Supplemental Table 1. Demographic features of group 3 and group 4

	Group 3	Group 4.1	Group 4.2	Group 4.3	Group 4.4	Group 4.5	Group 4.6	Group 4.7
Number	40	359	68	659	77	85	7	34
Male	21 (52.5)	187 (52.1)	34 (50)	346 (52.5)	37 (48.1)	62 (72.9)	3 (42.9)	21(61.8)
Age (year)	59 [50–66]	60 [54-68]	63 ±11	60 [53-66]	61 ±11	65 ±14	64 ±10	64 ±13
Height (cm)	165 [160–170]	165 [160-170]	165 ±8	165 [160-171]	164 ±9	167 ±8	164 ±8	167 ±10
Weight (kg)	64 [59–70]	64 ±11	62 ±9	65 [56-72]	63 ±12	65 ±11	55 ±6	65 ±10
BMI (kg/m2)	23.4 ± 3.4	23.4 [21.0-25.1]	22.9 ±3.2	23.6 ±3.5	23.4 ±4.4	23.6 ±3.5	20.5 ±2.8	23.3 ±3.2
FVC (L)	2.80 (0.83)	2.61 [2.20-3.11]	2.41 ±0.82	2.67 [2.23-3.29]	2.36 ±0.74	2.58 ±0.87	1.39 ±0.18	2.48 ±0.75
FEV 1 (L)	2.30 (0.73)	2.06 ±0.73	1.68 ±0.76	2.16 [1.61-2.65]	1.84 ±0.67	2.01 ±0.77	1.14 ±0.23	1.99 ±0.68
FEV 1/FVC (%)	85.4 [75.2–91.1]	80.1 [68.3-87.2]	68.8 ±15.1	82.0 [71.2-89.6]	78.1 ±15.3	78.0 ±14.3	82.7 ±15.4	79.4 ±9.9
RV/TLC (%)	43.7 ± 9.3	46.9 ±8.6	48.9 ±8.2	47.0 ±9.5	49.7 ±7.8	45.2 ±9.9	56.7 ±8.9	44.9 ±5.6
TLC-SB	4.87 ± 0.86	4.51 ±0.91	4.21 ±1.05	4.41 [3.84-5.32]	4.12 ±0.98	4.17 ±1.02	3.36 ±1.03	4.38 ±0.93
DLCO SB	5.97 ±1.57	5.36 ±1.71	4.47 ±1.71	5.45 ±1.93	4.28 ±1.43	3.92 ±2.04	2.91 ±0.86	4.95 ±1.39
DLCO/VA	1.31 [1.10–1.50]	1.28 [1.08-1.44]	1.13 ±0.35	1.29 [1.08-1.45]	1.11 ±0.36	0.97 ±0.37	0.99 ±0.37	1.17 ±0.26
FEV 1% pred	88.0 [73.0–94.9]	82.0 [62.7-95.0]	65.7 ±22.9	85.2 [66.2-97.7]	73.2 ±21.7	76.3 ±21.6	51.8 ±24.5	75.2 ±17.7
FVC% pred	80.8 ± 16.3	81.9 ±17.6	75.6 ±17.1	83.9 ±17.2	75.7 ±17.9	77.1 ±17.7	49.4 ±16.7	74.8 ±13.5

TLC-SB% pred	84.1 4.87 ± 0.86 8.5	79.0 ±12.7	74.1 ±10.9	79.7 ±12.1	74.5 ±11.3	69.1 ±12.3	57.9 ±9.4	71.8 ±10.8
DLCO SB% pred	4.87 ± 0.86	66.3 ±17.4	58.5 ±15.3	68.7 [58.0-79.0]	61.0 [46.0-65.6]	50.5 ±18.2	35.8 ±9.3	59.0 ±13.7
DLCO/VA% pred	86.0 [78.6–103.6]	86.4 ±20.8	80.0 ±23.5	88.5 [76.3-99.7]	76.9 ±23.9	71.4 ±25.2	67.4 ±23.6	85.0 ±16.7
FEV_1 (L) post-bronchodilation	2.41 ± 0.74	2.17 ±0.74	1.82 ±0.83	2.20 [1.72-2.77]	1.92 ±0.68	2.13 ±0.80	1.21 ±0.25	2.04 ±0.70
FEV_1/FVC (%) post-bronchodilation	83.4 [76.2–91.2]	81.7 [70.8-89.2]	70.2 ±15.7	83.8 [73.4-90.6]	78.5 ±15.6	81.8 [68.9-89.6]	84.5 ±12.8	79.7 ±9.8
FEV_1%pred post-bronchodilation	91.0 [74.6–102.0]	86.6 [69.8-98.0]	71.5 ±24.6	88.5 [71.4-99.8]	76.7 ±22.7	81.3 ±23.4	57.4 ±34.3	77.7 ±20.6
FEV_1/FVC < 70% post-bronchodilation	5 (12.5)	88(24.5)	26(38.2)	133(20.2)	15(19.5)	22(25.9)	1(14.3)	6(17.6)
FEV_1/FVC < 70% positive in bronchodilation test	5 (12.5) 6 (15)	95(26.5) 45(12.5)	30(44.1) 13(19.1)	151(22.9) 80(12.1)	21(27.3) 8(10.4)	21(24.7) 11(12.9)	1(14.3) 1(14.3)	5(14.7) 5(14.7)
LAA%(-950HU)	NA	0.33 [0.07-0.79]	0.55 [0.18-1.67]	0.30 [0.05-0.64]	0.37 [0.06-0.88]	0.38 [0.06-2.59]	0.76 ±0.79	0.31 [0.12-0.72]
Perc 15 (HU)	NA	-891 [-906-868]	-896 ±32	-890 [-906-870]	-875 ±42	-886 [-906-855]	-854 ±52	-866 ±43

BMI: body mass index; FVC: forced vital capacity; FEV 1: forced expiratory volume in 1 second; RV: residual volume; TLC: total lung capacity; TLCO SB: The single-breath diffusing capacity of the lung for CO; DLCO: Diffusion Capacity for Carbon Monoxide of the Lung; LAA%: percentage of the lung volume occupied by low attenuation areas; Perc n: percentile of the histogram of attenuation values.

Supplemental Table 2. Independent predictors of persistent airflow limitation

	β	SE	p value	OR	95%CI
Model 1					
LAA%(-950HU)	0.792	0.12	<0.001	2.209	(1.75,2.79)
Age(year)	0.026	0.009	0.006	1.026	(1.01,1.04)
gender (male=1, female=0)	0.608	0.256	0.018	1.837	(1.11,3.03)
Constant	-3.503	0.588	<0.001		
Model 2					
LAA%(-950HU)	0.68	0.128	<0.001	1.974	(1.54,2.54)
Perc15	-0.017	0.005	0.002	0.984	(0.97,0.99)
Age(year)	0.029	0.01	0.003	1.029	(1.01,1.05)
Weight(kg)	0.023	0.011	0.026	1.024	(1.00,1.05)
Constant	-20.132	4.972	<0.001		
Model 3					
LAA%(-930HU)	0.168	0.041	<0.001	1.183	(1.09,1.28)
Perc3	-0.064	0.017	<0.001	0.938	(0.91,0.97)
Perc15	0.039	0.013	0.003	1.039	(1.01,1.07)
Age(year)	0.026	0.01	0.01	1.026	(1.01,1.05)
Constant	-27.515	7.041	<0.001		
Model 4					
Perc4	0.218	0.073	0.003	1.243	(1.08,1.43)
Perc8	-0.554	0.124	<0.001	0.575	(0.45,0.73)
Perc33	0.614	0.172	<0.001	1.847	(1.32,2.59)
Perc43	-0.321	0.121	0.008	0.726	(0.57,0.92)
Perc97	0.042	0.011	<0.001	1.043	(1.02,1.07)
LAA%(-973HU)	-0.304	0.145	0.036	0.738	(0.56,0.98)

LAA%(-927HU)	0.187	0.044	<0.001	1.206	(1.11,1.31)
LAA%(-292HU)	1.633	0.578	0.005	5.118	(1.65,15.89)
Constant	-190.496	53.657	<0.001		

LAA%: percentage of the lung volume occupied by low attenuation areas; Perc n: percentile of the histogram of attenuation values; OR: odds ratio.

Supplemental Table 3. The area under ROC curve of emphysema indexes and predicting model in diagnosing persistent airflow limitation

	group 1.1		group 1.2	
Rule	AUC±SD	95%CI	AUC±SD	95%CI
LAA%(-950HU)	0.79±0.025	(0.742,0.838)	0.817±0.025	(0.769,0.865)
LAA%(-930HU)	0.83±0.021	(0.788,0.872)	0.867±0.021	(0.825,0.908)
Perc 3	0.827±0.022	(0.785,0.87)	0.869±0.021	(0.828,0.909)
Perc 15	0.782±0.024	(0.735,0.83)	0.838±0.023	(0.794,0.882)
Model 1	0.804±0.023	(0.758,0.85)	0.845±0.023	(0.8,0.89)
Model 2	0.815±0.023	(0.771,0.86)	0.875±0.019	(0.839,0.912)
Model 3	0.852±0.021	(0.811,0.892)	0.892±0.017	(0.858,0.925)
Model 4	0.882±0.019	(0.845,0.92)	0.894±0.018	(0.858,0.93)

LAA%: percentage of the lung volume occupied by low attenuation areas; Perc n: percentile of the histogram of attenuation values. Model 1: y1 = 0.792 × LAA%(-950 HU) + 0.026 × Age(year) + 0.608 × sex(male = 1, female = 0) – 3.503. Model 2: y2 = 0.68 × LAA%(-950 HU) – 0.017 × Perc15 + 0.029 × Age(year) + 0.023 × Weight(kg) – 20.132. Model 3: y3 = 0.168 × LAA%(-930 HU) – 0.064 × Perc 3 + 0.039 × Perc 15 + 0.026 × Age (year) – 27.515. Model 4: y4 = 0.218 × Perc 4 – 0.554 × Perc 8 + 0.614 × Perc 33 – 0.321 × Perc 43 + 0.042 × Perc 97 – 0.304 × LAA%(-973 HU) + 0.187 × LAA% (-927 HU) + 1.633 × LAA% (-292 HU) – 190.496.

Supplemental Table 4. Diagnostic value of emphysema extent and predicting model in diagnosing persistent airflow limitation, compared with concurrent post-bronchodilator FEV1/FVC, the best FEV1/ the best FVC and the FEV1/FVC in the spirometry with the best FEV1

Rule	a	b	c	d	Sensitivity	Specificity	PPV	NPV
LAA%(-950HU)>0.84%								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	77	63	54	477	59%	88%	55%	90%
Group 1.1, compared with the best FEV1/ the best FVC.	80	61	59	471	58%	89%	57%	89%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	77	64	53	477	59%	88%	55%	90%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	65	45	41	328	61%	88%	59%	89%
Group 1.2, compared with the best FEV1/ the best FVC.	66	44	43	326	61%	88%	60%	88%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	66	44	37	332	64%	88%	60%	90%
LAA%(-950HU)>0.90%								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	73	53	58	487	56%	90%	57%	89%
Group 1.1, compared with the best FEV1/ the best FVC.	76	51	63	481	55%	90%	60%	88%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	73	54	57	487	56%	90%	57%	90%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	62	39	44	334	58%	90%	61%	88%
Group 1.2, compared with the best FEV1/ the best FVC.	62	39	47	331	57%	89%	61%	88%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	62	39	41	337	60%	90%	61%	89%
LAA%(-950HU)>1.4%								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	58	26	73	514	44%	95%	68%	88%
Group 1.1, compared with the best FEV1/ the best FVC.	58	27	81	505	42%	95%	68%	86%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	58	27	72	514	45%	95%	68%	88%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	50	16	56	357	47%	96%	76%	86%
Group 1.2, compared with the best FEV1/ the best FVC.	50	16	59	354	46%	96%	76%	86%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	50	16	53	360	49%	96%	76%	87%
LAA%(-950HU)>3.0%								

Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	43	5	88	535	34%	99%	85%	86%
Group 1.1, compared with the best FEV1/ the best FVC.	44	8	95	524	32%	98%	85%	85%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	44	8	86	533	34%	99%	85%	86%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	33	4	73	369	31%	99%	87%	83%
Group 1.2, compared with the best FEV1/ the best FVC.	33	5	76	365	30%	99%	87%	83%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	33	5	70	371	32%	99%	87%	84%
Perc15<-907HU								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	73	76	58	464	56%	84%	46%	89%
Group 1.1, compared with the best FEV1/ the best FVC.	78	82	61	450	56%	85%	49%	88%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	72	88	58	453	55%	84%	45%	89%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	63	52	43	321	61%	86%	55%	89%
Group 1.2, compared with the best FEV1/ the best FVC.	65	54	44	316	60%	85%	55%	88%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	64	55	39	321	62%	85%	54%	89%
Perc15<-910HU								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	63	53	68	487	51%	89%	53%	88%
Group 1.1, compared with the best FEV1/ the best FVC.	70	57	69	475	50%	89%	55%	87%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	66	61	64	480	51%	89%	52%	88%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	60	32	46	341	57%	90%	62%	88%
Group 1.2, compared with the best FEV1/ the best FVC.	59	38	50	332	54%	90%	61%	87%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	59	38	44	338	57%	90%	61%	88%
Perc15<-915HU								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	54	23	77	517	42%	95%	67%	87%
Group 1.1, compared with the best FEV1/ the best FVC.	55	27	84	505	40%	95%	67%	86%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	55	27	75	514	42%	95%	67%	87%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	49	19	57	354	46%	94%	70%	86%
Group 1.2, compared with the best FEV1/ the best FVC.	48	22	61	348	44%	94%	69%	85%

Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	48	22	55	354	47%	94%	69%	87%
Perc15<-928HU								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	33	4	98	536	28%	99%	86%	85%
Group 1.1, compared with the best FEV1/ the best FVC.	37	6	102	526	27%	99%	86%	84%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	37	6	93	535	28%	99%	86%	85%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	24	0	82	373	23%	99%	92%	82%
Group 1.2, compared with the best FEV1/ the best FVC.	24	2	85	368	22%	99%	92%	81%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	24	2	79	374	23%	99%	92%	83%
LAA%(-930HU)>1.4%								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	103	142	28	398	79%	72%	41%	93%
Group 1.1, compared with the best FEV1/ the best FVC.	109	143	30	389	78%	73%	43%	93%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	103	149	27	392	79%	72%	41%	94%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	86	97	20	276	81%	73%	46%	93%
Group 1.2, compared with the best FEV1/ the best FVC.	87	99	22	271	80%	73%	47%	92%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	85	101	18	275	83%	73%	46%	94%
LAA%(-930HU)>3.4%								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	76	53	55	487	58%	90%	59%	90%
Group 1.1, compared with the best FEV1/ the best FVC.	80	49	59	483	58%	91%	62%	89%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	75	54	55	487	58%	90%	58%	90%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	72	34	34	339	68%	91%	68%	91%
Group 1.2, compared with the best FEV1/ the best FVC.	71	35	38	335	65%	91%	67%	90%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	71	35	32	341	69%	91%	67%	91%
LAA%(-930HU)>5.2%								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	65	26	66	514	50%	95%	71%	89%
Group 1.1, compared with the best FEV1/ the best FVC.	65	26	74	506	47%	95%	71%	87%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	65	26	65	515	50%	95%	71%	89%

Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	56	20	50	353	53%	95%	74%	88%
Group 1.2, compared with the best FEV1/ the best FVC.	56	20	53	350	51%	95%	74%	87%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	56	20	47	356	54%	95%	74%	88%
LAA%(-930HU)>13%								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	38	5	93	535	31%	99%	87%	85%
Group 1.1, compared with the best FEV1/ the best FVC.	40	6	99	526	29%	99%	87%	84%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	40	6	90	535	31%	99%	87%	86%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	25	1	81	372	24%	99%	93%	82%
Group 1.2, compared with the best FEV1/ the best FVC.	25	2	84	368	23%	99%	93%	81%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	25	2	78	374	24%	99%	93%	83%
Perc3<-922HU								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	96	124	35	416	76%	75%	42%	93%
Group 1.1, compared with the best FEV1/ the best FVC.	105	131	34	401	76%	75%	44%	92%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	98	138	32	403	75%	74%	42%	93%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	85	78	21	295	81%	77%	50%	93%
Group 1.2, compared with the best FEV1/ the best FVC.	87	85	22	285	80%	77%	51%	93%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	85	87	18	289	83%	77%	49%	94%
Perc3<-931HU								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	75	52	56	488	58%	90%	58%	90%
Group 1.1, compared with the best FEV1/ the best FVC.	80	51	59	481	58%	90%	61%	89%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	75	56	55	485	58%	90%	57%	90%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	70	32	36	341	69%	90%	67%	91%
Group 1.2, compared with the best FEV1/ the best FVC.	72	37	37	333	66%	90%	66%	90%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	72	37	31	339	70%	90%	66%	92%
Perc3<-937HU								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	64	24	67	516	50%	95%	71%	89%

Group 1.1, compared with the best FEV1/ the best FVC.	65	27	74	505	47%	95%	71%	87%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	65	27	65	514	50%	95%	71%	89%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	54	16	52	357	53%	94%	73%	88%
Group 1.2, compared with the best FEV1/ the best FVC.	56	21	53	349	51%	94%	73%	87%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	56	21	47	355	54%	94%	73%	88%
Perc3<-951HU								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	39	4	92	536	32%	99%	88%	86%
Group 1.1, compared with the best FEV1/ the best FVC.	42	6	97	526	30%	99%	88%	84%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	42	6	88	535	32%	99%	88%	86%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	28	4	78	369	28%	99%	88%	83%
Group 1.2, compared with the best FEV1/ the best FVC.	30	4	79	366	28%	99%	88%	82%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	30	4	73	372	29%	99%	88%	84%
Model 1: y1=0.792*LAA%(-950HU)+0.026*Age(year)+0.608*gender (male=1, female=0)-3.503>-0.64								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	78	57	53	483	60%	89%	58%	90%
Group 1.1, compared with the best FEV1/ the best FVC.	82	53	57	479	59%	90%	61%	89%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	78	57	52	484	60%	89%	58%	90%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	61	35	45	338	58%	91%	64%	88%
Group 1.2, compared with the best FEV1/ the best FVC.	63	33	46	337	58%	91%	66%	88%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	63	33	40	343	61%	91%	66%	90%
Model 1: y1=0.792*LAA%(-950HU)+0.026*Age(year)+0.608*gender (male=1, female=0)-3.503>-0.57								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	74	54	57	486	56%	90%	58%	90%
Group 1.1, compared with the best FEV1/ the best FVC.	77	51	62	481	55%	90%	60%	89%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	75	53	55	488	58%	90%	59%	90%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	60	30	46	343	57%	92%	67%	88%

Group 1.2, compared with the best FEV1/ the best FVC.	61	29	48	341	56%	92%	68%	88%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	61	29	42	347	59%	92%	68%	89%
Model 1: y1=0.792*LAA%(-950HU)+0.026*Age(year)+0.608*gender (male=1, female=0)-3.503>-0.15								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	61	27	70	513	47%	95%	69%	88%
Group 1.1, compared with the best FEV1/ the best FVC.	62	26	77	506	45%	95%	70%	87%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	61	27	69	514	47%	95%	69%	88%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	48	15	58	358	45%	96%	76%	86%
Group 1.2, compared with the best FEV1/ the best FVC.	48	15	61	355	44%	96%	76%	85%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	48	15	55	361	47%	96%	76%	87%
Model 1: y1=0.792*LAA%(-950HU)+0.026*Age(year)+0.608*gender (male=1, female=0)-3.503>1.15								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	43	6	88	534	33%	99%	88%	86%
Group 1.1, compared with the best FEV1/ the best FVC.	43	6	96	526	31%	99%	88%	85%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	43	6	87	535	33%	99%	88%	86%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	33	3	73	370	31%	99%	92%	84%
Group 1.2, compared with the best FEV1/ the best FVC.	33	3	76	367	30%	99%	92%	83%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	33	3	70	373	32%	99%	92%	84%
Model 2: y2=0.68*LAA%(-950HU)-0.017*Perc15+0.029*Age(year)+0.023*Weight(kg)-20.132>-0.89								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	78	57	53	483	60%	89%	58%	90%
Group 1.1, compared with the best FEV1/ the best FVC.	81	54	58	478	58%	90%	60%	89%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	78	57	52	484	60%	89%	58%	90%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	69	38	37	335	65%	90%	64%	90%
Group 1.2, compared with the best FEV1/ the best FVC.	70	37	39	333	64%	90%	65%	90%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	70	37	33	339	68%	90%	65%	91%

Model 2: y2=0.68*LAA%(-950HU)-0.017*Perc15+0.029*Age(year)+0.023*Weight(kg)-20.132>-0.83								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	77	54	54	486	59%	90%	59%	90%
Group 1.1, compared with the best FEV1/ the best FVC.	80	51	59	481	58%	90%	61%	89%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	78	53	52	488	60%	90%	60%	90%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	64	36	42	337	60%	90%	64%	89%
Group 1.2, compared with the best FEV1/ the best FVC.	65	35	44	335	60%	91%	65%	88%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	65	35	38	341	63%	91%	65%	90%
Model 2: y2=0.68*LAA%(-950HU)-0.017*Perc15+0.029*Age(year)+0.023*Weight(kg)-20.132>-0.43								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	65	27	66	513	50%	95%	71%	89%
Group 1.1, compared with the best FEV1/ the best FVC.	65	27	74	505	47%	95%	71%	87%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	65	27	65	514	50%	95%	71%	89%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	53	15	53	358	50%	96%	78%	87%
Group 1.2, compared with the best FEV1/ the best FVC.	53	15	56	355	49%	96%	78%	86%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	53	15	50	361	51%	96%	78%	88%
Model 2: y2=0.68*LAA%(-950HU)-0.017*Perc15+0.029*Age(year)+0.023*Weight(kg)-20.132>0.76								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	45	6	86	534	34%	99%	88%	86%
Group 1.1, compared with the best FEV1/ the best FVC.	45	6	94	526	32%	99%	88%	85%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	45	6	85	535	35%	99%	88%	86%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	34	3	72	370	32%	99%	92%	84%
Group 1.2, compared with the best FEV1/ the best FVC.	34	3	75	367	31%	99%	92%	83%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	34	3	69	373	33%	99%	92%	84%

Model 3: y3=0.168*LAA%(-930HU)-0.064*Perc3+0.039*Perc15+0.026*Age(year)-27.515>-1.71								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	104	116	27	424	79%	79%	47%	94%
Group 1.1, compared with the best FEV1/ the best FVC.	109	111	30	421	78%	79%	50%	93%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	104	116	26	425	80%	79%	47%	94%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	85	80	21	293	80%	79%	52%	93%
Group 1.2, compared with the best FEV1/ the best FVC.	86	79	23	291	79%	79%	52%	93%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	85	80	18	296	83%	79%	52%	94%
Model 3: y3=0.168*LAA%(-930HU)-0.064*Perc3+0.039*Perc15+0.026*Age(year)-27.515>-1.13								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	79	53	52	487	60%	90%	60%	90%
Group 1.1, compared with the best FEV1/ the best FVC.	82	50	57	482	59%	91%	62%	89%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	78	54	52	487	60%	90%	59%	90%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	72	36	34	337	68%	90%	67%	91%
Group 1.2, compared with the best FEV1/ the best FVC.	73	35	36	335	67%	91%	68%	90%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	73	35	30	341	71%	91%	68%	92%
Model 3: y3=0.168*LAA%(-930HU)-0.064*Perc3+0.039*Perc15+0.026*Age(year)-27.515>-0.63								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	69	27	62	513	53%	95%	72%	89%
Group 1.1, compared with the best FEV1/ the best FVC.	70	26	69	506	50%	95%	73%	88%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	69	27	61	514	53%	95%	72%	89%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	58	21	48	352	55%	94%	73%	88%
Group 1.2, compared with the best FEV1/ the best FVC.	58	21	51	349	53%	94%	73%	87%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	58	21	45	355	56%	94%	73%	89%

Model 3: y3=0.168*LAA%(-930HU)-0.064*Perc3+0.039*Perc15+0.026*Age(year)-27.515>1.03								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	44	5	87	535	34%	99%	90%	86%
Group 1.1, compared with the best FEV1/ the best FVC.	44	5	95	527	32%	99%	90%	85%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	44	5	86	536	34%	99%	90%	86%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	29	6	77	367	27%	98%	83%	83%
Group 1.2, compared with the best FEV1/ the best FVC.	29	6	80	364	27%	98%	83%	82%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	29	6	74	370	28%	98%	83%	83%
Model 4: y4=0.218*Perc4-0.554*Perc8+0.614*Perc33-0.321*Perc43+0.042*Perc97-0.304*LAA%(-973HU)+0.187*LAA%(-927HU)+1.633*LAA%(-292HU)-190.496>-1.43								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	100	56	31	484	76%	90%	64%	94%
Group 1.1, compared with the best FEV1/ the best FVC.	104	52	35	480	75%	90%	67%	93%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	98	58	32	483	75%	89%	63%	94%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	72	35	34	338	68%	91%	67%	91%
Group 1.2, compared with the best FEV1/ the best FVC.	73	34	36	336	67%	91%	68%	90%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	73	34	30	342	71%	91%	68%	92%
Model 4: y4=0.218*Perc4-0.554*Perc8+0.614*Perc33-0.321*Perc43+0.042*Perc97-0.304*LAA%(-973HU)+0.187*LAA%(-927HU)+1.633*LAA%(-292HU)-190.496>-1.37								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	99	55	32	485	76%	90%	64%	94%
Group 1.1, compared with the best FEV1/ the best FVC.	103	51	36	481	74%	90%	67%	93%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	97	57	33	484	75%	89%	63%	94%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	70	33	36	340	66%	91%	68%	90%
Group 1.2, compared with the best FEV1/ the best FVC.	71	32	38	338	65%	91%	69%	90%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	71	32	32	344	69%	91%	69%	91%

Model 4: y4=0.218*Perc4-0.554*Perc8+0.614*Perc33-0.321*Perc43+0.042*Perc97-0.304*LAA%(-973HU)+0.187*LAA%(-927HU)+1.633*LAA%(-292HU)-190.496>-0.7								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	82	27	49	513	63%	95%	75%	91%
Group 1.1, compared with the best FEV1/ the best FVC.	83	26	56	506	60%	95%	76%	90%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	81	28	49	513	62%	95%	74%	91%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	65	13	41	360	61%	97%	83%	90%
Group 1.2, compared with the best FEV1/ the best FVC.	65	13	44	357	60%	96%	83%	89%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	65	13	38	363	63%	97%	83%	91%
Model 4: y4=0.218*Perc4-0.554*Perc8+0.614*Perc33-0.321*Perc43+0.042*Perc97-0.304*LAA%(-973HU)+0.187*LAA%(-927HU)+1.633*LAA%(-292HU)-190.496>0.57								
Group 1.1, compared with concurrent post-bronchodilator FEV1/FVC	57	6	74	534	44%	99%	90%	88%
Group 1.1, compared with the best FEV1/ the best FVC.	57	6	82	526	41%	99%	90%	87%
Group 1.1, compared with the FEV1/FVC in the spirometry with the best FEV1.	57	6	73	535	44%	99%	90%	88%
Group 1.2, compared with concurrent post-bronchodilator FEV1/FVC	38	2	68	371	36%	99%	95%	85%
Group 1.2, compared with the best FEV1/ the best FVC.	38	2	71	368	35%	99%	95%	84%
Group 1.2, compared with the FEV1/FVC in the spirometry with the best FEV1.	38	2	65	374	37%	99%	95%	85%

a: True positives, (with obvious emphysema and persistent airflow limitation); b: False positives, (with obvious emphysema but without persistent airflow limitation); c: False negatives, (without obvious emphysema but with persistent airflow limitation); d: True negatives, (without obvious emphysema and persistent airflow limitation). LAA%: percentage of the lung volume occupied by low attenuation areas; Perc n: percentile of the histogram of attenuation values; PPV: positive predictive values; NPV: negative predictive values.