Online Data Supplement

Prognostic Significance of Large Airway Dimensions on Computed Tomography in the General Population: The Multi-Ethnic Study of Atherosclerosis (MESA) Lung Study

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Table E1. Associations Between Pi10 and Incident Pre-Bronchodilator Airflow Limitation, Defined by the Lower-Limit-of-Normal, Over Five Years of Follow-up in MESA-Lung Participants Without Initial Airflow Limitation or Prevalent Clinical Chronic Lower Respiratory Disease.

N = 1,830*	**Incident airflow limitation†**	
Model‡	OR per SD§ of pi10 (95% CI)	P-value
Crude	1.32 (0.95, 1.85)	.096
Partially-adjusted	1.51 (1.05, 2.17)	.025
Fully-adjusted	1.80 (1.17, 2.77)	.008
Genetic risk-adjusted	1.91 (1.20, 3.05)	.007
FEV1-Adjusted	1.90 (1.16, 3.12)	.011

B = beta estimate is mL per year per SD increment of pi10. CI = confidence interval. FEV1 = forced expiratory volume in one second. OR = odds ratio. SD = standard deviation.

*All models exclude participants with prevalent clinical chronic lower respiratory disease, defined as self-reported asthma or emphysema and/or inhaler use at study baseline, as well as those with airflow limitation (FEV1/FVC<0.7) on initial pre-bronchodilator spirometry in 2004-06 and those without valid pre-bronchodilator spirometry in 2010-12.

†Incident airflow limitation was defined as FEV1/FVC<lower-limit-of-normal on pre-bronchodilator spirometry in 2010-12, which was present in 34 cases, and analyzed by logistic regression models.

‡Models were adjusted for age, sex, race/ethnicity, height and weight (partially-adjusted); smoking status, packyears, voxel size, CT scanner type, and percent emphysema (fully-adjusted). The genetic risk-adjusted model is additionally adjusted for principal components of genetic ancestry (in the place of self-reported race/ethnicity) and COPD genetic risk score. The FEV1-adjusted model was additionally adjusted for the FEV1 percent predicted at the initial spirometry exam. Models adjusted for the genetic risk score and the initial FEV1 were limited to N=1,762, events = 33.

§Results are per standard deviation of log-transformed pi10 (one SD = 0.057 on the log-scale).

Table E2. Associations Between Pi10 and Decline in Lung Function Over Five Years of Follow-up in MESA-Lung Participants Without Initial Airflow Limitation or Prevalent Clinical Chronic Lower Respiratory Disease, Including Those Lost-To-Follow-Up.

N = 2,687*	**Annual decline in FEV1 (mL)†**	
Model‡	B per SD§ (95% CI)	P-value
Unadjusted	-2.45 (-4.32, -0.58)	.010
Partially-adjusted	-2.46 (-4.27, -0.65)	.008
Fully-adjusted	-2.35 (-4.16, -0.55)	.011
Genetic risk-adjusted	-2.53 (-4.40, -0.66)	.008
FEV1-Adjusted	-2.65 (-4.63, -0.67)	.009

B = beta estimate is mL per year per SD increment of pi10. CI = confidence interval. FEV1 = forced expiratory volume in one second. OR = odds ratio. SD = standard deviation.

*All models exclude participants with prevalent clinical chronic lower respiratory disease, defined as self-reported asthma or emphysema and/or inhaler use at study baseline, as well as those with airflow limitation (FEV1/FVC<0.7) on initial pre-bronchodilator spirometry in 2004-06.

†FEV1 was measured on pre-bronchodilator spirometry in 2004-06 and 2010-12. Annual decline in FEV1 was analyzed by random-intercept mixed models including all available data from both spirometry exams, including data N=2,687 with initial lung function, of whom N=857 were lost-to-follow-up and N=1,830 underwent repeated lung function measurement.

‡Models were adjusted for age, sex, race/ethnicity, height* and weight* (partially-adjusted); smoking status,* packyears,* voxel size, CT scanner type, and percent emphysema (fully-adjusted); asterisks (*) denote time-varying covariates in the mixed models. The genetic risk-adjusted model is additionally adjusted for principal components of genetic ancestry (in the place of self-reported race/ethnicity) and COPD genetic risk score. The FEV1-adjusted model was additionally adjusted for the FEV1 percent predicted at the initial spirometry exam. Models adjusted for the genetic risk score and the initial FEV1 were limited to N=1,762.

§Results are per standard deviation of log-transformed pi10 (one SD = 0.058 on the log-scale).

Table E3. Pi10 and Cause-specific Risks of Incident Chronic Lower Respiratory Disease (CLRD) Hospitalization, CLRD Mortality, and Non-CLRD Mortality, Over Fourteen Years of Follow-Up in Participants Without Prevalent CLRD.

N=6,029*	**CLRD Hospitalization**		**CLRD Mortality**		**Non-CLRD Mortality**	
N, Events	68		16		962	
Model‡	HR per SD§ (95% CI)	P-value	HR per SD§ (95% CI)	P-value	HR per SD§ (95% CI)	P-value
Cause-specific risk model	1.39 (1.19, 1.62)	<.0001	1.41 (0.97, 2.06)	.076	1.02 (0.95, 1.10)	.36
Competing risk model	1.41 (1.25, 1.58)	<.0001	1.41 (1.10, 1.81)	.007	1.01 (0.93, 1.10)	.79

CI = confidence interval. CLRD = chronic lower respiratory disease. Cum Inc = cumulative incidence. HR = hazard ratio. SD = standard deviation.

*Excludes participants with prevalent chronic lower respiratory disease, defined as self-reported asthma or emphysema and/or inhaler use at study baseline.

†CLRD Events are defined by the primary discharge diagnosis or underlying cause of asthma (ICD-9 493, ICD-10 J45-6), COPD (ICD-9 496, ICD-10 J44), chronic bronchitis (ICD-9 490-1, ICD-10 J40-2); or emphysema (ICD-9 492, ICD-10 J43).

‡The fully adjusted model includes age, sex, race/ethnicity, body mass index, smoking status, pack-years, percent emphysema, voxel size, and CT scanner type.

§HRs are per standard deviation of log-transformed pi10 (one SD = 0.064 on the log-scale).

Figure E1. Stratified Associations Between Pi10 and Risk of First Hospitalization or Mortality due to Chronic Lower Respiratory Disease (CLRD) over Fourteen Years of Follow-Up in Participants Without Prevalent Clinical CLRD, With 95% Confidence Intervals.

Fully-adjusted models include age, sex, race/ethnicity, body mass index, smoking status, pack-years, percent emphysema, voxel size, and CT scanner type. Results are per standard deviation of log-transformed pi10 (one SD = 0.064 on the log-scale).

BMI = body mass index. CT = computed tomography. SD = standard deviation. PM 2.5 = fine particulate matter pollution.

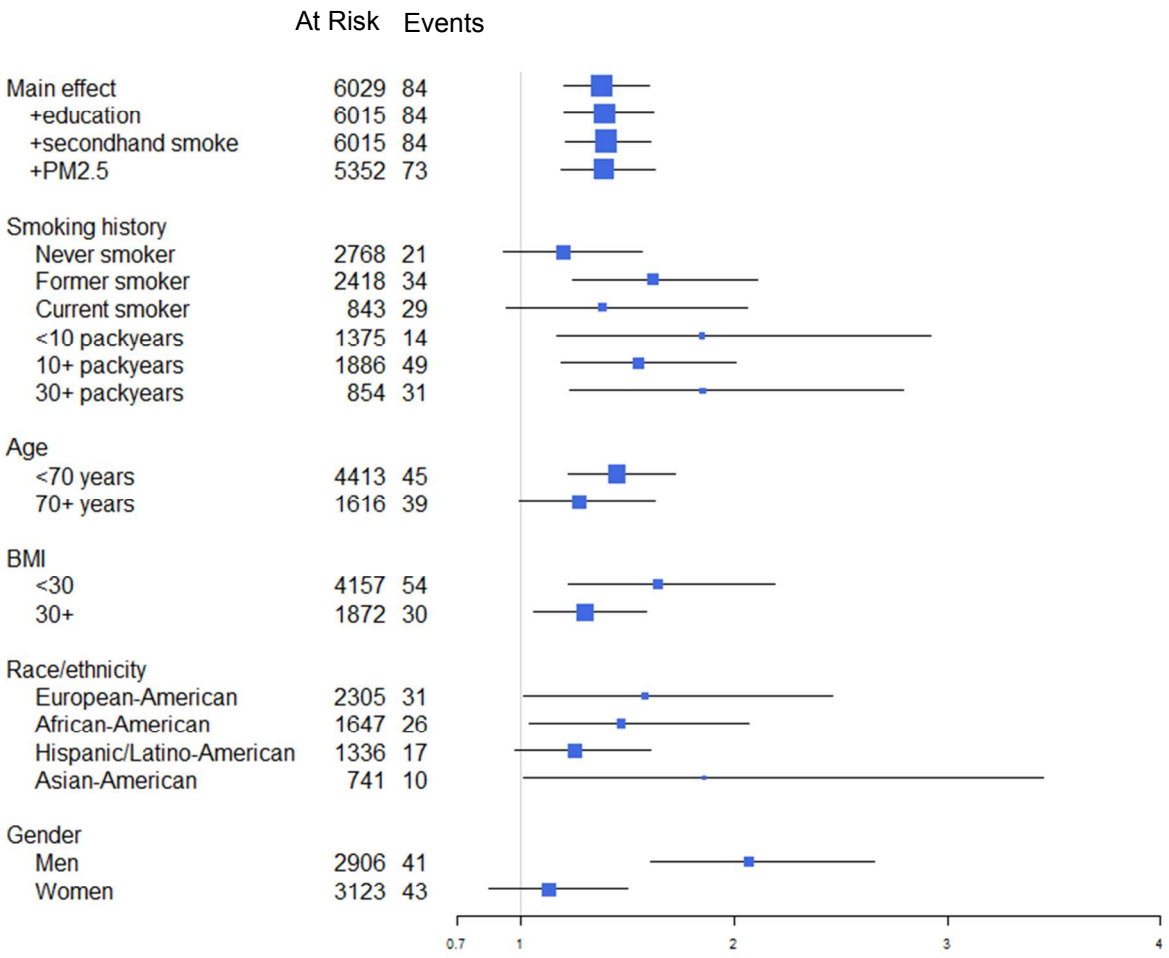

Figure E2. Associations Between Pi10, Decline in FEV1, and Risk of First Hospitalization or Mortality due to Chronic Lower Respiratory Disease (CLRD) over Fourteen Years of Follow-Up in Participants Without Prevalent Clinical CLRD, With 95% Confidence Intervals, Stratified by Scanner Type and Site.

Fully-adjusted models include age, sex, race/ethnicity, body mass index, smoking status, pack-years, percent emphysema, voxel size, and CT scanner type. Results are per standard deviation of log-transformed pi10 (site-specific standard deviations used for site-stratified analyses).

EBT = electron beam CT scanner. MDCT = multi-detector CT scanner. SD = standard deviation.