Mild COPD, COPD in Young People, Early COPD: Definition and Screening

Dongguk University Gyeongju Hospital

Sang Hyuk Kim

Contents

...2021, 2022

PULMONARY PERSPECTIVE

At the Root: Defining and Halting Progression of Early Chronic Obstructive Pulmonary Disease

Fernando J. Martinez[1,2*], MeiLan K. Han[2*], James P. Allinson[3], R. Graham Barr[4], Richard C. Boucher[5], Peter M. A. Calverley[6], Bartolome R. Celli[7], Stephanie A. Christenson[8], Ronald G. Crystal[1], Malin Fagerås[9], Christine M. Freeman[2,10], Lars Groenke[11], Eric A. Hoffman[12], Mehmet Kesimer[5], Kostantinos Kostikas[13], Robert Paine III[14,15], Shahin Rafii[1], Stephen I. Rennard[11], Leopoldo N. Segal[16], Renat Shaykhiev[1], Christopher Stevenson[17], Ruth Tal-Singer[18], Jørgen Vestbo[19], Prescott G. Woodruff[8], Jeffrey L. Curtis[2,10‡], and Jadwiga A. Wedzicha[3‡]

CrossMark

What is early COPD and why is it important?

Joan B. Soriano [1,2], Francesca Polverino[3,4] and Borja G. Cosio [2,5]

ORIGINAL ARTICLE

Importance of Early COPD In Young Adults for Development of Clinical COPD

Findings from the Copenhagen General Population Study

Yunus Çolak[1,2,3], Shoaib Afzal[1,2,3], Børge G. Nordestgaard[1,2,3], Peter Lange[2,3,4,5], and Jørgen Vestbo[6]

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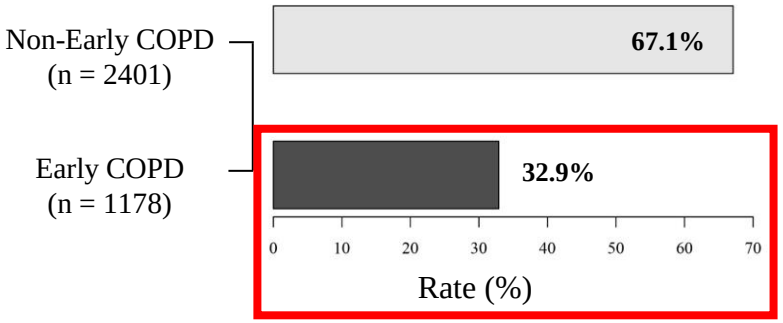
ORIGINAL ARTICLE

Prevalence, Characteristics, and Prognosis of Early Chronic Obstructive Pulmonary Disease

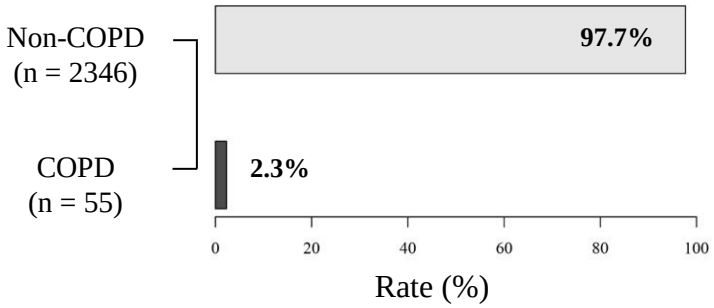
The Copenhagen General Population Study

Yunus Çolak[1,2,3], Shoaib Afzal[1,2,3], Børge G. Nordestgaard[1,2,3], Jørgen Vestbo[4], and Peter Lange[2,3,5,6]

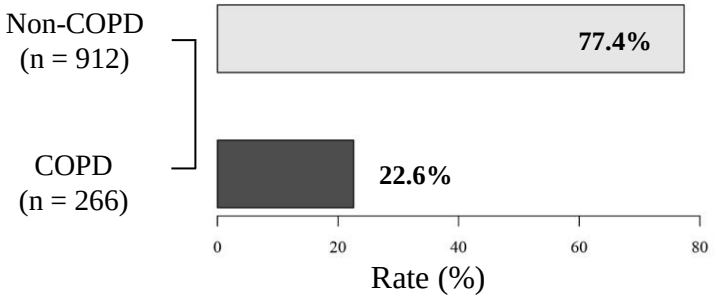
At baseline measurement

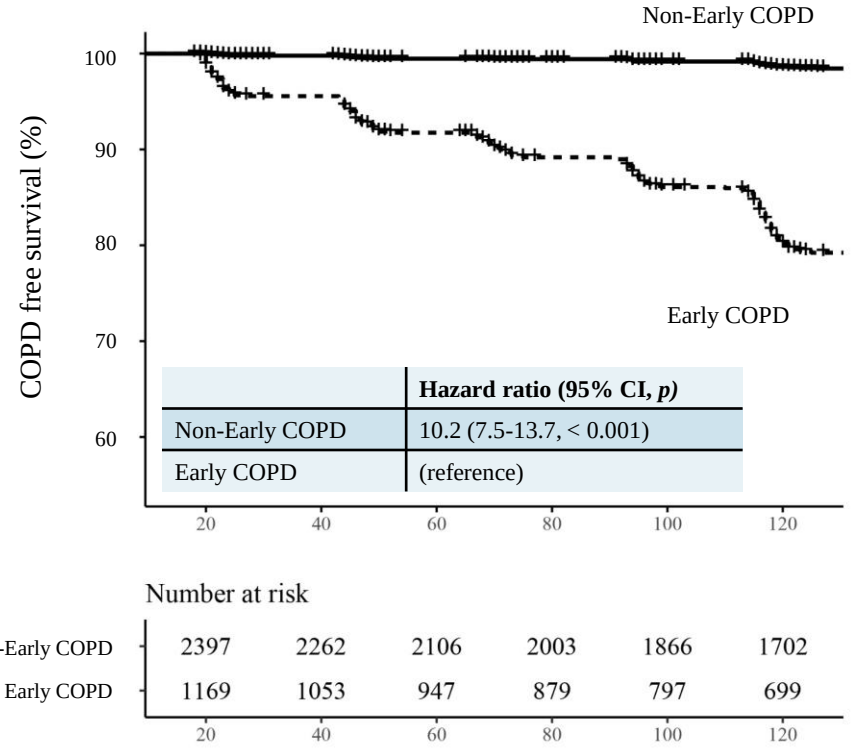


COPD development during follow-up among non-Early COPD



COPD development during follow-up among Early COPD





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JKMS

Brief Communication

Preventive & Social Medicine

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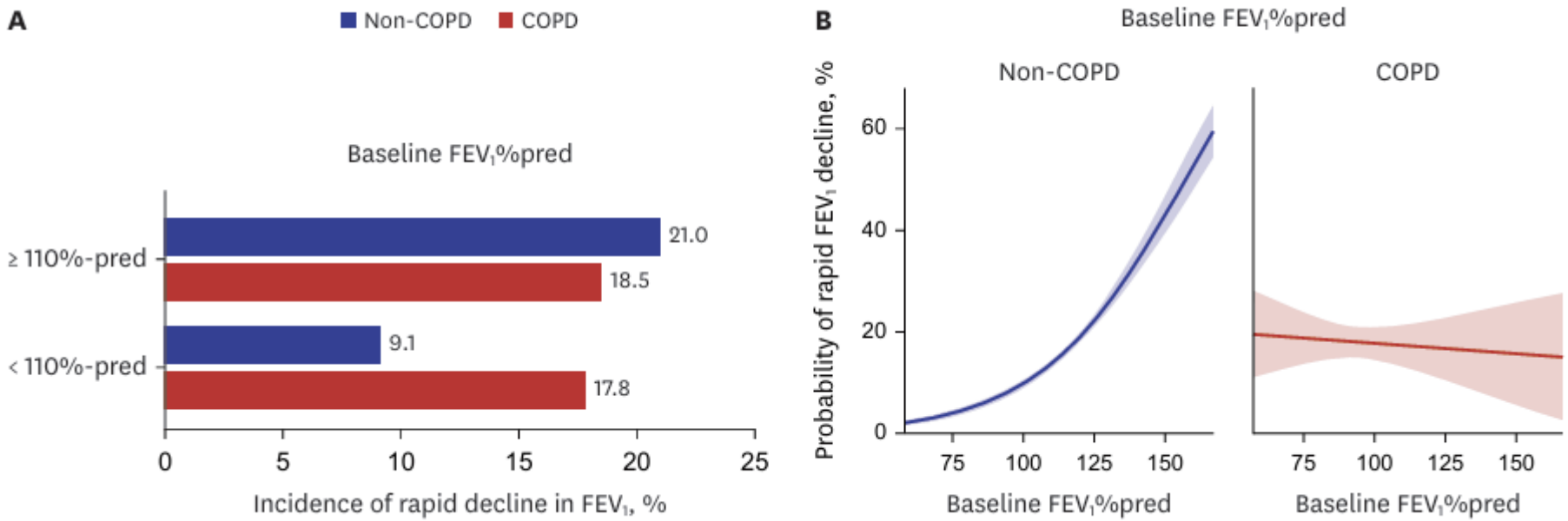
Risk of Rapid Lung Function Decline in Young Adults With Chronic Obstructive Pulmonary Disease: A Community-Based Prospective Cohort Study

Sang Hyuk Kim,[1*] **Hyun Lee**,[2*] **Hyonsoo Joo**,[3] **Hayoung Choi**,[1] **Yun Su Sim**,[1] **Chin Kook Rhee**,[4] **Yong Bum Park**,[5] **Youlim Kim**,[6] **and Kwang Ha Yoo**[6]



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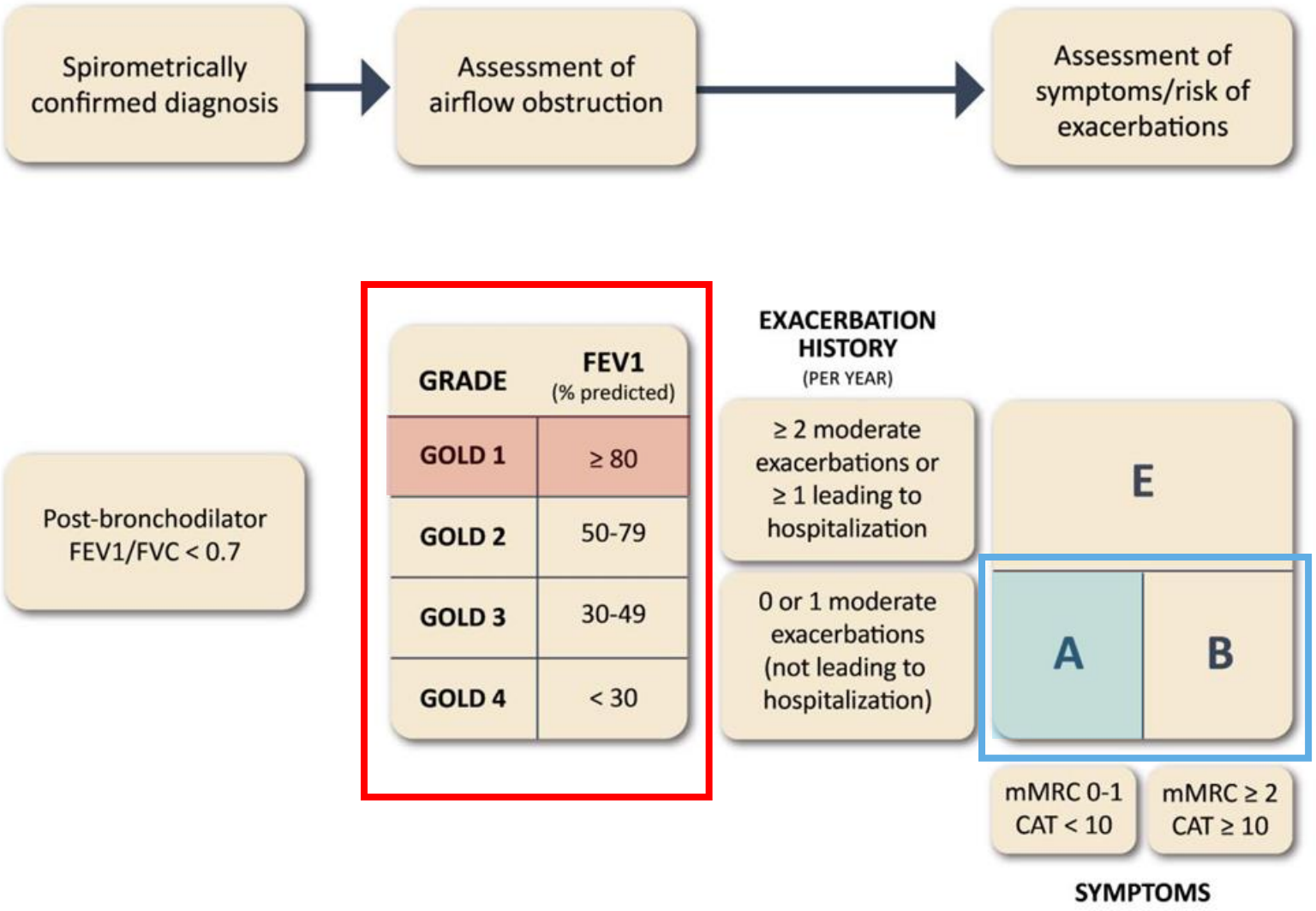
Definition

Mild COPD

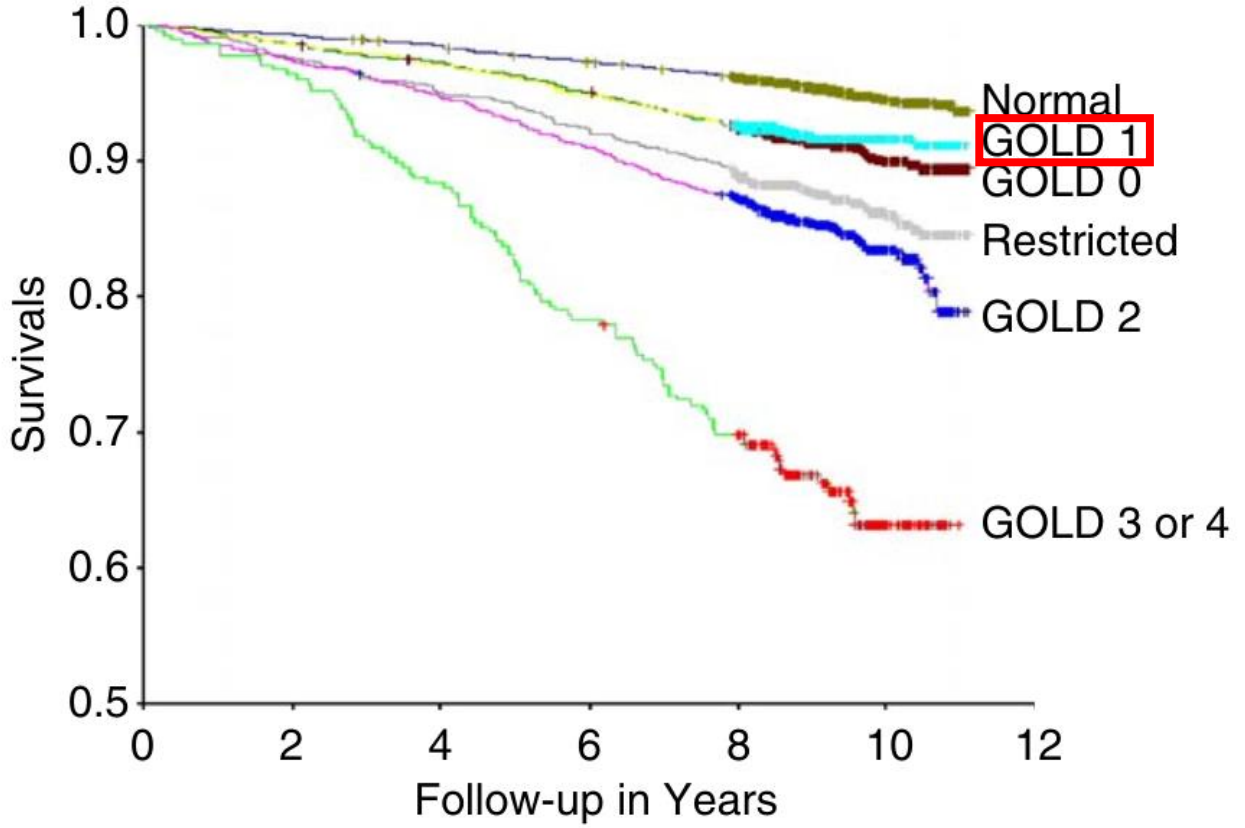
Some studies have used “mild” airflow obstruction as a surrogate for “early” disease.[141] This assumption is incorrect because not all patients started their journey from a normal peak lung function in early adulthood, so some of them may never suffer “mild” disease in terms of “severity” of airflow obstruction.[117] Further, “mild” disease can occur at any age and may progress or not over time.[139] Accordingly, we propose that “mild” should not be used to identify “early” COPD and used only to describe the severity of airflow obstruction measured spirometrically.

What is mild COPD?



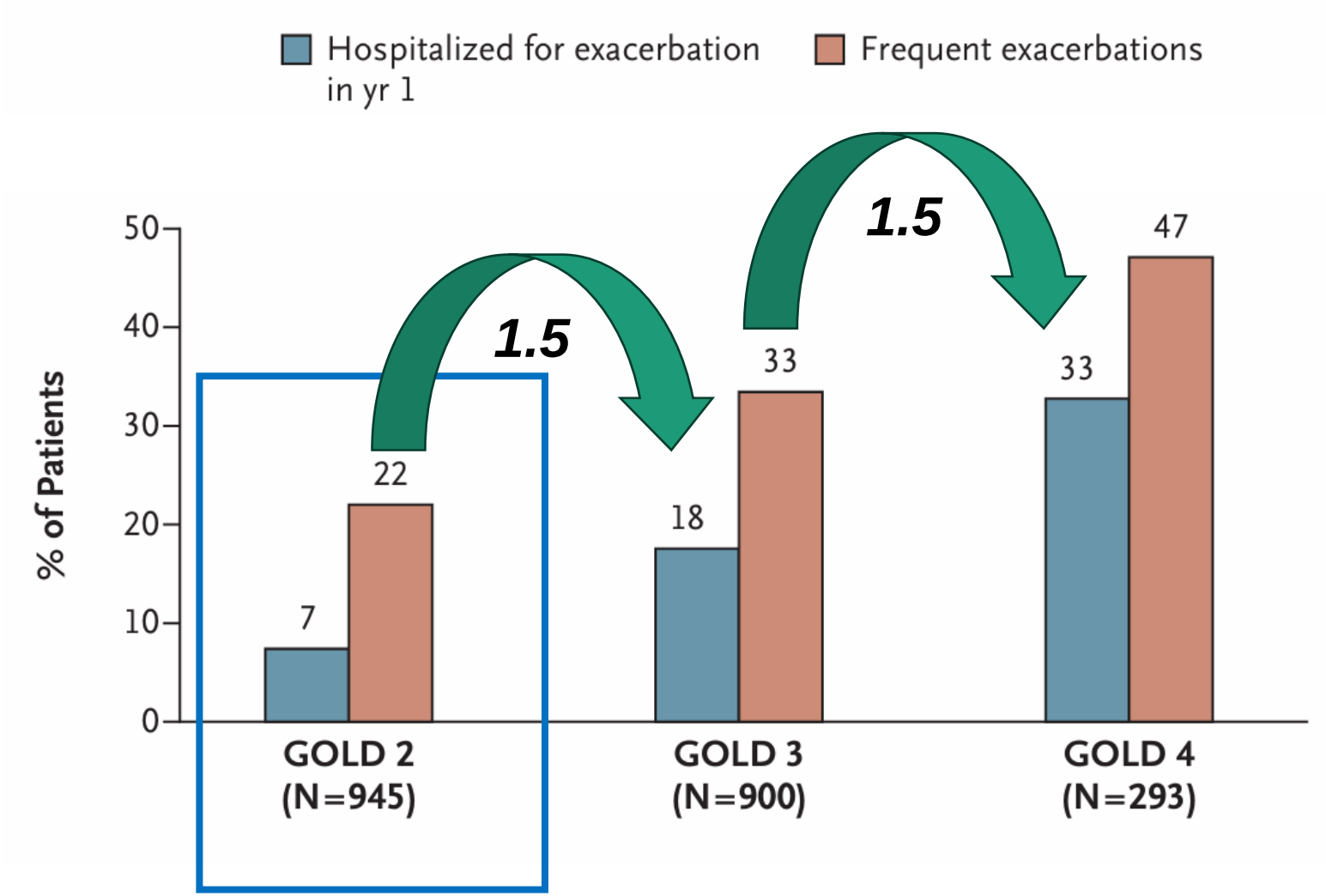
GOLD 2024

Lung Function and Mortality



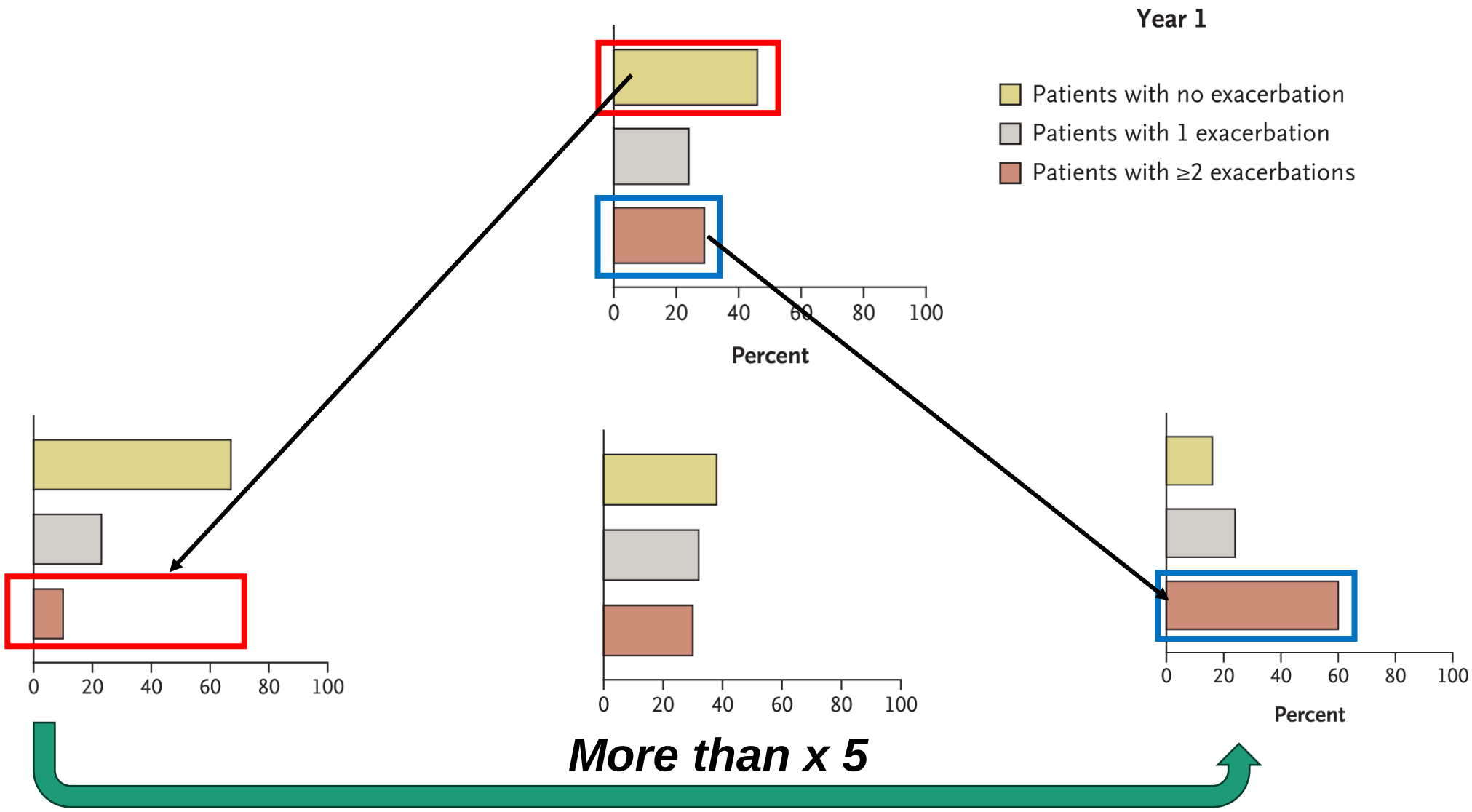
Respir Med. 2006;100(1):115-122.

Spirometry vs. ABE assessment: ECLIPSE



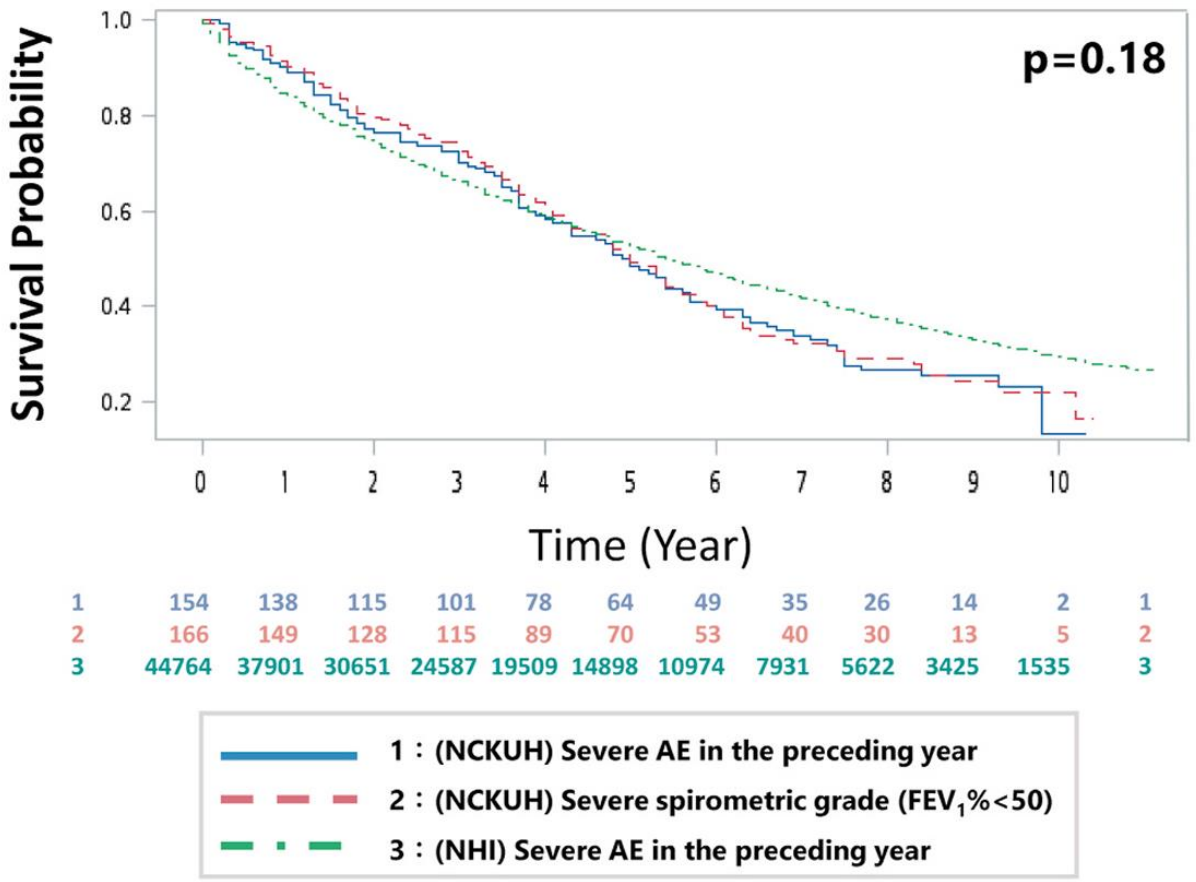
N Engl J Med. 2010;363(12):1128-1138.

Spirometry vs. ABE assessment: ECLIPSE



N Engl J Med. 2010;363(12):1128-1138.

GOLD Grade/Severe Exacerbation History On Mortality: Taiwan Study



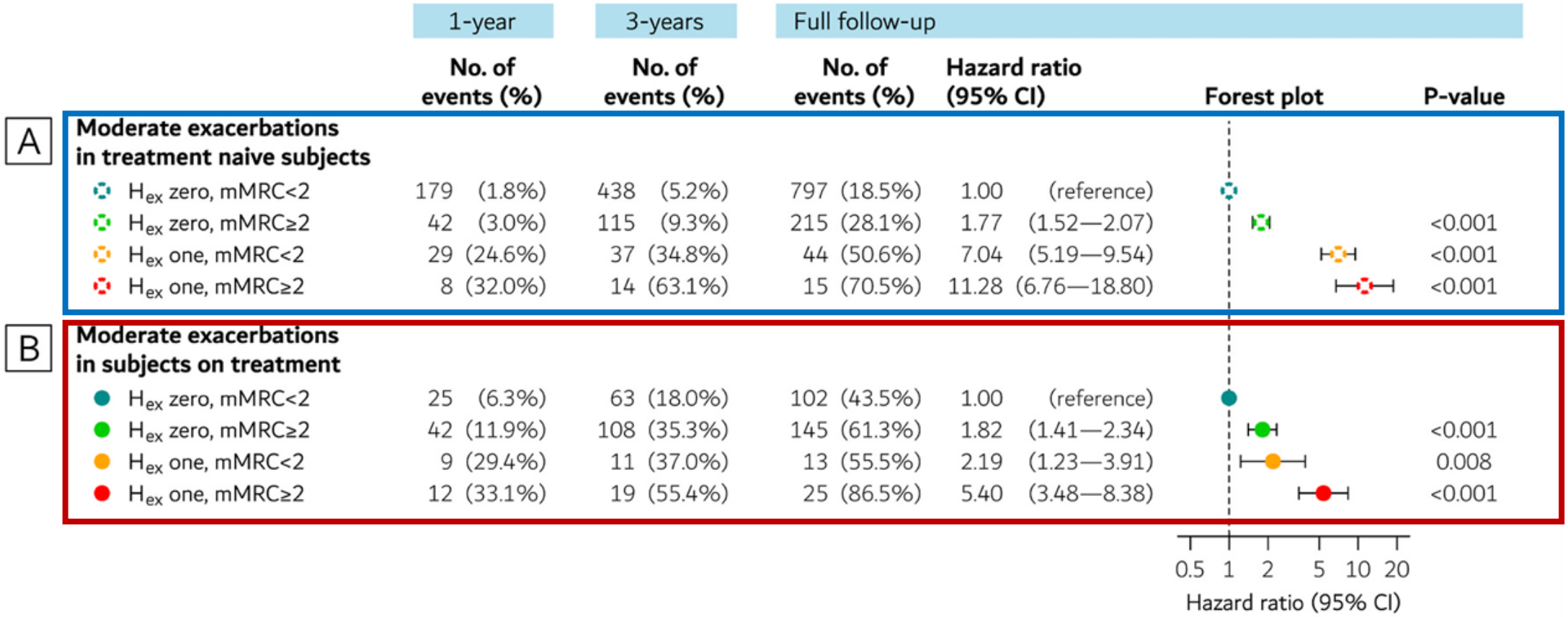
Respir Med. 2020;172:106132.

Symptom, Exacerbation History and Future Exacerbation: Copenhagen Study

COPD subgroup	No. of participants	Males	Age (years)	FEV_1 in % predicted	FEV_1/FVC	Current smokers
Severe dyspnoea mMRC $\geq$ 2						
H_{ex} zero, treatment naive	1486	677 (45.6%)	70.9 ± 11.5	73.6 ± 20.4	0.62 ± 0.07	491 (33.9%)
H_{ex} zero, on treatment	369	178 (48.2%)	72.1 ± 8.9	55.1 ± 18.4	0.54 ± 0.11	102 (28.0%)
H_{ex} one, treatment naive	25	11 (44.0%)	71.7 ± 9.6	73.2 ± 18.7	0.62 ± 0.07	9 (36.0%)
H_{ex} one, on treatment	41	18 (43.9%)	70.3 ± 10.1	50.6 ± 22.3	0.51 ± 0.11	11 (28.2%)
H_{ex} freq, treatment naive	42	19 (45.2%)	72.6 ± 10.4	72.8 ± 23.1	0.61 ± 0.08	9 (22.0%)
H_{ex} freq, on treatment	55	24 (43.6%)	73.8 ± 8.0	46.6 ± 16.5	0.52 ± 0.09	9 (16.4%)
Less dyspnoea mMRC $<$ 2						
H_{ex} zero, treatment naive	10640	5139 (48.3%)	65.2 ± 11.2	85.4 ± 20.4	0.65 ± 0.06	3142 (30.4%)
H_{ex} zero, on treatment	434	215 (49.5%)	68.4 ± 10.6	71.3 ± 18.9	0.61 ± 0.08	119 (28.3%)
H_{ex} one, treatment naive	121	63 (52.1%)	68.1 ± 10.5	81.4 ± 18.8	0.63 ± 0.06	37 (31.6%)
H_{ex} one, on treatment	33	10 (30.3%)	70.4 ± 8.9	74.7 ± 20.8	0.61 ± 0.09	7 (21.9%)

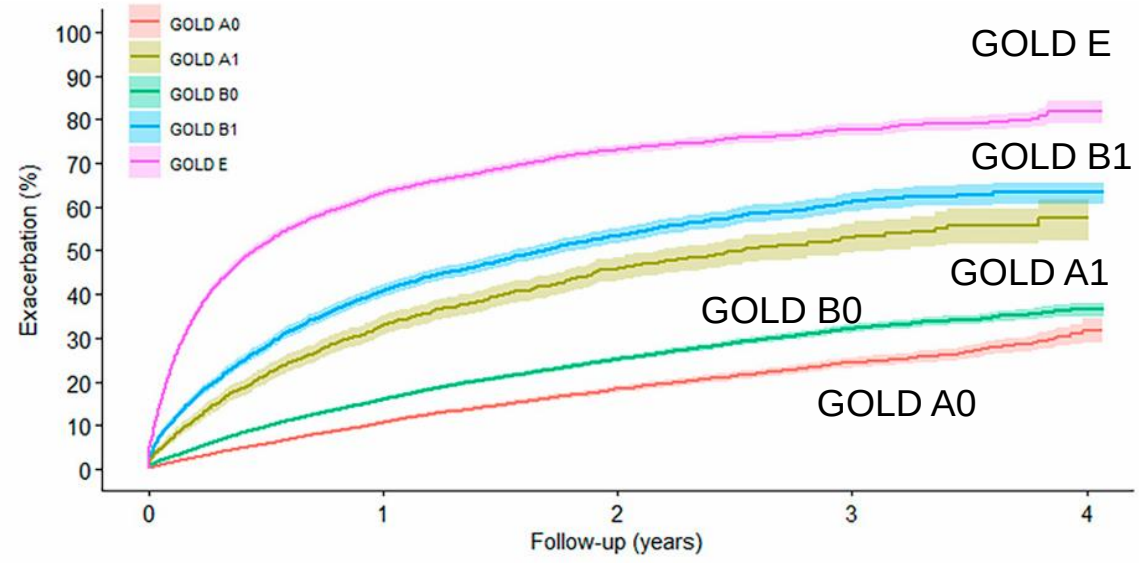
Respir Med. 2022;192:106725.

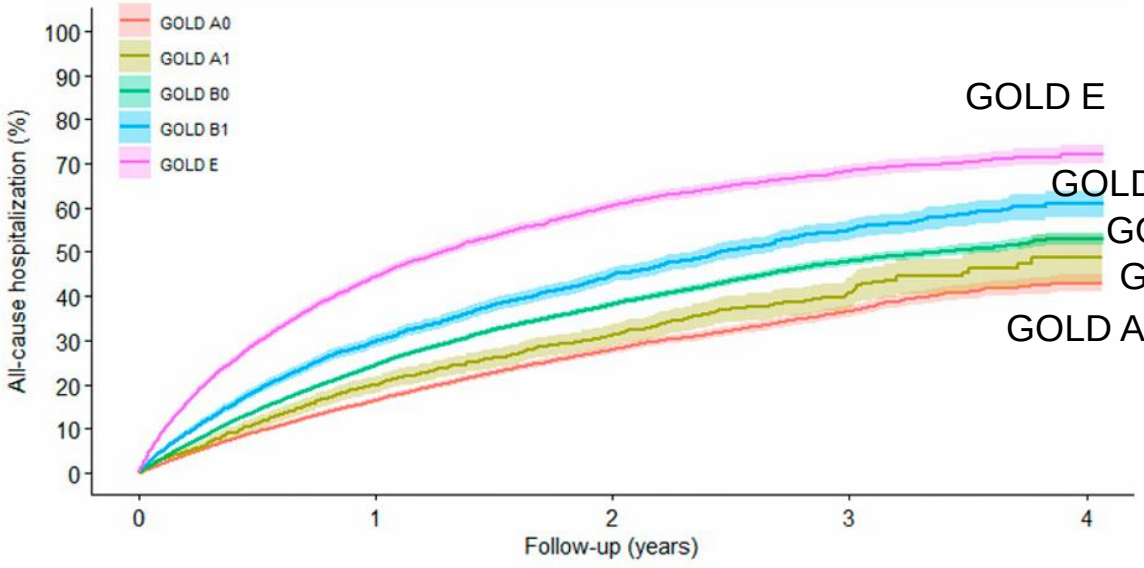
Cumulative Incidence of Moderate Exacerbations



Respir Med. 2022;192:106725.

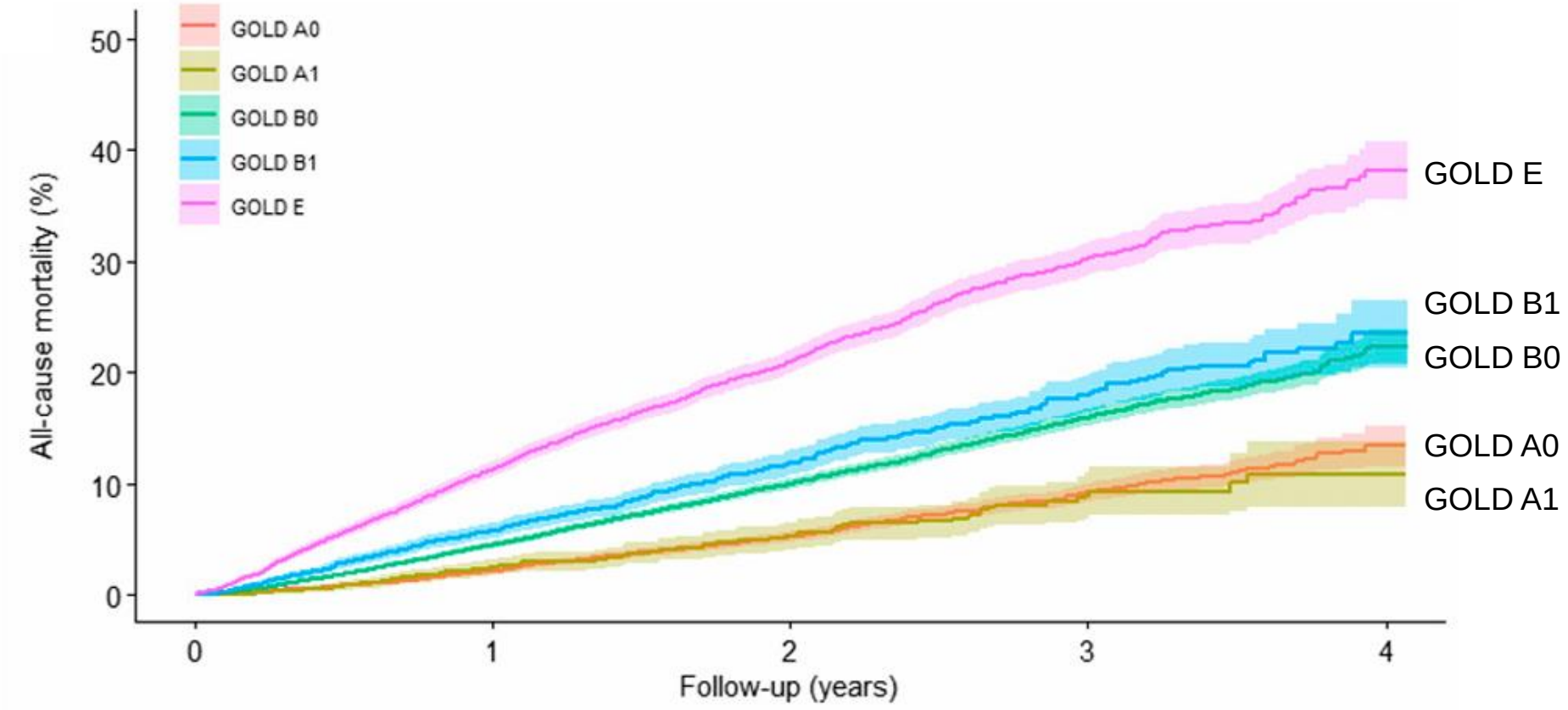
GOLD A/B, Exacerbation History, and Future Exacerbation: Swedish National data





Am J Respir Crit Care Med. 2023;208(2):163-175.

GOLD A/B, Exacerbation History, and Future Exacerbation: Swedish National data



Am J Respir Crit Care Med. 2023;208(2):163-175.

Comorbidities

KEY POINTS:

- COPD often coexists with other diseases (comorbidities) that may have a significant impact on disease course.
- In general, the presence of comorbidities should not alter COPD treatment and comorbidities should be treated per usual standards regardless of the presence of COPD.
- Cardiovascular diseases are common and important comorbidities in COPD.
- Lung cancer is frequently seen in people with COPD and is a major cause of death.

Cause of Death in GOLD 1

	Deaths	Underlying cause of death (%)*			
		Respiratory	Lung cancer	Cardiac	Other
GOLD 3 or 4†	92	31.5	23.9	13.0	31.5
GOLD 2	232	3.5	25.4	27.6	43.5
GOLD 1	137	0.7	18.3	24.8	56.2
Restricted	150	1.3	7.3	39.3	52.0
GOLD 0	204	0.5	8.3	35.3	55.9
Normal	427	0.5	6.3	30.2	63.0
Total	1242	3.5	13.0	29.8	53.8

From the Atherosclerosis Risk in Communities (ARIC) study 1986–1989 and follow-up through 1997.

*Based on International Classification of Disease, Ninth Revision (ICD-9) codes to classify death as respiratory (ICD-9 490-496), lung cancer (ICD-9 162), cardiovascular (ICD-9 410-429), or other (all others).

†GOLD stage 3 or 4 ($FEV_1/FVC < 0.70$ and $FEV_1 < 50\%$ predicted), GOLD stage 2 ($FEV_1/FVC < 0.70$ and $FEV_1 \geq 50$ to $< 80\%$ predicted), GOLD Stage 1 ($FEV_1/FVC < 0.70$ and $FEV_1 \geq 80\%$), restricted ($FEV_1/FVC \geq 0.70$ and $FVC < 80\%$ predicted), GOLD stage 0 (presence of respiratory symptoms in the absence of any lung function abnormality), and no lung disease.

Ann Intern Med. 2005;142(4):233-239.

HOW TO DEFINE AND SCREEN Mild COPD

Q1. Preserved lung function and low risk of exacerbation

R1. Spirometry and exacerbation history

Q2. Depends on symptoms

R2. Questionnaires : CAT, mMRC

Q3. Number of comorbidities

R3. Echocardiography, CT, and questionnaires

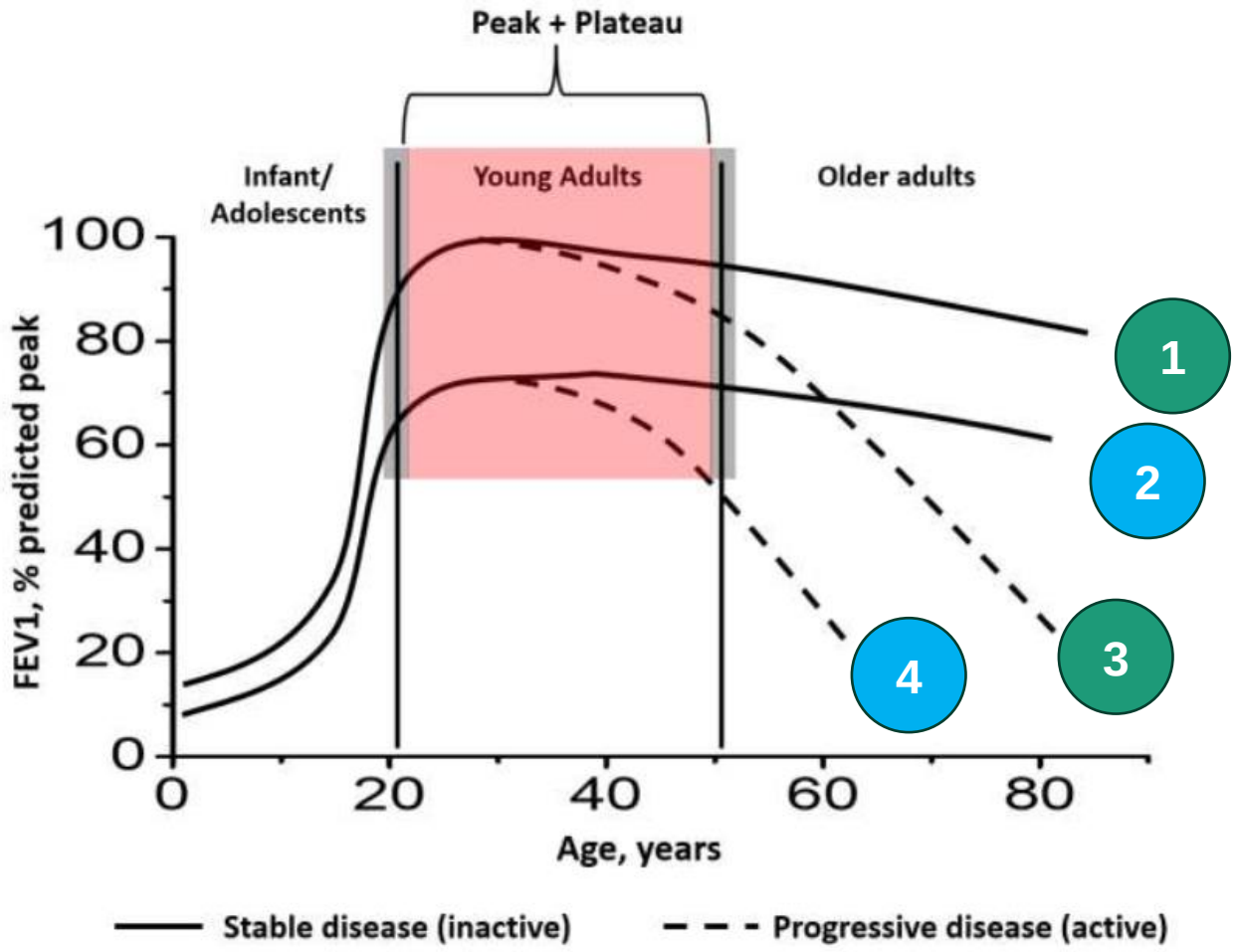
Contents

Definition

Young COPD

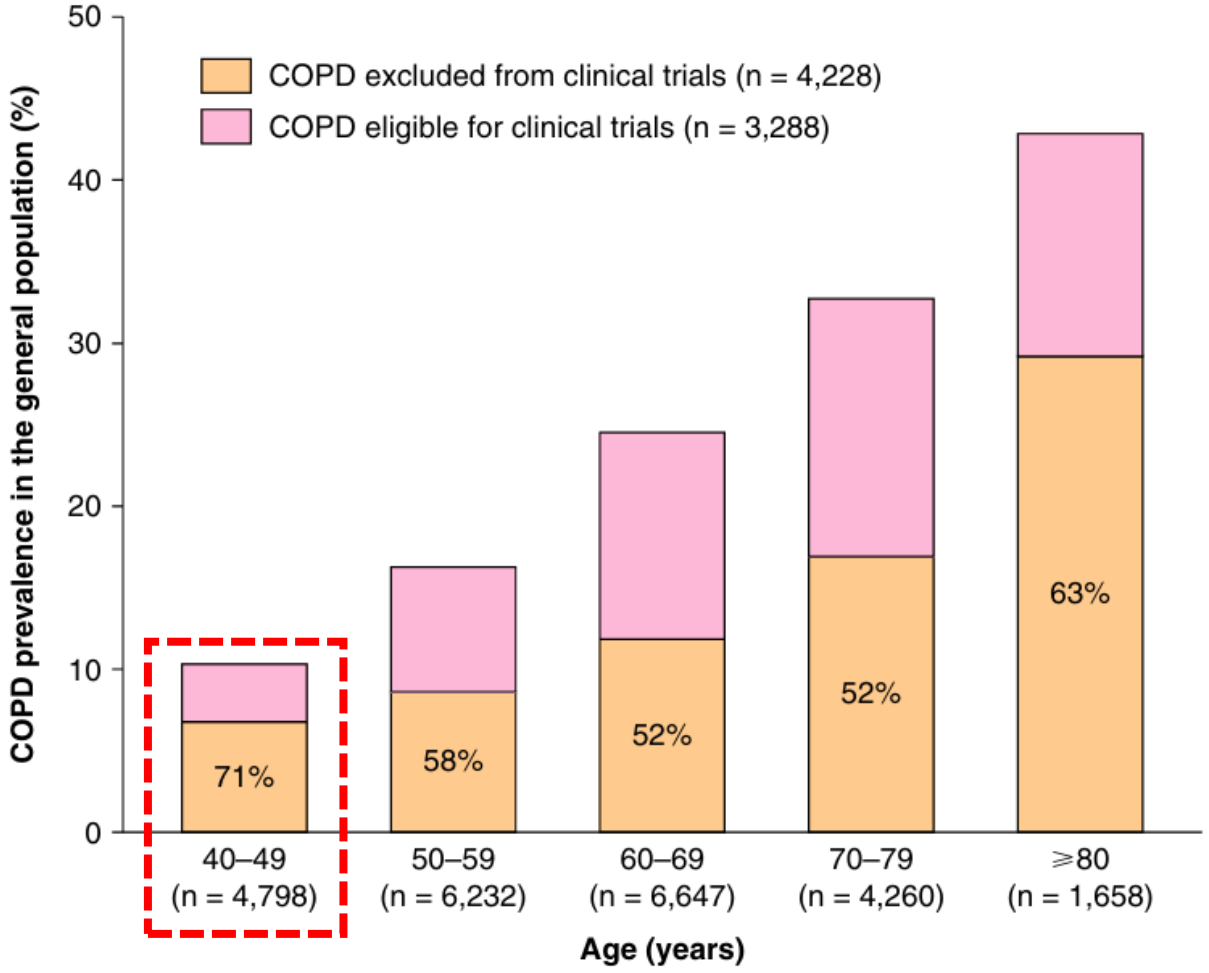
The term "young COPD" is seemingly straightforward because it directly relates to the chronological age of the patient. Given that lung function peaks at around 20-25 years,[67] we propose to operationally consider "young COPD" in patients aged 20–50 years.[142] Of note, this can include patients who had never achieved normal peak lung function in early adulthood and/or those with shorter *plateau* and/or early lung function decline.[143,144] Young COPD may be associated with significant structural and functional lung abnormalities (i.e., young COPD is not necessarily synonymous with "mild" COPD) that can have a substantial impact on health and, importantly, is frequently not diagnosed and thus not treated. A family history of respiratory diseases and/or early-life events (including hospitalizations before the age of 5 years) is reported by a significant proportion of young patients with COPD, further supporting the possibility of early-life origins of COPD.[140,144]

Why young people?



GOLD 2024

Prevalence of COPD in Individuals Aged 40-49: Danish Population Cohort



7,516 individuals with COPD based on

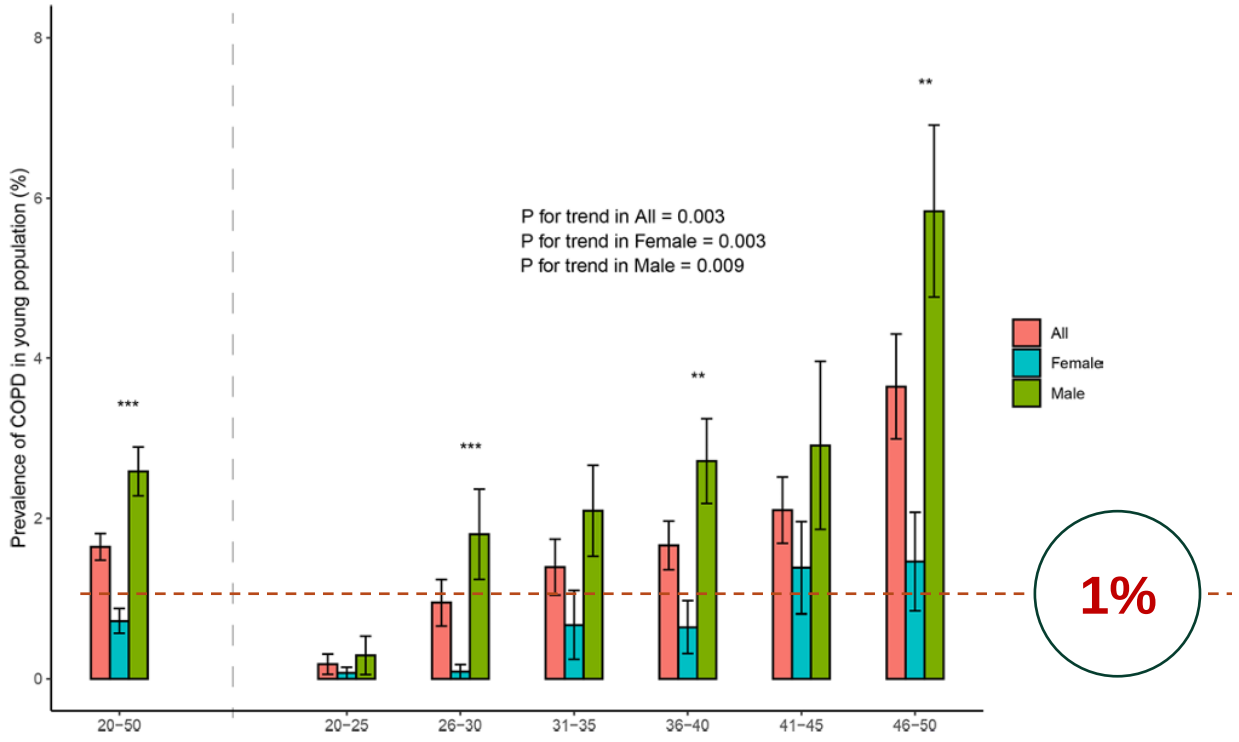
Age ⩾40 years
Chronic respiratory symptoms
History of smoking exposure
FEV_1/FVC <0.70

COPD eligible for clinical trials
n = 3,288

FEV_1 <80% predicted
Smoking history ⩾10 pack-years
No comorbid asthma

Am J Respir Crit Care Med. 2022;206(3):271-280.

Prevalence of COPD in Young people – U.S.



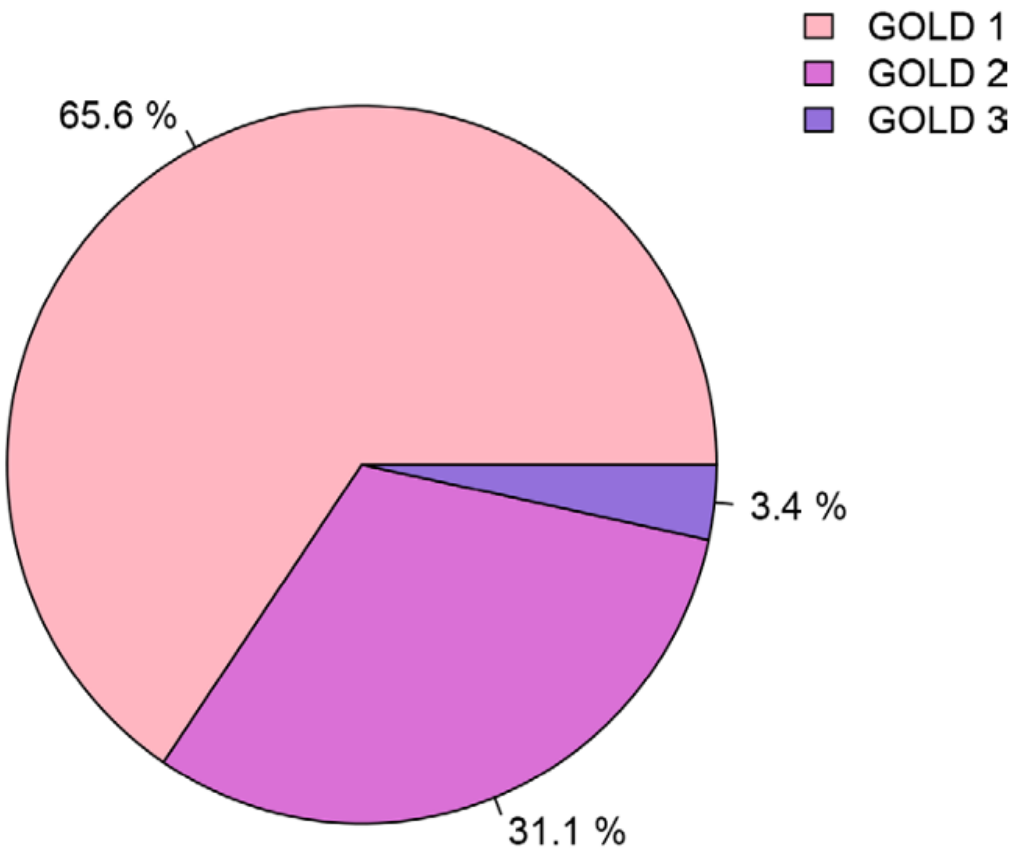
KOR

연령별	2020 전체 (명)
20~24세	3,193,316
25~29세	3,423,231
30~34세	3,032,832
35~39세	3,594,213
40~44세	3,758,298
45~49세	4,195,327

통계청, [인구총조사, 2020]

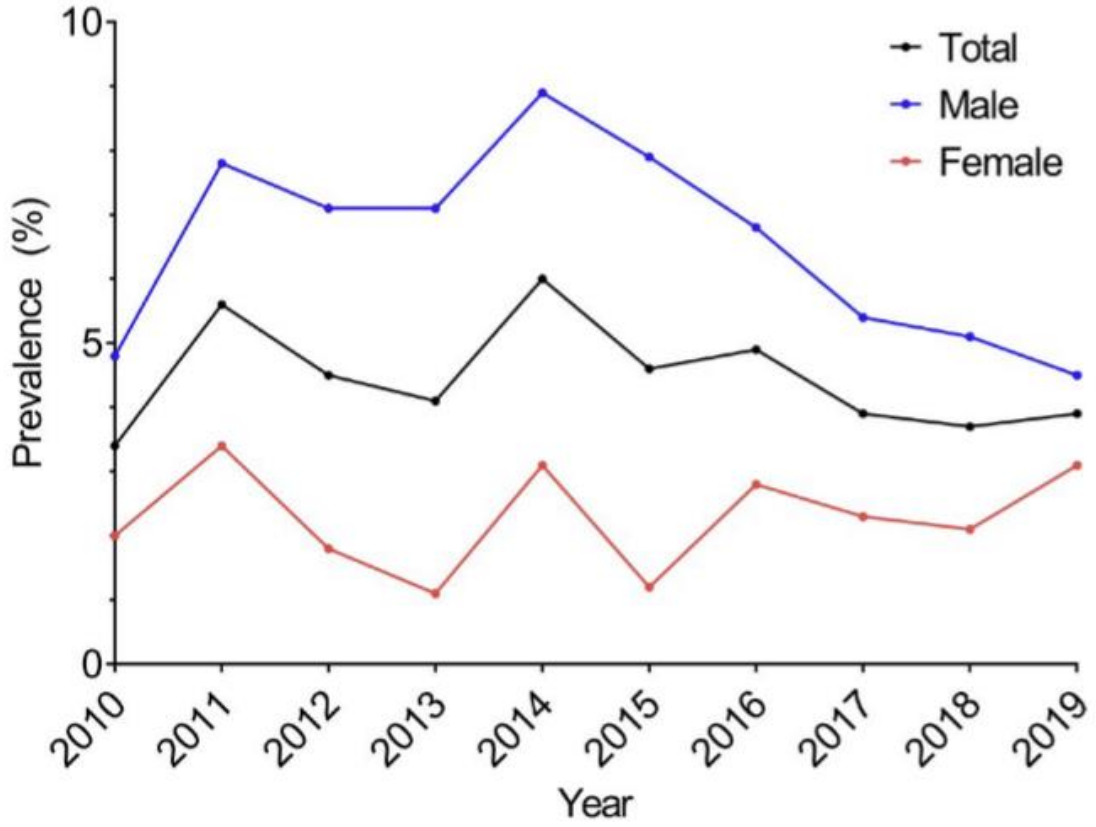
BMJ Open Respir Res. 2023;10(1):e001550.

Prevalence of COPD in Young people – U.S.



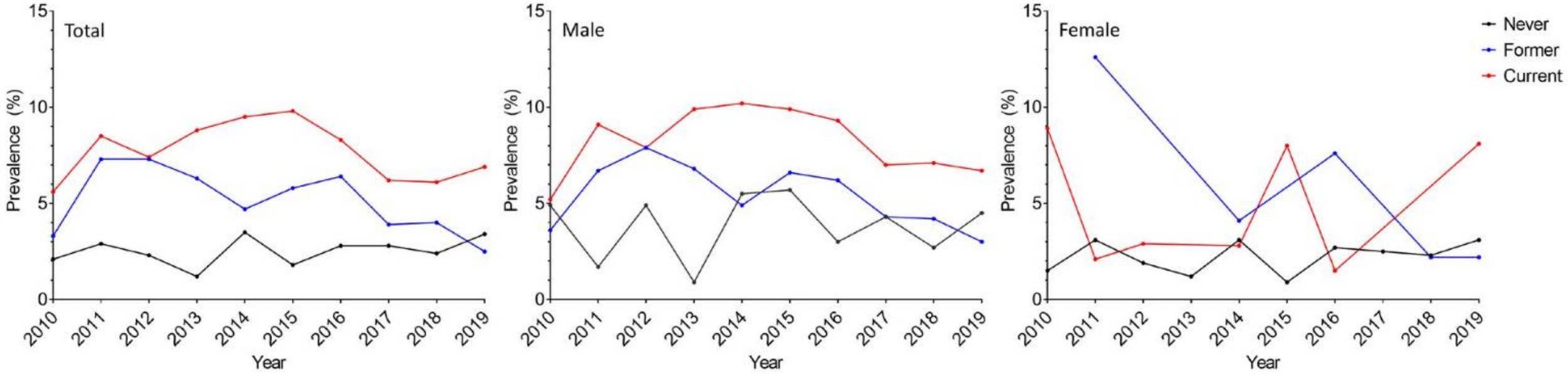
BMJ Open Respir Res. 2023;10(1):e001550.

Prevalence of COPD in Young people – KOR



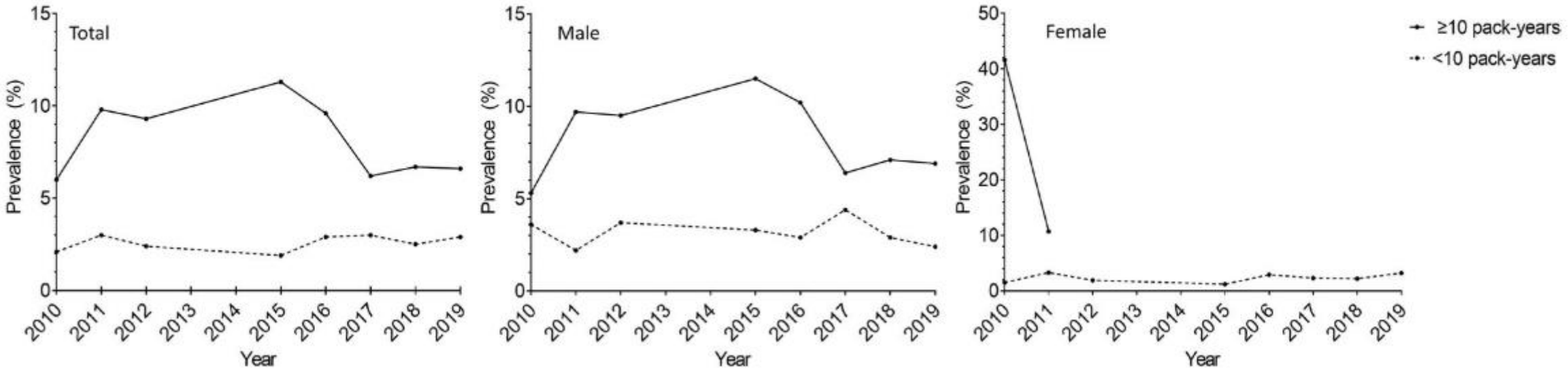
COPD. 2023;20(1):153-161

Prevalence of COPD in Young people – KOR



COPD. 2023;20(1):153-161

Prevalence of COPD in Young people – KOR



COPD. 2023;20(1):153-161

Characteristics of COPD in Young people – U.S

	Unweighted			Weighted		
Level	Non-COPD	COPD	P values	Non-COPD	COPD	P values
Sex (%)						
Female	3896 (50.9)	28 (21.5)	<0.001	64 888 155 (51.1)	471 368 (22.2)	<0.001
Male	3758 (49.1)	102 (78.5)		62 186 874 (48.9)	1 652 709 (77.8)	
Age (mean (SD))	34.86 (9.02)	40.72 (7.79)	<0.001	35.17 (9.11)	41.36 (7.40)	<0.001
Race (%)						
Mexican American	1365 (17.8)	6 (4.6)	<0.001	13 937 594 (11.0)	45 274 (2.1)	0.001
Non-Hispanic black	1558 (20.4)	22 (16.9)		15 734 511 (12.4)	192 977 (9.1)	
Non-Hispanic white	3115 (40.7)	94 (72.3)		78 672 445 (61.9)	1 762 937 (83.0)	
Other Hispanic	825 (10.8)	3 (2.3)		8 666 670 (6.8)	22 101 (1.0)	
Other race	791 (10.3)	5 (3.8)		10 063 810 (7.9)	100 787 (4.7)	
BMI (mean (SD))	28.72 (7.07)	26.73 (5.67)	0.002	28.42 (6.85)	27.04 (5.40)	0.005
Family income to poverty (mean (SD))	2.40 (1.64)	2.45 (1.74)	0.722	2.81 (1.68)	3.08 (1.75)	0.142
Smoking status (%)						
Current	1988 (26.0)	77 (59.2)	<0.001	31 227 546 (24.6)	1 125 638 (53.0)	<0.001
Ever	1097 (14.3)	19 (14.6)		20 619 373 (16.2)	425 555 (20.0)	
Never	4563 (59.6)	34 (26.2)		75 163 769 (59.1)	572 883 (27.0)	
Not available	6 (0.1)	0 (0.0)		64 341 (0.1)	0 (0.0)	
Passive smoking (%)						
Yes	1339 (17.5)	58 (44.6)	<0.001	20 276 302 (16.0)	944 053 (44.4)	<0.001
No	6278 (82.0)	72 (55.4)		106 138 576 (83.5)	1 180 023 (55.6)	
Not available	37 (0.5)	0 (0.00)		660 151 (0.5)	0 (0.0)	
Occupational exposure (%)						
Yes	3955 (51.7)	86 (66.2)	0.004	65 872 426 (51.8)	1 443 492 (68.0)	0.006
No	3426 (44.8)	42 (32.3)		57 146 593 (45.0)	648 803 (30.5)	

BMJ Open Respir Res. 2023;10(1):e001550.

Characteristics of COPD in Young people – U.S

	Unweighted			Weighted		
Level	Non-COPD	COPD	P values	Non-COPD	COPD	P values
Self-reported asthma (%)						
Yes	1093 (14.3)	27 (20.8)	0.009	18 573 023 (14.6)	320 395 (15.1)	0.023
No	6553 (85.6)	102 (78.5)		108 366 090 (85.3)	1 781 931 (83.9)	
Not available	8 (0.1)	1 (0.8)		135 916 (0.1)	21 751 (1.0)	
Self-reported emphysema (%)						
Yes	32 (0.4)	4 (3.1)	<0.001	695 925 (0.5)	64 197 (3.0)	<0.001
No	7621 (99.6)	125 (96.2)		126 338 246 (99.4)	2 026 371 (95.4)	
Not available	1 (0.0)	1 (0.8)		40 858 (0.0)	33 509 (1.6)	
Self-reported chronic bronchitis (%)						
Yes	286 (3.7)	10 (7.7)	0.002	5 015 364 (3.9)	141 679 (6.7)	0.063
No	7362 (96.2)	119 (91.5)		121 959 624 (96.0)	1 971 504 (92.8)	
Not available	6 (0.1)	1 (0.8)		100 042 (0.1)	10 894 (0.5)	
Self-reported cancer (%)						
Yes	202 (2.6)	6 (4.6)	0.371	4 228 071 (3.3)	175 608 (8.3)	0.148
No	7448 (97.3)	124 (95.4)		122 714 211 (96.6)	1 948 469 (91.7)	
Not available	4 (0.1)	0 (0.00)		132 747 (0.1)	0 (0.0)	
Self-reported congestive heart failure (%)						
Yes	40 (0.5)	1 (0.8)	0.875	707 293 (0.6)	37 463 (1.8)	0.288
No	7607 (99.4)	129 (99.2)		126 306 191 (99.4)	2 086 614 (98.2)	
Not available	7 (0.1)	0 (0.0)		61 545 (0.0)	0 (0.0)	
Pre-FEV_1 (mean (SD))	3.42 (0.81)	2.99 (0.84)	<0.001	3.54 (0.82)	3.07 (0.90)	<0.001
Pre-FEV_1/FVC (mean (SD))	0.81 (0.07)	0.62 (0.06)	<0.001	0.81 (0.07)	0.61 (0.07)	<0.001

BMJ Open Respir Res. 2023;10(1):e001550.

Characteristics of COPD in Young people – Kor

	Non-COPD (n = 2141)		Young COPD (n = 95)		p value
	Never-smoker	Ever-smoker	Never-smoker	Ever-smoker	
Subjects (N)	1294	847	36	59	
Age, years	44.47 ± 5	44.37 ± 5	45.06 ± 6	44.98 ± 4	0.255
Sex, male (%)	163 (12.6)	761 (89.9)	7 (19.4)	55 (93.2) **Total 65%**	< 0.001
BMI (kg/m^2)	23.87 ± 3.98	24.65 ± 3.83	23.54 ± 4.58	23.74 ± 3.90	< 0.001
Smoking, pack-year	0	18.77 ± 15.65	0	22.52 ± 15.00	< 0.001
Comorbid condition					
DM	121 (9.4)	99 (11.7)	5 (13.9)	7 (11.9)	0.302
HTN	194 (15.0)	162 (19.1)	4 (11.1)	12 (20.3)	0.053
Ischemic heart disease	16 (1.24)	18 (2.13)	1 (2.78)	3 (5.1)	0.076
Congestive heart failure	9 (0.7)	4 (0.5)	0	1 (1.7)	0.630)
Gastroesophageal reflux disease	473 (36.6)	247 (29.2)	14 (38.9)	20 (33.9)	0.005
History of PTB	8 (0.6)	8 (0.94)	2 (5.6)	1 (1.7)	0.012
Depression	76 (5.9)	28 (3.3)	2 (5.6)	7 (11.9)	0.005
Atopic dermatitis	57 (4.4)	27 (3.2)	3 (8.3)	3 (5.1)	0.270
Any allergy[a]	521 (40.3)	295 (34.8)	15 (41.7)	18 (30.5)	0.045
Asthma	214 (16.5)	96 (11.3) **Total 14%**	11 (30.6)	7 (11.9) **Total 19%**	< 0.001
Index of quality of life, EQ-5D	0.97 ± 0.09	0.97 ± 0	0.95 ± 0.09	0.96 ± 0.09	0.224
Lung function					
FEV_1, % predicted	93.79 ± 14.25	92.37 ± 13.42	72.91 ± 15.05	75.00 ± 14.81	< 0.001
FVC, % predicted	94.51 ± 14.32	93.38 ± 14.19	93.40 ± 15.42	94.27 ± 16.69	0.139
FEV_1/FVC, %	0.83 ± 0.06	0.81 ± 0.07	0.65 ± 0.06	0.65 ± 0.05	< 0.001

Respir Res. 2022;23(1):212.

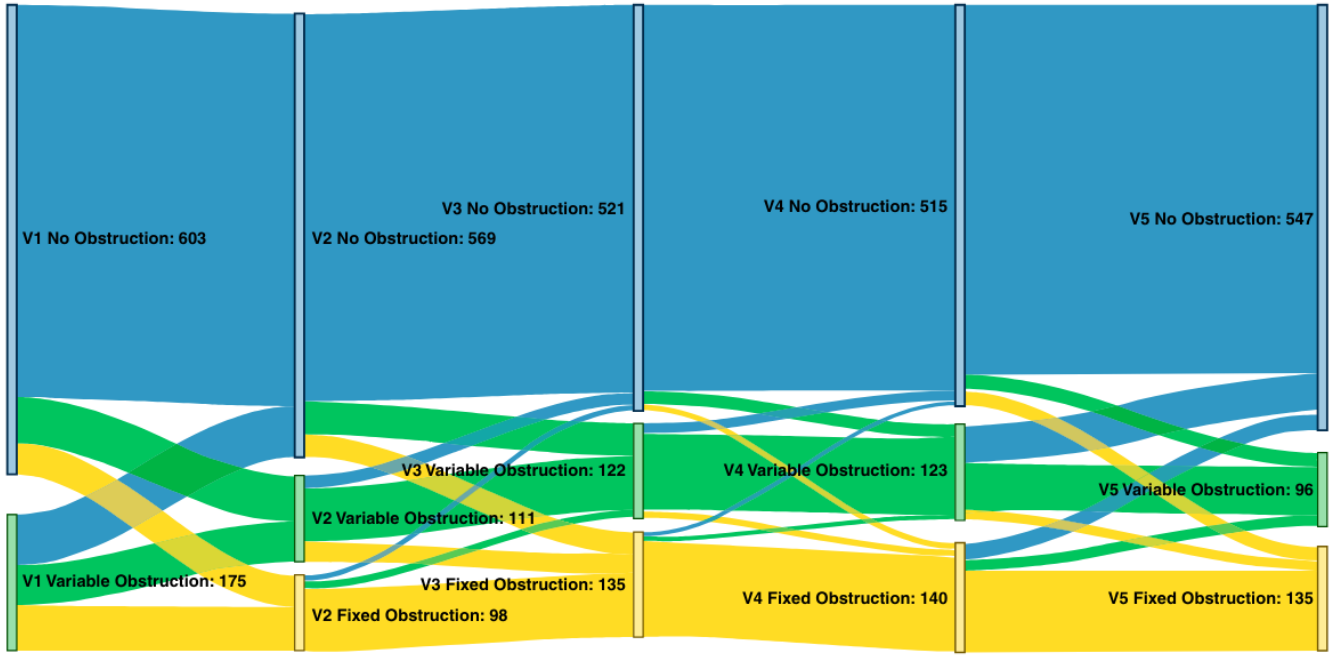
Limitations

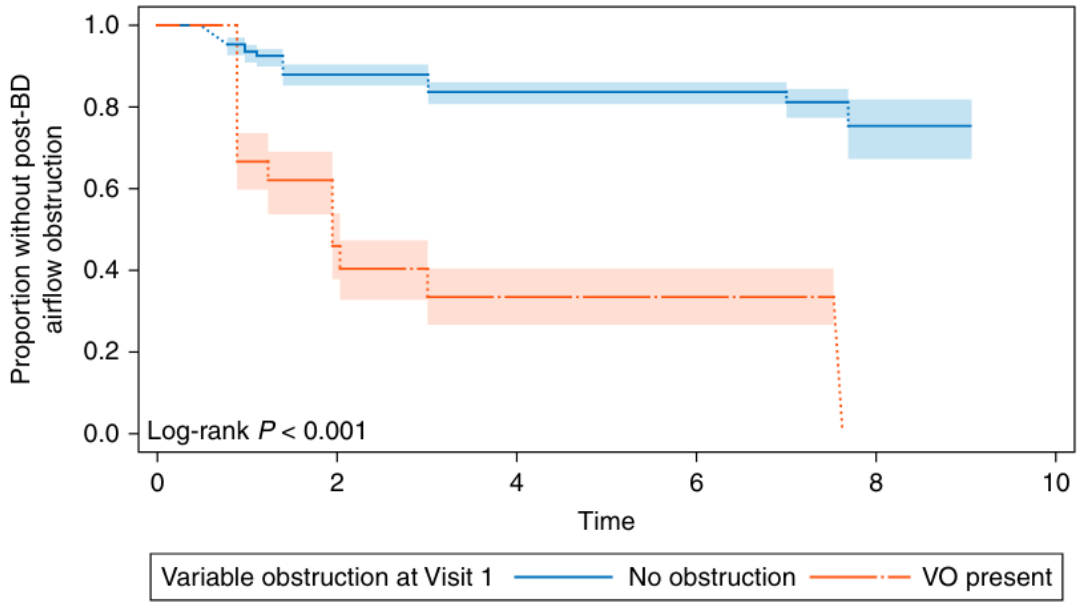
“…Third, the KNHANES only assessed probronchodilator PFT.”

“…First, post-bronchodilator spirometry was not used to identify COPD in young patients at the baseline, nor we identified changes in lung function during the follow-up period.”

Use of Pre-bronchodilator Results: SPIROMICS

No Obst / Variable Obst / Fixed Obst





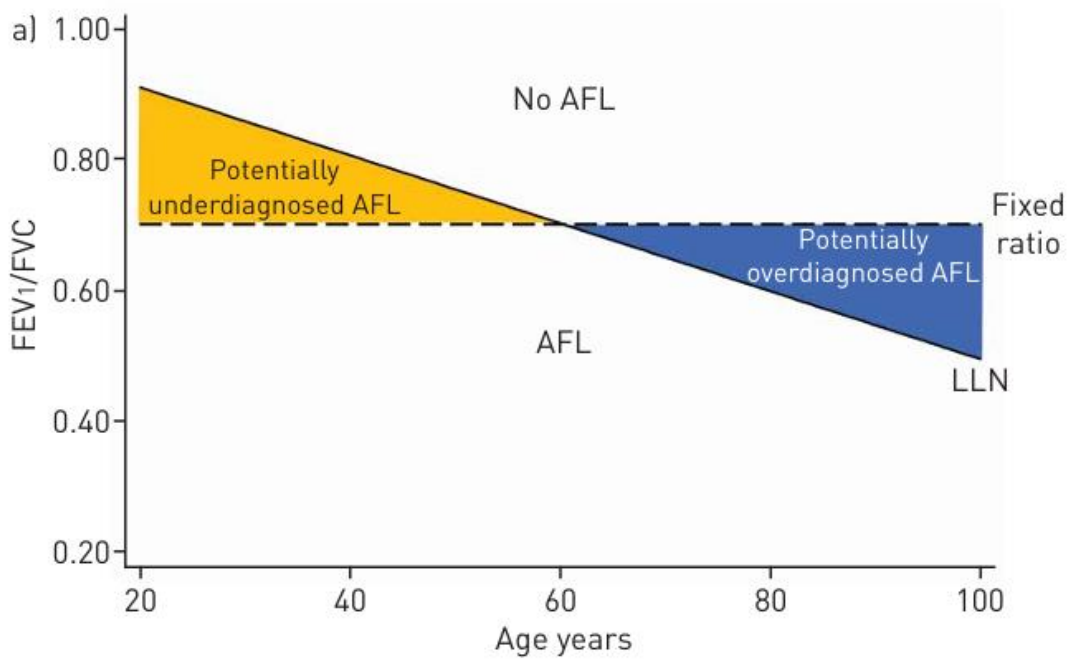
Am J Respir Crit Care Med. 2022;206(5):554-562.

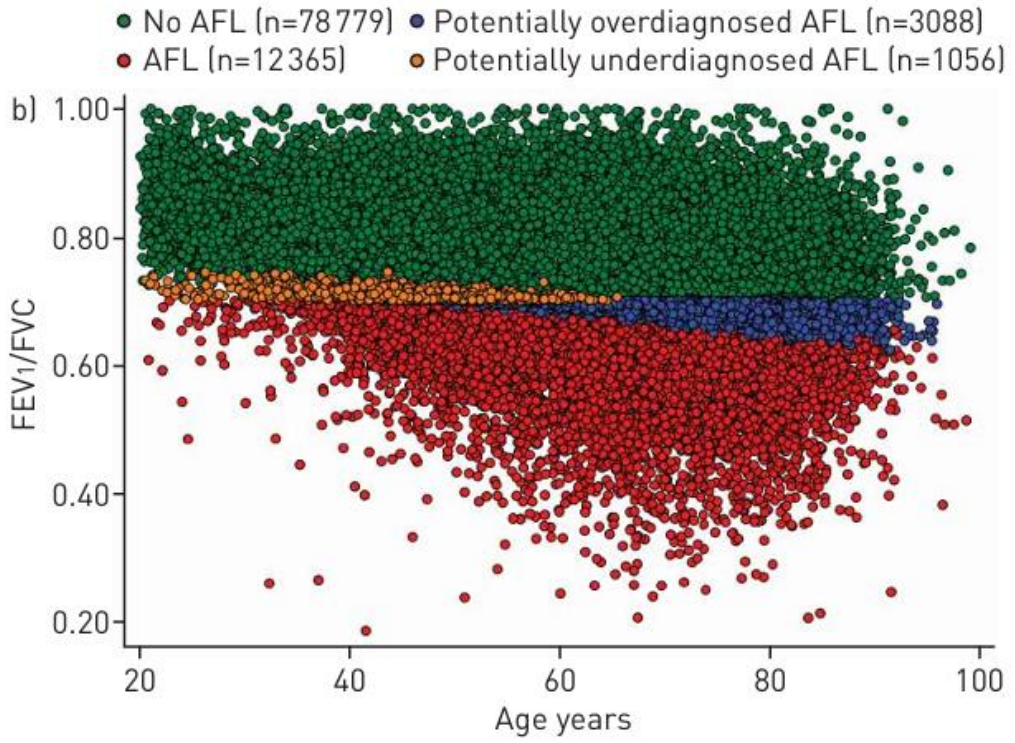
PRE-BD LLN vs. Post-BD LLN: Swedish General Population

Characteristic	FEV_1 ⩾ pre-BD LLN and ⩾ post-BD LLN (G1)	FEV_1 < post-BD LLN but ⩾ pre-BD LLN (G2)	FEV_1 < post-BD LLN and < pre-BD LLN (G3)	*P* Value		
				G1 vs. G2	G1 vs. G3	G2 vs. G3
Number of subjects	26,274 (91.0%)	1,056 (3.7%)	1,521 (5.3%)	–	–	–
Age, yr	57.4 ± 4.3	58.0 ± 4.3	58.2 ± 4.3	–	–	–
Female sex	51.3	48.3	55.2	–	–	–
Smoking habits						
Never-smokers	51.9	43.4	34.1	–	–	–
Ex-smokers	36.7	34.0	37.0	–	–	–
Current smokers	11.4	22.6	28.9	–	–	–
Cough	17.4	28.3	34.8	<0.001	<0.001	0.001
Sputum production	10.0	18.9	25.9	<0.001	<0.001	<0.001
Wheeze	5.7	16.9	27.9	<0.001	<0.001	<0.001
Dyspnea*	8.1	20.4	31.5	<0.001	<0.001	<0.001
Chronic bronchitis	4.3	9.9	13.0	<0.001	<0.001	0.002
Having reported asthma	7.4	15.3	19.4	<0.001	<0.001	0.011
Having reported COPD	0.6	3.7	10.2	<0.001	<0.001	<0.001
Emphysema†	4.8	11.4	18.4	<0.001	<0.001	<0.001
Emphysema score‡	0.17 ± 0.99	0.49 ± 1.72	1.02 ± 2.70	<0.001	<0.001	<0.001

Am J Respir Crit Care Med. 2023 Aug 15;208(4):461-471.

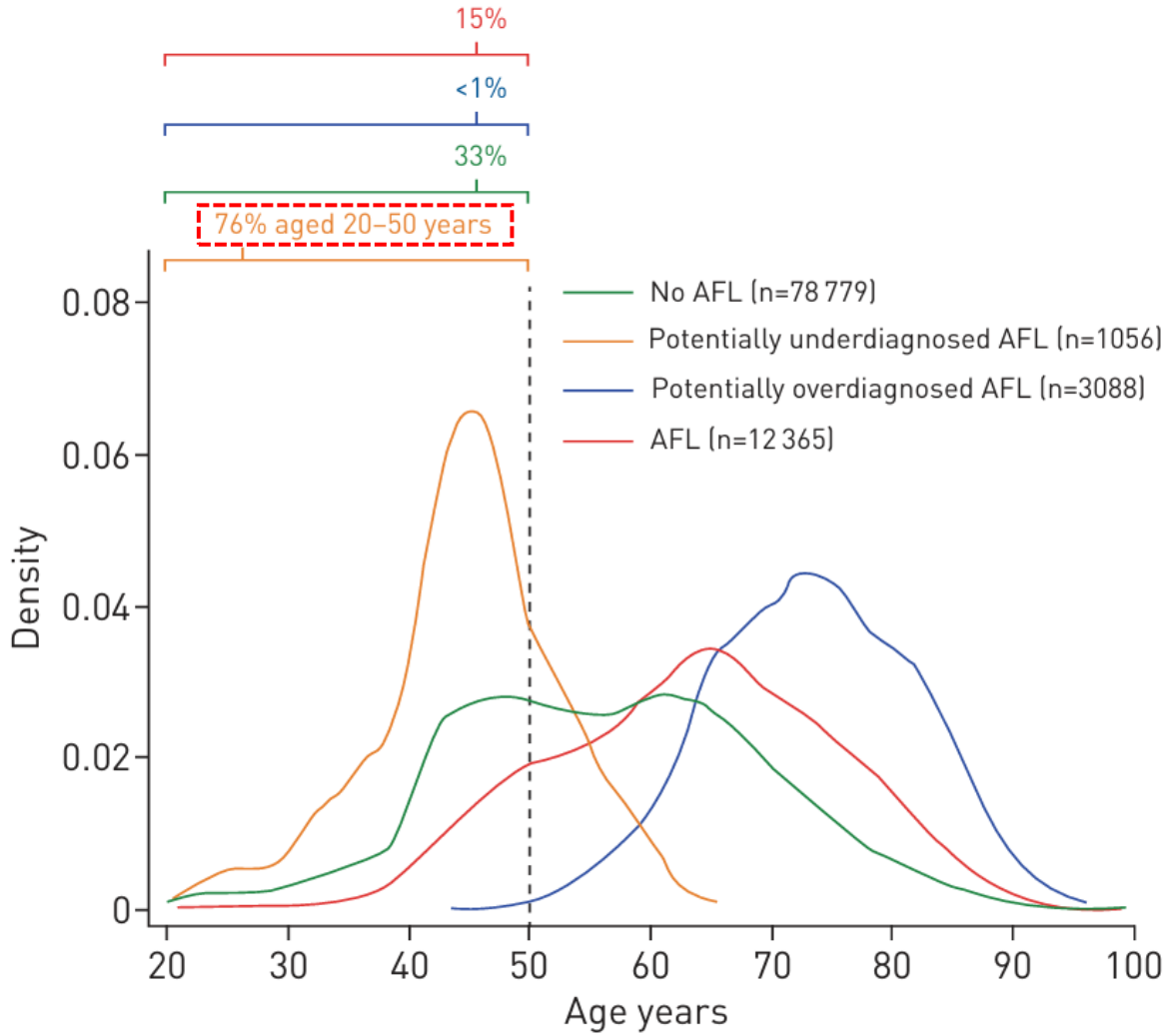
Fixed Ratio vs. LLN: Copenhagen Study





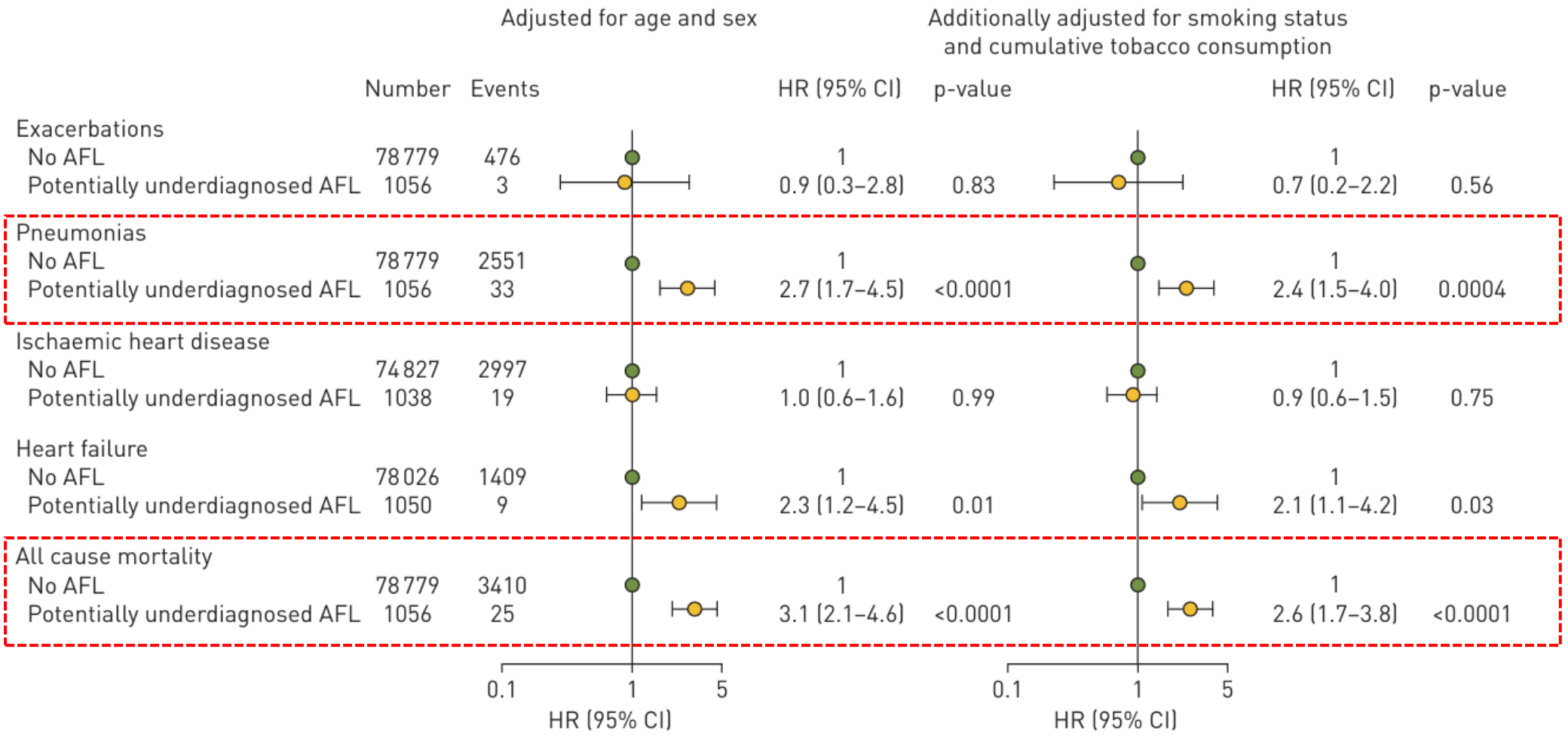
Eur Respir J. 2018;51(3):1702681.

Age Distribution in Clinical Groups of AFL



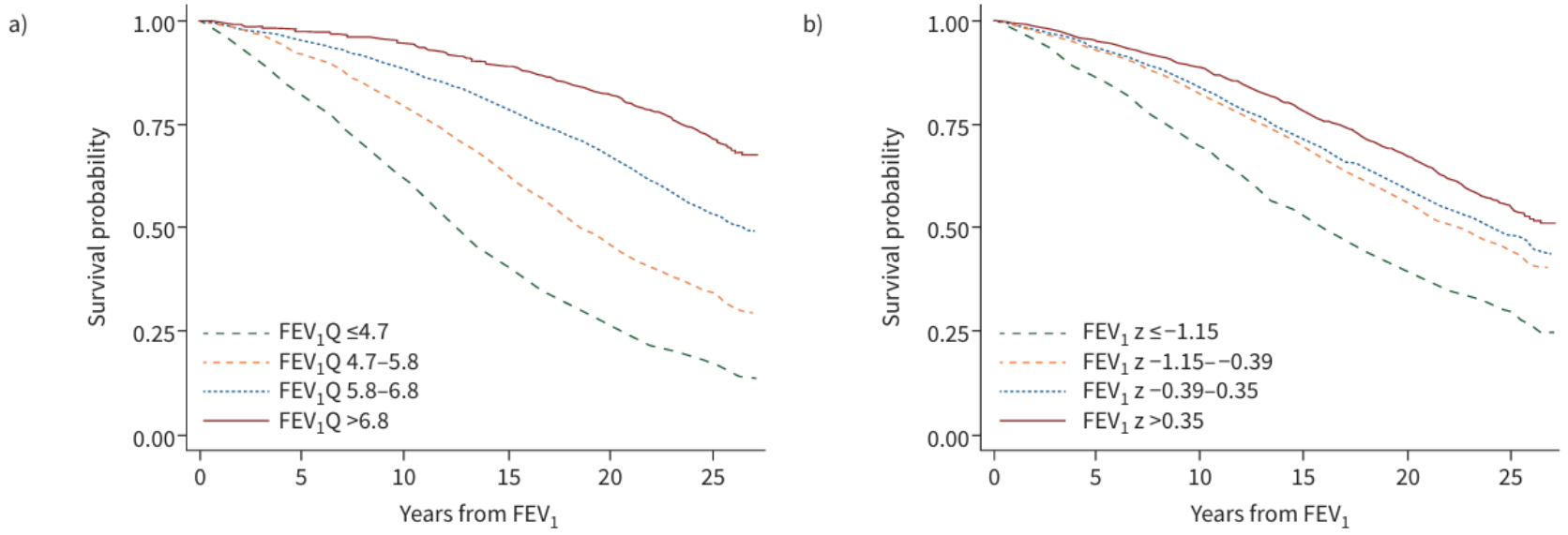
Eur Respir J. 2018;51(3):1702681.

Future Effect of Underdiagnosed AFL



Eur Respir J. 2018;51(3):1702681.

FEV1Q : Clinical Utility of Raw Value



At risk (n):

$FEV_1Q \leq 4.7$	1795	1482	1114	735	479	117
FEV_1Q 4.7–5.8	1796	1652	1429	1131	834	235
FEV_1Q 5.8–6.8	1794	1712	1586	1411	1211	369
$FEV_1Q > 6.8$	1797	1754	1702	1597	1476	491

At risk (n):

$z \leq -1.15$	1792	1543	1247	939	707	202
z −1.15–−0.39	1795	1667	1480	1251	1012	327
z −0.39–0.35	1799	1684	1510	1281	1068	309
$z > 0.35$	1796	1706	1594	1403	1213	374

FIGURE 2 Kaplan–Meier curves of survival comparing a) forced expiratory volume in 1 s quotient (FEV_1Q) and b) FEV_1 z-score quartiles from the National Health and Nutrition Examination Survey III study population.

Eur Respir J. 2024 Apr 4;63(4):2301622

FEV1Q: How Good the Model is

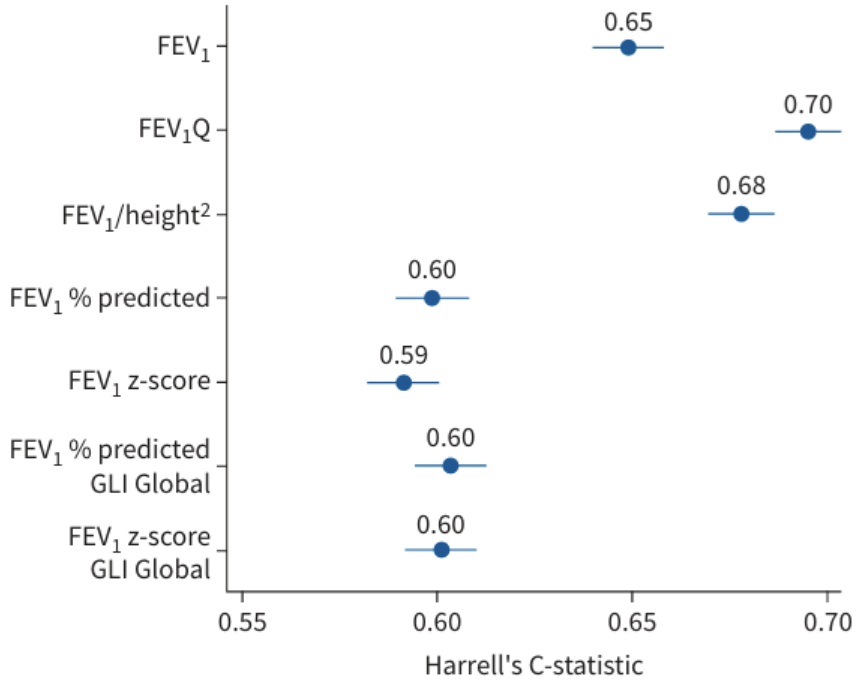


FIGURE 3 Comparison of Harrell's C-statistics for univariate Cox regression models in the National Health and Nutrition Examination Survey III population for each method of forced expiratory volume in 1 s (FEV_1) interpretation. FEV_1Q: FEV_1 quotient; GLI: Global Lung Initiative.

Eur Respir J. 2024 Apr 4;63(4):2301622

HOW TO SCREEN COPD IN YOUNG PEOPLE

Q1. Pre vs. Post BDR

R1. Use of pre-bronchodilator should be considered

Q2. Fixed ratio vs. LLN

R2. LLN is more appropriate, but has limitation

Q3. Others

R3. What if we can use raw value

Contents

Definition

Early COPD

The word “early” means “near the beginning of a process”. Because COPD can start early in life and take a long time to manifest clinically, identifying “early” COPD is difficult. Further, a biological “early” related to the initial mechanisms that eventually lead to COPD should be differentiated from a clinical “early”, which reflects the initial perception of symptoms, functional limitation and/or structural abnormalities noted. Thus, we propose to use the term “early COPD” only to discuss the “biological” first steps of the disease in an experimental setting.

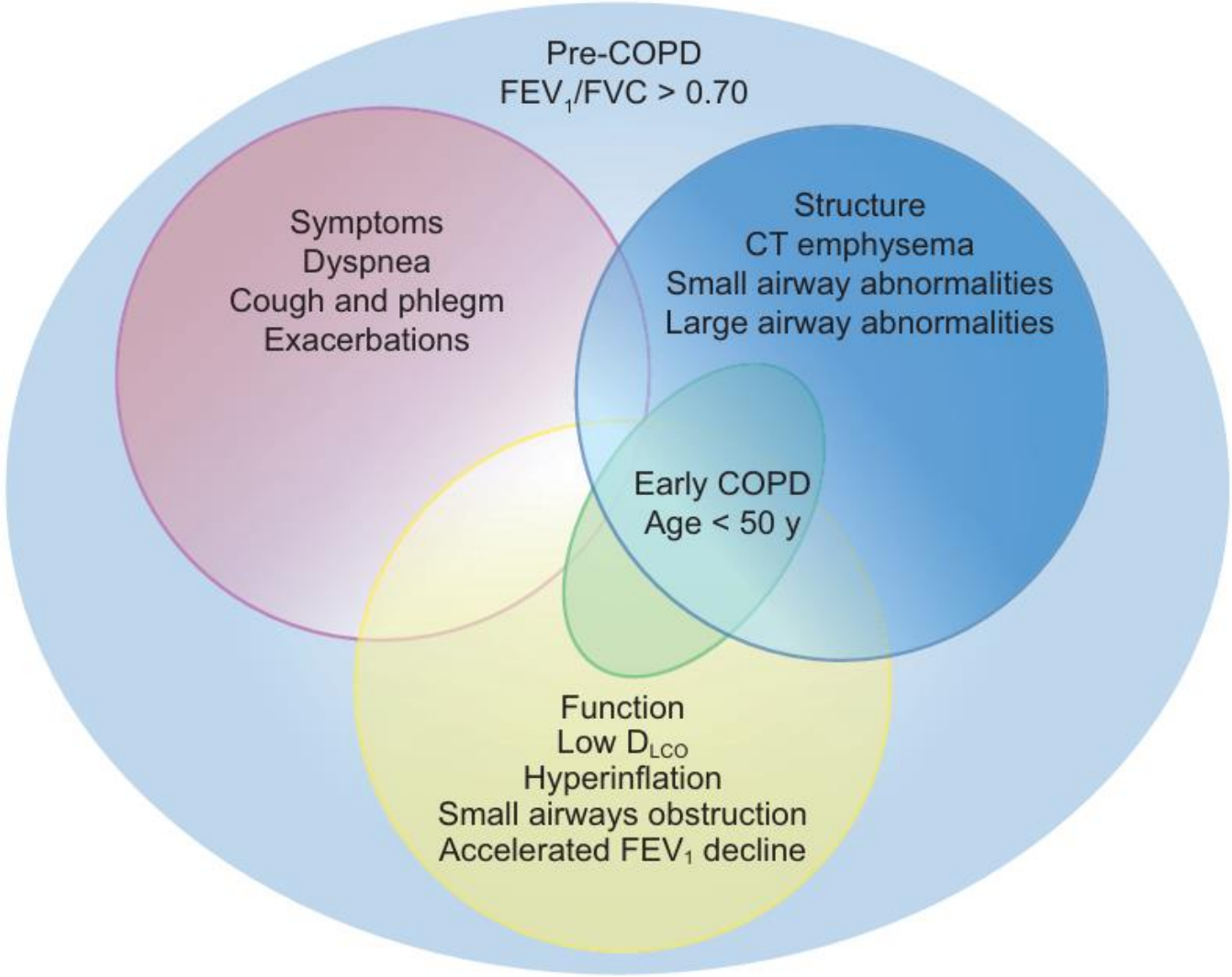
Definition

Table 1. Definitions

Term	Definition
Airflow limitation	FEV_1/FVC < LLN or 0.70 that does not fully reverse with bronchodilators
COPD	Patients with typical pulmonary symptoms of cough and/or dyspnea in the context of significant airflow limitation that is incompletely reversed with bronchodilators
Early COPD	Persons of any age, who manifest pathological or functional hallmarks of COPD in their lungs (e.g., emphysema) but do not yet demonstrate significant airflow limitation on spirometry
Pre-COPD	Persons of any age, who harbor hallmarks of COPD in their lungs (e.g., emphysema) but do not yet demonstrate significant airflow limitation

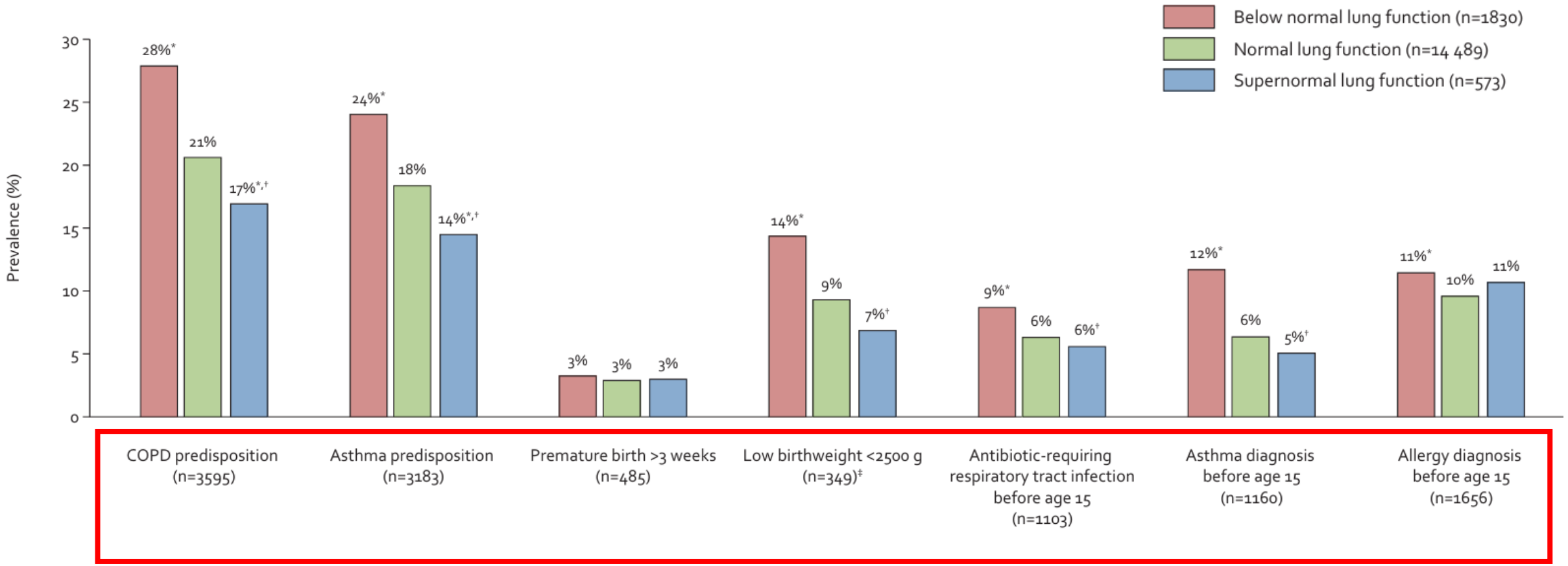
Tuberculosis and Respiratory Diseases 2023;86(2):71-81.

Definition



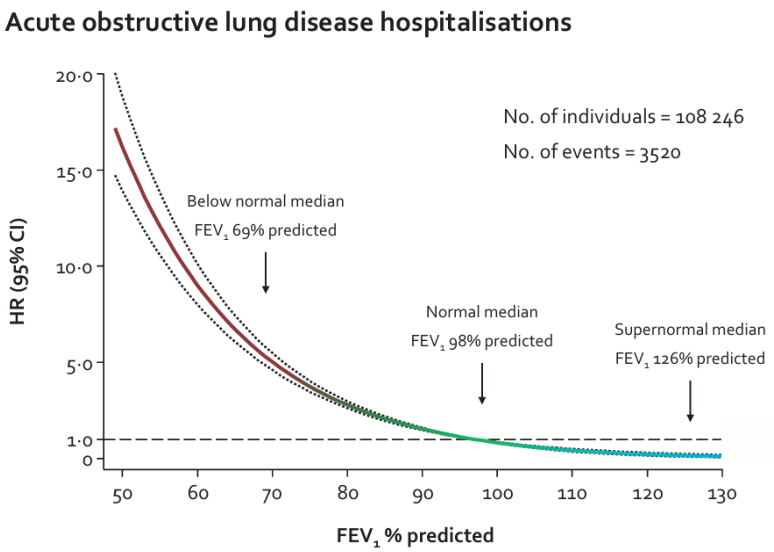
Respir Care. 2023;68(7):881-888.

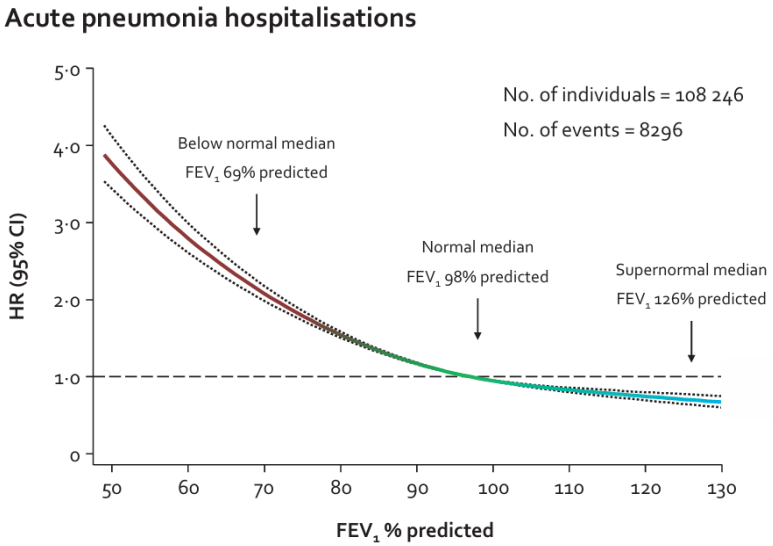
Prevalence of Early Risk Factors for COPD: Copenhagen Study

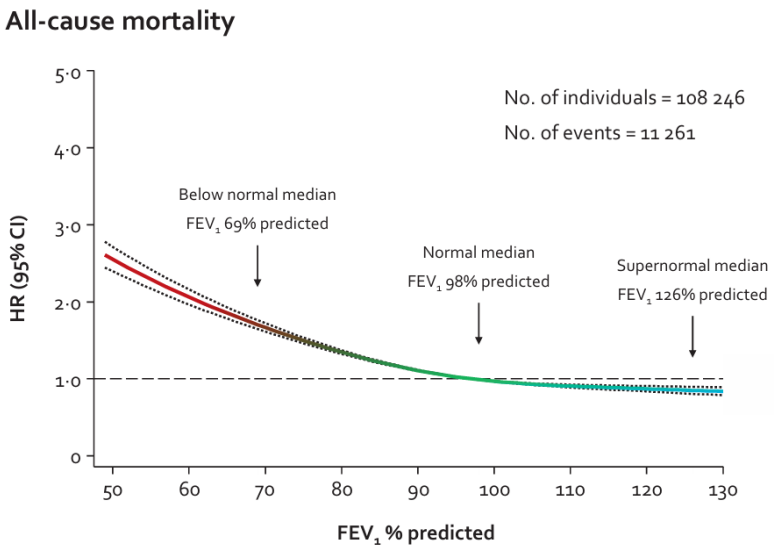


EClinicalMedicine. 2021;37:100974.

Risk of Hospitalisations and Mortality

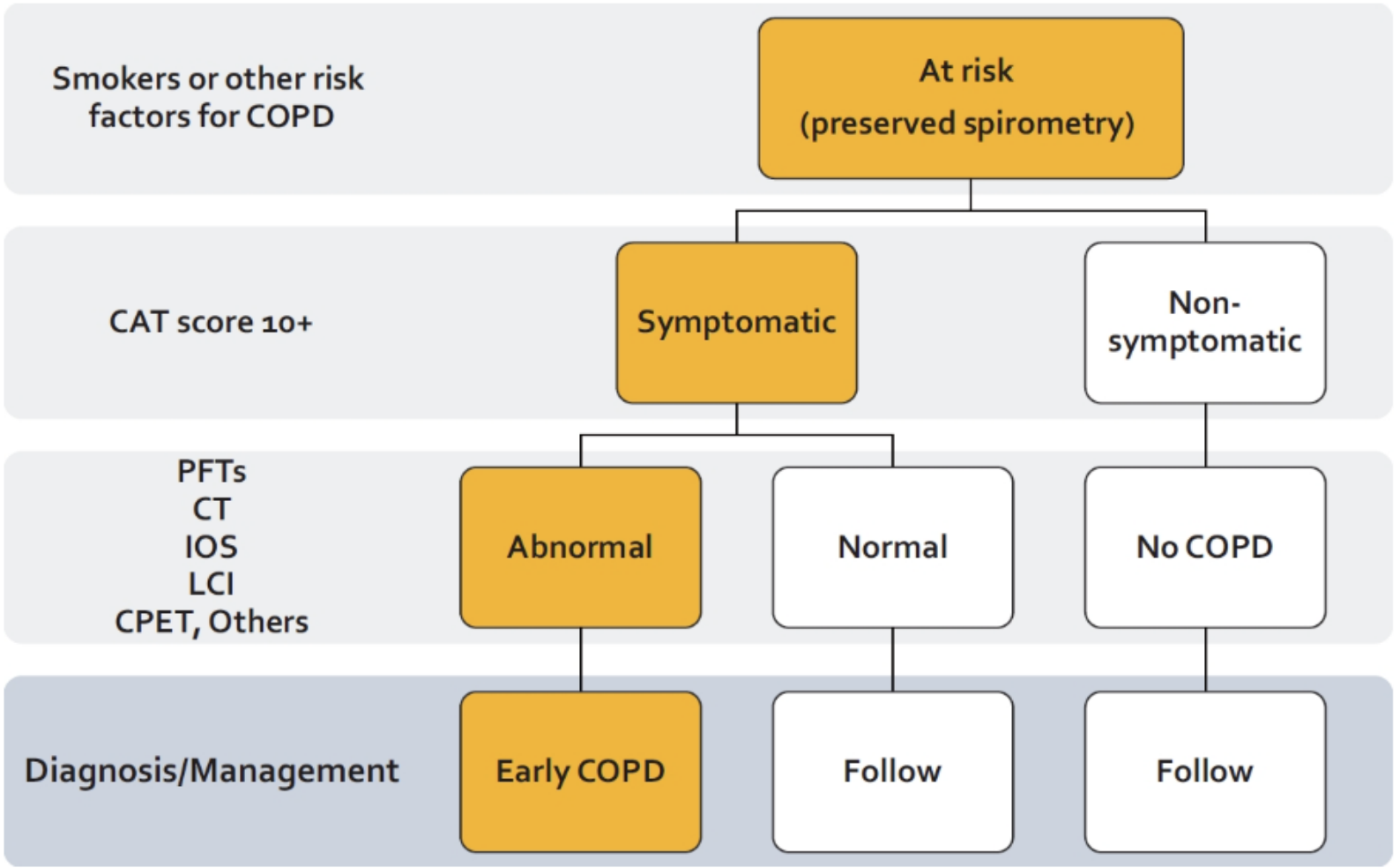






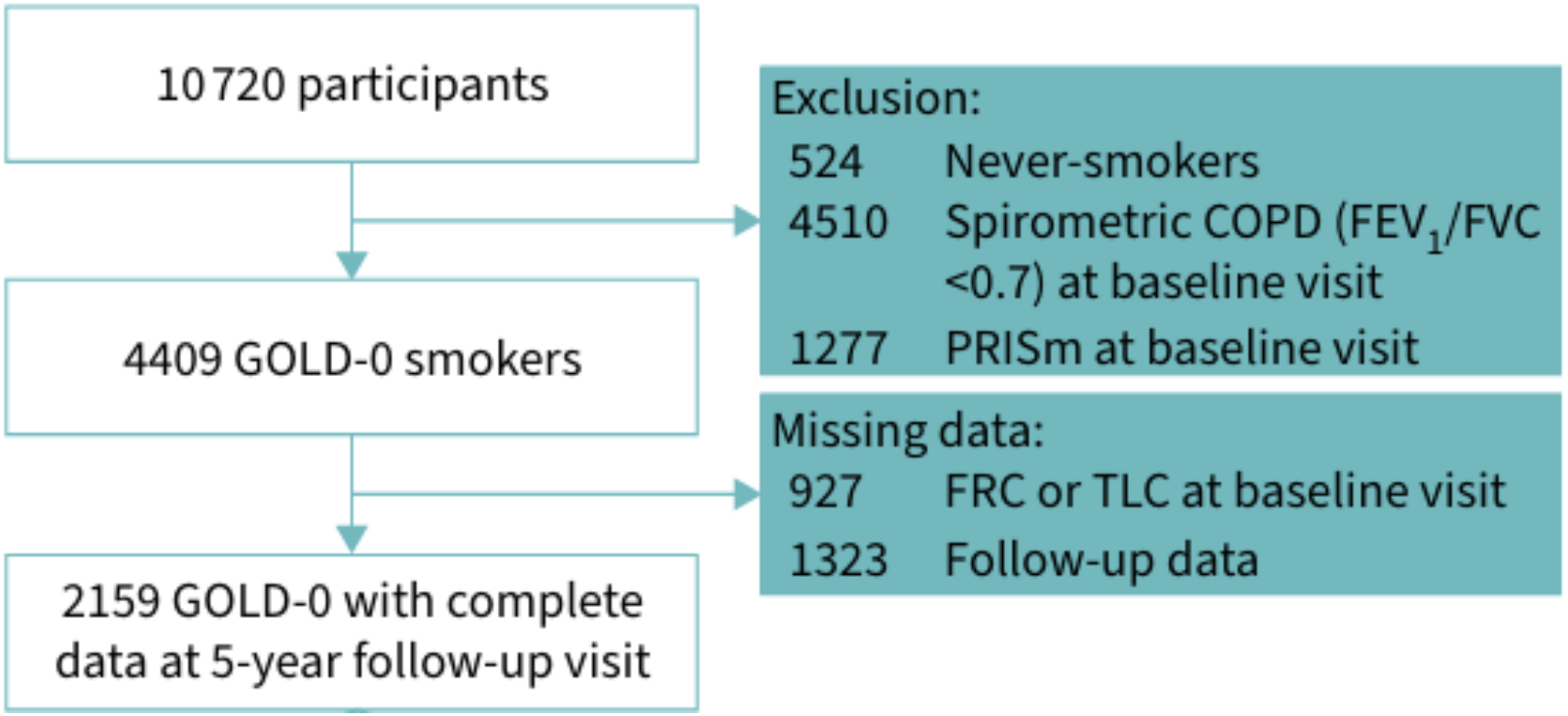
EClinicalMedicine. 2021;37:100974.

Suggested diagnostic approach for Early COPD



Tuberculosis and Respiratory Diseases 2023;86(2):71-81.

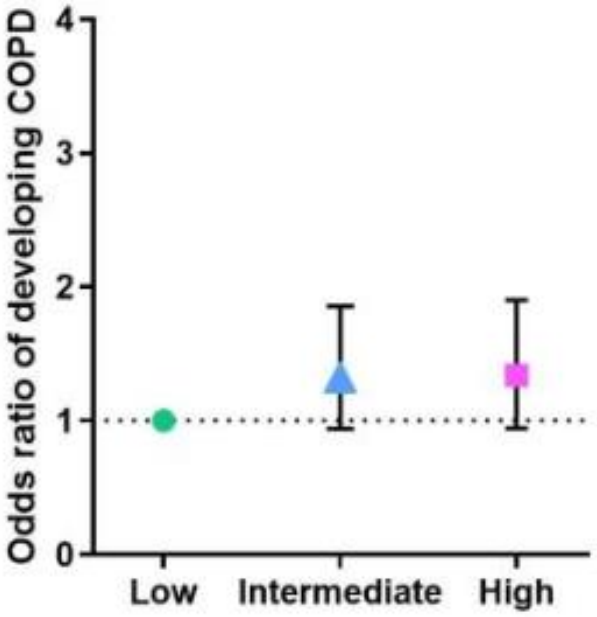
Future COPD Development in Susceptible Smokers: COPDgene



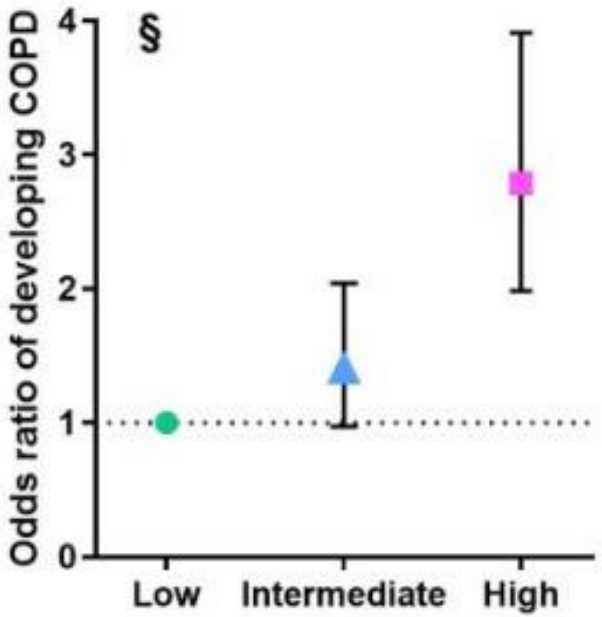
ERJ Open Res. 2023;9(5):00289-2023.

Future COPD Development in Susceptible Smokers: COPDgene

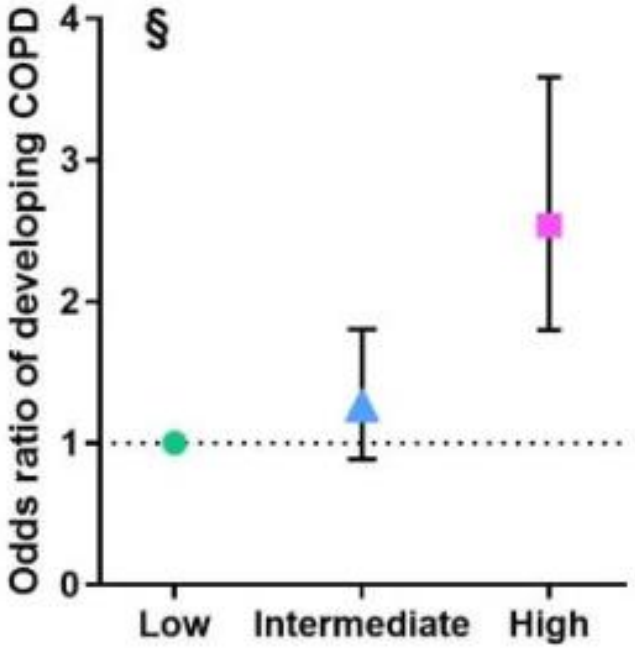
FRC/TLC



FRC



TLC



ERJ Open Res. 2023;9(5):00289-2023.

Future COPD Development in Susceptible Smokers: COPDgene

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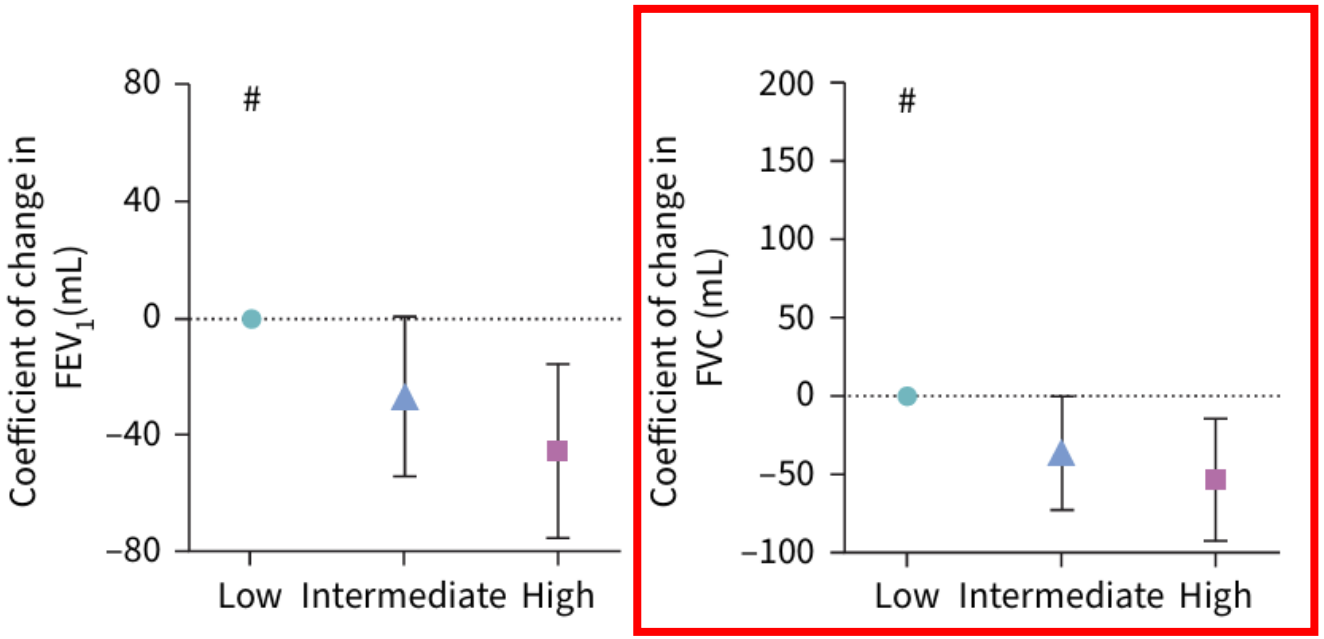
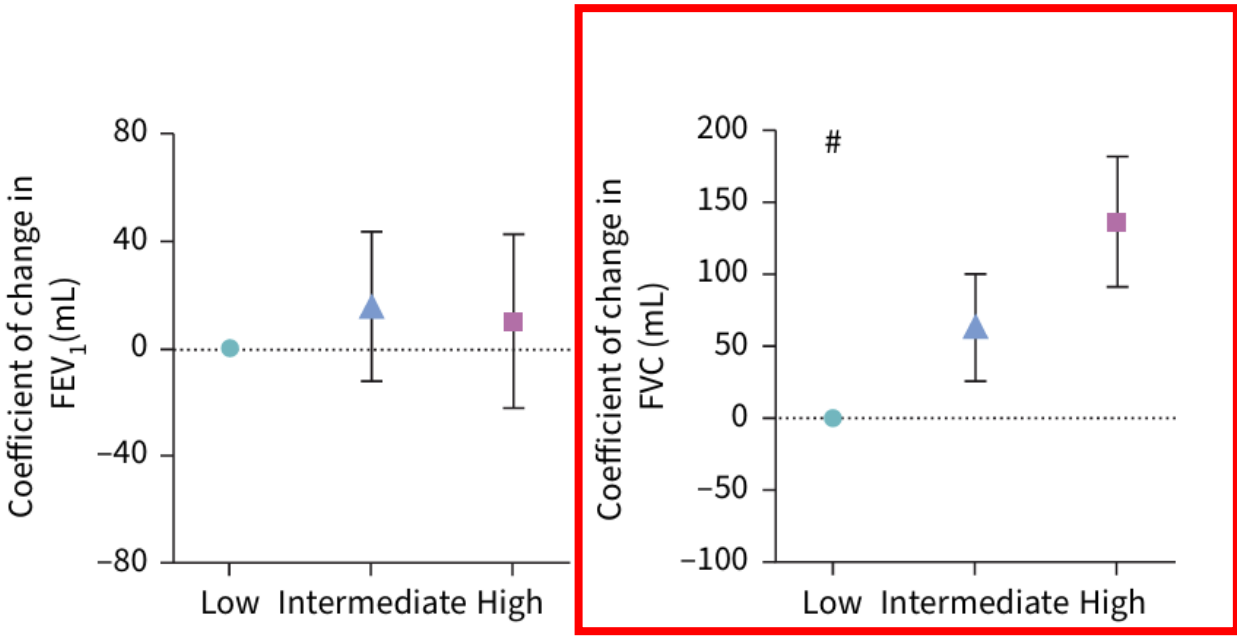
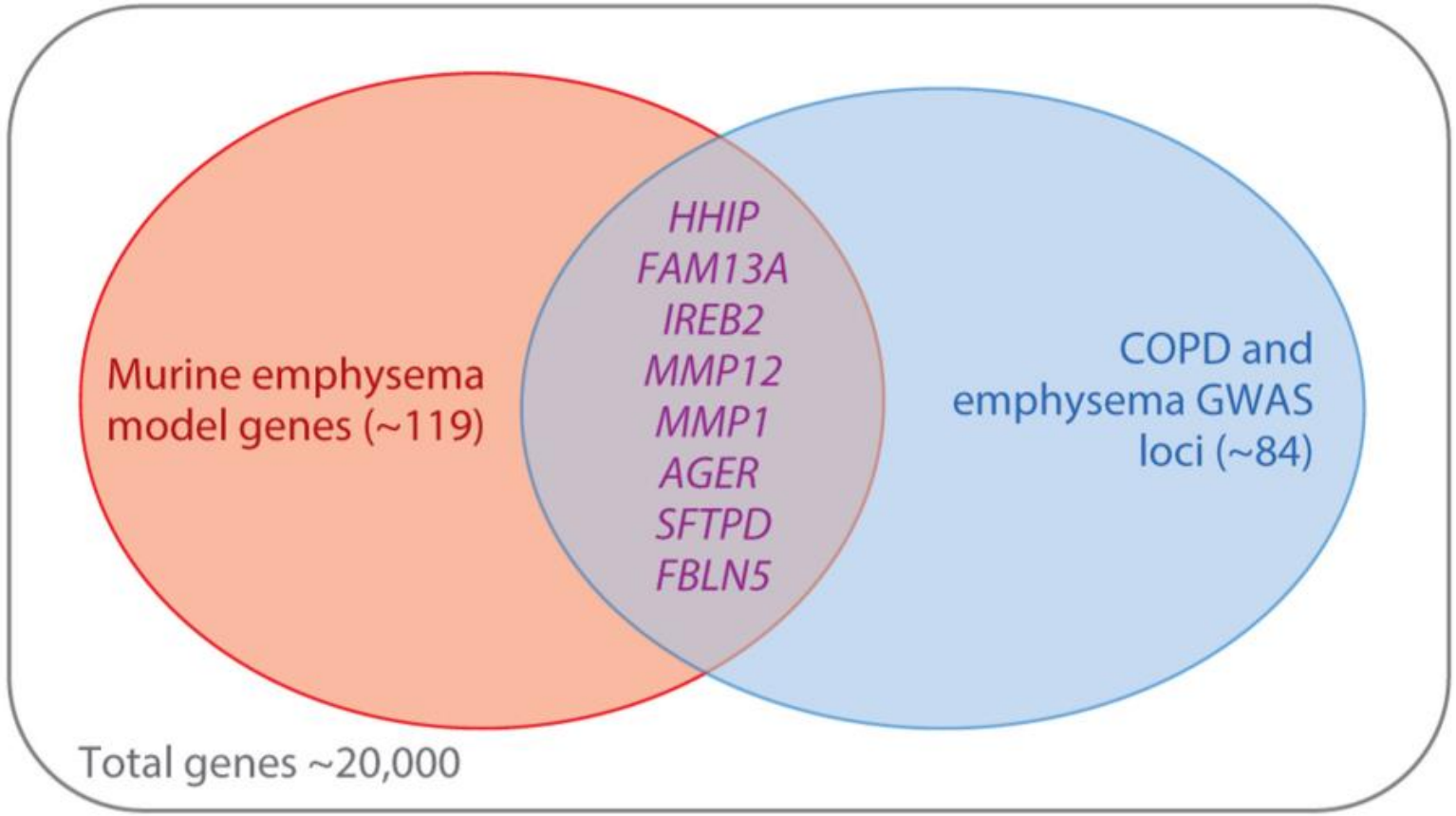


TLC



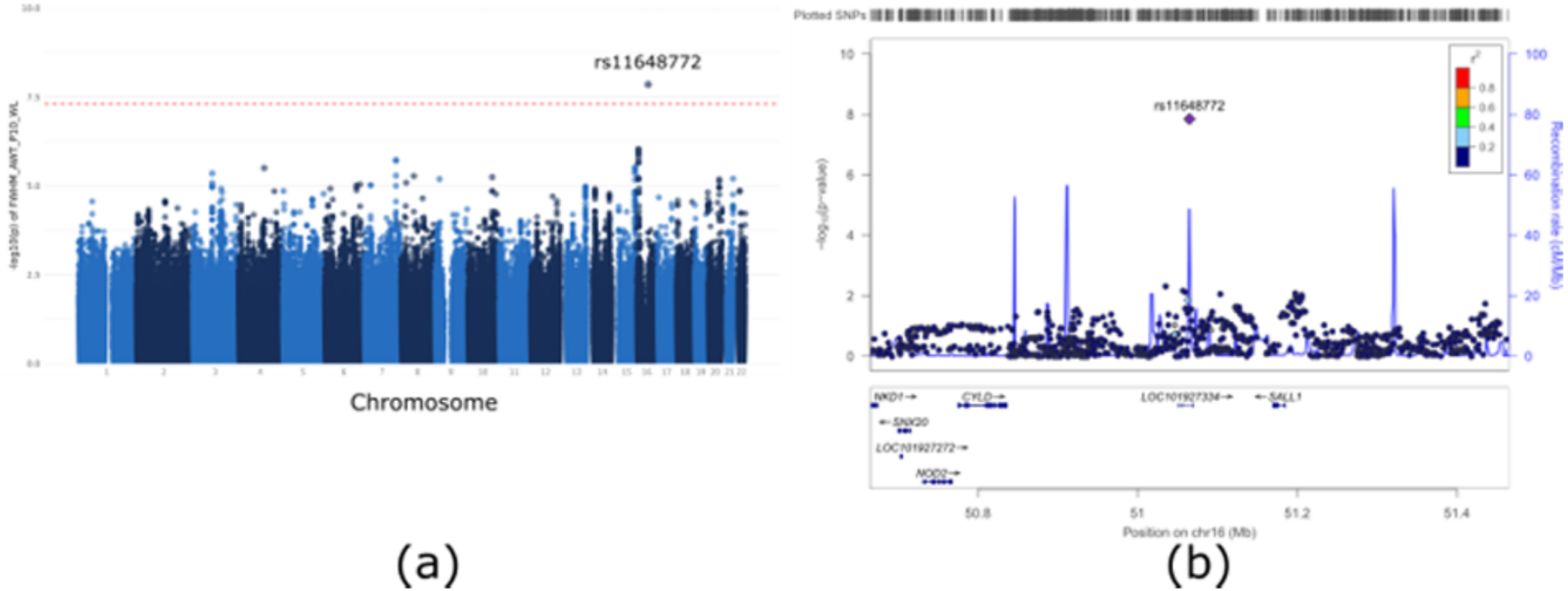
ERJ Open Res. 2023;9(5):00289-2023.

Overlap of Genes Implicated by Murine Emphysema and COPD



Annu Rev Physiol. 2020;82:413-431.

GWAS for Possible Early COPD: Small Airway Thickening



Genes (Basel). 2022;13(7):1258.

Genome-wide Association Analysis of Rapid Decline in Lung Function: Analysis from the KoGES

Design

GWAS

Ansan-Ansung cohort

Korean adults aged 40-69 years (n = 6,516)

11.6 Years

Follow-up Duration

Phenotypes

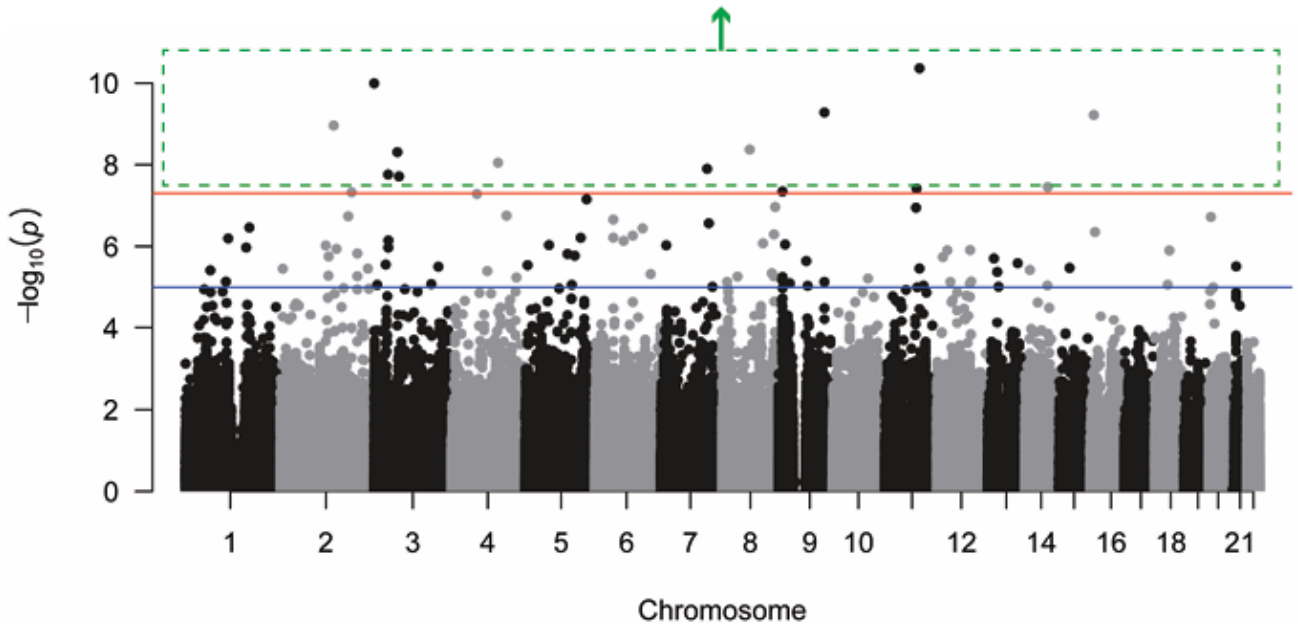
Rapid decline in FEV_1

≥ 60ml/yr

Annual decline in FEV_1

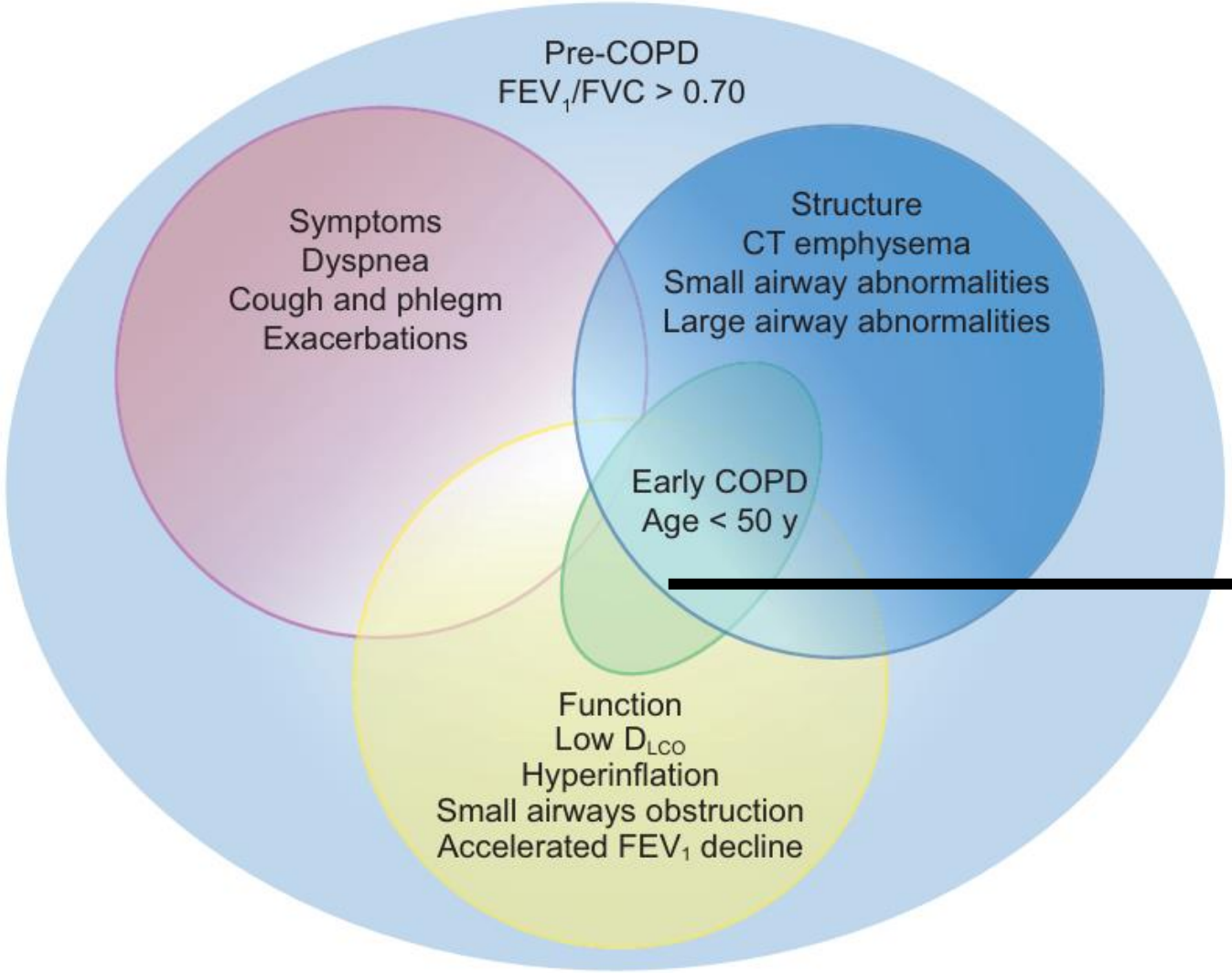
Findings

Identified 15 SNPs, incldluing rs1496255 and rs9833533, which are associated with lung function development



Unpublished data

Definition



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Respir Care. 2023;68(7):881-888.

Contents

1. Which COPD is mild?

Table 1 | Classification of blood pressure (BP) levels in adults[11]

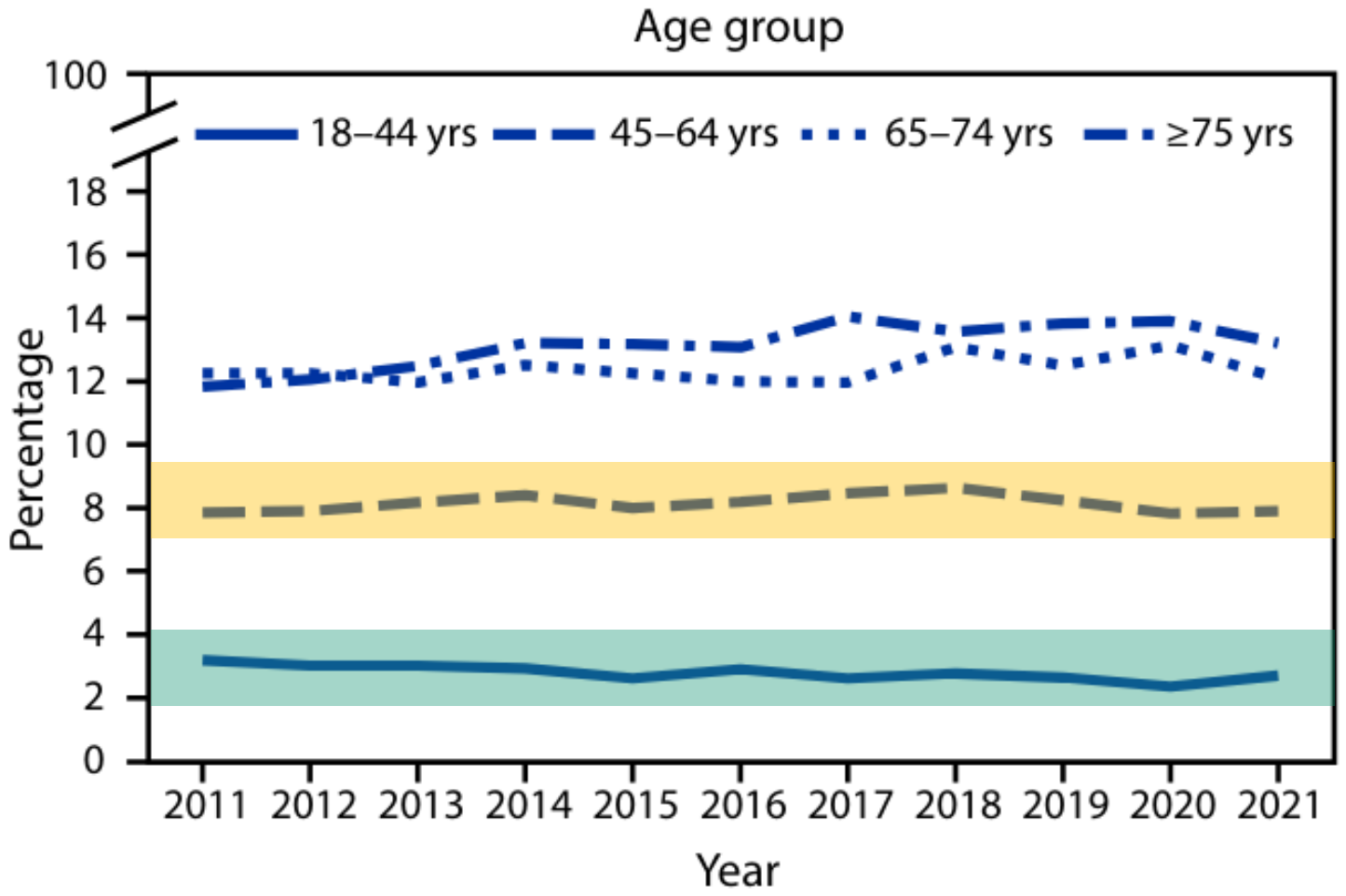
BP classification	Systolic BP (mm Hg)	Diastolic BP (mm Hg)	Typical management
Normal	<120	<80	Healthy lifestyle recommendations to maintain optimal BP
Pre-hypertension	120-139	80-89	Healthy lifestyle recommendations to try to prevent hypertension
Stage 1 ("mild") hypertension	140-159	90-99	Healthy lifestyle recommendations plus BP lowering drug(s)*
Stage 2 ("moderate/severe") hypertension	≥160	≥100	Healthy lifestyle recommendations plus BP lowering drug(s)

Adapted from Joint National Committee-7 report.[11]
*BP lowering drugs may not be indicated for all; the evidence for this group is limited

Classification of asthma	
Mild asthma	Currently defined as asthma is well controlled with as-needed ICS-formoterol, or with low dose ICS as-needed SABA

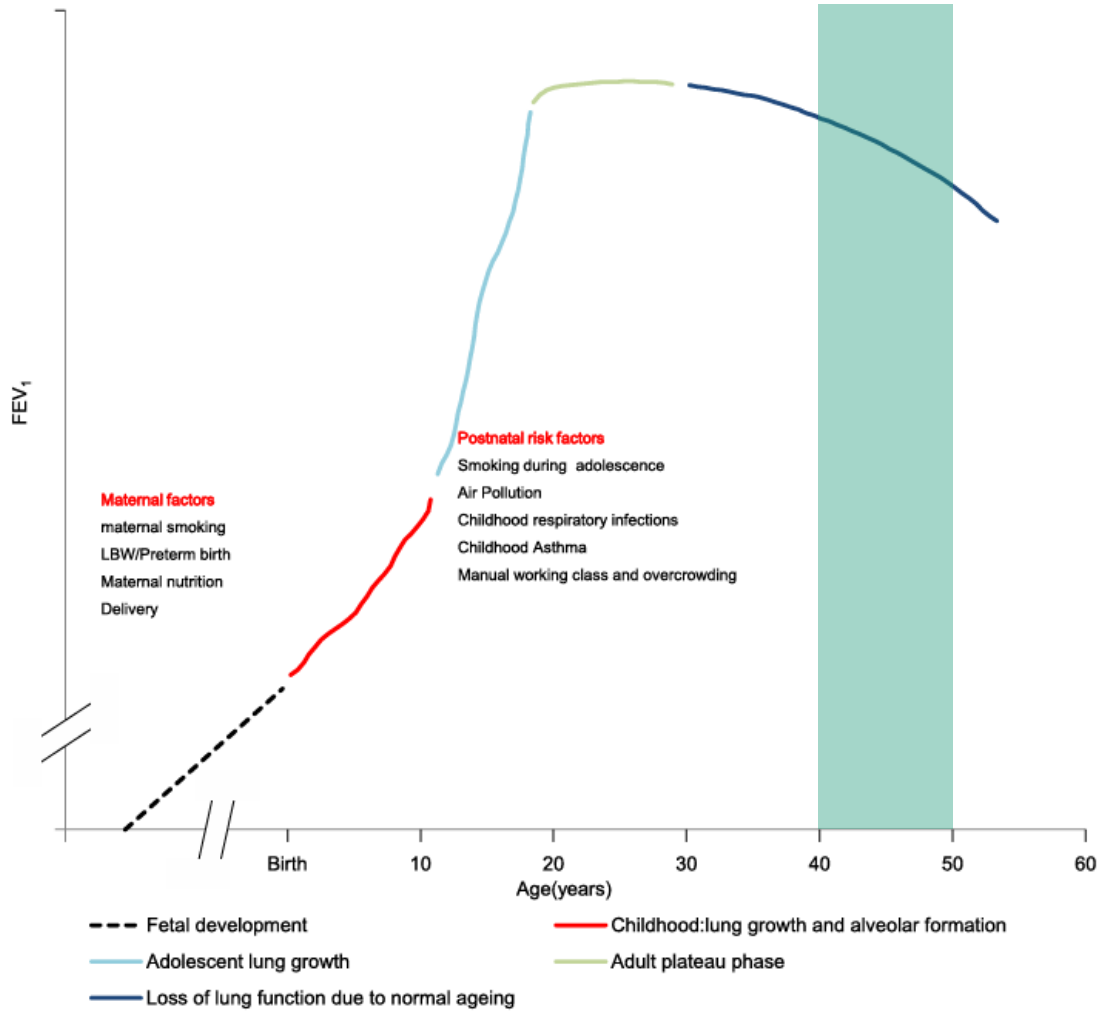
BMJ. 2016;355:i5719.

2. Who is a Young?



2021. MMWR Morb Mortal Wkly Rep. 2023 Nov 17;72(46):1250-1256.

2. Who is a Young?



The Stage of Life	The Risk Factors for Lung Function
Genetics	α1-antitrypsin deficiency
	ADAM33, SOX5, TNS1
Antenatal period	Maternal smoking
	LBW/VLBW, Preterm birth
	Maternal nutrition
	Mode of delivery Vitamin D deficiency
Childhood	Childhood smoking
	Air Pollution
	Childhood respiratory infections
	Childhood asthma Manual working class and overcrowding

Abbreviations: LBW, low birth weight; VLBW, very low birth weight.

Int J Chron Obstruct Pulmon Dis. 2021;16:3217-3228.

3. Time to review of diagnostic criteria of COPD?

Predisease	Functional/Structural abnormality	COPD
Symptom	CT, Plethysmography, IOS	Spirometry

4. Role of Early COPD

Lowering disease burden, development of potential therapy, so on..

Genetic counseling in COPD?

Clinicians centered care → Patients centered care

Summary

Mild COPD: Exacerbation/Symptom/Comorbidities

COPD in Young People: Underdiagnosis/Pre-BD/LLN

Early COPD: Concept/Risk factors/Diagnosis/Genetics