Comorbidities of COPD
الأمراض المرافقة لالتهاب القصبات المزمن

مؤتمر الرابطة السورية لأمراض وجراحة الصدر
اللاذقية 22_24 تشرين الأول 2026
د بيهس جرجور
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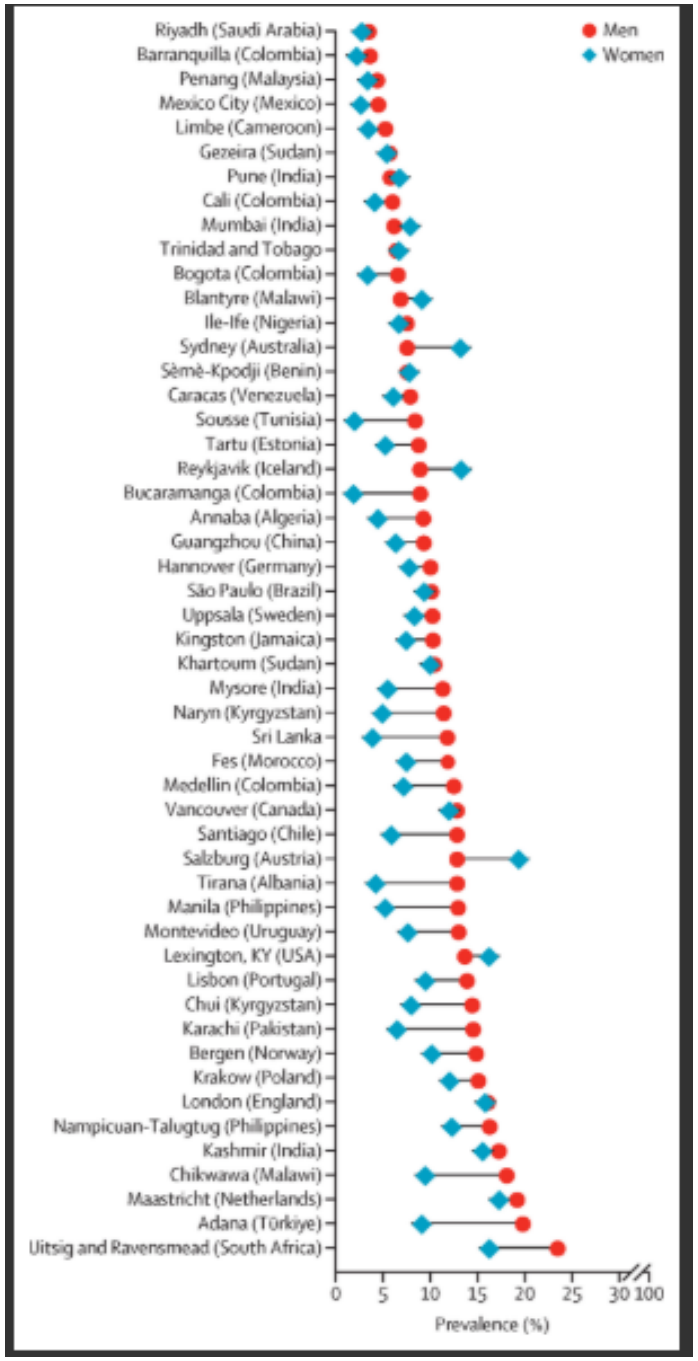
Conflict of interest disclosure

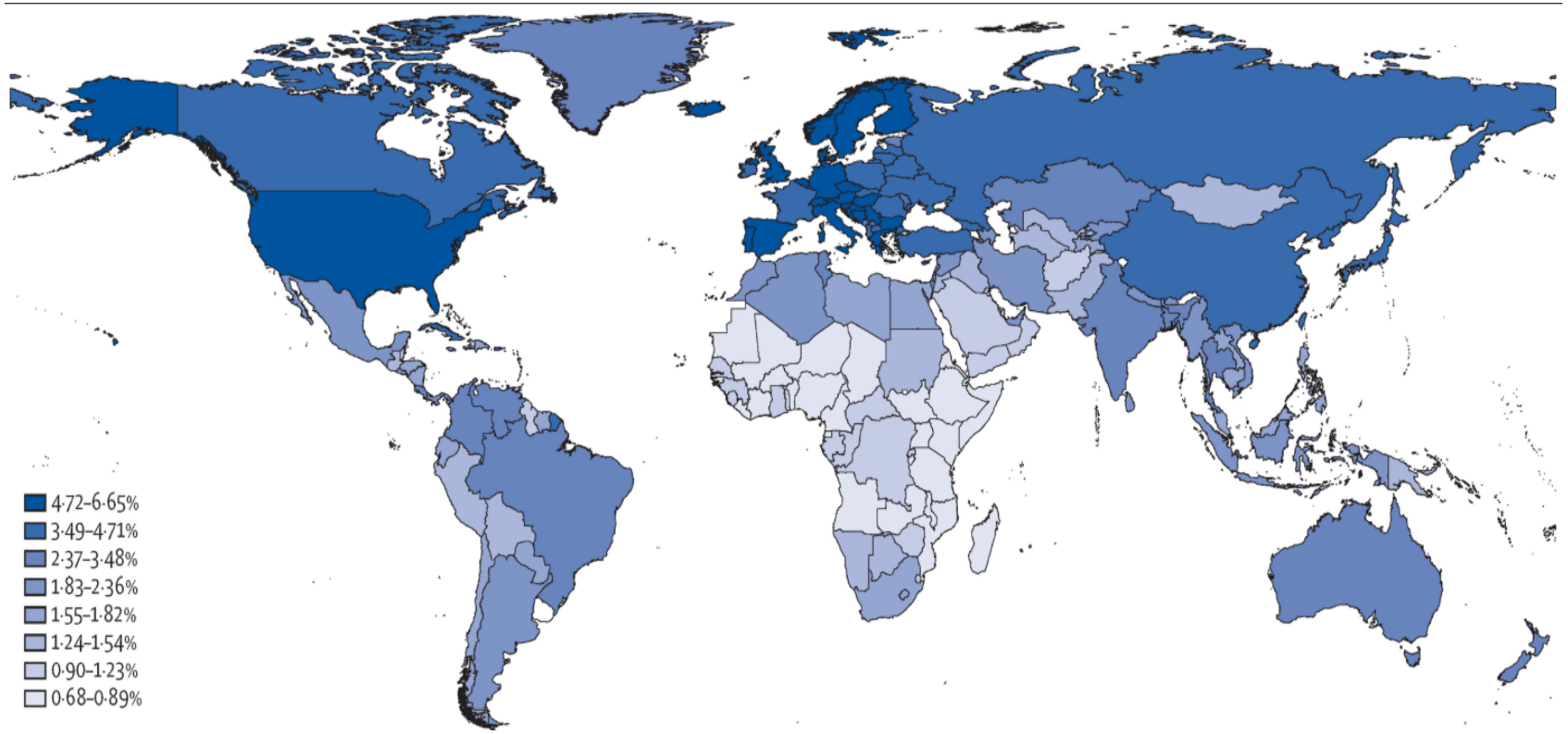
- SOS oxygene
- Agir A Dom
- Adène Santé
- Astra Zeneca
- Menarini
- Elivie
- Boehringer Ingelheim
- BMS

- Chronic obstructive pulmonary disease (COPD) is the third leading cause of death worldwide, causing 3.4 million deaths in 2023, approximately 6% of all global deaths *(1)*.
- Nearly 90% of COPD deaths in those under 70 years of age occur in low- and middle-income countries (LMIC) mainly undiagnosed (70%)*
- COPD is the seventh leading cause of poor health worldwide (measured by disability-adjusted life years).

*E Puzzolo *et al.* Lancet Respir Med 2024



Prevalence



The global burden of COPD: epidemiology and effect of prevention strategies Montes De Oca Lancet Respir Med 2025

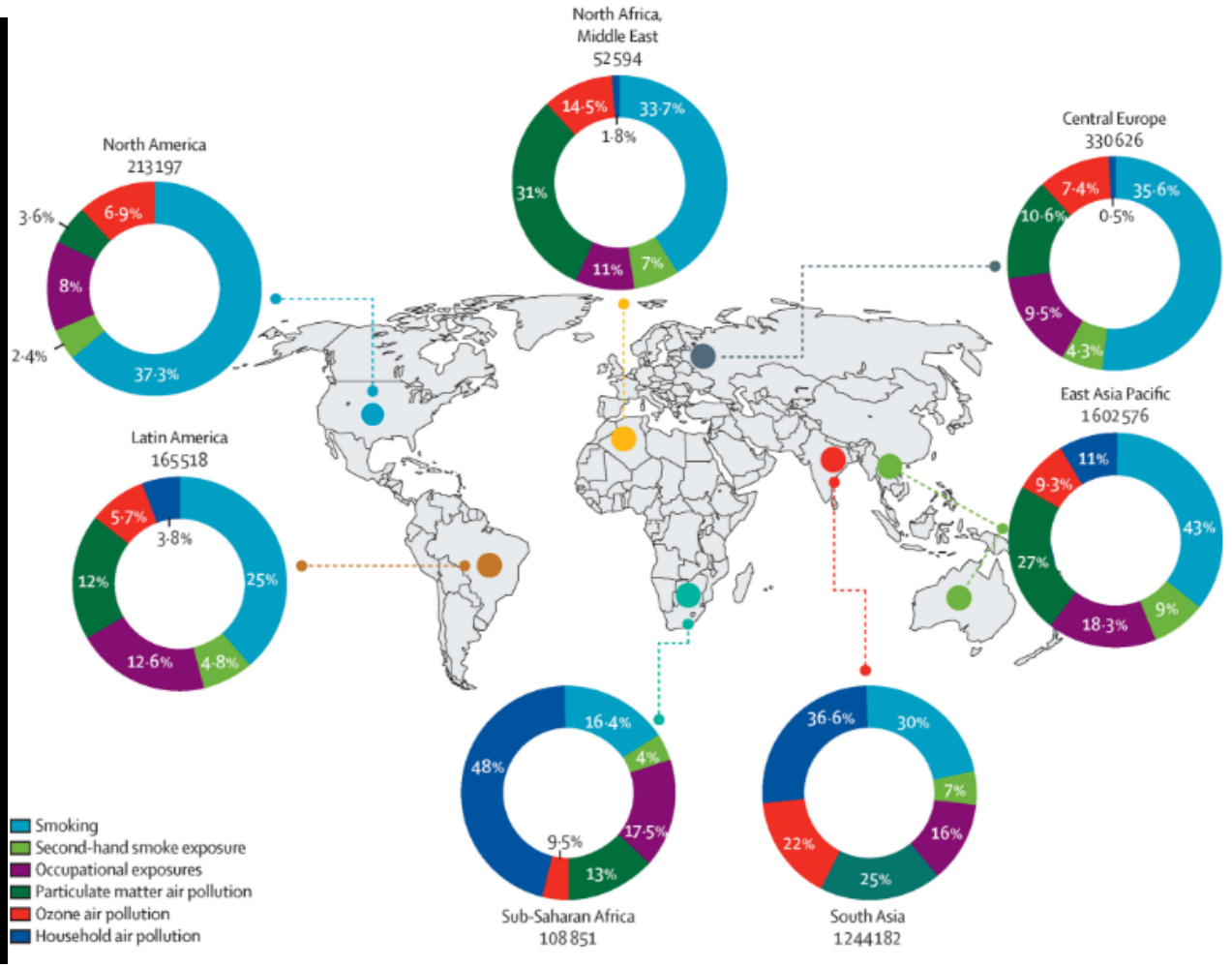
Causes

Proposed Taxonomy (Etiotypes) for COPD

Figure 1.3

Classification	Description
Genetically determined COPD (COPD-G)	Alpha-1 antitrypsin deficiency (AATD) Other genetic variants with smaller effects acting in combination
COPD due to abnormal lung development (COPD-D)	Early life events, including premature birth and low birthweight, among others
Environmental COPD	
Cigarette smoking COPD (COPD-C)	• Exposure to tobacco smoke, including *in utero* or via passive smoking • Vaping or e-cigarette use • Cannabis
Biomass and pollution exposure COPD (COPD-P)	Exposure to household pollution, ambient air pollution, wildfire smoke, occupational hazards
COPD due to infections (COPD-I)	Childhood infections, tuberculosis-associated COPD, HIV-associated COPD
COPD & asthma (COPD-A)	Particularly childhood asthma
COPD of unknown cause (COPD-U)	

*Adapted from Celli et al. (2022) and Stolz et al. (2022)



GOLD 2026

The global burden of COPD: epidemiology and effect of prevention strategies. Montes De Oca Lancet Respir Med 2025

COPD Mortality

Causes of death in COPD; data from major clinical trials.

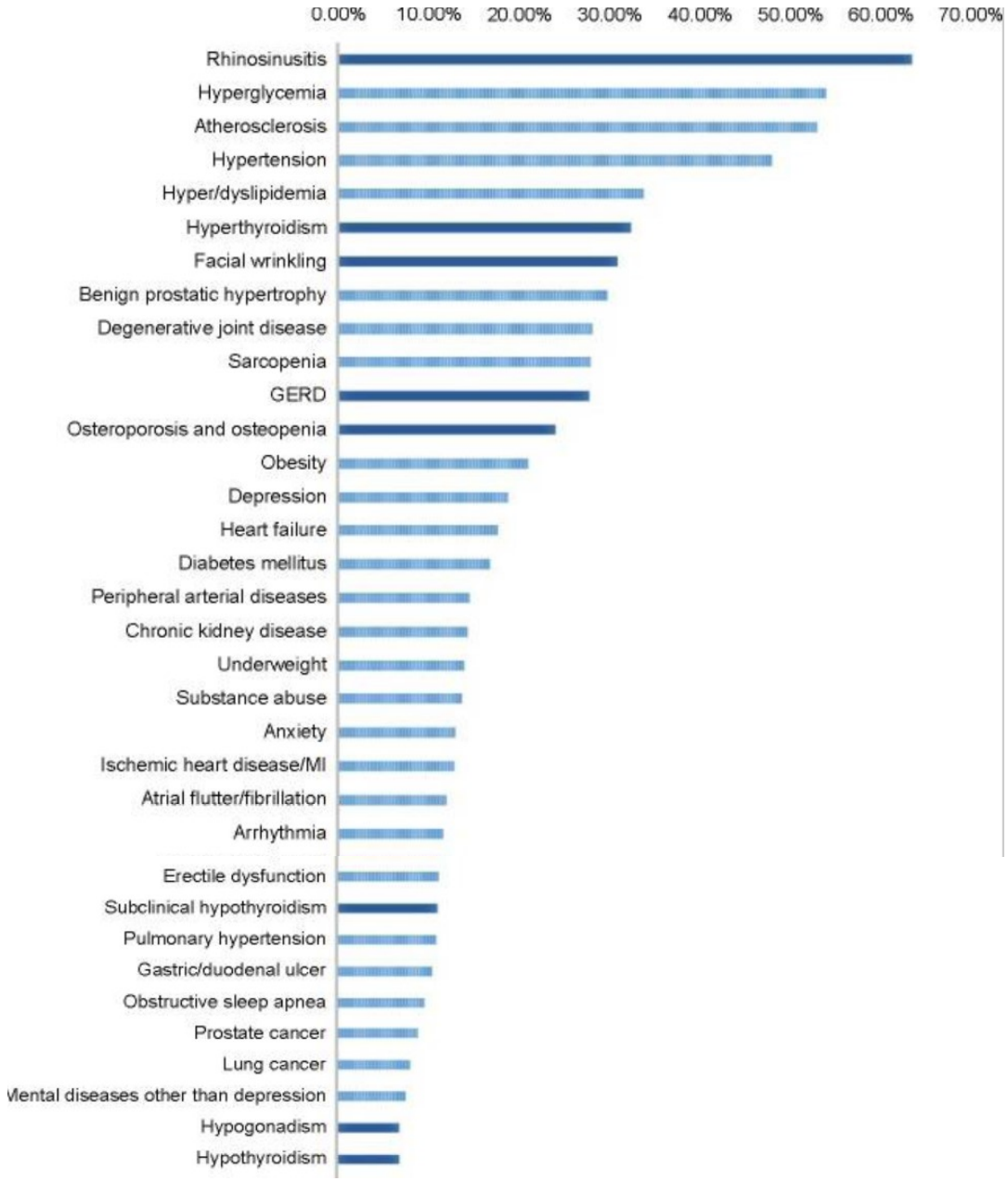
Mean FE_1 (L)	Cause of death (% of trial participants)				Trial Reference	Study size (n)	Deaths	Study follow-up
	Cardio-vascular	Cancer	Respiratory (non-malignant)	Other				
2.75[a]	22%	54%	8%	16%	LHS III (13)	5887	731	up to 14.5 years
2.54[b]	39%	39%	11%	11%	EUROSCOP (14)	1277	18	3 years
1.41[a]	32%[c]	32%[c]	22%	13%[c]	ISOLDE (15)	751	68	3 years
1.22[a]	26%	21%	35%	18%	TORCH (16, 17)	6184	911	3+ years
1.32[a]	16%	22%	39%	23%	UPLIFT (18, 19)	5993	941	4 years + 30 days

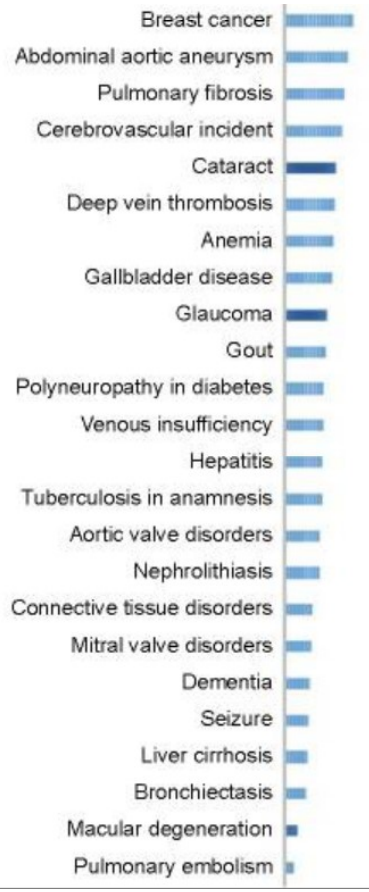
Measures that predict all-cause mortality risk in COPD patients.

Predictor
FEV_1
IC/TLC
6MWD
VO_2 max
BMI
Dyspnea Score
BODE index
Modified BODE index
Fibronectin/CRP ratio
Exacerbation frequency

Mortality in COPD: Causes, Risk Factors, and Prevention. Berry, Pub Med Central 2020

Comorbidities



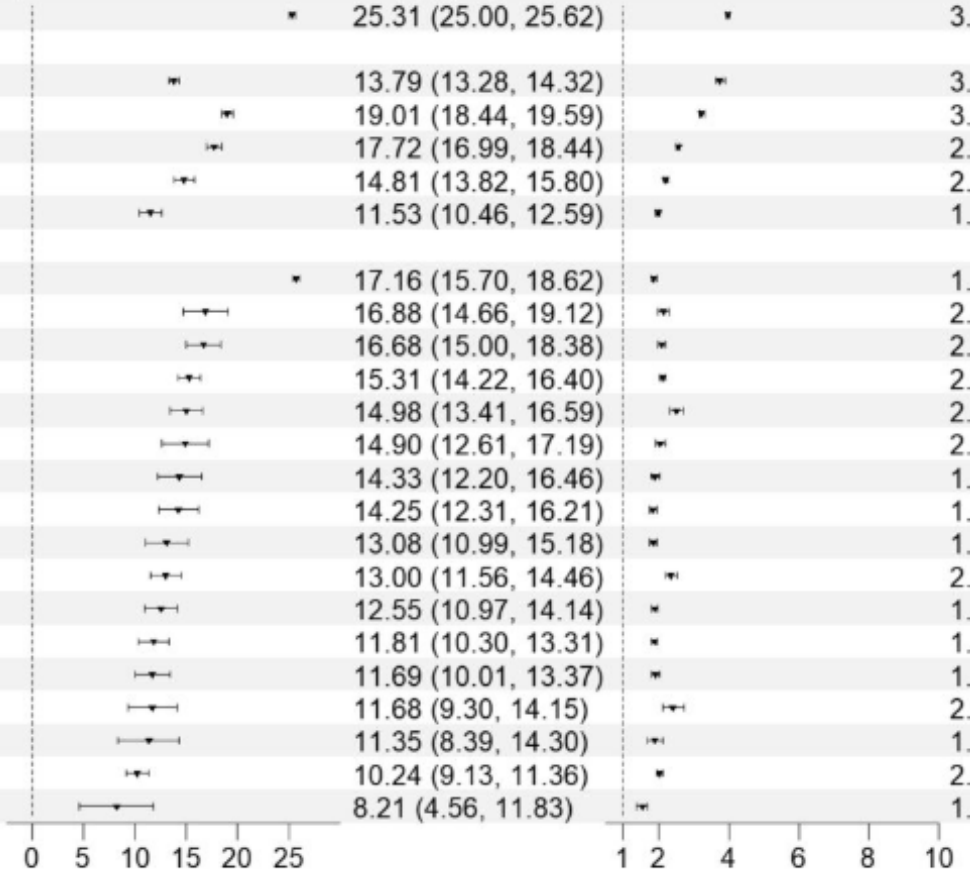


Underrecognized comorbidities of chronic obstructive pulmonary disease

Int J Chron Obstruct Pulmon Dis . 2015

Comorbidities and COPD Mortality

Comorbidity	5-year risk among COPD patients, % (95% CI)	RD, % (95% CI)	HR (95% CI)
Overall	43.00 (42.72, 43.29)	25.31 (25.00, 25.62)	3.98 (3.93, 4.03)
Number of prevalent comorbidities			
0	7.39 (7.27, 7.53)	13.79 (13.28, 14.32)	3.75 (3.64, 3.88)
1	16.45 (16.21, 16.68)	19.01 (18.44, 19.59)	3.23 (3.16, 3.31)
2	29.09 (28.69, 29.49)	17.72 (16.99, 18.44)	2.57 (2.51, 2.63)
3	42.75 (42.10, 43.40)	14.81 (13.82, 15.80)	2.20 (2.14, 2.27)
≥4	58.12 (57.33, 58.92)	11.53 (10.46, 12.59)	1.99 (1.93, 2.04)
Individual comorbidities			
Smoking-related cancers	46.98 (46.11, 47.87)	17.16 (15.70, 18.62)	1.86 (1.79, 1.94)
Acute myocardial infarction	31.63 (30.46, 32.84)	16.88 (14.66, 19.12)	2.14 (1.99, 2.30)
Non-smoking-related cancers	26.80 (26.10, 27.51)	16.68 (15.00, 18.38)	2.10 (1.99, 2.22)
Mood, stress-related, or anxiety disorders	30.39 (29.80, 30.99)	15.31 (14.22, 16.40)	2.13 (2.05, 2.20)
Prostate disorders	16.31 (15.65, 16.99)	14.98 (13.41, 16.59)	2.51 (2.34, 2.70)
Ulcer/chronic gastritis	33.56 (32.22, 34.94)	14.90 (12.61, 17.19)	2.05 (1.91, 2.21)
Venous thromboembolism	36.77 (35.52, 38.06)	14.33 (12.20, 16.46)	1.90 (1.78, 2.03)
Dementia	38.59 (37.69, 39.50)	14.25 (12.31, 16.21)	1.84 (1.74, 1.95)
Chronic kidney disease	42.07 (40.81, 43.36)	13.08 (10.99, 15.18)	1.85 (1.74, 1.96)
Diabetes mellitus	17.40 (16.70, 18.13)	13.00 (11.56, 14.46)	2.36 (2.21, 2.53)
Stroke	36.50 (35.70, 37.31)	12.55 (10.97, 14.14)	1.89 (1.80, 1.98)
Heart failure	42.96 (42.01, 43.92)	11.81 (10.30, 13.31)	1.88 (1.80, 1.96)
Peripheral artery disease	29.18 (28.21, 30.17)	11.69 (10.01, 13.37)	1.91 (1.80, 2.03)
Connective tissue disorders	14.32 (13.29, 15.41)	11.68 (9.30, 14.15)	2.40 (2.12, 2.73)
Alcohol or substance abuse disorders	30.11 (28.21, 32.10)	11.35 (8.39, 14.30)	1.89 (1.70, 2.11)
Osteoporosis/hip fracture	25.83 (25.21, 26.46)	10.24 (9.13, 11.36)	2.04 (1.96, 2.13)
Chronic liver disease	46.32 (43.86, 48.85)	8.21 (4.56, 11.83)	1.54 (1.38, 1.70)

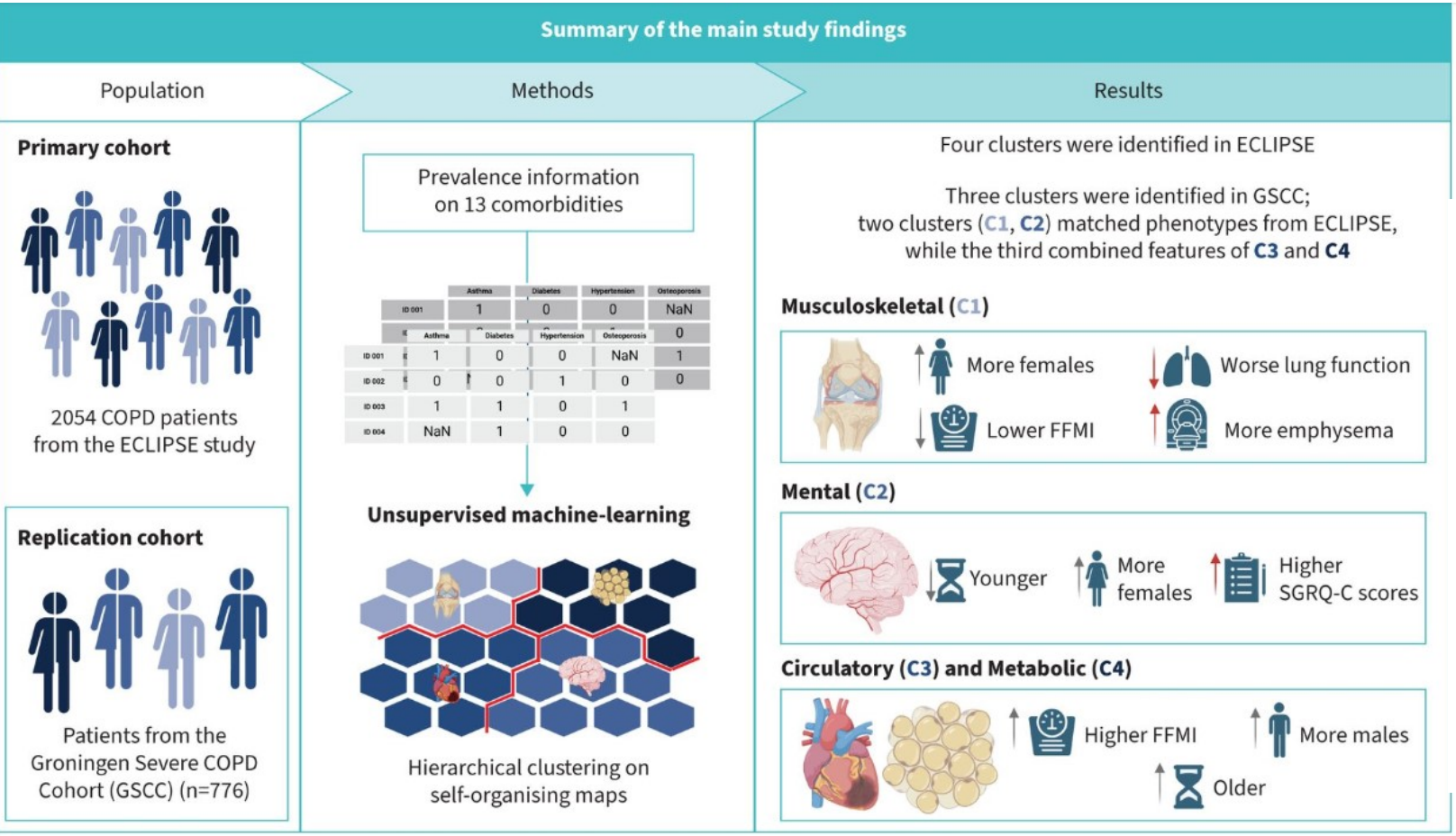


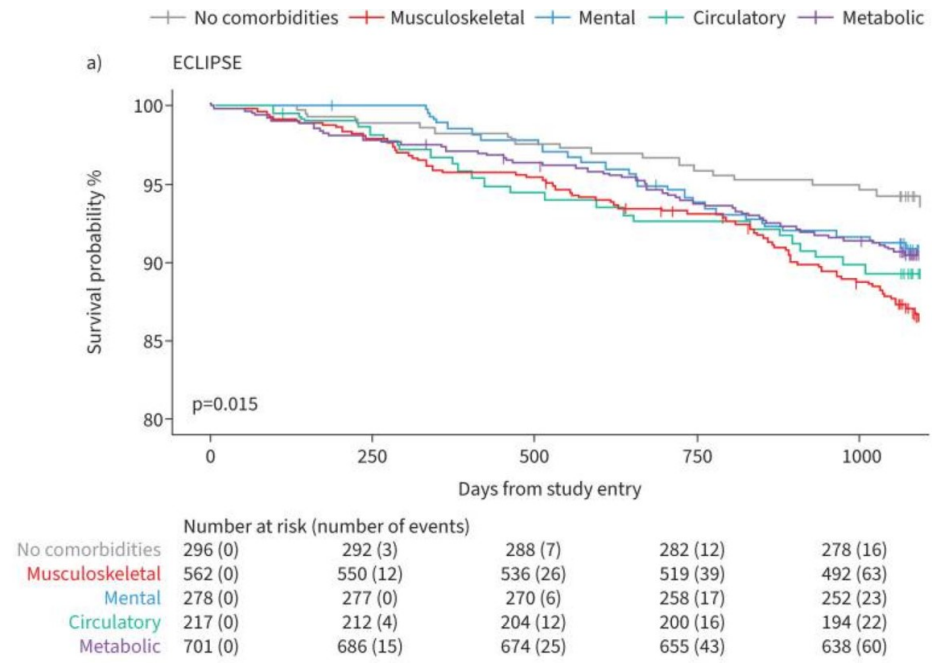
BMJ Open Respiratory Research

Comorbidities and mortality among patients with chronic obstructive pulmonary disease

Nils Skajaa, Kristina Laugesen, Erzsébet Horváth-Puhó, Henrik Toft Sørensen

COPD Comorbidities' Clusters?





Comorbidity profiles in chronic obstructive pulmonary disease: a multicohort study L Egerod et al. ERJ Open Research 2024

Reducing Mortalities of COPD ‘’Specific Treatments ’’

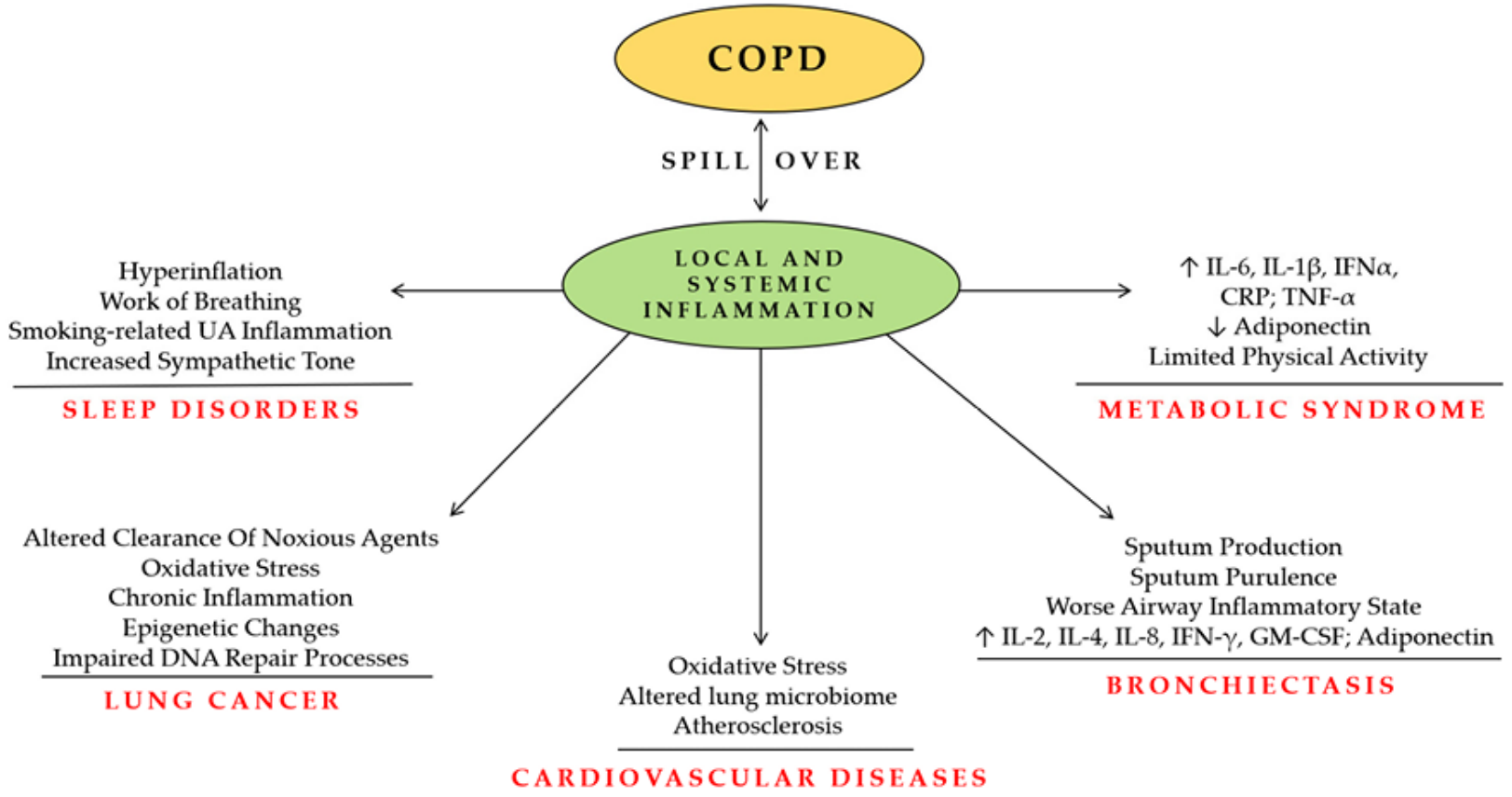
	NNTB	NNTH[#]
Smoking cessation	21 (in 10 years)	NA
LTOT	5 in 5 years 6 in 2 years	NA
NIMV	7.7 in 1 year	NA
LVRS	246 in 5 years (NETT) 7 in 5 years in patients with predominantly upper lobe disease and low exercise capacity	NA
Rehabilitation	6 in 2 years[+]	NA
Triple therapy[¶] (ICS/LABA/LAMA)	120 (FF/UMEC/VI *versus* UMEC/VI) 80 BGF *versus* GFF	33 FF/UMEC/VI *versus* UMEC/VI 58 BGF *versus* GFF

Mortality prevention as the centre of COPD management. Papaioannu, ERJ Open Research 2023

Major Comorbidities

- Cardiovascular
- Respiratory
- Metabolic and nutritional-hematologic
- Musculo-squeletal
- Neuropsychiatric

Coesisting Mechanisms



Mriniello Journal of Clinical Medecine 2024

Cardiovascular comorbidities

- Among the most frequent and most lethal > respiratory
- Shared mechanisms and causes
  - systemic inflammation
  - oxidative stress
  - endothelial dysfunction
  - smoking.
- Similar symptomes
  - Dyspnea
  - Fatigue
  - impaired exercise tolerance
- Elevated CV events risk following moderate to severe exacerbations
  - Acute coronary syndrome
  - Heart failure decompensation
  - Cerebrovascular events
  - Arrythmias

Cardiovascular Comorbidities

- Coronary artery disease
  - Inflammation and epithelial dysfonction
  - Frequent coronary calcifications with emphysema
- Heart failure and pulmonary hypertention
  - Left ventricular dyastolic diysfonction (preserved EF)
  - Right verticular overload
  - Pulmonary hypertention (50% of severe COPD)
  - Notion of cardiopulmonary continuum
- Arrythmias (AF)
  - Increases symptoms, hospitalisations and thrombnoembolic events
  - Role of treatment (B2 agonists, antibiotics)
- Abdominal Aortic Aneurism AAA
  - 1.78 fold increased prevalence (6%)
  - Poor surgical repair ouctome and increased risk of rupture
- CVA's and small vessel diseases with cognitive decline
  - more frequent in COPD patients
  - Impact on QOL and mortality

Respiratory Comorbidities

- Lung cancer
  - Shared causes (genetic predisposition and toxic exposure)
  - Major cause of mortality
  - Limited treatments with impaired LFTs
  - Screening (smoking >20 P/Y, age >50, emphysema and family history)
- Infections
  - Related to exacerbations, lung fonction impairment, and mortality
  - Viaccinal prevention
  - Role of chronic infections (HIV, tubrculosis and atypical Mycobacterial infections)
- Asthma (ACOS)
  - Similar phenotypes
  - Role of ICS, biotherapies
- Bronchectasis
  - High incidence (30%)
  - Risk factor for exacerbations and mortality
  - Caution with ICS use
- Obstructive Sleep Apnea and Overlap Syndrome
  - Majors hypoxic stress, exacerbations and hospitalisations
  - Role of treatment by CPAP and NIV

Metabolic and Nutritional Comorbidities

- Diabetes Mellitus
  - High prevalence (30%)
  - Role of inflammation in metabolic syndrome, corticoids and sedentarity
  - Increased morbiditiy and mortality
- Osteopropsis and Musculoskeletal comorbidities
  - Malnutrition, Vit D deficiency, corticoids, female gender and sedentarity
  - Vertebral fractures- impaired lung fonctions, hip fractures (increased mortality)
  - Muscle waisting (predictor of mortality)
  - Nutritional advice, supplements and exercise
- Hematologic comorbidities
  - Anemia (inflammation, malnutrition)- fatigue, dyspnea and reduced exercise tolerance
  - Polycythemia (hypoxia) - thromboembolic events

Neuropsychiatric Morbidities

An under estimated impact on the quality of life and mortalitiy

- Depression
  - Chronicity, sedetarity and social isolation
- Anxiety
  - Dyspnea and hypoxia related stress
- Addictions
  - Tobacco, alcohol, THC and other substances
- Schyzophrenia
  - X3 among COPD patients
- Impaired cognitive fonction
  - Hypoxia, limited social interaction and isolation

Coclusion

- COPD si a major cause of altered life quality and mortality, often underdiagnosed with limited treatments
- Essential role of prevention (smoking cessation, pollution and infection control)
- Early detection by screenig for COPD and comorbidities (routine LFTs and CT screening for lung cancer, reducing cardiovascular, mental and musculoskeletal risks)
- Important role of patient education, smoking cessation, physical rehabilitation, mental and nutritionnal support along with pharmaceutical treatments to reduce exacerbations

شكرا لحسن استماعكم