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Supplementary Table S1. ICD codes used for the identification of CVD subtypes

	ICD-9	ICD-10
Ischemic heart disease	410.x, 411.x, 412.x, 413.x, 414.x	I20.x, I21.x, I22.x, I23.x, I24.x, I25.x
Cerebrovascular disease	430.x, 431.x, 432.x, 433.x, 434.x, 435.x, 436.x, 437.x, 438.x	I60.x, I61.x, I62.x, I63.x, I64.x, I65.x, I66.x, I67.x, I68.x, I69.x
Heart failure	398.91, 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428.x	I50.x
Cardiomyopathy	425.x	I42.x
Arrhythmia	426.x, 427.x, 785.0	I44.x, I45.x, I47.x, I48.x, I49.x, R00.0, R00.1, R00.8, R94.31, T82.1, T82.11, T82.110, T82.111, T82.118, T82.119, Z45.0, Z45.01, Z45.010, Z45.018, Z45.02, Z45.09, Z95.0
Valvular heart disease	424.x	I34.x, I35.x, I36.x, I37.x, I38.x, I39.x
Thoracic and abdominal aortic aneurysms	441.x	I71.x

Supplementary Methods. Methodology for PM_{2.5} exposure calibration

The predicted PM_{2.5} levels at grid cells were modeled and validated using monitored data. Therefore, it is possible that the prediction model's performance in terms of accuracy may be better for grid cells with monitors compared to those without monitors. To account for the fact that some areas had more PM_{2.5} monitors than the others, we used a regression calibration approach with inverse probability weighting to correct for measurement error of the predicted PM_{2.5}.

We created an indicator variable to determine the presence of PM_{2.5} monitors in each ZIP code and year from 2000 to 2016 (coded as 1 if there were operating monitors and 0 otherwise). We performed a logistic regression using population density, racial demographics (percent Black, percent Hispanic, percent Asian), percent poverty, distance between industrial facility and the center of ZIP code, road density, normalized difference vegetation index (NDVI), and tree canopy as predictors. The fitted logistic regression was used to predict the probability of having at least one operating monitor for ZIP code-years. By taking the inverse of the probability, we obtained weight for each ZIP code-year combination. These weights were used to account for the sampling bias caused by the variation in the presence of monitors across ZIP code-years.

We collected daily monitored PM_{2.5} data for the entire study period and aggregated them at the seasonal level, resulting in one observation for each season in each year. We then stratified the seasonal aggregates by census divisions (New England, Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain and Pacific regions), season, and elevation (above or below 75th percentile), resulting in 72 strata.

We aggregated predicted PM_{2.5} values for the days corresponding to the available monitored data and stratified them in the same manner as the monitored data. These predicted values were then linked to the monitored data by season, year, and ZIP code. The estimated weights were linked to those aggregates by ZIP code and year. The calibrated PM_{2.5} levels were obtained as below:

- a. Within each of the 72 strata, we randomly generated 1,000 bootstrap samples. Each bootstrap sample had the same number of observations as the original stratum.
- b. For each bootstrap sample, we regressed the monitored PM_{2.5} against the predicted PM_{2.5} and other variables using simple linear regressions and incorporating the estimated weights: $E(PM_{2.5 \text{ monitored}}) = \beta_0 + \beta_1 PM_{2.5 \text{ predicted}} + \beta_2 \text{wind speed} + \beta_3 \text{humidity} + \beta_4 \text{impervious surface} + \beta_5 I(2000 - 2003) + \beta_6 I(2004 - 2007) + \beta_7 I(2008 - 2011) + \beta_8 I(2012 - 2016)$.

The betas for each stratum and bootstrap sample were used to obtain the calibrated PM_{2.5} at grid cells given predicted values. Specifically, the predicted daily PM_{2.5} at grid cells across the contiguous US were aggregated and stratified in the same way as the monitored data. This gave us 1,000 sets of calibrated PM_{2.5} for each grid cell and season through 2000–2016 based on the betas for each stratum as $PM_{2.5 \text{ calibrated}} = \widehat{\beta}_0 + \widehat{\beta}_1 PM_{2.5 \text{ predicted}} + \widehat{\beta}_2 \text{wind speed} + \widehat{\beta}_3 \text{humidity} + \widehat{\beta}_4 \text{impervious surface} + \widehat{\beta}_5 I(2000 - 2003) + \widehat{\beta}_6 I(2004 - 2007) + \widehat{\beta}_7 I(2008 - 2011) + \widehat{\beta}_8 I(2012 - 2016)$. Given that our exposure of interest was annual PM_{2.5}, we calculated the annual average calibrated PM_{2.5} in each grid cell by averaging the values across the four seasons within the year and obtained 1,000 calibrated annual PM_{2.5} levels in each grid cell and each year through the study period.

Supplementary Table S2. Summary statistics of neighborhood-level covariates

	Mean	SD
Proportion of population ≥ 65 years of age living below the poverty line (%)	9.4	6.5
Population density (persons/mi ²)	3109.2	8751.7
Median value of owner-occupied properties (USD)	201505.4	161483.5
Proportion of housing units occupied by the owner (%)	68.5	15.7
Proportion of the population identified as Hispanic (%)	11.6	16.7
Proportion of the population ≥ 65 years of age who had not graduated from high school (%)	24.8	14.4
Mean BMI (kg/m ²)	27.7	1.7
Percent of ever-smokers (%)	46.4	6.9
Annual lung cancer hospitalization rate ($\times 10^4$ %)	3.9	3.7
Proportion of Medicare beneficiaries who received at least one hemoglobin A1c test per year (%)	83.3	4.9
Proportion of beneficiaries who had at least one ambulatory doctor visit per year (%)	78.4	6.1
Percent of beneficiaries who had at least one low-density lipoprotein cholesterol test per year (%)	79.6	6.3
Proportion of female beneficiaries who received a mammogram within a two-year period (%)	64.0	6.7
Proportion of beneficiaries who had at least one eye exam per year (%)	67.4%	5.8%
Distance to the nearest hospital (km)	6.7	7.6
Annual warm-season ozone from April–September (ppb)	44.9	5.8
Annual nitrogen dioxide (ppb)	18.7	9.8
Annual temperature (°C)	14.1	4.6

Supplementary Table S3. Median PM_{2.5} levels within exposure intervals for the entire Medicare FFS cohort

Exposure interval	Median
[0, 5)	4.02
[5, 6)	5.54
[6, 7)	6.54
[7, 8)	7.55
[8, 9)	8.54
[9, 10)	9.50
[10, 11)	10.48
[11, 12)	11.47
[12, 13)	12.47
[13, 14)	13.46
[14, ∞)	14.87

Supplementary Table S4. Numerical results for Figure 3

	Exposure interval	Relative risk	95% CI
Composite CVD	[0, 5)	1	NA
	[5, 6)	1.062	(1.052, 1.072)
	[6, 7)	1.115	(1.105, 1.124)
	[7, 8)	1.172	(1.163, 1.181)
	[8, 9)	1.221	(1.211, 1.230)
	[9, 10)	1.291	(1.281, 1.300)
	[10, 11)	1.400	(1.390, 1.411)
	[11, 12)	1.538	(1.526, 1.550)
	[12, 13)	1.665	(1.652, 1.678)
	[13, 14)	1.742	(1.728, 1.756)
	[14, ∞)	1.810	(1.795, 1.824)
Ischemic heart disease	[0, 5)	1	NA
	[5, 6)	1.009	(0.995, 1.023)
	[6, 7)	1.038	(1.025, 1.051)
	[7, 8)	1.073	(1.061, 1.086)
	[8, 9)	1.124	(1.111, 1.136)
	[9, 10)	1.211	(1.198, 1.224)
	[10, 11)	1.346	(1.332, 1.361)
	[11, 12)	1.535	(1.518, 1.552)
	[12, 13)	1.698	(1.679, 1.717)
	[13, 14)	1.813	(1.792, 1.834)
	[14, ∞)	1.898	(1.877, 1.921)
Cerebrovascular disease	[0, 5)	1	NA
	[5, 6)	1.091	(1.075, 1.107)
	[6, 7)	1.158	(1.143, 1.173)
	[7, 8)	1.242	(1.227, 1.257)
	[8, 9)	1.309	(1.293, 1.325)
	[9, 10)	1.389	(1.373, 1.405)
	[10, 11)	1.484	(1.466, 1.501)
	[11, 12)	1.606	(1.587, 1.626)
	[12, 13)	1.722	(1.701, 1.743)
	[13, 14)	1.781	(1.759, 1.804)
	[14, ∞)	1.822	(1.799, 1.846)
Heart failure	[0, 5)	1	NA
	[5, 6)	1.193	(1.172, 1.215)
	[6, 7)	1.327	(1.305, 1.349)
	[7, 8)	1.452	(1.429, 1.474)
	[8, 9)	1.527	(1.504, 1.549)
	[9, 10)	1.620	(1.597, 1.644)
	[10, 11)	1.766	(1.740, 1.792)
	[11, 12)	1.939	(1.910, 1.968)
	[12, 13)	2.097	(2.066, 2.129)
	[13, 14)	2.180	(2.146, 2.214)
	[14, ∞)	2.315	(2.279, 2.351)
Cardiomyopathy	[0, 5)	1	NA

	[5, 6)	1.073	(0.961, 1.199)
	[6, 7)	1.106	(1.001, 1.223)
	[7, 8)	1.128	(1.028, 1.239)
	[8, 9)	1.147	(1.049, 1.254)
	[9, 10)	1.279	(1.171, 1.397)
	[10, 11)	1.375	(1.259, 1.502)
	[11, 12)	1.494	(1.366, 1.635)
	[12, 13)	1.641	(1.497, 1.799)
	[13, 14)	1.748	(1.589, 1.923)
	[14, ∞)	1.775	(1.614, 1.953)
Arrhythmia	[0, 5)	1	NA
	[5, 6)	1.126	(1.109, 1.143)
	[6, 7)	1.232	(1.216, 1.249)
	[7, 8)	1.317	(1.301, 1.334)
	[8, 9)	1.351	(1.335, 1.367)
	[9, 10)	1.406	(1.389, 1.423)
	[10, 11)	1.479	(1.461, 1.496)
	[11, 12)	1.563	(1.544, 1.582)
	[12, 13)	1.627	(1.607, 1.648)
	[13, 14)	1.646	(1.624, 1.667)
	[14, ∞)	1.640	(1.619, 1.662)
Valvular heart disease	[0, 5)	1	NA
	[5, 6)	1.088	(1.057, 1.120)
	[6, 7)	1.093	(1.064, 1.122)
	[7, 8)	1.131	(1.104, 1.159)
	[8, 9)	1.072	(1.048, 1.098)
	[9, 10)	1.002	(0.978, 1.025)
	[10, 11)	0.943	(0.921, 0.965)
	[11, 12)	0.881	(0.859, 0.903)
	[12, 13)	0.847	(0.825, 0.869)
	[13, 14)	0.811	(0.789, 0.834)
	[14, ∞)	0.764	(0.743, 0.787)
Thoracic and abdominal aortic aneurysms	[0, 5)	1	NA
	[5, 6)	1.013	(0.976, 1.050)
	[6, 7)	1.018	(0.984, 1.052)
	[7, 8)	1.030	(0.999, 1.063)
	[8, 9)	1.050	(1.019, 1.081)
	[9, 10)	1.075	(1.044, 1.107)
	[10, 11)	1.137	(1.104, 1.171)
	[11, 12)	1.216	(1.181, 1.253)
	[12, 13)	1.261	(1.223, 1.301)
	[13, 14)	1.308	(1.266, 1.351)
	[14, ∞)	1.265	(1.224, 1.306)

Supplementary Table S5. Numerical results for Figure 4

	Exposure interval	Absolute risk (%)	95% CI (%)
Composite CVD	[0, 5)	2.592	NA
	[5, 6)	2.753	(2.728, 2.779)
	[6, 7)	2.890	(2.866, 2.914)
	[7, 8)	3.038	(3.014, 3.062)
	[8, 9)	3.164	(3.140, 3.188)
	[9, 10)	3.346	(3.322, 3.371)
	[10, 11)	3.630	(3.603, 3.657)
	[11, 12)	3.987	(3.957, 4.017)
	[12, 13)	4.316	(4.282, 4.349)
	[13, 14)	4.515	(4.479, 4.551)
	[14, ∞)	4.691	(4.654, 4.729)
Ischemic heart disease	[0, 5)	0.975	NA
	[5, 6)	0.983	(0.970, 0.997)
	[6, 7)	1.012	(0.999, 1.024)
	[7, 8)	1.046	(1.034, 1.058)
	[8, 9)	1.095	(1.083, 1.107)
	[9, 10)	1.180	(1.167, 1.193)
	[10, 11)	1.312	(1.298, 1.327)
	[11, 12)	1.496	(1.480, 1.513)
	[12, 13)	1.655	(1.636, 1.674)
	[13, 14)	1.767	(1.746, 1.788)
	[14, ∞)	1.850	(1.829, 1.872)
Cerebrovascular disease	[0, 5)	0.7646	NA
	[5, 6)	0.8343	(0.822, 0.847)
	[6, 7)	0.8853	(0.874, 0.897)
	[7, 8)	0.9496	(0.938, 0.961)
	[8, 9)	1.0008	(0.989, 1.013)
	[9, 10)	1.0619	(1.049, 1.075)
	[10, 11)	1.1344	(1.121, 1.148)
	[11, 12)	1.2283	(1.214, 1.243)
	[12, 13)	1.3164	(1.300, 1.333)
	[13, 14)	1.3620	(1.345, 1.380)
	[14, ∞)	1.3934	(1.376, 1.411)
Heart failure	[0, 5)	0.548	NA
	[5, 6)	0.654	(0.642, 0.666)
	[6, 7)	0.727	(0.715, 0.739)
	[7, 8)	0.795	(0.783, 0.808)
	[8, 9)	0.837	(0.824, 0.849)
	[9, 10)	0.888	(0.875, 0.901)
	[10, 11)	0.967	(0.953, 0.982)
	[11, 12)	1.062	(1.047, 1.078)
	[12, 13)	1.149	(1.132, 1.167)
	[13, 14)	1.195	(1.176, 1.213)
	[14, ∞)	1.268	(1.249, 1.288)
Cardiomyopathy	[0, 5)	0.012	NA

	[5, 6)	0.013	(0.012, 0.015)
	[6, 7)	0.014	(0.012, 0.015)
	[7, 8)	0.014	(0.013, 0.015)
	[8, 9)	0.014	(0.013, 0.016)
	[9, 10)	0.016	(0.015, 0.017)
	[10, 11)	0.017	(0.016, 0.019)
	[11, 12)	0.019	(0.017, 0.020)
	[12, 13)	0.020	(0.019, 0.022)
	[13, 14)	0.022	(0.020, 0.024)
	[14, ∞)	0.022	(0.020, 0.024)
Arrhythmia	[0, 5)	0.656	NA
	[5, 6)	0.738	(0.727, 0.749)
	[6, 7)	0.808	(0.797, 0.819)
	[7, 8)	0.864	(0.853, 0.874)
	[8, 9)	0.886	(0.875, 0.896)
	[9, 10)	0.922	(0.911, 0.933)
	[10, 11)	0.970	(0.958, 0.981)
	[11, 12)	1.025	(1.013, 1.038)
	[12, 13)	1.067	(1.054, 1.081)
	[13, 14)	1.079	(1.065, 1.093)
Valvular heart disease	[0, 5)	0.130	NA
	[5, 6)	0.141	(0.137, 0.145)
	[6, 7)	0.142	(0.138, 0.145)
	[7, 8)	0.147	(0.143, 0.150)
	[8, 9)	0.139	(0.136, 0.142)
	[9, 10)	0.130	(0.127, 0.133)
	[10, 11)	0.122	(0.119, 0.125)
	[11, 12)	0.114	(0.111, 0.117)
	[12, 13)	0.110	(0.107, 0.113)
	[13, 14)	0.105	(0.102, 0.108)
Thoracic and abdominal aortic aneurysms	[0, 5)	0.099	NA
	[5, 6)	0.100	(0.097, 0.104)
	[6, 7)	0.101	(0.098, 0.104)
	[7, 8)	0.102	(0.099, 0.105)
	[8, 9)	0.104	(0.101, 0.107)
	[9, 10)	0.107	(0.103, 0.110)
	[10, 11)	0.113	(0.109, 0.116)
	[11, 12)	0.121	(0.117, 0.124)
	[12, 13)	0.125	(0.121, 0.129)
	[13, 14)	0.130	(0.125, 0.134)
	[14, ∞)	0.125	(0.121, 0.129)

Supplementary Table S6. Numerical results for Figure 5

	Exposure interval	Lag 0		Lag 1		Lag 2	
		Relative risk	95% CI	Relative risk	95% CI	Relative risk	95% CI
Composite CVD	[0, 5)	1	NA	1	NA	1	NA
	[5, 6)	1.076	(1.066, 1.086)	1.069	(1.058, 1.080)	1.085	(1.074, 1.097)
	[6, 7)	1.132	(1.123, 1.142)	1.132	(1.121, 1.142)	1.142	(1.131, 1.153)
	[7, 8)	1.202	(1.192, 1.211)	1.186	(1.176, 1.197)	1.195	(1.184, 1.206)
	[8, 9)	1.255	(1.245, 1.265)	1.234	(1.224, 1.245)	1.233	(1.222, 1.243)
	[9, 10)	1.358	(1.348, 1.369)	1.314	(1.303, 1.325)	1.310	(1.299, 1.322)
	[10, 11)	1.468	(1.457, 1.480)	1.423	(1.412, 1.435)	1.398	(1.385, 1.410)
	[11, 12)	1.608	(1.595, 1.621)	1.553	(1.540, 1.566)	1.533	(1.520, 1.546)
	[12, 13)	1.739	(1.725, 1.754)	1.677	(1.663, 1.692)	1.654	(1.639, 1.669)
	[13, 14)	1.816	(1.800, 1.831)	1.757	(1.741, 1.773)	1.727	(1.711, 1.743)
[14, ∞)	1.858	(1.842, 1.875)	1.827	(1.810, 1.843)	1.823	(1.807, 1.839)	
Ischemic heart disease	[0, 5)	1	NA	1	NA	1	NA
	[5, 6)	1.020	(1.006, 1.034)	1.025	(1.009, 1.040)	1.048	(1.032, 1.065)
	[6, 7)	1.058	(1.044, 1.071)	1.062	(1.047, 1.077)	1.071	(1.056, 1.087)
	[7, 8)	1.121	(1.108, 1.135)	1.107	(1.093, 1.122)	1.114	(1.099, 1.129)
	[8, 9)	1.179	(1.166, 1.193)	1.159	(1.144, 1.173)	1.150	(1.135, 1.165)
	[9, 10)	1.312	(1.297, 1.327)	1.255	(1.240, 1.271)	1.243	(1.228, 1.259)
	[10, 11)	1.454	(1.437, 1.471)	1.396	(1.379, 1.413)	1.356	(1.338, 1.373)
	[11, 12)	1.661	(1.641, 1.680)	1.580	(1.561, 1.600)	1.542	(1.523, 1.562)
	[12, 13)	1.827	(1.805, 1.849)	1.738	(1.716, 1.761)	1.688	(1.666, 1.710)
	[13, 14)	1.933	(1.908, 1.957)	1.863	(1.838, 1.887)	1.799	(1.775, 1.823)
[14, ∞)	1.992	(1.967, 2.018)	1.946	(1.921, 1.971)	1.925	(1.899, 1.950)	
Cerebrovascular disease	[0, 5)	1	NA	1	NA	1	NA
	[5, 6)	1.113	(1.096, 1.129)	1.095	(1.078, 1.113)	1.097	(1.079, 1.116)
	[6, 7)	1.184	(1.168, 1.200)	1.172	(1.155, 1.190)	1.179	(1.161, 1.197)
	[7, 8)	1.264	(1.248, 1.281)	1.247	(1.230, 1.264)	1.245	(1.227, 1.263)
	[8, 9)	1.345	(1.329, 1.362)	1.315	(1.297, 1.332)	1.304	(1.286, 1.323)
	[9, 10)	1.441	(1.423, 1.459)	1.396	(1.377, 1.414)	1.386	(1.367, 1.405)
	[10, 11)	1.541	(1.522, 1.560)	1.494	(1.475, 1.514)	1.468	(1.448, 1.488)
	[11, 12)	1.645	(1.624, 1.666)	1.603	(1.582, 1.625)	1.583	(1.561, 1.605)
	[12, 13)	1.765	(1.742, 1.788)	1.719	(1.696, 1.743)	1.706	(1.682, 1.730)
	[13, 14)	1.834	(1.809, 1.859)	1.783	(1.758, 1.808)	1.761	(1.736, 1.787)
[14, ∞)	1.854	(1.828, 1.880)	1.820	(1.795, 1.846)	1.826	(1.800, 1.852)	
Heart failure	[0, 5)	1	NA	1	NA	1	NA
	[5, 6)	1.216	(1.194, 1.238)	1.191	(1.168, 1.215)	1.207	(1.182, 1.232)
	[6, 7)	1.329	(1.307, 1.351)	1.339	(1.315, 1.363)	1.350	(1.325, 1.376)
	[7, 8)	1.451	(1.429, 1.474)	1.447	(1.423, 1.472)	1.472	(1.445, 1.498)
	[8, 9)	1.534	(1.511, 1.558)	1.516	(1.491, 1.541)	1.533	(1.506, 1.560)
	[9, 10)	1.666	(1.641, 1.692)	1.620	(1.594, 1.647)	1.633	(1.605, 1.661)
	[10, 11)	1.798	(1.770, 1.825)	1.756	(1.728, 1.785)	1.742	(1.713, 1.772)
	[11, 12)	1.965	(1.935, 1.996)	1.927	(1.895, 1.959)	1.916	(1.883, 1.949)
	[12, 13)	2.137	(2.103, 2.171)	2.078	(2.044, 2.114)	2.070	(2.034, 2.106)
	[13, 14)	2.228	(2.192, 2.265)	2.159	(2.122, 2.197)	2.151	(2.113, 2.190)
[14, ∞)	2.316	(2.278, 2.355)	2.290	(2.251, 2.330)	2.313	(2.273, 2.354)	
Cardiomyopathy	[0, 5)	1	NA	1	NA	1	NA
	[5, 6)	1.070	(0.958, 1.197)	1.087	(0.963, 1.227)	1.022	(0.900, 1.159)
	[6, 7)	1.125	(1.016, 1.246)	1.168	(1.045, 1.305)	1.096	(0.977, 1.229)
	[7, 8)	1.163	(1.057, 1.280)	1.161	(1.046, 1.290)	1.135	(1.019, 1.264)
	[8, 9)	1.209	(1.101, 1.328)	1.196	(1.080, 1.324)	1.159	(1.044, 1.286)
	[9, 10)	1.332	(1.214, 1.462)	1.312	(1.187, 1.450)	1.229	(1.110, 1.362)
	[10, 11)	1.469	(1.338, 1.612)	1.427	(1.291, 1.578)	1.344	(1.214, 1.488)
	[11, 12)	1.589	(1.445, 1.747)	1.572	(1.420, 1.739)	1.479	(1.334, 1.639)
[12, 13)	1.725	(1.564, 1.902)	1.719	(1.549, 1.907)	1.602	(1.443, 1.779)	

	[13, 14)	1.789	(1.615, 1.981)	1.777	(1.597, 1.978)	1.662	(1.493, 1.850)
	[14, ∞)	1.804	(1.624, 2.004)	1.831	(1.645, 2.038)	1.774	(1.597, 1.971)
Arrhythmia	[0, 5)	1	NA	1	NA	1	NA
	[5, 6)	1.147	(1.130, 1.164)	1.138	(1.120, 1.157)	1.147	(1.128, 1.167)
	[6, 7)	1.246	(1.229, 1.263)	1.242	(1.224, 1.260)	1.256	(1.237, 1.276)
	[7, 8)	1.329	(1.313, 1.346)	1.313	(1.295, 1.331)	1.323	(1.304, 1.342)
	[8, 9)	1.361	(1.344, 1.378)	1.342	(1.324, 1.360)	1.349	(1.331, 1.369)
	[9, 10)	1.434	(1.416, 1.451)	1.403	(1.384, 1.422)	1.411	(1.391, 1.430)
	[10, 11)	1.507	(1.488, 1.526)	1.479	(1.459, 1.499)	1.471	(1.451, 1.492)
	[11, 12)	1.571	(1.551, 1.591)	1.551	(1.530, 1.572)	1.559	(1.537, 1.581)
	[12, 13)	1.633	(1.612, 1.654)	1.611	(1.588, 1.633)	1.625	(1.602, 1.648)
	[13, 14)	1.647	(1.624, 1.670)	1.636	(1.613, 1.660)	1.650	(1.626, 1.675)
	[14, ∞)	1.637	(1.614, 1.661)	1.644	(1.621, 1.668)	1.669	(1.645, 1.693)
Valvular heart disease	[0, 5)	1	NA	1	NA	1	NA
	[5, 6)	1.068	(1.038, 1.098)	1.072	(1.040, 1.106)	1.077	(1.043, 1.113)
	[6, 7)	1.084	(1.056, 1.113)	1.080	(1.050, 1.111)	1.102	(1.069, 1.135)
	[7, 8)	1.083	(1.056, 1.110)	1.095	(1.066, 1.125)	1.124	(1.093, 1.156)
	[8, 9)	1.021	(0.997, 1.046)	1.039	(1.013, 1.067)	1.064	(1.036, 1.093)
	[9, 10)	0.950	(0.927, 0.973)	0.979	(0.954, 1.004)	1.008	(0.982, 1.036)
	[10, 11)	0.894	(0.872, 0.916)	0.927	(0.903, 0.952)	0.954	(0.929, 0.980)
	[11, 12)	0.844	(0.823, 0.866)	0.868	(0.845, 0.892)	0.906	(0.881, 0.931)
	[12, 13)	0.807	(0.785, 0.829)	0.819	(0.797, 0.843)	0.855	(0.831, 0.879)
	[13, 14)	0.775	(0.752, 0.798)	0.797	(0.773, 0.821)	0.826	(0.801, 0.851)
	[14, ∞)	0.745	(0.722, 0.769)	0.757	(0.734, 0.780)	0.765	(0.743, 0.788)
Thoracic and abdominal aortic aneurysms	[0, 5)	1	NA	1	NA	1	NA
	[5, 6)	1.036	(0.999, 1.075)	1.009	(0.970, 1.050)	1.026	(0.984, 1.070)
	[6, 7)	1.034	(1.000, 1.070)	1.035	(0.998, 1.073)	1.044	(1.005, 1.084)
	[7, 8)	1.063	(1.030, 1.097)	1.038	(1.003, 1.074)	1.057	(1.019, 1.095)
	[8, 9)	1.080	(1.047, 1.114)	1.055	(1.020, 1.090)	1.064	(1.028, 1.101)
	[9, 10)	1.136	(1.101, 1.171)	1.096	(1.061, 1.133)	1.104	(1.067, 1.142)
	[10, 11)	1.200	(1.164, 1.238)	1.154	(1.117, 1.192)	1.140	(1.102, 1.179)
	[11, 12)	1.261	(1.221, 1.301)	1.225	(1.185, 1.266)	1.229	(1.187, 1.271)
	[12, 13)	1.301	(1.259, 1.344)	1.269	(1.226, 1.313)	1.267	(1.223, 1.312)
	[13, 14)	1.338	(1.292, 1.385)	1.307	(1.262, 1.355)	1.303	(1.257, 1.351)
	[14, ∞)	1.303	(1.257, 1.351)	1.287	(1.242, 1.334)	1.301	(1.256, 1.348)

Supplementary Table S7. Numerical results for Figure 6

	Exposure interval	Female		Male	
		Relative risk	95% CI	Relative risk	95% CI
Composite CVD	[0, 5)	1	NA	1	NA
	[5, 6)	1.074	(1.060, 1.089)	1.060	(1.047, 1.073)
	[6, 7)	1.135	(1.121, 1.149)	1.111	(1.099, 1.124)
	[7, 8)	1.205	(1.191, 1.219)	1.161	(1.149, 1.173)
	[8, 9)	1.260	(1.246, 1.274)	1.208	(1.196, 1.220)
	[9, 10)	1.341	(1.327, 1.356)	1.271	(1.258, 1.283)
	[10, 11)	1.456	(1.440, 1.472)	1.380	(1.367, 1.394)
	[11, 12)	1.605	(1.587, 1.623)	1.515	(1.500, 1.531)
	[12, 13)	1.733	(1.713, 1.753)	1.650	(1.633, 1.667)
	[13, 14)	1.811	(1.790, 1.832)	1.732	(1.713, 1.751)
	[14, ∞)	1.891	(1.869, 1.914)	1.791	(1.772, 1.810)
Ischemic heart disease	[0, 5)	1	NA	1	NA
	[5, 6)	1.035	(1.013, 1.057)	1.007	(0.990, 1.024)
	[6, 7)	1.074	(1.053, 1.095)	1.038	(1.022, 1.054)
	[7, 8)	1.127	(1.106, 1.147)	1.070	(1.054, 1.085)
	[8, 9)	1.185	(1.165, 1.206)	1.122	(1.106, 1.137)
	[9, 10)	1.292	(1.270, 1.315)	1.202	(1.186, 1.219)
	[10, 11)	1.449	(1.424, 1.474)	1.335	(1.317, 1.353)
	[11, 12)	1.670	(1.641, 1.699)	1.517	(1.496, 1.537)
	[12, 13)	1.848	(1.816, 1.881)	1.687	(1.664, 1.711)
	[13, 14)	1.980	(1.944, 2.017)	1.802	(1.776, 1.828)
	[14, ∞)	2.101	(2.063, 2.140)	1.869	(1.842, 1.896)
Cerebrovascular disease	[0, 5)	1	NA	1	NA
	[5, 6)	1.082	(1.061, 1.104)	1.102	(1.079, 1.126)
	[6, 7)	1.148	(1.127, 1.169)	1.171	(1.148, 1.194)
	[7, 8)	1.237	(1.217, 1.259)	1.249	(1.227, 1.272)
	[8, 9)	1.304	(1.283, 1.325)	1.318	(1.295, 1.341)
	[9, 10)	1.392	(1.369, 1.414)	1.388	(1.365, 1.412)
	[10, 11)	1.485	(1.461, 1.509)	1.486	(1.461, 1.512)
	[11, 12)	1.616	(1.589, 1.642)	1.599	(1.571, 1.627)
	[12, 13)	1.726	(1.697, 1.755)	1.722	(1.691, 1.753)
	[13, 14)	1.780	(1.749, 1.811)	1.790	(1.756, 1.824)
	[14, ∞)	1.820	(1.789, 1.852)	1.833	(1.799, 1.868)
Heart failure	[0, 5)	1	NA	1	NA
	[5, 6)	1.179	(1.150, 1.210)	1.211	(1.180, 1.242)
	[6, 7)	1.317	(1.287, 1.348)	1.342	(1.311, 1.374)
	[7, 8)	1.447	(1.417, 1.479)	1.464	(1.432, 1.497)
	[8, 9)	1.535	(1.504, 1.567)	1.526	(1.495, 1.559)
	[9, 10)	1.642	(1.608, 1.676)	1.607	(1.573, 1.641)
	[10, 11)	1.796	(1.760, 1.834)	1.744	(1.707, 1.781)
	[11, 12)	1.982	(1.941, 2.023)	1.905	(1.864, 1.945)
	[12, 13)	2.146	(2.101, 2.192)	2.059	(2.015, 2.104)
	[13, 14)	2.233	(2.185, 2.282)	2.138	(2.090, 2.187)
	[14, ∞)	2.382	(2.331, 2.434)	2.257	(2.207, 2.309)
Cardiomyopathy	[0, 5)	1	NA	1	NA
	[5, 6)	1.038	(0.885, 1.218)	1.113	(0.957, 1.294)
	[6, 7)	1.057	(0.915, 1.222)	1.165	(1.016, 1.335)
	[7, 8)	1.033	(0.903, 1.183)	1.237	(1.089, 1.405)

	[8, 9)	1.100	(0.967, 1.251)	1.213	(1.073, 1.371)
	[9, 10)	1.199	(1.056, 1.361)	1.385	(1.227, 1.563)
	[10, 11)	1.296	(1.141, 1.472)	1.488	(1.318, 1.679)
	[11, 12)	1.357	(1.192, 1.545)	1.679	(1.486, 1.899)
	[12, 13)	1.510	(1.323, 1.725)	1.832	(1.616, 2.078)
	[13, 14)	1.630	(1.421, 1.870)	1.935	(1.698, 2.205)
	[14, ∞)	1.622	(1.414, 1.861)	2.008	(1.763, 2.287)
Arrhythmia	[0, 5)	1	NA	1	NA
	[5, 6)	1.132	(1.108, 1.155)	1.124	(1.100, 1.148)
	[6, 7)	1.235	(1.212, 1.259)	1.236	(1.213, 1.259)
	[7, 8)	1.326	(1.302, 1.349)	1.318	(1.295, 1.341)
	[8, 9)	1.365	(1.342, 1.388)	1.347	(1.324, 1.370)
	[9, 10)	1.432	(1.408, 1.456)	1.391	(1.367, 1.414)
	[10, 11)	1.504	(1.479, 1.530)	1.467	(1.442, 1.492)
	[11, 12)	1.590	(1.563, 1.617)	1.553	(1.527, 1.580)
	[12, 13)	1.649	(1.620, 1.678)	1.628	(1.599, 1.657)
	[13, 14)	1.662	(1.632, 1.693)	1.654	(1.624, 1.685)
	[14, ∞)	1.655	(1.625, 1.685)	1.653	(1.623, 1.684)
Valvular heart disease	[0, 5)	1	NA	1	NA
	[5, 6)	1.100	(1.051, 1.152)	1.092	(1.053, 1.133)
	[6, 7)	1.136	(1.090, 1.183)	1.083	(1.047, 1.120)
	[7, 8)	1.207	(1.161, 1.254)	1.105	(1.071, 1.140)
	[8, 9)	1.163	(1.120, 1.207)	1.039	(1.008, 1.070)
	[9, 10)	1.087	(1.048, 1.128)	0.972	(0.943, 1.001)
	[10, 11)	1.032	(0.994, 1.071)	0.911	(0.884, 0.939)
	[11, 12)	0.972	(0.935, 1.009)	0.849	(0.823, 0.877)
	[12, 13)	0.940	(0.903, 0.979)	0.816	(0.789, 0.844)
	[13, 14)	0.909	(0.871, 0.949)	0.776	(0.748, 0.805)
	[14, ∞)	0.875	(0.838, 0.913)	0.718	(0.692, 0.746)
Thoracic and abdominal aortic aneurysms	[0, 5)	1	NA	1	NA
	[5, 6)	1.008	(0.939, 1.083)	1.035	(0.994, 1.079)
	[6, 7)	1.038	(0.974, 1.107)	1.044	(1.006, 1.083)
	[7, 8)	1.076	(1.014, 1.143)	1.058	(1.022, 1.095)
	[8, 9)	1.087	(1.026, 1.151)	1.091	(1.056, 1.128)
	[9, 10)	1.126	(1.064, 1.191)	1.120	(1.084, 1.157)
	[10, 11)	1.168	(1.104, 1.237)	1.204	(1.166, 1.244)
	[11, 12)	1.261	(1.190, 1.335)	1.296	(1.254, 1.340)
	[12, 13)	1.281	(1.207, 1.360)	1.371	(1.324, 1.419)
	[13, 14)	1.325	(1.245, 1.410)	1.432	(1.381, 1.485)
	[14, ∞)	1.282	(1.204, 1.365)	1.392	(1.343, 1.444)

Supplementary Table S8. Numerical results for Figure 7

	Exposure interval	65–74 years		≥75 years	
		Relative risk	95% CI	Relative risk	95% CI
Composite CVD	[0, 5)	1	NA	1	NA
	[5, 6)	1.041	(1.027, 1.055)	1.067	(1.055, 1.078)
	[6, 7)	1.080	(1.067, 1.094)	1.123	(1.112, 1.134)
	[7, 8)	1.134	(1.121, 1.147)	1.180	(1.169, 1.191)
	[8, 9)	1.198	(1.185, 1.212)	1.214	(1.203, 1.225)
	[9, 10)	1.282	(1.268, 1.296)	1.265	(1.254, 1.277)
	[10, 11)	1.391	(1.376, 1.406)	1.352	(1.340, 1.364)
	[11, 12)	1.534	(1.517, 1.551)	1.461	(1.448, 1.474)
	[12, 13)	1.666	(1.647, 1.685)	1.560	(1.546, 1.575)
	[13, 14)	1.732	(1.711, 1.752)	1.627	(1.611, 1.642)
[14, ∞)	1.795	(1.774, 1.816)	1.679	(1.663, 1.695)	
Ischemic heart disease	[0, 5)	1	NA	1	NA
	[5, 6)	0.994	(0.974, 1.014)	1.017	(0.998, 1.036)
	[6, 7)	1.008	(0.990, 1.026)	1.057	(1.039, 1.075)
	[7, 8)	1.041	(1.024, 1.059)	1.092	(1.075, 1.109)
	[8, 9)	1.103	(1.086, 1.121)	1.129	(1.113, 1.146)
	[9, 10)	1.206	(1.187, 1.225)	1.197	(1.180, 1.215)
	[10, 11)	1.352	(1.331, 1.373)	1.314	(1.294, 1.333)
	[11, 12)	1.556	(1.531, 1.581)	1.477	(1.455, 1.499)
	[12, 13)	1.736	(1.708, 1.765)	1.615	(1.590, 1.640)
	[13, 14)	1.846	(1.815, 1.878)	1.727	(1.700, 1.754)
[14, ∞)	1.922	(1.889, 1.955)	1.814	(1.786, 1.843)	
Cerebrovascular disease	[0, 5)	1	NA	1	(1.067, 1.103)
	[5, 6)	1.064	(1.038, 1.091)	1.085	(1.125, 1.159)
	[6, 7)	1.126	(1.101, 1.151)	1.142	(1.199, 1.233)
	[7, 8)	1.215	(1.190, 1.241)	1.216	(1.251, 1.285)
	[8, 9)	1.306	(1.280, 1.332)	1.268	(1.313, 1.349)
	[9, 10)	1.401	(1.374, 1.429)	1.331	(1.383, 1.420)
	[10, 11)	1.504	(1.474, 1.534)	1.401	(1.482, 1.523)
	[11, 12)	1.625	(1.593, 1.658)	1.503	(1.573, 1.617)
	[12, 13)	1.745	(1.709, 1.781)	1.595	(1.620, 1.668)
	[13, 14)	1.800	(1.762, 1.839)	1.644	(1.644, 1.692)
[14, ∞)	1.851	(1.812, 1.891)	1.668	(1.067, 1.103)	
Heart failure	[0, 5)	1	NA	1	NA
	[5, 6)	1.139	(1.099, 1.181)	1.185	(1.162, 1.207)
	[6, 7)	1.250	(1.210, 1.290)	1.308	(1.285, 1.330)
	[7, 8)	1.382	(1.341, 1.424)	1.419	(1.396, 1.442)
	[8, 9)	1.508	(1.466, 1.552)	1.471	(1.449, 1.494)
	[9, 10)	1.646	(1.599, 1.693)	1.537	(1.514, 1.561)
	[10, 11)	1.812	(1.761, 1.864)	1.646	(1.621, 1.672)
	[11, 12)	2.031	(1.973, 2.090)	1.772	(1.744, 1.799)
	[12, 13)	2.231	(2.166, 2.298)	1.887	(1.857, 1.917)
	[13, 14)	2.324	(2.254, 2.396)	1.948	(1.916, 1.980)
[14, ∞)	2.530	(2.455, 2.608)	2.037	(2.004, 2.070)	
Cardiomyopathy	[0, 5)	1	NA	1	NA
	[5, 6)	1.060	(0.906, 1.240)	1.087	(0.931, 1.270)
	[6, 7)	1.078	(0.935, 1.243)	1.136	(0.987, 1.307)
	[7, 8)	1.090	(0.955, 1.245)	1.167	(1.023, 1.330)
	[8, 9)	1.121	(0.988, 1.273)	1.173	(1.034, 1.330)

	[9, 10)	1.221	(1.077, 1.383)	1.339	(1.183, 1.516)
	[10, 11)	1.335	(1.178, 1.513)	1.412	(1.247, 1.599)
	[11, 12)	1.502	(1.322, 1.705)	1.479	(1.303, 1.678)
	[12, 13)	1.662	(1.458, 1.894)	1.610	(1.415, 1.832)
	[13, 14)	1.759	(1.535, 2.015)	1.727	(1.511, 1.973)
	[14, ∞)	1.786	(1.559, 2.046)	1.752	(1.533, 2.002)
Arrhythmia	[0, 5)	1	NA	1	NA
	[5, 6)	1.101	(1.074, 1.128)	1.118	(1.099, 1.137)
	[6, 7)	1.194	(1.168, 1.221)	1.218	(1.199, 1.237)
	[7, 8)	1.275	(1.249, 1.302)	1.297	(1.279, 1.316)
	[8, 9)	1.323	(1.297, 1.349)	1.322	(1.304, 1.341)
	[9, 10)	1.390	(1.363, 1.418)	1.362	(1.343, 1.381)
	[10, 11)	1.467	(1.439, 1.496)	1.412	(1.393, 1.432)
	[11, 12)	1.563	(1.532, 1.594)	1.470	(1.450, 1.491)
	[12, 13)	1.635	(1.602, 1.669)	1.512	(1.491, 1.534)
	[13, 14)	1.649	(1.614, 1.685)	1.522	(1.500, 1.545)
	[14, ∞)	1.642	(1.607, 1.678)	1.510	(1.488, 1.533)
Valvular heart disease	[0, 5)	1	NA	1	NA
	[5, 6)	1.024	(0.976, 1.073)	1.111	(1.072, 1.151)
	[6, 7)	1.024	(0.981, 1.069)	1.106	(1.071, 1.143)
	[7, 8)	1.052	(1.011, 1.094)	1.148	(1.114, 1.183)
	[8, 9)	1.015	(0.977, 1.054)	1.077	(1.046, 1.109)
	[9, 10)	0.969	(0.933, 1.007)	0.988	(0.960, 1.017)
	[10, 11)	0.949	(0.913, 0.986)	0.899	(0.873, 0.926)
	[11, 12)	0.913	(0.877, 0.950)	0.818	(0.793, 0.843)
	[12, 13)	0.905	(0.868, 0.944)	0.766	(0.742, 0.791)
	[13, 14)	0.884	(0.845, 0.925)	0.722	(0.697, 0.747)
	[14, ∞)	0.841	(0.803, 0.880)	0.674	(0.651, 0.698)
Thoracic and abdominal aortic aneurysms	[0, 5)	1	NA	1	NA
	[5, 6)	1.021	(0.966, 1.078)	0.993	(0.946, 1.043)
	[6, 7)	1.005	(0.957, 1.057)	1.009	(0.966, 1.055)
	[7, 8)	1.006	(0.960, 1.053)	1.030	(0.988, 1.073)
	[8, 9)	1.051	(1.005, 1.098)	1.028	(0.988, 1.069)
	[9, 10)	1.087	(1.041, 1.136)	1.041	(1.001, 1.082)
	[10, 11)	1.171	(1.121, 1.223)	1.078	(1.037, 1.121)
	[11, 12)	1.273	(1.218, 1.331)	1.133	(1.089, 1.179)
	[12, 13)	1.336	(1.276, 1.399)	1.159	(1.113, 1.208)
	[13, 14)	1.389	(1.324, 1.458)	1.197	(1.147, 1.250)
	[14, ∞)	1.355	(1.291, 1.423)	1.147	(1.099, 1.198)

Supplementary Table S9. Numerical results for Figure 8

	Exposure interval	High school completion rate \leq 25th percentile		High school completion rate \geq 25th percentile	
		Relative risk	95% CI	Relative risk	95% CI
Composite CVD	[0, 5)	1	NA	1	NA
	[5, 6)	1.085	(1.072, 1.099)	1.041	(1.028, 1.055)
	[6, 7)	1.133	(1.120, 1.146)	1.081	(1.068, 1.093)
	[7, 8)	1.186	(1.173, 1.199)	1.118	(1.106, 1.130)
	[8, 9)	1.208	(1.196, 1.221)	1.156	(1.144, 1.168)
	[9, 10)	1.259	(1.245, 1.272)	1.213	(1.200, 1.225)
	[10, 11)	1.334	(1.319, 1.349)	1.303	(1.290, 1.316)
	[11, 12)	1.442	(1.424, 1.460)	1.420	(1.405, 1.434)
	[12, 13)	1.568	(1.545, 1.591)	1.523	(1.507, 1.538)
	[13, 14)	1.621	(1.591, 1.650)	1.586	(1.569, 1.603)
	[14, ∞)	1.703	(1.667, 1.741)	1.633	(1.616, 1.650)
Ischemic heart disease	[0, 5)	1	NA	1	NA
	[5, 6)	1.016	(0.996, 1.036)	1.001	(0.983, 1.020)
	[6, 7)	1.035	(1.017, 1.054)	1.011	(0.994, 1.028)
	[7, 8)	1.095	(1.077, 1.113)	1.004	(0.988, 1.020)
	[8, 9)	1.112	(1.095, 1.130)	1.039	(1.024, 1.055)
	[9, 10)	1.159	(1.140, 1.177)	1.111	(1.095, 1.127)
	[10, 11)	1.247	(1.226, 1.268)	1.217	(1.200, 1.235)
	[11, 12)	1.385	(1.359, 1.411)	1.372	(1.352, 1.392)
	[12, 13)	1.557	(1.523, 1.592)	1.495	(1.473, 1.518)
	[13, 14)	1.649	(1.604, 1.694)	1.585	(1.561, 1.609)
	[14, ∞)	1.782	(1.726, 1.840)	1.637	(1.612, 1.662)
Cerebrovascular disease	[0, 5)	1	NA	1	NA
	[5, 6)	1.110	(1.089, 1.132)	1.073	(1.050, 1.095)
	[6, 7)	1.161	(1.141, 1.182)	1.141	(1.120, 1.163)
	[7, 8)	1.222	(1.201, 1.242)	1.221	(1.200, 1.243)
	[8, 9)	1.261	(1.241, 1.282)	1.279	(1.257, 1.301)
	[9, 10)	1.330	(1.309, 1.352)	1.345	(1.323, 1.367)
	[10, 11)	1.410	(1.386, 1.435)	1.422	(1.398, 1.446)
	[11, 12)	1.500	(1.471, 1.529)	1.533	(1.507, 1.558)
	[12, 13)	1.599	(1.563, 1.636)	1.633	(1.605, 1.661)
	[13, 14)	1.636	(1.591, 1.683)	1.684	(1.655, 1.713)
	[14, ∞)	1.660	(1.604, 1.717)	1.712	(1.682, 1.741)
Heart failure	[0, 5)	1	NA	1	NA
	[5, 6)	1.260	(1.229, 1.292)	1.137	(1.109, 1.166)
	[6, 7)	1.366	(1.335, 1.398)	1.270	(1.242, 1.299)
	[7, 8)	1.448	(1.417, 1.479)	1.385	(1.356, 1.414)
	[8, 9)	1.483	(1.452, 1.514)	1.437	(1.408, 1.466)
	[9, 10)	1.555	(1.523, 1.588)	1.506	(1.476, 1.536)
	[10, 11)	1.653	(1.617, 1.690)	1.620	(1.588, 1.653)
	[11, 12)	1.760	(1.718, 1.803)	1.764	(1.729, 1.800)
	[12, 13)	1.874	(1.821, 1.928)	1.892	(1.854, 1.930)
	[13, 14)	1.924	(1.858, 1.992)	1.953	(1.913, 1.993)
	[14, ∞)	1.972	(1.892, 2.056)	2.054	(2.013, 2.097)
Cardiomyopathy	[0, 5)	1	NA	1	NA
	[5, 6)	1.011	(0.870, 1.173)	1.124	(0.965, 1.309)
	[6, 7)	1.081	(0.944, 1.237)	1.108	(0.964, 1.273)
	[7, 8)	1.103	(0.972, 1.250)	1.097	(0.963, 1.249)

	[8, 9)	1.124	(0.995, 1.270)	1.094	(0.965, 1.239)
	[9, 10)	1.268	(1.123, 1.432)	1.197	(1.058, 1.354)
	[10, 11)	1.378	(1.212, 1.567)	1.266	(1.120, 1.432)
	[11, 12)	1.467	(1.270, 1.694)	1.369	(1.209, 1.549)
	[12, 13)	1.582	(1.333, 1.877)	1.497	(1.320, 1.696)
	[13, 14)	1.678	(1.363, 2.066)	1.587	(1.396, 1.803)
	[14, ∞)	1.742	(1.358, 2.235)	1.595	(1.405, 1.811)
Arrhythmia	[0, 5)	1	NA	1	NA
	[5, 6)	1.153	(1.130, 1.175)	1.100	(1.077, 1.124)
	[6, 7)	1.261	(1.239, 1.283)	1.193	(1.170, 1.216)
	[7, 8)	1.339	(1.317, 1.362)	1.273	(1.250, 1.296)
	[8, 9)	1.352	(1.331, 1.374)	1.305	(1.282, 1.327)
	[9, 10)	1.404	(1.382, 1.427)	1.350	(1.327, 1.373)
	[10, 11)	1.475	(1.449, 1.500)	1.410	(1.386, 1.434)
	[11, 12)	1.566	(1.536, 1.596)	1.482	(1.457, 1.507)
	[12, 13)	1.662	(1.625, 1.700)	1.532	(1.506, 1.559)
	[13, 14)	1.653	(1.607, 1.701)	1.551	(1.523, 1.578)
	[14, ∞)	1.674	(1.618, 1.732)	1.539	(1.512, 1.567)
Valvular heart disease	[0, 5)	1	NA	1	NA
	[5, 6)	1.079	(1.042, 1.118)	1.092	(1.044, 1.143)
	[6, 7)	1.071	(1.037, 1.106)	1.124	(1.079, 1.171)
	[7, 8)	1.123	(1.090, 1.157)	1.171	(1.128, 1.217)
	[8, 9)	1.069	(1.039, 1.101)	1.121	(1.081, 1.163)
	[9, 10)	1.010	(0.980, 1.040)	1.050	(1.013, 1.089)
	[10, 11)	0.950	(0.920, 0.981)	0.998	(0.963, 1.035)
	[11, 12)	0.894	(0.861, 0.930)	0.937	(0.903, 0.972)
	[12, 13)	0.870	(0.828, 0.915)	0.905	(0.871, 0.940)
	[13, 14)	0.825	(0.772, 0.880)	0.871	(0.837, 0.906)
	[14, ∞)	0.800	(0.737, 0.869)	0.822	(0.791, 0.856)
Thoracic and abdominal aortic aneurysms	[0, 5)	1	NA	1	NA
	[5, 6)	1.030	(0.980, 1.082)	0.995	(0.946, 1.047)
	[6, 7)	1.048	(1.002, 1.097)	0.975	(0.931, 1.021)
	[7, 8)	1.073	(1.029, 1.120)	0.967	(0.926, 1.010)
	[8, 9)	1.076	(1.033, 1.121)	0.983	(0.943, 1.024)
	[9, 10)	1.119	(1.074, 1.166)	0.991	(0.951, 1.032)
	[10, 11)	1.130	(1.081, 1.181)	1.053	(1.011, 1.096)
	[11, 12)	1.213	(1.153, 1.276)	1.117	(1.072, 1.163)
	[12, 13)	1.298	(1.222, 1.380)	1.145	(1.099, 1.194)
	[13, 14)	1.326	(1.229, 1.430)	1.187	(1.137, 1.238)
	[14, ∞)	1.303	(1.186, 1.432)	1.141	(1.093, 1.191)

Supplementary Table S10. Numerical results for Figure 9

	Exposure interval	Distance to the nearest hospital ≤ 75 th percentile		Distance to the nearest hospital ≥ 75 th percentile	
		Relative risk	95% CI	Relative risk	95% CI
Composite CVD	[0, 5)	1	NA	1	NA
	[5, 6)	1.059	(1.042, 1.077)	1.062	(1.049, 1.075)
	[6, 7)	1.096	(1.079, 1.112)	1.149	(1.136, 1.162)
	[7, 8)	1.157	(1.141, 1.174)	1.194	(1.181, 1.207)
	[8, 9)	1.205	(1.189, 1.222)	1.250	(1.238, 1.262)
	[9, 10)	1.267	(1.250, 1.285)	1.349	(1.336, 1.362)
	[10, 11)	1.369	(1.350, 1.388)	1.484	(1.470, 1.499)
	[11, 12)	1.497	(1.476, 1.518)	1.652	(1.635, 1.668)
	[12, 13)	1.630	(1.607, 1.653)	1.759	(1.740, 1.778)
	[13, 14)	1.704	(1.680, 1.729)	1.846	(1.825, 1.867)
	[14, ∞)	1.774	(1.749, 1.799)	1.936	(1.912, 1.961)
Ischemic heart disease	[0, 5)	1	NA	1	NA
	[5, 6)	0.998	(0.974, 1.022)	1.025	(1.007, 1.045)
	[6, 7)	1.009	(0.988, 1.031)	1.105	(1.086, 1.124)
	[7, 8)	1.051	(1.030, 1.073)	1.130	(1.112, 1.148)
	[8, 9)	1.104	(1.082, 1.126)	1.182	(1.165, 1.200)
	[9, 10)	1.182	(1.159, 1.205)	1.307	(1.288, 1.326)
	[10, 11)	1.302	(1.277, 1.328)	1.494	(1.472, 1.516)
	[11, 12)	1.477	(1.448, 1.507)	1.727	(1.701, 1.753)
	[12, 13)	1.651	(1.618, 1.684)	1.864	(1.835, 1.894)
	[13, 14)	1.760	(1.725, 1.796)	2.008	(1.974, 2.042)
	[14, ∞)	1.854	(1.817, 1.891)	2.131	(2.092, 2.170)
Cerebrovascular disease	[0, 5)	1	NA	1	NA
	[5, 6)	1.096	(1.069, 1.125)	1.075	(1.053, 1.097)
	[6, 7)	1.147	(1.121, 1.174)	1.164	(1.143, 1.187)
	[7, 8)	1.229	(1.202, 1.256)	1.249	(1.227, 1.271)
	[8, 9)	1.293	(1.266, 1.321)	1.325	(1.303, 1.347)
	[9, 10)	1.368	(1.339, 1.398)	1.422	(1.399, 1.445)
	[10, 11)	1.458	(1.427, 1.490)	1.531	(1.506, 1.557)
	[11, 12)	1.573	(1.540, 1.607)	1.674	(1.646, 1.703)
	[12, 13)	1.687	(1.651, 1.724)	1.792	(1.760, 1.824)
	[13, 14)	1.747	(1.709, 1.786)	1.848	(1.812, 1.885)
	[14, ∞)	1.791	(1.752, 1.830)	1.889	(1.849, 1.929)
Heart failure	[0, 5)	1	NA	1	NA
	[5, 6)	1.198	(1.160, 1.236)	1.171	(1.142, 1.201)
	[6, 7)	1.315	(1.278, 1.353)	1.321	(1.291, 1.352)
	[7, 8)	1.442	(1.403, 1.482)	1.429	(1.399, 1.461)
	[8, 9)	1.511	(1.471, 1.552)	1.524	(1.493, 1.556)
	[9, 10)	1.596	(1.554, 1.639)	1.643	(1.610, 1.677)
	[10, 11)	1.737	(1.692, 1.784)	1.798	(1.762, 1.835)
	[11, 12)	1.893	(1.843, 1.945)	2.018	(1.977, 2.061)
	[12, 13)	2.054	(1.999, 2.110)	2.160	(2.114, 2.208)
	[13, 14)	2.136	(2.079, 2.195)	2.242	(2.190, 2.296)
	[14, ∞)	2.272	(2.212, 2.335)	2.371	(2.312, 2.431)
Cardiomyopathy	[0, 5)	1	NA	1	NA
	[5, 6)	1.034	(0.859, 1.244)	1.138	(0.973, 1.331)
	[6, 7)	1.077	(0.913, 1.270)	1.165	(1.006, 1.350)
	[7, 8)	1.107	(0.946, 1.295)	1.166	(1.017, 1.338)

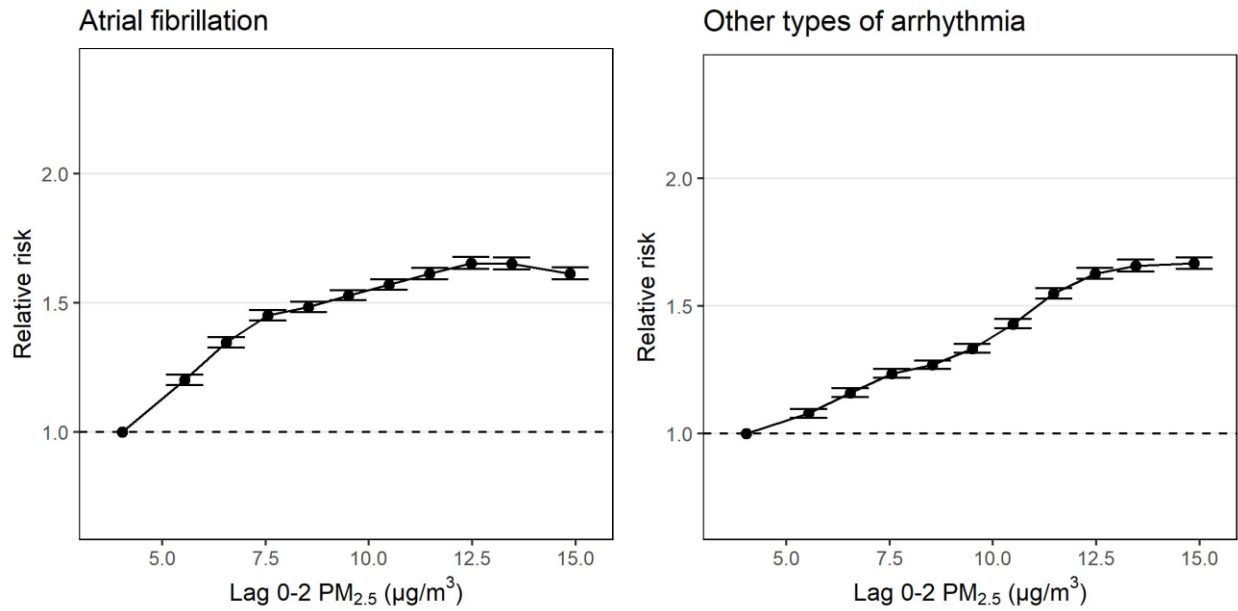
	[8, 9)	1.141	(0.979, 1.331)	1.146	(1.006, 1.305)
	[9, 10)	1.261	(1.083, 1.469)	1.311	(1.155, 1.489)
	[10, 11)	1.335	(1.146, 1.556)	1.481	(1.304, 1.682)
	[11, 12)	1.450	(1.244, 1.691)	1.612	(1.413, 1.838)
	[12, 13)	1.603	(1.373, 1.873)	1.737	(1.511, 1.996)
	[13, 14)	1.705	(1.457, 1.996)	1.863	(1.602, 2.165)
	[14, ∞)	1.718	(1.470, 2.008)	1.984	(1.687, 2.333)
Arrhythmia	[0, 5)	1	NA	1	NA
	[5, 6)	1.128	(1.099, 1.157)	1.114	(1.091, 1.138)
	[6, 7)	1.208	(1.181, 1.236)	1.263	(1.239, 1.288)
	[7, 8)	1.301	(1.273, 1.330)	1.317	(1.293, 1.341)
	[8, 9)	1.329	(1.301, 1.357)	1.374	(1.351, 1.398)
	[9, 10)	1.374	(1.345, 1.403)	1.462	(1.438, 1.487)
	[10, 11)	1.441	(1.411, 1.472)	1.549	(1.523, 1.575)
	[11, 12)	1.524	(1.492, 1.557)	1.636	(1.608, 1.665)
	[12, 13)	1.593	(1.559, 1.628)	1.679	(1.648, 1.711)
	[13, 14)	1.617	(1.582, 1.653)	1.677	(1.643, 1.712)
	[14, ∞)	1.604	(1.569, 1.639)	1.708	(1.670, 1.747)
Valvular heart disease	[0, 5)	1	NA	1	NA
	[5, 6)	1.092	(1.041, 1.146)	1.082	(1.038, 1.128)
	[6, 7)	1.085	(1.039, 1.133)	1.117	(1.074, 1.161)
	[7, 8)	1.120	(1.075, 1.166)	1.172	(1.131, 1.215)
	[8, 9)	1.062	(1.021, 1.106)	1.111	(1.074, 1.150)
	[9, 10)	0.990	(0.951, 1.030)	1.047	(1.012, 1.084)
	[10, 11)	0.938	(0.901, 0.976)	0.970	(0.937, 1.005)
	[11, 12)	0.875	(0.840, 0.912)	0.910	(0.876, 0.945)
	[12, 13)	0.853	(0.819, 0.890)	0.837	(0.802, 0.873)
	[13, 14)	0.807	(0.773, 0.843)	0.835	(0.795, 0.877)
	[14, ∞)	0.764	(0.732, 0.797)	0.786	(0.743, 0.831)
Thoracic and abdominal aortic aneurysms	[0, 5)	1	NA	1	NA
	[5, 6)	0.983	(0.925, 1.044)	1.060	(1.007, 1.116)
	[6, 7)	0.978	(0.927, 1.033)	1.105	(1.053, 1.159)
	[7, 8)	0.995	(0.945, 1.048)	1.116	(1.068, 1.167)
	[8, 9)	1.012	(0.963, 1.064)	1.150	(1.103, 1.200)
	[9, 10)	1.031	(0.981, 1.083)	1.204	(1.156, 1.255)
	[10, 11)	1.092	(1.038, 1.147)	1.273	(1.221, 1.327)
	[11, 12)	1.170	(1.113, 1.230)	1.357	(1.299, 1.417)
	[12, 13)	1.219	(1.159, 1.283)	1.391	(1.328, 1.457)
	[13, 14)	1.267	(1.202, 1.334)	1.442	(1.370, 1.518)
	[14, ∞)	1.225	(1.164, 1.290)	1.437	(1.358, 1.522)

Supplementary Table S11. Numerical results for Figure 10

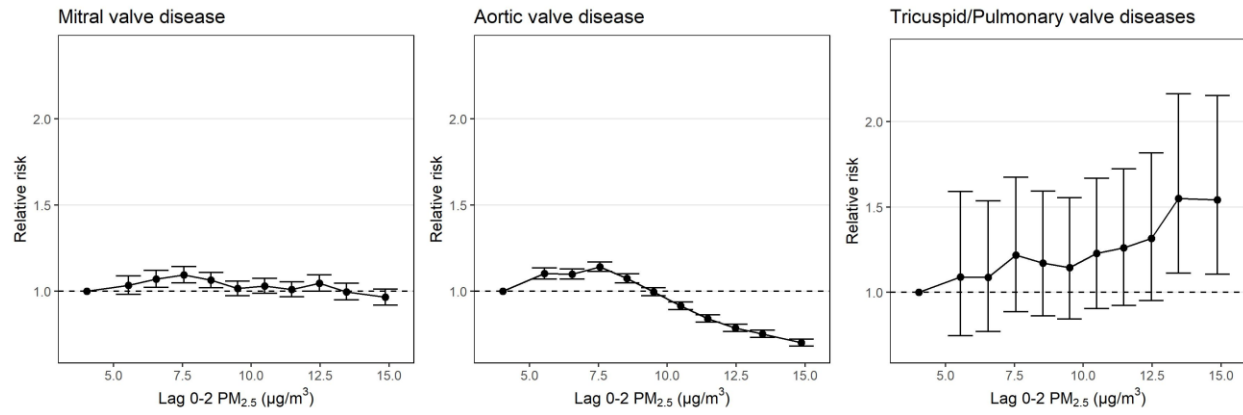
	Exposure interval	ADI ≤75th percentile		ADI ≥75th percentile	
		Relative risk	95% CI	Relative risk	95% CI
Composite CVD	[0, 5)	1	NA	1	NA
	[5, 6)	1.060	(1.049, 1.070)	1.077	(1.044, 1.111)
	[6, 7)	1.105	(1.096, 1.115)	1.181	(1.149, 1.214)
	[7, 8)	1.158	(1.148, 1.167)	1.257	(1.225, 1.291)
	[8, 9)	1.204	(1.195, 1.214)	1.287	(1.254, 1.319)
	[9, 10)	1.269	(1.259, 1.279)	1.375	(1.341, 1.410)
	[10, 11)	1.371	(1.361, 1.382)	1.486	(1.450, 1.524)
	[11, 12)	1.501	(1.490, 1.513)	1.648	(1.608, 1.690)
	[12, 13)	1.627	(1.614, 1.640)	1.773	(1.729, 1.819)
	[13, 14)	1.710	(1.696, 1.725)	1.839	(1.792, 1.887)
[14, ∞)	1.778	(1.763, 1.793)	1.937	(1.887, 1.988)	
Ischemic heart disease	[0, 5)	1	NA	1	NA
	[5, 6)	0.998	(0.984, 1.012)	1.080	(1.033, 1.130)
	[6, 7)	1.020	(1.007, 1.034)	1.138	(1.093, 1.184)
	[7, 8)	1.052	(1.040, 1.065)	1.169	(1.125, 1.214)
	[8, 9)	1.104	(1.092, 1.117)	1.167	(1.125, 1.211)
	[9, 10)	1.185	(1.172, 1.199)	1.261	(1.216, 1.307)
	[10, 11)	1.309	(1.294, 1.324)	1.401	(1.351, 1.453)
	[11, 12)	1.493	(1.476, 1.511)	1.586	(1.529, 1.645)
	[12, 13)	1.663	(1.644, 1.683)	1.708	(1.646, 1.772)
	[13, 14)	1.788	(1.767, 1.810)	1.797	(1.731, 1.866)
[14, ∞)	1.877	(1.854, 1.899)	1.900	(1.829, 1.973)	
Cerebrovascular disease	[0, 5)	1	NA	1	NA
	[5, 6)	1.094	(1.078, 1.111)	1.059	(1.004, 1.117)
	[6, 7)	1.151	(1.136, 1.167)	1.222	(1.167, 1.280)
	[7, 8)	1.227	(1.212, 1.243)	1.357	(1.299, 1.418)
	[8, 9)	1.288	(1.272, 1.304)	1.433	(1.373, 1.495)
	[9, 10)	1.362	(1.345, 1.378)	1.535	(1.471, 1.601)
	[10, 11)	1.450	(1.432, 1.468)	1.639	(1.571, 1.710)
	[11, 12)	1.563	(1.544, 1.583)	1.798	(1.724, 1.876)
	[12, 13)	1.673	(1.652, 1.695)	1.933	(1.852, 2.017)
	[13, 14)	1.737	(1.714, 1.761)	1.991	(1.906, 2.080)
[14, ∞)	1.781	(1.758, 1.805)	2.050	(1.962, 2.143)	
Heart failure	[0, 5)	1	NA	1	NA
	[5, 6)	1.203	(1.181, 1.226)	1.099	(1.034, 1.168)
	[6, 7)	1.326	(1.304, 1.349)	1.309	(1.241, 1.380)
	[7, 8)	1.442	(1.419, 1.465)	1.468	(1.395, 1.544)
	[8, 9)	1.511	(1.488, 1.534)	1.532	(1.458, 1.609)
	[9, 10)	1.593	(1.569, 1.617)	1.656	(1.577, 1.739)
	[10, 11)	1.724	(1.698, 1.750)	1.818	(1.731, 1.909)
	[11, 12)	1.877	(1.848, 1.906)	2.051	(1.953, 2.154)
	[12, 13)	2.029	(1.997, 2.061)	2.222	(2.115, 2.335)
	[13, 14)	2.125	(2.090, 2.160)	2.276	(2.164, 2.393)
[14, ∞)	2.254	(2.218, 2.291)	2.481	(2.359, 2.611)	
Cardiomyopathy	[0, 5)	1	NA	1	NA
	[5, 6)	1.056	(0.944, 1.182)	1.210	(0.831, 1.761)
	[6, 7)	1.099	(0.992, 1.218)	1.144	(0.815, 1.605)
	[7, 8)	1.115	(1.013, 1.226)	1.182	(0.857, 1.630)
	[8, 9)	1.160	(1.059, 1.271)	1.033	(0.756, 1.413)

	[9, 10)	1.283	(1.172, 1.404)	1.214	(0.891, 1.654)
	[10, 11)	1.366	(1.248, 1.495)	1.339	(0.984, 1.822)
	[11, 12)	1.485	(1.354, 1.629)	1.450	(1.064, 1.977)
	[12, 13)	1.602	(1.456, 1.763)	1.698	(1.244, 2.320)
	[13, 14)	1.730	(1.567, 1.909)	1.739	(1.263, 2.394)
	[14, ∞)	1.772	(1.607, 1.954)	1.861	(1.240, 2.373)
Arrhythmia	[0, 5)	1	NA	1	NA
	[5, 6)	1.126	(1.109, 1.143)	1.121	(1.062, 1.183)
	[6, 7)	1.223	(1.206, 1.240)	1.309	(1.249, 1.373)
	[7, 8)	1.307	(1.291, 1.324)	1.385	(1.324, 1.449)
	[8, 9)	1.342	(1.326, 1.359)	1.398	(1.338, 1.461)
	[9, 10)	1.392	(1.375, 1.409)	1.472	(1.409, 1.538)
	[10, 11)	1.466	(1.448, 1.484)	1.527	(1.462, 1.595)
	[11, 12)	1.546	(1.527, 1.566)	1.629	(1.560, 1.703)
	[12, 13)	1.615	(1.594, 1.636)	1.671	(1.598, 1.746)
	[13, 14)	1.635	(1.613, 1.658)	1.685	(1.610, 1.763)
	[14, ∞)	1.625	(1.603, 1.647)	1.723	(1.646, 1.805)
Valvular heart disease	[0, 5)	1	NA	1	NA
	[5, 6)	1.083	(1.052, 1.115)	1.133	(1.002, 1.281)
	[6, 7)	1.072	(1.044, 1.101)	1.340	(1.203, 1.493)
	[7, 8)	1.125	(1.098, 1.154)	1.265	(1.140, 1.403)
	[8, 9)	1.069	(1.044, 1.095)	1.202	(1.087, 1.329)
	[9, 10)	1.002	(0.979, 1.026)	1.106	(1.001, 1.223)
	[10, 11)	0.949	(0.926, 0.972)	1.020	(0.923, 1.128)
	[11, 12)	0.890	(0.868, 0.912)	0.939	(0.848, 1.039)
	[12, 13)	0.859	(0.837, 0.883)	0.884	(0.797, 0.980)
	[13, 14)	0.821	(0.797, 0.845)	0.849	(0.761, 0.947)
	[14, ∞)	0.765	(0.743, 0.788)	0.839	(0.750, 0.939)
Thoracic and abdominal aortic aneurysms	[0, 5)	1	NA	1	NA
	[5, 6)	1.003	(0.966, 1.040)	1.073	(0.941, 1.222)
	[6, 7)	1.007	(0.974, 1.042)	1.077	(0.959, 1.210)
	[7, 8)	1.021	(0.989, 1.053)	1.076	(0.964, 1.201)
	[8, 9)	1.041	(1.010, 1.072)	1.074	(0.966, 1.195)
	[9, 10)	1.068	(1.037, 1.100)	1.081	(0.973, 1.201)
	[10, 11)	1.134	(1.100, 1.168)	1.116	(1.004, 1.240)
	[11, 12)	1.212	(1.175, 1.250)	1.194	(1.074, 1.328)
	[12, 13)	1.260	(1.220, 1.301)	1.224	(1.100, 1.363)
	[13, 14)	1.308	(1.264, 1.352)	1.268	(1.135, 1.416)
	[14, ∞)	1.254	(1.213, 1.297)	1.285	(1.148, 1.439)

Supplementary Figure S1. E-R relationships between calibrated lag 0–2 PM_{2.5} concentration and relative risks (and 95% CIs) of incident hospitalizations for subtypes of arrhythmia



Supplementary Figure S2. E-R relationships between calibrated lag 0–2 PM_{2.5} concentration and relative risks (and 95% CIs) of incident hospitalizations for subtypes of valvular heart disease



Supplementary Figure S3. E-R relationships between calibrated lag 0–2 PM_{2.5} exposure and relative risks (and 95% CIs) of incident CVD hospitalizations, excluding individual-level characteristics

