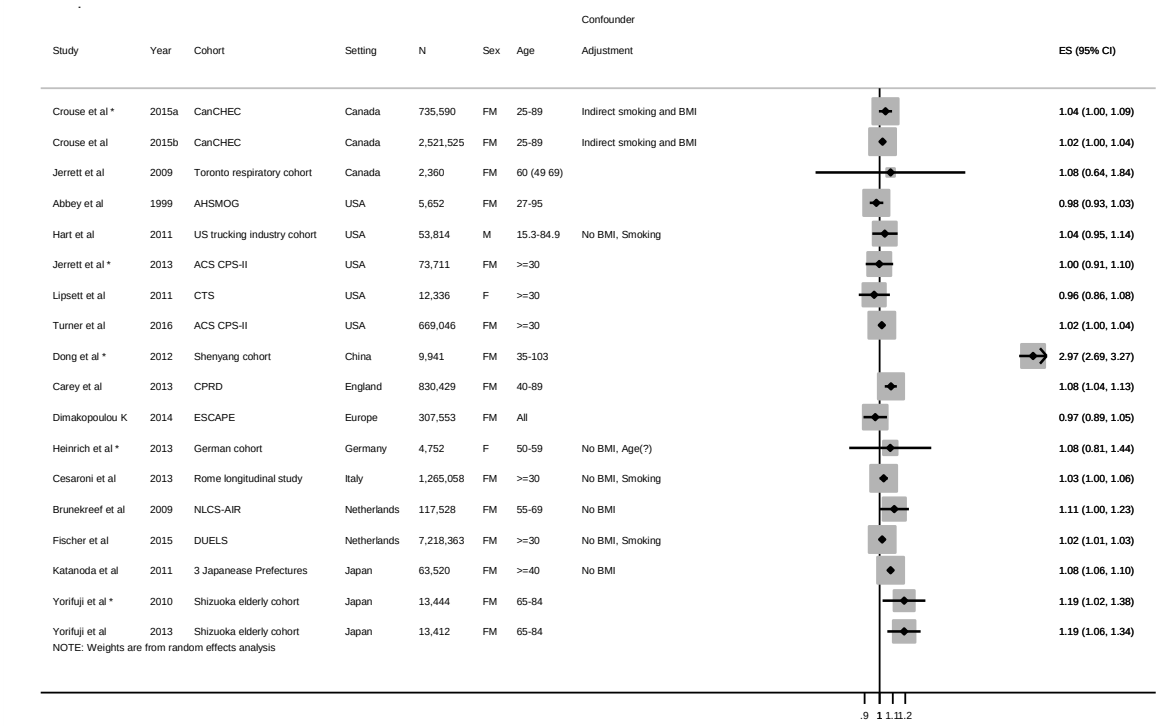
eFigure 19 Cerebrovascular mortality - stratification by level of adjustment for smoking and BMI



eFigure 20 Cerebrovascular mortality - stratification by spatial resolution of NO_2 concentration

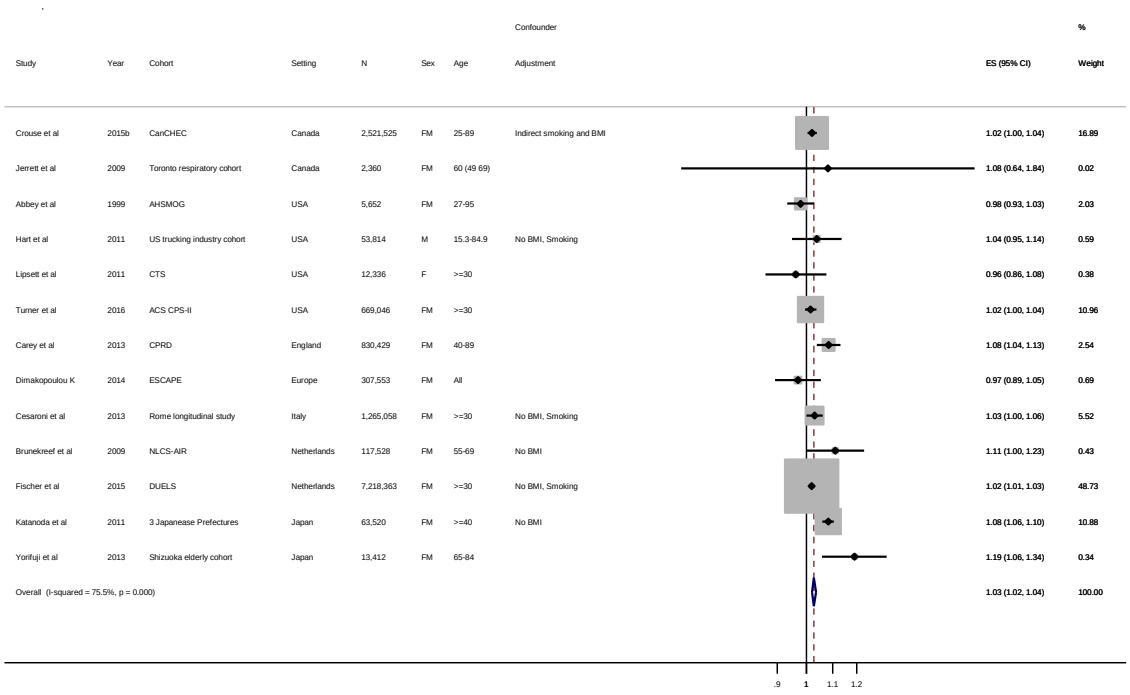


eFigure 21 Respiratory mortality

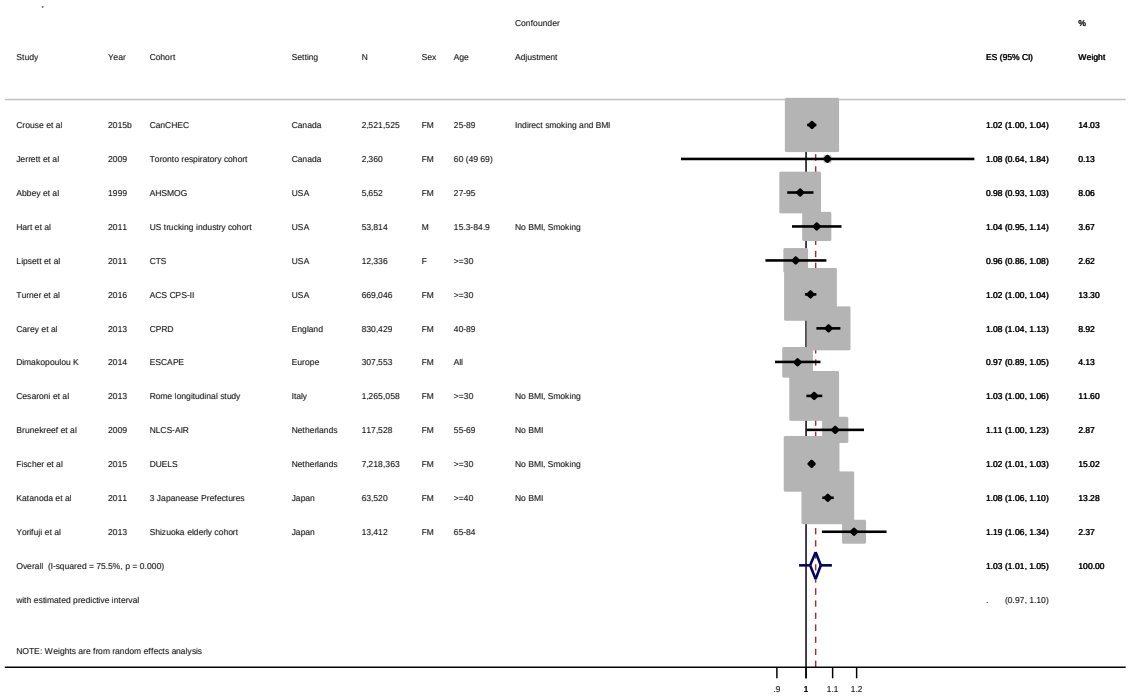


* indicates exclusion from meta-analysis. Refer to methods/results sections of manuscript.

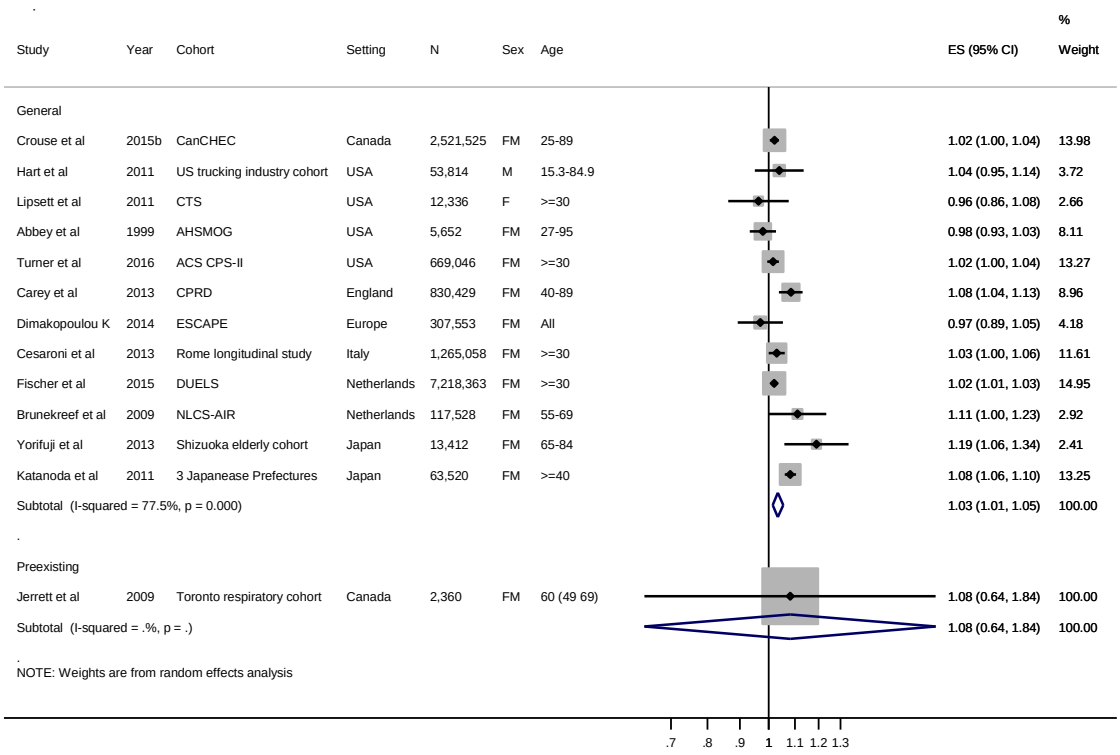
eFigure 22a Respiratory mortality - fixed effects model



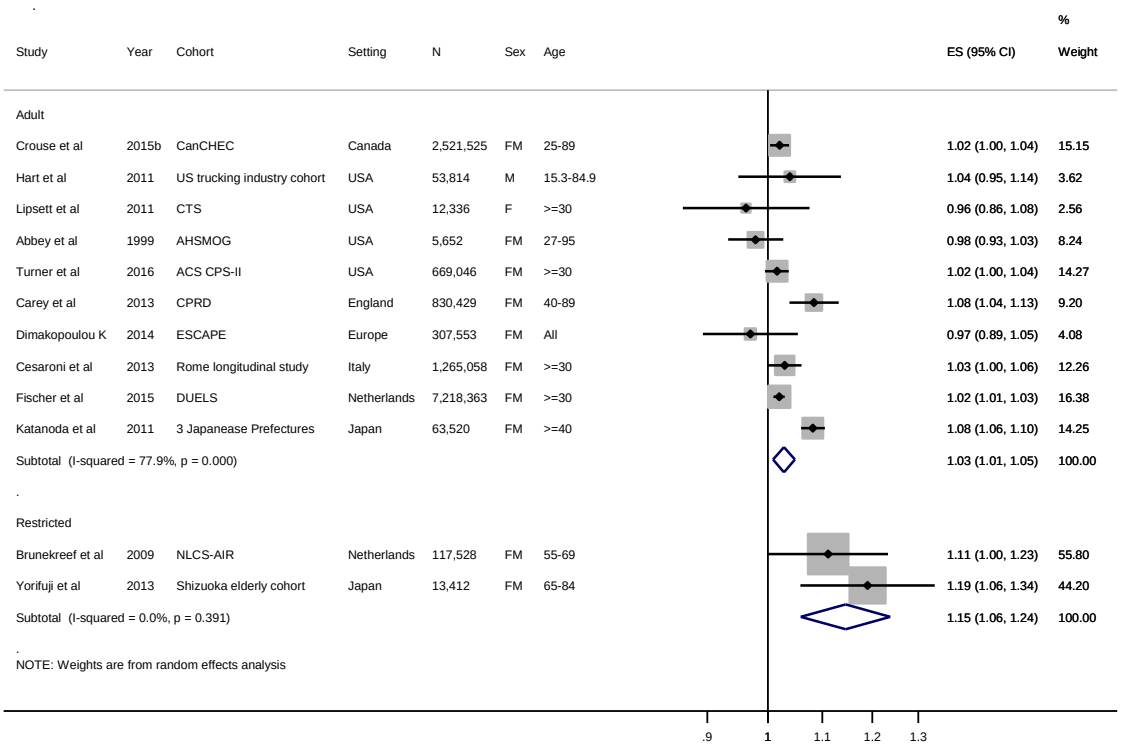
eFigure 22b Respiratory mortality - random effects model



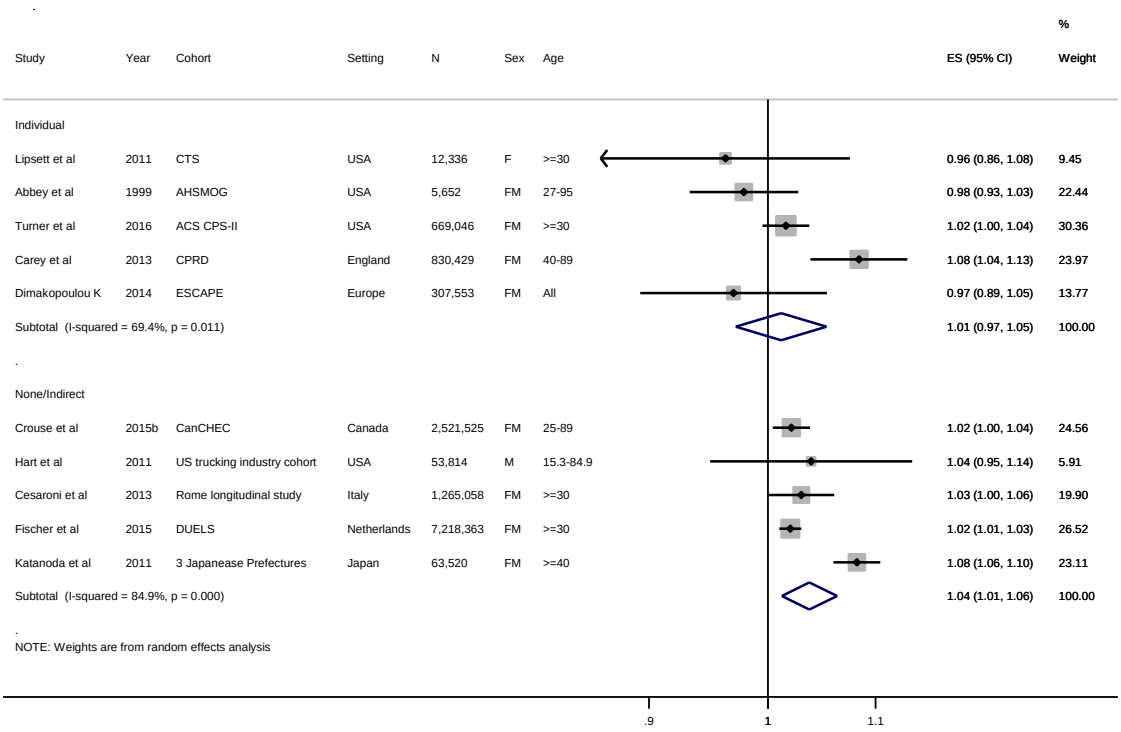
eFigure 23 Respiratory mortality - stratification by pre-existing disease



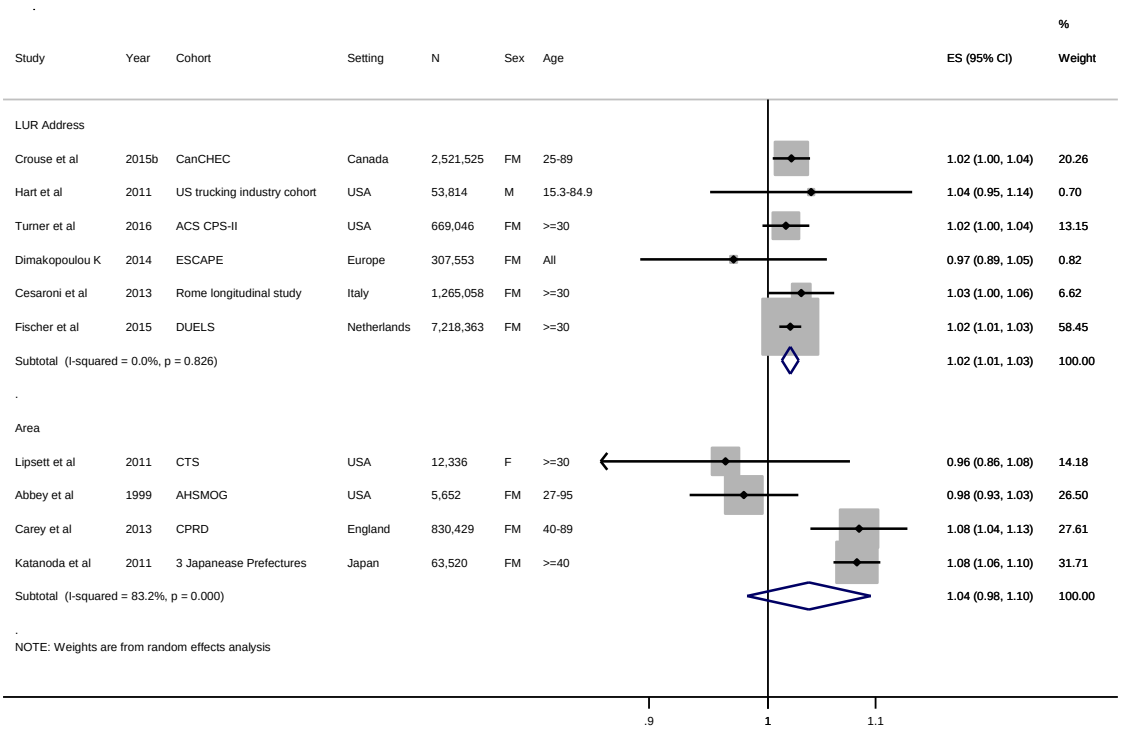
eFigure 24 Respiratory mortality - stratification by age range at cohort recruitment



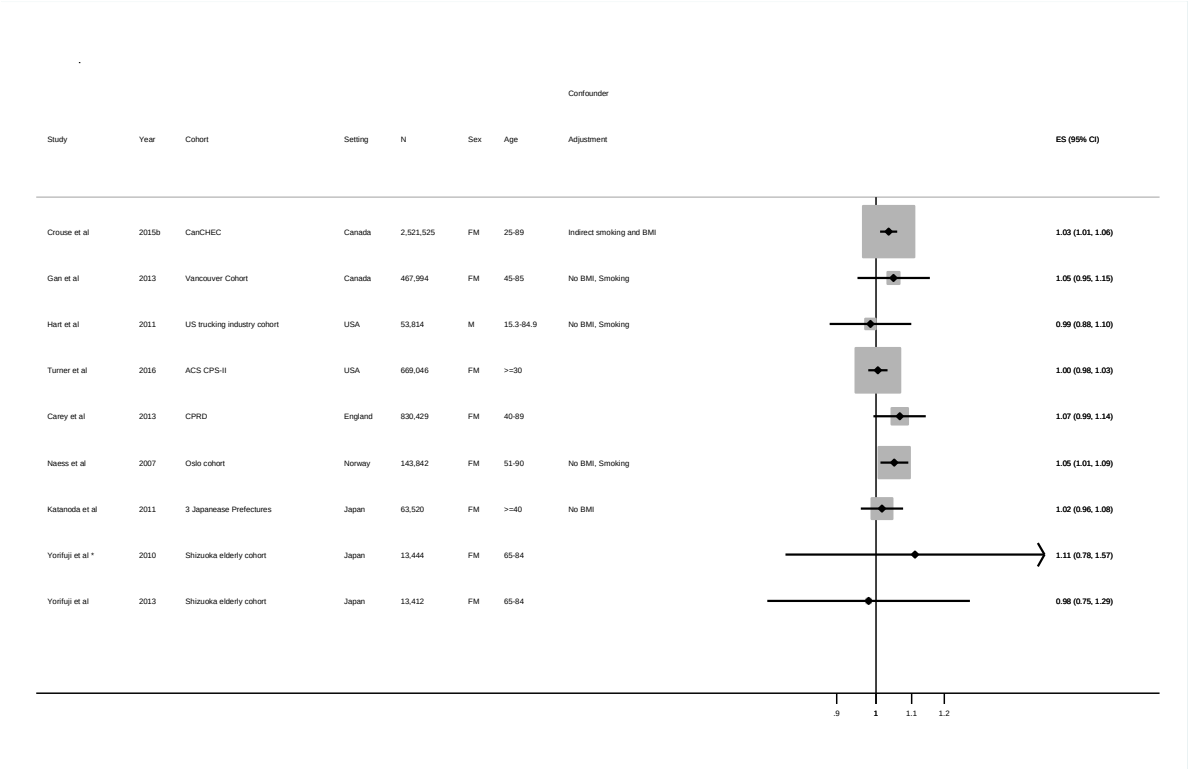
eFigure 25 Respiratory mortality - stratification by level of adjustment for smoking and BMI



eFigure 26 Respiratory mortality - stratification by spatial resolution of NO_2 concentration

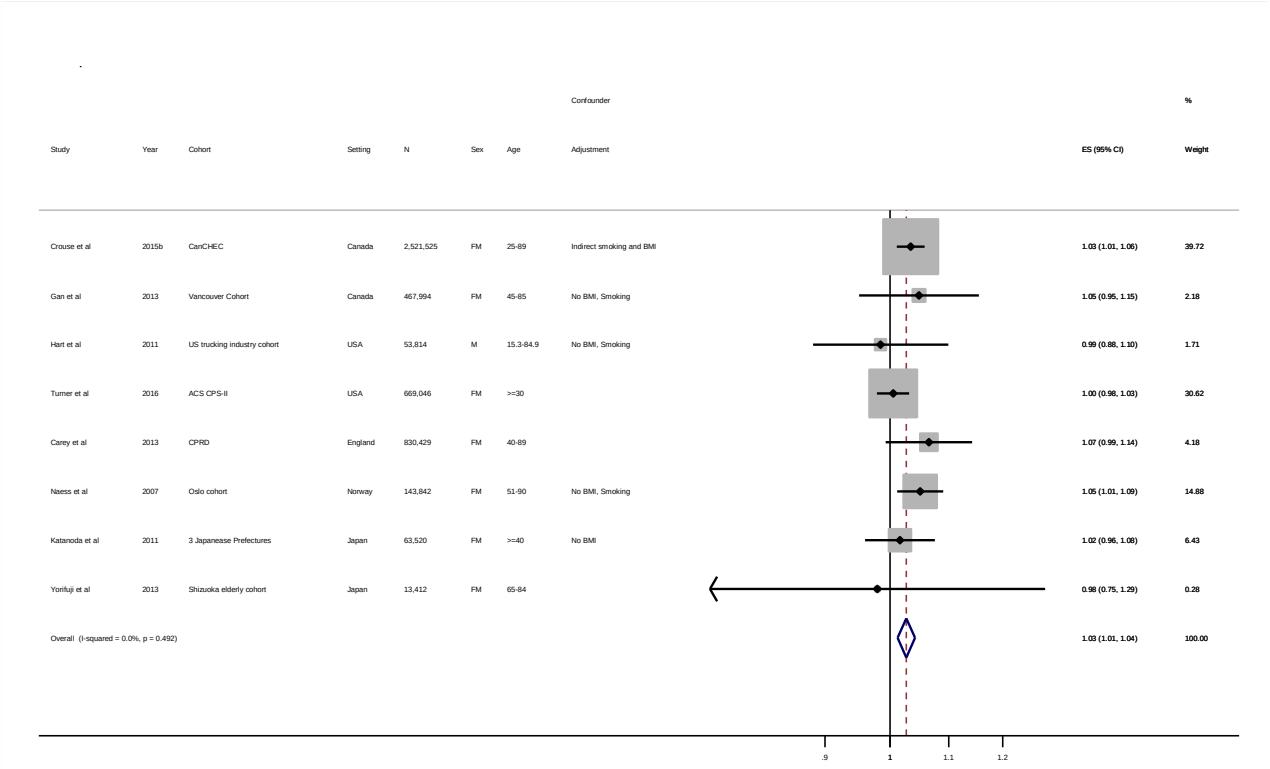


eFigure 27 COPD mortality

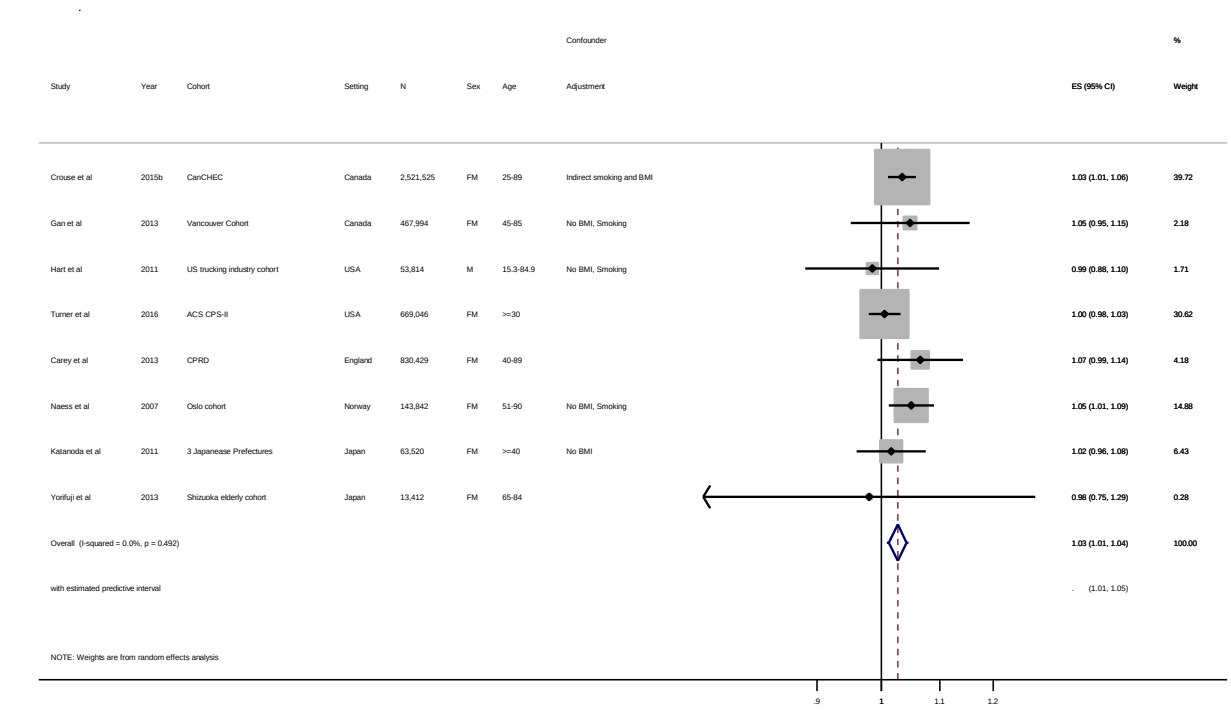


* indicates exclusion from meta-analysis. Refer to methods/results sections of manuscript.

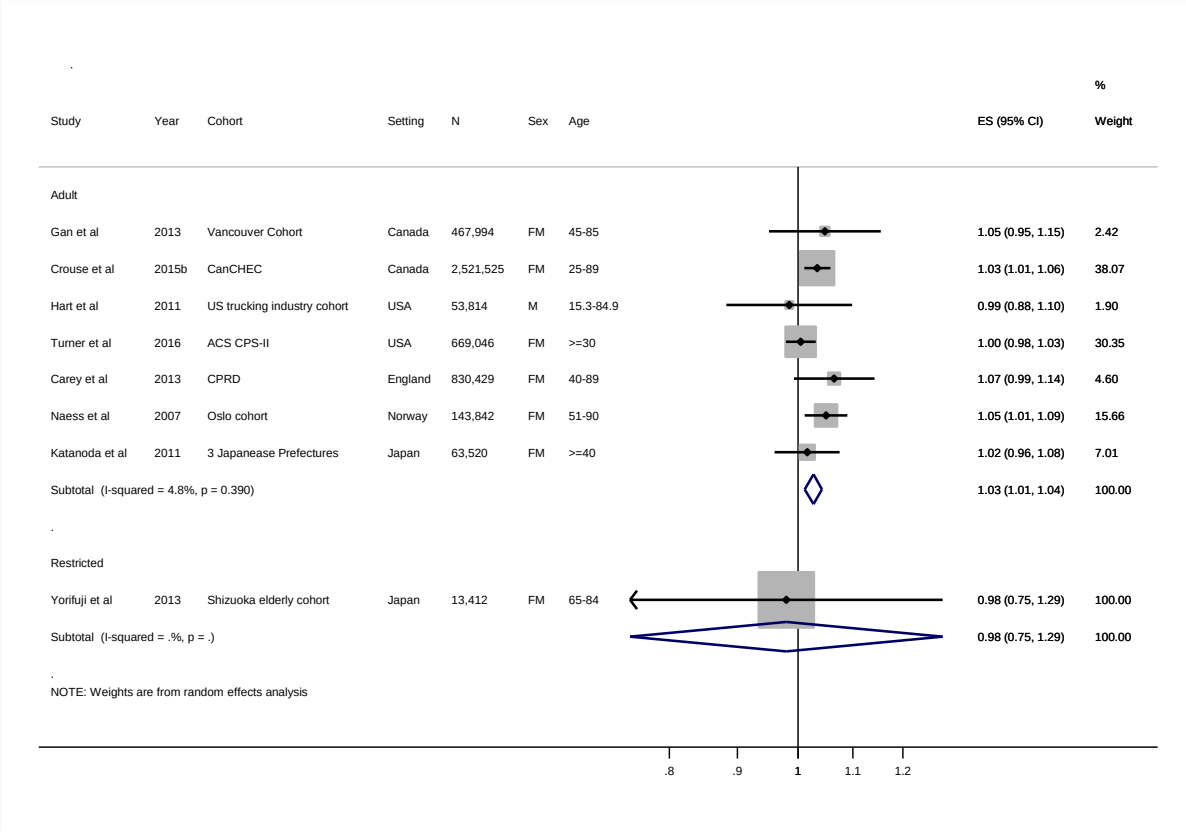
eFigure 28a COPD mortality - fixed effects model



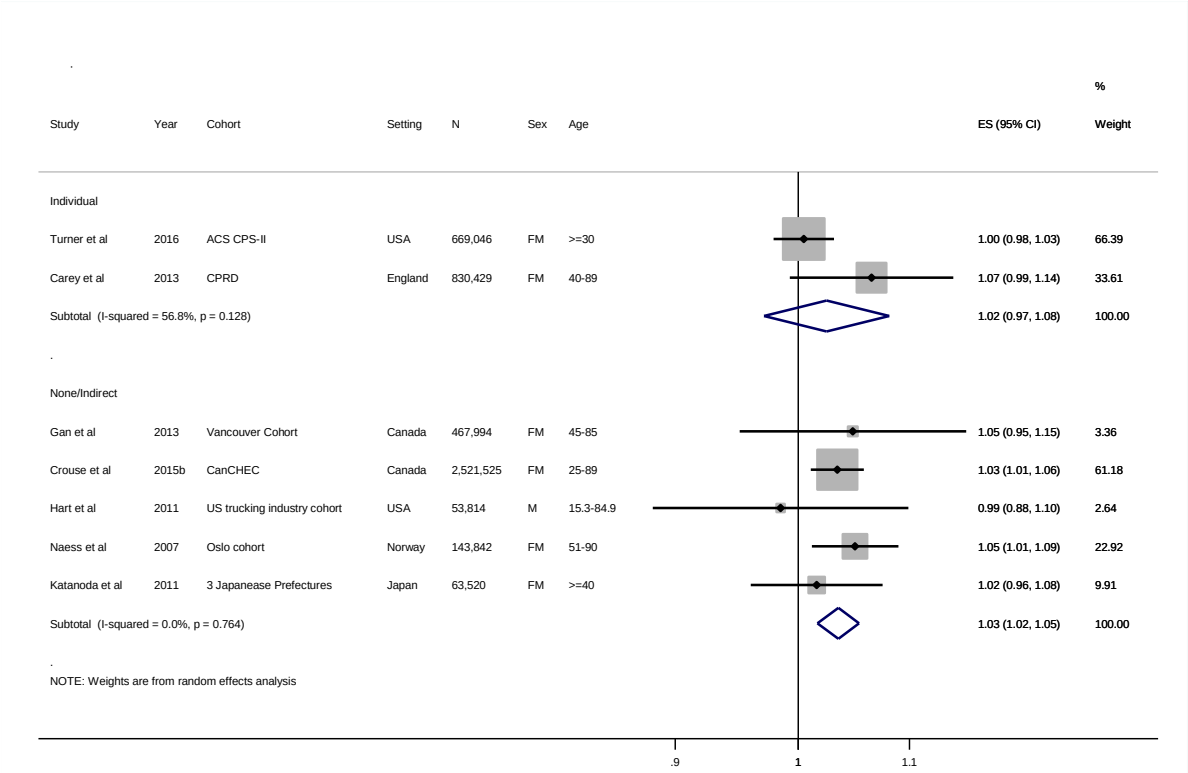
eFigure 28b COPD mortality - random effects model



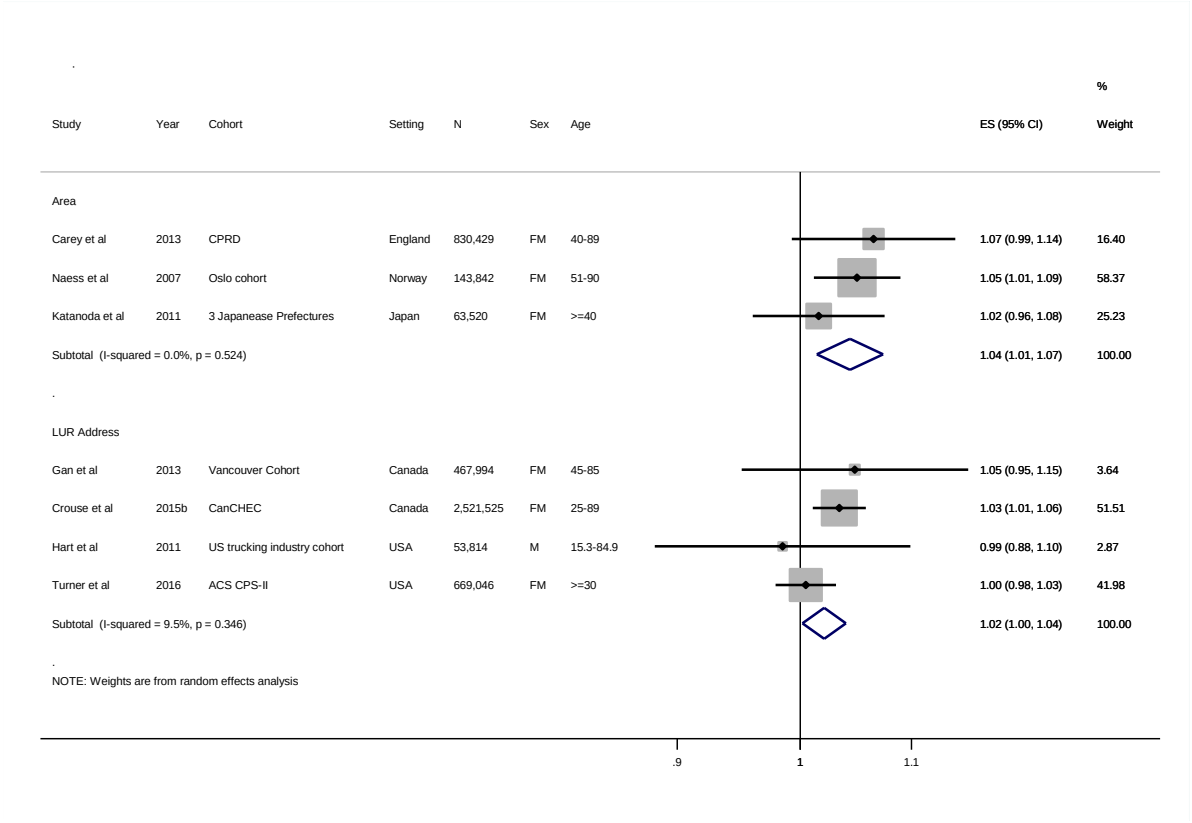
eFigure 29 COPD mortality - stratification by age range at cohort recruitment



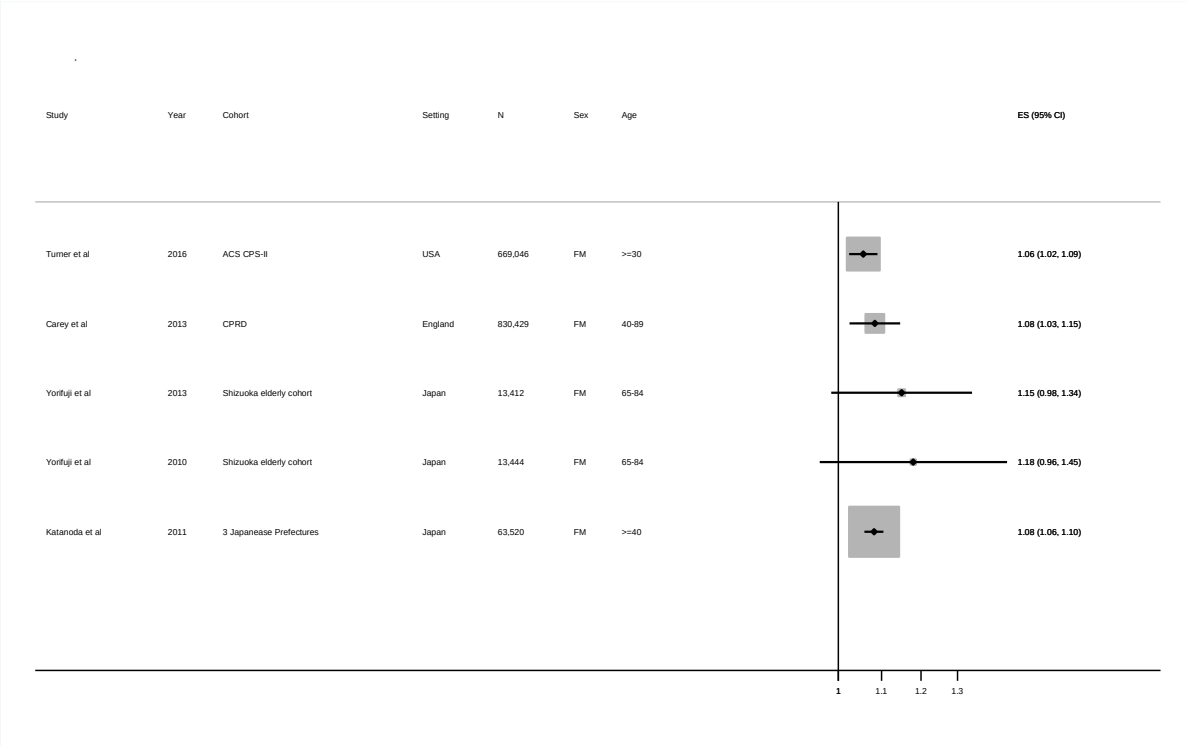
eFigure 30 COPD mortality - stratification by level of adjustment for smoking and BMI



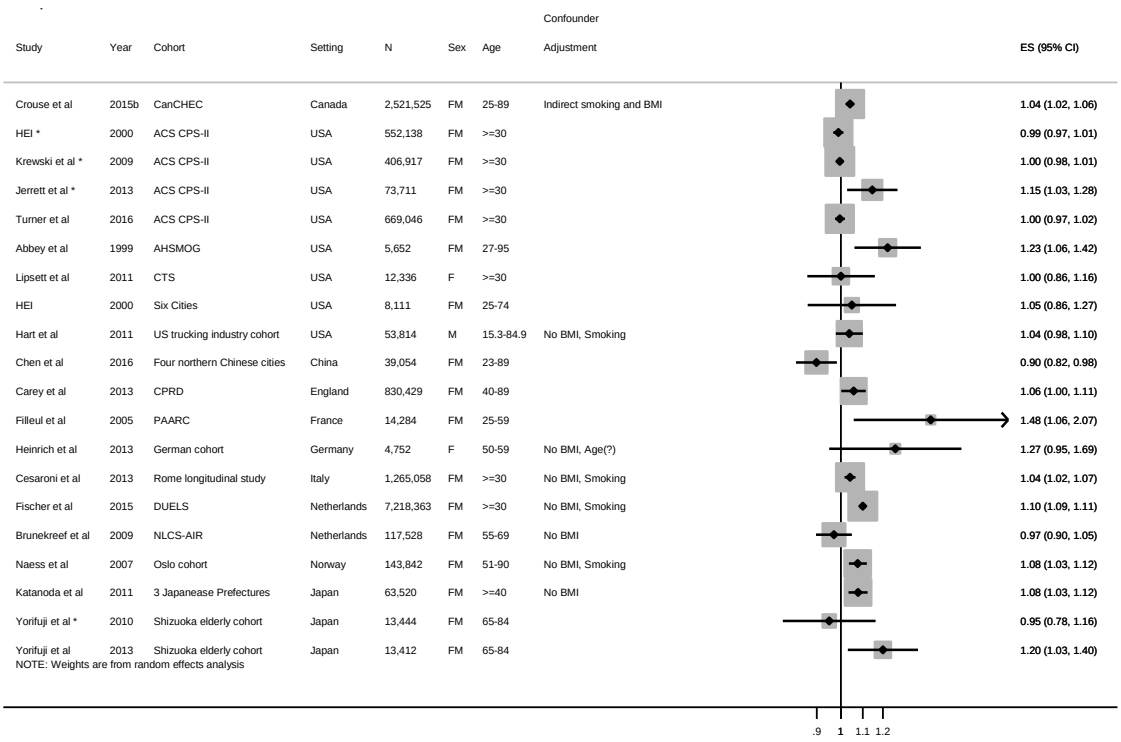
eFigure 31 COPD mortality - stratification by spatial resolution of NO_2 concentration



eFigure 32 Pneumonia mortality

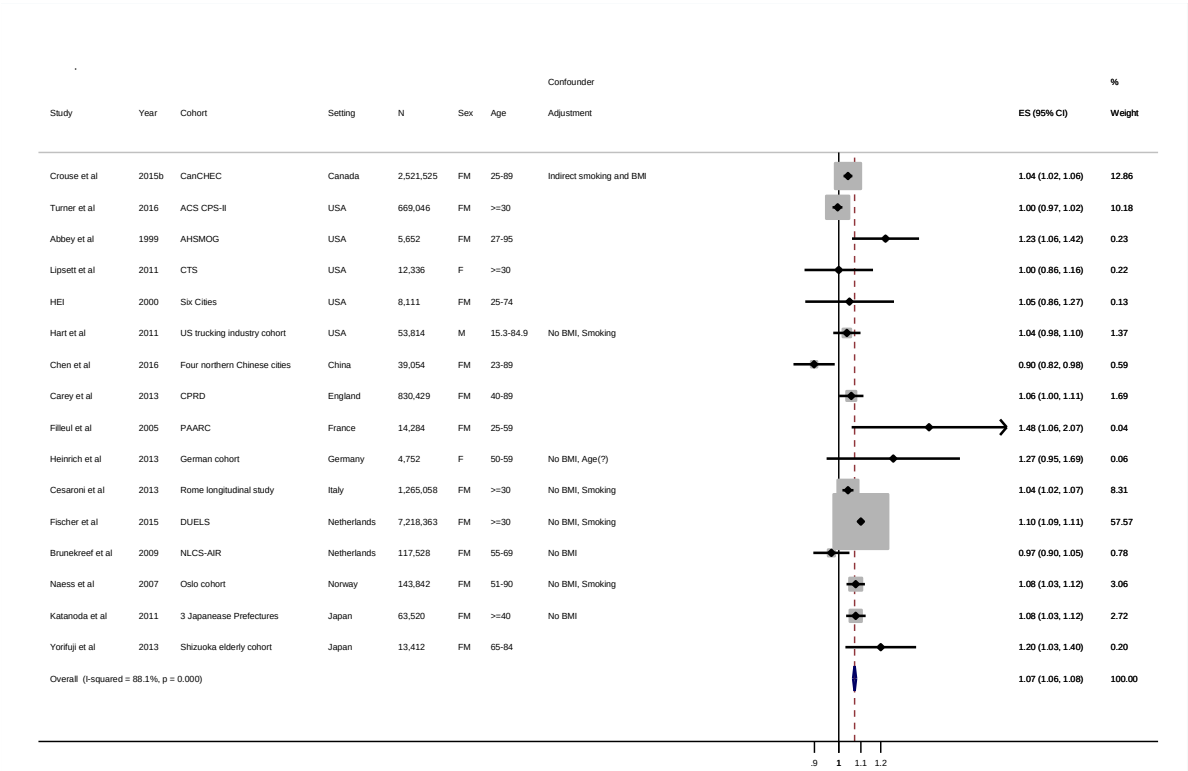


eFigure 33 Lung cancer mortality

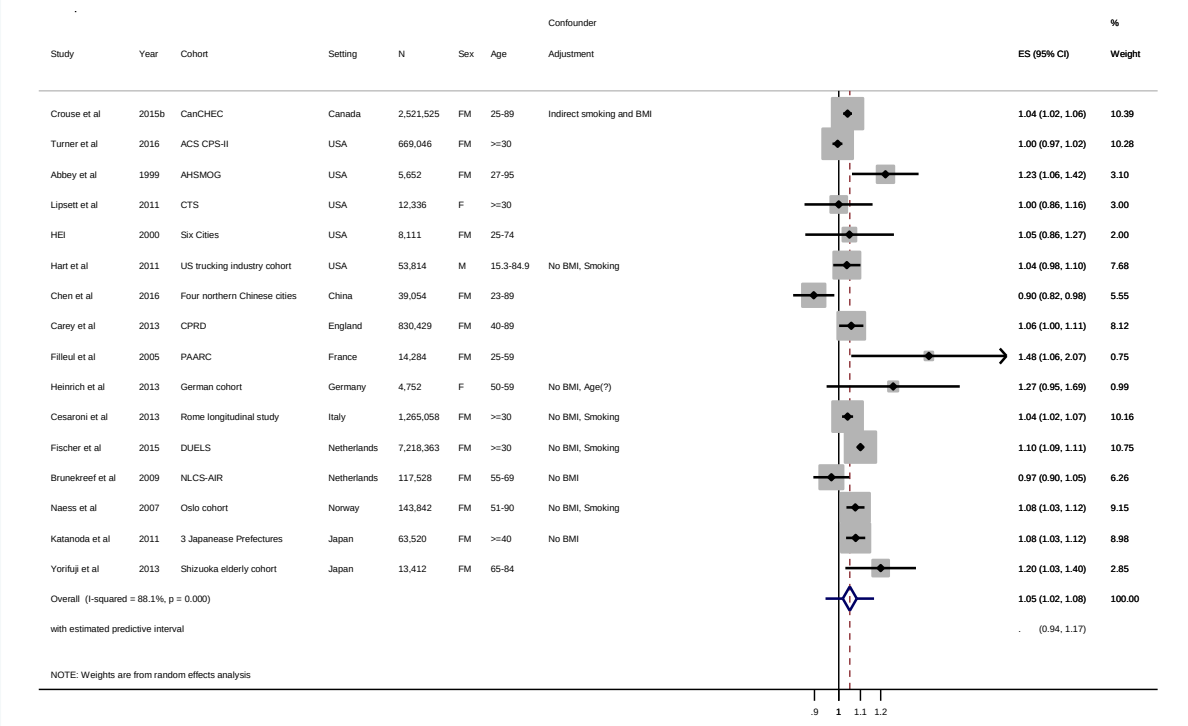


* indicates exclusion from meta-analysis. Refer to methods/results sections of manuscript.

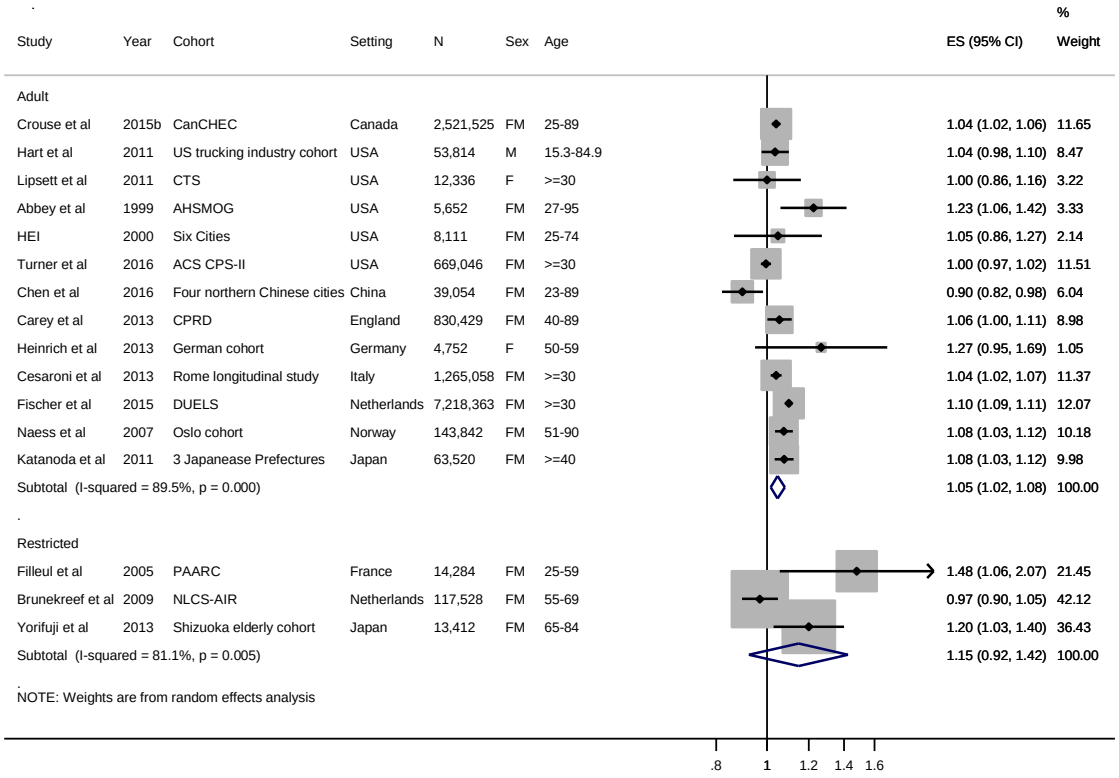
eFigure 34a Lung cancer mortality - fixed effects model



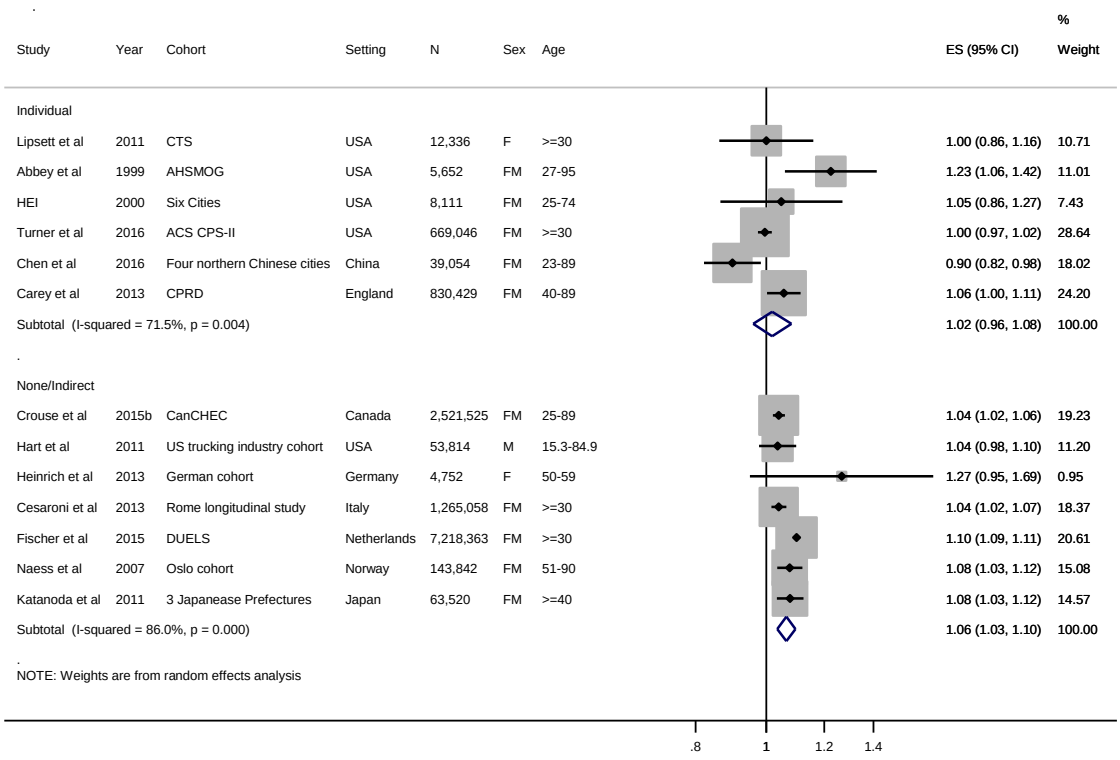
eFigure 34b Lung cancer mortality - random effects model



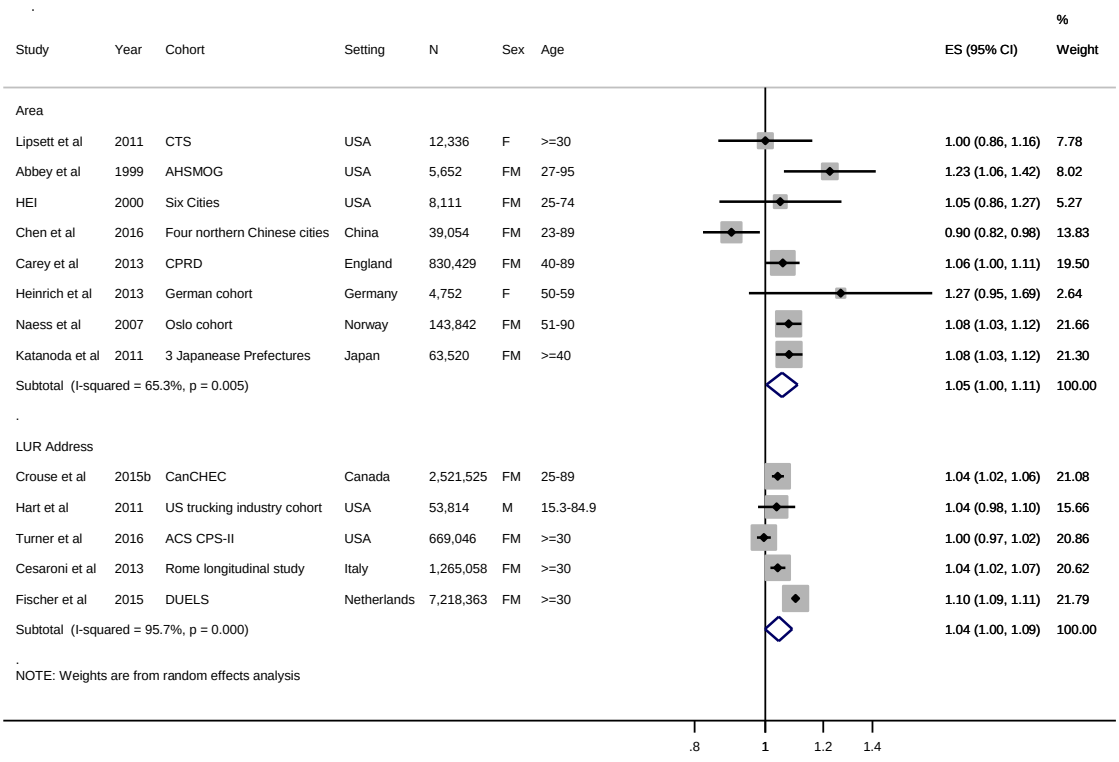
eFigure 35 Lung cancer mortality - stratification by age range at cohort recruitment



eFigure 36 Lung cancer mortality - stratification by level of adjustment for smoking and BMI



eFigure 37 Lung cancer mortality - stratification by spatial resolution of NO_2 concentration



eFigure 38 Diabetes associated mortality – random effects model