Supplementary Online Content

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

eAppendix 1. Steps for Derivation of Sources-Specific $PM_{2.5}$

Step 1.

Gridded emissions of $PM_{2.5}$ components and precursors were developed as a function of each source. The emissions dataset included the Community Emissions Data System (CEDS) that has been updated for the GBD-MAPS project for agriculture-, energy-, industry- and traffic-related sources as well as the Global Fire Emissions Database (GFED) and Dust Entrainment and Deposition (DEAD) model for the wildfires and windblown dust sources respectively.

Step 2.

The emissions dataset described in Step 1 was used as input in the GEOS-Chem 3d chemical transport model. Briefly, the GEOS-Chem Model enables simulations of atmospheric composition using meteorological data, emission inventories, and algorithms that represent the physics and chemistry of atmospheric processes. The model was run globally at a resolution of 0.5° latitude×0.625° longitude, ~ 50×70 km^2.

Step 3.

A series of simulations were conducted for each source with the GEOS-Chem Model by systematically removing the emission from the individual source. The $PM_{2.5}$ concentrations from each simulation were compared with the base simulation (with all emission sources) to obtain the fractional contribution (Eq. S1).

$$(\%PM_{2.5})_{source} = \frac{[PM_{2.5}]_{base\ simulation} - [PM_{2.5}]_{source-specific\ simulation}}{[PM_{2.5}]_{base\ simulation}}\ (Eq.S1)$$

Step 4.

The source-specific $PM_{2.5}$ concentrations were then derived by multiplying the total $PM_{2.5}$ concentrations at each address from the spatiotemporal model by local fractions of $PM_{2.5}$ attributable to each source (Eq. S2).

$$(PM_{2.5})_{source} = Total\ PM_{2.5} \times (\%PM_{2.5})_{source} (Eq.S2)$$

eAppendix 2. Description of Nine Emission Sources[1]

Agriculture - Includes manure management, soil fertilizer emissions, rice cultivation, enteric fermentation, and other agriculture

Road Traffic - Includes cars, motorcycles, heavy and light duty trucks and buses

Non-road Traffic - Includes rail, domestic navigation, other transportation

Coal Combustion for Energy Production - Includes electricity and heat production, fuel production and transformation, oil and gas fugitive/flaring, and fossil fuel fires

Other Energy Production - Includes electricity and heat production, fuel production and transformation, oil and gas fugitive/flaring, and fossil fuel fires

Coal Combustion for Industry - Includes industrial combustion (iron and steel, non-ferrous metals, chemicals, pulp and paper, food and tobacco, non-metallic minerals, construction, transportation equipment, machinery, mining and quarrying, wood products, textile and leather, and other industry combustion) and non-combustion industrial processes and product use (cement production, lime production, other minerals, chemical industry, metal production, food, beverage, wood, pulp, and paper, and other non-combustion industrial emissions)

Other Industry - Includes industrial combustion (iron and steel, non-ferrous metals, chemicals, pulp and paper, food and tobacco, non-metallic minerals, construction, transportation equipment, machinery, mining and quarrying, wood products, textile and leather, and other industry combustion) and non-combustion industrial processes and product use (cement production, lime production, other minerals, chemical industry, metal production, food, beverage, wood, pulp, and paper, and other non-combustion industrial emissions)

Wildfires - Includes deforestation, boreal forest, peat, savannah, and temperate forest fires (from the GFED fires inventory)

Windblown Dust - (from the DEAD dust model)

eAppendix 3. Estimation of the Burden of Incident Dementia Attributable to Total $PM_{2.5}$ for the US Population in 2015

Step 1.

We used the average of the minimum (2.2 μg/m^3) and fifth percentiles (6.2 μg/m^3) of total $PM_{2.5}$ distribution as the theoretical minimum risk exposure level (TMREL, 4.2 μg/m^3). $PM_{2.5}$ concentrations at or below this level are considered to reflect background concentrations and the baseline rates of dementia without any added anthropogenic pollution (i.e., HR of 1).

Step 2.

We used the 10-year average tract-level $PM_{2.5}$ over 10 years before 2015 to estimate the HRs of dementia attributable to the $PM_{2.5}$ exposure in each census tract.

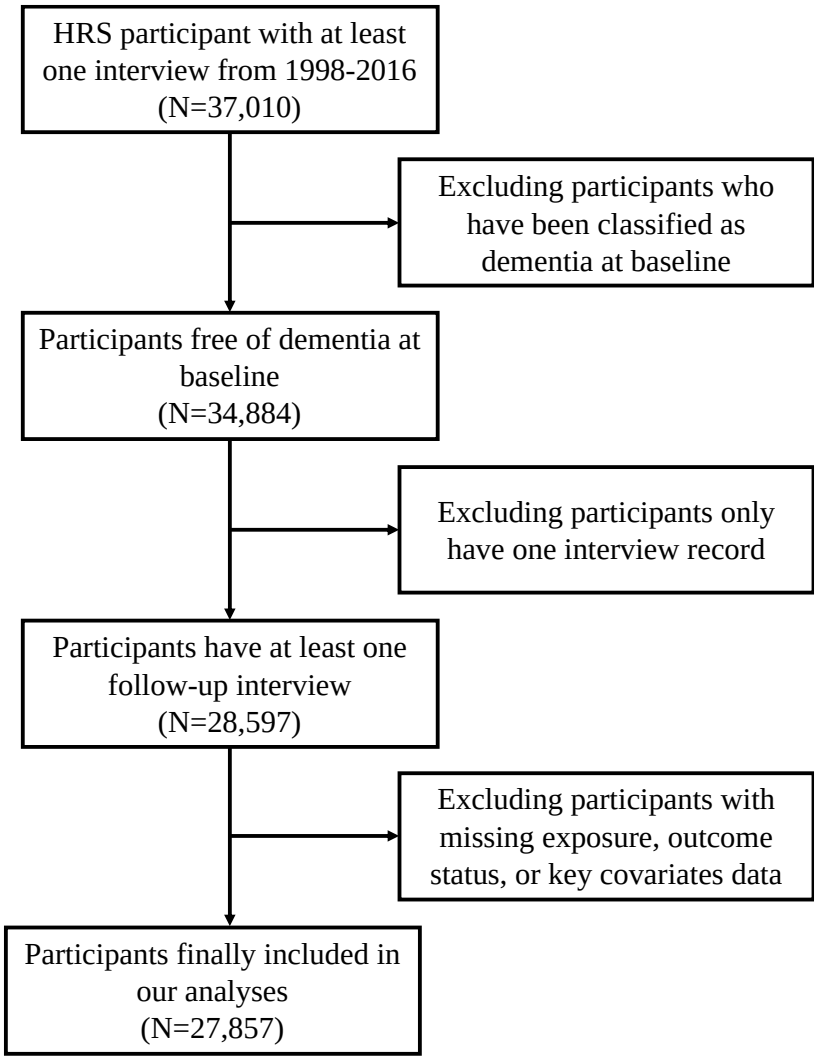
Step 3.

Then, we estimated the tract-level attributable fraction (AF) of incident dementia due to $PM_{2.5}$ exposure.

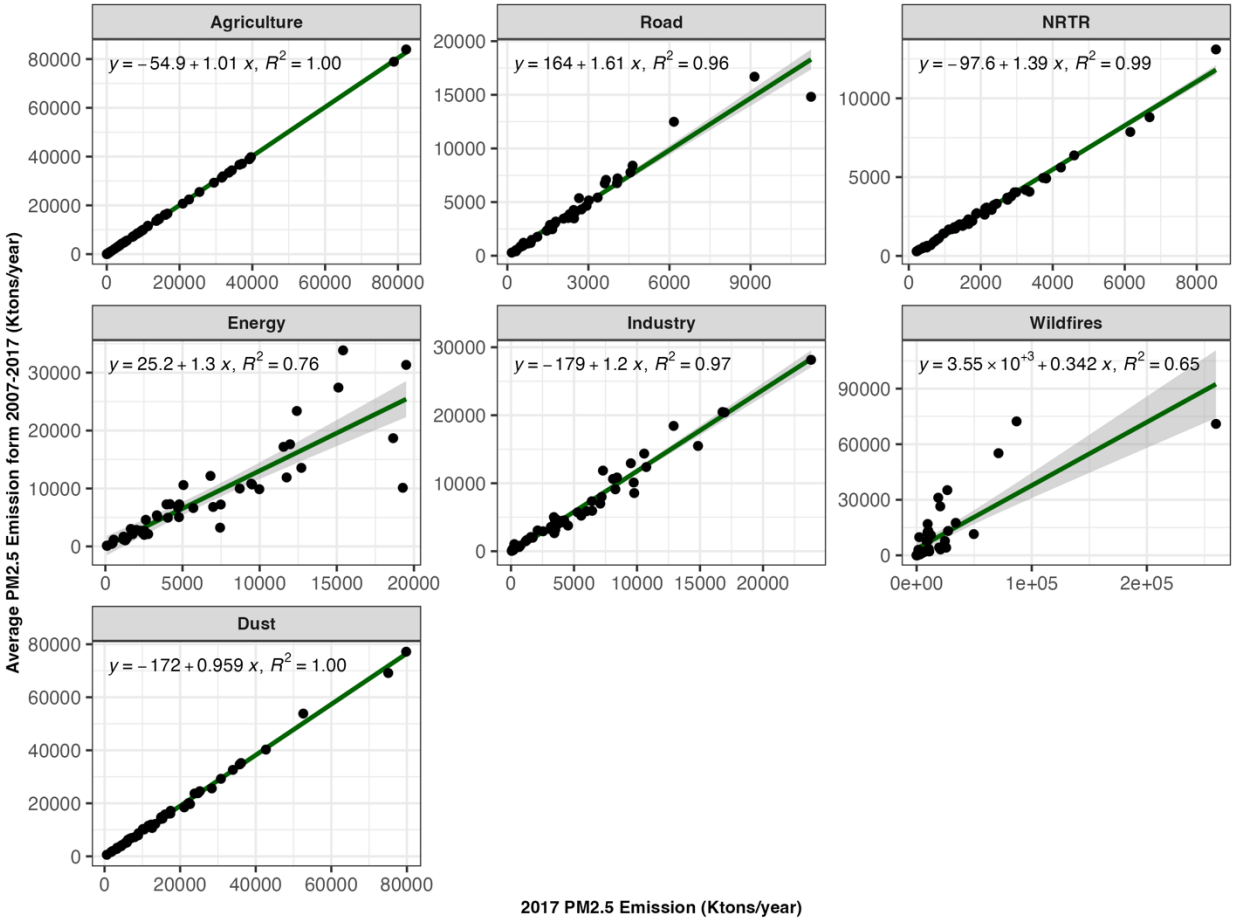
$$AF_{tract} = 1 - 1/HR_{tract}$$

Step 4.

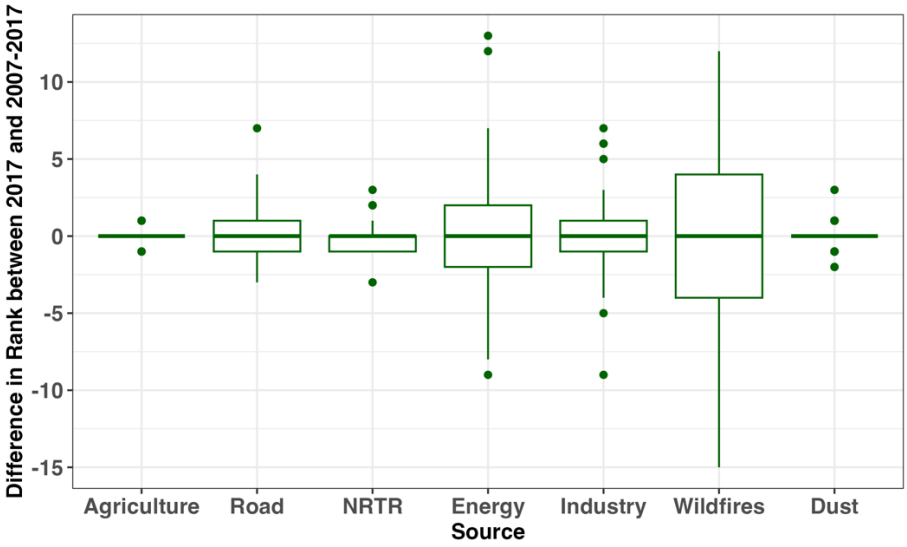
We obtained the total number of dementia cases that could be attributed to $PM_{2.5}$ by summing the product of all tract-level AF, incident rates of dementia and population in 2015 among those older than 50 years over the continental US. Given expected differences in incident rates of dementia in different subpopulations, we estimated the rates separately for each region (Northeast, Midwest, South, and West), race/ethnicity, and age group (50-64, 65-74, 75-84, >85) separately using HRS data.



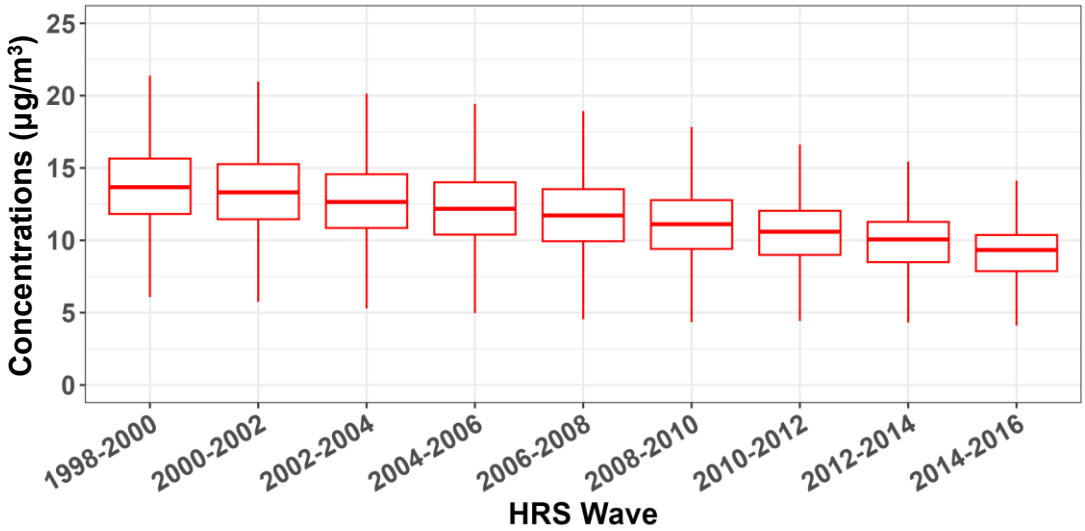
eFigure 1. Schematic Flowchart of the Study Population Selection.



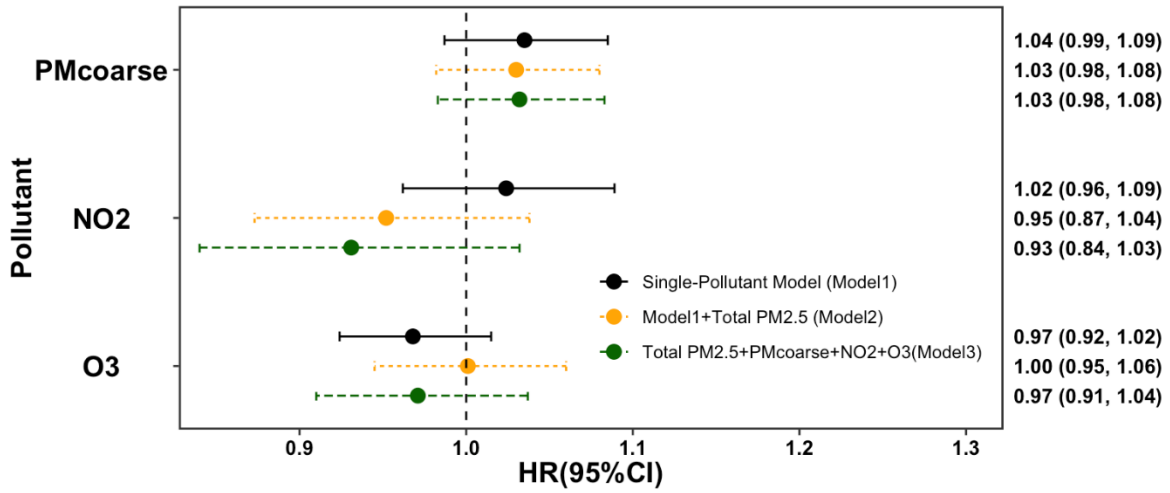
eFigure 2. Correlations between Primary Source-Specific $PM_{2.5}$ Emissions from 2017 and 10-Year Average Primary Source-Specific $PM_{2.5}$ Emissions from 2007-2017 for Each State in the US.



eFigure 3. Difference in the Rank of States by Source-Specific Primary $PM_{2.5}$ Emissions between 2017 and the Average over the 10 Years before 2017 in the US.



eFigure 4. 10-Year Average Concentrations of Total $PM_{2.5}$ by Biennial HRS Wave.
The middle line represents the median value; the edges of the box represent the 25th and 75th percentiles, and the whiskers extended up to 1.5 times the interquartile range.



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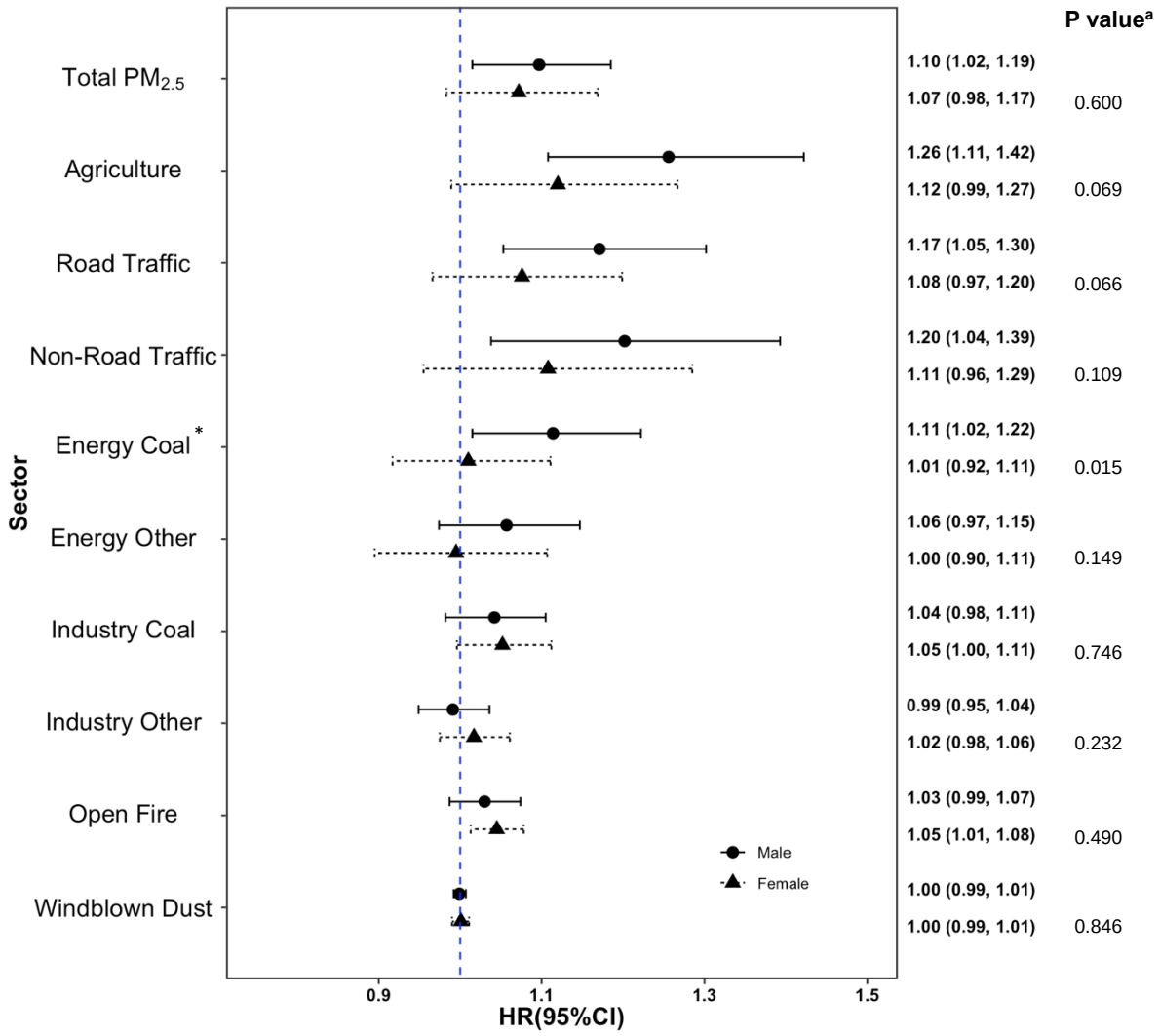
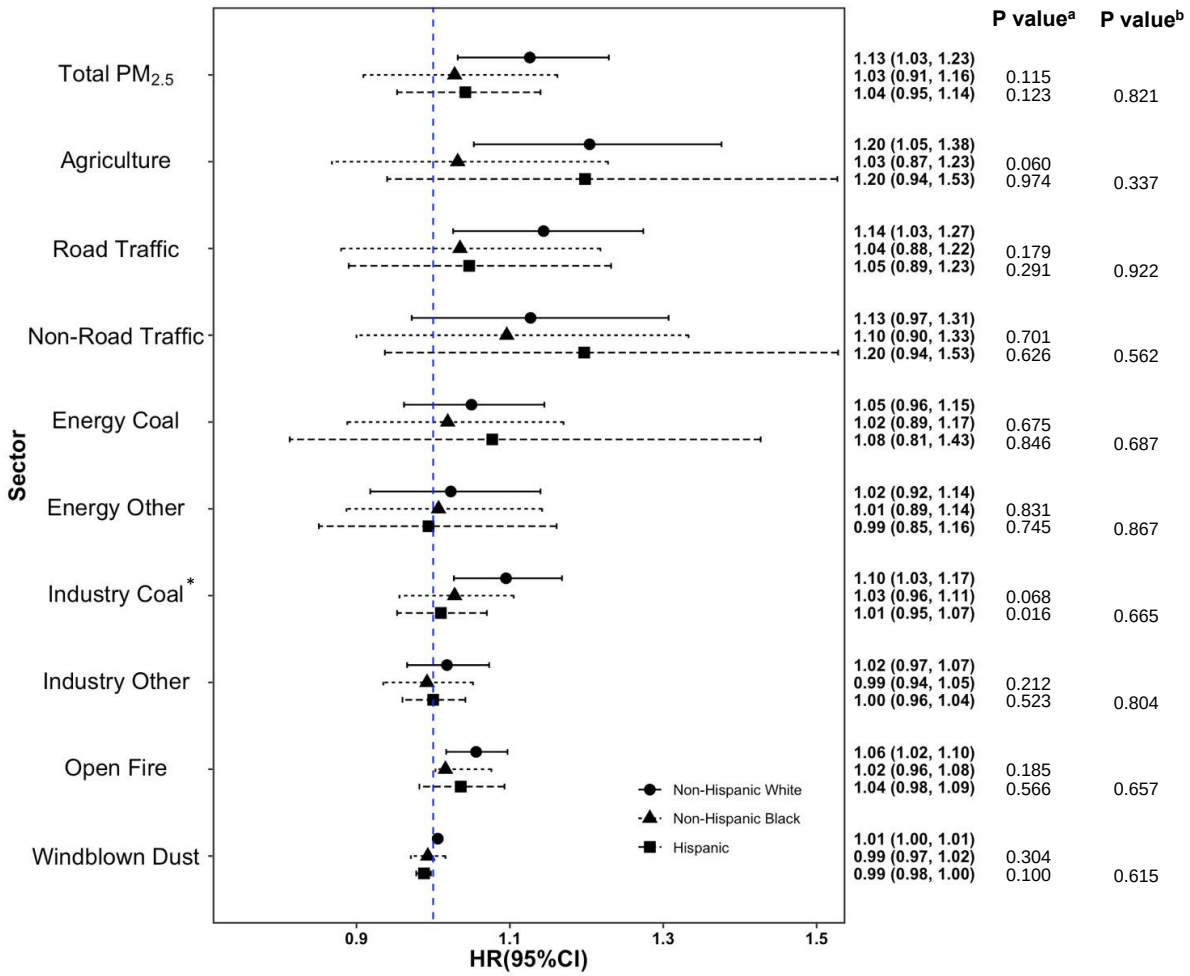


* Significant interaction by age ($p<0.05$)

[a] P value for interaction between $PM_{2.5}$ and gender (using Male as reference level)

eFigure 6. Hazard Ratios (95% Confidence Intervals) of Incident Dementia in the Health and Retirement Study (1998-2016) Associated With Interquartile Differences in 10-Year Average Concentrations of Source-Specific $PM_{2.5}$ in Single-Pollutant Models by Sex.

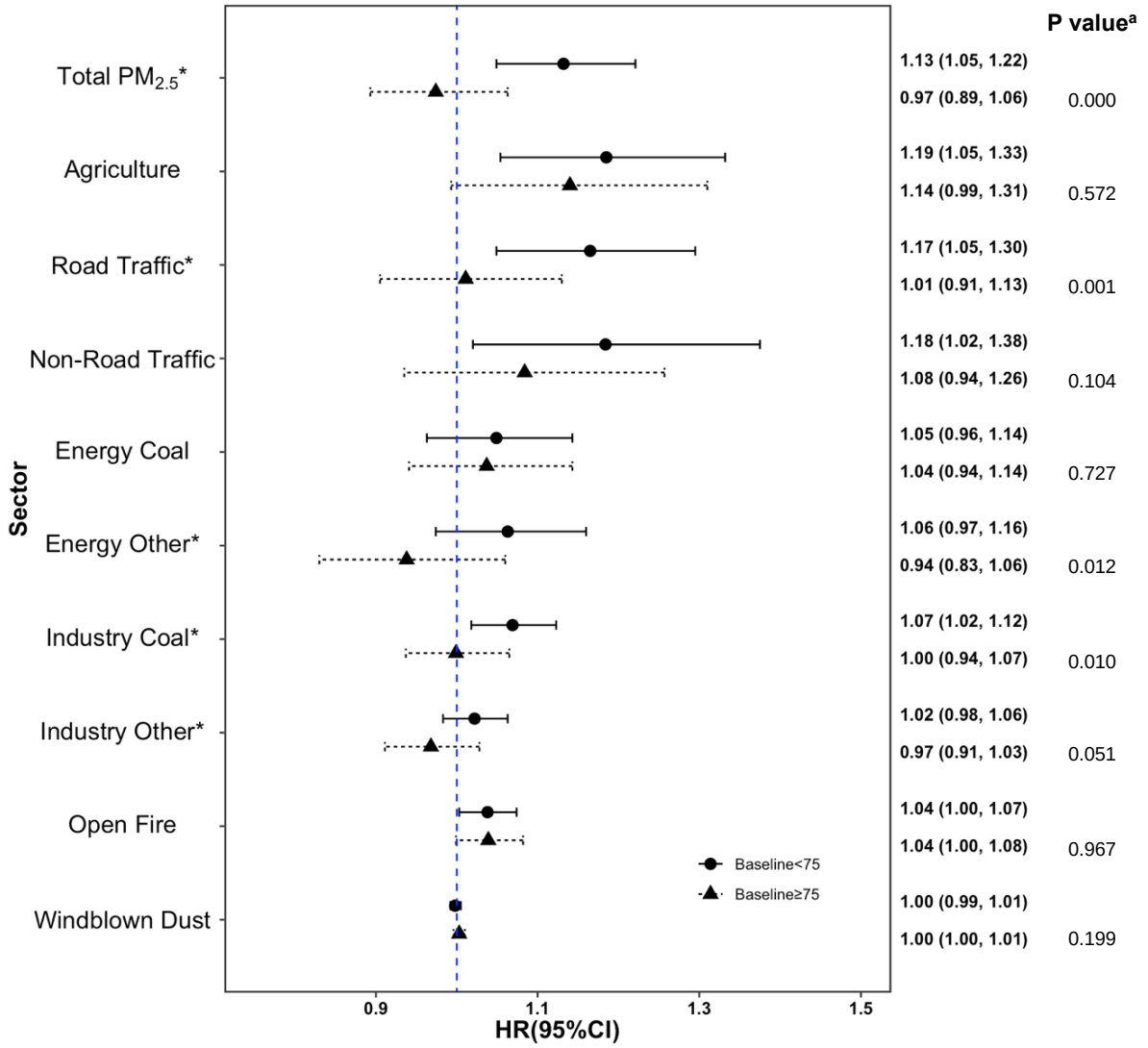


* Significant interaction by age ($p<0.05$)

[a] P value for interaction between $PM_{2.5}$ and race (using Non-Hispanic White as reference level)

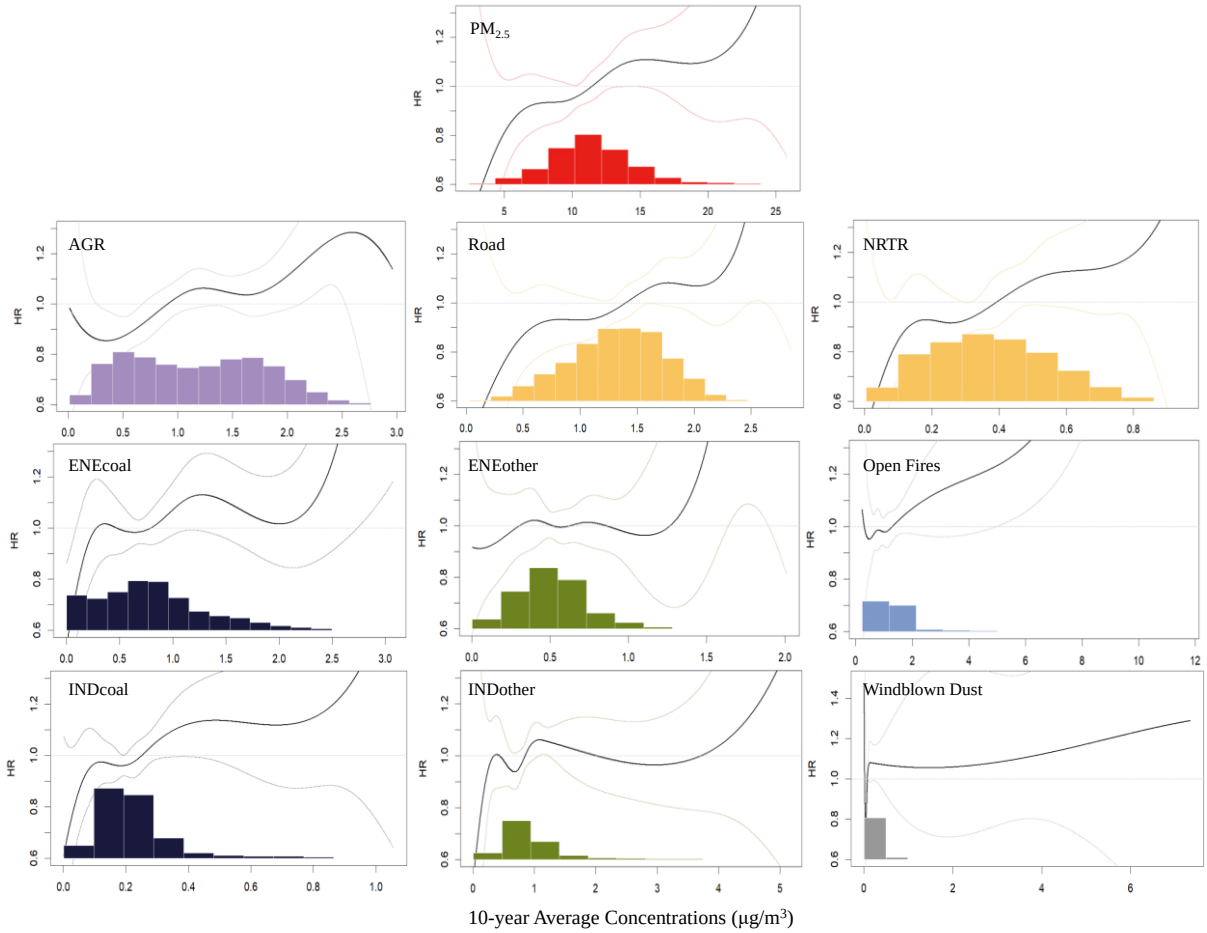
[b] P value for interaction between $PM_{2.5}$ and race (using Non-Hispanic Black as reference level)

eFigure 7. Hazard Ratios (95% Confidence Intervals) of Incident Dementia in the Health and Retirement Study (1998-2016) Associated With Interquartile Differences in 10-Year Average Concentrations of Source-Specific $PM_{2.5}$ in Single-Pollutant Models by Race/Ethnicity.



* Significant interaction by age ($p<0.05$)
[a] P value for interaction between $PM_{2.5}$ and baseline age (using baseline age <75 as reference level)

eFigure 8. Hazard Ratios (95% Confidence Intervals) of Incident Dementia in the Health and Retirement Study (1998-2016) Associated With Interquartile Differences in 10-Year Average Concentrations of Source-Specific $PM_{2.5}$ in Single-Pollutant Models by Baseline Age.



eFigure 9. The Concentration–Response Curves for Each Total and Source-Specific $PM_{2.5}$ with Incident Dementia Derived from the Single-Pollutant Models, Adjusted for 2-year Birth Cohorts, 2-year Age at Baseline, Sex, Race/Ethnicity, Educational Attainment, Ownership of the Primary Residence, Total Household Wealth, Urbanicity, NSES and a Flexible Set of Unpenalized Thin-Plate Regression Splines with 10 df.

eTable 1. Correlations among 10-Year Average Air Pollutants for Participants of the Health and Retirement Study (1998-2016)[a].

	Total $PM_{2.5}$	**Other**	**Agriculture**	**Road**	**NRTR**	**Energy Coal**	**Energy Other**	**Industry Coal**	**Industry Other**	**Wildfires**	**Dust**	**PM_{coarse}**	**NO_2**	**O_3**
Total $PM_{2.5}$	1	NA	0.51	0.75	0.52	0.43	0.56	0.75	0.72	0.11	-0.03	0.02	0.62	-0.43
Other		1	0.34	0.69	0.48	0.27	0.51	0.73	0.61	-0.13	-0.16	NA	NA	NA
Agriculture			1	0.77	0.88	0.75	0.54	0.04	-0.02	0.02	-0.31	-0.21	-0.04	-0.06
Road				1	0.80	0.77	0.62	0.38	0.28	-0.15	-0.12	-0.07	0.24	-0.19
NRTR					1	0.70	0.58	-0.03	0.06	-0.09	-0.38	-0.29	0.01	-0.24
Energy Coal						1	0.56	0	-0.12	-0.2	-0.26	-0.26	-0.12	0.00
Energy Other							1	0.14	0.2	-0.28	-0.23	-0.14	0.20	-0.34
Industry Coal								1	0.84	0.08	0.26	0.33	0.67	-0.23
Industry Other									1	-0.09	0.08	0.12	0.79	-0.51
Wildfires										1	-0.07	0.10	0.06	0.04
Dust											1	0.66	0.24	0.18
PM_{coarse}												1	0.21	0.16
NO_2													1	-0.59
O_3														1

[a]Abbreviations for the name of source: The sum of $PM_{2.5}$ from all other sources (Other); Road Traffic (Road); Non-Road Traffic (NRTR); Windblown Dust (Dust).

eTable 2. The Median (IQR) Concentrations of Air Pollutants within Each Category of the Baseline Characteristics of Our Study Population during Follow-Up from 1998 to 2016[a,b].

	N	Characteristics	Total $PM_{2.5}$	Agriculture	Road	NRTR	Energy Coal	Energy Other	Industry Coal	Industry Other	Wildfires	Dust	PM_{coarse}	NO_2, ppb	O_3, ppb
Total	27857		11.20 (3.70)	1.14 (1.05)	1.41 (0.60)	0.38 (0.27)	0.79 (0.65)	0.55 (0.29)	0.21 (0.12)	0.91 (0.46)	1.01 (0.57)	0.09 (0.08)	8.88 (4.85)	9.04 (7.68)	27.05 (3.81)
Age, years	14974	<60	11.12 (2.99)	1.13 (0.60)	1.36 (0.42)	0.38 (0.18)	0.82 (0.51)	0.55 (0.24)	0.24 (0.13)	1.03 (0.63)	1.15 (0.86)	0.21 (0.45)	9.86 (4.67)	10.48 (6.51)	26.91 (3.65)
	7180	60-70	11.68 (3.07)	1.20 (0.63)	1.43 (0.45)	0.40 (0.18)	0.87 (0.53)	0.57 (0.24)	0.24 (0.14)	1.06 (0.64)	1.23 (0.95)	0.21 (0.42)	9.69 (4.57)	10.96 (6.85)	26.76 (3.49)
	4232	70-80	12.04 (3.08)	1.24 (0.66)	1.46 (0.44)	0.42 (0.19)	0.86 (0.54)	0.59 (0.25)	0.25 (0.14)	1.10 (0.67)	1.30 (1.00)	0.22 (0.48)	9.82 (4.71)	11.69 (6.98)	26.32 (3.52)
	1471	≥80	12.60 (3.05)	1.23 (0.68)	1.49 (0.43)	0.42 (0.20)	0.83 (0.52)	0.62 (0.25)	0.26 (0.15)	1.21 (0.74)	1.33 (1.02)	0.24 (0.48)	9.69 (4.76)	12.87 (7.34)	25.85 (3.48)
Sex	12110	Male	11.40 (3.07)	1.16 (0.62)	1.39 (0.44)	0.39 (0.18)	0.83 (0.52)	0.56 (0.24)	0.24 (0.14)	1.05 (0.64)	1.20 (0.92)	0.22 (0.45)	9.85 (4.70)	10.74 (6.68)	26.83 (2.64)
	15747	Female	11.48 (3.04)	1.17 (0.62)	1.40 (0.43)	0.39 (0.18)	0.84 (0.52)	0.57 (0.24)	0.24 (0.13)	1.05 (0.64)	1.19 (0.91)	0.21 (0.44)	9.76 (4.61)	10.92 (6.74)	26.71 (3.56)
Race /Ethnicity	19249	Non-Hispanic White	11.21 (2.90)	1.21 (0.63)	1.39 (0.44)	0.40 (0.18)	0.86 (0.53)	0.55 (0.22)	0.22 (0.12)	0.98 (0.54)	1.21 (0.85)	0.20 (0.42)	9.49 (4.40)	9.70 (5.80)	27.18 (3.39)
	4654	Non-Hispanic Black	12.48 (2.71)	1.27 (0.58)	1.52 (0.41)	0.44 (0.16)	0.97 (0.49)	0.63 (0.23)	0.27 (0.11)	1.23 (0.61)	1.08 (0.77)	0.13 (0.26)	8.71 (3.46)	13.71 (7.18)	25.29 (3.10)
	3164	Hispanic	11.68 (4.07)	0.73 (0.46)	1.24 (0.40)	0.26 (0.13)	0.50 (0.33)	0.61 (0.24)	0.31 (0.21)	1.30 (1.05)	1.23 (1.31)	0.46 (0.70)	13.44 (5.92)	14.60 (9.00)	26.90 (4.72)
	790	Other	11.48 (3.49)	0.96 (0.58)	1.27 (0.46)	0.33 (0.17)	0.60 (0.46)	0.49 (0.23)	0.28 (0.18)	1.24 (0.87)	1.41 (1.28)	0.26 (0.42)	10.91 (5.22)	12.91 (7.55)	26.38 (3.98)
Education	5825	<High School	12.06 (3.19)	1.15 (0.63)	1.45 (0.42)	0.39 (0.18)	0.85 (0.52)	0.62 (0.27)	0.27 (0.15)	1.14 (0.75)	1.19 (0.97)	0.24 (0.50)	10.44 (5.04)	11.96 (7.76)	26.28 (3.76)
	1369	GED	11.34 (2.79)	1.19 (0.58)	1.42 (0.41)	0.40 (0.17)	0.92 (0.51)	0.59 (0.25)	0.23 (0.11)	0.97 (0.54)	1.18 (0.86)	0.20 (0.44)	9.66 (4.49)	10.05 (6.44)	26.82 (3.44)
	8278	High School	11.51 (2.93)	1.25 (0.63)	1.43 (0.42)	0.42 (0.18)	0.90 (0.53)	0.58 (0.23)	0.23 (0.12)	1.02 (0.58)	1.17 (0.81)	0.19 (0.42)	9.76 (4.47)	10.34 (6.44)	26.82 (3.33)
	6561	Some college	11.26 (3.15)	1.13 (0.62)	1.36 (0.45)	0.38 (0.19)	0.79 (0.52)	0.54 (0.23)	0.24 (0.14)	1.04 (0.65)	1.26 (0.99)	0.23 (0.44)	9.99 (4.72)	10.88 (6.53)	26.86 (3.73)
	5824	College and above	11.08 (3.00)	1.09 (0.60)	1.34 (0.44)	0.37 (0.18)	0.78 (0.50)	0.53 (0.23)	0.23 (0.13)	1.05 (0.61)	1.18 (0.91)	0.21 (0.41)	9.17 (4.44)	10.79 (6.32)	26.94 (3.65)
Primary Residence	6285	Don't Own	11.90 (3.17)	1.09 (0.60)	1.40 (0.43)	0.38 (0.18)	0.79 (0.51)	0.58 (0.24)	0.27 (0.15)	1.23 (0.79)	1.17 (0.99)	0.23 (0.47)	10.07 (4.76)	13.52 (8.00)	25.61 (3.98)
	21572	Own	11.34 (3.02)	1.19 (0.63)	1.39 (0.44)	0.40 (0.18)	0.85 (0.52)	0.56 (0.24)	0.23 (0.13)	1.01 (0.59)	1.20 (0.89)	0.21 (0.44)	9.74 (4.62)	10.25 (6.24)	27.02 (3.45)
Total wealth, $	6964	Q1: <9800	11.79 (3.11)	1.12 (0.61)	1.41 (0.42)	0.38 (0.17)	0.84 (0.51)	0.60 (0.26)	0.26 (0.14)	1.13 (0.72)	1.16 (0.95)	0.23 (0.50)	10.21 (4.91)	12.21 (7.61)	26.09 (3.72)
	6964	Q2: 9800-60500	11.54 (3.07)	1.19 (0.62)	1.41 (0.43)	0.40 (0.18)	0.87 (0.53)	0.57 (0.24)	0.24 (0.13)	1.05 (0.63)	1.19 (0.89)	0.21 (0.44)	9.84 (4.48)	10.81 (6.62)	26.74 (3.50)
	6964	Q3: 60500-237000	11.39 (3.02)	1.20 (0.63)	1.40 (0.44)	0.40 (0.19)	0.85 (0.53)	0.56 (0.23)	0.23 (0.13)	1.02 (0.60)	1.22 (0.89)	0.20 (0.40)	9.67 (4.55)	10.43 (6.29)	26.98 (3.48)
	6965	Q4: ≥237000	11.07 (2.98)	1.15 (0.62)	1.35 (0.45)	0.39 (0.19)	0.79 (0.51)	0.53 (0.22)	0.23 (0.13)	1.00 (0.59)	1.23 (0.91)	0.21 (0.42)	9.48 (4.61)	9.94 (6.04)	27.23 (3.57)
Urbanicity	14475	Urban	11.95 (3.24)	1.04 (0.63)	1.36 (0.45)	0.36 (0.19)	0.76 (0.53)	0.57 (0.25)	0.27 (0.15)	1.29 (0.78)	1.10 (0.84)	0.27 (0.56)	9.98 (5.05)	14.15 (7.32)	25.61 (3.63)
	6028	Suburban	11.28 (2.83)	1.21 (0.64)	1.41 (0.43)	0.40 (0.19)	0.80 (0.49)	0.54 (0.27)	0.22 (0.11)	0.87 (0.29)	1.50 (1.33)	0.15 (0.24)	9.21 (4.64)	8.97 (4.10)	26.79 (2.88)
	6201	Ex-urban	10.78 (2.62)	1.41 (0.52)	1.46 (0.39)	0.45 (0.16)	1.03 (0.48)	0.58 (0.19)	0.19 (0.08)	0.78 (0.28)	1.12 (0.40)	0.15 (0.30)	9.69 (3.58)	6.29 (2.76)	28.78 (2.90)
Region	4631	Northeast	11.51 (2.82)	1.07 (0.46)	1.30 (0.29)	0.36 (0.09)	0.66 (0.39)	0.60 (0.20)	0.22 (0.10)	1.38 (0.63)	0.81 (0.29)	0.07 (0.08)	7.10 (2.46)	14.51 (8.43)	25.16 (3.46)
	6493	Midwest	11.89 (2.34)	1.76 (0.40)	1.62 (0.33)	0.60 (0.13)	1.07 (0.38)	0.68 (0.16)	0.18 (0.07)	0.91 (0.34)	1.21 (0.26)	0.10 (0.10)	9.96 (3.38)	9.37 (5.01)	26.31 (3.12)
	11203	South	11.41 (2.37)	1.10 (0.59)	1.47 (0.41)	0.38 (0.13)	1.05 (0.50)	0.60 (0.24)	0.24 (0.07)	0.90 (0.26)	0.92 (0.45)	0.13 (0.10)	8.50 (2.97)	8.46 (3.90)	27.26 (2.07)
	5530	West	10.90 (4.75)	0.62 (0.38)	1.02 (0.44)	0.18 (0.08)	0.26 (0.25)	0.32 (0.18)	0.33 (0.24)	1.28 (1.12)	2.07 (1.64)	0.66 (0.85)	14.52 (6.49)	14.49 (8.41)	27.70 (5.61)

[a]Abbreviations for the name of source: The sum of $PM_{2.5}$ from all other sources (Other); Road Traffic (Road); Non-Road Traffic (NRTR); Windblown Dust (Dust).
[b]The concentrations are given in $\mu g/m^3$ unless otherwise specified.

eTable 3. Hazard Ratios (95% Confidence Intervals) of Incident Dementia in the Health and Retirement Study (1998-2016) per 1-µg/m^3 Increment in 10-Year Average Concentrations of Source-Specific $PM_{2.5}$ in Single- and Multi-Pollutant Models.

	Single-Pollutant Model (Model 1[a])		**Model 1+ other $PM_{2.5}$ (Model 2[b])**		**Model 2+ PMcoarse, NO_2, O_3 (Model 3[c])**	
	HR	**P-value**	**HR**	**P-value**	**HR**	**P-value**
Total $PM_{2.5}$	1.02 (1.00, 1.04)	0.032			1.03 (1.01, 1.06)	0.021
Source-Specific $PM_{2.5}$						
Agriculture	1.16 (1.05, 1.29)	0.005	1.13 (1.01, 1.26)	0.029	1.11 (0.98, 1.26)	0.105
Road Traffic	1.20 (1.01, 1.41)	0.033	1.10 (0.90, 1.34)	0.369	1.05 (0.85, 1.29)	0.672
Non-road Traffic	1.65 (0.98, 2.77)	0.059	1.30 (0.72, 2.33)	0.382	1.28 (0.72, 2.29)	0.404
Energy Coal	1.07 (0.94, 1.22)	0.302	1.04(0.91, 1.19)	0.546	1.03 (0.90, 1.17)	0.689
Energy Other	1.07 (0.79, 1.45)	0.666	0.86 (0.61, 1.22)	0.402	0.84 (0.60, 1.19)	0.331
Industry Coal	1.46 (0.98, 2.16)	0.060	1.00 (0.56, 1.77)	0.989	1.07 (0.59, 1.93)	0.825
Industry Other	1.01 (0.93, 1.10)	0.738	0.93 (0.86, 1.01)	0.073	0.94 (0.85, 1.04)	0.225
Wildfire	1.07 (1.02, 1.13)	0.011	1.08 (1.03, 1.14)	0.003	1.09 (1.03, 1.15)	0.002
Windblown Dust	1.00 (0.92, 1.09)	0.992	1.03 (0.93, 1.15)	0.539	1.03 (0.91, 1.16)	0.644

[a]Model 1 stratified by 2-year birth cohorts, 2-year age at baseline, and adjusted for sex, race, educational attainment, ownership of the primary residence, total household wealth, urbanicity, NSES and a flexible set of unpenalized thin-plate regression splines with 10 df.
[b]Model 2 additional adjust for the sum of $PM_{2.5}$ from all other sources in Model 1.
[c]Model 3 additional adjust for other pollutants (i.e., $PM_{10-2.5}$, NO_2, O_3) in Model 2.

eTable 4. Hazard Ratios (95% Confidence Intervals) of Incident Dementia in the Health and Retirement Study (1998-2016) Associated With Interquartile Differences in Source-Specific $PM_{2.5}$ Concentrations in Single Pollutant Models (Model 1) with Different Exposure Averaging Periods.

	10 Years (Primary)	**5 Years**	**1 Year**
Total $PM_{2.5}$	1.08 (1.01, 1.17)	1.08 (1.00, 1.15)	1.06 (0.99, 1.13)
Source-specific $PM_{2.5}$			
Agriculture	1.17 (1.05, 1.30)	1.16 (1.03, 1.30)	1.11 (0.99, 1.25)
Road Traffic	1.11 (1.01, 1.23)	1.10 (1.00, 1.22)	1.07 (0.97, 1.18)
Non-road Traffic	1.14 (1.00, 1.32)	1.14 (0.97, 1.33)	1.11 (0.93, 1.31)
Energy Coal	1.05 (0.96, 1.14)	1.04 (0.95, 1.13)	1.02 (0.94, 1.12)
Energy Other	1.02 (0.93, 1.11)	1.02 (0.93, 1.12)	1.02 (0.93, 1.11)
Industry Coal	1.05 (1.00, 1.10)	1.05 (1.00, 1.10)	1.04 (0.99, 1.08)
Industry Other	1.01 (0.97, 1.05)	1.01 (0.97, 1.05)	1.01 (0.97, 1.04)
Wildfires	1.04 (1.01, 1.07)	1.04 (1.01, 1.07)	1.03 (1.00, 1.07)
Windblown Dust	1.00 (0.99, 1.01)	1.00 (0.99, 1.01)	1.00 (0.99, 1.01)

[a]All models stratified by 2-year birth cohorts, 2-year age at baseline, and adjusted for sex, race, educational attainment, ownership of the primary residence, total household wealth, urbanicity, NSES and a flexible set of unpenalized thin-plate regression splines with 10 df.

eTable 5. Hazard Ratios (95% Confidence Intervals) of Incident Dementia in the Health and Retirement Study Associated With Interquartile Differences in 10-Year Average Concentrations of Total and Source-Specific $PM_{2.5}$ When Adding or Subtracting Each SES Indicator One at a Time in Single-Pollutant Models (Model 1).

	Total $PM_{2.5}$	**Agriculture**	**Wildfires**
Model 1 (Primary)[a]	1.08 (1.01, 1.17)	1.17 (1.05, 1.30)	1.04 (1.01, 1.07)
- Total Wealth	1.08 (1.01, 1.17)	1.17 (1.05, 1.31)	1.05 (1.01, 1.08)
- Education	1.07 (0.99, 1.16)	1.15 (1.03, 1.29)	1.03 (1.00, 1.06)
- NSES	1.08 (1.00, 1.16)	1.17 (1.05, 1.31)	1.04 (1.01, 1.07)
+ Agriculture-related occupation	1.08 (1.01, 1.16)	1.20 (1.07, 1.35)	1.04 (1.00, 1.08)
+ Individual NSES indicators			
+ Median Household Income	1.10 (1.02, 1.18)	1.18 (1.06, 1,31)	1.04 (1.01, 1.07)
+ % households that own their home	1.09 (1.01, 1.17)	1.17 (1.05, 1.31)	1.04 (1.00, 1.07)
+ % persons with at least a high school degree	1.07 (1.00, 1.15)	1.17 (1.06, 1.31)	1.03 (1.01, 1.07)
+ % unemployed	1.08 (1.00, 1.16)	1.18 (1.05, 1.30)	1.04 (1.01, 1.07)

[a]Model1 stratified by 2-year birth cohorts, 2-year age at baseline, and adjusted for sex, race, educational attainment, ownership of the primary residence, total household wealth, urbanicity, NSES and a flexible set of unpenalized thin-plate regression splines with 10 df.

eTable 6. Hazard Ratios (95% Confidence Intervals) of Incident Dementia in the Health and Retirement Study Associated With Interquartile Differences in 10-Year Average Concentrations of Source-Specific $PM_{2.5}$ in Single-Pollutant Models (Model 1) When Limiting to Non-Movers.

	Baseline 1998 (Primary)	**Non-Mover**
Total $PM_{2.5}$	1.08 (1.01, 1.17)	1.05 (0.94, 1.16)
Source-specific $PM_{2.5}$		
Agriculture	1.17 (1.05, 1.30)	1.16 (1.01, 1.31)
Traffic road	1.11 (1.01, 1.23)	1.05 (0.94, 1.17)
Non-road Traffic	1.14 (1.00, 1.32)	1.12 (0.93, 1.35)
Energy Coal	1.05 (0.96, 1.14)	1.00 (0.90, 1.10)
Energy Other	1.02 (0.93, 1.11)	1.05 (0.94, 1.17)
Industry Coal	1.05 (1.00, 1.10)	1.02 (0.94, 1.09)
Industry Other	1.01 (0.97, 1.05)	1.00 (0.94, 1.06)
Wildfires	1.04 (1.01, 1.07)	1.03 (1.00, 1.07)
Windblown Dust	1.00 (0.99, 1.01)	0.99 (0.98, 1.00)

[a]All models stratified by 2-year birth cohorts, 2-year age at baseline, and adjusted for sex, race, educational attainment, ownership of the primary residence, total household wealth, urbanicity, NSES and a flexible set of unpenalized thin-plate regression splines with 10 df.

eTable 7. Hazard Ratios (95% Confidence Intervals) of Incident Dementia in the Health and Retirement Study Associated With Interquartile Differences in Average Concentrations of $PM_{2.5}$ from Wildfires Estimated with Time-Fixed Emission Data (Primary) and Wildfires Estimated with Time-Varying Emission Data (2006 to 2016) with Different Average Periods and Baseline.

	Baseline	Fixed Estimates	Time-Varying Estimates
10-year average	2012	1.02 (0.95, 1.09)	1.02 (0.91, 1.14)
5-year average	2008	1.04 (1.00, 1.09)	1.06 (0.98, 1.13)
1-year average	2006	1.03 (1.00, 1.06)	1.02 (0.96, 1.06)

[a]All models stratified by 2-year birth cohorts, 2-year age at baseline, and adjusted for sex, race, educational attainment, ownership of the primary residence, total household wealth, urbanicity, NSES and a flexible set of unpenalized thin-plate regression splines with 10 df.

We evaluated the association of wildfire-related $PM_{2.5}$ with incident dementia using time-varying fires data from another published source[2]. Since the time-varying fire data was only available from 2006 to 2018, we were able to use data after 2014 since this would allow us to calculate a 10-year average exposure when allowing for <75% non-missing data. To facilitate the comparison between the results using this time-varying fires data and our previous ones using fixed fractional contribution, we also limited our analyses to the same baseline using fire-related $PM_{2.5}$ from our primary estimation. We also make similar comparisons using 5-year and 1-year exposure periods with 2010 and 2006 as the earliest baseline respectively.

eReferences

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2. O'Dell K, Ford B, Fischer EV, Pierce JR. Contribution of Wildland-Fire Smoke to US PM2.5 and Its Influence on Recent Trends. *Environmental Science & Technology.* 2019;53(4):1797-1804.