



# Respiratory Diseases

U.S. Department of Health & Human Services • Public Health Service

June 29, 2004

## PROGRESS REVIEW



In the 23rd in a series of assessments of *Healthy People 2010*, Senior Executive Advisor to the Assistant Secretary for Health Larry Fields chaired a focus area Progress Review on Respiratory Diseases. Dr. Fields noted how widespread chronic respiratory illnesses continue to be among the total population and how severe their consequences can be, especially in the early and late years of life. In conducting the review, Dr. Fields was assisted by staff of the co-lead agencies for this *Healthy People 2010* focus area, the National Institutes of Health (NIH) and the Centers for Disease Control and Prevention (CDC). Also participating were representatives of other U.S. Department of Health and Human Services (HHS) offices and agencies.

The complete text for the Respiratory Diseases focus area of *Healthy People 2010* is available at [www.healthypeople.gov/document/html/volume2/24respiratory.htm](http://www.healthypeople.gov/document/html/volume2/24respiratory.htm). The meeting agenda, tabulated data for all focus area objectives, charts, and other materials used in the Progress Review can be found at [www.cdc.gov/nchs/about/otheract/hpdata2010/focusareas/fa24-rd.htm](http://www.cdc.gov/nchs/about/otheract/hpdata2010/focusareas/fa24-rd.htm).

### Data Trends

Richard Klein of the CDC National Center for Health Statistics provided an overview of progress achieved in meeting the targets of selected objectives in the Respiratory Diseases focus area. In the United States, chronic respiratory diseases afflict approximately 3.6 million children and 22 million adults, Mr. Klein noted. Consequently, these diseases impose an annual societal burden of approximately 20 million physician and outpatient visits, 3.5 hospital emergency visits, 1.2 million hospitalizations, and 124,000 deaths. In general, the objectives in the Respiratory Diseases focus area for which data are available have shown either an improvement or no significant change so far in this decade. Major exceptions are noted below.

**Asthma**—From 1980 to 1996, a 74 percent increase was recorded for self-reported asthma and, from 1980 to 1999, an 85 percent increase was recorded in physician visits prompted by this condition. In recent years, available data

show decreases in asthma mortality rates for most age groups. The notable exception to this trend is children younger than age 5, for whom the asthma death rate increased from 1.7 per million in 1999 to 2.1 per million in 2001. The 2010 target is 1.0 deaths per million for this age group (Obj. 24-1a). There is a strong ascending gradient with advancing age in asthma mortality rates. For adults age 65 years and older, the death rate from asthma was 60.7 per million in 2001, compared with 69.5 per million in 1999. The target is 60.0 per million (Obj. 24-1e). In addition, there are marked differences in asthma mortality rates by racial or ethnic group and by gender. Among the age group 35 to 64 years, for example, the asthma death rate for non-Hispanic blacks in 2001 (45.1 per million) was by far the highest of any racial or ethnic group for whom data were available. (The death rate for non-Hispanic whites in this age group was 10.5 per million.) In 2001, 35- to 64-year-old females died from asthma at a

rate of 74.4 per million, compared with a rate of 41.2 per million for males in the age group. The target is 9.0 per million (Obj. 24-1d).

In 2001, the rate of hospitalization for asthma was highest—at 56.2 per 10,000 population—among children younger than age 5 years, compared with 11.8 per 10,000 among the age group 5 to 64 years and 21.4 per 10,000 among the age group 65 years and older. Between 1998 and 2001, the changes in the rate of hospitalization for asthma that occurred for these three age groups were not statistically significant. Among children younger than age 5 years, males had a higher asthma hospitalization rate (71.4 per 10,000) in 2001 than females (40.3 per 10,000). In the two older age groups, the reverse was true. Among people age 5 to 64 years, females were hospitalized for asthma at an age-adjusted rate of 14.8 per 10,000, compared with 8.5 per 10,000 for males. Among people age 65 years and older, females had a rate of hospitalization for asthma about 2 1/2 times the rate for males (27.9 per 10,000 for females, compared with 11.8 per 10,000 for males). The targets for these three age groups (younger than 5 years, 5 to 64, 65 years and older) from youngest to oldest are, respectively, 25.0, 7.7, and 11.0 per 10,000 (Objs. 24-2a, -2b, -2c).

The proportion of people with asthma who experience activity limitations decreased from 10.2 percent in 1997 to 7.9 percent in 2002. Over that time span, the decrease was from 14.2 to 9.1 percent for non-Hispanic blacks and from 10.2 to 6.5 percent for Hispanics. Of people with asthma in 2002, 6.1 percent of men and 9.1 percent of women had such limitations, as did 13.6 percent of the poor and 22.8 percent of persons with disabilities. The target is 10 percent (Obj. 24-4). From 1997 to 2002, none of the changes in the proportion of people who experience activity limitations from asthma was statistically significant. In general, activity limitations both in 2002 and in 1997 were higher among non-Hispanic blacks compared with other racial and ethnic groups, among

females compared with males, and among the poor compared with middle-/high-income persons.

Among people who have asthma, an average of 18 days (age-adjusted) of school or work were lost because of the disease in 2002, with no significant differences among racial and ethnic groups or between males and females. A target has not yet been determined (Obj. 24-5). In 1999, 13.8 percent of persons with asthma (age-adjusted) received formal patient education to help in managing their condition, up from 8.4 percent in 1998. No notable differences were evident among racial and ethnic groups. However, females received more formal education compared with males, both in 1998 and 1999. Furthermore, the increase to 16.4 percent among females in 1999 from 9.1 percent in 1998 is a significant step toward achieving the target of 30 percent (Obj. 24-6). Among blacks, 17.5 percent (age-adjusted) received such education in 1999—an increase from 11.2 percent in 1998—as did 16.4 percent of females, compared with 9.6 percent of males.

**Chronic Obstructive Pulmonary Disease—**Chronic obstructive pulmonary disease (COPD) imposes an estimated annual burden of approximately 8 million physician and outpatient visits, 1.5 million hospital emergency visits, 726,000 hospitalizations, and 119,000 deaths. It is the fourth leading cause of death in the United States. While approximately 10 million adults reported having physician-diagnosed COPD according to the most recent data available, 24 million adults have evidence of impaired lung function. This serious degree of under-diagnosis and identification of persons with COPD reflects the low utilization of spirometry to identify persons with diminished lung function. Reduced lung function is particularly common among smokers.

The death rate from COPD in the United States increased greatly during the 1980s and most of the 1990s. From 1980 to 2000, the death rate from COPD among women age 45 years and older tripled, whereas

the corresponding rate for males increased 15 percent. The overall increase from 1980 to 2000 was 67 percent. In more recent years, the age-adjusted COPD death rate in people age 45 years and older decreased from 123.9 per 100,000 in 1999 to 119.4 per 100,000 in 2001. This change reflects the compounding of a sharp decrease for males over this time period—from 163.1 to 150.3 per 100,000—together with no significant change for females, among whom the 2001 age-adjusted death rate was 101.0 per 100,000. The decline in the death rate held true for all racial groups for whom data were available. Among those groups, the age-adjusted death rate for COPD in 2001 was highest for non-Hispanic whites, at 129.6 per 100,000—a

reflection of current smoking patterns. The target is 60.0 deaths per 100,000 (Obj. 24-10).

For the total population, the age-adjusted proportion of people age 45 and older who experienced activity limitations due to COPD was 2.5 percent in 2002, the same as in 1997. Of three racial and ethnic groups for whom data were available, the lowest proportion in this category was recorded for Hispanics in 2002—1.4 percent—compared with 2.5 percent for non-Hispanic blacks and 2.6 percent for non-Hispanic whites. Activity limitations of this kind were experienced by 5.7 percent of the poor in this age group in 2002—a proportion more than three times that for persons of middle/high income. The target is 1.5 percent (Obj. 24-9).

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## **Key Challenges and Current Strategies**

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In the presentations that followed the data overview, the principal themes were introduced by representatives of the two co-lead agencies—Barbara Alving of NIH's National Heart, Lung, and Blood Institute (NHLBI), Sheila Newton of NIH's National Institute of Environmental Health Sciences (NIEHS), Marshall Plaut of NIH's National Institute of Allergy and Infectious Diseases (NIAID), and Stephen Redd of CDC's National Center for Environmental Health. These agency representatives and other participants in the review identified a number of obstacles to achieving the objectives and discussed activities under way to meet these challenges, including the following:

- Maternal asthma is an important risk factor in the development of asthma in children, but the maternal factors conferring this risk are not yet known.
- Environmental exposure can be an important factor in asthma severity. Working as part of the National Cooperative Inner-City Asthma Study, funded by NIAID, investigators found that children in inner-city areas who were allergic to cockroach allergen and

exposed to high levels of it had more than 3 times the rate of hospitalizations per year as children who were not exposed. Data from the related Inner-City Asthma Study, funded by NIAID and NIEHS, show that an environmental intervention targeted to reducing exposure of inner-city children with asthma to cockroach and other indoor allergens and to tobacco smoke substantially reduces asthma morbidity.

- The total estimated cost of COPD in 2002 was \$32.1 billion, including \$18 billion in direct costs and \$14.1 billion in indirect costs. COPD is projected to be the third leading cause of death for both males and females by the year 2020.
- Among the factors associated with the greater prevalence of asthma in women are higher levels of overweight, more severe physiological effects from smoking, and generally narrower airways.
- An estimated 70 million people in the United States suffer from sleep problems, nearly 60 percent on a chronic basis. Approximately 18 million adults have obstructive sleep apnea (i.e., sleep-disordered

breathing), but less than 50 percent are being diagnosed and treated.

- The National Asthma Education and Prevention Program (NAEPP), begun in 1989, is responsible for coordinating research translation activities among Federal agencies and among other national organizations.
- A primary responsibility of NAEPP is to provide ongoing monitoring of the asthma scientific literature to identify areas of research or controversy where there is new, compelling, and strong evidence that could warrant a change to the current clinical practice recommendations for diagnosing and treating asthma. A core patient education booklet is expected to be released in the fall of 2004 that will dovetail with the NAEPP *Guidelines for the Diagnosis and Management of Asthma*, portions of which were updated in 2002.
- Beginning in 1998, NHLBI has stimulated action and support for community-based asthma programs through the building of asthma coalitions, of which there are more than 200 today.
- NHLBI is sponsoring a genome-wide search to identify all the various genes that confer susceptibility to asthma. Early findings from these studies confirm that multiple genes may be involved in asthma and that they may vary among racial and ethnic groups. In addition, NHLBI is supporting pharmacogenetics research to explore how genetically determined factors may influence individual response to pharmacologic therapy.
- CDC's National Asthma Control Program was created in 1999 to support the respiratory disease goals and objectives of *Healthy People 2010*. To improve asthma surveillance and promote scientifically validated interventions, CDC implemented 11 asthma-tracking projects, 48 asthma interventions, and 33 partnership activities in 2003. To conduct school health-related asthma-control programs, the agency also developed partnerships with six urban school districts, one state education agency, and six nongovernmental organizations.
- *Environmental Justice: Partnerships to Address Ethical Challenges in Environmental Health* is an initiative of NIEHS to support projects that promote public understanding of the social, ethical, and legal implications of conducting environmental health research involving human subjects in areas such as gene-environment interactions, environmental health hazards, and disease susceptibility.
- The NIEHS program of Health Disparities Research supports interdisciplinary research to elucidate how the interaction of physical exposures and the social environment contributes to health disparities. Several studies focus on high-risk, socioeconomically disadvantaged children living in inner cities.
- NHLBI'S National Center on Sleep Disorders Research conducts and supports research and coordinates the Federal Government's efforts to improve communication among scientists, policymakers, and healthcare professionals to accelerate the speed of scientific discovery and dissemination of findings about sleep disorders.

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## **Approaches for Consideration**

Participants in the review made the following suggestions for steps to enable further progress toward achievement of the objectives for Respiratory Diseases:

- Improve the surveillance of asthma by making data available quickly enough and in fine enough geographic resolution for optimal program planning and evaluation.

- Encourage elementary and secondary schools to institute comprehensive asthma management programs.
- Increase research aimed at identifying relevant environmental exposures and the mechanisms by which they may cause and aggravate asthma.
- Seek to elevate fitness levels of asthma and COPD patients by encouraging them to exercise to the extent possible with careful management by physicians and other healthcare professionals.
- Take greater advantage of opportunities to partner with organizations that promote programs to help people quit smoking, the cause of at least 15 percent of COPD.
- In the quest to reduce COPD morbidity and mortality, stress to healthcare providers the importance of using spirometry for accurate diagnosis and assessment of disease severity, administering influenza and pneumococcal vaccines, using bronchodilators for symptomatic relief, and managing exacerbations aggressively.
- To guide development of new therapeutic drugs, expand research to (1) characterize the molecular and cellular processes involved in the initiation and progression of COPD and (2) identify biomarkers reflecting disease activity; these biomarkers can be used for testing the efficacy of putative therapies.
- Encourage interested entities to collect national population-based prevalence data for sleep-disordered breathing, which independent surveys have confirmed is under-diagnosed in the United States.

**Contacts for information about *Healthy People 2010* focus area 24—Respiratory Diseases:**

- National Institutes of Health—Robinson Fulwood, fulwoodr@nhlbi.nih.gov; Jeanette Guyton-Krishnan, guytonj@nhlbi.nih.gov; William Jirles, jirles@niehs.nih.gov; Marshall Plaut, mp27s@nih.gov; Daniel Rotrosen, dr17g@nih.gov
- Centers for Disease Control and Prevention—Stephen Redd, scr1@cdc.gov
- Office of Disease Prevention and Health Promotion (coordinator of the Progress Reviews)—Emmeline Ochiai (liaison to the focus area 24 workgroup), eochiai@osophs.dhhs.gov

*Cristina V. Beato M.D.*

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**Cristina V. Beato, M.D.**

Acting Assistant Secretary for Health