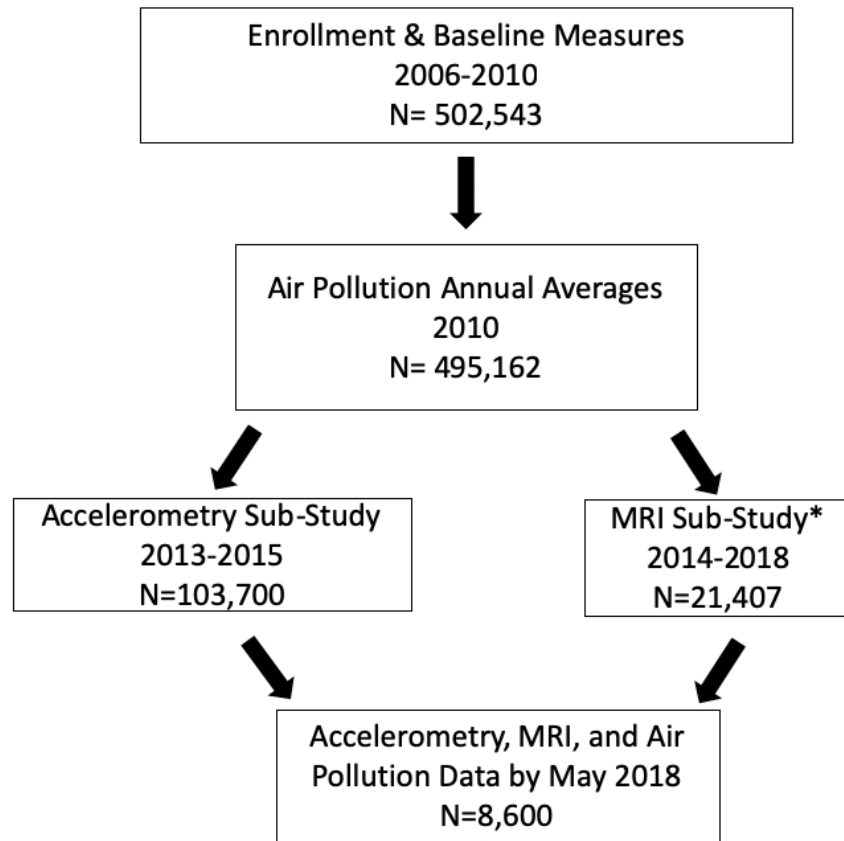


eFigure 1, Timeline of Instrument Collection and N's



\*MRI Measurements are ongoing. The latest measurement date as of the data download for this study, was May 2018

e Figure 2, Correlation Matrix of NO<sub>2</sub> Measures Over Time

	NO <sub>2</sub> 2005	NO <sub>2</sub> 2006	NO <sub>2</sub> 2007	NO <sub>2</sub> 2010
NO <sub>2</sub> 2005	1	0.99	0.98	0.87
NO <sub>2</sub> 2006		1	0.98	0.88
NO <sub>2</sub> 2007			1	0.85
NO <sub>2</sub> 2010				1

Legend

	Both estimates via EU- wide air pollution maps
	2010 estimate via ESCAPE

eTable 1a Sensitivity Analyses of Main Effects of Associations of NO<sub>2</sub> and PM<sub>2.5</sub> with Gray Matter Volume: Household income, Time between Imaging and Air Pollution, PA Season Measurement

	Model 1 standard set of covariates & sample reported in Table 2 N=8,600	Model 2 Restricting to population with household income data, controlling for standard set of covariates N=7,870	Model 3 Model 2, and controlling for time between imaging and air pollution, season, household income N=7,870
NO <sub>2</sub>	-0.042 (-0.068, -0.016)	-0.036 (-0.063, -0.009)	-0.034 (-0.061, -0.007)
PM <sub>2.5</sub>	-0.033 (-0.052, -0.007)	-0.029 (-0.051, -0.006)	-0.025 (-0.048, -0.002)

eTable 1b Sensitivity Analyses of Main Effects of Associations Between NO<sub>2</sub> and PM<sub>2.5</sub> with Gray Matter Volume: Adjustments for BMI, Alcohol Intake, Smoking, and Other Medical Conditions

	Model 1 standard set of covariates & sample reported in Table 2 N=8,600	Model 2 Restricting to sample with smoking, BMI, and alcohol intake N=8,456	Model 3 Model 2, and controlling for BMI, Alcohol, and smoking N=8,456	Model 4 Model 3, and controlling for history of heart attack, high blood pressure, and diabetes, and excluding those with any dementia N=8,393
NO <sub>2</sub>	-0.042 (-0.068, -0.016)	-0.038 (-0.064, -0.011)	-0.034 (-0.060, -0.008)	-0.037 (-0.063, -0.010)
PM <sub>2.5</sub>	-0.033 (-0.052, -0.007)	-0.031 (-0.053, -0.008)	-0.029 (-0.051, -0.007)	-0.029 (-0.051, -0.006)

eTable 2a Sensitivity Analyses of Interaction Models: Associations of NO<sub>2</sub> and PM<sub>2.5</sub> absorbance with white matter hyperintensity volume, among participants with >30 minutes/week of vigorous physical activity: Household income, Time between Imaging and Air Pollution, PA Season Measurement

	Model 1 sample reported in Table 3 & standard set of covariates N= 8,016	Model 2 Restricting to sample with household income data and with acceleration before brain imaging N=6,549	Model 3 Model 2 + controlling for times between imaging and accelerometry, and imaging and air pollution measurements, + season +household income N=6,549	Model 4 Model 3, but restricted to those with white matter hyperintensities<2.5 sd above the mean N=6,502
NO2	0.063 (0.015, 0.111)	0.064 (0.011, 0.117)	0.058 (0.006, 0.109)	0.056 (0.005, 0.106)
PM2.5 absorbance	0.071 (0.025, 0.116)	0.072 (0.022, 0.122)	0.065 (0.015, 0.115)	0.060 (0.011, 0.109)

eTable 2b Sensitivity Analyses of Interaction Models: Associations of NO<sub>2</sub> and PM<sub>2.5</sub> absorbance with white matter hyperintensity volume, Adjustments for BMI, Alcohol Intake, Smoking, and Other Medical Conditions

	Model 1 Sample reported in Table 3 & standard set of covariates N= 8,016	Model 2 Restricting to sample with smoking, BMI, and alcohol intake N=7,881	Model 3 Model 2, and controlling for BMI, Alcohol, and smoking N=7,881	Model 4 Model 3, and controlling for history of heart attack, high blood pressure, and diabetes, and excluding those with any dementia N=7,881
NO2	0.063 (0.015, 0.111)	0.063 (0.015, 0.111)	0.061 (0.014, 0.109)	0.049 (0.002, 0.096)
PM2.5 absorbance	0.071 (0.025, 0.116)	0.075 (0.030, 0.120)	0.065 (0.021, 0.110)	0.063 (0.019, 0.107)

eTable 3 Associations of Air Pollution with Grey Matter Volume (N=8,600) and White Matter Hyperintensity Volume (n=8,016), by Age Categories

	Age category	Beta coefficients for Air Pollution with Grey Matter Volume, by Age	Beta coefficients for Air Pollution with White Matter Hyperintensity Volume, by Age
PM <sub>2.5-10</sub>	<50	-0.053 (-0.086, -0.020)	0.049 ( 0.012, 0.086)
	50-60	0.012 (-0.014, 0.037)	-0.024 (-0.053, 0.004)
	61+	-0.011 (-0.038, 0.016)	-0.021 ( -0.052, 0.010)
	p-interaction	.01	.01

These effect estimates represent beta coefficients for associations of PM<sub>2.5-10</sub> with grey matter and white matter hyperintensity volume by age. None of the other AP measures had measurable interactions with Age on any structural brain volume outcomes.