**SUPPLEMENTARY MATERIALS**

Supplementary Table 1. Sensitivity analyses

|  |  |  |  |
| --- | --- | --- | --- |
| Sensitivity analysis | Variable | HR (95% confidence limits) | p-value |
| Exclude dementia in 1st 7 yearsa | PM2.5 absorbance\* ACCave | 1.27 (1.05,1.54) | 0.014 |
|  | PM2.5 \* ACCave | 1.37 (1.13,1.66) | 0.002 |
| Use accelerometer wear as start of follow upb | PM2.5 absorbance \* ACCave | 1.24 (1.05,1.45) | 0.010 |
|  | PM2.5 \* ACCave | 1.33 (1.12,1.57) | 0.001 |
| Include all participants age 40+c | PM2.5 absorbance \* ACCave | 1.18 (1.02,1.37) | 0.028 |
|   | PM2.5 \* ACCave | 1.23 (1.06,1.43) | 0.008 |

Note: results presented are Cox proportional hazards regression adjusted for age, sex, education, Townsend deprivation index, ethnicity, and *APOE* ε4 genotype, alcohol consumption, smoking status, chronic disease, general health, depression, healthy diet score, BMI, difference in date between accelerometer wear and pollution measure, and accelerometer wear duration. Air pollution exposures are scaled so that a one unit increase equals one interquartile range increase. a198 cases, 34,429 controls; b271 cases, 44,457 controls; c307 cases, 68,174 controls.

Supplementary Table 2. Correlation matrix of NO2 measures over time in the main study sample.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | NO2 2005 | NO2 2006 | NO2 2007 | NO2 2010 |
| NO2 2005 | 1 |  |  |  |
| NO2 2006 | 0.99 | 1 |  |  |
| NO2 2007 | 0.99 | 0.98 | 1 |  |
| NO2 2010 | 0.85 | 0.86 | 0.82 | 1 |

Note: The UK Biobank reports NO2 estimates using EU-wide air pollution maps, and not ESCAPE methods, for 2005-2007.