



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
National Institutes of Health  
National Heart, Lung, and Blood Institute

# CHRONIC OBSTRUCTIVE PULMONARY DISEASE

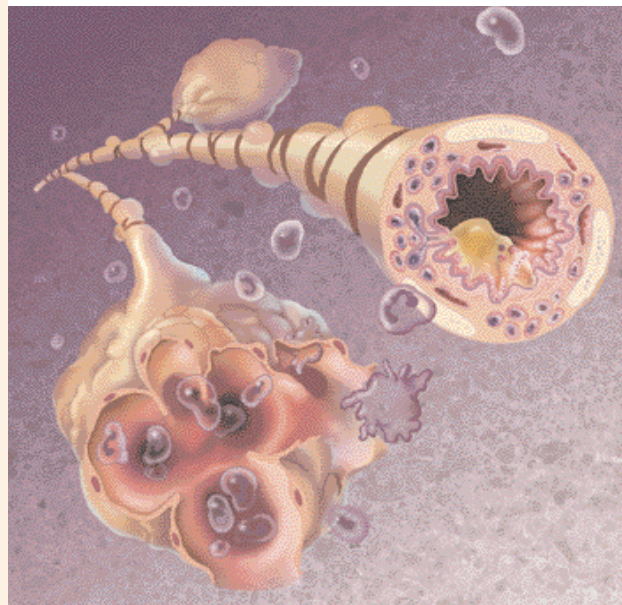
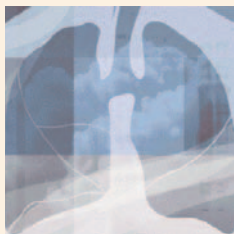
Chronic Obstructive Pulmonary Disease (COPD) is a slowly progressive disease of the airways that is characterized by a gradual loss of lung function. In the U.S., the term COPD includes chronic bronchitis, chronic obstructive bronchitis, or emphysema, or combinations of these conditions. It represents the fourth leading cause of death in the U.S.

The symptoms of COPD can range from chronic cough and sputum production to severe disabling shortness of breath. In some individuals, chronic cough and sputum production are the first signs that they are at risk for developing the airflow obstruction and shortness of breath characteristic of COPD. In others, shortness of breath may be the first indication of the disease.

In the U.S., the most important risk factor for COPD by far is cigarette smoking. Pipe, cigar, other types of tobacco smoking, and passive exposure to cigarette smoke are also risk factors. Other documented causes of COPD include occupational dusts and chemicals. Outdoor air pollution adds to the total burden of inhaled particles in the lungs, but its role in causing COPD is uncertain. The most important measure for preventing COPD – and for stopping disease progression – is avoidance of smoking.

The diagnosis of COPD is confirmed by the presence of airway obstruction on testing with spirometry. There is no known cure for COPD at the present time. Treatment is usually supportive and designed to relieve symptoms and improve quality of life.

With continued exposure to cigarettes or noxious particles, the disease progresses and individuals with COPD increasingly lose their ability to breathe. Acute infections or certain weather conditions may temporarily worsen symptoms (exacerbations), occasionally where hospitalization may be required.



## COPD FACTS

### *Prevalence*

- 12.1 million adults ages 25 and older reported being diagnosed with COPD in 2001.
- About 24 million adults have evidence of impaired lung function indicating that COPD is underdiagnosed.
- The prevalence of self-reported COPD is higher in females than males and in whites than blacks.

### *Mortality*

- About 119,000 adults ages 25 and older died from COPD in 2000.
- While the COPD death rate for females more than doubled between 1980 and 2000, and the number of deaths for females surpassed the number for males in 2000, the overall age-adjusted death rate for COPD remained higher for males in 2000. The age-adjusted COPD death rate was about 46 percent higher in males than females and 63 percent higher in whites than blacks.
- COPD is the fourth leading cause of death in the U.S. and is projected to be the third leading cause of death for both males and females by the year 2020.

### *Emergency Department Visits and Hospitalizations*

- About 1.5 million emergency department visits by adults 25 and older were made for COPD in 2000.
- More emergency department visits for COPD were made by adult females than adult males (898,000 vs. 651,000).
- About 726,000 hospitalizations for COPD occurred in 2000. More females than males were hospitalized for COPD (404,000 vs. 322,000).

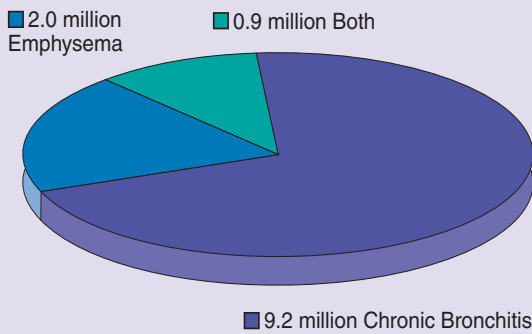
### *Costs*

- The total estimated cost of COPD in 2002 was \$32.1 billion.
  - ▶ \$18 billion direct costs
  - ▶ \$14.1 billion indirect costs

## PREVALENCE OF COPD

In 1997, the survey questions used to determine the prevalence of COPD in the U.S. changed. Prior to 1997, the prevalence was based on individuals who had, or knew someone in the family who had, chronic bronchitis or emphysema during the past 12 months. The new survey asks, "During the past 12 months, have you been told by a doctor or other health professional that you have chronic bronchitis?"; and "Have you ever been told by a doctor or other health professional that you have emphysema?" Based on these questions, during 2001, 12.1 million U.S. adults 25 years and older reported having COPD (figure 1).<sup>1</sup> In addition, millions may be unaware that they have COPD because they have minimal or no symptoms. Therefore, COPD may be underdiagnosed.

**Figure 1** Prevalence of Chronic Obstructive Pulmonary Disease, 25 Years and Older, U.S., 2001



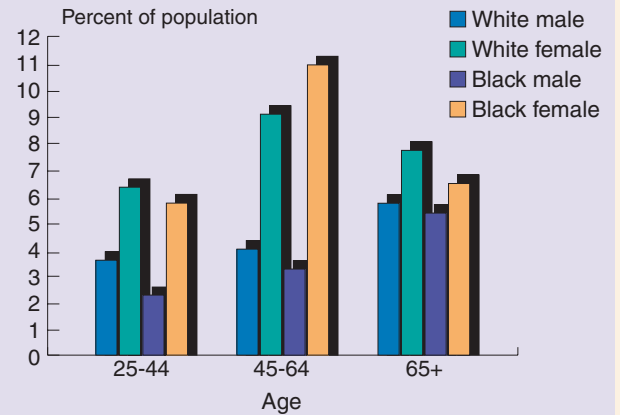
Source: National Health Interview Survey, CDC, NCHS

## CHRONIC BRONCHITIS

In 2001, the prevalence of chronic bronchitis was lowest among the 25-44 age group. Across age groups, females had higher rates than males for both races. Among the 25-44 and 65 and older age groups, prevalence was higher for whites than blacks for each sex group. For the 45-64 age group, chronic bronchitis was higher among females, and black females in particular, had the highest prevalence for this age group (figure 2). From 1997-2001, prevalence of chronic bronchitis was higher among

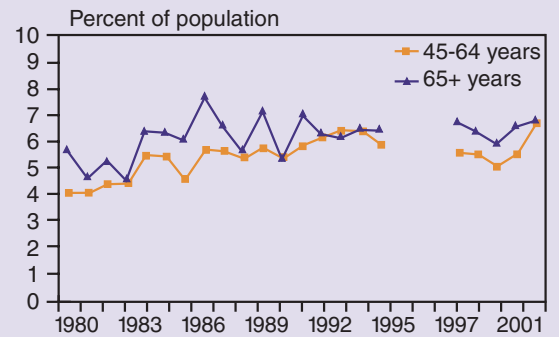
the 65 and older age group than the 45-64 age group. During this period, trends for both groups were similar, with rates declining from 1997 to 1999 and increasing in 2001 (figure 3).

**Figure 2** Prevalence of Chronic Bronchitis by Age, Sex and Race, U.S., 2001



Source: National Health Interview Survey, CDC, NCHS

**Figure 3** Trend in Prevalence of Chronic Bronchitis by Age, U.S., 1980-2001



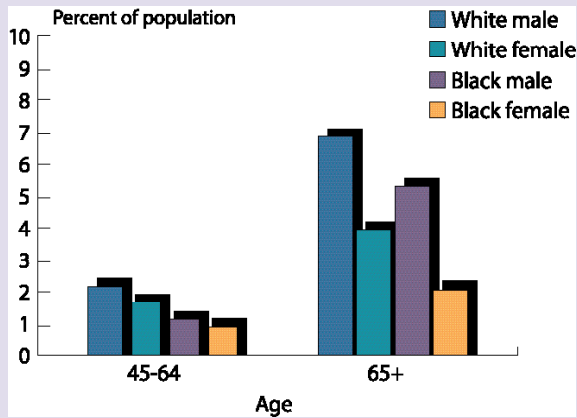
Source: National Health Interview Survey, CDC, NCHS  
Discontinuity between 1996 and 1997 is due to change in the questions used to determine prevalence

## EMPHYSEMA

In 2001, the prevalence of emphysema was appreciably higher for the 65 and older age group than the 45-64 age group for each race-sex group. The prevalence was higher in males than females and in whites than blacks. The prevalence was highest in white males and lowest in black females (figure 4). Over the past two decades, prevalence of emphysema has consistently been higher for the 65 and

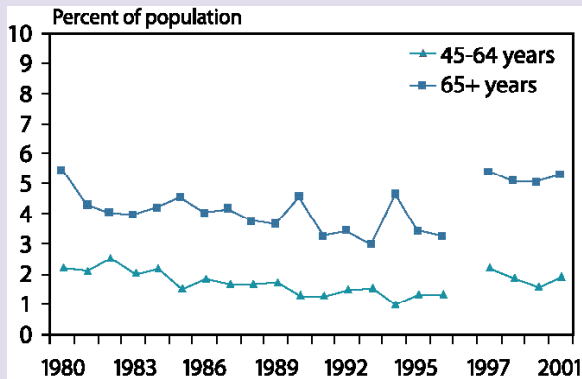
older age group. Between the period 1997 and 2001, the prevalence for the 65 and older age group was more than twice that of the 45-64 age group (figure 5).

**Figure 4** Prevalence of Emphysema by Age, Sex and Race, U.S., 2001



Source: National Health Interview Survey, CDC, NCHS

**Figure 5** Trend in Prevalence of Emphysema by Age, U.S., 1980-2001



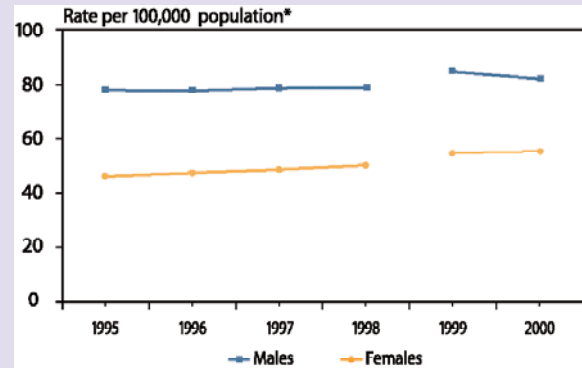
Source: National Health Interview Survey, CDC, NCHS  
Discontinuity between 1996 and 1997 is due to change in the questions used to determine prevalence

## MORTALITY

Mortality attributable to COPD has increased substantially in the U.S. In 2000, 119,054 adults 25 years and older died from COPD; 50.3 percent were females. Moreover, for females 25 years and older, the COPD age-adjusted death rate has more than doubled from 1980 to 2000

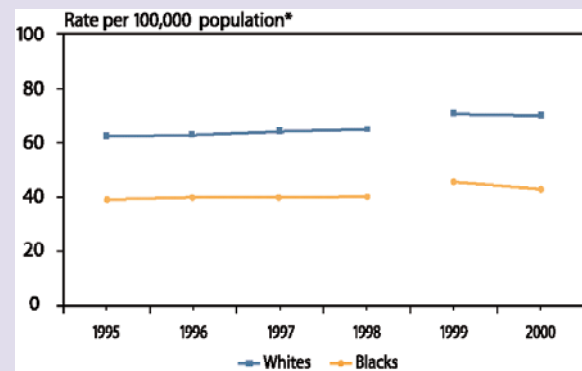
(20.1 vs. 56.7 per 100,000 population). COPD death rates were consistently higher for males than females from 1995-2000. In 2000, the death rate was 46 percent higher in males than females (82.6 vs. 56.7 per 100,000 population) (figure 6). COPD death rates were also consistently higher in whites than blacks from 1995-2000. In 2000, the death rate was 63 percent higher in whites than blacks (70.1 vs. 42.9 per 100,000 population) (figure 7). Across geographic regions of the U.S., the mountain States, particularly in the West, have the highest mortality from COPD (figure 8).

**Figure 6** Trend in Death Rates for COPD by Sex, 25 Years and Older, U.S., 1995-2000



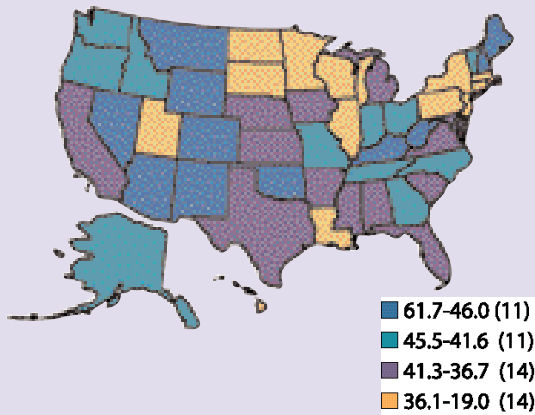
\*Age-adjusted to 2000 U.S. population  
Source: Vital Statistics of the U.S., CDC, NCHS  
Discontinuity between 1998 and 1999 is due to change in ICD codes

**Figure 7** Trend in Death Rates for COPD by Race, 25 Years and Older, U.S., 1995-2000



\*Age-adjusted to 2000 U.S. population  
Source: Vital Statistics of the U.S., CDC, NCHS  
Discontinuity between 1998 and 1999 is due to change in ICD codes

**Figure 8** Age-Adjusted Death Rates\* for COPD by State, U.S., 1996-1998



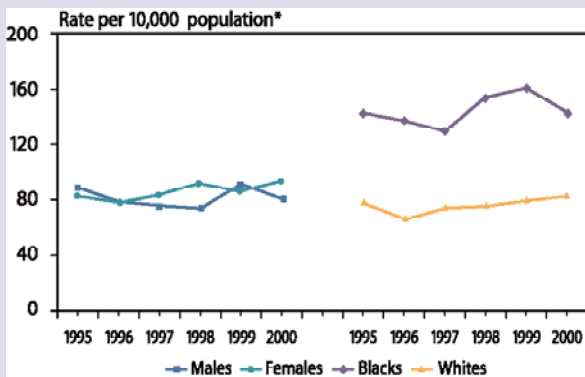
\*Age-adjusted to 2000 U.S. population; rate per 100,000 population  
Source: Vital Statistics of the U.S., CDC, NCHS

## EMERGENCY TREATMENTS AND HOSPITALIZATIONS

### EMERGENCY DEPARTMENT VISITS

Patients with COPD require emergency treatment and sometimes hospitalizations during periods of exacerbations of their disease. During the period 1995-2000, the rates of emergency department visits showed no consistent pattern by sex, but were consistently higher for blacks than whites. In 2000, the rate for blacks was about 1.5 times higher than whites (figure 9).

**Figure 9** Trend in the Rate of Emergency Department Visits for COPD by Sex and Race, 25 Years and Older, U.S., 1995-2000

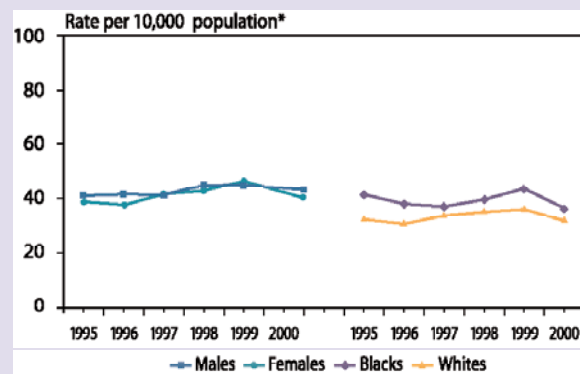


\*Age-adjusted to 2000 U.S. population  
Source: National Hospital Ambulatory Medical Care Survey, CDC, NCHS

## HOSPITALIZATIONS

From 1995 to 2000, the trend in COPD hospitalization rates was about the same for males and females. However, the rates were slightly higher among blacks than whites during this same period (figure 10). In 2000, the COPD hospitalization rates were 31.5 and 36.0 per 10,000 population for whites and blacks, respectively.

**Figure 10** Trend in Hospitalization Rates for COPD by Sex and Race, 25 Years and Older, U.S., 1995-2000

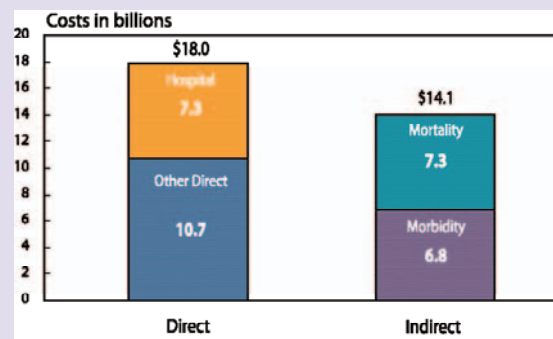


\*Age-adjusted to 2000 U.S. population  
Source: National Hospital Discharge Survey, CDC, NCHS

## COSTS OF COPD

The cost of COPD to the nation in 2002 was estimated to be \$32.1 billion. Direct medical services accounted for \$18.0 billion, and indirect cost of morbidity and premature mortality was \$14.1 billion (figure 11). Medicare expenses for COPD beneficiaries were nearly 2.5 times that of the expenditures for all other patients.

**Figure 11** Estimated Cost of COPD, U.S., 2002



Source: NHLBI Chart Book, 2002

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