Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.

eMethods

Outcome identification

There were 626 and 623 participants lost to follow up for depression and anxiety outcomes, respectively.

Covariates

Age was categorized into <65 years and ≥65 years. Race and ethnicity were classified as Asian (Indian, Pakistani, Bangladeshi, or any other Asian background except Chinese), Black, Chinese, multiracial, White, and other ethnic group. Considering the relatively small number of Asian, Black, Chinese, multiracial and other ethnic group, these were synthesized into "Others" in the analysis. Length of time at residence was collected with touchscreen questionnaire and categorized into <10 years and ≥10 years. Townsend deprivation index is a continuous composite area-level indicator of socioeconomic status and was assigned based on residential postcode, provided directly by the UK Biobank. Education was synthesized into "others" and "university or college degree". Employment status was categorized into in paid or not (not employed or not in paid). 24-h weighted average noise was calculated with a 5 and 10-decibel (dB) penalty added to evening and night time, respectively. Proximity to major road was indicated by the inverse distance to the nearest major road.

Statistical analysis

The standardized loadings for $PM_{2.5}$, NO_2, and NO with the first principal component are 0.94, 0.94, and 0.89, respectively.

Sensitivity analysis

Household income was categorized into <£18 000, £18 000–£30 999, £31 000–51 999, >£52 000. Considering the high missing proportion (large than 15%) of household income, we used a new category 'missing' to maximize the data. Income score and housing score are single area-level indicator of socioeconomic status, and are calculated in different ways between England, Scotland and Wales. Thus, they were scaled to reduce the difference in calculation in this study. We used green space percentage in 1000-m buffer to indicate proximity to green space given the data available. Similarly, we used median value to impute continuous income score, housing score, and green space percentage in 1000-m buffer.

eTable 1. Description of Air Pollutants

	min	**25th**	**median**	**75th**	**max**	**IQR**
$PM_{2.5}$ ($\mu g/m^3$)	8.2	9.3	9.9	10.6	21.3	1.3
$PM_{2.5-10}$ ($\mu g/m^3$)	5.6	5.8	6.1	6.6	12.8	0.8
NO_2 ($\mu g/m^3$)	12.9	21.3	26.0	31.1	108.5	9.9
NO ($\mu g/m^3$)	0	11.6	15.9	20.6	160.1	9.0
Air pollution score	-1.7	-0.6	-0.1	0.5	12.8	1.1

$PM_{2.5}$, particulate matter with aerodynamic diameter ≤2.5 μm; $PM_{2.5-10}$, particulate matter with aerodynamic diameter between 2.5 and 10 μm; NO_2, nitrogen dioxide; NO, nitric oxide.

eTable 2. Annual Guidelines for $PM_{2.5}$ and NO_2 in 2021 WHO Global Air Quality Guidelines and Standards in Other Countries

Air pollutants	**2021AQGs**	**UK**	**US**	**European Obligations**
$PM_{2.5}$ ($\mu g/m^3$)	5	20 (except Scotland) 10 (Scotland)	12 (primary) 15 (secondary)	25 (Stage 1 Limit) 20 (Stage 2 Limit)
NO_2 ($\mu g/m^3$ or ppb)	10[a]	40[a]	53[b]	40[a]

AQGs, air quality guidelines; $PM_{2.5}$, particulate matter with aerodynamic diameter ≤2.5 μm; NO_2, nitrogen dioxide. [a]: $\mu g/m^3$, [b]: ppb

eTable 3. The Spearman Correlations Between Air Pollutants

	$PM_{2.5}$	**$PM_{2.5-10}$**	**NO_2**	**NO**
$PM_{2.5}$	1.00			
$PM_{2.5-10}$	0.28*	1.00		
NO_2	0.85*	0.29*	1.00	
NO	0.75*	0.25*	0.68*	1.00

$PM_{2.5}$, particulate matter with aerodynamic diameter ≤2.5 μm; $PM_{2.5-10}$, particulate matter with aerodynamic diameter between 2.5 and 10 μm; NO_2, nitrogen dioxide; NO, nitric oxide.

*Statistically significant correlation (p<0.05).

eTable 4. Censoring Rates for Study Participants According to Categorical Air Pollutants

	$PM_{2.5}$	**$PM_{2.5-10}$**	**NO_2**	**NO**	**Air pollution score**
Depression					
Quartile 1	97.21%	96.78%	97.18%	97.14%	97.21%
Quartile 2	96.84%	96.63%	96.71%	96.80%	96.86%
Quartile 3	96.48%	96.56%	96.42%	96.50%	96.40%
Quartile 4	95.99%	96.54%	96.19%	96.07%	96.03%
Anxiety					
Quartile 1	96.39%	96.06%	96.30%	96.40%	96.40%
Quartile 2	96.04%	95.81%	95.98%	96.00%	96.01%
Quartile 3	95.76%	95.94%	95.66%	95.68%	95.70%
Quartile 4	95.55%	95.93%	95.78%	95.64%	95.62%

$PM_{2.5}$, particulate matter with aerodynamic diameter ≤2.5 μm; $PM_{2.5-10}$, particulate matter with aerodynamic diameter between 2.5 and 10 μm; NO_2, nitrogen dioxide; NO, nitric oxide.

eTable 5. Associations of Incidence of Depression and Anxiety With Individual Air Pollutant

	$PM_{2.5}$				$PM_{2.5-10}$				NO_2				NO			
	HR (95% CI) [a]	***P* value** [a]	**HR (95% CI)** [b]	***P* value** [b]	**HR (95% CI)** [a]	***P* value** [a]	**HR (95% CI)** [b]	***P* value** [b]	**HR (95% CI)** [a]	***P* value** [a]	**HR (95% CI)** [b]	***P* value** [b]	**HR (95% CI)** [a]	***P* value** [a]	**HR (95% CI)** [b]	***P* value** [b]
Depression																
Q1	ref	/	ref	/	ref	/	ref	/	ref	/	ref	/	ref	/	ref	/
Q2	1.13 (1.08, 1.19)	<0.001	1.09 (1.03, 1.14)	0.002	1.04 (0.99, 1.10)	0.081	1.01 (0.96, 1.06)	0.707	1.17 (1.11, 1.23)	<0.001	1.11 (1.06, 1.17)	<0.001	1.12 (1.06, 1.18)	<0.001	1.07 (1.02, 1.13)	0.006
Q3	1.26 (1.20, 1.33)	<0.001	1.14 (1.08, 1.20)	<0.001	1.09 (1.04, 1.15)	<0.001	1.01 (0.96, 1.07)	0.567	1.29 (1.22, 1.36)	<0.001	1.15 (1.09, 1.22)	<0.001	1.21 (1.15, 1.27)	<0.001	1.11 (1.06, 1.17)	<0.001
Q4	1.42 (1.34, 1.49)	<0.001	1.15 (1.08, 1.21)	<0.001	1.10 (1.04, 1.15)	<0.001	1.01 (0.95, 1.06)	0.804	1.45 (1.37, 1.53)	<0.001	1.14 (1.07, 1.21)	<0.001	1.33 (1.27, 1.40)	<0.001	1.12 (1.06, 1.18)	<0.001
Anxiety																
Q1	ref	/	ref	/	ref	/	ref	/	ref	/	ref	/	ref	/	ref	/
Q2	1.11 (1.06, 1.17)	<0.001	1.09 (1.04, 1.14)	<0.001	1.03 (0.99, 1.08)	0.145	1.02 (0.97, 1.06)	0.478	1.09 (1.04, 1.14)	<0.001	1.06 (1.01, 1.11)	0.018	1.11 (1.06, 1.16)	<0.001	1.09 (1.04, 1.14)	<0.001
Q3	1.18 (1.13, 1.24)	<0.001	1.11 (1.06, 1.17)	<0.001	1.05 (1.00, 1.10)	0.037	1.01 (0.96, 1.06)	0.752	1.18 (1.12, 1.23)	<0.001	1.10 (1.05, 1.15)	<0.001	1.19 (1.13, 1.24)	<0.001	1.13 (1.08, 1.18)	<0.001
Q4	1.25 (1.19, 1.31)	<0.001	1.11 (1.05, 1.16)	<0.001	1.08 (1.03, 1.13)	<0.001	1.03 (0.98, 1.08)	0.229	1.24 (1.18, 1.30)	<0.001	1.08 (1.03, 1.15)	0.004	1.20 (1.15, 1.26)	<0.001	1.08 (1.03, 1.14)	0.003

[a] Models were adjusted for age, sex and assessment centre.

[b] Models were further adjusted for ethnicity, length of time at residence, Townsend deprivation index, education level, employment status, 24-h weighted average noise, and

proximity to major roads (main model).
HR, hazard ratio; CI, confidence interval.

eTable 6. Interaction Between $PM_{2.5}$, NO_2, and NO for Depression and Anxiety in Additive Hazards Models

	No. additional deaths per 100,000 person-years (95% CI)	
	Depression	**Anxiety**
High $PM_{2.5}$ vs Low $PM_{2.5}$	0.308 (-0.750, 1.370)	0.418 (-0.752, 1.590)
High NO_2 vs Low NO_2	-0.018 (-0.767, 0.731)	-0.379 (-0.996, 0.238)
High $PM_{2.5}$ * High NO_2	-0.192 (-1.490, 1.100)	0.016 (-1.310, 1.340)
High $PM_{2.5}$ vs Low $PM_{2.5}$	0.159 (-0.131, 0.449)	0.136 (-0.170, 0.442)
High NO vs Low NO	-0.073 (-0.277, 0.131)	-0.030 (-0.277, 0.217)
High $PM_{2.5}$ * High NO	0 (-0.355, 0.355)	-0.037 (-0.427, 0.353)
High NO_2 vs Low NO_2	0.217 (0.009, 0.425)	0.243 (0.016, 0.470)
High NO vs Low NO	-0.083 (-0.262, 0.096)	0.020 (-0.194, 0.233)
High NO_2 * High NO	-0.019 (-0.289, 0.252)	-0.210 (-0.518, 0.098)

Models were adjusted for age, sex, assessment centre, ethnicity, length of time at residence, Townsend deprivation index, education level, employment status, 24-h weighted average noise, and proximity to major roads.

High air pollution level indicates $\geqslant 75^{th}$, and low air pollution level indicates $< 25^{th}$.

eTable 7. Subgroup Analysis and Effect Modification for the Association of Incidence of Depression and Anxiety With Air Pollution Score

			Q1		Q2		Q3		Q4	
Subgroup		**N**	**HR (95% CI)**	***P*-interaction**	**HR (95% CI)**	***P*-interaction**	**HR (95% CI)**	***P*-interaction**	**HR (95% CI)**	***P*-interaction**
Depression										
Age	<65 years	312 639	ref	ref	1.07 (1.01, 1.14)	ref	1.16 (1.09, 1.23)	ref	1.13 (1.05, 1.20)	ref
	≥65 years	76 546	ref	ref	1.11 (0.99, 1.25)	0.718	1.25 (1.11, 1.41)	0.544	1.31 (1.14, 1.50)	0.397
Sex	Female	205 855	ref	ref	1.05 (0.98, 1.12)	ref	1.13 (1.06, 1.21)	ref	1.13 (1.05, 1.22)	ref
	Male	183 330	ref	ref	1.12 (1.03, 1.22)	0.223	1.24 (1.13, 1.35)	0.065	1.20 (1.09, 1.32)	0.061
Length of time at residence	<10 years	122 209	ref	ref	1.12 (1.03, 1.23)	ref	1.20 (1.10, 1.31)	ref	1.18 (1.07, 1.30)	ref
	≥10 years	266 976	ref	ref	1.05 (0.99, 1.13)	0.280	1.16 (1.08, 1.24)	0.567	1.15 (1.06, 1.24)	0.556
Education	Other	262 624	ref	ref	1.05 (0.99, 1.12)	ref	1.15 (1.08, 1.22)	ref	1.13 (1.05, 1.21)	ref
	University or college degree	126 561	ref	ref	1.17 (1.06, 1.30)	0.113	1.25 (1.12, 1.39)	0.509	1.27 (1.13, 1.43)	0.917
Anxiety										
Age	<65 years	312 639	ref	ref	1.08 (1.02, 1.13)	ref	1.12 (1.06, 1.18)	ref	1.08 (1.02, 1.15)	ref

	≥65 years	76 546	ref	ref	1.14 (1.03, 1.26)	0.413	1.19 (1.07, 1.32)	0.648	1.24 (1.10, 1.40)	0.311
Sex	Female	205 855	ref	ref	1.05 (1.00, 1.12)	ref	1.11 (1.05, 1.18)	ref	1.08 (1.01, 1.16)	ref
	Male	183 330	ref	ref	1.16 (1.07, 1.26)	0.065	1.18 (1.09, 1.28)	0.284	1.16 (1.06, 1.27)	0.021
Length of time at residence	<10 years	122 209	ref	ref	1.16 (1.07, 1.25)	ref	1.16 (1.07, 1.26)	ref	1.09 (1.00, 1.20)	ref
	≥10 years	266 976	ref	ref	1.06 (1.00, 1.12)	0.051	1.12 (1.06, 1.19)	0.386	1.12 (1.05, 1.20)	0.854
Education	Other	262 624	ref	ref	1.09 (1.03, 1.15)	ref	1.14 (1.08, 1.20)	ref	1.11 (1.04, 1.18)	ref
	University or college degree	126 561	ref	ref	1.10 (1.01, 1.20)	0.875	1.12 (1.02, 1.23)	0.486	1.13 (1.02, 1.25)	0.561

HR, hazard ratio; CI, confidence interval. The models were adjusted for age, sex, assessment centre, ethnicity, length of time at residence, Townsend deprivation index, education level, employment status, 24-h weighted average noise, and proximity to major roads (main model).

eTable 8. Subgroup Analysis and Effect Modification for the Association of Incidence of Depression and Anxiety With $PM_{2.5}$

			Q1		Q2		Q3		Q4	
Subgroup		**N**	**HR (95% CI)**	***P*-interaction**	**HR (95% CI)**	***P*-interaction**	**HR (95% CI)**	***P*-interaction**	**HR (95% CI)**	***P*-interaction**
Depression										
Age	<65 years	312 639	ref	ref	1.09 (1.02, 1.15)	ref	1.13 (1.07, 1.20)	ref	1.13 (1.06, 1.20)	ref
	≥65 years	76 546	ref	ref	1.09 (0.97, 1.22)	0.845	1.18 (1.05, 1.32)	0.850	1.22 (1.07, 1.39)	0.907
Sex	Female	205 855	ref	ref	1.07 (1.00, 1.14)	ref	1.09 (1.02, 1.17)	ref	1.10 (1.03, 1.19)	ref
	Male	183 330	ref	ref	1.11 (1.02, 1.21)	0.444	1.21 (1.11, 1.32)	0.061	1.21 (1.10, 1.33)	0.028
Length of time at residence	<10 years	122 209	ref	ref	1.11 (1.02, 1.21)	ref	1.17 (1.07, 1.28)	ref	1.16 (1.06, 1.28)	ref
	≥10 years	266 976	ref	ref	1.07 (1.00, 1.14)	0.543	1.12 (1.05, 1.20)	0.496	1.14 (1.06, 1.22)	0.695
Education	Other	262 624	ref	ref	1.07 (1.00, 1.13)	ref	1.13 (1.06, 1.20)	ref	1.13 (1.06, 1.21)	ref
	University or college degree	126 561	ref	ref	1.15 (1.03, 1.27)	0.303	1.18 (1.06, 1.31)	0.897	1.21 (1.08, 1.35)	0.665
Anxiety										
Age	<65 years	312 639	ref	ref	1.06 (1.01, 1.12)	ref	1.11 (1.05, 1.17)	ref	1.08 (1.02, 1.14)	ref

	≥65 years	76 546	ref	ref	1.17 (1.06, 1.29)	0.149	1.13 (1.02, 1.26)	0.933	1.22 (1.09, 1.37)	0.317
Sex	Female	205 855	ref	ref	1.06 (1.01, 1.13)	ref	1.11 (1.05, 1.17)	ref	1.07 (1.00, 1.14)	ref
	Male	183 330	ref	ref	1.13 (1.04, 1.22)	0.285	1.12 (1.04, 1.22)	0.779	1.18 (1.08, 1.29)	0.009
Length of time at residence	<10 years	122 209	ref	ref	1.13 (1.04, 1.23)	ref	1.13 (1.05, 1.23)	ref	1.11 (1.02, 1.21)	ref
	≥10 years	266 976	ref	ref	1.06 (1.00, 1.13)	0.189	1.10 (1.04, 1.17)	0.517	1.11 (1.04, 1.18)	0.597
Education	Other	262 624	ref	ref	1.07 (1.01, 1.13)	ref	1.11 (1.05, 1.17)	ref	1.10 (1.03, 1.16)	ref
	University or college degree	126 561	ref	ref	1.14 (1.04, 1.24)	0.295	1.11 (1.02, 1.22)	0.701	1.15 (1.04, 1.27)	0.961

$PM_{2.5}$, particulate matter with aerodynamic diameter ≤2.5 μm; HR, hazard ratio; CI, confidence interval. Models were adjusted for age, sex, assessment centre, ethnicity, length of time at residence, Townsend deprivation index, education level, employment status, 24-h weighted average noise, and proximity to major roads (main model).

eTable 9. Subgroup Analysis and Effect Modification for the Association of Incidence of Depression and Anxiety With NO_2

			Q1		Q2		Q3		Q4	
Subgroup		**N**	**HR (95% CI)**	***P*-interaction**	**HR (95% CI)**	***P*-interaction**	**HR (95% CI)**	***P*-interaction**	**HR (95% CI)**	***P*-interaction**
Depression										
Age	<65 years	312 639	ref	ref	1.10 (1.04, 1.17)	ref	1.13 (1.06, 1.20)	ref	1.10 (1.03, 1.18)	ref
	≥65 years	76 546	ref	ref	1.16 (1.03, 1.30)	0.575	1.26 (1.11, 1.42)	0.347	1.29 (1.12, 1.49)	0.365
Sex	Female	205 855	ref	ref	1.08 (1.01, 1.15)	ref	1.15 (1.07, 1.23)	ref	1.10 (1.02, 1.19)	ref
	Male	183 330	ref	ref	1.16 (1.07, 1.26)	0.138	1.16 (1.06, 1.26)	0.618	1.19 (1.08, 1.31)	0.037
Length of time at residence	<10 years	122 209	ref	ref	1.14 (1.05, 1.24)	ref	1.18 (1.08, 1.29)	ref	1.16 (1.05, 1.29)	ref
	≥10 years	266 976	ref	ref	1.10 (1.03, 1.17)	0.533	1.14 (1.07, 1.22)	0.682	1.12 (1.04, 1.21)	0.655
Education	Other	262 624	ref	ref	1.11 (1.04, 1.18)	ref	1.13 (1.06, 1.20)	ref	1.11 (1.04, 1.20)	ref
	University or college degree	126 561	ref	ref	1.12 (1.01, 1.24)	0.964	1.23 (1.10, 1.37)	0.483	1.23 (1.09, 1.38)	0.754
Anxiety										
Age	<65 years	312 639	ref	ref	1.06 (1.00, 1.11)	ref	1.09 (1.04, 1.15)	ref	1.06 (1.00, 1.13)	ref

	≥65 years	76 546	ref	ref	1.07 (0.96, 1.18)	0.959	1.13 (1.02, 1.26)	0.919	1.19 (1.05, 1.34)	0.582
Sex	Female	205 855	ref	ref	1.04 (0.99, 1.11)	ref	1.08 (1.02, 1.15)	ref	1.07 (1.00, 1.15)	ref
	Male	183 330	ref	ref	1.08 (1.00, 1.17)	0.628	1.14 (1.05, 1.23)	0.390	1.10 (1.00, 1.21)	0.163
Length of time at residence	<10 years	122 209	ref	ref	1.09 (1.01, 1.18)	ref	1.11 (1.02, 1.21)	ref	1.04 (0.94, 1.14)	ref
	≥10 years	266 976	ref	ref	1.04 (0.98, 1.10)	0.130	1.10 (1.04, 1.17)	0.534	1.11 (1.03, 1.19)	0.397
Education	Other	262 624	ref	ref	1.05 (0.99, 1.11)	ref	1.09 (1.03, 1.15)	ref	1.08 (1.01, 1.15)	ref
	University or college degree	126 561	ref	ref	1.08 (0.99, 1.18)	0.660	1.13 (1.03, 1.24)	0.845	1.10 (0.99, 1.23)	0.538

NO_2, nitrogen dioxide; HR, hazard ratio; CI, confidence interval. Models were adjusted for age, sex, assessment centre, ethnicity, length of time at residence, Townsend deprivation index, education level, employment status, 24-h weighted average noise, and proximity to major roads (main model).

eTable 10. Subgroup Analysis and Effect Modification for the Association of Incidence of Depression and Anxiety With NO

			Q1		Q2		Q3		Q4	
Subgroup		**N**	**HR (95% CI)**	***P*-interaction**	**HR (95% CI)**	***P*-interaction**	**HR (95% CI)**	***P*-interaction**	**HR (95% CI)**	***P*-interaction**
Depression										
Age	<65 years	312 639	ref	ref	1.06 (1.00, 1.12)	ref	1.11 (1.05, 1.17)	ref	1.10 (1.03, 1.17)	ref
	≥65 years	76 546	ref	ref	1.14 (1.02, 1.28)	0.308	1.12 (1.00, 1.26)	0.907	1.19 (1.04, 1.35)	0.771
Sex	Female	205 855	ref	ref	1.07 (1.01, 1.15)	ref	1.09 (1.02, 1.17)	ref	1.12 (1.04, 1.20)	ref
	Male	183 330	ref	ref	1.07 (0.98, 1.16)	1.000	1.14 (1.05, 1.24)	0.283	1.11 (1.01, 1.21)	0.472
Length of time at residence	<10 years	122 209	ref	ref	1.12 (1.03, 1.22)	ref	1.13 (1.04, 1.23)	ref	1.13 (1.03, 1.23)	ref
	≥10 years	266 976	ref	ref	1.05 (0.98, 1.12)	0.207	1.10 (1.03, 1.17)	0.660	1.12 (1.04, 1.20)	0.673
Education	Other	262 624	ref	ref	1.06 (1.00, 1.12)	ref	1.11 (1.04, 1.17)	ref	1.08 (1.01, 1.15)	ref
	University or college degree	126 561	ref	ref	1.12 (1.01, 1.24)	0.459	1.14 (1.02, 1.26)	0.834	1.26 (1.13, 1.41)	0.485
Anxiety										
Age	<65 years	312 639	ref	ref	1.08 (1.02, 1.14)	ref	1.13 (1.07, 1.19)	ref	1.07 (1.01, 1.13)	ref

	≥65 years	76 546	ref	ref	1.12 (1.01, 1.23)	0.633	1.13 (1.02, 1.25)	0.750	1.13 (1.01, 1.27)	0.877
Sex	Female	205 855	ref	ref	1.05 (1.00, 1.12)	ref	1.11 (1.05, 1.17)	ref	1.05 (0.99, 1.12)	ref
	Male	183 330	ref	ref	1.15 (1.06, 1.24)	0.099	1.18 (1.09, 1.28)	0.170	1.13 (1.04, 1.24)	0.023
Length of time at residence	<10 years	122 209	ref	ref	1.14 (1.06, 1.24)	ref	1.20 (1.11, 1.30)	ref	1.09 (0.99, 1.18)	ref
	≥10 years	266 976	ref	ref	1.06 (1.00, 1.12)	0.134	1.10 (1.04, 1.16)	0.061	1.08 (1.02, 1.15)	0.419
Education	Other	262 624	ref	ref	1.07 (1.02, 1.13)	ref	1.13 (1.07, 1.19)	ref	1.08 (1.02, 1.15)	ref
	University or college degree	126 561	ref	ref	1.13 (1.03, 1.23)	0.399	1.15 (1.05, 1.26)	0.961	1.09 (0.99, 1.21)	0.675

NO, nitric oxide; HR, hazard ratio; CI, confidence interval. Models were adjusted for age, sex, assessment centre, ethnicity, length of time at residence, Townsend deprivation index, education level, employment status, 24-h weighted average noise, and proximity to major roads (main model).

eTable 11. Associations of Incidence of Depression and Anxiety With Exposure to Air Pollutants by Multiple Imputation

	$PM_{2.5}$		$PM_{2.5-10}$		NO_2		NO		Air pollution score	
	HR (95% CI)	***P* value**	**HR (95% CI)**	***P* value**	**HR (95% CI)**	***P* value**	**HR (95% CI)**	***P* value**	**HR (95% CI)**	***P* value**
Depression										
Quartile 1	ref		ref		ref		ref		ref	
Quartile 2	1.09 (1.04, 1.15)	<0.001	1.00 (0.95, 1.05)	0.923	1.11 (1.05, 1.16)	<0.001	1.06 (1.01, 1.11)	0.019	1.09 (1.03, 1.14)	0.001
Quartile 3	1.13 (1.08, 1.19)	<0.001	1.01 (0.96, 1.06)	0.772	1.15 (1.09, 1.21)	<0.001	1.11 (1.06, 1.16)	<0.001	1.17 (1.11, 1.23)	<0.001
Quartile 4	1.14 (1.08, 1.20)	<0.001	1.01 (0.96, 1.06)	0.796	1.11 (1.05, 1.18)	<0.001	1.12 (1.06, 1.18)	0<0.001	1.14 (1.08, 1.21)	<0.001
Anxiety										
Quartile 1	ref		ref		ref		ref		ref	
Quartile 2	1.08 (1.04, 1.13)	<0.001	1.02 (0.97, 1.06)	0.427	1.05 (1.01, 1.10)	0.022	1.08 (1.03, 1.13)	0.001	1.07 (1.02, 1.12)	0.002
Quartile 3	1.10 (1.06, 1.15)	<0.001	1.01 (0.96, 1.06)	0.694	1.10 (1.05, 1.15)	<0.001	1.11 (1.06, 1.16)	<0.001	1.13 (1.08, 1.18)	<0.001
Quartile 4	1.10 (1.05, 1.15)	<0.001	1.04 (0.99, 1.09)	0.154	1.07 (1.02, 1.13)	0.011	1.08 (1.03, 1.13)	0.003	1.11 (1.05, 1.17)	<0.001

$PM_{2.5}$, particulate matter with aerodynamic diameter ≤2.5 μm; $PM_{2.5-10}$, particulate matter with aerodynamic diameter between 2.5 and 10 μm; NO_2, nitrogen dioxide; NO, nitric oxide; HR, hazard ratio; CI, confidence interval.

Models were adjusted for age, sex, assessment centre, ethnicity, length of time at residence, Townsend deprivation index, education level, employment status, 24-h weighted average noise, and proximity to major roads (main model). N = 440 828.

eTable 12. Associations of Incidence of Depression and Anxiety With Exposure to Air Pollutants by Further Adjusting for Household Income

	$PM_{2.5}$		$PM_{2.5-10}$		NO_2		NO		Air pollution score	
	HR (95% CI)	***P* value**	**HR (95% CI)**	***P* value**	**HR (95% CI)**	***P* value**	**HR (95% CI)**	***P* value**	**HR (95% CI)**	***P* value**
Incident depression										
Quartile 1	ref		ref		ref		ref		ref	
Quartile 2	1.06 (1.01, 1.12)	0.027	1.01 (0.96, 1.06)	0.841	1.08 (1.03, 1.14)	0.004	1.05 (1.00, 1.11)	0.066	1.05 (1.00, 1.11)	0.057
Quartile 3	1.10 (1.05, 1.16)	<0.001	1.01 (0.96, 1.06)	0.826	1.12 (1.06, 1.18)	<0.001	1.08 (1.02, 1.13)	0.005	1.13 (1.07, 1.19)	<0.001
Quartile 4	1.11 (1.05, 1.17)	<0.001	0.99 (0.94, 1.05)	0.848	1.10 (1.04, 1.17)	0.002	1.08 (1.02, 1.14)	0.009	1.12 (1.06, 1.19)	<0.001
Incident anxiety										
Quartile 1	ref		ref		ref		ref		ref	
Quartile 2	1.07 (1.02, 1.12)	0.003	1.02 (0.97, 1.06)	0.457	1.04 (0.99, 1.09)	0.098	1.07 (1.02, 1.12)	0.003	1.07 (1.03, 1.13)	0.002
Quartile 3	1.10 (1.05, 1.15)	<0.001	1.00 (0.96, 1.05)	0.874	1.08 (1.03, 1.14)	0.001	1.11 (1.06, 1.16)	<0.001	1.11 (1.06, 1.17)	<0.001
Quartile 4	1.09 (1.03, 1.15)	0.001	1.03 (0.98, 1.08)	0.290	1.07 (1.01, 1.13)	0.026	1.06 (1.01, 1.12)	0.024	1.09 (1.03, 1.15)	0.002

$PM_{2.5}$, particulate matter with aerodynamic diameter ≤2.5 μm; $PM_{2.5-10}$, particulate matter with aerodynamic diameter between 2.5 and 10 μm; NO_2, nitrogen dioxide; NO, nitric oxide; HR, hazard ratio; CI, confidence interval.

Models were adjusted for age, sex, assessment centre, ethnicity, length of time at residence, Townsend deprivation index, education level, employment status, 24-h weighted average noise, and proximity to major roads (main model).

eTable 13. Associations of Incidence of Depression and Anxiety With Exposure to Air Pollutants by Further Adjusting for Green Space Percentage

	$PM_{2.5}$		$PM_{2.5-10}$		NO_2		NO		Air pollution score	
	HR (95% CI)	***P* value**	**HR (95% CI)**	***P* value**	**HR (95% CI)**	***P* value**	**HR (95% CI)**	***P* value**	**HR (95% CI)**	***P* value**
Incident depression										
Quartile 1	ref		ref		ref		ref		ref	
Quartile 2	1.09 (1.03, 1.15)	0.003	1.01 (0.96, 1.06)	0.765	1.12 (1.05, 1.18)	<0.001	1.06 (1.01, 1.12)	0.021	1.09 (1.03, 1.15)	0.004
Quartile 3	1.15 (1.08, 1.22)	<0.001	1.01 (0.96, 1.06)	0.669	1.16 (1.09, 1.25)	<0.001	1.10 (1.04, 1.16)	<0.001	1.19 (1.12, 1.26)	<0.001
Quartile 4	1.15 (1.07, 1.24)	<0.001	1.01 (0.95, 1.06)	0.771	1.15 (1.06, 1.25)	<0.001	1.10 (1.04, 1.17)	0.002	1.18 (1.09, 1.27)	<0.001
Incident anxiety										
Quartile 1	ref		ref		ref		ref		ref	
Quartile 2	1.09 (1.04, 1.15)	<0.001	1.01 (0.97, 1.06)	0.525	1.06 (1.01, 1.12)	0.024	1.08 (1.03, 1.13)	0.001	1.10 (1.05, 1.16)	<0.001
Quartile 3	1.13 (1.07, 1.19)	<0.001	1.00 (0.96, 1.05)	0.838	1.11 (1.04, 1.18)	0.001	1.12 (1.07, 1.18)	<0.001	1.15 (1.09, 1.22)	<0.001
Quartile 4	1.12 (1.05, 1.20)	<0.001	1.03 (0.98, 1.08)	0.215	1.09 (1.02, 1.18)	0.019	1.07 (1.02, 1.14)	0.010	1.13 (1.06, 1.21)	<0.001

$PM_{2.5}$, particulate matter with aerodynamic diameter ≤2.5 μm; $PM_{2.5-10}$, particulate matter with aerodynamic diameter between 2.5 and 10 μm; NO_2, nitrogen dioxide; NO, nitric oxide; HR, hazard ratio; CI, confidence interval.

Models were adjusted for age, sex, assessment centre, ethnicity, length of time at residence, Townsend deprivation index, education level, employment status, 24-h weighted average noise, and proximity to major roads (main model).

eTable 14. Associations of Incidence of Depression and Anxiety With Exposure to Air Pollutants by Replacing Townsend Deprivation Index With Income Score and Housing Score

	$PM_{2.5}$		$PM_{2.5-10}$		NO_2		NO		Air pollution score	
	HR (95% CI)	***P* value**	**HR (95% CI)**	***P* value**	**HR (95% CI)**	***P* value**	**HR (95% CI)**	***P* value**	**HR (95% CI)**	***P* value**
Depression										
Quartile 1	ref		ref		ref		ref		ref	
Quartile 2	1.10 (1.04, 1.16)	<0.001	1.01 (0.96, 1.07)	0.605	1.12 (1.06, 1.18)	<0.001	1.08 (1.03, 1.14)	0.003	1.10 (1.04, 1.16)	<0.001
Quartile 3	1.18 (1.12, 1.24)	<0.001	1.02 (0.97, 1.08)	0.378	1.18 (1.12, 1.25)	<0.001	1.14 (1.08, 1.20)	<0.001	1.21 (1.14, 1.27)	<0.001
Quartile 4	1.22 (1.15, 1.29)	<0.001	1.03 (0.97, 1.08)	0.358	1.21 (1.14, 1.29)	<0.001	1.18 (1.11, 1.25)	<0.001	1.24 (1.17, 1.32)	<0.001
Anxiety										
Quartile 1	ref		ref		ref		ref		ref	
Quartile 2	1.08 (1.03, 1.13)	0.001	1.02 (0.97, 1.06)	0.500	1.05 (1.00, 1.10)	0.044	1.08 (1.04, 1.14)	<0.001	1.09 (1.04, 1.14)	<0.001
Quartile 3	1.12 (1.06, 1.17)	<0.001	1.01 (0.96, 1.06)	0.681	1.10 (1.05, 1.16)	<0.001	1.14 (1.09, 1.19)	<0.001	1.14 (1.09, 1.20)	<0.001
Quartile 4	1.12 (1.07, 1.18)	<0.001	1.03 (0.98, 1.09)	0.185	1.10 (1.04, 1.16)	<0.001	1.10 (1.05, 1.16)	<0.001	1.13 (1.07, 1.19)	<0.001

$PM_{2.5}$, particulate matter with aerodynamic diameter ≤2.5 μm; $PM_{2.5-10}$, particulate matter with aerodynamic diameter between 2.5 and 10 μm; NO_2, nitrogen dioxide; NO, nitric oxide; HR, hazard ratio; CI, confidence interval.

Models were adjusted for age, sex, assessment centre, ethnicity, length of time at residence, Townsend deprivation index, education level, employment status, 24-h weighted average noise, and proximity to major roads.

eTable 15. Associations of Incidence of Depression and Anxiety With Exposure to Air Pollutants by Avoiding the Second Depression Outcome for the Same Person if Follow-up Anxiety Was Diagnosed First, and Vice Versa

	$PM_{2.5}$		$PM_{2.5-10}$		NO_2		NO		Air pollution score	
	HR (95% CI)	***P* value**	**HR (95% CI)**	***P* value**	**HR (95% CI)**	***P* value**	**HR (95% CI)**	***P* value**	**HR (95% CI)**	***P* value**
Incident depression										
Quartile 1	ref		ref		ref		ref		ref	
Quartile 2	1.09 (1.03, 1.15)	0.002	1.01 (0.96, 1.06)	0.711	1.11 (1.05, 1.17)	<0.001	1.06 (1.00, 1.12)	0.038	1.08 (1.02, 1.14)	0.009
Quartile 3	1.14 (1.08, 1.20)	<0.001	1.02 (0.97, 1.08)	0.438	1.15 (1.09, 1.22)	<0.001	1.10 (1.05, 1.17)	<0.001	1.18 (1.11, 1.24)	<0.001
Quartile 4	1.13 (1.07, 1.20)	<0.001	1.01 (0.95, 1.07)	0.792	1.13 (1.06, 1.20)	<0.001	1.11 (1.05, 1.18)	<0.001	1.15 (1.08, 1.22)	<0.001
Incident anxiety										
Quartile 1	ref		ref		ref		ref		ref	
Quartile 2	1.08 (1.03, 1.13)	0.002	1.03 (0.98, 1.08)	0.258	1.04 (0.99, 1.09)	0.104	1.09 (1.04, 1.14)	<0.001	1.08 (1.03, 1.14)	0.001
Quartile 3	1.11 (1.06, 1.16)	<0.001	1.01 (0.97, 1.06)	0.585	1.09 (1.03, 1.14)	0.001	1.13 (1.08, 1.19)	<0.001	1.13 (1.07, 1.18)	<0.001
Quartile 4	1.10 (1.05, 1.16)	<0.001	1.04 (0.99, 1.10)	0.114	1.07 (1.01, 1.14)	0.014	1.08 (1.02, 1.14)	0.005	1.10 (1.04, 1.17)	<0.001

$PM_{2.5}$, particulate matter with aerodynamic diameter ≤2.5 μm; $PM_{2.5-10}$, particulate matter with aerodynamic diameter between 2.5 and 10 μm; NO_2, nitrogen dioxide; NO, nitric oxide; HR, hazard ratio; CI, confidence interval.

Models were adjusted for age, sex, assessment centre, ethnicity, length of time at residence, Townsend deprivation index, education level, employment status, 24-h weighted average noise, and proximity to major roads.

eTable 16. Associations of Incidence of Depression and Anxiety With Exposure to Air Pollutants by Excluding Depression and Anxiety Cases Occurred in the First 2 Years of Follow-up

	$PM_{2.5}$		$PM_{2.5-10}$		NO_2		NO		Air pollution score	
	HR (95% CI)	***P* value**	**HR (95% CI)**	***P* value**	**HR (95% CI)**	***P* value**	**HR (95% CI)**	***P* value**	**HR (95% CI)**	***P* value**
Depression										
Quartile 1	ref		ref		ref		ref		ref	
Quartile 2	1.08 (1.02, 1.14)	0.011	1.03 (0.98, 1.09)	0.254	1.11 (1.05, 1.17)	<0.001	1.08 (1.02, 1.14)	0.007	1.07 (1.01, 1.13)	0.024
Quartile 3	1.12 (1.06, 1.19)	<0.001	1.03 (0.98, 1.09)	0.283	1.14 (1.08, 1.21)	<0.001	1.11 (1.05, 1.18)	<0.001	1.16 (1.09, 1.23)	<0.001
Quartile 4	1.13 (1.07, 1.20)	<0.001	1.01 (0.95, 1.07)	0.710	1.13 (1.06, 1.21)	<0.001	1.12 (1.06, 1.19)	<0.001	1.15 (1.08, 1.23)	<0.001
Anxiety										
Quartile 1	ref		ref		ref		ref		ref	
Quartile 2	1.08 (1.02, 1.13)	0.005	1.02 (0.97, 1.07)	0.444	1.06 (1.01, 1.12)	0.017	1.08 (1.03, 1.13)	0.003	1.08 (1.03, 1.14)	0.003
Quartile 3	1.11 (1.05, 1.16)	<0.001	1.02 (0.97, 1.07)	0.539	1.12 (1.06, 1.18)	<0.001	1.13 (1.07, 1.18)	<0.001	1.14 (1.08, 1.20)	<0.001
Quartile 4	1.11 (1.05, 1.17)	<0.001	1.04 (0.99, 1.10)	0.155	1.10 (1.03, 1.17)	0.003	1.08 (1.02, 1.14)	0.010	1.12 (1.05, 1.18)	<0.001

$PM_{2.5}$, particulate matter with aerodynamic diameter ≤2.5 μm; $PM_{2.5-10}$, particulate matter with aerodynamic diameter between 2.5 and 10 μm; NO_2, nitrogen dioxide; NO, nitric oxide; HR, hazard ratio; CI, confidence interval.

Models were adjusted for age, sex, assessment centre, ethnicity, length of time at residence, Townsend deprivation index, education level, employment status, 24-h weighted average noise, and proximity to major roads.

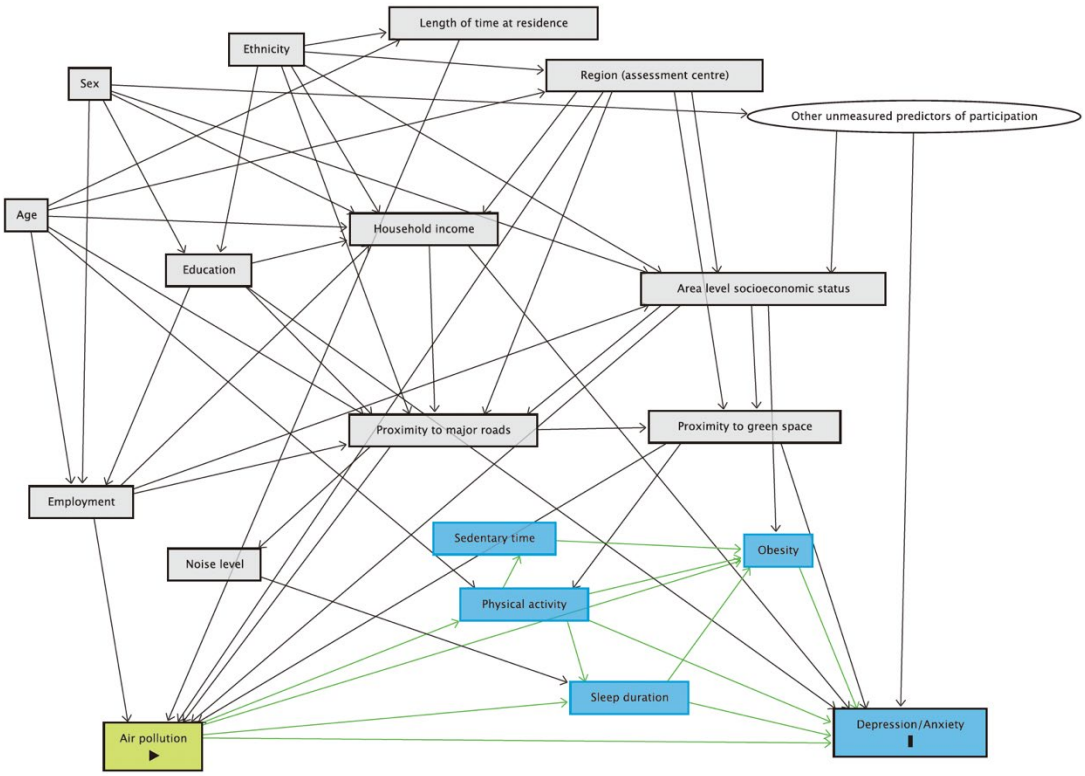
eTable 17. Associations of Incidence of Depression and Anxiety With Time-Varying $PM_{2.5}$

	HR (95% CI)	***P* value**
Depression		
Quartile 1	ref	/
Quartile 2	1.06 (1.00 ,1.12)	0.046
Quartile 3	1.10 (1.04 ,1.16)	0.001
Quartile 4	1.07 (1.01 ,1.15)	0.035
Anxiety		
Quartile 1	ref	/
Quartile 2	1.09 (1.04 ,1.14)	0.001
Quartile 3	1.06 (1.01 ,1.12)	0.023
Quartile 4	1.07 (1.00 ,1.13)	0.037

The models were adjusted for age, sex, assessment center, ethnicity, length of time at residence, Townsend deprivation index, education level, employment status, 24-h weighted average noise, and proximity to major roads (main model).

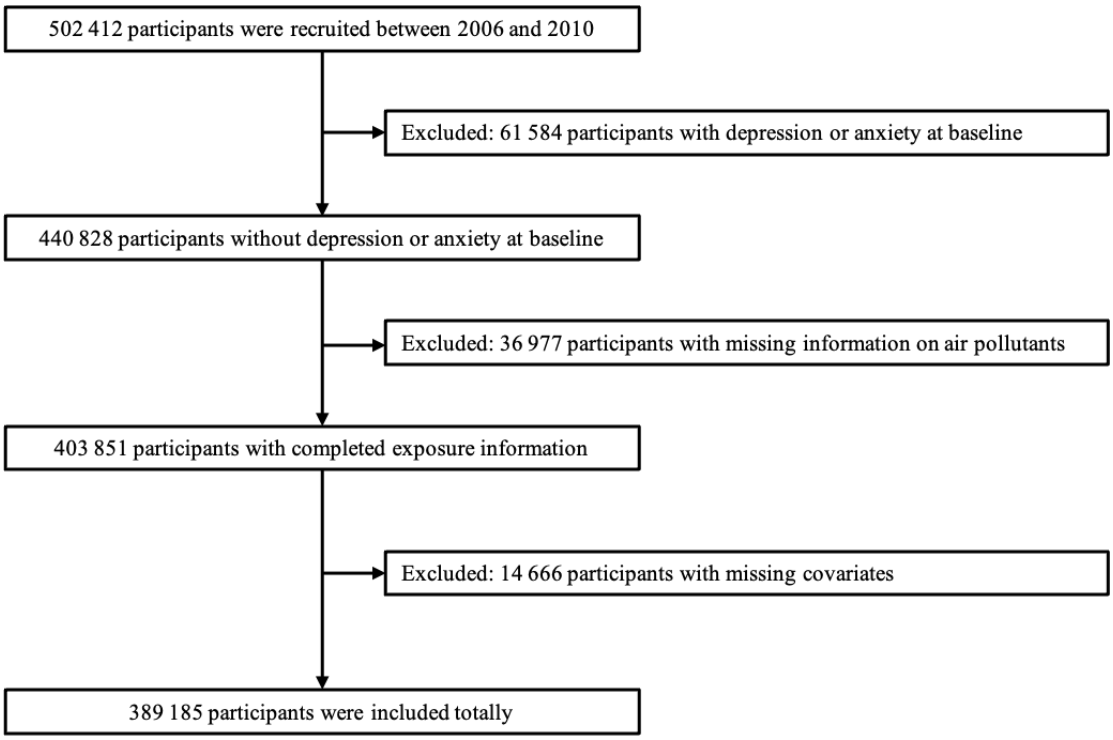
Quartile 1: < 8.6 μg/m^3; Quartile 2: 8.6 ~ 10.5 μg/m^3; Quartile 3: 10.5 ~ 12.2 μg/m^3; Quartile 4: ⩾12.2 μg/m^3.

Time-varying $PM_{2.5}$ concentrations are updated to 2018. The median $PM_{2.5}$ concentrations are 10.5 μg/m^3.



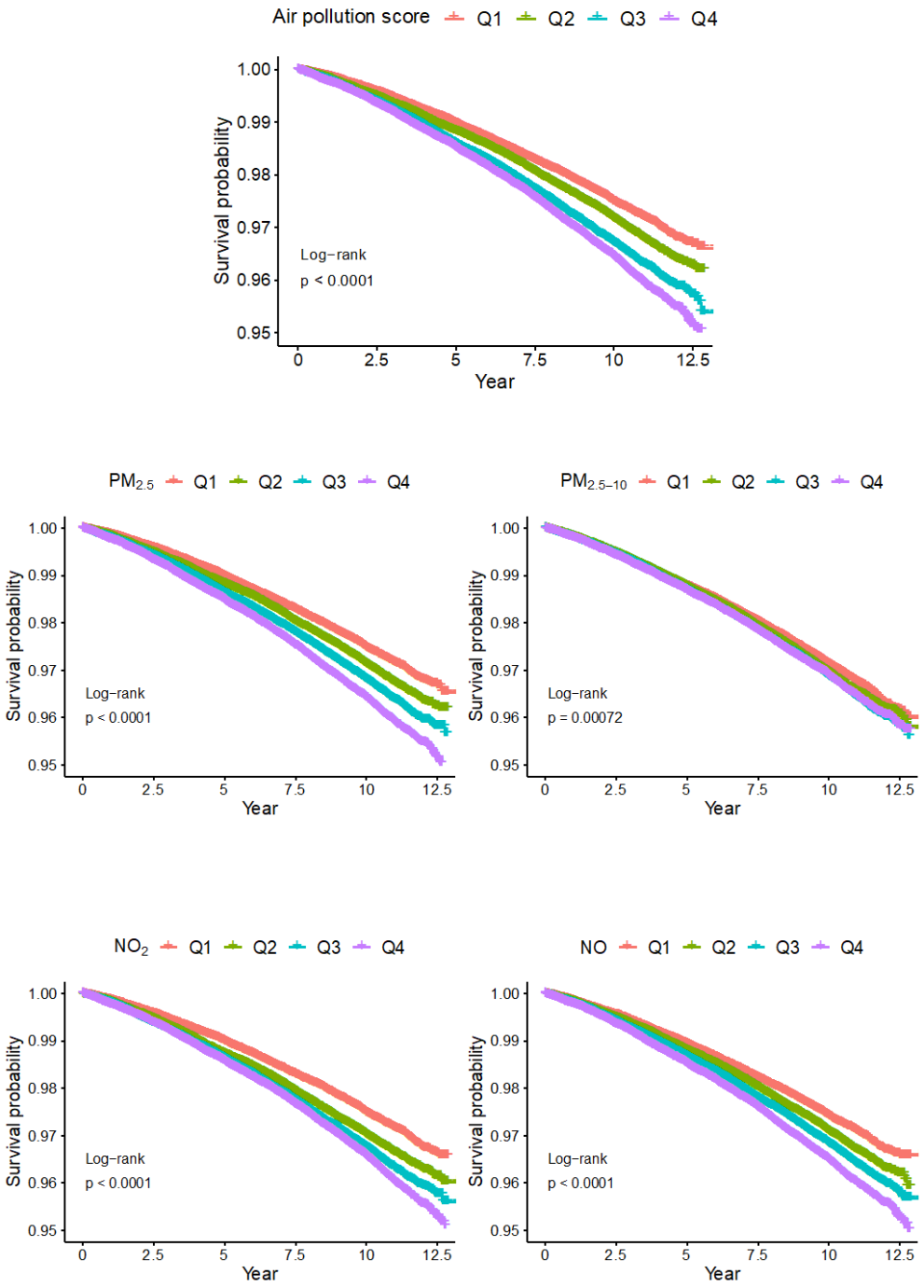
eFigure 1. Directed Acyclic Graph for the Association Between Air Pollution and Depression or Anxiety

Air pollution indicates exposure, and *Depression/Anxiety* indicates outcomes. For other covariates, grey color indicates these covariates are adjusted in the analysis, blue color indicates these covariates lie the casual path between exposure and outcomes, and white color indicates these covariates are unmeasured.

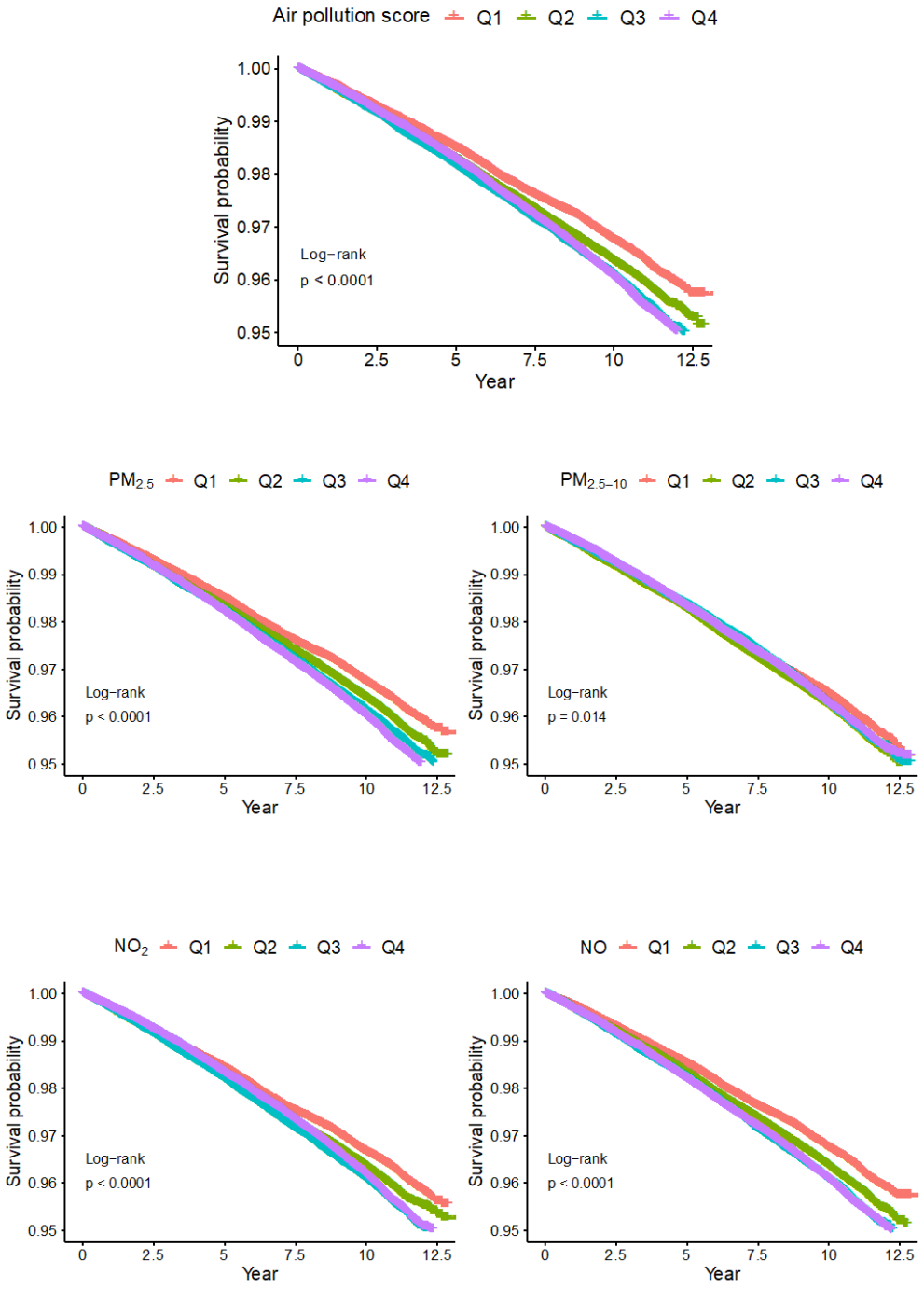


eFigure 2. Flow Chart of Participants Included in the Study

(A) depression



(B) anxiety



eFigure 3. Cumulative Survival Curves for Air Pollutants and Incident Depression (A) and Anxiety (B)