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Supplemental Material

Air Pollution and Progression of Atherosclerosis in Different Vessel Beds—Results from a Prospective Cohort Study in the Ruhr Area, Germany

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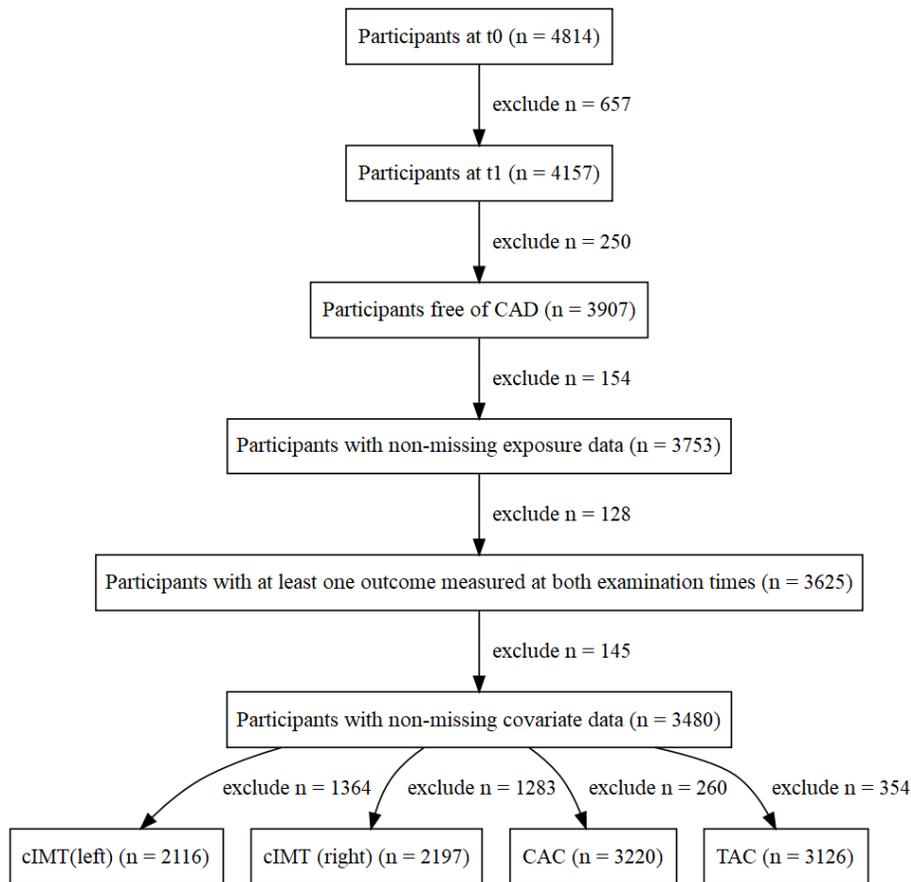


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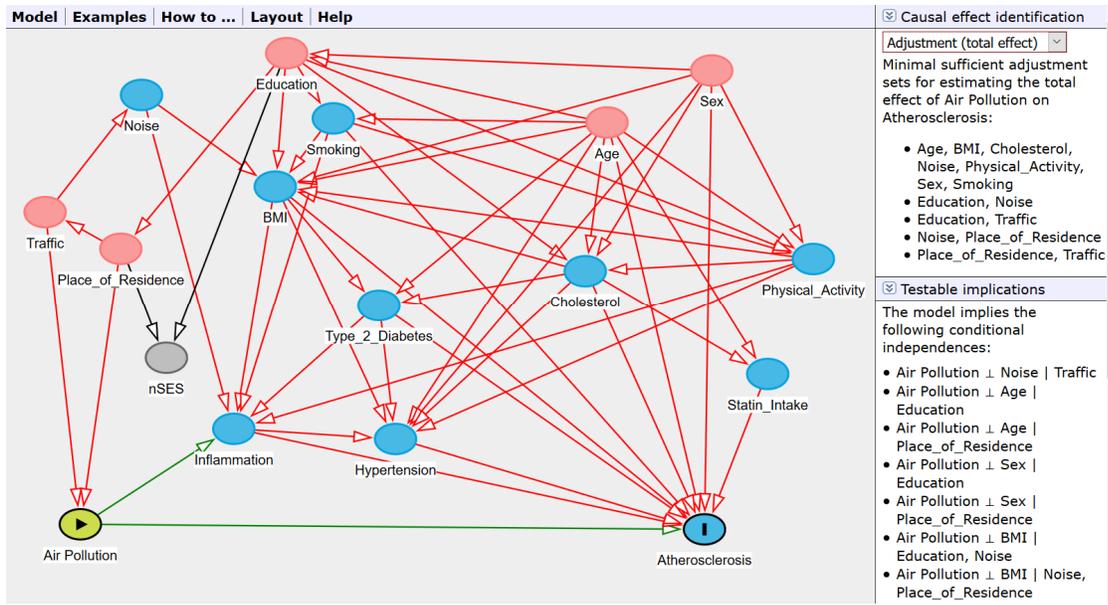


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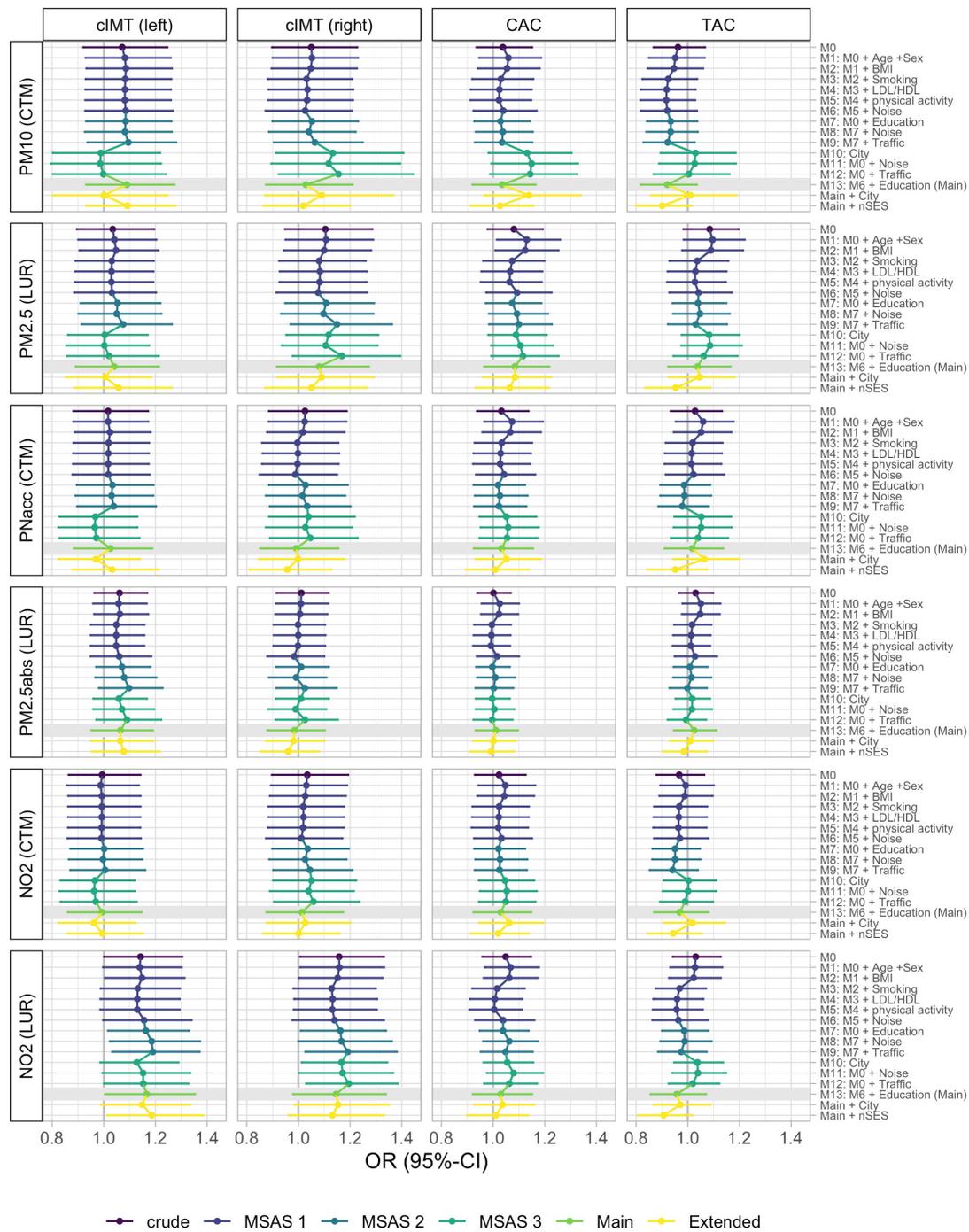


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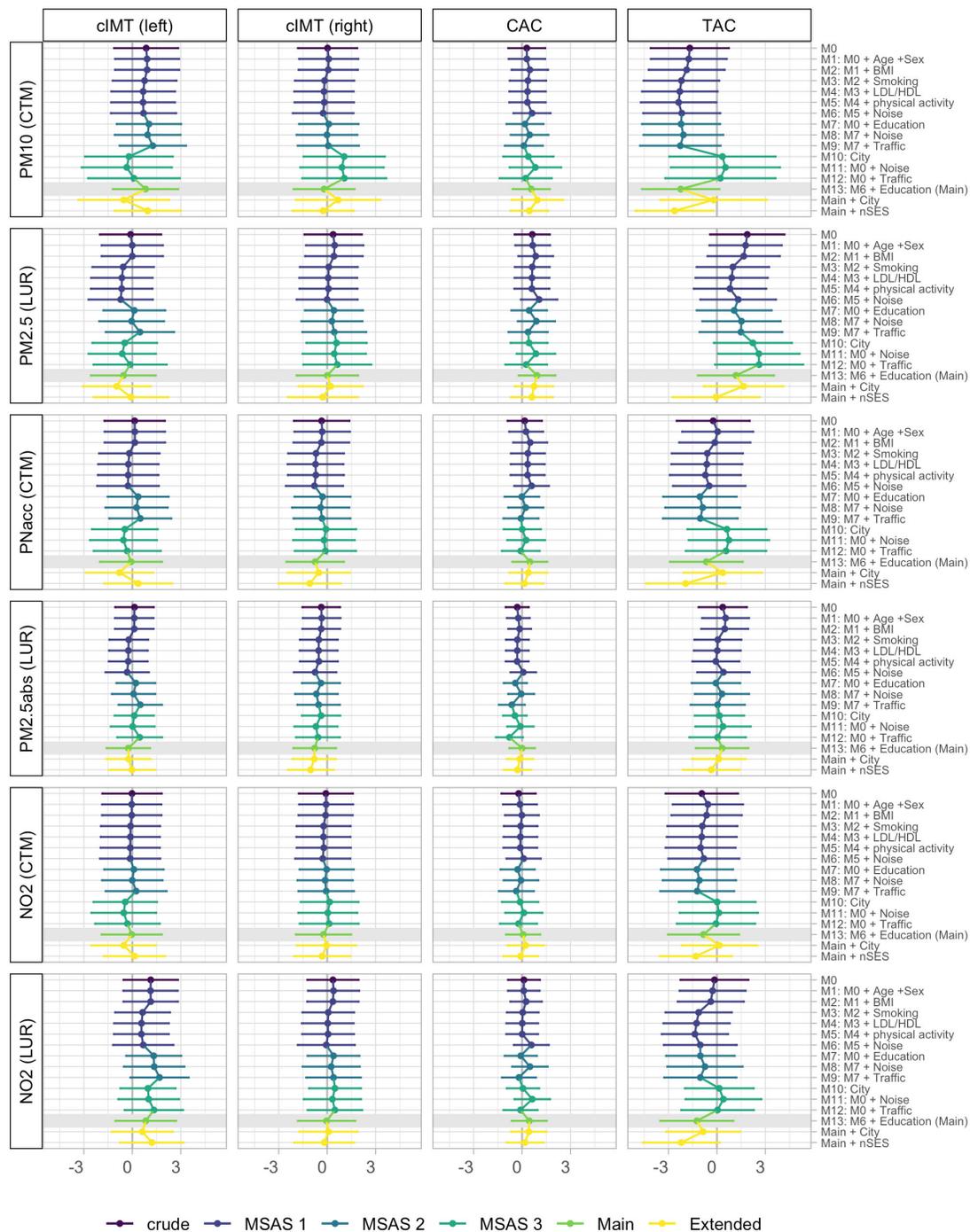


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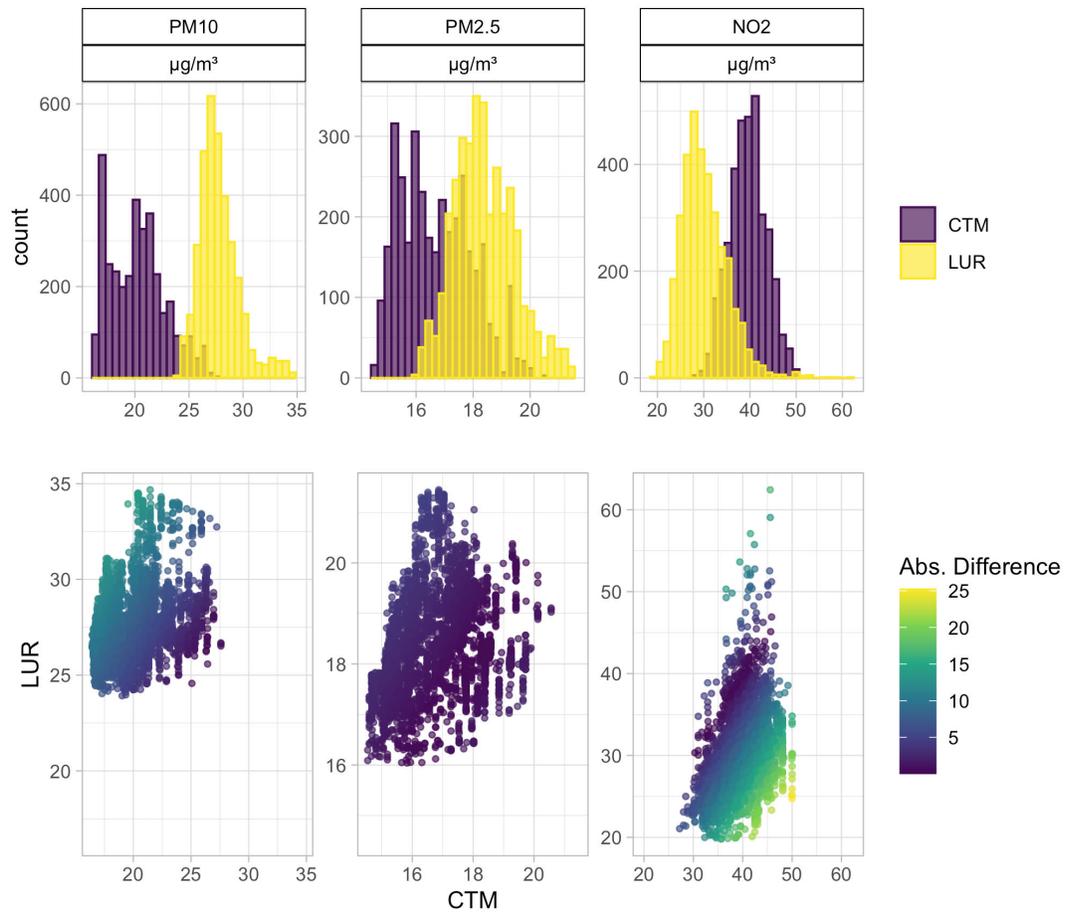


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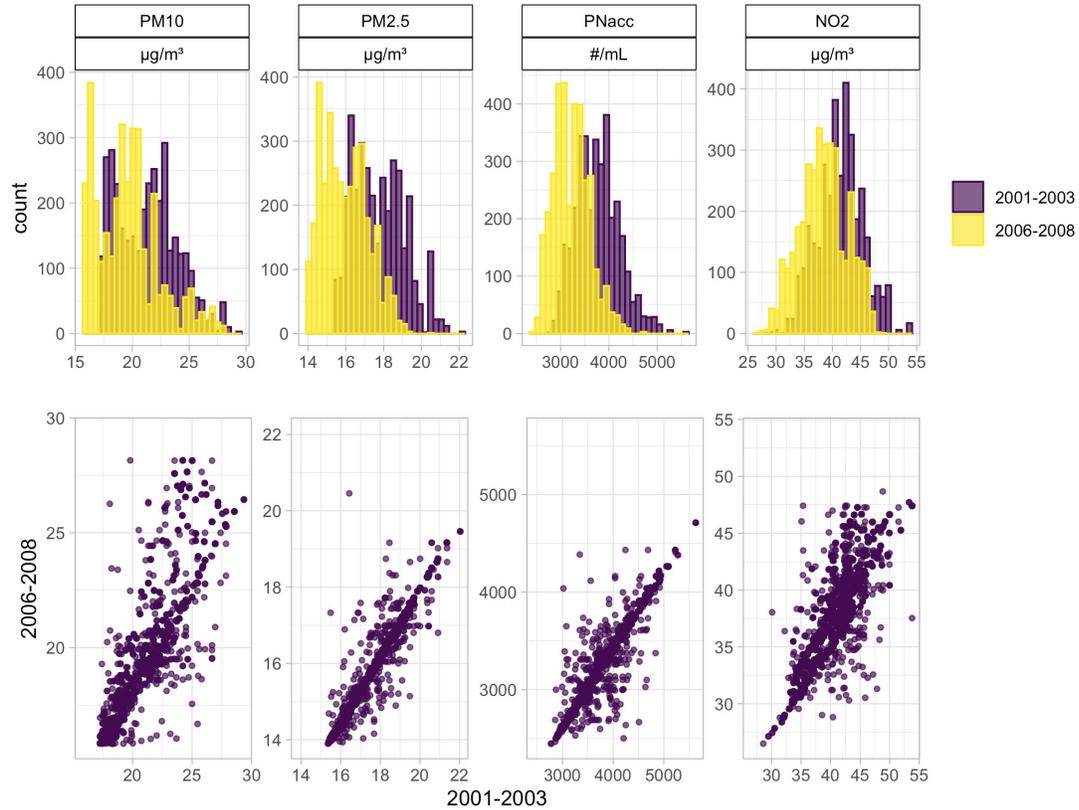


Figure S6: Histograms and Scatterplots of CTM air pollutant concentrations (PM10, PM2.5, PNacc, and NO2) at baseline (2001-2003) and follow-up (2006-2008).

Table S1: Spearman correlation coefficients for CTM-modelled air pollutant concentrations PM10, PM2.5, PNacc, and NO2 between baseline (2001-2003) and follow-up (2006-2008).

Variable 1	Variable 2	cor
PM10 (2001-2003), $\mu\text{g}/\text{m}^3$	PM10 (2006-2008), $\mu\text{g}/\text{m}^3$	0.93
PM2.5 (2001-2003), $\mu\text{g}/\text{m}^3$	PM2.5 (2006-2008), $\mu\text{g}/\text{m}^3$	0.98
PNacc (2001-2003), #/mL	PNacc (2006-2008), #/mL	0.95
NO2 (2001-2003), $\mu\text{g}/\text{m}^3$	NO2 (2006-2008), $\mu\text{g}/\text{m}^3$	0.87

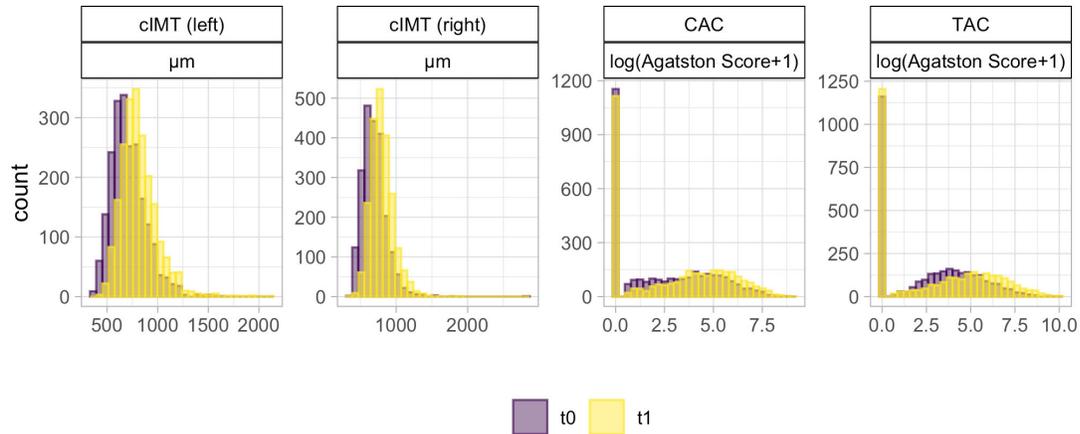


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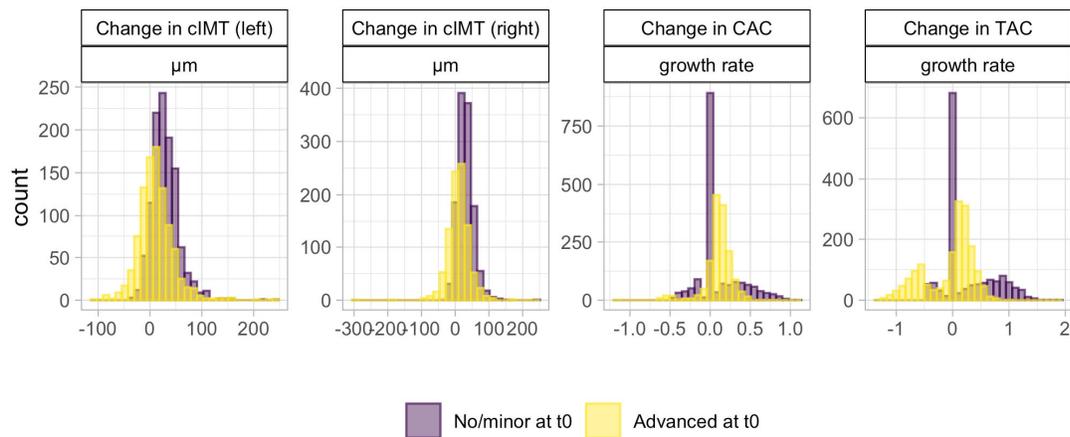


Figure S8: Histograms of change in markers of atherosclerosis (cIMT (left), cIMT (right), CAC, and TAC) in participants of the Heinz-Nixdorf-Recall Study.

Table S2: Estimated Odds Ratio [95%-CI] for progression of atherosclerosis and estimated change [95%-CI] in cIMT (μm) and calcification (growth rate) displayed per interquartile ranges of exposure based on participants of the Heinz-Nixdorf Recall Study sample (N = 2116 for cIMT (left), N = 2197 for cIMT (right), N = 3220 for CAC, and N = 3126 for TAC).

Marker	Exposure	Model	OR [95%-CI]	Change [95%-CI]
cIMT (left)	PM10 (CTM)	Crude	1.07 [0.92, 1.25]	0.86 [-1.13, 2.84]
		Main	1.09 [0.93, 1.27]	0.82 [-1.20, 2.85]
	PM10 (LUR)	Crude	1.02 [0.91, 1.15]	-0.18 [-1.72, 1.36]
		Main	1.02 [0.90, 1.16]	-0.52 [-2.13, 1.10]
	PM2.5 (CTM)	Crude	1.05 [0.89, 1.23]	1.10 [-1.01, 3.21]
		Main	1.06 [0.90, 1.25]	1.12 [-0.99, 3.24]
	PM2.5 (LUR)	Crude	1.03 [0.90, 1.20]	-0.11 [-2.01, 1.79]
		Main	1.04 [0.89, 1.21]	-0.55 [-2.55, 0.45]
	PNacc (CTM)	Crude	1.02 [0.88, 1.17]	0.14 [-1.73, 2.01]
		Main	1.02 [0.88, 1.19]	-0.08 [-2.00, 1.84]
	PM2.5abs (LUR)	Crude	1.06 [0.96, 1.17]	0.13 [-1.06, 1.33]
		Main	1.06 [0.95, 1.19]	-0.25 [-1.59, 1.10]
	NO2 (CTM)	Crude	0.99 [0.86, 1.14]	-0.02 [-1.86, 1.82]
		Main	0.99 [0.86, 1.15]	-0.04 [-1.90, 1.83]
NO2 (LUR)	Crude	1.14 [1.00, 1.30]	1.14 [-0.54, 2.82]	
	Main	1.17 [1.00, 1.35]	0.83 [-1.05, 2.71]	
cIMT (right)	PM10 (CTM)	Crude	1.05 [0.90, 1.23]	0.02 [-1.81, 1.86]
		Main	1.03 [0.87, 1.21]	-0.19 [-2.07, 1.69]
	PM10 (LUR)	Crude	1.09 [0.96, 1.23]	0.51 [-0.92, 1.95]
		Main	1.07 [0.94, 1.23]	0.32 [-1.20, 1.85]
	PM2.5 (CTM)	Crude	1.03 [0.87, 1.21]	-0.33 [-2.27, 1.61]
		Main	1.01 [0.85, 1.19]	-0.45 [-2.41, 1.50]
	PM2.5 (LUR)	Crude	1.10 [0.95, 1.29]	0.37 [-1.41, 2.14]
		Main	1.08 [0.92, 1.27]	0.01 [-1.89, 1.91]
	PNacc (CTM)	Crude	1.03 [0.89, 1.19]	-0.34 [-2.06, 1.37]
		Main	0.99 [0.85, 1.15]	-0.75 [-2.53, 1.04]
	PM2.5abs (LUR)	Crude	1.01 [0.92, 1.12]	-0.37 [-1.53, 0.80]
		Main	0.98 [0.88, 1.10]	-0.77 [-2.09, 0.55]
	NO2 (CTM)	Crude	1.03 [0.90, 1.19]	-0.08 [-1.76, 1.59]
		Main	1.01 [0.88, 1.17]	-0.23 [-1.94, 1.48]
NO2 (LUR)	Crude	1.16 [1.01, 1.33]	0.36 [-1.23, 1.94]	
	Main	1.15 [0.98, 1.34]	-0.04 [-1.81, 1.74]	
CAC	PM10 (CTM)	Crude	1.04 [0.94, 1.15]	0.00 [-0.01, 0.01]
		Main	1.04 [0.92, 1.16]	0.01 [-0.01, 0.02]
	PM10 (LUR)	Crude	1.07 [0.99, 1.16]	0.00 [0.00, 0.01]
		Main	1.07 [0.97, 1.18]	0.01 [0.00, 0.02]

Marker	Exposure	Model	OR [95%-CI]	Change [95%-CI]
	PM2.5 (CTM)	Crude	0.98 [0.88, 1.10]	0.00 [-0.01, 0.01]
		Main	0.98 [0.87, 1.11]	0.00 [-0.01, 0.01]
	PM2.5 (LUR)	Crude	1.08 [0.98, 1.19]	0.01 [0.00, 0.02]
		Main	1.08 [0.97, 1.22]	0.01 [0.00, 0.02]
	PNacc (CTM)	Crude	1.03 [0.94, 1.14]	0.00 [-0.01, 0.01]
		Main	1.03 [0.93, 1.15]	0.00 [-0.01, 0.02]
	PM2.5abs (LUR)	Crude	1.00 [0.94, 1.07]	0.00 [-0.01, 0.00]
		Main	1.01 [0.93, 1.10]	0.00 [-0.01, 0.01]
	NO2 (CTM)	Crude	1.02 [0.93, 1.13]	0.00 [-0.01, 0.01]
		Main	1.03 [0.92, 1.15]	0.00 [-0.01, 0.01]
	NO2 (LUR)	Crude	1.05 [0.96, 1.15]	0.00 [-0.01, 0.01]
		Main	1.03 [0.92, 1.15]	0.00 [-0.01, 0.02]
TAC	PM10 (CTM)	Crude	0.96 [0.87, 1.07]	-0.02 [-0.04, 0.01]
		Main	0.92 [0.82, 1.04]	-0.02 [-0.05, 0.00]
	PM10 (LUR)	Crude	1.06 [0.98, 1.14]	0.02 [0.00, 0.04]
		Main	1.02 [0.93, 1.12]	0.01 [-0.01, 0.03]
	PM2.5 (CTM)	Crude	0.91 [0.82, 1.02]	-0.03 [-0.05, 0.00]
		Main	0.90 [0.79, 1.02]	-0.03 [-0.05, 0.00]
	PM2.5 (LUR)	Crude	1.08 [0.98, 1.20]	0.02 [0.00, 0.04]
		Main	1.04 [0.92, 1.17]	0.01 [-0.01, 0.04]
	PNacc (CTM)	Crude	1.03 [0.93, 1.13]	0.00 [-0.02, 0.02]
		Main	1.02 [0.91, 1.14]	-0.01 [-0.03, 0.02]
	PM2.5abs (LUR)	Crude	1.03 [0.97, 1.10]	0.00 [-0.01, 0.02]
		Main	1.02 [0.95, 1.11]	0.00 [-0.01, 0.02]
	NO2 (CTM)	Crude	0.97 [0.88, 1.06]	-0.01 [-0.03, 0.01]
		Main	0.97 [0.87, 1.08]	-0.01 [-0.03, 0.01]
	NO2 (LUR)	Crude	1.03 [0.94, 1.13]	0.00 [-0.02, 0.02]
		Main	0.96 [0.86, 1.07]	-0.01 [-0.04, 0.01]

Note: Main model is adjusted for age, sex, BMI, smoking status and quantity, environmental tobacco smoke (ETS), LDL-C/HDL-C, physical activity, education, traffic noise and for dichotomous outcomes additionally years of follow-up.

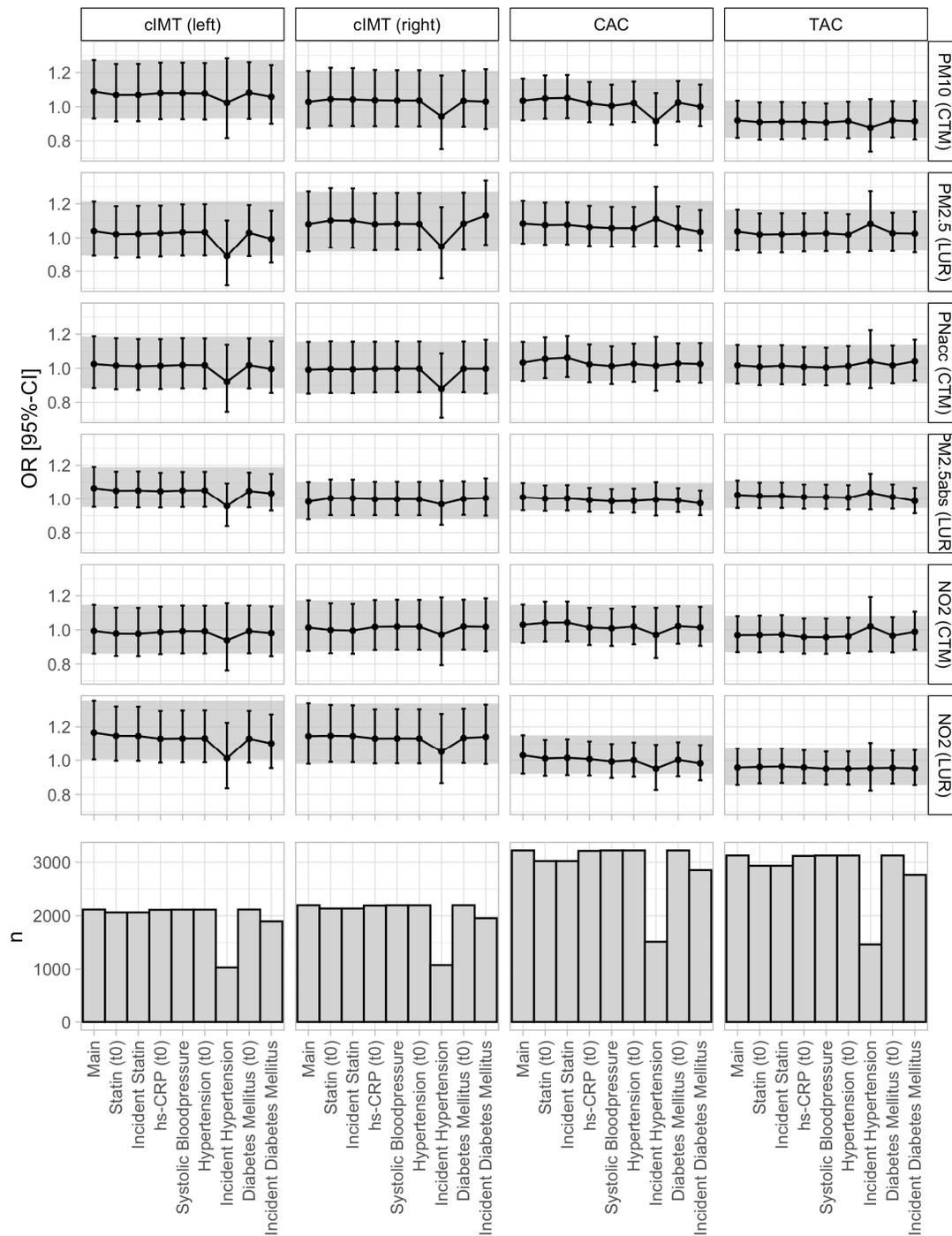


Figure S9: Estimated Odds Ratios (OR) (95%-CI) for progression of atherosclerosis measured using different markers (cIMT (left), cIMT (right), CAC, TAC) per IQR increase in air pollution concentration based on participants of the Heinz Nixdorf Recall cohort study evaluating adjustment by potential mediating variables.

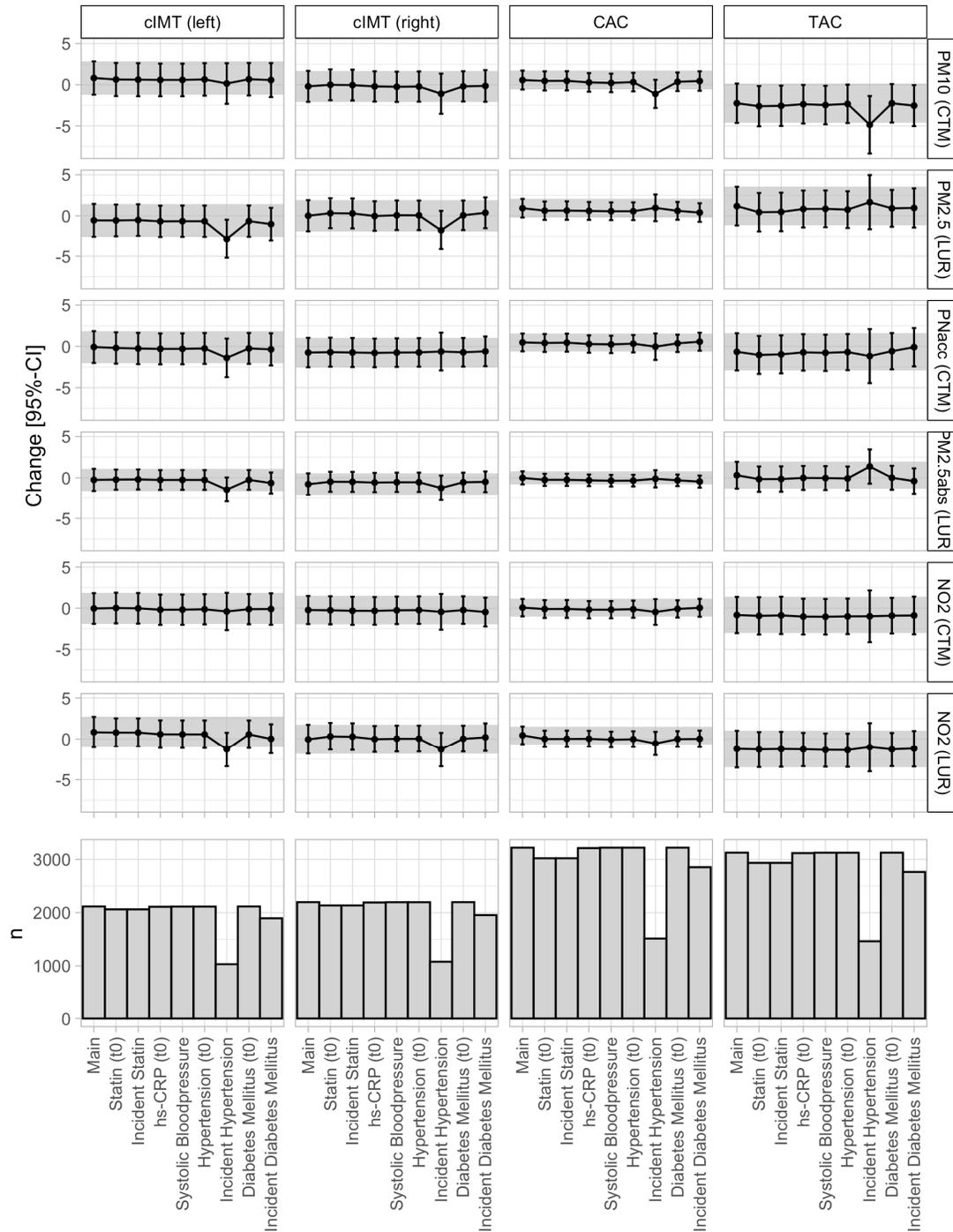


Figure S10: Estimated change (95%-CI) in carotid intima media thickness (μm) (cIMT (left) and cIMT (right)) and calcification (growth rate) (CAC and TAC) per IQR increase in air pollution concentration based on participants of the Heinz Nixdorf Recall cohort study evaluating adjustment by potential mediating variables.

Table S3: Odds Ratio [95%-CI] for progression and change [95%-CI] in cIMT (μm) and calcification (growth rate) displayed per interquartile ranges of exposure estimated in participants of the Heinz-Nixdorf Recall Study with no/minor atherosclerotic burden at baseline (t0) (cIMT (left)=1054, cIMT (right)=1017, CAC=1527,TAC=1761) and participants with advanced atherosclerotic burden at t0 (cIMT (left)=1203, cIMT (right)=1317, CAC=1693,TAC=1469).

Marker	Exposure	Atherosclerotic burden ^a	OR [95%-CI]	Change [95%-CI]	
cIMT (left)	PM10 (CTM)	No/Minor	1.42 [1.04, 1.94]	2.43 [-0.23, 5.09]	
		Advanced	1.02 [0.84, 1.24]	-0.36 [-3.08, 2.37]	
	PM10 (LUR)	No/Minor	1.16 [0.91, 1.48]	-0.30 [-2.39, 1.80]	
		Advanced	0.98 [0.84, 1.14]	-0.52 [-2.68, 1.63]	
	PM2.5 (CTM)	No/Minor	1.30 [0.95, 1.78]	2.15 [-0.58, 4.88]	
		Advanced	0.99 [0.81, 1.22]	0.07 [-2.91, 3.04]	
	PM2.5 (LUR)	No/Minor	1.37 [1.02, 1.84]	0.62 [-1.96, 3.20]	
		Advanced	0.96 [0.80, 1.16]	-1.08 [-3.75, 1.60]	
	PNacc (CTM)	No/Minor	1.41 [1.06, 1.88]	1.93 [-0.54, 4.39]	
		Advanced	0.94 [0.78, 1.13]	-1.51 [-4.15, 1.12]	
	PM2.5abs (LUR)	No/Minor	1.03 [0.86, 1.24]	-0.93 [-2.50, 0.65]	
		Advanced	1.06 [0.92, 1.23]	0.40 [-1.49, 2.29]	
	NO2 (CTM)	No/Minor	1.24 [0.95, 1.61]	1.49 [-0.88, 3.86]	
		Advanced	0.93 [0.78, 1.12]	-1.13 [-3.76, 1.49]	
	NO2 (LUR)	No/Minor	1.14 [0.88, 1.48]	-0.43 [-2.71, 1.84]	
		Advanced	1.18 [0.98, 1.42]	2.14 [-0.39, 4.68]	
	cIMT (right)	PM10 (CTM)	No/Minor	0.88 [0.64, 1.21]	0.64 [-1.65, 2.93]
			Advanced	1.08 [0.88, 1.33]	-1.40 [-4.04, 1.23]
PM10 (LUR)		No/Minor	0.93 [0.72, 1.20]	-1.05 [-2.94, 0.83]	
		Advanced	1.12 [0.95, 1.32]	1.59 [-0.42, 3.60]	
PM2.5 (CTM)		No/Minor	0.88 [0.63, 1.22]	0.74 [-1.66, 3.13]	
		Advanced	1.09 [0.88, 1.35]	-1.69 [-4.45, 1.07]	
PM2.5 (LUR)		No/Minor	0.92 [0.67, 1.26]	-0.64 [-2.94, 1.66]	
		Advanced	1.12 [0.91, 1.37]	0.29 [-2.26, 2.83]	
PNacc (CTM)		No/Minor	0.85 [0.64, 1.14]	0.71 [-1.42, 2.84]	
		Advanced	1.01 [0.83, 1.23]	-3.40 [-5.92, -0.89]	
PM2.5abs (LUR)		No/Minor	0.86 [0.72, 1.02]	-1.15 [-2.70, 0.39]	
		Advanced	1.03 [0.90, 1.19]	-0.65 [-2.41, 1.10]	
NO2 (CTM)		No/Minor	0.92 [0.69, 1.22]	0.93 [-1.12, 2.97]	
		Advanced	1.08 [0.89, 1.31]	-1.62 [-4.08, 0.84]	
NO2 (LUR)		No/Minor	0.88 [0.67, 1.16]	-0.99 [-3.10, 1.12]	
		Advanced	1.23 [1.02, 1.49]	0.44 [-1.89, 2.76]	
CAC		PM10 (CTM)	No/Minor	1.12 [0.96, 1.31]	0.01 [0.00, 0.03]
			Advanced	0.93 [0.74, 1.17]	0.00 [-0.02, 0.01]
	PM10 (LUR)	No/Minor	1.13 [1.00, 1.28]	0.01 [0.00, 0.03]	

Marker	Exposure	Atherosclerotic burden ^a	OR [95%-CI]	Change [95%-CI]
		Advanced	0.98 [0.82, 1.17]	0.00 [-0.01, 0.01]
	PM2.5 (CTM)	No/Minor	1.06 [0.90, 1.25]	0.01 [-0.01, 0.02]
		Advanced	0.84 [0.66, 1.07]	-0.01 [-0.03, 0.01]
	PM2.5 (LUR)	No/Minor	1.19 [1.03, 1.39]	0.02 [0.01, 0.04]
		Advanced	0.96 [0.77, 1.19]	0.00 [-0.02, 0.01]
	PNacc (CTM)	No/Minor	1.13 [0.97, 1.30]	0.02 [0.00, 0.03]
		Advanced	0.88 [0.71, 1.09]	-0.01 [-0.02, 0.01]
	PM2.5abs (LUR)	No/Minor	1.00 [0.90, 1.12]	0.00 [-0.01, 0.01]
		Advanced	0.99 [0.86, 1.14]	0.00 [-0.01, 0.01]
	NO2 (CTM)	No/Minor	1.07 [0.93, 1.24]	0.01 [-0.01, 0.02]
		Advanced	0.90 [0.72, 1.11]	-0.01 [-0.02, 0.01]
	NO2 (LUR)	No/Minor	1.13 [0.98, 1.31]	0.01 [0.00, 0.03]
		Advanced	0.90 [0.74, 1.10]	0.00 [-0.02, 0.01]
TAC	PM10 (CTM)	No/Minor	1.09 [0.92, 1.29]	0.01 [-0.02, 0.05]
		Advanced	0.78 [0.66, 0.91]	-0.04 [-0.06, -0.01]
	PM10 (LUR)	No/Minor	1.02 [0.89, 1.16]	0.00 [-0.02, 0.02]
		Advanced	1.03 [0.91, 1.17]	0.01 [-0.01, 0.03]
	PM2.5 (CTM)	No/Minor	1.13 [0.95, 1.36]	0.03 [0.00, 0.07]
		Advanced	0.72 [0.61, 0.85]	-0.06 [-0.09, -0.03]
	PM2.5 (LUR)	No/Minor	1.11 [0.94, 1.30]	0.01 [-0.02, 0.04]
		Advanced	0.99 [0.85, 1.16]	0.00 [-0.02, 0.03]
	PNacc (CTM)	No/Minor	1.18 [1.00, 1.39]	0.01 [-0.02, 0.04]
		Advanced	0.89 [0.77, 1.04]	-0.02 [-0.05, 0.01]
	PM2.5abs (LUR)	No/Minor	1.06 [0.95, 1.18]	0.00 [-0.02, 0.02]
		Advanced	1.00 [0.90, 1.11]	0.00 [-0.02, 0.02]
	NO2 (CTM)	No/Minor	1.13 [0.96, 1.32]	0.03 [0.00, 0.06]
		Advanced	0.84 [0.72, 0.97]	-0.03 [-0.06, -0.01]
	NO2 (LUR)	No/Minor	1.04 [0.89, 1.22]	-0.01 [-0.04, 0.02]
		Advanced	0.90 [0.78, 1.04]	-0.02 [-0.04, 0.01]

Note: Main model is adjusted for age, sex, BMI, smoking status and quantity, environmental tobacco smoke (ETS), LDL-C/HDL-C, physical activity, education, traffic noise and for dichotomous outcomes additionally years of follow-up.

a. No/minor atherosclerotic burden is defined by baseline cIMT \leq 0.7mm and CAC/TAC \leq 10 Agatston score units; Advanced atherosclerotic burden is defined by baseline cIMT $>$ 0.7mm and CAC/TAC $>$ 10 Agatston score units.

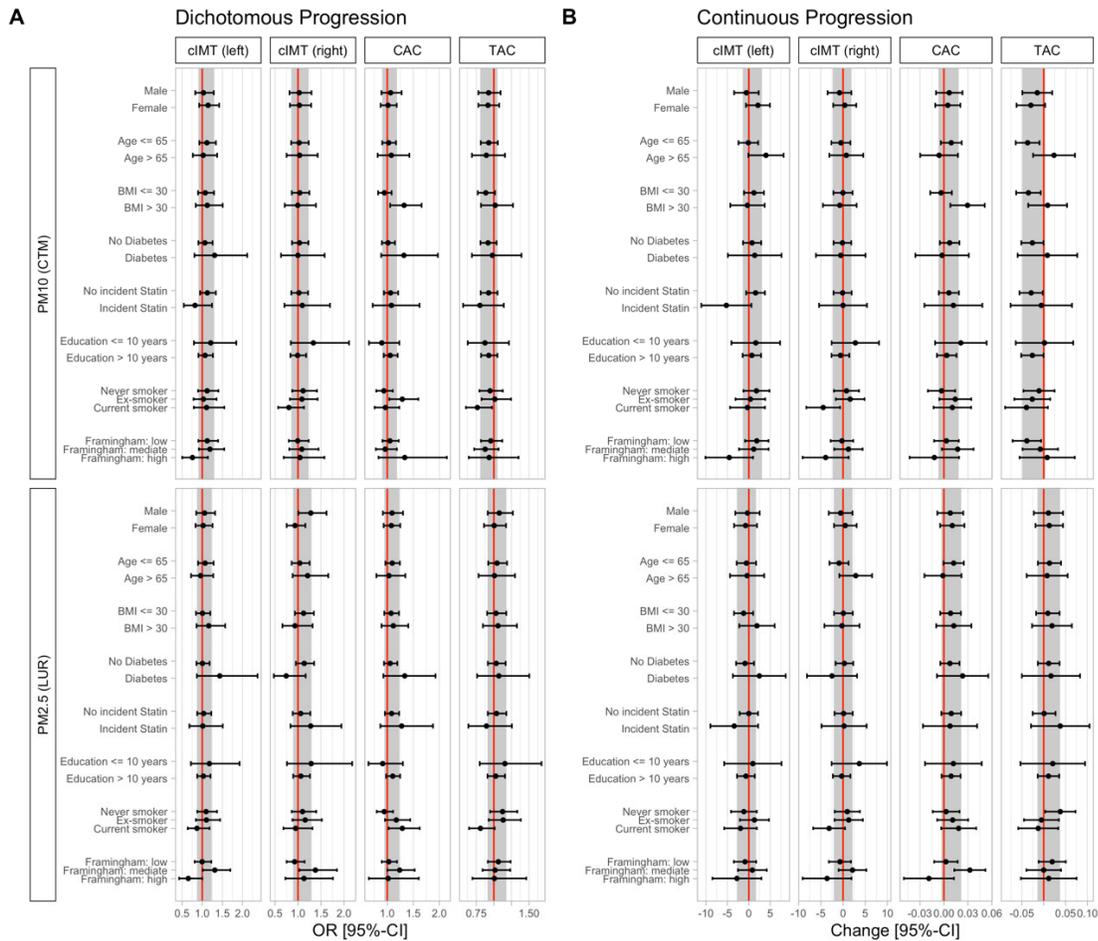


Figure S11: Subgroup effect estimates for the associations between different air pollutants and progression of atherosclerosis in subpopulations of the Heinz Nixdorf Recall Study based on the marker of atherosclerosis (cIMT (left)=2116, cIMT (right)=2197, CAC=3220, TAC=3126). Model is adjusted for age, sex, BMI, smoking status and quantity, environmental tobacco smoke (ETS), LDL-C/HDL-C, physical activity, education, traffic noise and for dichotomous outcomes additionally years of follow-up Panel A displays Odds Ratios (OR) (95%-CI) for any progression in atherosclerosis based on an interquartile range (IQR) in exposure. Panel B displays change in thickness (μm) for cIMT and change in growth rate for CAC and TAC.

Table S4: Estimated Odds Ratio (95%-CI) for progression of atherosclerosis in different markers defined by 10% increase (first column) and Relative Risks (95%-CI) for progression of atherosclerosis estimated using Poisson regression (second column) displayed per interquartile ranges of exposure based on participants of the Heinz-Nixdorf Recall Study sample (N = 2116 for cIMT (left), N = 2197 for cIMT (right), N = 3220 for CAC, and N = 3126 for TAC).

Marker	Exposure	OR (95%-CI), 10%	RR (95%-CI)
cIMT (left)	PM10 (CTM)	1.06 [0.93, 1.21]	1.02 [0.95, 1.09]
	PM10 (LUR)	1.00 [0.90, 1.11]	1.00 [0.95, 1.06]
	PM2.5 (CTM)	1.06 [0.92, 1.21]	1.01 [0.94, 1.09]
	PM2.5 (LUR)	0.99 [0.87, 1.13]	1.01 [0.94, 1.08]
	PNacc (CTM)	1.02 [0.90, 1.15]	1.01 [0.94, 1.08]
	PM2.5abs (LUR)	1.01 [0.93, 1.11]	1.01 [0.97, 1.06]
	NO2 (CTM)	0.99 [0.87, 1.11]	1.00 [0.93, 1.07]
	NO2 (LUR)	1.04 [0.92, 1.18]	1.03 [0.97, 1.10]
cIMT (right)	PM10 (CTM)	0.97 [0.85, 1.10]	1.01 [0.94, 1.08]
	PM10 (LUR)	0.95 [0.86, 1.06]	1.01 [0.96, 1.07]
	PM2.5 (CTM)	0.94 [0.82, 1.08]	1.00 [0.93, 1.08]
	PM2.5 (LUR)	0.94 [0.82, 1.07]	1.01 [0.95, 1.09]
	PNacc (CTM)	0.98 [0.87, 1.11]	1.00 [0.93, 1.07]
	PM2.5abs (LUR)	0.99 [0.90, 1.08]	1.00 [0.95, 1.05]
	NO2 (CTM)	0.96 [0.85, 1.08]	1.00 [0.94, 1.07]
	NO2 (LUR)	1.03 [0.91, 1.16]	1.03 [0.96, 1.10]
CAC	PM10 (CTM)	1.02 [0.91, 1.15]	1.01 [0.94, 1.08]
	PM10 (LUR)	1.08 [0.99, 1.19]	1.03 [0.98, 1.08]
	PM2.5 (CTM)	0.96 [0.85, 1.08]	0.99 [0.93, 1.07]
	PM2.5 (LUR)	1.10 [0.98, 1.23]	1.03 [0.97, 1.10]
	PNacc (CTM)	1.02 [0.92, 1.14]	1.01 [0.95, 1.07]
	PM2.5abs (LUR)	1.03 [0.95, 1.11]	1.00 [0.96, 1.05]
	NO2 (CTM)	1.00 [0.90, 1.11]	1.01 [0.95, 1.07]
	NO2 (LUR)	1.04 [0.93, 1.16]	1.01 [0.95, 1.08]
TAC	PM10 (CTM)	0.92 [0.82, 1.03]	0.96 [0.90, 1.04]
	PM10 (LUR)	1.02 [0.93, 1.12]	1.01 [0.95, 1.07]
	PM2.5 (CTM)	0.91 [0.81, 1.03]	0.95 [0.88, 1.03]
	PM2.5 (LUR)	1.04 [0.93, 1.17]	1.01 [0.94, 1.09]
	PNacc (CTM)	1.02 [0.92, 1.14]	1.00 [0.94, 1.07]
	PM2.5abs (LUR)	1.01 [0.94, 1.10]	1.01 [0.96, 1.06]
	NO2 (CTM)	0.97 [0.87, 1.08]	0.99 [0.92, 1.06]
	NO2 (LUR)	0.96 [0.86, 1.07]	0.98 [0.92, 1.05]

Marker	Exposure	OR (95%-CI), 10%	RR (95%-CI)
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Note: Main model is adjusted for age, sex, BMI, smoking status and quantity, environmental tobacco smoke (ETS), LDL-C/HDL-C, physical activity, education, traffic noise and for dichotomous outcomes additionally years of follow-up; changing the cutpoint to 20% did not differ from using a cut point of 10%.

Table S5: Estimated Odds Ratio (95%-CI) for progression of atherosclerosis in different markers as a sensitivity analysis investigating mean of left and/or right cIMT, faster progression of CAC based on personal percentile, displayed per interquartile ranges of exposure based on participants of the Heinz-Nixdorf Recall Study sample (N = 2594 for cIMT (left/right), N = 3220 for faster CAC).

Marker	Exposure	OR [95%-CI]	Change [95%-CI]
cIMT (left or right)	PM10 (CTM)	1.04 [0.90, 1.22]	0.34 [-1.23, 1.90]
	PM10 (LUR)	1.06 [0.93, 1.20]	0.28 [-0.98, 1.54]
	PM2.5 (CTM)	1.01 [0.86, 1.18]	0.19 [-1.45, 1.82]
	PM2.5 (LUR)	1.04 [0.89, 1.21]	0.05 [-1.51, 1.62]
	PNacc (CTM)	0.96 [0.84, 1.11]	-0.40 [-1.87, 1.08]
	PM2.5abs (LUR)	1.04 [0.93, 1.17]	-0.26 [-1.33, 0.81]
	NO2 (CTM)	1.00 [0.87, 1.14]	-0.26 [-1.70, 1.17]
	NO2 (LUR)	1.11 [0.96, 1.28]	0.45 [-1.01, 1.92]
faster CAC	PM10 (CTM)	1.04 [0.91, 1.19]	
	PM10 (LUR)	1.08 [0.97, 1.19]	
	PM2.5 (CTM)	0.95 [0.83, 1.09]	
	PM2.5 (LUR)	1.10 [0.97, 1.25]	
	PNacc (CTM)	1.05 [0.93, 1.19]	
	PM2.5abs (LUR)	1.02 [0.93, 1.12]	
	NO2 (CTM)	0.99 [0.88, 1.12]	
	NO2 (LUR)	1.05 [0.93, 1.19]	

Note: Main model is adjusted for age, sex, BMI, smoking status and quantity, environmental tobacco smoke (ETS), LDL-C/HDL-C, physical activity, education, traffic noise and for dichotomous outcomes additionally years of follow-up.

Table S6: Estimated Odds Ratio [95%-CI] for progression of atherosclerosis and estimated change [95%-CI] in cIMT (μm) and calcification (growth rate) displayed per interquartile ranges of exposure with regard to different time windows of exposure, modelled using the EURAD chemistry-transport model (CTM). Estimation are based on the main model and participants of the Heinz-Nixdorf Recall Study sample (N = 2116 for cIMT (left), N = 2197 for cIMT (right), N = 3220 for CAC, and N = 3126 for TAC).

Marker	Exposure	OR [95%-CI]	Change [95%-CI]	
cIMT (left)	PM10 (CTM)	1.09 [0.93, 1.27]	0.82 [-1.20, 2.85]	
	PM10 (CTM, 2000-2003)	1.10 [0.93, 1.31]	1.21 [-1.01, 3.42]	
	PM10 (CTM, 2006-2008)	1.07 [0.93, 1.24]	0.46 [-1.40, 2.31]	
	PM2.5 (CTM)	1.06 [0.90, 1.25]	1.12 [-0.99, 3.24]	
	PM2.5 (CTM, 2000-2003)	1.07 [0.91, 1.26]	1.34 [-0.80, 3.48]	
	PM2.5 (CTM, 2006-2008)	1.04 [0.89, 1.23]	0.87 [-1.25, 2.99]	
	PNacc (CTM)	1.02 [0.88, 1.19]	-0.08 [-2.00, 1.84]	
	PNacc (CTM, 2000-2003)	1.04 [0.89, 1.21]	0.21 [-1.78, 2.21]	
	PNacc (CTM, 2006-2008)	1.01 [0.86, 1.17]	-0.40 [-2.39, 1.59]	
	NO2 (CTM)	0.99 [0.86, 1.15]	-0.04 [-1.90, 1.83]	
	NO2 (CTM, 2000-2003)	1.00 [0.87, 1.14]	0.14 [-1.62, 1.90]	
	NO2 (CTM, 2006-2008)	0.99 [0.86, 1.13]	-0.25 [-2.02, 1.52]	
	cIMT (right)	PM10 (CTM)	1.03 [0.87, 1.21]	-0.19 [-2.07, 1.69]
		PM10 (CTM, 2000-2003)	1.01 [0.85, 1.20]	-0.41 [-2.47, 1.65]
		PM10 (CTM, 2006-2008)	1.04 [0.90, 1.21]	0.00 [-1.72, 1.73]
PM2.5 (CTM)		1.01 [0.85, 1.19]	-0.45 [-2.41, 1.50]	
PM2.5 (CTM, 2000-2003)		1.01 [0.85, 1.20]	-0.37 [-2.34, 1.60]	
PM2.5 (CTM, 2006-2008)		1.01 [0.85, 1.19]	-0.54 [-2.50, 1.42]	
PNacc (CTM)		0.99 [0.85, 1.15]	-0.75 [-2.53, 1.04]	
PNacc (CTM, 2000-2003)		0.99 [0.85, 1.16]	-0.71 [-2.55, 1.14]	
PNacc (CTM, 2006-2008)		0.98 [0.84, 1.15]	-0.88 [-2.72, 0.97]	
NO2 (CTM)		1.01 [0.88, 1.17]	-0.23 [-1.94, 1.48]	
NO2 (CTM, 2000-2003)		1.00 [0.87, 1.15]	-0.24 [-1.85, 1.38]	
NO2 (CTM, 2006-2008)		1.02 [0.89, 1.18]	-0.18 [-1.80, 1.44]	
CAC		PM10 (CTM)	1.04 [0.92, 1.16]	0.01 [-0.01, 0.02]
		PM10 (CTM, 2000-2003)	1.03 [0.90, 1.17]	0.01 [-0.01, 0.02]
		PM10 (CTM, 2006-2008)	1.04 [0.93, 1.16]	0.01 [-0.01, 0.02]
	PM2.5 (CTM)	0.98 [0.87, 1.11]	0.00 [-0.01, 0.01]	
	PM2.5 (CTM, 2000-2003)	0.98 [0.86, 1.11]	0.00 [-0.01, 0.01]	
	PM2.5 (CTM, 2006-2008)	0.99 [0.88, 1.12]	0.00 [-0.01, 0.01]	
	PNacc (CTM)	1.03 [0.93, 1.15]	0.00 [-0.01, 0.02]	
	PNacc (CTM, 2000-2003)	1.02 [0.91, 1.15]	0.00 [-0.01, 0.02]	
	PNacc (CTM, 2006-2008)	1.05 [0.93, 1.17]	0.01 [0.00, 0.02]	
	NO2 (CTM)	1.03 [0.92, 1.15]	0.00 [-0.01, 0.01]	
	NO2 (CTM, 2000-2003)	1.01 [0.91, 1.12]	0.00 [-0.01, 0.01]	

Marker	Exposure	OR [95%-CI]	Change [95%-CI]
	NO2 (CTM, 2006-2008)	1.04 [0.94, 1.16]	0.00 [-0.01, 0.01]
TAC	PM10 (CTM)	0.92 [0.82, 1.04]	-0.02 [-0.05, 0.00]
	PM10 (CTM, 2000-2003)	0.91 [0.80, 1.04]	-0.02 [-0.05, 0.01]
	PM10 (CTM, 2006-2008)	0.93 [0.84, 1.04]	-0.02 [-0.05, 0.00]
	PM2.5 (CTM)	0.90 [0.79, 1.02]	-0.03 [-0.05, 0.00]
	PM2.5 (CTM, 2000-2003)	0.90 [0.79, 1.02]	-0.03 [-0.05, 0.00]
	PM2.5 (CTM, 2006-2008)	0.90 [0.80, 1.02]	-0.03 [-0.05, 0.00]
	PNacc (CTM)	1.02 [0.91, 1.14]	-0.01 [-0.03, 0.02]
	PNacc (CTM, 2000-2003)	1.02 [0.91, 1.15]	0.00 [-0.03, 0.02]
	PNacc (CTM, 2006-2008)	1.02 [0.91, 1.14]	-0.01 [-0.03, 0.02]
	NO2 (CTM)	0.97 [0.87, 1.08]	-0.01 [-0.03, 0.01]
	NO2 (CTM, 2000-2003)	0.99 [0.90, 1.10]	0.00 [-0.02, 0.02]
	NO2 (CTM, 2006-2008)	0.95 [0.86, 1.06]	-0.02 [-0.04, 0.01]

Note: Main model is adjusted for age, sex, BMI, smoking status and quantity, environmental tobacco smoke (ETS), LDL-C/HDL-C, physical activity, education, traffic noise and for dichotomous outcomes additionally years of follow-up.

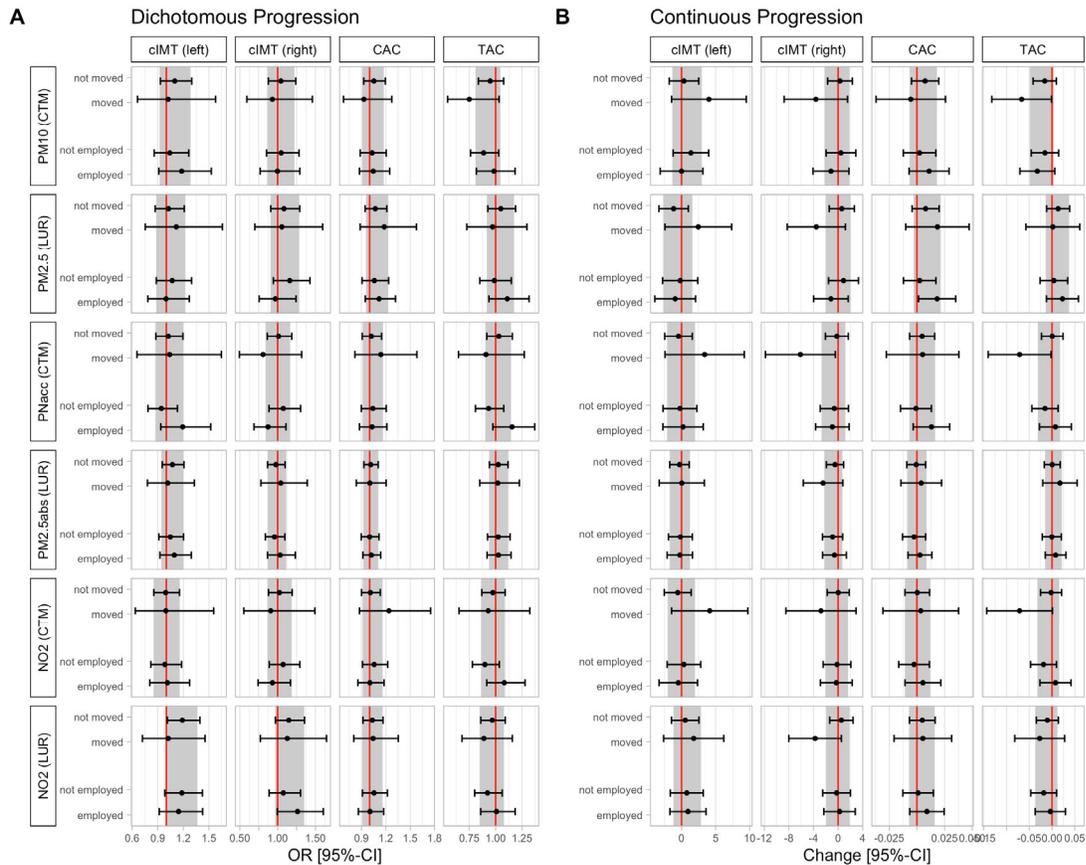


Figure S12: Subgroup effect estimates for the associations between different air pollutants and progression of atherosclerosis in subpopulations of the Heinz Nixdorf Recall Study based on the marker of atherosclerosis with respect to exposure misclassification (cIMT (left)=2116, cIMT (right)=2197, CAC=3220, TAC=3126). Movers within subsamples: cIMT (left) = 13.3%; cIMT (right) = 12.8%; CAC = 12.9%; TAC = 12.8%. Non-Employees within subsamples: cIMT (left) = 57.9%; cIMT (right) = 58%; CAC = 58.8%; TAC = 59.9%. Panel A displays Odds Ratios (OR) (95%-CI) for any progression in atherosclerosis based on an interquartile range (IQR) in exposure. Panel B displays change in thickness (μm) for cIMT and change in growth rate for CAC and TAC.