

Supplemental information:**Appendix A: General Information****Table A1: International Classification of Disease (ICD) codes used for outcomes:**

	ICD-8	ICD-9	ICD-10
All-cause mortality excluding accidents (all codes excluding:)	800 to 999	800 to 999	Chapter V Chapter W Chapter X Y00 to Y98.9
Cardiovascular mortality	393 to 458 782	390 to 459 671 to 673	Chapter I
Cardiovascular mortality: Coronary heart disease (CHD)	410 to 424	410 to 414.9	I20 to I25.9
Cardiovascular mortality: Stroke	430 to 438	430 to 439.9	I60 to I63.9 G46.3 G46.4
Respiratory mortality (excludes lung cancer)	460 to 493 516 518 783	460 to 519.9	Chapter J
Respiratory mortality: Respiratory Infections	460 to 466 470 to 474 480 to 486	460 to 466 470 to 478 480 to 488	J00 to J06 J09 to J18 J20 to J22
Respiratory mortality: Chronic Obstructive Pulmonary Disease (COPD)	491 to 492 518	490 to 492 494 496	J40 to J44 J47
Lung cancer	162	162	C34, C33

Table A2: Comparison of included and excluded

	Included n=367,658	Excluded n=154,312	χ²
	Mean(SD)		
Age in 1971	38 (22.9)	24.7 (19)	0.000
Gender	n(%)	n(%)	
Males	175,532 (47.7)	53,428 (54.1)	0.000
Females	192,126 (52.3)	45,355 (45.9)	
Region 1991¹			
Northern	18,313 (5.0)	2,063 (2.1)	0.000
Yorkshire/Humber	28,462 (7.7)	3,840 (3.9)	
North West	35,086 (9.5)	5,440 (5.5)	
East Midlands	22,791 (6.2)	3,198 (3.2)	
West Midlands	25,146 (6.8)	4,664 (4.7)	
East Anglia	11,605 (3.2)	1,561 (1.6)	
South East	55,335 (15.1)	10,042 (10.1)	
South West	26,248 (7.1)	3,905 (4.0)	
Wales	16,442 (4.5)	2,190 (2.2)	
Inner London	7,742 (2.1)	4,294 (4.4)	
Outer London	18,743 (5.1)	5,845 (5.9)	
<i>Missing region in 1991</i>	<i>101,742 (27.67)</i>	<i>51,739 (52.38)</i>	
Individual-level social class 1981² (Registrar General occupational categories)			
I Professional	6,597 (2.12)	1,427 (2.3)	0.000
II Intermediate	40,848 (13.1)	7,447 (12.2)	
III(N) Skilled non-manual	44,511 (14.3)	6,834 (11.2)	
III(M) Skilled manual	50,034 (16.0)	8,891 (14.5)	
IV Semi-skilled manual	36,441 (11.7)	7,244 (11.8)	
V Unskilled manual	12,432 (4.0)	2,673 (4.4)	
Armed forces & inadequately described	16,335 (5.0)	635 (1.04)	
Other economically inactive/student/childcare/ Retired/permanently sick	74,793 (24.0)	14,698 (24.0)	
Missing	29,893 (9.6)	11,465 (18.7)	
Area-level deprivation 1971 (Carstairs quintile)			
1 (least deprived)	69,608 (19.0)	20,699 (21.0)	0.000
2	74,140 (20.2)	18,421 (18.7)	
3	75,428 (20.6)	18,149 (18.4)	
4	75,511 (20.6)	18,315 (18.6)	
5 (most deprived)	72,202 (19.7)	22,945 (23.3)	
Moved in the 5 year migration 1966-71			
Movers	144,596 (39.33)	58,236 (59.0)	0.000
Non-movers	223,055 (60.7)	40,547 (41.1)	

¹Those without region information at 1971 were excluded. ²Those without social class information at 1971 were excluded. Source: ONS Longitudinal Study (Authors' own work).

Table A3: Air pollution levels in $\mu\text{g}/\text{m}^3$ by social class and area-level deprivation and by geographical region

	BS 1971	BS 1981	BS 1991	SO ₂ 1971	SO ₂ 1981	SO ₂ 1991	PM ₁₀ 2001
	Mean						
Individual social class based on occupation	1971	1981	1991	1971	1981	1991	2001
I Professional	39.0	15.7	11.6	81.7	42.6	28.9	20.7
II Intermediate	39.2	15.6	11.6	79.6	42.1	29.0	20.5
III(N) Skilled non-manual	42.5	16.3	11.8	88.8	44.1	29.4	20.7
III(M) Skilled manual	44.5	16.7	12.1	86.8	43.7	30.0	20.6
IV Partly skilled manual	44.1	16.7	12.2	87.0	43.6	30.1	20.6
V Unskilled manual	46.6	16.9	12.1	91.7	44.3	30.1	20.7
Armed forces & inadequately described	41.7	13.2	9.3	85.0	36.8	25.8	20.0
Other economically inactive/student/childcare/Retired or permanently sick	44.1	16.2	11.6	84.4	44	29.3	20.6
<i>Analysis of Variance</i>	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
<i>Test for trend (nptrend)</i>	<0.001	0.068	<0.001	<0.001	<0.001	0.010	<0.001
Area-level deprivation (Carstairs quintiles)	1971	1981	1991	1971	1981	1991	2001
1 (least deprived)	33.9	14.4	11.3	74.9	39.6	27.7	19.6
2	38.2	14.8	11.0	81.5	39.4	28.1	20.2
3	40.6	15.8	11.4	82.1	41.5	29.2	20.6
4	45.9	17.5	12.4	88.7	45.4	30.9	21.0
5 (most deprived)	54.9	19.0	13.3	99.0	50.6	32.6	22.5
<i>Analysis of Variance</i>	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
<i>Test for trend (nptrend)</i>	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Geographical region	1971	1981	1991	1971	1981	1991	2001
Northern	65.8	19.2	15.2	89.1	40.6	32.0	20.5
Yorkshire/Humberside	61.6	21.1	16.6	100.4	49.5	36.3	20.3
North West	62.8	19.4	15.6	102.3	45.9	35.2	21.4
East Midlands	47.5	19.5	16.2	84.7	47.0	33.4	19.7
West Midlands	48.9	17.5	13.8	95.9	46.8	32.3	20.0
East Anglia	26.1	13.0	10.3	59.9	37.3	29.6	20.4
South East	24.7	13.4	9.4	62.2	38.6	23.8	20.3
South West	19.0	10.1	4.5	44.1	28.6	21.2	19.6
Wales	22.4	10.2	5.7	44.5	28.2	25.9	12.2
Inner London	45.6	17.0	10.5	150.8	65.3	28.5	27.3
Outer London	37.7	16.6	10.8	115.6	56.3	30.2	24.4
<i>Analysis of Variance</i>	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Source: ONS Longitudinal Study (Authors' own work)

Appendix B: Supplemental BS and PM₁₀ results

Table B1: Logistic regression odds ratios (95% CI) per 10 µg/m³ for BS exposure in 1981 and 1991 and mortality in subsequent decades shown in main paper in Figure 2

Decade of outcome	i) Unadjusted (age and sex only)	ii) Adjusted (age, sex, social class, area-level deprivation, region, pop density)	Sensitivity analysis: Adjusted (age, sex, social class, area-level deprivation, region, pop density & lung cancer)
Additional outcomes – Exposure in 1971			
Cardiovascular mortality: Coronary heart disease (CHD)			
1972-2009	1.10 [1.09;1.11]	1.03 [1.01;1.05]	-
1972-1981	1.11 [1.09;1.13]	1.03 [0.98;1.08]	-
1982-1991	1.12 [1.10;1.13]	1.04 [1.01;1.08]	-
1992-2001	1.09 [1.07;1.10]	1.03 [1.00;1.06]	-
2002-2009	1.07 [1.05;1.08]	1.02 [0.98;1.05]	1.01 [0.99;1.02]
Cardiovascular mortality: Stroke			
1972-2009	1.08 [1.06;1.09]	1.05 [1.02;1.09]	-
1972-1981	1.12 [1.09;1.16]	1.05 [0.98;1.13]	-
1982-1991	1.09 [1.06;1.11]	1.03 [0.98;1.09]	-
1992-2001	1.06 [1.04;1.08]	1.06 [1.02;1.11]	-
2002-2009	1.02 [0.99;1.06]	1.03 [0.95;1.12]	1.03 [0.94;1.12]
Respiratory mortality: Respiratory Infections			
1972-2009	1.08 [1.06;1.09]	1.06 [1.02;1.11]	-
1972-1981	1.10 [1.06;1.15]	1.12 [1.01;1.23]	-
1982-1991	1.10 [1.06;1.15]	1.02 [0.92;1.14]	-
1992-2001	1.08 [1.05;1.10]	1.07 [1.02;1.13]	-
2002-2009	1.05 [1.03;1.08]	1.04 [0.98;1.10]	1.02 [0.96;1.08]
Respiratory mortality: COPD			
1972-2009	1.14 [1.12;1.16]	1.07 [1.03;1.11]	-
1972-1981	1.18 [1.12;1.23]	1.12 [1.00;1.25]	-
1982-1991	1.16 [1.12;1.20]	1.02 [0.95;1.10]	-
1992-2001	1.14 [1.11;1.16]	1.09 [1.03;1.15]	-
2002-2009	1.12 [1.09;1.14]	1.08 [1.02;1.14]	1.06 [1.00;1.13]
Lung cancer mortality			
1972-2009	1.13 [1.12;1.15]	1.05 [1.02;1.09]	-
1972-1981	1.16 [1.12;1.19]	1.08 [1.00;1.16]	-
1982-1991	1.15 [1.13;1.18]	1.09 [1.04;1.15]	-
1992-2001	1.13 [1.10;1.15]	1.04 [0.99;1.09]	-
2002-2009	1.11 [1.08;1.13]	1.04 [0.99;1.09]	-
Exposure in 1981			
All-cause mortality excluding accidents			
1982-2009	1.23 [1.20;1.26]	1.11 [1.08;1.15]	-
1982-1991	1.31 [1.26;1.36]	1.12 [1.06;1.18]	-
1992-2001	1.25 [1.21;1.28]	1.13 [1.08;1.18]	-
2002-2009	1.18 [1.14;1.21]	1.09 [1.04;1.13]	1.09 [1.04;1.13]
Cardiovascular mortality			
1982-2009	1.26 [1.22;1.30]	1.12 [1.07;1.17]	-
1982-1991	1.34 [1.27;1.41]	1.13 [1.05;1.22]	-
1992-2001	1.28 [1.22;1.33]	1.18 [1.11;1.25]	-
2002-2009	1.17 [1.12;1.22]	1.07 [1.01;1.14]	1.07 [1.01;1.14]
Cardiovascular mortality: Coronary heart disease (CHD)			
1982-2009	1.32 [1.27;1.36]	1.13 [1.08;1.20]	-
1982-1991	1.37 [1.29;1.46]	1.16 [1.06;1.26]	-
1992-2001	1.32 [1.25;1.39]	1.17 [1.09;1.26]	-

2002-2009	1.22 [1.16;1.29]	1.04 [1.01;1.08]	1.1 [1.01;1.19]
Cardiovascular mortality: Stroke			
1982-2009	1.24 [1.16;1.31]	1.15 [1.06;1.26]	-
1982-1991	1.28 [1.17;1.41]	1.11 [0.97;1.28]	-
1992-2001	1.25 [1.16;1.35]	1.22 [1.09;1.36]	-
2002-2009	1.09 [0.95;1.25]	1.09 [0.89;1.33]	1.08 [0.88;1.33]
Respiratory mortality			
1982-2009	1.37 [1.31;1.44]	1.20 [1.12;1.28]	-
1982-1991	1.52 [1.38;1.68]	1.28 [1.10;1.47]	-
1992-2001	1.35 [1.26;1.44]	1.19 [1.08;1.30]	-
2002-2009	1.30 [1.22;1.39]	1.18 [1.08;1.29]	1.17 [1.06;1.29]
Respiratory mortality – Infectious disease			
1982-2009	1.25 [1.17;1.34]	1.13 [1.03;1.25]	-
1982-1991	1.36 [1.15;1.61]	1.14 [0.89;1.46]	-
1992-2001	1.30 [1.19;1.42]	1.19 [1.04;1.35]	-
2002-2009	1.15 [1.05;1.27]	1.10 [0.96;1.27]	1.08 [0.93;1.24]
Respiratory mortality - COPD			
1982-2009	1.52 [1.42;1.61]	1.34 [1.22;1.47]	-
1982-1991	1.61 [1.42;1.82]	1.32 [1.11;1.59]	-
1992-2001	1.49 [1.35;1.63]	1.30 [1.13;1.48]	-
2002-2009	1.48 [1.34;1.63]	1.39 [1.21;1.60]	1.41 [1.22;1.62]
Lung cancer mortality			
1982-2009	1.44 [1.37;1.52]	1.16 [1.08;1.25]	-
1982-1991	1.55 [1.42;1.70]	1.21 [1.06;1.38]	-
1992-2001	1.42 [1.31;1.54]	1.15 [1.02;1.29]	-
2002-2009	1.37 [1.25;1.49]	1.12 [0.99;1.27]	-
Exposure in 1991			
All-cause mortality excluding accidents			
1992-1991	1.18 [1.15;1.21]	1.13 [1.08;1.18]	-
1992-2001	1.22 [1.18;1.26]	1.17 [1.11;1.24]	-
2002-2009	1.15 [1.11;1.18]	1.10 [1.05;1.16]	1.10 [1.04;1.16]
Cardiovascular mortality			
1992-1991	1.22 [1.18;1.27]	1.18 [1.11;1.25]	-
1992-2001	1.29 [1.23;1.35]	1.26 [1.16;1.36]	-
2002-2009	1.15 [1.09;1.10]	1.11 [1.03;1.20]	1.11 [1.02;1.20]
Cardiovascular mortality: Coronary heart disease (CHD)			
1992-1991	1.30 [1.25;1.37]	1.21 [1.13;1.31]	-
1992-2001	1.36 [1.29;1.44]	1.29 [1.17;1.42]	-
2002-2009	1.22 [1.14;1.30]	1.14 [1.03;1.27]	1.14 [1.02;1.27]
Cardiovascular mortality: Stroke			
1992-1991	1.22 [1.13;1.32]	1.27 [1.12;1.44]	-
1992-2001	1.27 [1.17;1.39]	1.32 [1.14;1.53]	-
2002-2009	1.05 [0.90;1.23]	1.13 [0.88;1.46]	1.10 [0.85;1.43]
Respiratory mortality			
1992-1991	1.29 [1.22;1.36]	1.28 [1.16;1.41]	-
1992-2001	1.31 [1.21;1.41]	1.38 [1.22;1.57]	-
2002-2009	1.26 [1.17;1.35]	1.19 [1.06;1.35]	1.17 [1.03;1.33]
Respiratory mortality – Infectious disease			
1992-2009	1.19 [1.10;1.28]	1.19 [1.04;1.36]	-
1992-2001	1.24 [1.12;1.37]	1.31 [1.10;1.55]	-
2002-2009	1.12 [1.00;1.24]	1.09 [0.91;1.30]	1.06 [0.88;1.28]
Respiratory mortality - COPD			
1992-2009	1.39 [1.29;1.51]	1.44 [1.26;1.65]	-
1992-2001	1.43 [1.28;1.59]	1.53 [1.27;1.83]	-

2002-2009	1.36 [1.21;1.51]	1.36 [1.13;1.64]	1.35 [1.11;1.63]
Lung cancer mortality			
1992-2009	1.38 [1.29;1.48]	1.22 [1.09;1.37]	-
1992-2001	1.38 [1.26;1.51]	1.16 [1.00;1.36]	-
2002-2009	1.39 [1.26;1.54]	1.31 [1.10;1.55]	-

Source: ONS Longitudinal Study (Authors' own work)

Table B2: Sensitivity analyses for logistic regression odds ratios (95% CI) per 10 µg/m³ for BS exposure in 1971 and mortality in subsequent decades

Decade of outcome	i) Unadjusted (age and sex only)	ii) Adjusted (age, sex, social class, area-level deprivation, region, pop density)	Adjusted (age, sex, social class, area-level deprivation, region, pop density & lung cancer)	Adjusted (age, sex, social class, area-level deprivation, region, pop density) - non-movers	Adjusted (age, sex, social class, area-level deprivation, region, pop density and later exposures ¹)
All-cause mortality excluding accidents					
1972-2009	1.07 [1.07;1.08]	1.03 [1.02;1.05]		1.03 [1.01;1.05]	
1972-1981	1.10 [1.08;1.11]	1.05 [1.02;1.08]		1.06 [1.02;1.09]	
1982-1991	1.09 [1.08;1.10]	1.03 [1.01;1.06]		1.03 [1.00;1.06]	
1992-2001	1.07 [1.07;1.08]	1.04 [1.02;1.06]		1.04 [1.02;1.07]	1.01 [0.99;1.03]
2002-2009	1.05 [1.05;1.06]	1.02 [1.01;1.04]	1.02 [1.0;1.04]	1.02 [1.00;1.04]	1.01 [1.00;1.03]
Cardiovascular mortality					
1972-2009	1.08 [1.07;1.09]	1.03 [1.01;1.05]		1.03 [1.01;1.05]	
1972-1981	1.11 [1.09;1.13]	1.03 [0.99;1.08]		1.04 [0.99;1.09]	
1982-1991	1.10 [1.09;1.12]	1.04 [1.01;1.07]		1.04 [1.00;1.08]	
1992-2001	1.08 [1.07;1.09]	1.04 [1.01;1.07]		1.04 [1.01;1.08]	1.00 [0.97;1.03]
2002-2009	1.05 [1.04;1.06]	1.01 [0.98;1.04]	1.01 [0.98;1.03]	1.01 [0.98;1.04]	0.99 [0.97;1.03]
Respiratory mortality					
1972-2009	1.11 [1.10;1.12]	1.07 [1.04;1.10]		1.06 [1.02;1.09]	
1972-1981	1.12 [1.09;1.16]	1.10 [1.02;1.18]		1.14 [1.04;1.24]	
1982-1991	1.14 [1.12;1.17]	1.05 [0.99;1.12]		1.04 [0.97;1.12]	
1992-2001	1.10 [1.08;1.12]	1.08 [1.04;1.13]		1.07 [1.02;1.12]	1.04 [1.00;1.09]
2002-2009	1.09 [1.07;1.11]	1.05 [1.01;1.09]	1.03 [0.99;1.08]	1.03 [0.99;1.08]	1.03 [0.98;1.07]

¹ BS exposure in 1981 and 1991. Source: ONS Longitudinal Study (Authors' own work)

Table B3: Logistic regression odds ratios [95% CI] per 10 µg/m³ for PM₁₀ exposure in 2001 and mortality 2002-9 adjusted for past BS and SO₂ exposure

(2002-2009)	i) Unadjusted (age and sex only)	ii) Adjusted (age, sex, social class, area-level deprivation, region, pop density)	Sensitivity analysis: Adjusted (age, sex, social class, area-level deprivation, region, pop density & lung cancer)
All-cause mortality excluding accidents			
PM ₁₀ 2001	1.37 [1.29;1.45]	1.24 [1.16;1.34]	1.24 [1.15;1.33]
PM ₁₀ 2001 + SO ₂ 1971	1.24 [1.15;1.32]	1.23 [1.15;1.33]	1.23 [1.14;1.32]
PM ₁₀ 2001 + SO ₂ 1981	1.22 [1.14;1.31]	1.17 [1.08;1.26]	1.16 [1.08;1.26]
PM ₁₀ 2001 + SO ₂ 1991	1.25 [1.17;1.33]	1.18 [1.09;1.27]	1.17 [1.09;1.27]
PM ₁₀ 2001 + SO ₂ all years	1.19 [1.11;1.29]	1.14 [1.06;1.24]	1.14 [1.05;1.23]
PM ₁₀ 2001 + BS 1971 + SO ₂ 1971	1.32 [1.23;1.41]	1.24 [1.15;1.33]	1.23 [1.15;1.33]
PM ₁₀ 2001 + BS 1981 + SO ₂ 1981	1.30 [1.21;1.40]	1.18 [1.09;1.27]	1.18 [1.09;1.27]
PM ₁₀ 2001 + BS 1991 + SO ₂ 1991	1.25 [1.18;1.34]	1.19 [1.11;1.29]	1.19 [1.10;1.28]
PM ₁₀ 2001 + BS and SO ₂ all years	1.23 [1.14;1.33]	1.16 [1.07;1.26]	1.16 [1.07;1.26]
Cardiovascular mortality			
PM ₁₀ 2001	1.25 [1.14;1.37]	1.13 [1.01;1.25]	1.12 [1.01;1.25]
PM ₁₀ 2001 + SO ₂ 1971	1.14 [1.03;1.26]	1.12 [0.99;1.26]	1.12 [1.00;1.25]
PM ₁₀ 2001 + SO ₂ 1981	1.15 [1.03;1.27]	1.08 [0.96;1.21]	1.08 [0.96;1.21]
PM ₁₀ 2001 + SO ₂ 1991	1.14 [1.03;1.25]	1.07 [0.96;1.22]	1.07 [0.95;1.20]
PM ₁₀ 2001 + SO ₂ all years	1.11 [0.99;1.24]	1.05 [0.93;1.18]	1.05 [0.93;1.18]
PM ₁₀ 2001 + BS 1971 + SO ₂ 1971	1.22 [1.10;1.36]	1.13 [1.01;1.26]	1.12 [1.01;1.26]
PM ₁₀ 2001 + BS 1981 + SO ₂ 1981	1.24 [1.11;1.38]	1.10 [0.97;1.23]	1.09 [0.97;1.23]
PM ₁₀ 2001 + BS 1991 + SO ₂ 1991	1.15 [1.04;1.26]	1.10 [0.98;1.23]	1.09 [0.98;1.23]
PM ₁₀ 2001 + BS and SO ₂ all years	1.16 [1.03;1.30]	1.08 [0.95;1.22]	1.07 [0.95;1.21]
Respiratory mortality			
PM ₁₀ 2001	1.55 [1.35;1.77]	1.23 [1.05;1.45]	1.22 [1.04;1.44]
PM ₁₀ 2001 + SO ₂ 1971	1.26 [1.08;1.47]	1.22 [1.03;1.44]	1.21 [1.02;1.43]
PM ₁₀ 2001 + SO ₂ 1981	1.30 [1.11;1.53]	1.15 [0.96;1.37]	1.14 [0.96;1.36]
PM ₁₀ 2001 + SO ₂ 1991	1.41 [1.22;1.62]	1.16 [0.98;1.37]	1.15 [0.97;1.36]
PM ₁₀ 2001 + SO ₂ all years	1.30 [1.09;1.54]	1.15 [0.96;1.38]	1.14 [0.95;1.37]
PM ₁₀ 2001 + BS 1971 + SO ₂ 1971	1.40 [1.19;1.65]	1.24 [1.05;1.47]	1.23 [1.04;1.46]
PM ₁₀ 2001 + BS 1981 + SO ₂ 1981	1.45 [1.23;1.71]	1.18 [0.99;1.41]	1.17 [0.98;1.40]
PM ₁₀ 2001 + BS 1991 + SO ₂ 1991	1.40 [1.21;1.62]	1.17 [0.98;1.38]	1.15 [0.97;1.37]
PM ₁₀ 2001 + BS and SO ₂ all years	1.34 [1.12;1.59]	1.19 [0.99;1.43]	1.18 [0.98;1.42]

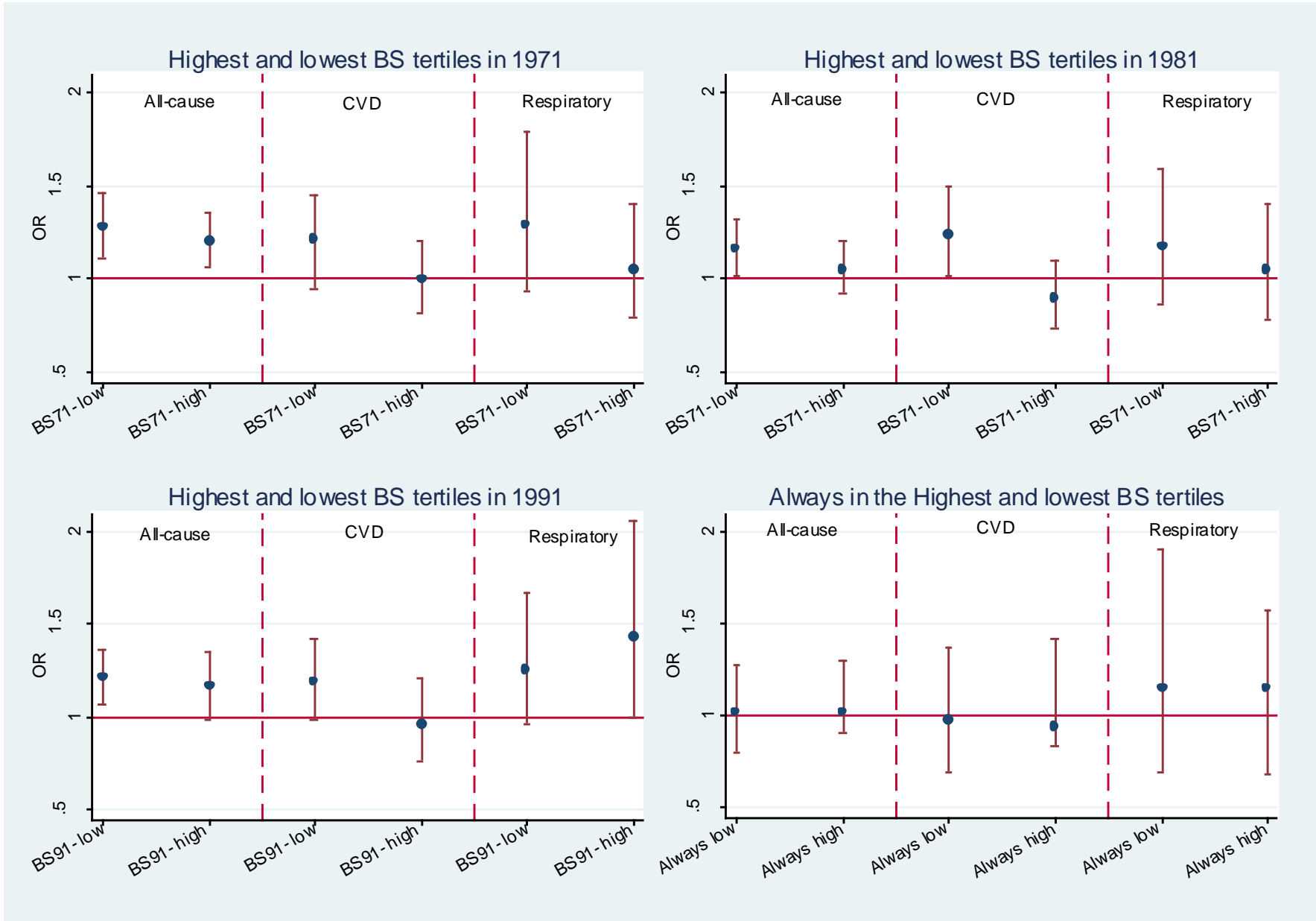
Source: ONS Longitudinal Study (Authors' own work)

Table B4: Logistic regression odds ratios [95% CI] per 10 µg/m³ for PM₁₀ exposure in 2001 and subgroup analyses of mortality 2002-9

(2002-2009)	i) Unadjusted (age and sex only)	ii) Adjusted (age, sex, social class, area-level deprivation, region, pop density)	Sensitivity analysis: Adjusted (age, sex, social class, area-level deprivation, region, pop density & lung cancer)
All-cause mortality excluding accidents			
PM ₁₀ 2001	1.37 [1.29;1.45]	1.24 [1.16;1.34]	1.24 [1.15;1.33]
Cardiovascular mortality			
PM ₁₀ 2001	1.25 [1.14;1.37]	1.13 [1.01;1.25]	1.12 [1.01;1.25]
Cardiovascular mortality: Coronary heart disease (CHD)			
PM ₁₀ 2001	1.36 [1.21;1.53]	1.21 [1.05;1.4]	1.21 [1.05;1.39]
Cardiovascular mortality: Stroke			
PM ₁₀ 2001	0.85 [0.63;1.15]	0.86 [0.60;1.22]	0.84 [0.59;1.20]
Respiratory mortality			
PM ₁₀ 2001	1.55 [1.35;1.77]	1.23 [1.05;1.45]	1.22 [1.04;1.44]
Respiratory mortality: Infectious disease			
PM ₁₀ 2001	1.35 [1.11;1.64]	1.17 [0.92;1.49]	1.16 [0.91;1.47]
Respiratory mortality: COPD			
PM ₁₀ 2001	1.83 [1.49;2.24]	1.32 [1.04;1.68]	1.31 [1.03;1.68]
Lung cancer			
PM ₁₀ 2001	1.98 [1.65;2.38]	1.60 [1.29;1.99]	-

Source: ONS Longitudinal Study (Authors' own work)

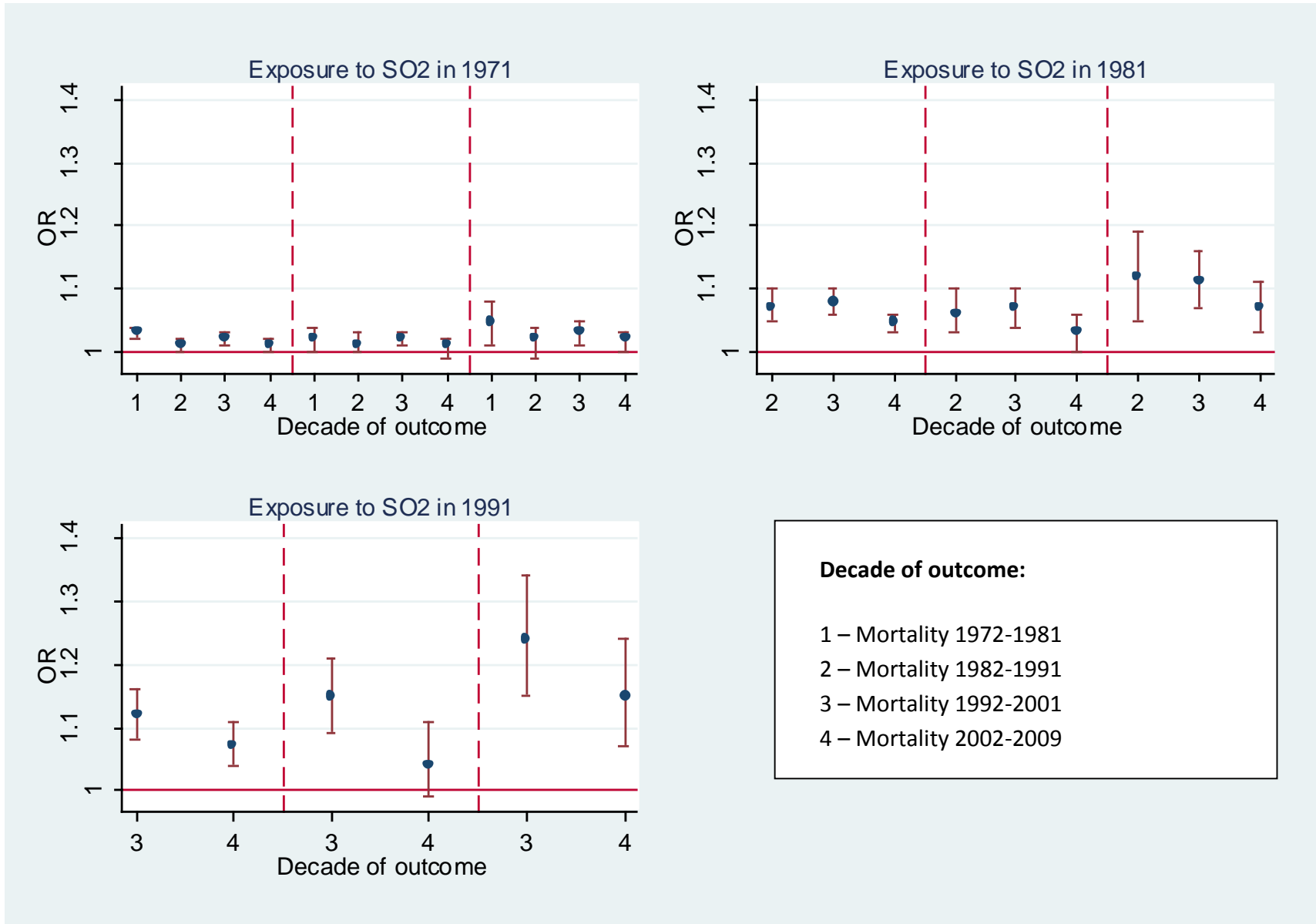
Figure B1: Logistic regression odds ratios¹ [95% CI] per 10 µg/m³ for PM₁₀ exposure in 2001 and mortality 2002-9 stratified by highest and lowest BS tertiles



¹Adjusted for sex, age, social class, area-level deprivation, region & population density. Source: ONS Longitudinal Study (Authors' own work)

Appendix C: SO₂ Results

Figure C1: Logistic regression odds ratios (95% CI) per 10 µg/m³ for SO₂ exposure in 1971, 1981 and 1991 and mortality in subsequent decades¹



¹Adjusted for for age and sex, social class of individual and area, population density and geographical region. Source: ONS Longitudinal Study (Authors' own work)

Table C1: Logistic regression odds ratios (95% CI) per 10 µg/m³ for SO₂ exposure in 1971, 1981 and 1991 and mortality in subsequent decades.

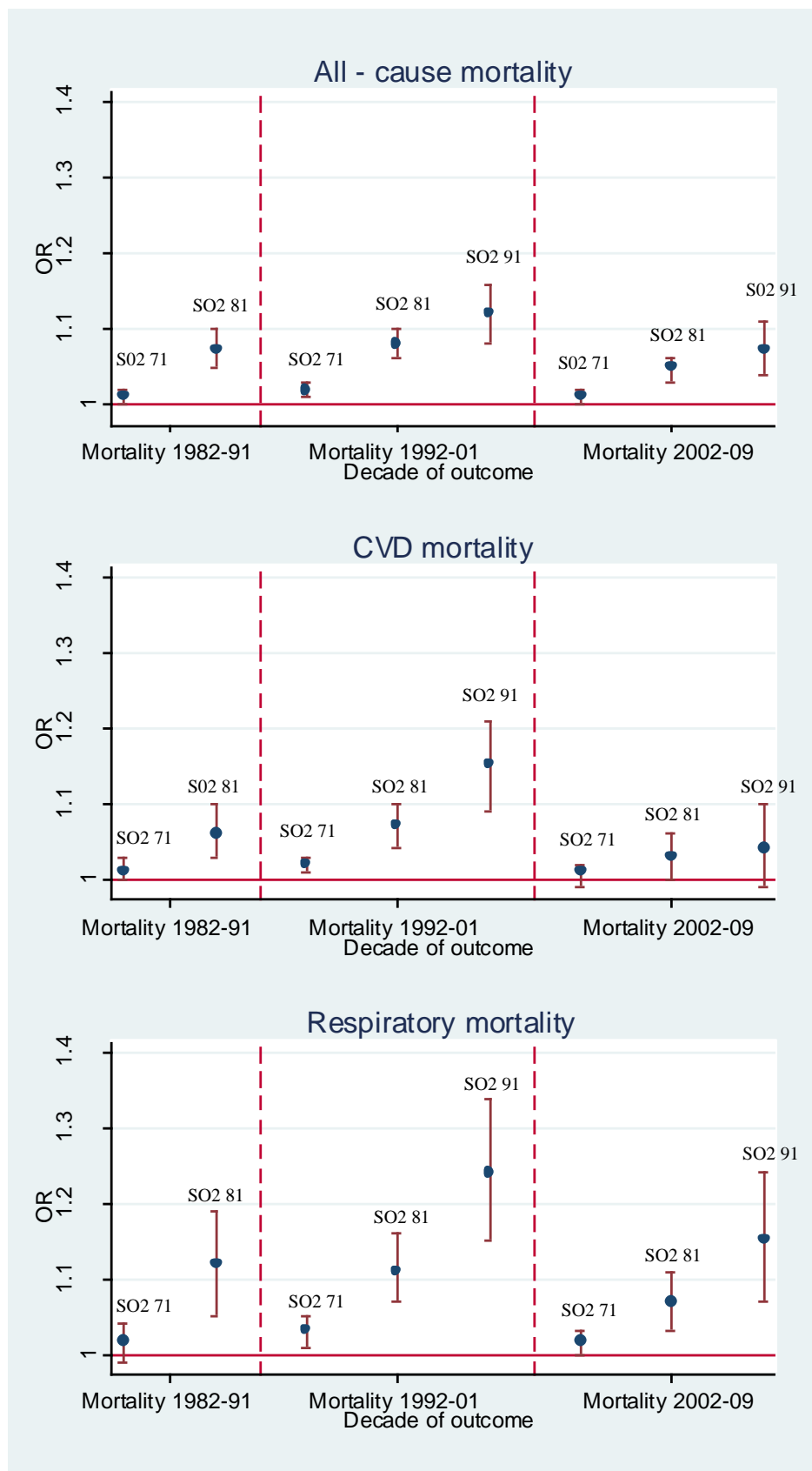
Decade of outcome	i) Unadjusted (age and sex only)	ii) Adjusted (age, sex, social class, area-level deprivation, region, pop density)	Sensitivity analysis: Adjusted (age, sex, social class, area-level deprivation, region, pop density & lung cancer)
Exposure in 1971			
All-cause mortality excluding accidents			
1972-2009	1.04 [1.03;1.04]	1.02 [1.01;1.02]	-
1972-1981	1.04 [1.03;1.05]	1.03 [1.02;1.04]	-
1982-1991	1.04 [1.03;1.05]	1.01 [1.01;1.02]	-
1992-2001	1.04 [1.03;1.04]	1.02 [1.01;1.03]	-
2002-2009	1.02 [1.02;1.03]	1.01 [1.01;1.02]	1.01 [1.00;1.02]
Cardiovascular mortality			
1972-2009	1.03 [1.03;1.04]	1.01 [1.01;1.02]	-
1972-1981	1.04 [1.03;1.05]	1.02 [1.00;1.04]	-
1982-1991	1.03 [1.03;1.04]	1.01 [1.00;1.03]	-
1992-2001	1.03 [1.02;1.04]	1.02 [1.01;1.03]	-
2002-2009	1.02 [1.01;1.03]	1.01 [0.99;1.02]	1.00 [0.99;1.01]
Cardiovascular mortality: Coronary heart disease (CHD)			
1972-2009	1.03 [1.03;1.04]	1.02 [1.01;1.03]	-
1972-1981	1.03 [1.02;1.05]	1.02 [1.01;1.04]	-
1982-1991	1.03 [1.02;1.04]	1.01 [1.00;1.03]	-
1992-2001	1.03 [1.03;1.04]	1.02 [1.01;1.03]	-
2002-2009	1.03 [1.02;1.03]	1.01 [0.99;1.02]	1.01 [0.99;1.02]
Cardiovascular mortality: Stroke			
1972-2009	1.02 [1.01;1.03]	1.02 [1.00;1.03]	-
1972-1981	1.03 [1.01;1.04]	1.01 [0.98;1.04]	-
1982-1991	1.02 [1.01;1.04]	1.00 [0.98;1.03]	-
1992-2001	1.02 [1.01;1.03]	1.02 [1.00;1.04]	-
2002-2009	1.00 [0.98;1.02]	1.02 [0.98;1.06]	1.01 [0.97;1.04]
Respiratory mortality			
1972-2009	1.05 [1.04;1.06]	1.03 [1.01;1.04]	-
1972-1981	1.05 [1.03;1.07]	1.05 [1.01;1.08]	-
1982-1991	1.06 [1.04;1.07]	1.02 [0.99;1.04]	-
1992-2001	1.05 [1.04;1.06]	1.03 [1.01;1.05]	-
2002-2009	1.04 [1.03;1.05]	1.02 [1.00;1.03]	1.01 [0.99;1.03]
Respiratory mortality: Respiratory Infections			
1972-2009	1.04 [1.03;1.05]	1.03 [1.01;1.05]	-
1972-1981	1.05 [1.03;1.07]	1.06 [1.02;1.11]	-
1982-1991	1.04 [1.02;1.07]	1.01 [0.97;1.06]	-
1992-2001	1.05 [1.03;1.06]	1.03 [1.01;1.06]	-
2002-2009	1.03 [1.01;1.04]	1.02 [0.99;1.04]	1.01 [0.98;1.03]
Respiratory mortality: COPD			
1972-2009	1.06 [1.05;1.07]	1.03 [1.01;1.04]	-
1972-1981	1.06 [1.03;1.08]	1.04 [0.99;1.09]	-
1982-1991	1.06 [1.04;1.08]	1.01 [0.98;1.04]	-
1992-2001	1.06 [1.04;1.07]	1.03 [1.01;1.05]	-
2002-2009	1.06 [1.04;1.07]	1.03 [1.01;1.05]	1.02 [1.00;1.05]
Lung cancer mortality			
1972-2009	1.07 [1.06;1.07]	1.04 [1.02;1.05]	-
1972-1981	1.07 [1.05;1.09]	1.04 [1.01;1.07]	-
1982-1991	1.08 [1.06;1.09]	1.05 [1.03;1.07]	-
1992-2001	1.06 [1.05;1.07]	1.03 [1.01;1.05]	-
2002-2009	1.05 [1.04;1.07]	1.03 [1.01;1.05]	-

Exposure in 1981			
All-cause mortality excluding accidents			
1982-2009	1.09 [1.08;1.10]	1.07 [1.05;1.08]	-
1982-1991	1.10 [1.09;1.12]	1.07 [1.05;1.10]	-
1992-2001	1.10 [1.08;1.11]	1.08 [1.06;1.10]	-
2002-2009	1.07 [1.05;1.08]	1.05 [1.03;1.06]	1.04 [1.02;1.06]
Cardiovascular mortality			
1982-2009	1.08 [1.06;1.09]	1.06 [1.04;1.08]	-
1982-1991	1.08 [1.06;1.10]	1.06 [1.03;1.10]	-
1992-2001	1.08 [1.06;1.10]	1.07 [1.04;1.10]	-
2002-2009	1.05 [1.03;1.07]	1.03 [1.00;1.06]	1.03 [1.00;1.05]
Cardiovascular mortality: Coronary heart disease (CHD)			
1982-2009	1.08 [1.07;1.10]	1.06 [1.04;1.09]	-
1982-1991	1.08 [1.05;1.11]	1.07 [1.03;1.11]	-
1992-2001	1.08 [1.06;1.11]	1.07 [1.04;1.10]	-
2002-2009	1.07 [1.04;1.09]	1.04 [1.01;1.08]	1.04 [1.00;1.08]
Cardiovascular mortality: Stroke			
1982-2009	1.05 [1.02;1.07]	1.04 [1.01;1.08]	-
1982-1991	1.05 [1.00;1.09]	1.01 [0.96;1.07]	-
1992-2001	1.06 [1.02;1.09]	1.06 [1.01;1.11]	-
2002-2009	1.00 [0.95;1.07]	1.04 [0.96;1.13]	1.02 [0.94;1.11]
Respiratory mortality			
1982-2009	1.14 [1.11;1.15]	1.10 [1.07;1.13]	-
1982-1991	1.16 [1.11;1.21]	1.12 [1.05;1.19]	-
1992-2001	1.14 [1.11;1.17]	1.11 [1.07;1.16]	-
2002-2009	1.10 [1.07;1.13]	1.07 [1.03;1.11]	1.06 [1.02;1.10]
Respiratory mortality: Respiratory Infections			
1982-2009	1.12 [1.09;1.15]	1.09 [1.04;1.13]	-
1982-1991	1.14 [1.06;1.22]	1.10 [1.00;1.22]	-
1992-2001	1.15 [1.11;1.19]	1.12 [1.07;1.18]	-
2002-2009	1.05 [1.01;1.10]	1.04 [0.99;1.11]	1.03 [0.97;1.09]
Respiratory mortality: COPD			
1982-2009	1.16 [1.13;1.19]	1.14 [1.09;1.18]	-
1982-1991	1.17 [1.12;1.24]	1.12 [1.04;1.21]	-
1992-2001	1.15 [1.11;1.20]	1.13 [1.07;1.19]	-
2002-2009	1.16 [1.12;1.21]	1.14 [1.08;1.21]	1.14 [1.07;1.21]
Lung cancer mortality			
1982-2009	1.17 [1.14;1.19]	1.11 [1.08;1.15]	-
1982-1991	1.20 [1.15;1.25]	1.13 [1.07;1.19]	-
1992-2001	1.14 [1.10;1.18]	1.10 [1.04;1.15]	-
2002-2009	1.14 [1.10;1.19]	1.11 [1.05;1.17]	-
Exposure in 1991			
All-cause mortality excluding accidents			
1992-2009	1.16 [1.14;1.19]	1.10 [1.07;1.13]	-
1992-2001	1.20 [1.17;1.23]	1.12 [1.08;1.16]	-
2002-2009	1.13 [1.10;1.16]	1.07 [1.04;1.11]	1.07 [1.03;1.11]
Cardiovascular mortality			
1992-2009	1.18 [1.15;1.21]	1.09 [1.05;1.14]	-
1992-2001	1.23 [1.19;1.27]	1.15 [1.09;1.21]	-
2002-2009	1.12 [1.08;1.16]	1.04 [0.99;1.10]	1.04 [0.99;1.09]
Cardiovascular mortality: Coronary heart disease (CHD)			
1992-1991	1.24 [1.20;1.28]	1.13 [1.07;1.18]	-
1992-2001	1.28 [1.23;1.33]	1.17 [1.11;1.25]	-
2002-2009	1.18 [1.13;1.23]	1.07 [1.00;1.15]	1.07 [1.00;1.15]

Cardiovascular mortality: Stroke			
1992-1991	1.15 [1.09;1.22]	1.11 [1.03;1.21]	-
1992-2001	1.18 [1.11;1.26]	1.14 [1.04;1.25]	-
2002-2009	1.05 [0.94;1.17]	1.04 [0.88;1.22]	1.03 [0.87;1.22]
Respiratory mortality			
1992-2009	1.26 [1.21;1.31]	1.19 [1.12;1.26]	-
1992-2001	1.28 [1.21;1.35]	1.24 [1.15;1.34]	-
2002-2009	1.23 [1.17;1.30]	1.15 [1.07;1.24]	1.14 [1.05;1.23]
Respiratory mortality: Respiratory Infections			
1992-2009	1.17 [1.11;1.24]	1.13 [1.04;1.23]	-
1992-2001	1.22 [1.14;1.31]	1.22 [1.10;1.36]	-
2002-2009	1.11 [1.03;1.20]	1.05 [0.94;1.17]	1.03 [0.92;1.16]
Respiratory mortality: COPD			
1992-2009	1.36 [1.29;1.44]	1.31 [1.20;1.42]	-
1992-2001	1.37 [1.28;1.48]	1.30 [1.16;1.45]	-
2002-2009	1.34 [1.24;1.45]	1.31 [1.17;1.47]	1.31 [1.16;1.47]
Lung cancer mortality			
1992-2009	1.31 [1.25;1.37]	1.18 [1.10;1.27]	-
1992-2001	1.32 [1.24;1.41]	1.16 [1.05;1.27]	-
2002-2009	1.30 [1.21;1.40]	1.21 [1.09;1.34]	-

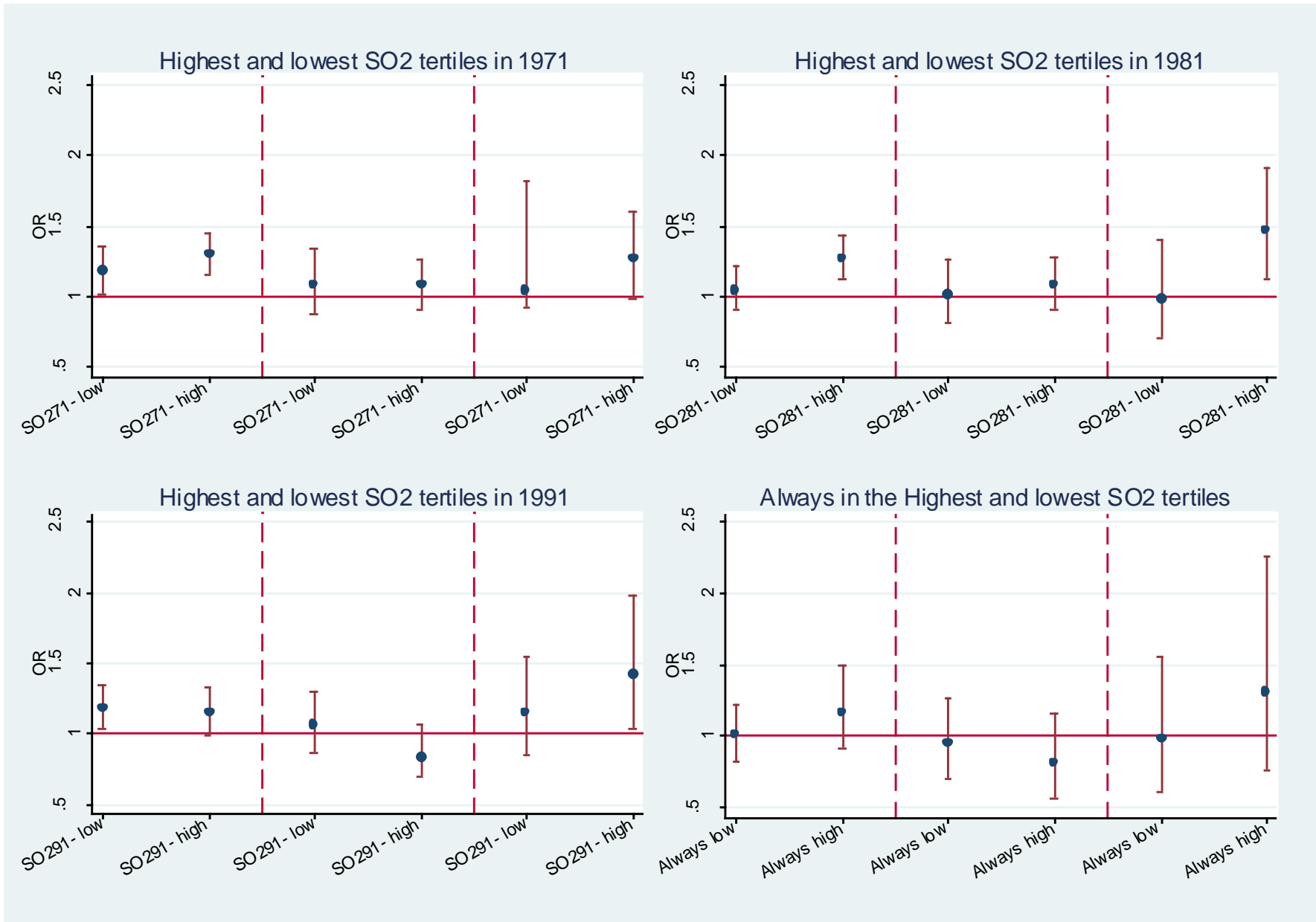
Source: ONS Longitudinal Study (Authors' own work)

Figure C2: Logistic regression odds ratios (95% CI) per 10 $\mu\text{g}/\text{m}^3$ for SO_2 exposure in 1971, 1981 and 1991 and mortality in each subsequent decade¹



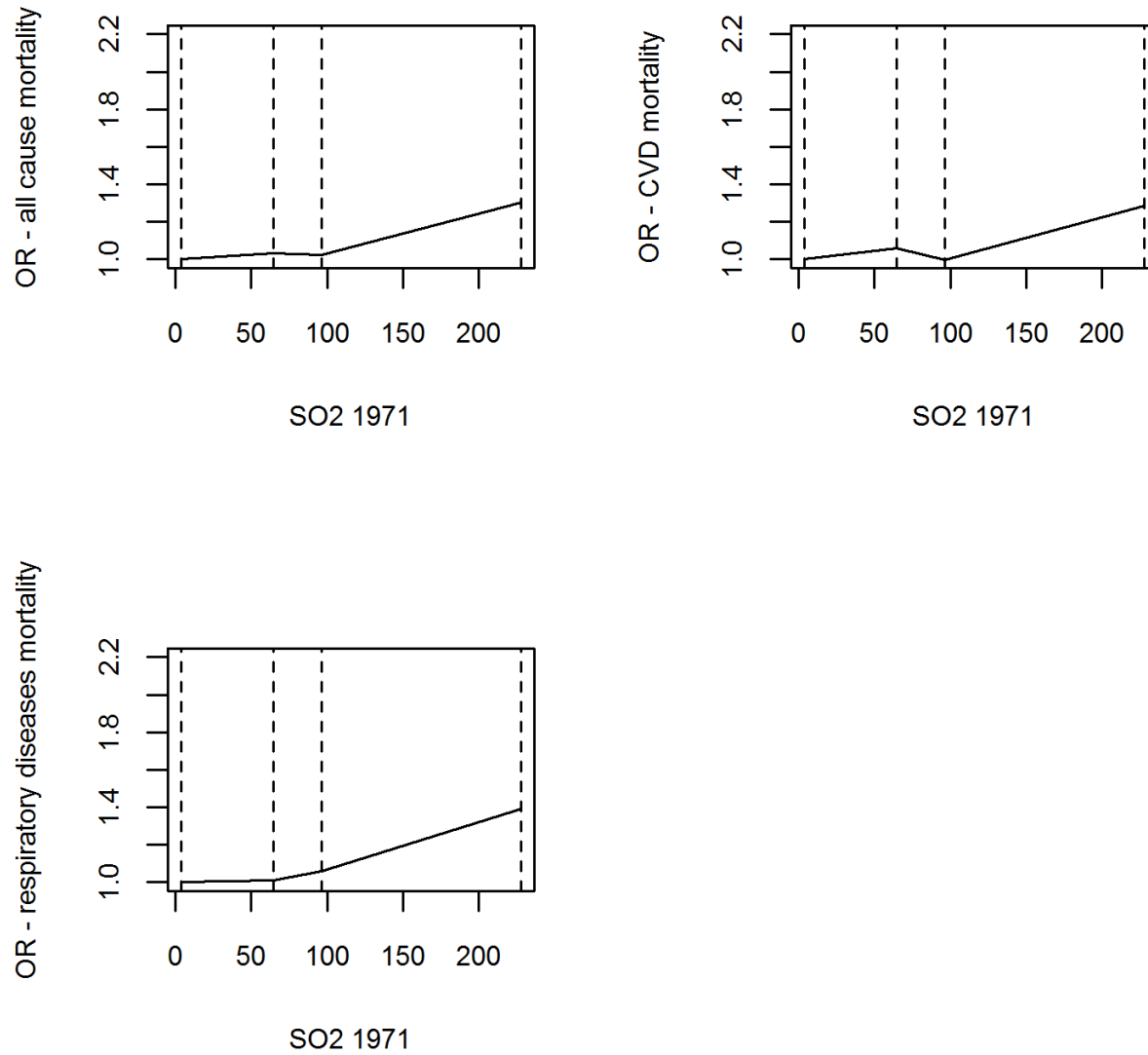
¹Adjusted for for age and sex, social class of individual and area, population density and geographical region. Source: ONS Longitudinal Study (Authors' own work)

Figure C3: Logistic regression odds ratios¹ [95% CI] per 10 µg/m³ for PM₁₀ exposure in 2001 and mortality 2002-9 stratified by highest and lowest SO₂ tertiles



¹Adjusted for sex, age, social class, area-level deprivation, region, & population density. Source: ONS Longitudinal Study (Authors' own work)

Figure C4: Concentration-response for tertiles of SO₂ exposure in 1971 and subsequent mortality 1971 – 2009 for all-cause, CVD and respiratory mortality



¹Adjusted for sex, age, social class, area-level deprivation, region & population density. Source: ONS Longitudinal Study (Authors' own work)