

Supplementary Table 1. Distribution of COPD patients with phenotype by GOLD classifications.

GOLD assessment	All patients	Phenotype			
		NON-AE (a)	AE CB (b)	AE NON-CB (c)	ACO (d)
GOLD assessment (CAT) ^e					
GOLD A	4129 (54.1)	4043 (59.2) ^d	-	-	86 (21.9) ^a
GOLD B	3015 (39.5)	2795 (40.9) ^d	-	-	220 (56.0) ^a
GOLD C	127 (1.7)	-	35 (20.8) ^{c,d}	82 (34.2) ^{b,d}	10 (2.5) ^{b,c}
GOLD D	368 (4.8)	-	133 (79.2) ^{c,d}	158 (65.8) ^{b,d}	77 (19.6) ^{b,c}
GOLD assessment (mMRC) ^f					
GOLD A	8269 (90.9)	7962 (96.8) ^d	-	-	307 (70.1) ^a
GOLD B	295 (3.2)	259 (3.2) ^d	-	-	36 (8.2) ^a
GOLD C	419 (4.6)	-	128 (71.1) ^{c,d}	217 (82.8) ^{b,d}	74 (16.9) ^{b,c}
GOLD D	118 (1.3)	-	52 (28.9) ^{c,d}	45 (17.2) ^{b,d}	21 (4.8) ^{b,c}

Abbreviations: NON-AE, non-exacerbator; AE-CB, exacerbator with chronic bronchitis; AE NON-CB, exacerbator without chronic bronchitis; ACO, asthma-COPD overlap; GOLD, Global Initiative for Chronic Obstructive Lung Disease; CAT, COPD assessment tool; mMRC, Modified British Medical Research Council Questionnaire.

Note: Data are presented as No. (%). ^{a, b, c, d} indicate statistically significant difference between two phenotypes in pairwise comparisons, tested by Rao-Scott χ^2 test using Bonferroni-adjusted p values.

^e 1495 COPD patients were excluded for GOLD category by CAT due to missing CAT scores.

^f 33 COPD patients were excluded for GOLD category by mMRC due to missing mMRC scores.

Supplementary Table 2. Phenotypic characteristics of COPD patients who were defined by the lower limited normal value of FEV1/FVC.

	All patients	Phenotype				P value
		NON-AE (a)	AE-CB (b)	AE NON-CB (c)	ACO (d)	
Subjects , No. (%)	9593	8700 (90.7)	180 (1.9)	257 (2.7)	456 (4.8)	
Sex , No. (%), male	6697 (69.8)	6109 (70.2)	138 (76.7)	165 (64.2)	285 (62.5) ^{a,b}	<0.001
Age , mean (SD), years	58.6 (10.1)	58.4 (10.1) ^{b,d}	63.4 (9.1) ^a	64.4 (10.0)	58.0 (9.4) ^a	<0.001
Rural residence , No. (%), rural	5604 (58.4)	5096 (58.6)	112 (62.2)	148 (57.6)	248 (54.4)	0.44
Smoking status , No. (%)						
Never smoker	3698 (38.6)	3343 (38.5)	56 (31.3)	99 (38.5)	200 (44.0)	0.03
Former smoker	1355 (14.2)	1149 (13.2) ^{c,d}	44 (24.6) ^{c,d}	83 (32.3) ^{a,b}	79 (17.4) ^{a,b}	<0.001
Current smoker	4522 (47.2)	4192 (48.3) ^{c,d}	79 (44.1) ^{c,d}	75 (29.2) ^{a,b}	176 (38.7) ^{a,b}	<0.001
Smoking exposure , mean (SD), pack-years	20.4 (26.3)	20.3 (26.1)	27.8 (32.8)	20.5 (26.4)	18.8 (26.2)	0.06
Hospital admission for severe pulmonary disease in childhood , No. (%)	381 (3.9)	303 (3.5) ^d	10 (5.6) ^d	13 (5.1) ^d	55 (12.1) ^{a,b,c}	<0.001
Indoor to exposure to biomass pollutant , No. (%)	4739 (49.5)	4266 (49.1)	109 (60.9)	140 (54.5)	224 (49.2)	0.05
Exposure to dust or chemicals in workplace , No. (%)	4876 (50.9)	4385 (50.5)	108 (60.0) ^a	142 (55.3)	241 (52.9)	0.04
Family history of respiratory disease , No. (%)	3012 (31.4)	2596 (26.6) ^{b,c,d}	90 (49.7) ^{a,c}	103 (39.4) ^{a,b,d}	223 (49.9) ^{a,c}	<0.001
BMI , mean (SD), kg.m ⁻²	24.1 (3.6)	24.1 (3.5) ^{b,c,d}	22.9 (3.8) ^{a,d}	23.4 (3.8) ^{a,d}	24.5 (3.8) ^{a,b,c}	<0.001
Obesity , No. (%)	1242 (12.9)	1119 (11.7)	18 (10.0)	35 (13.6)	70 (15.4)	0.36
FEV₁ % pred , mean (SD), %	82.1 (19.8)	83.6 (18.9) ^{b,c,d}	60.3 (23.5) ^{a,d}	66.4 (22.7) ^a	70.1 (19.4) ^{a,b}	<0.001
FVC % pred , mean (SD), %	104.2 (19.6)	105.2 (19.2) ^{b,c}	88.5 (22.0) ^{a,c,d}	93.9 (20.8) ^{a,b}	97.9 (19.4) ^b	<0.001
FEV₁ / FVC , mean (SD), %	62.5 (8.6)	63.1 (7.9) ^{b,c,d}	52.9 (12.8) ^{a,d}	54.9 (11.8) ^a	56.8 (10.3) ^{a,b}	<0.001
GOLD Grade , No. (%)						
GOLD 1	5559 (57.9)	5302 (60.9) ^{b,c,d}	38 (21.3) ^a	77 (30.0) ^a	142 (31.1) ^a	<0.001
GOLD 2	3369 (35.1)	2945 (33.9) ^d	72 (40.0) ^d	110 (42.8) ^d	242 (53.1) ^{a,b,c}	<0.001
GOLD 3	587 (6.1)	410 (4.7) ^{b,c,d}	54 (30.0) ^{a,d}	58 (22.6) ^a	65 (14.3) ^{a,b}	<0.001
GOLD 4	78 (0.8)	43 (0.5) ^{b,c,d}	16 (8.9) ^{a,d}	12 (4.7) ^{a,d}	7 (1.5) ^{a,b,c}	<0.001
mMRC Score , mean (SD)	0.2 (0.6)	0.2 (0.5) ^{b,c,d}	1.1 (1.1) ^{a,c,d}	0.8 (0.9) ^{a,b}	0.6 (0.9) ^{a,b}	<0.001

Abbreviations: GOLD, Global Initiative for Chronic Obstructive Lung Disease; BMI, body mass index; FEV₁, forced expiratory volume in one second; FVC, forced vital capacity; GOLD, Global Initiative for Chronic Obstructive Lung Disease; mMRC, Modified British Medical Research Council Questionnaire.

Note: Data are presented as No. (%) or mean (SD). ^{a, b, c, d} showed statistically significant difference between two phenotypes in pairwise comparisons, using Rao-Scott χ^2 test for category variables and Kruskal–Wallis test for continuous variables with Bonferroni-adjusted *P* value.

Bold type represents statistical significance in multiple comparisons.

Supplementary Table 3. Characteristics of COPD patients residing in northern region versus southern region.

	Northern regions	Southern regions	<i>P</i> value
Subjects	4397 (48·1)	4737 (51·9)	
Sex (male)	3072 (69·9)	3563 (75·2)	0·002
Age (years)	59·8±9·4	62·7±9·6	<0·001
Rural residence (rural)	2327 (52·9)	2930(61·9)	0·12
Education Level (Primary or lower)	2217 (50·4)	3000 (63·3)	<0·001
Smoking status			
Never smoker	1798 (41·0)	1528 (32·3)	<0·001
Former smoker	698 (15·9)	747 (15·8)	0·94
Current smoker	1893 (43·1)	2453 (51·9)	<0·001
Smoking exposure (pack-year)	18·9±25·6	24·9±28·3	<0·001
Hospital admission for severe pulmonary disease in childhood	161 (3·7)	189 (4·0)	0·45
Indoor to exposure to biomass pollutant	2186 (49·8)	2416 (51·1)	0·84
Exposure to dust or chemicals in workplace	2059 (46·9)	2491 (52·6)	0·16
Family history of respiratory disease	1433 (32·6)	1414 (29·9)	0·21
BMI (kg.m⁻²)	24·8±3·6	23·2±3·3	<0·001
CAT Score	9·9±7·5	9·8±7·0	0·42
mMRC Score	0·2±0·6	0·2±0·6	0·87
Comorbidity number per person	0·5±0·8	0·4±0·7	0·04
Environmental and social factors			
Annual average temperature (°C)	11·2 (3·8)	18·4 (2·6)	<0·001
Annual average humidity (%)	59·1 (8·4)	77·8 (4·2)	<0·001
Annual average PM _{2·5} (µg/m ³)	65·1 (19·2)	48·3 (13·6)	<0·001
GDP per capita in 2015 (dollar)	7354 (2910)	7551 (3048)	0·71

Abbreviations: CAT, COPD assessment tool; mMRC, Modified British Medical Research Council Questionnaire; BMI, body mass index; FEV₁, forced expiratory volume in one second; FVC, forced vital capacity; PM, particulate matter; GDP, gross domestic product.

Note: Data are presented as No. (%) or mean±SD. *P* value showed statistically significant difference in comparisons, using Rao-Scott χ^2 test for category variables and Kruskal–Wallis test for continuous variables. Bold type represents statistical significance in comparisons.

Supplementary Table 4. Odds ratio (95% CI) of geographic areas for COPD phenotype with progressive adjustment of risk factors.

	AE with or without CB vs NON-AE ^a		ACO vs AE and NON-AE ^b	
	Odds ratio (95%CI)	p value	Odds ratio (95%CI)	p value
Models with geographic areas (South vs North)				
Model 1 ^c	2·25 (1·72-2·94)	<0·001	0·72 (0·54-0·96)	0·03
Model 2 ^d	2·13 (1·63-2·79)	<0·001	0·78 (0·58-1·06)	0·11
Model 3 ^e	2·10 (1·60-2·76)	<0·001	0·77 (0·57-1·05)	0·10
Model 4 ^f	2·03 (1·55-2·66)	0·01	0·75 (0·56-0·99)	0·04
Model with meteorological factors ^g				
Temperature (>50 th quantile vs <50 th quantile)	1·79 (1·18-2·71)	0·006	0·61 (0·47-0·78)	<0·001
Humidity (>50 th quantile vs <50 th quantile)	1·40 (0·70-1·56)	0·85	1·27 (0·97-1·66)	0·09

Abbreviations: AE-CB, exacerbator with chronic bronchitis; AE NON-CB, exacerbator without chronic bronchitis; ACO, asthma-COPD overlap; FEV₁, forced expiratory volume in one second; OR, odds ratio.

Note: Odds ratios with 95% CI were obtained by multiple logistic regressions taking into account complex sample design and cluster effect.

^a Models were fitted for AE with or without CB phenotype, and NON-AE was taken as reference group.

^b Models were fitted for ACO phenotype, and AE-CB, AE NON-CB, and NON-AE were taken as reference group.

^c Model 1: unadjusted.

^d Model 2: adjusted for age, sex, residential areas and educational level.

^e Model 3: adjusted for age, sex, residential areas, educational level, and per capita GDP of DSPs in 2015.

^f Model 4: adjusted for age, sex, residential areas, educational level, per capita GDP of DSPs in 2015, FEV₁ % pred., smoking does, BMI, hospital admission for severe pulmonary disease in childhood, indoor to exposure to biomass for cooking or heating, exposure to dust or chemicals in the workplace, comorbidities, and family history of pulmonary diseases.

^g Model included average temperature and humidity of DSPs in 2015 instead of geographic areas and were adjusted for those covariates included in model 4.

Bold type represents OR (95% CI) and *P* value with statistical significance in models.

Supplementary Table 5. Characteristics of COPD patients according to GOLD classification based on CAT.

	GOLD categories				p value
	GOLD A (a)	GOLD B (b)	GOLD C (c)	GOLD D (d)	
Subjects, No. (%)	4129 (54.1)	3015 (39.5)	127 (1.7)	368 (4.8)	
Sex, No. (%) , male	3049 (73.8)	2259 (74.9)	86 (67.7)	249 (67.7) ^{a,b}	0.05
Age , mean (SD), years	60.8 (9.6) ^{b, d}	62.1 (9.5) ^{a, d}	63.8 (10.3)	64.1 (9.0) ^{a, b}	<0.001
Rural residence , No. (%), rural	2257 (54.7) ^b	1921 (63.7) ^{a, c}	63 (49.6) ^b	215 (58.4)	0.001
Education Level , No. (%), primary or lower	2250 (54.5) ^{b, d}	1868 (62.0) ^{a, c}	72 (56.7) ^b	246 (66.8) ^a	<0.001
Smoking status , No. (%)					
Never smoker	1459 (35.4)	1018 (33.8)	56 (44.1)	136 (37.1)	0.18
Former smoker	643 (15.6) ^{c, d}	465 (15.5) ^{c, d}	31 (24.4) ^{a, b}	106 (28.9) ^{a, b}	<0.001
Current smoker	2022 (49.0) ^{c, d}	1526 (50.7) ^{c, d}	40 (31.5) ^{a, b}	125 (34.1) ^{a, b}	<0.001
Smoking exposure , mean (SD), pack-years	22.1 (26.9)	23.9 (28.3)	18.6 (25.4)	23.0 (29.1)	0.16
Hospital admission for severe pulmonary disease in childhood , No. (%)	134 (3.2) ^{b, c, d}	138 (4.6) ^a	10 (7.9) ^a	25 (6.8) ^a	<0.001
Indoor to exposure to biomass pollutant , No. (%)	2012 (48.8) ^{b, d}	1702 (56.5) ^a	60 (47.2)	211 (57.7) ^a	<0.001
Exposure to dust or chemicals in workplace , No. (%)	2071 (50.2)	1539 (51.1)	65 (51.2)	213 (57.9)	0.31
Family history of respiratory disease , No. (%)	1170 (28.3) ^{b, c, d}	1036 (34.4) ^{a, d}	52 (40.9) ^a	169 (45.9) ^{a, b}	<0.001
BMI , mean (SD), kg.m ⁻²	23.8 (3.4) ^d	23.8 (3.5) ^d	23.4 (3.6) ^{a, b}	23.2 (3.9) ^{a, b}	0.006
FEV₁ , mean (SD), L	2.3 (0.7) ^{b, c, d}	2.1 (0.7) ^{a, c, d}	1.8 (0.7) ^{a, b, d}	1.5 (0.6) ^{a, b, c}	<0.001
FEV₁ % pred , mean (SD), %	83.7 (17.5) ^{b, c, d}	77.6 (21.1) ^{a, c, d}	72.4 (22.2) ^{a, b, d}	59.3 (21.3) ^{a, b, c}	<0.001
FVC , mean (SD), L	3.6 (0.9) ^{b, c, d}	3.5 (0.9) ^{a, c, d}	3.1 (0.9) ^{a, b, d}	2.9 (0.9) ^{a, b, c}	<0.001
FVC % pred , mean (SD), %	105.2 (18.6) ^{b, c, d}	101.9 (20.6) ^{a, c, d}	97.0 (20.3) ^{a, b, d}	89.3 (20.7) ^{a, b, c}	<0.001
FEV₁ / FVC , mean (SD), %	62.9 (6.6) ^{b, c, d}	59.7 (9.3) ^{a, d}	58.0 (10.2) ^{a, d}	51.7 (12.1) ^{a, b, c}	<0.001
CAT Score , mean (SD)	4.5 (3.7) ^{b, c, d}	16.0 (5.4) ^{a, c, d}	5.7 (2.5) ^{a, b, d}	19.5 (6.4) ^{a, b, c}	<0.001
mMRC Score , mean (SD)	0.1 (0.4) ^{b, c, d}	0.3 (0.7) ^{a, c, d}	0.6 (0.9) ^{a, b, d}	1.0 (1.0) ^{a, b, c}	<0.001

Abbreviations: GOLD, Global Initiative for Chronic Obstructive Lung Disease; BMI, body mass index; FEV₁, forced expiratory volume in one second; FVC, forced vital capacity; GOLD, Global Initiative for Chronic Obstructive Lung Disease; CAT, COPD assessment tool; mMRC, Modified British Medical Research Council Questionnaire.

Note: Data are presented as No. (%) or mean (SD). ^{a, b, c, d} showed statistically significant difference between two phenotypes in pairwise comparisons, using Rao-Scott χ^2 test for category variables and Kruskal–Wallis test for continuous variables with Bonferroni-adjusted *P* value.

Bold type represents statistical significance in multiple comparisons.

Supplementary Table 6. Characteristics of COPD patients who were never-smokers.

	Current or ex-Smokers	Never-smokers				
		All	NON-AE	AE-CB	AE NON-CB	ACO
Subjects , No. (%)	5791 (63.5)	3326 (36.5)	2977 (89.5)	56 (1.7)	102 (3.1)	191 (5.7) [†]
Sex , No. (%), male	5520 (95.3)	1107 (33.3)	1012 (34.0)	22 (39.3)	22 (21.6)	51 (26.7)
Age , mean (SD), years	61.5 (9.4)	61.0 (10.0)	61.0 (10.0)	65.6 (9.6)	63.8 (9.7)	58.1 (9.5)
Hospital admission for severe pulmonary disease in childhood , No. (%)	182 (3.1)	168 (5.1)	128 (4.3)	3 (5.4)	5 (4.9)	32 (16.8)
Indoor to exposure to biomass pollutant , No. (%)	2953 (51.0)	1641 (49.4)	1458 (49.0)	31 (56.4)	53 (52.0)	99 (51.8)
Exposure to dust or chemicals in workplace , No. (%)	3154 (54.5)	1391 (41.8)	1229 (41.3)	25 (44.6)	47 (46.1)	90 (47.1)
Exposure to passive smoking , No. (%) [‡]	-	1557 (46.8)	1374 (46.2)	19 (33.9)	56 (54.9)	108 (56.5)
Family history of respiratory disease , No. (%)	1791 (30.9)	1052 (31.6)	877 (29.5)	26 (46.4)	50 (49.0)	99 (51.8)
BMI , mean (SD), kg.m ⁻²	23.6 (3.4)	24.7 (3.6)	24.7 (3.6)	23.9 (4.1)	23.9 (4.0)	24.8 (4.1)

Abbreviations: NON-AE, non-exacerbator; AE-CB, exacerbator with chronic bronchitis; AE NON-CB, exacerbator without chronic bronchitis; ACO, asthma-COPD overlap; GOLD, Global Initiative for Chronic Obstructive Lung Disease; CAT, COPD assessment tool; mMRC, Modified British Medical Research Council Questionnaire.

Note: Data are presented as No. (%).

[‡]Exposure to passive smoking was defined as exposure to passive smoking more than one day in a week during the last 12 months.

[†] Among 191 ACO patients who were non-smokers, 166 (87%) had self-report exposure to biomass, occupational pollutants, or passive smoking.

Supplementary Table 7. Prevalence of comorbidities in COPD patients according to GOLD classification (CAT).

	GOLD assessment				p value
	GOLD A (a)	GOLD B (b)	GOLD C (c)	GOLD D (d)	
Comorbidities	1186 (28.7) ^{b,c,d}	1029 (34.1) ^{a,d}	57 (44.9) ^a	164 (44.6) ^{a,b}	<0.001
Solid tumor	29 (0.7)	22 (0.7)	0 (0)	3 (0.8)	-
Coronary heart disease	187 (4.5) ^{b,d}	191 (6.3) ^{a,d}	11 (8.7)	55 (14.9) ^{a,b}	<0.001
Cerebrovascular disease	191 (4.6) ^{b,c}	218 (7.2) ^a	15 (11.8) ^a	28 (7.6)	<0.001
Diabetes mellitus	187 (4.5)	169 (5.6)	7 (5.5)	21 (5.7)	0.26
Hypertension	819 (19.8)	670 (22.2)	37 (29.1)	91 (24.7)	0.007
Depression	17 (0.4) ^c	17 (0.6)	3 (2.4) ^a	2 (0.5)	0.02
Osteoporosis	145 (3.5) ^d	142 (4.7) ^d	8 (6.3)	36 (9.8) ^{a,b}	<0.001
Number of Comorbidities					
0	2942 (71.3) ^{b,c,d}	1985 (65.9) ^{a,d}	70 (55.1) ^a	204 (55.4) ^{a,b}	<0.001
1-2	1117 (27.1) ^{b,c,d}	949 (31.5) ^{a,d}	52 (40.9) ^a	142 (38.6) ^{a,b}	<0.001
≥3	69 (1.7) ^d	80 (2.7) ^d	5 (3.9)	22 (6.0) ^{a,b}	<0.001

Abbreviations: GOLD, Global Initiative for Chronic Obstructive Lung Disease.

Note: Data are presented as No. (%). ^{a, b, c, d} showed statistically significant difference between two phenotypes in pairwise comparisons, tested by Rao-Scott χ^2 test using Bonferroni-adjusted *P* value. Bold type represents statistical significance in multiple comparisons.

Supplementary Table 8. Treatment and prevention in COPD patients according to GOLD classification (CAT).

	GOLD assessment				p value
	GOLD A (a)	GOLD B (b)	GOLD C (c)	GOLD D (d)	
Therapy					
Inhaled therapy	46 (1·1) ^{b,c,d}	94 (3·1) ^{a,c,d}	34 (26·8) ^{a,b}	116 (31·5) ^{a,b}	<0·001
Mono-ICS	0 (0)	3 (0·1) ^c	1 (1·6) ^b	3 (0·8)	NA
Short-acting bronchodilators	17 (0·4) ^{b,c,d}	26 (0·9) ^{a,c,d}	5 (3·9) ^{a,b}	28 (7·6) ^{a,b}	<0·001
Long-acting bronchodilators	7 (0·2) ^d	9 (0·3) ^d	1 (0·8)	10 (2·7) ^{a,b}	<0·001
Combined therapy ^e	1 (0·02) ^{b,c,d}	15 (0·5) ^{a,d}	2 (1·6) ^a	15 (4·1) ^{a,b}	<0·001
Combined- ICS ^e	0 (0)	7 (0·2) ^d	1 (1·6)	9 (2·7) ^b	NA
Unknown inhaler therapy ^f	21 (0·5) ^{b,c,d}	41 (1·4) ^{a,c,d}	24 (18·9) ^{a,b}	60 (16·3) ^{a,b}	<0·001
Non-inhaled therapy	171 (4·1) ^{b,c,d}	373 (12·4) ^{a,c,d}	80 (63·0) ^{a,b}	245 (66·6) ^{a,b}	<0·001
Theophylline	41 (1·0) ^{b,c,d}	128 (4·2) ^{a,c,d}	13 (10·2) ^{a,b,d}	78 (21·2) ^{a,b,c}	<0·001
Oral corticosteroids	7 (0·2) ^{c,d}	13 (0·4) ^{c,d}	5 (3·9) ^{a,b}	17 (4·6) ^{a,b}	<0·001
Expectorant	23 (0·6) ^{b,c,d}	72 (2·4) ^{a,c,d}	20 (15·7) ^{a,b}	59 (16·0) ^{a,b}	<0·001
Antioxidants	1 (0·02) ^c	7 (0·2) ^c	2 (1·6) ^{a,b}	1 (0·3)	<0·001
Cough medicine	85 (2·1) ^{b,c,d}	191 (6·3) ^{a,c,d}	33 (26·0) ^{a,b}	135 (36·7) ^{a,b}	<0·001
Antibiotics	83 (2·0) ^{b,c,d}	206 (6·8) ^{a,c,d}	34 (26·8) ^{a,b}	140 (38·0) ^{a,b}	<0·001
Traditional Chinese medicine	48 (1·2) ^{b,c,d}	127 (4·2) ^{a,c,d}	22 (17·3) ^{a,b}	97 (26·4) ^{a,b}	<0·001
Antiallergic medicine	8 (0·2) ^{b,c,d}	21 (0·7) ^{a,c,d}	5 (3·9) ^{a,b}	27 (7·3) ^{a,b}	<0·001
PFT done before	214 (5·2) ^{c,d}	171 (5·7) ^{c,d}	19 (15·0) ^{a,b}	70 (19·0) ^{a,b}	<0·001
Rehabilitation	20 (0·5) ^{c,d}	20 (0·7) ^{c,d}	6 (4·7) ^{a,b}	24 (6·5) ^{a,b}	<0·001
Oxygen therapy	23 (0·6) ^{b,c,d}	55 (1·8) ^{a,c,d}	23 (18·1) ^{a,b,d}	113 (30·7) ^{a,b,c}	<0·001
Influenza vaccine	119 (2·9) ^d	114 (3·8)	7 (5·5)	20 (5·4) ^a	0·02
Pneumococcal vaccine	31 (0·8) ^c	21 (0·7) ^c	4 (3·1) ^{a,b}	7 (1·9)	0·001

Abbreviations: GOLD, Global Initiative for Chronic Obstructive Lung Disease; ICS, inhaled corticosteroid; PFT, pulmonary function testing.

Note: Data are presented as No. (%). ^{a, b, c, d} showed statistically significant difference between two phenotypes in pairwise comparisons, using Rao-Scott χ^2 test with Bonferroni-adjusted p value.

^e Combined ICS was contained in the combined therapy.

^f Patients do not know or remember the type of inhaled medications.

Bold type represents statistical significance in multiple comparisons.