

**In the name of GOD**

# **World COPD Day 2023**

## **Epidemiology & Etiology**

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# History of COPD day

- ❑ In 1769, Italian anatomist Giovanni Morgagni reported 19 cases of “turgid” lungs.
- ❑ In 1679, Swiss physician Théophile Bonet referred to “voluminous lungs”
- ❑ In 1814, chronic bronchitis was first identified as a disabling health condition and part of COPD by British physician Charles Badham.
- ❑ He was the first person to use the term ‘catarrh’ to describe the ongoing cough and excessive mucus that COPD produces.

1679

## Possible First Record of C.O.P.D.

Swiss physician Théophile Bonet refers to “voluminous lungs” to describe what was likely C.O.P.D.

1814

## Chronic Bronchitis Identified as Part of C.O.P.D.

British physician Charles Badham discovers that it is also a disabling heart condition.

# History of COPD day...

- ❑ In 1821, physician René Laënnec, the inventor of the stethoscope, recognized **emphysema** as another component of COPD as smoking wasn't common during the early 1800s.
- ❑ He identified **air pollution** and **genetic factors** as the principal causes of the development of COPD.
- ❑ In 1846, John Hutchinson invented the **spirometer**, which measures vital lung capacity and is still an essential tool in diagnosing COPD today.

1821

## Emphysema Identified as Part of C.O.P.D.

Physician René Laënnec recognizes emphysema as this, and air pollution and genetic factors as the principal causes of the development of C.O.P.D.

1846

## John Hutchinson Invents the Spirometer

It remains an essential tool in diagnosing C.O.P.D. to this day.

# History of COPD day...

- ❑ William Briscoe is believed to be the first person to use the term **COPD** in discussion at the 9th Aspen Emphysema Conference. This term became established and today we refer to COPD as the designation of this growing health problem.
- ❑ One of the first studies that began to look prospectively at risk factors for COPD was designed by Charles Fletcher.
- ❑ He discover that stopping **smoking** can help to slow the progress of the disease.

June 1965

## First Use Of "Chronic Obstructive Pulmonary Disorder"

The term is used by Dr. William Briscoe at the ninth Aspen Emphysema Conference, where pulmonary rehabilitation and home care are introduced as treatments as well.

1976

## Charles Fletcher Links Smoking to C.O.P.D.

He and his colleagues discover that stopping smoking can help to slow the progress of the disease.



# Global COPD Burden 2017

## THE GLOBAL BURDEN OF COPD



Currently the **4<sup>th</sup>** leading cause of death in the world

Estimated to become the **3<sup>rd</sup>** leading cause of death by 2020

More than **3** million people die of COPD annually

# Why COPD day is important

## A. It's an opportunity to make more people aware

- ⌘ Despite how common it is, many people don't quite know what COPD is and how it affects them. They may already have the symptoms and not realize it by dismissing them as just some cough.

## B. It's a day in which experts discuss new ways to reduce the problem

- ⌘ As we've mentioned, the GOLD organizes international conferences about this topic, including satellite conferences. That way, every professional can learn about the newest findings and help all of us.

## C. It's important to remember the facts

- ⌘ With the stress of daily life, it's possible to forget if we're at risk or not, or how serious this disease is. Having this day serves as a reminder of the data, symptoms, prevention methods, and treatments.

# Why COPD day is important...

- ❑ COPD is a heterogeneous lung condition characterized by chronic symptoms.
- ❑ The exact prevalence of COPD worldwide is largely unknown, but estimates have varied from 7-19%.
- ❑ There is no cure for COPD, we want to raise awareness of COPD and make sure that everyone with COPD, has access to the care and information that they need to manage their condition well.
- ❑ COPD prevalence was highest among women aged 65–74 (10.4%) and 75–84 (9.7%) and among men aged 75–84 (11.2%).
- ❑ About 10 to 15 percent of smokers develop COPD. The disease develops most often in people who are 40 or older.

# Why COPD day is important...

- ❑ **The main risk factors for COPD are tobacco smoking, indoor and outdoor air pollution.**
- ❑ **Exposure to air pollutants such as chemicals, fumes and dust in the workplace over a long period of time can compromise lung health.**
- ❑ **Approximately 300 million people have COPD globally, of which about 3.2 million deaths in 2019, (that is 1 death every 4 minutes).**
- ❑ **By 2030 predicted 4.5 million COPD related deaths annually.**
- ❑ **Total deaths from COPD are projected to increase by >30% over the next 10 years without interventions to decrease risk, particularly exposure to tobacco smoke.**

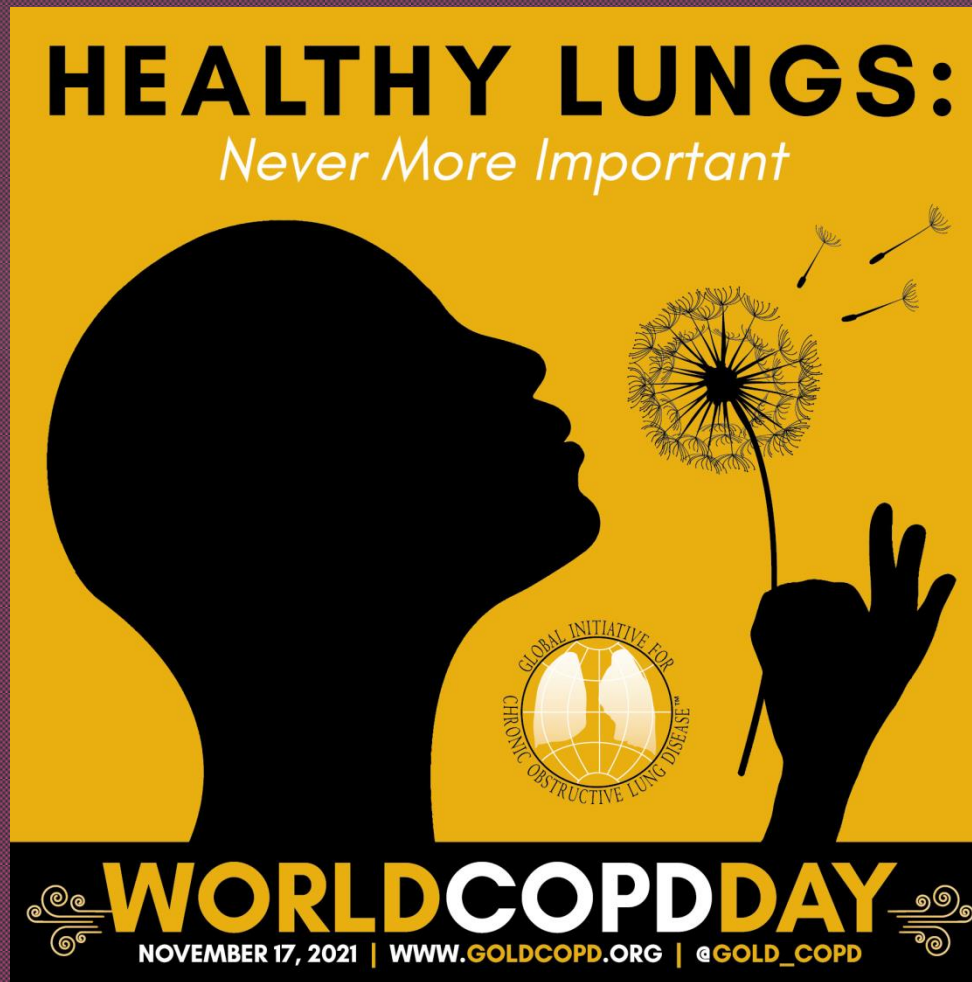


# World COPD Day 2023

- **COPD is a type of preventable, treatable and progressive lung disease that is characterized by long-term respiratory symptoms and airflow limitation.**
- **The first World COPD Day was held in 2002. World COPD Day , is celebrated on the third Wednesday of November every year (Wednesday 15 November 2023).**
- **WHO predicts that COPD will become the third leading cause of death worldwide by 2030.**
- **Each year GOLD chooses a theme and coordinates preparation and distribution of World COPD Day materials and resources.**

# World COPD Day 2021

The 2021 theme for World COPD Day ;  
“Healthy Lungs – Never More Important”

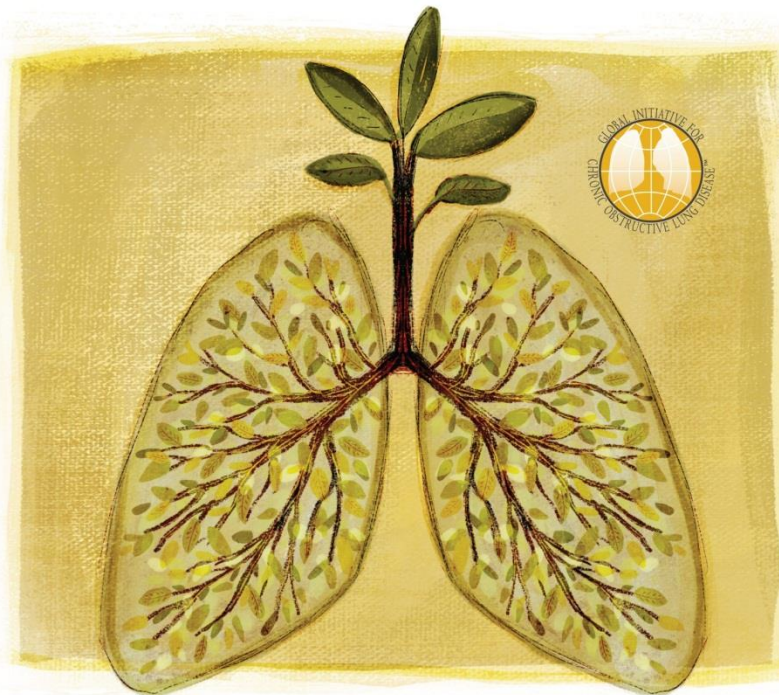


# World COPD Day 2022

The 2022 theme for World COPD Day;  
**"Your Lungs for Life"**

WORLD COPD DAY

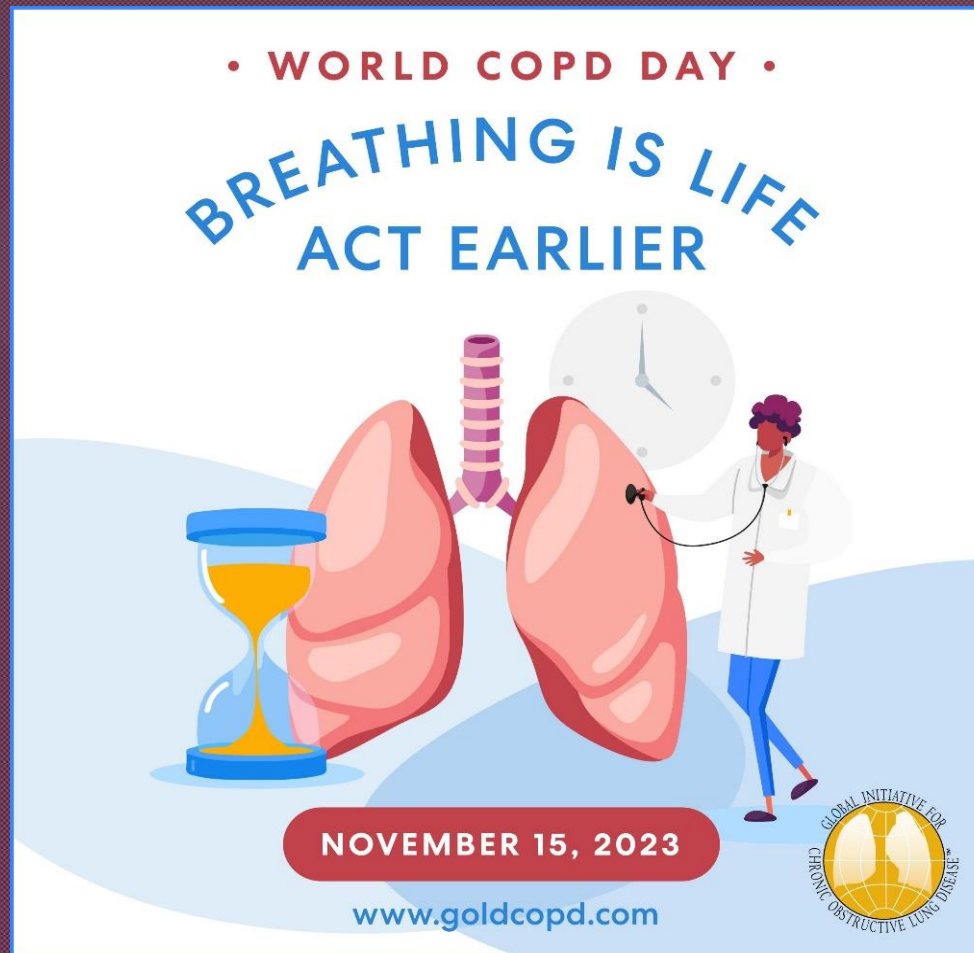
NOVEMBER 16th, 2022 | [www.GOLDCOPD.org](http://www.GOLDCOPD.org) | @GOLD\_COPD



YOUR LUNGS FOR LIFE

# World COPD Day 2023

The 2023 theme for World COPD Day ;  
“Breathing is Life - Act Earlier”





# Causes of COPD

- ✂ **COPD usually develops because of long-term damage to lungs from breathing in a harmful substance, usually cigarette smoke and air pollution.**
- ✂ **Long-term exposure to particulate matter PM 2.5 and nitrogen dioxides increases your risk of developing COPD.**
- ✂ **Ongoing and long-term exposure to chemicals, dust and fumes are environmental risks for COPD. (Occupational COPD)**
- ✂ **COPD often occurs in people exposed to fumes from burning fuel for cooking and heating in poorly ventilated homes**

# Facts About COPD

- ✎ The prevalence of COPD was estimated to be 7.6% (95% CI 6–9.2%) independent of the defined diagnostic criteria.
- ✎ COPD may also experience flare-ups. This is when symptoms suddenly become worse for a time.
- ✎ Triggers of COPD flare-ups can include chest infections and exposure to cigarette smoke and other lung irritants.
- ✎ The impact of COPD is reflected by:
  - ✎ Emergency department visits
  - ✎ Hospitalization rates
  - ✎ Impaired exercise performance and functional capacity

# Facts About COPD

- **The burden of COPD is underestimated because it is not usually recognized and diagnosed until it is clinically apparent and moderately advanced.**
- **Life with COPD can be difficult. It's a progressive condition, which means there is currently no cure and everyday tasks can become a challenge.**
- **Prevalence, morbidity, and mortality vary appreciably across countries, COPD is a significant health problem in both men and women.**
- **The economic costs of COPD are high and will continue to rise in direct relation to the ever-aging population, the increasing prevalence of the disease, and the cost of new and existing medical and public health interventions.**

# Burden of COPD; Limitations

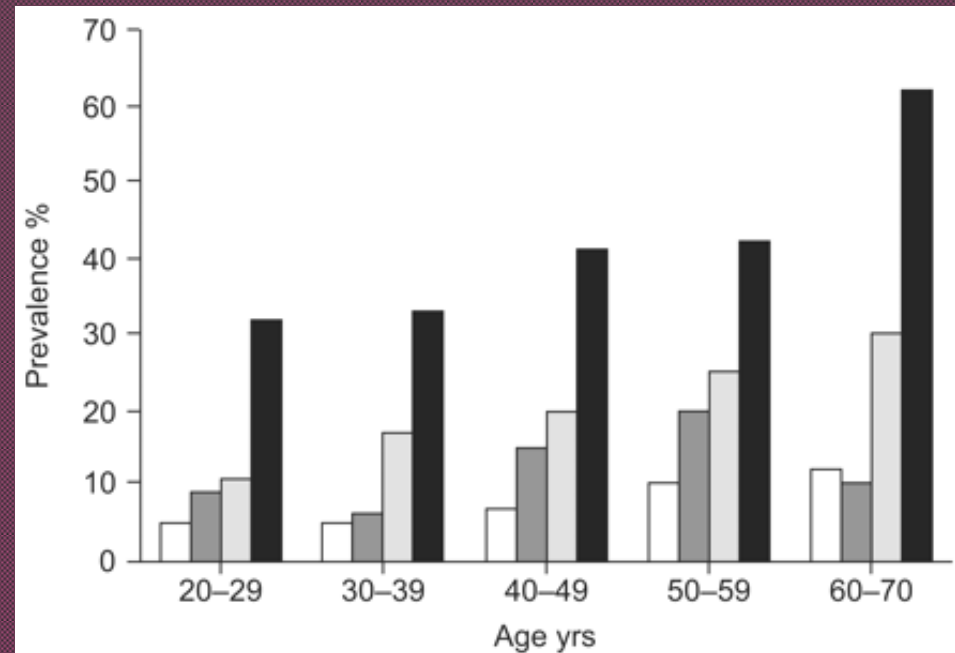
- ↳ **Under-recognition and under-diagnosis of COPD lead to under-reporting and influence estimates of global burden.**
- ↳ **Under-reporting varies across countries based on disease and awareness and understanding by healthcare professionals.**
- ↳ **Prevalence estimates from surveys using standardized methods and spirometry are higher than those based only on evaluation of symptoms.**
- ↳ **Additional sources of variation include:**
  - ↳ **Sampling methods**
  - ↳ **Spirometry quality control**



# Age and COPD

❧ **Prevalence of chronic bronchitis in relation to active smoking, stratified by age.**

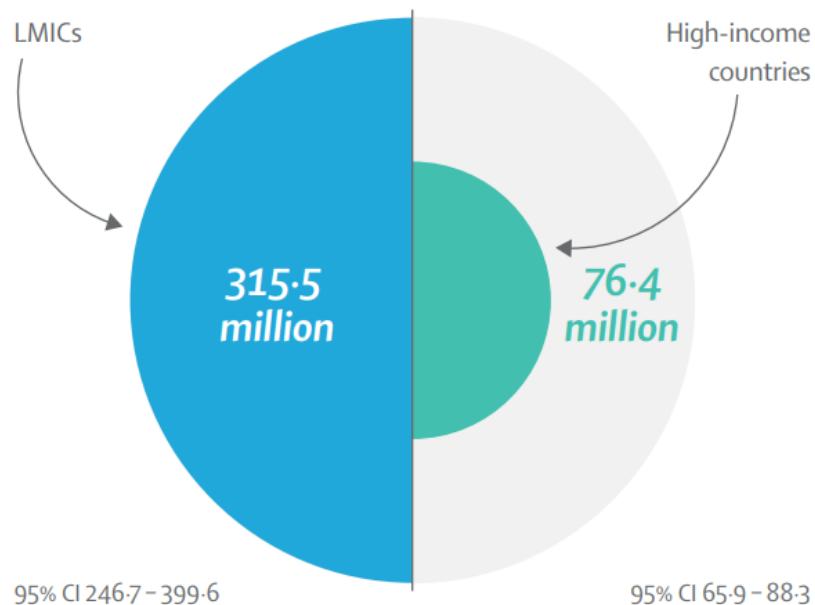
- I. **Nonsmokers;**
- II. **1–10 cigarettes per day;**
- III. **11–20 cigarettes per day;**
- IV. **More than 20 cigarettes per day.**



# Burden of COPD

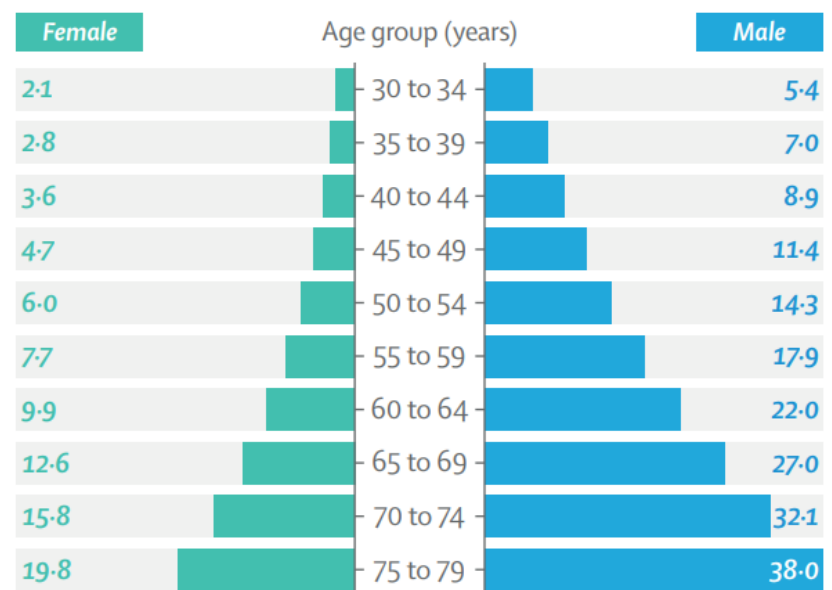
Four in every five cases of COPD are found in low-income and middle-income countries (LMICs)

Estimated worldwide COPD cases,<sup>1</sup> by socioeconomic region



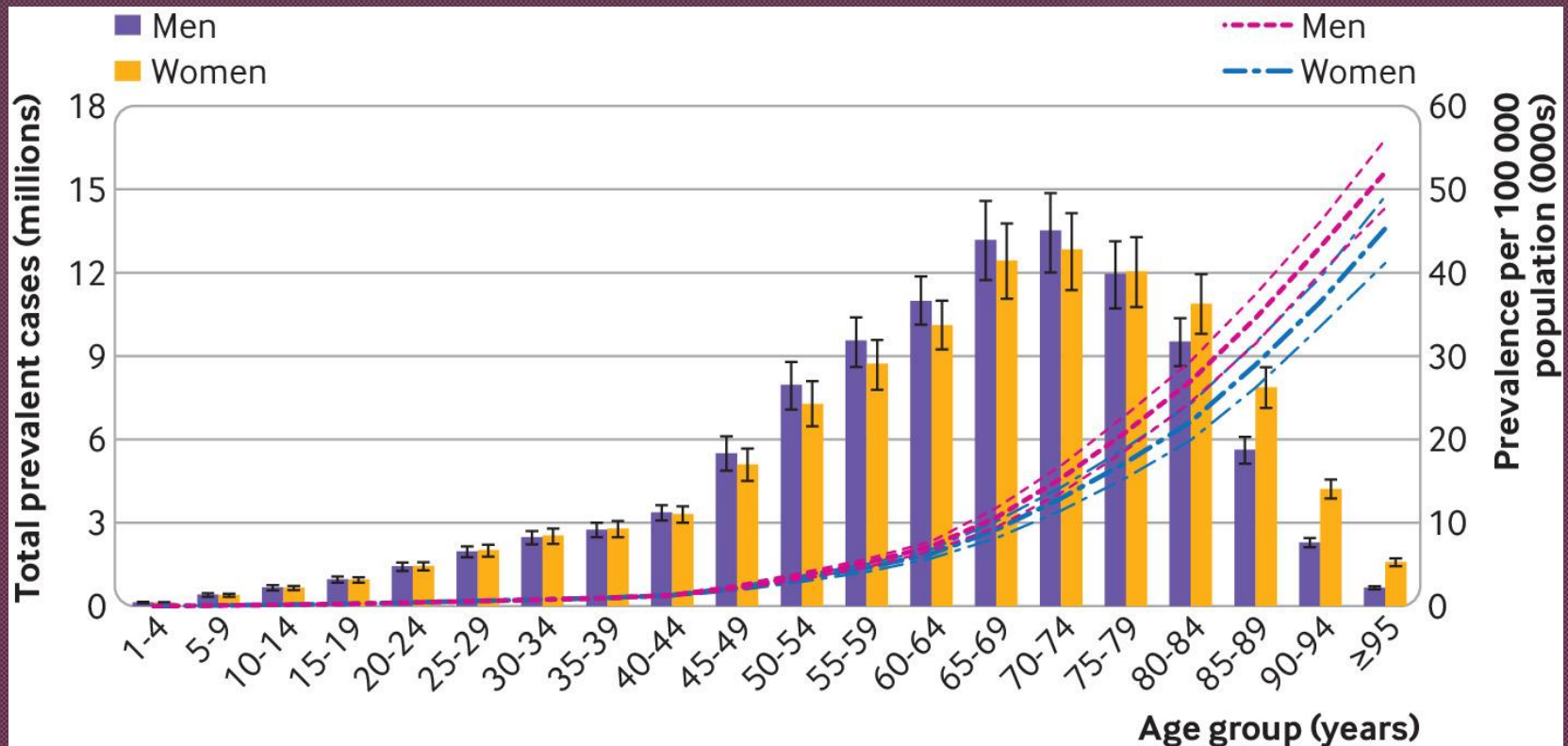
Globally, the disease is more prevalent in men than in women at all ages

Estimated worldwide prevalence of COPD (%),<sup>1</sup> by sex and age group



# Burden of COPD

Nearly 90% of COPD deaths in those under 70 years of age occur in low- and middle-income countries (LMIC).



# COPD Misdiagnosis

Among patients undergoing low-dose CT lung cancer screening:



57%

had COPD based on  
pre-bronchodilator  
spirometry



67%

67% of patients with  
COPD did not have  
a prior diagnosis

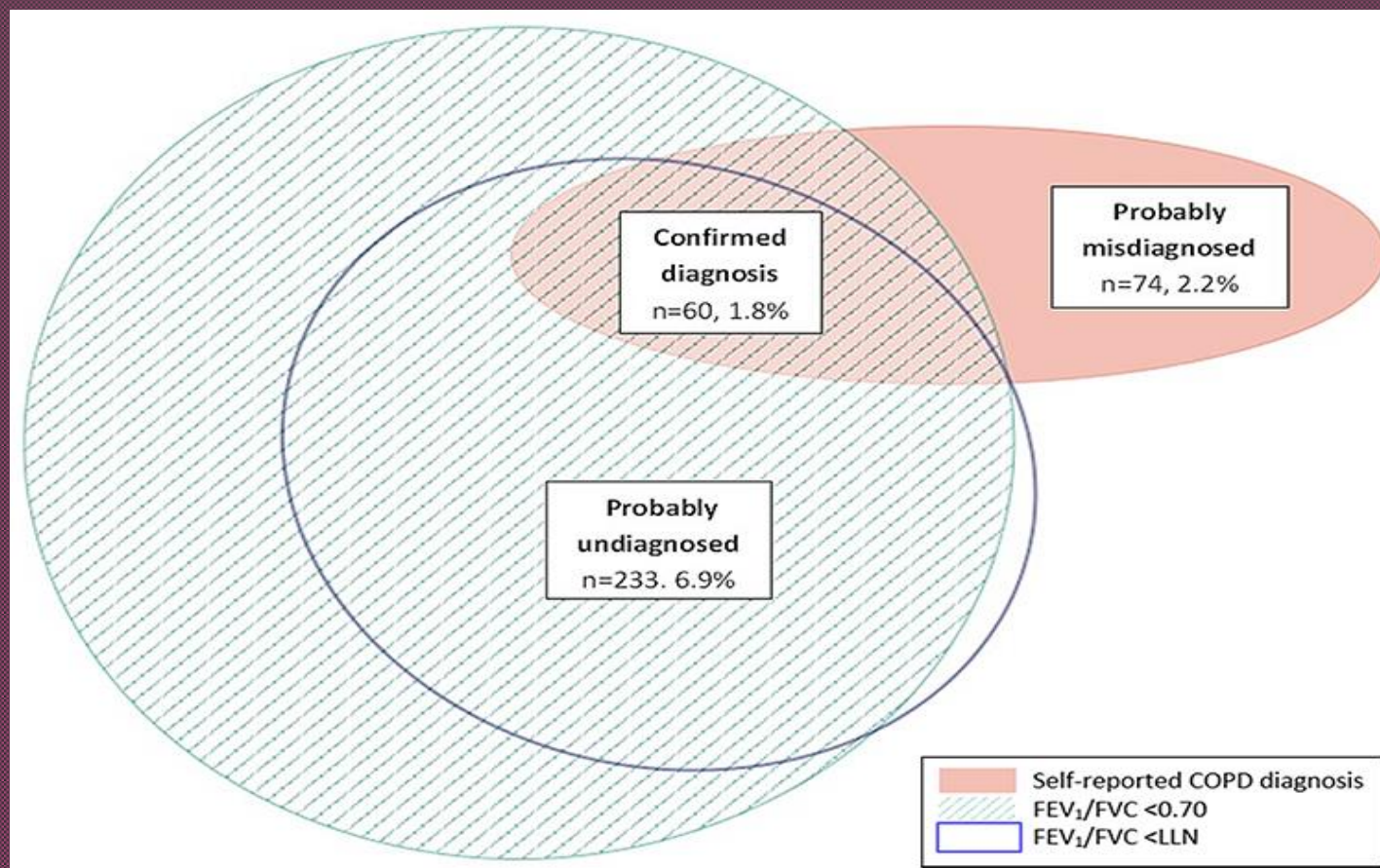


68%

of patients with  
undiagnosed COPD  
had emphysema



# COPD Misdiagnosis

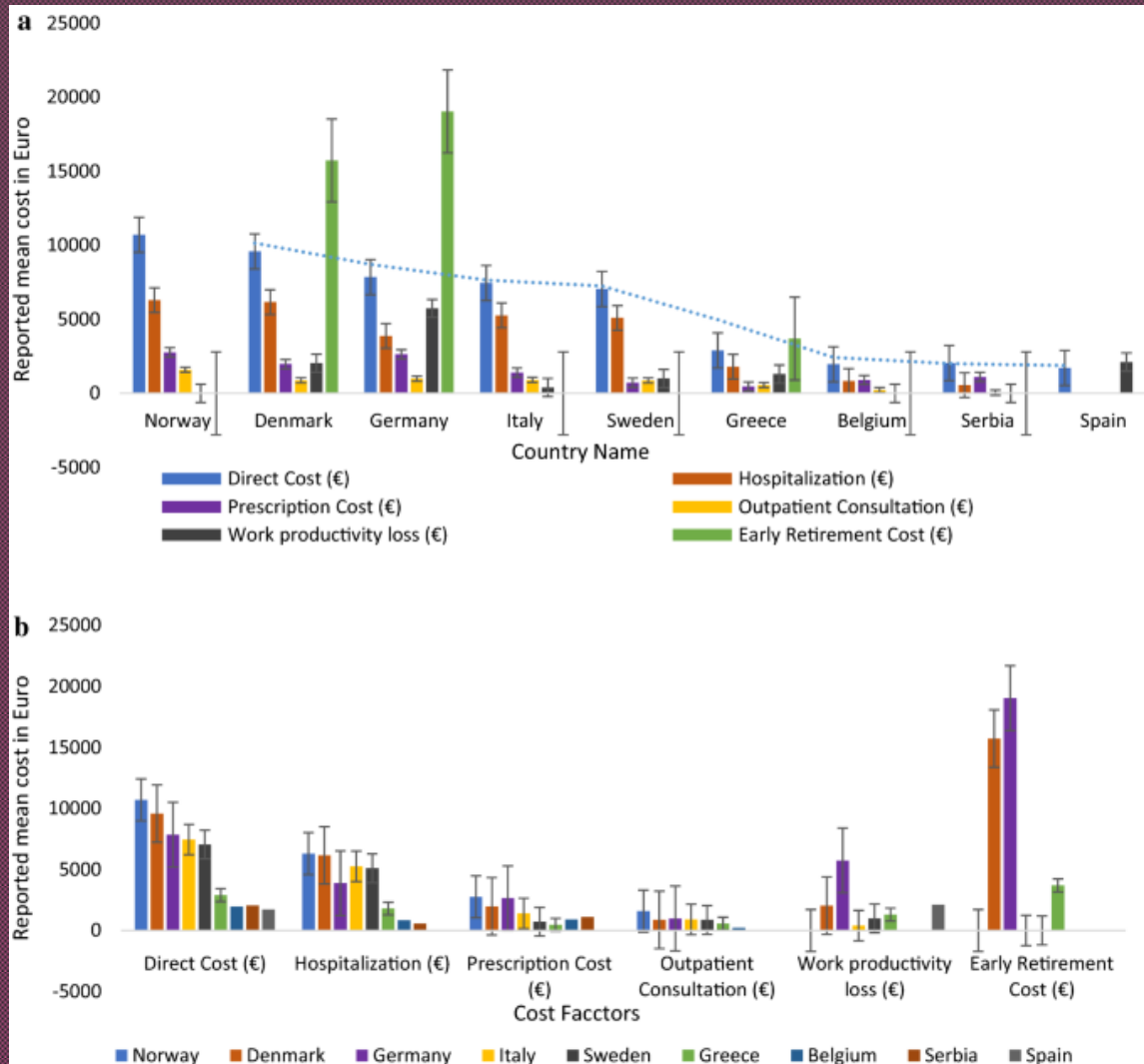


**COPD symptoms in women were most commonly misdiagnosed as asthma**

# Direct and Indirect Costs

- ⌘ **Approximately 13%–18% of those with COPD are limited in the work they can do and one-third or more experience general activity limitation.**
- ⌘ **Estimates of restricted activity days range from 27–63 days per year. Estimates of bed confinement range from 13–32 days per year.**
- ⌘ **Estimates of mean annual sick leave and/or disability days among employed individuals with COPD range from 1.3–19.4 days.**
- ⌘ **Estimated mean annual indirect costs were \$893–\$2,234/person with COPD and varied with the population studied, specific cost outcomes, and economic inputs.**
- ⌘ **Indirect costs accounted for 27%–61% of total costs, depending on the population studied.**

# Direct and Indirect Costs of COPD in Europe





# Direct and Indirect Costs...

- ✎ **The total costs of managing COPD per patient per year were estimated at €4,730, with direct (medical and nonmedical) and indirect costs accounting for 62.5% and 37.5%, respectively.**
- ✎ **COPD exacerbations were responsible for 32% of total costs (€1,512). Key exacerbation-related cost drivers were hospitalization (€830) and intensive care unit (ICU) admission costs (€454).**
- ✎ **Annual maintenance phase costs were estimated at €835, with pharmaceutical treatment accounting for 77% (€639.9).**
- ✎ **Patient time costs were estimated at €146 per year.**
- ✎ **The average number of sick days per year was estimated at 16.9, resulting in productivity losses of €968. Caregiver's costs were estimated at €806 per year.**

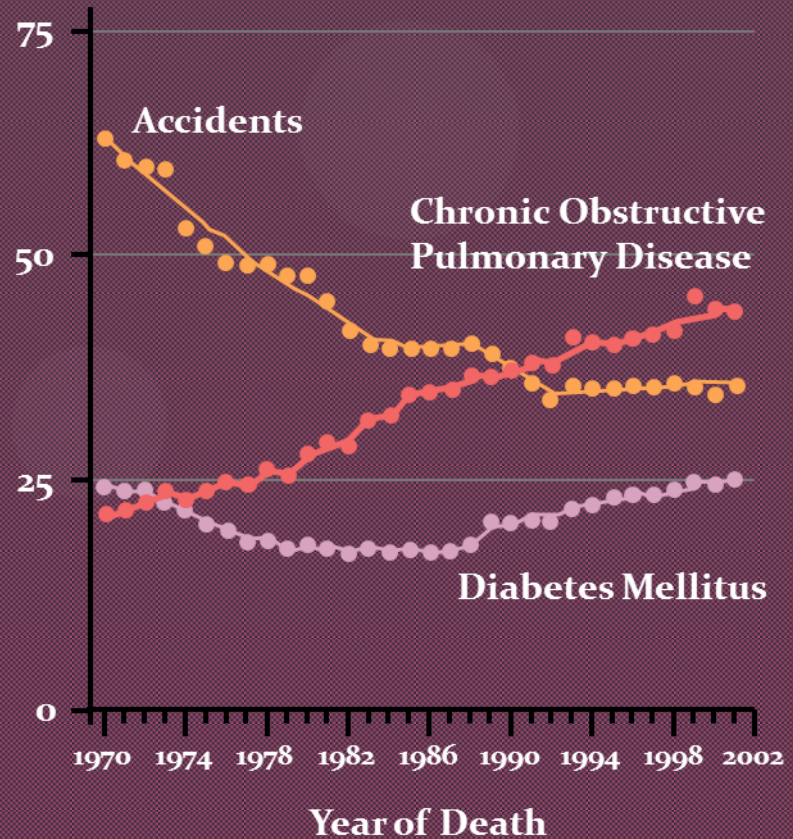
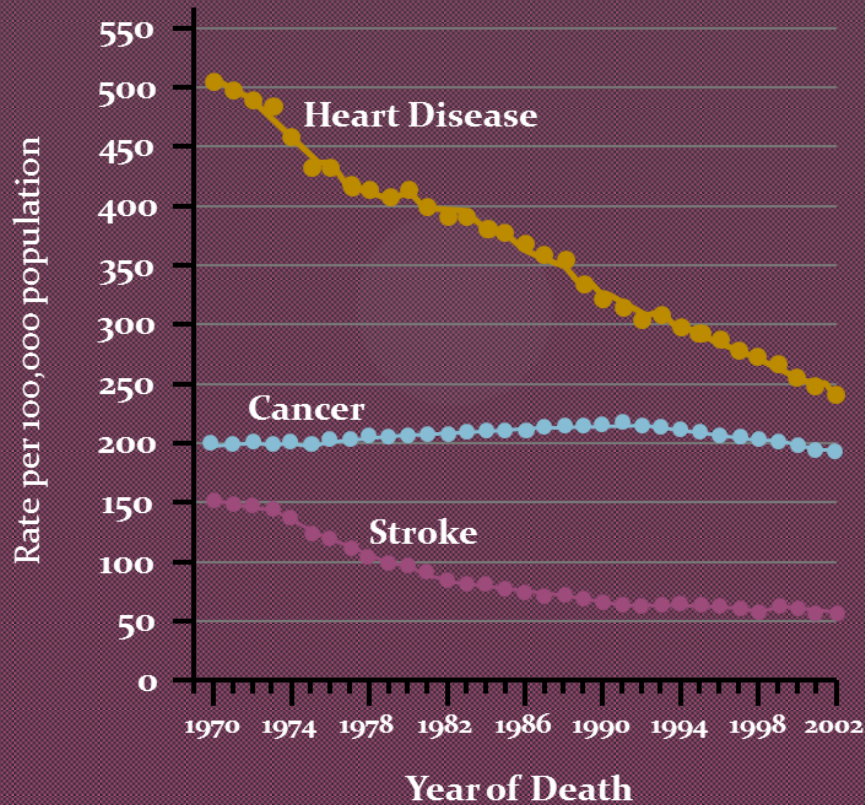


# Direct Costs of COPD in IRAN...

**This study investigated the effect of smoking status on the cost of hospitalization from the provider's perspective in Iran (2017).**

- ✎ **A total of 1,271 patients with a mean $\pm$ SD age of 62.5 $\pm$ 10.8 years (age range of 35 to 93 years) were included in the study.**
- ✎ **The average cost of hospitalization was 34.5 $\pm$ 32.4 million IR. However, the average cost of hospitalization was 45.6 $\pm$ 41.8 million IR for current smokers, 34.9 $\pm$ 23 million IR for former smokers and 27.6 $\pm$ 24.6 million IR for never smokers, respectively.**
- ✎ **The average cost of hospitalization was 25.3 $\pm$ 21 million IR for COPD, 39.1 $\pm$ 37.2 million IR for IHD.**

# COPD Mortality Is Increasing Versus Other Diseases: United States Data



# Risk Factors for COPD

## ❑ Host Factors

Genes (e.g. alpha1-antitrypsin deficiency)

Hyper responsiveness

Lung growth

## ❑ Exposure

Tobacco smoke

Occupational dusts and chemicals

Infections

Socioeconomic status



Male sex



Advanced age



Smoking — current smokers, ex-smokers, and ever smokers



Being underweight — BMI <18.5 kg/m<sup>2</sup>



History of tuberculosis



Exposure to biomass



Family history of obstructive lung disease



Childhood hospital admission for severe respiratory disease



Occupational exposure to dust or smoke

# Risk Factors for COPD

- ⌘ Susceptibility genes
- ⌘ Exposure to inhaled particles:
  - ⌘ Tobacco smoke (active and passive)
  - ⌘ Indoor air pollution from heating and cooking with biomass in poorly ventilated dwellings
  - ⌘ Occupational dusts, organic and inorganic
  - ⌘ Outdoor air pollution
- ⌘ Poor lung growth and development
- ⌘ Oxidative stress
- ⌘ Female gender
- ⌘ Age
- ⌘ Respiratory infections
- ⌘ Low socioeconomic status
- ⌘ Poor nutrition
- ⌘ Comorbidities



# Pathogenesis of COPD

**NOXIOUS AGENT**

**(Tobacco smoke, Pollutants, Occupational agent)**

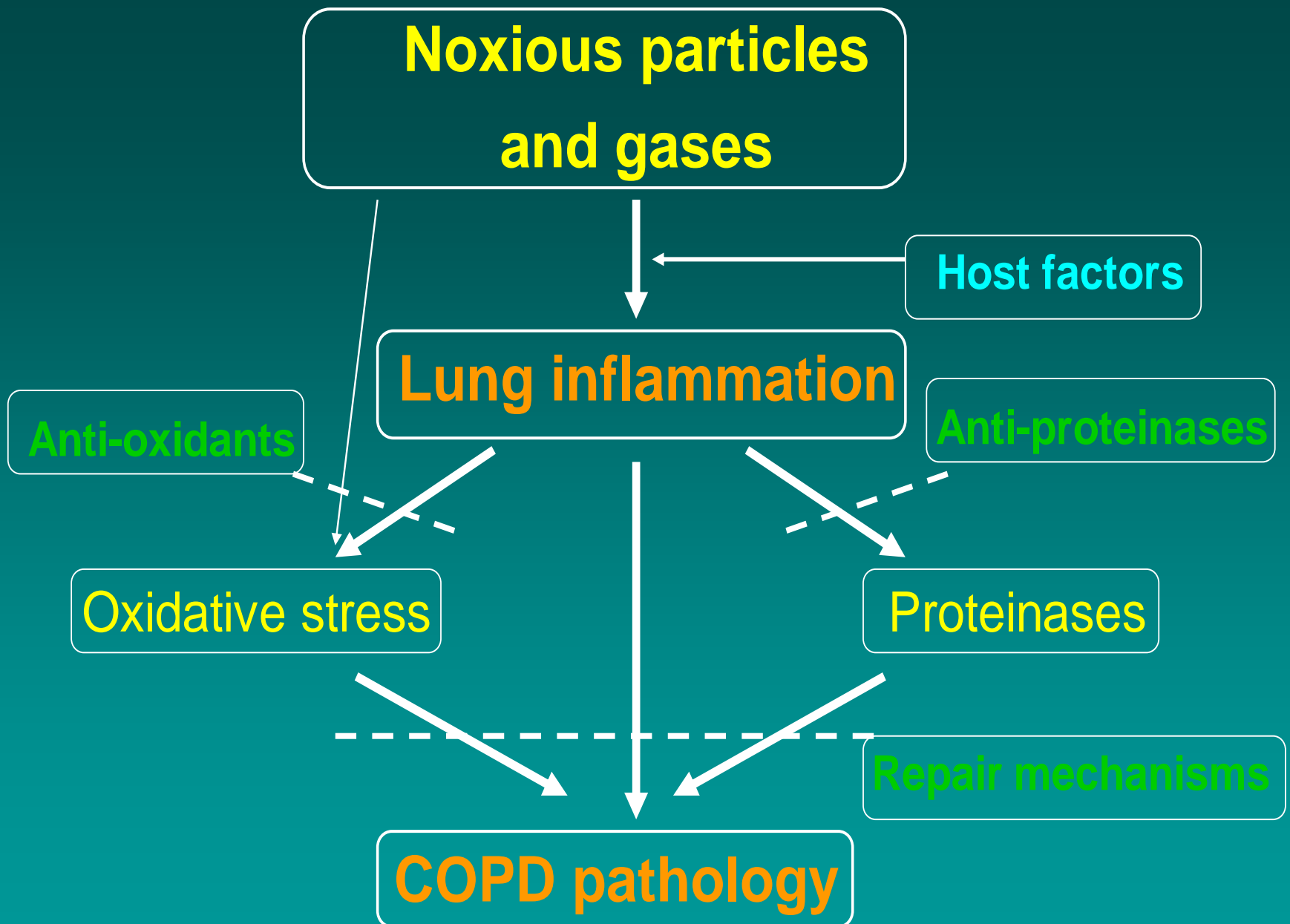


**Genetic factors**

**Respiratory infection**

**Other**

**COPD**



# Inflammation in Asthma and COPD

## ASTHMA

Sensitising agent

**Asthmatic airway inflammation**  
CD4+ T-lymphocytes  
Eosinophils  
Macrophages  
Mast cells

Mostly  
reversible

**Airflow limitation**

## COPD

Noxious agent

**COPD airway inflammation**  
CD8+ T-lymphocytes  
Macrophages  
Neutrophils

Mostly  
irreversible

# Causes of Airflow Limitation

## ➤ Irreversible

- ❖ Loss of elastic recoil due to alveolar destruction
- ❖ Fibrosis and narrowing of the airways
- ❖ Destruction of alveolar support that maintains patency of small airways

## ➤ Reversible

- ❖ Accumulation of inflammatory cells, mucus, and plasma exudate in bronchi
- ❖ Smooth muscle contraction in peripheral and central airways
- ❖ Dynamic hyperinflation during exercise



# COPD and Comorbidities

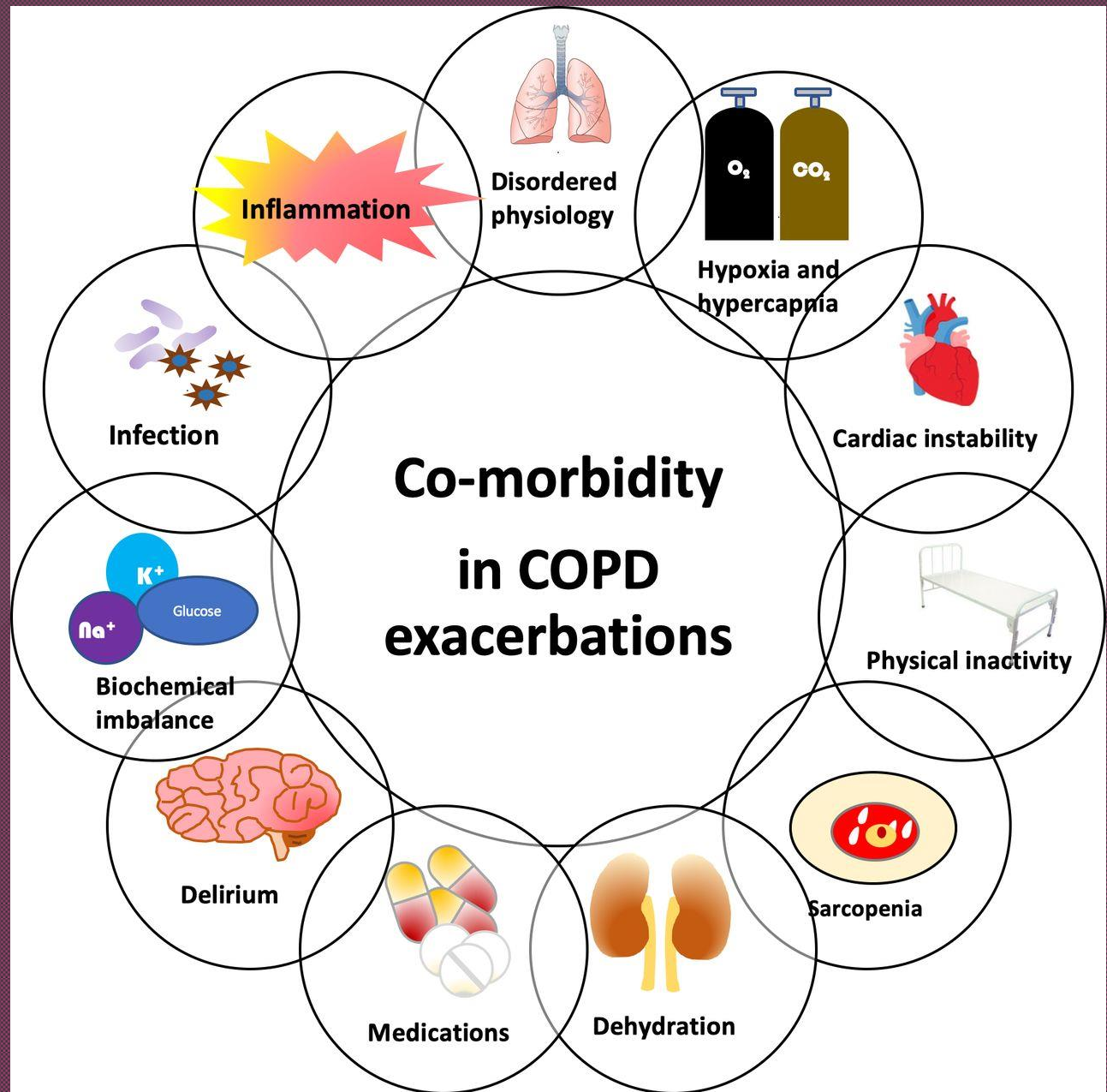
✧ COPD has significant extrapulmonary (systemic) effects including:

- ✧ Weight loss/gain
- ✧ Nutritional abnormalities
- ✧ Skeletal muscle dysfunction

✧ COPD patients are at increased risk for:

- ✧ Myocardial infarction
- ✧ Diabetes
- ✧ Respiratory infection
- ✧ Bone fractures
- ✧ Depression
- ✧ Osteoporosis
- ✧ Lung cancer
- ✧ Sleep disorders
- ✧ Anaemia

# COPD and Comorbidities



# Reduce Risk Factors

## Reduction of total personal exposure to:

- ⌘ Tobacco smoke,
- ⌘ Occupational dusts and chemicals,
- ⌘ Indoor and outdoor air pollutants

**Smoking cessation** is the single most effective — and cost effective — intervention in most people to reduce the risk of developing COPD and stop its progression.

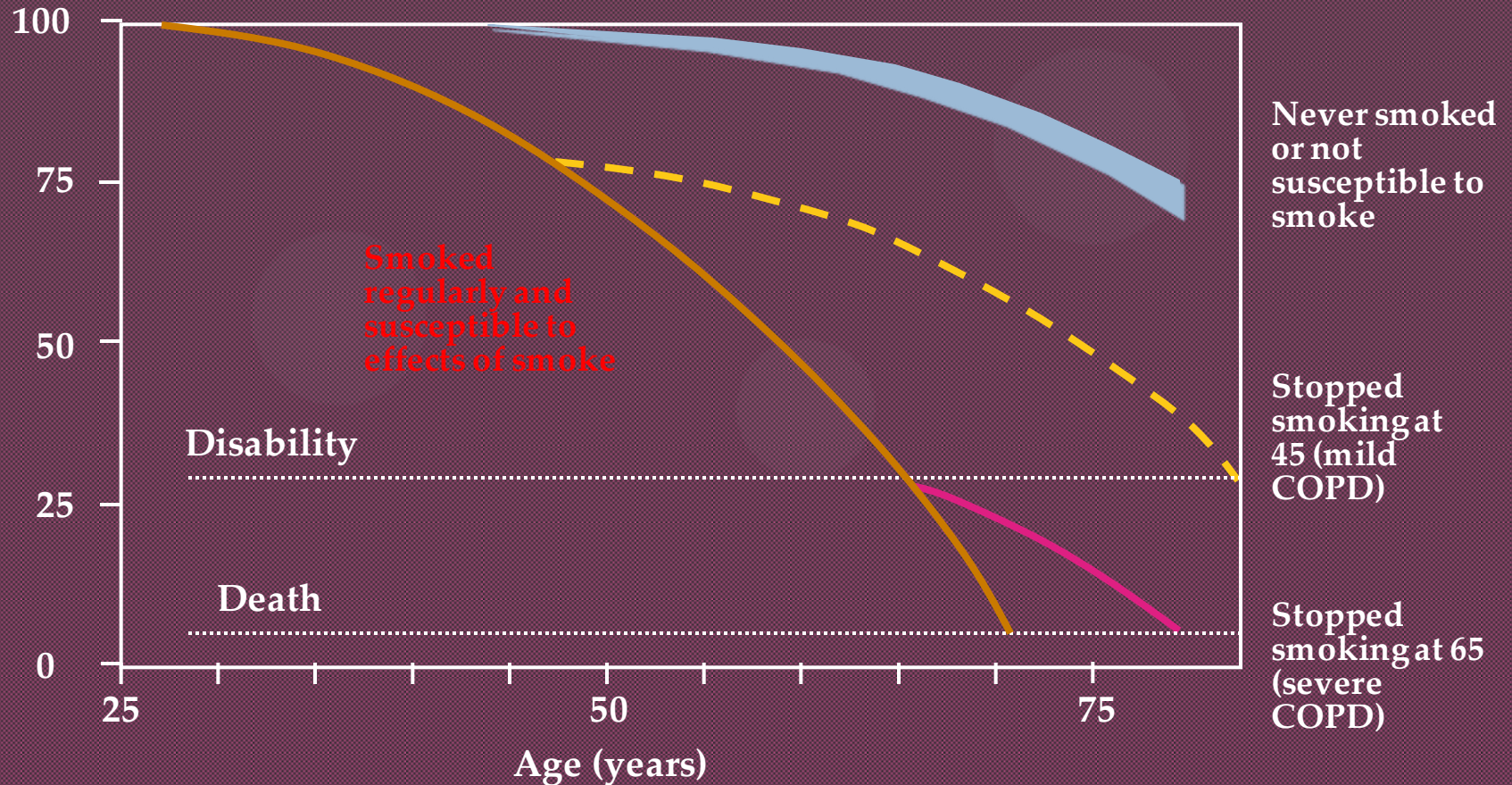
# Brief Strategies to Help the Patient Willing to Quit Smoking

- **ASK** Systematically identify all tobacco users
- **ADVISE** Strongly urge all tobacco users to quit
- **ASSESS** Determine willingness to make a quit attempt
- **ASSIST** Aid the patient in quitting
- **ARRANGE** Schedule follow-up contact

**Patients should also be empowered to help them stop smoking**



# COPD Risk and Smoking Cessation



# Screen for COPD?

- ⌘ Consider COPD, and perform spirometry, if any of these indicators are present in an individual over age 40:
- ⌘ Dyspnea that is progressive, usually worse with exercise, and persistent
- ⌘ Chronic cough (may be intermittent and unproductive)
- ⌘ Chronic sputum production
- ⌘ History of tobacco smoke exposure
- ⌘ Exposure to occupational dusts and chemicals
- ⌘ Exposure to smoke from home cooking and heating fuels

# Diagnosis of COPD

## ***SYMPTOMS***

**Cough**  
**Sputum**  
**Shortness of breath**

## ***EXPOSURE TO RISK FACTORS***

**Tobacco**  
**Indoor air pollution**  
**Occupation**  
**Outdoor air pollution**

**SPIROMETRY**

# Diagnosis of COPD (PFT)

**Table 2.6. Role of spirometry**

- **Diagnosis**
- **Assessment of severity of airflow obstruction (for prognosis)**
- **Follow-up assessment**
  - » Therapeutic decisions.
    - Pharmacological in selected circumstances (e.g., discrepancy between spirometry and level of symptoms).
    - Consider alternative diagnoses when symptoms are disproportionate to degree of airflow obstruction.
    - Non-pharmacological (e.g., interventional procedures).
  - » Identification of rapid decline.



# At Risk for COPD

COPD includes four stages of severity classified by spirometry

Stage	Criteria*
I: Mild	$FEV_1/FVC < 0.70$ , $FEV_1 \geq 80\%$ predicted
II: Moderate	$FEV_1/FVC < 0.70$ , $50\% \leq FEV_1 < 80\%$ predicted
III: Severe	$FEV_1/FVC < 0.70$ , $30\% \leq FEV_1 < 50\%$ predicted
IV: Very Severe	$FEV_1 < 30\%$ predicted <i>or</i> $FEV_1 < 50\%$ predicted <i>plus</i> chronic respiratory failure

- ⌘ **A fifth category** – *Stage 0: At Risk* – that appeared in the 2001 report is no longer included as a stage of COPD, as there is incomplete evidence that the individuals who meet the definition of “At Risk” (chronic cough and sputum production, normal spirometry) necessarily progress on to *Stage I: Mild COPD*<sup>2</sup>
- ⌘ **The public health message that chronic cough and sputum are not normal remains important** – their presence should trigger a search for underlying cause(s)

1. From the *Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease*, Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2010. Available from: <http://www.goldcopd.org>. 2. From the *Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease*, Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2001.

# What Do People Do?

Various health care organizations, educators, government agencies, and patient groups worldwide work together to promote World COPD Day on the third Wednesday of November each year. Activities include:

- 1) Educational evenings for COPD patients and the general public.
- 2) Openings for COPD education or health clinics.
- 3) Free pulmonary function tests.
- 4) Outpatient education sessions on quitting smoking.
- 5) Talk show radio programs on dealing with COPD.

# Combined Assessment of COPD

- Assess symptoms, exercise capacity and QOL
- Assess degree of airflow limitation using spirometry
- Assess risk of exacerbations

*Combined Assessments for the purpose of improving management of COPD*

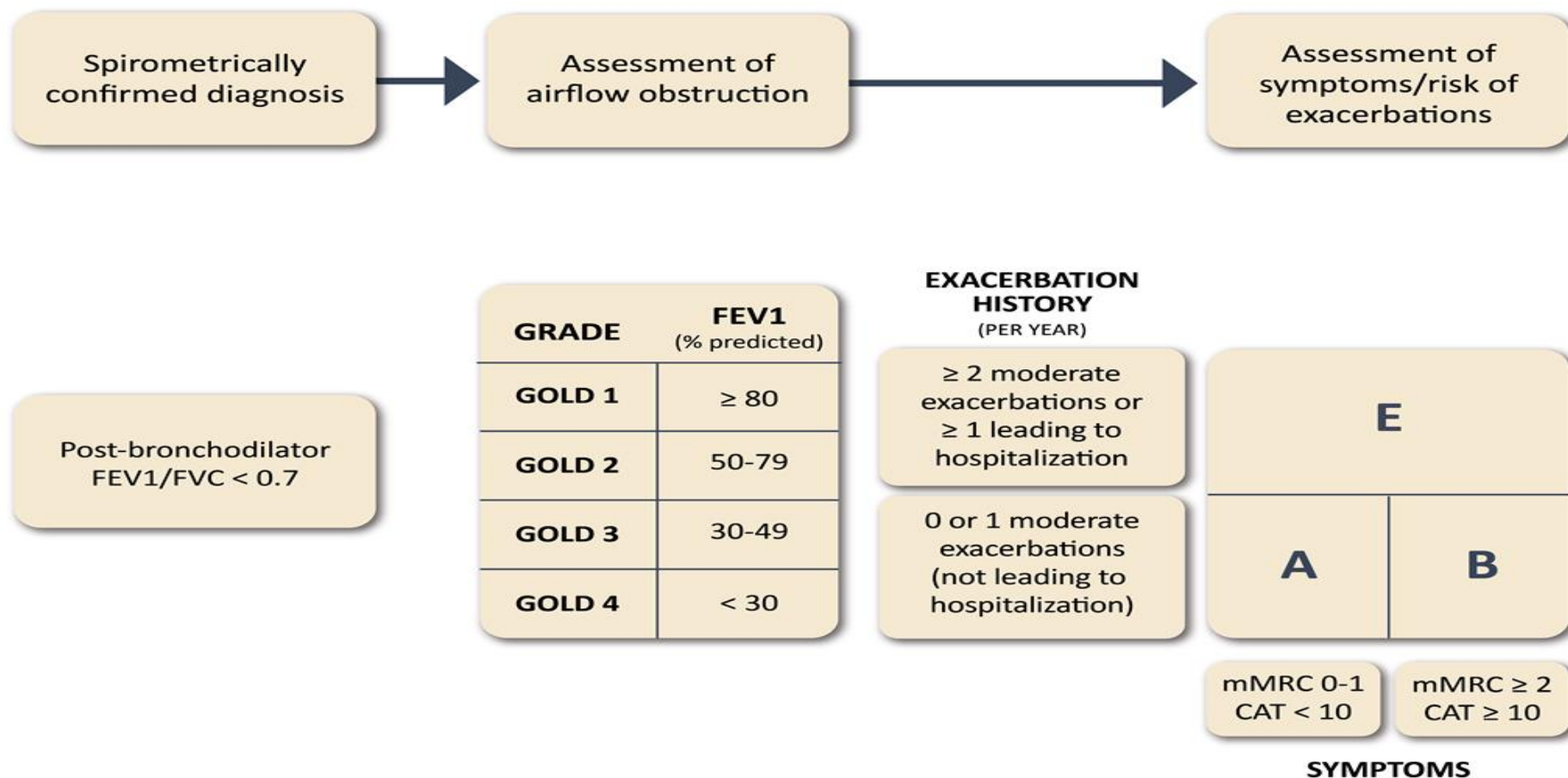
For each item below, place a mark (x) in the box that best describes you currently.  
Be sure to only select one response for each question.

EXAMPLE: I am very happy	0 1 2 3 4 5	I am very sad	Score
I never cough	0 1 2 3 4 5	I cough all the time	
I have no phlegm (mucus) in my chest at all	0 1 2 3 4 5	My chest is completely full of phlegm (mucus)	
My chest does not feel tight at all	0 1 2 3 4 5	My chest feels very tight	
When I walk up a hill or one flight of stairs I am not breathless	0 1 2 3 4 5	When I walk up a hill or one flight of stairs I am very breathless	
I am not limited doing any activities at home	0 1 2 3 4 5	I am very limited doing activities at home	
I am confident leaving my home despite my lung condition	0 1 2 3 4 5	I am not at all confident leaving my home because of my lung condition	
I sleep soundly	0 1 2 3 4 5	I don't sleep soundly because of my lung condition	
I have lots of energy	0 1 2 3 4 5	I have no energy at all	

# Combined Assessment of COPD

## GOLD ABE Assessment Tool

Figure 2.3





# Combined Assessment of COPD

COPD patients are at increased risk for:

- **Cardiovascular diseases**
- **Osteoporosis**
- **Respiratory infections**
- **Anxiety and Depression**
- **Diabetes**
- **Lung cancer**

These comorbid conditions may influence mortality and hospitalizations and should be looked for routinely, and treated appropriately.

# Differential Diagnosis: COPD and Asthma

## COPD

- Onset in mid-life
- Symptoms slowly progressive
- Long smoking history

## ASTHMA

- Onset early in life (often childhood)
- Symptoms vary from day to day
- Symptoms worse at night/early morning
- Allergy, rhinitis, and/or eczema also present
- Family history of asthma

# Additional Investigations

## **Chest X-ray:**

Seldom diagnostic but valuable to exclude alternative diagnoses and establish presence of significant comorbidities.

## **Lung Volumes and Diffusing Capacity:**

Help to characterize severity, but not essential to patient management.

## **Oximetry and Arterial Blood Gases:**

Pulse oximetry can be used to evaluate a patient's oxygen saturation and need for supplemental oxygen therapy.

## **Alpha-1 Antitrypsin Deficiency Screening:**

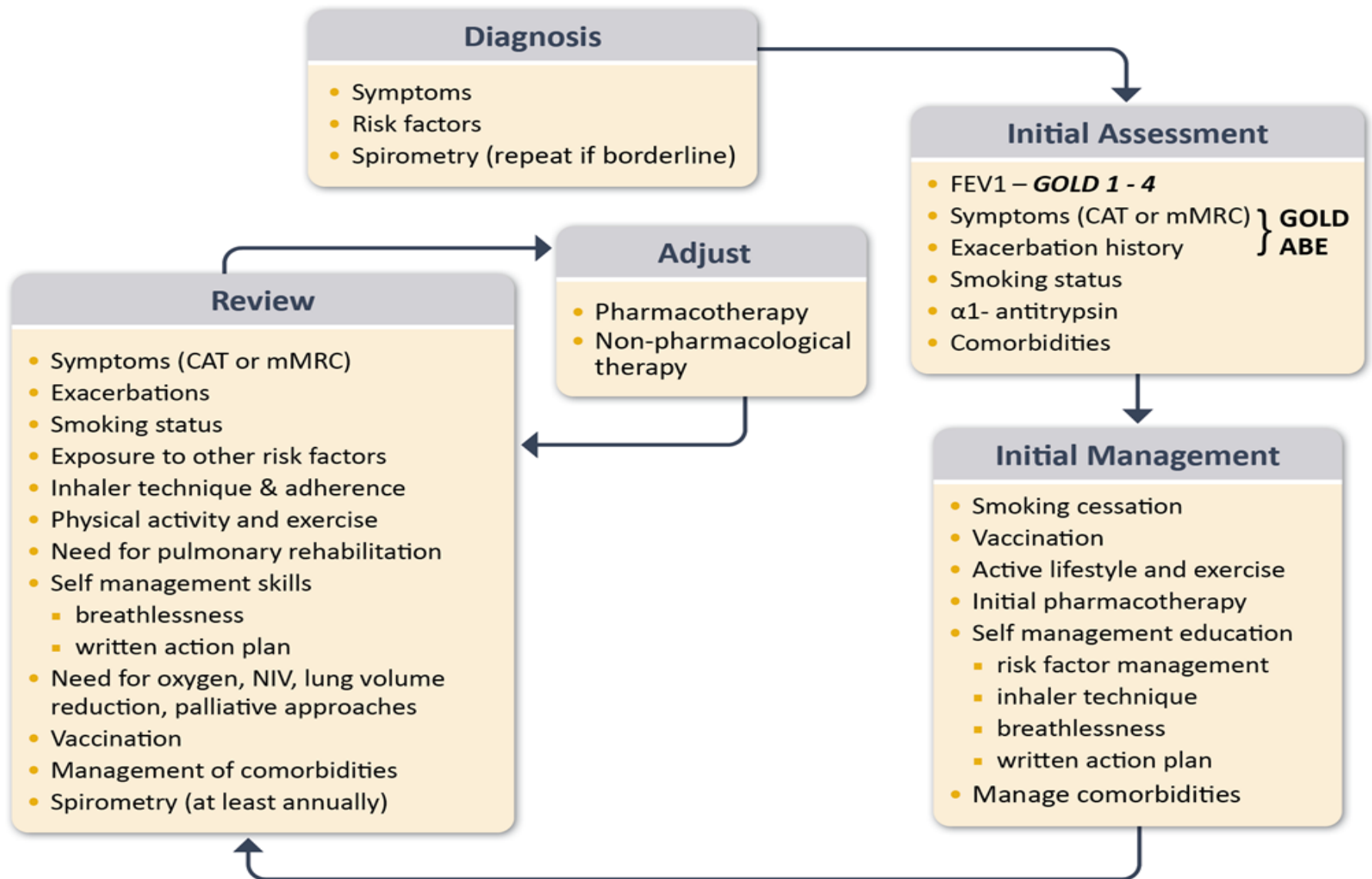
Perform when COPD develops in patients of Caucasian descent under 45 years or with a strong family history of COPD.

# How is COPD treated?

- ❖ **Quit smoking.** the most important part of treatment is smoking cessation.
- ❖ **Avoid tobacco smoke and air pollutants** at home and at work.
- ❖ **Pulmonary rehabilitation**, which is a personalized treatment program that teaches COPD management strategies to improve quality of life.
- ❖ **Take medication.** Symptoms can be treated with medication.
- ❖ **Avoid lung infections.** Certain vaccines, such as flu and pneumococcal vaccines.
- ❖ **Use supplemental oxygen.**

# Management of COPD

Figure 4.1





# Global Strategy for the Prevention and Control of Non-communicable Diseases

- **Non-communicable diseases (NCDs), mainly cardiovascular diseases, cancers, diabetes, and chronic respiratory diseases:**
  - ⌘ Cause an estimated 35 million deaths each year—60% of all deaths globally and 80% in low- and middle-income countries are preventable
- **The mortality and disease burden from these health problems will continue to increase:**
  - ⌘ WHO projects that, globally, NCD deaths will increase by 17% over the next 10 years

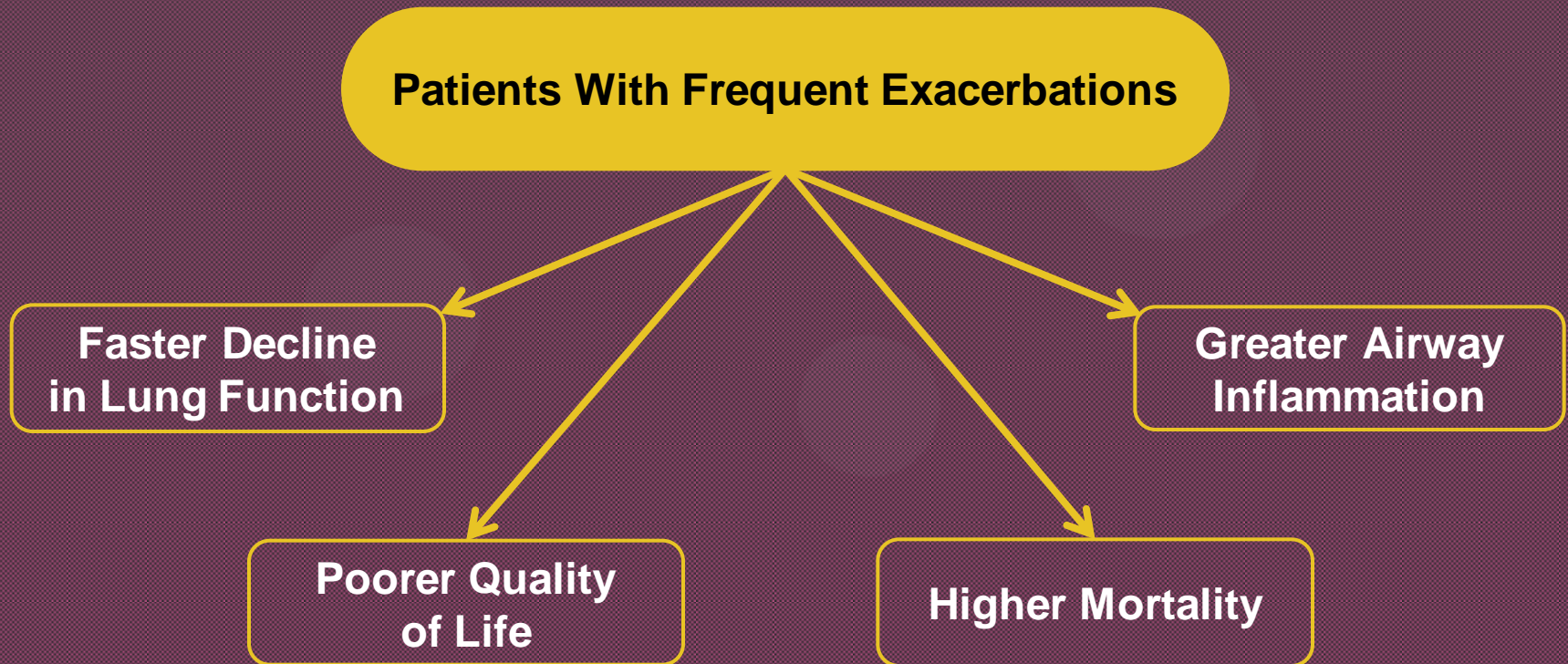
# Global Strategy for the Prevention and Control of Non-communicable Diseases

- WHO has developed an Action Plan to prevent NCDs
  - ⌘ Focuses on low- and middle-income countries and vulnerable populations
  - ⌘ Aims at reducing the level of exposure of individuals and populations to the common modifiable risk factors for NCDs:
    - ⌘ Tobacco use
    - ⌘ Unhealthy diet
    - ⌘ Physical inactivity
    - ⌘ Harmful use of alcohol

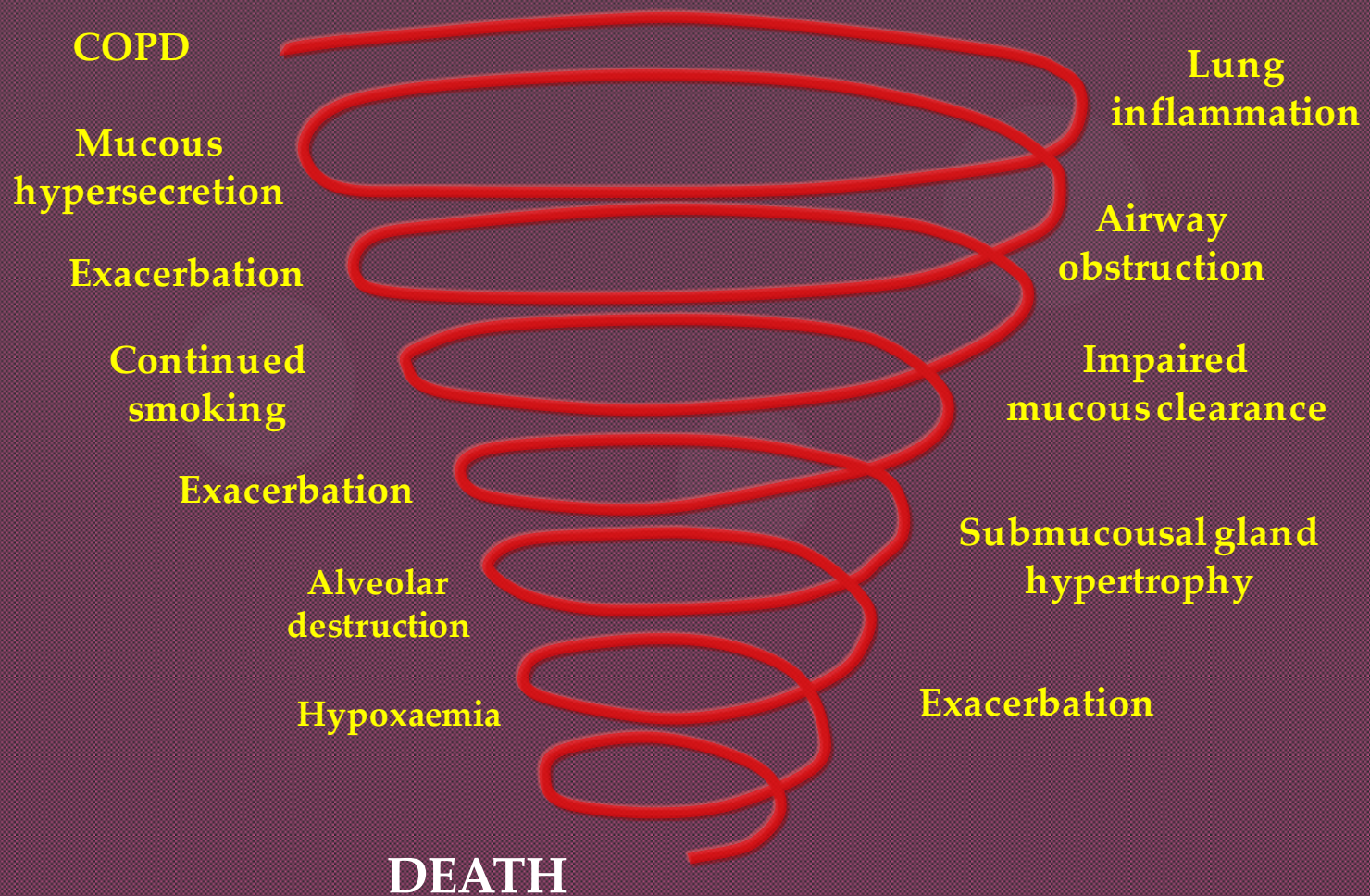
# Definition of COPD Exacerbations

**“An event in the natural course of the disease characterised by a change in the patient’s baseline dyspnea, cough, and/or sputum that is beyond normal day-to-day variations, is acute in onset, and may warrant a change in regular medication in a patient with underlying COPD.”**

# Impact of Exacerbations in COPD



# The Downward Spiral in COPD





الهي عاقبت محمود گردان به حق صالحان ونيك مردان

