

National Heart, Lung and Blood Institute

OFFICE OF SCIENCE AND TECHNOLOGY

FAX TRANSMISSION



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 tonight + at home*

DATE: Monday, 7/28/97

PAGES: 17 . plus cover sheet

TO: SARAH HURWITZ

FAX #: 202-456-⁷⁴³¹~~3552~~

FROM: _____

CALL (301) 496-

OR FAX (301) 402-1056

COMMENTS: Asthma data, as requested

Parashar Patel

Table 1
 Prevalence of Asthma from the National Health Interview Survey
 United States, 1994

Age	Numbers in thousands					Prevalence per 1,000 Population				
	Total	Male	Female	White	Black	Total	Male	Female	White	Black
Total	14,562	6,542	8,019	12,052	1,862	56.1	51.7	60.2	56.2	56.4
<18	4,837	—	—	—	—	69.1	—	—	—	—
18-44	5,598	—	—	—	—	51.7	—	—	—	—
45-64	2,561	787	1,773	2,258	255	50.8	32.3	68.0	52.3	49.7
65-74	956	319	637	878	65	52.4	39.3	62.8	54.3	41.9 *
75+	610	339	271	563	47	47.8	70.3	34.1	48.7	48.4 *
<45	10,435	5,097	5,338	8,353	1,495	58.6	57.1	60.0	58.2	58.9
65+	1,566	658	946	1,441	111	50.5	50.9	50.2	51.9	44.0 *

* Estimate does not meet standards of reliability or precision.

— Estimate is not available.

Source: Vital and Health Statistics, Series 10, No. 193, Dec., 1995.

National Health Interview Survey, National Center for Health Statistics.

Table 2
Prevalence of Asthma from the National Health Interview Survey
United States, 1991-1993

Age	Numbers in thousands					Prevalence per 1,000 Population				
	Total	Male	Female	White	Black	Total	Male	Female	White	Black
Total	12,394	5,729	6,665	10,194	1,831	49.3	46.9	51.6	48.6	58.2
<18	4,380	2,051	1,749	3,337	875	65.0	77.2	53.9	62.9	82.8
18-44	4,612	1,892	2,720	3,875	595	43.6	36.4	50.6	44.4	44.7
45-64	2,115	746	1,369	1,831	253	43.6	32.0	54.3	43.9	50.6
65-74	830	317	513	737	66	45.0	38.3	50.3	44.9	40.2
75-84	367	129	238	325	42	37.6	33.6	40.1	36.8	54.1
85+	90	13	77	90	0	35.2	16.7	43.4	38.8	0.0
65+	1,286	459	827	1,152	108	41.8	35.6	46.2	41.8	41.2
LIA	2,791	1,291	1,500	2,095	568	11.1	10.6	11.6	10.0	18.7
% LIA	22.5	22.5	22.5	20.6	32.1	—	—	—	—	—

Note: Estimates below 64,000 are statistically unreliable as are rates based on those numbers.

LIA: Limited in activity.

Source: Unpublished person count estimates furnished on 6/28/95 from Gary Collins
National Health Interview Survey, National Center for Health Statistics.

FACT BOOK
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- Except for an increase in the percent of the population who are overweight, the prevalence of high cholesterol, hypertension, and smoking declined appreciably (p. 41).
- Hypertension is a highly prevalent condition that is more common in blacks than in whites (p. 41).
- The percent of hospitalized CVD patients who were discharged dead declined markedly between 1974 and 1994 (p. 42).
- The estimated economic cost of CVD is expected to be \$259 billion in 1997:
 - \$158 billion in direct health expenditures.
 - \$25 billion in indirect cost of morbidity.
 - \$76 billion in indirect cost of mortality (p. 44).

Lung Diseases

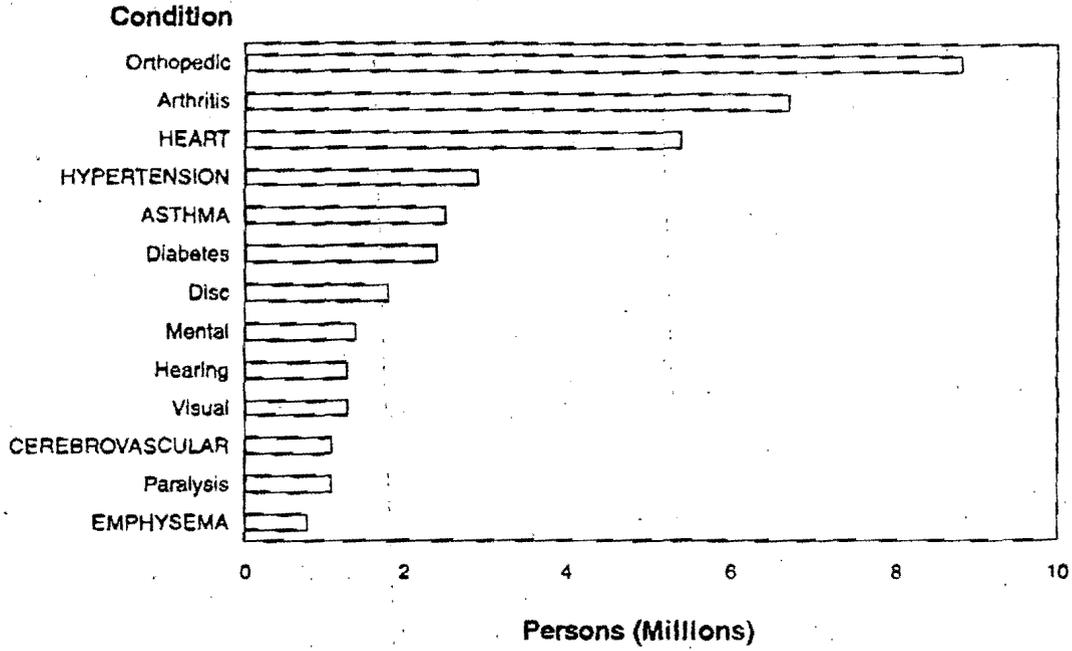
- Lung diseases, excluding lung cancer, caused an estimated 228,000 deaths in 1995 (p. 31).
- Chronic obstructive pulmonary disease caused 99,000 deaths in 1995 and is the fourth leading cause of death (pp. 32, 33).
- The four leading causes of infant mortality are lung diseases or have a lung disease component; rates declined between 1985 and 1995 for three of them:
 - Congenital anomalies (-26%).
 - Sudden infant death syndrome (-40%).
 - Respiratory distress syndrome (-62%).
 - Disorders relating to short gestation (+13%) (p. 34).
- Lung diseases account for 46 percent of all deaths under 1 year of age in 1994 (p. 34).
- Between 1985 and 1995, the total death rate for COPD increased by 13 percent in contrast with declines for other major causes except lung cancer (p. 35); however, the age-specific trend in COPD is downwards for men under age 75 years and for women under age 45 years (not shown).
- Between 1984 and 1994, the percent increase in death rate for COPD and asthma was greater in women than in men (p. 35).
- Asthma and emphysema are among the leading chronic conditions causing limitation of activity (p. 40).

- Asthma is the fourth leading chronic condition causing bed disability days (p. 40).
- Asthma and chronic bronchitis are present in at least 5 percent of the population in each age group from childhood to adulthood (p. 42).
- Among 28 industrialized countries, the United States ranked 12th for COPD mortality in men ages 35 to 74 years and 7th in women in that age group in 1993 (p. 43).
- Between 1984 and 1994, the prevalence of asthma increased for all age groups (p. 43). Presently, 14.6 million Americans have the disease.
- The estimated economic cost of these lung diseases is expected to be \$114.7 billion in 1997:
 - \$78 billion in direct health expenditures.
 - \$20 billion in indirect cost of morbidity.
 - \$16 billion in indirect cost of mortality (p. 44).

Blood Diseases and Resources

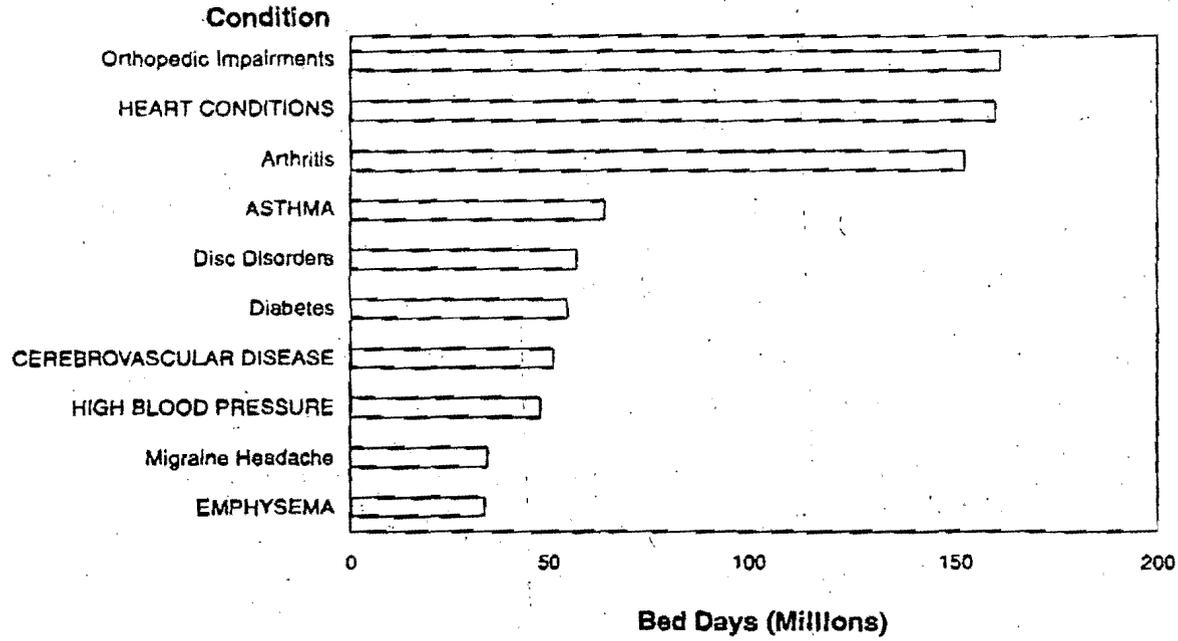
- An estimated 268,000 deaths, 12 percent of all deaths, were attributed to diseases of the blood in 1995. This includes:
 - 259,000 due to blood-clotting disorders.
 - 7,000 due to diseases of the red blood cell.
 - 2,000 due to bleeding disorders (pp. 31, 32).
- A large proportion of the deaths from acute myocardial infarction and cerebrovascular disease involve blood-clotting problems (p. 32).
- In 1997, blood-clotting disorders will cost the Nation's economy \$64 billion, and other blood diseases will cost \$10 billion (p. 44).
- In 1989, 13 million units of blood were collected from almost 9 million donors (not shown).
- In 1989, approximately 20 million units of blood products were transfused to 4 million patients (not shown).

Prevalence of Leading Chronic Conditions Causing Limitation of Activity, U.S., 1990-92



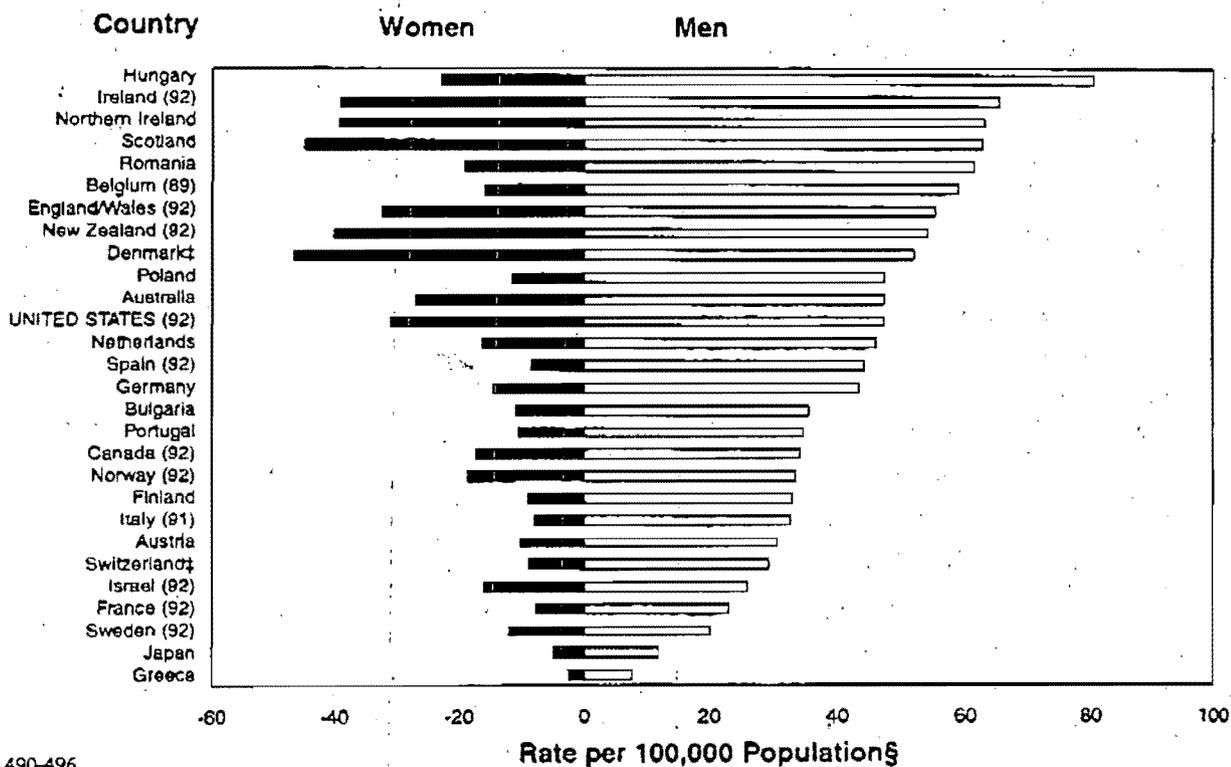
Note: Capitalization indicates diseases addressed in Institute programs.
Source: National Health Interview Survey (NHIS), NCHS.

Leading Chronic Conditions Causing Bed Disability, U.S., 1990-92



Note: Capitalization indicates diseases addressed in Institute programs.
Source: NHIS, NCHS.

Death Rates for Chronic Obstructive Pulmonary Disease and Allied Conditions* by Gender, Ages 35-74 Years, Selected Countries, 1993†



* ICD/9 codes 490-496.

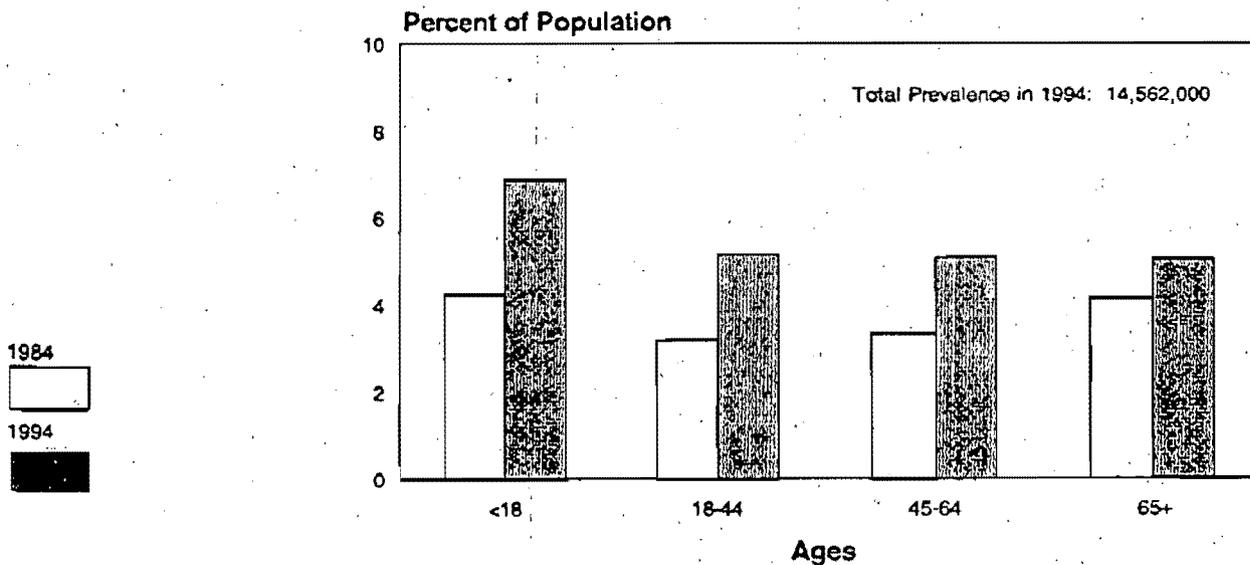
† Years may vary as indicated.

‡ ICD/8 codes 490-493.

§ Rates are age adjusted to the European standard population.

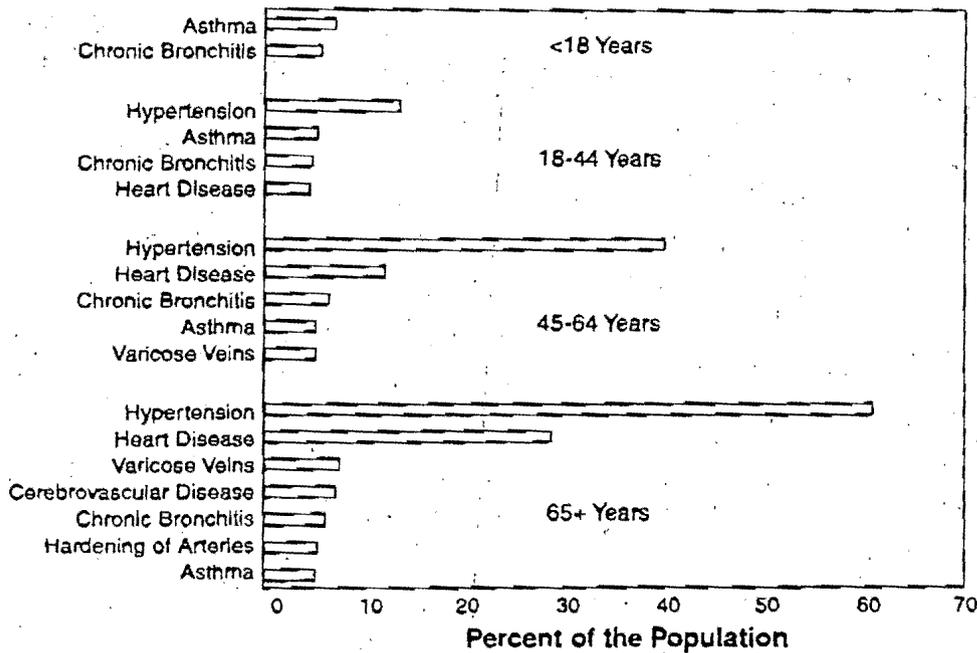
Source: Published and unpublished data from WHO.

Prevalence of Asthma by Age, U.S., 1984 and 1994



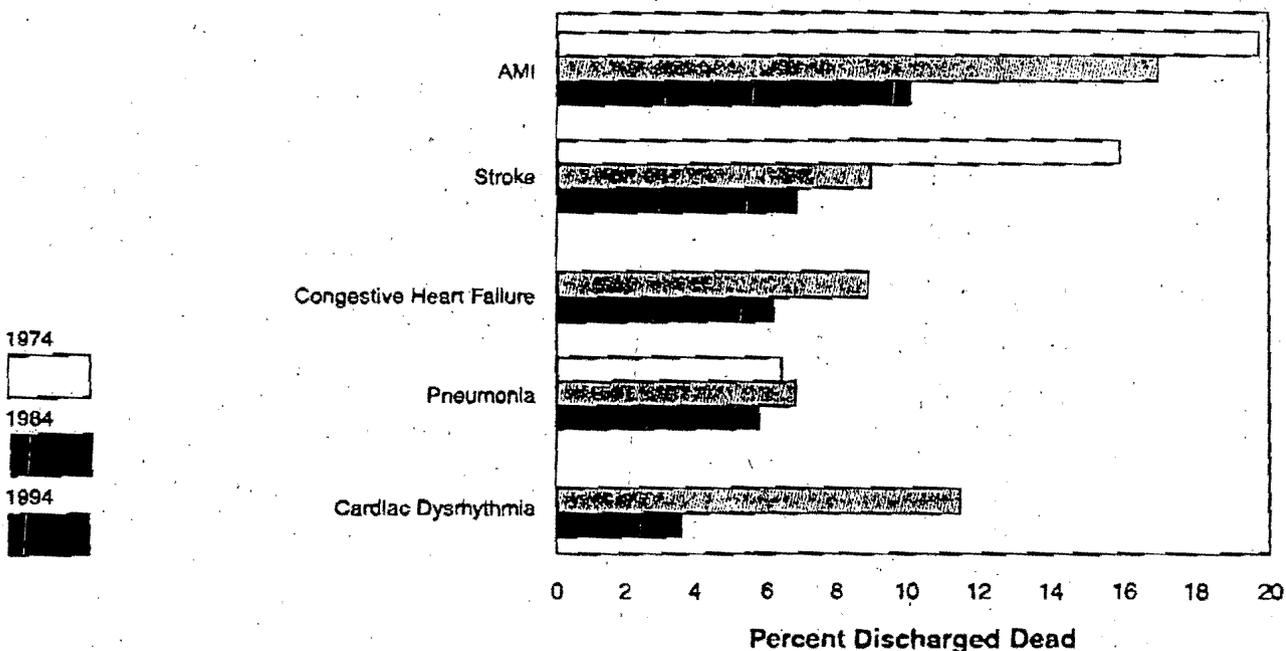
Source: NHIS, NCHS.

Prevalence of Common Cardiovascular and Lung Diseases by Age, U.S., 1994



Note: Each estimate for heart disease refers to the number of persons with one or more forms: coronary, arrhythmic, other. Numbers depicted in bars are not additive by disease because some persons have more than one disease.
Source: NHIS and, for hypertension, National Health and Nutrition Examination Survey, NCHS.

Common Cardiovascular and Lung Diseases With High Percentage Discharged Dead From Hospitals, U.S., 1974, 1984, 1994



Source: National Hospital Discharge Survey, NCHS.

of activities across the continuum of biomedical research, with an emphasis on fundamental mechanisms. Multidisciplinary programs are supported to advance basic knowledge of disease and to generate the most effective methods of clinical management and prevention. Clinical trials, which are an important part of the research program, provide an opportunity to test and apply promising preventive or therapeutic measures.

Arteriosclerosis, CHD, and hypertension were areas of major emphasis within the Division's research program in fiscal year (FY) 1996. Examples of newly supported programs include those that focus on research in gene-nutrient interactions in the pathogenesis of congenital heart defects, etiology of excess CVD in diabetes mellitus, angiogenesis and vascular remodeling in the microvasculature, and innovative ventricular assist systems. Additional examples are Specialized Centers of Research (SCORs) that examine genetic determinants of high blood pressure; ischemic heart disease, sudden cardiac death, and heart failure; and ischemic heart disease in blacks. Solicitations of applications were issued for research on the elucidation of mechanisms responsible for myocardial dysfunction, specifically those involved in the transition from cardiac hypertrophy to overt heart failure; and for research on atherosclerotic lesions using human tissues. The Division provides significant support to minority institutions through such research career and training programs as the Minority National Research Service Award, Minority School Faculty Development Award, Research Development Award for Minority Faculty, and Short-Term Research Training for Minority Students Award.

Division of Lung Diseases

Lung diseases are among the leading causes of death and disability in the United States. More than 25 million persons have chronic bronchitis, emphysema, asthma, or other obstructive or interstitial lung diseases. Pulmonary diseases accounted for 26 percent of all hospitalizations of children under 15 years of age in the United States in 1994.

As an underlying cause, lung diseases, excluding cancer, account for 228,000 deaths annually, and lung diseases are a contributing cause to

perhaps an equal number of additional deaths. The lung disease problems addressed by the Institute will cost the Nation about \$115 billion in 1997, of which \$78 billion will be for health expenditures and \$37 billion will be for lost productivity.

The DLD plans and directs a coordinated research program on the causes of lung diseases and on their prevention, diagnosis, and treatment. Its activities focus on understanding the structure and function of the respiratory system, increasing fundamental knowledge of mechanisms associated with specific pulmonary disorders, and applying new findings to evolving treatment strategies for patients.

The NHLBI established six centers for gene therapy in FY 1993. Presently, the centers are focusing mainly on cystic fibrosis (CF) research but include other areas associated with gene therapy for heart, lung, and blood diseases. Basic, preclinical, and clinical studies are directed toward developing safe, efficient, and efficacious vehicles for delivering genes to appropriate target cells. Basic science and clinical findings are identifying new directions needed to generate improved gene transfer vectors, to manage the inflammatory and immune consequences of vector transfer, and to develop alternative vector systems. A grant program was initiated to stimulate research on the molecular pathogenesis and pathophysiology of CF and to develop new approaches to therapy. Several grants were cofunded with the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK).

Asthma research is an area of high priority for the Division. The DLD supports a collaborative multicenter study in human pedigrees from various racial/ethnic groups to identify the major genes responsible for asthma. With recruitment near completion, gene mapping studies have been initiated. Identification of the genes important to asthma will facilitate development of new modes of treatment and will lead to an understanding of causal interactions between genes and environmental factors that are relevant in asthma. In 1996, the Division sponsored two workshops on asthma prevention to stimulate research in this critical area. It supports several research programs designed to develop and evaluate effective strategies for improving asthma care among Latino and black children, who

appear to suffer disproportionately from the disease. Some of the findings from this research were recently published in the document *Asthma Management in Minority Children: Practical Insights for Clinicians, Researchers, and Public Health Planners*.

Additional asthma research projects involving children include a 5-year, multicenter clinical trial to examine the long-term effects of three different asthma medications on 1,000 children and a study to develop and evaluate innovative approaches to ensure optimal disease management and prevention in the elementary school setting. The DLD is also participating in a collaborative study with the National Institute of Child Health and Human Development (NICHD) to determine the effects of asthma and its treatment on pregnancy and the effects of pregnancy on asthma.

The Division supports an asthma clinical research network of interactive asthma clinical research groups to rapidly assess novel treatment methods and to ensure that these findings on optimal management of asthmatic patients are rapidly disseminated to practitioners and health care professionals. One trial is investigating the long-term effects of two short-acting beta-agonist treatment regimens and another is studying the use of colchicine in moderate asthma. Additional clinical trials are examining the effectiveness and side effects of a long-acting beta-agonist and corticosteroids.

To promote the application of scientific findings in the clinical setting, the Division prepared a report on the diagnosis and management of asthma in the elderly. Currently, it is preparing an update of the *National Asthma Education and Prevention Program's Expert Panel Report on Asthma Management*. A report entitled *Global Strategy for Asthma Management and Prevention* was published in FY 1995 as part of a collaboration between the NHLBI and the World Health Organization (WHO); a followup series of practical guides was published in FY 1996. With its international partners, the DLD is participating in the organization of "Global Initiative for Asthma," a program to increase awareness of asthma and its public health consequences, promote the study of the association between asthma and the environment, and reduce asthma morbidity and mortality throughout the world.

Smoking-related diseases are a major cause of mortality and morbidity in the United States. Division-supported research in this area includes a randomized trial on the effect of inhaled corticosteroids on the natural history of lung function in continuing smokers.

Acquired immunodeficiency syndrome (AIDS) and tuberculosis (TB) research are also important areas of investigation for the Division. Specific programs include a clinical study of cardiopulmonary complications of HIV infection in infants and children and several programs to address the pathobiology of *pneumocystis carinii*, the basic cell biology of pulmonary manifestations of AIDS, the development of lung-specific drug delivery systems for enhanced TB treatment, and behavioral interventions for control of TB. A new program started in FY 1996 will support research on cellular and molecular events involved in the regulation of HIV activation in the lung. Microbial and other cofactors, cytokines, and chemokines that allow HIV to remain quiescent in lung cells and those that stimulate viral replication are being investigated.

Several newly initiated programs include a prospective randomized clinical trial to assess innovative treatment methods in patients at risk for developing adult respiratory distress syndrome; an epidemiological study to investigate causes and environmental and genetic risk factors for sarcoidosis; a study of causes of noninfectious pneumonia, an often fatal complication of bone marrow transplantation; and a multi-institutional collaboration to create a molecular profile of bronchopulmonary dysplasia that will provide insight into the condition and offer directions for developing new reagents for clinical interventions.

The Division supports several other activities. Examples include research training and career development programs to provide postdoctoral opportunities to beginning investigators, prevention programs to extend important services to communities, and demonstration and education activities to transfer basic research and clinical findings to health care professionals and patients.

Support for all the activities of the Division constitute not less than 15 percent of the funds allocated to the NHLBI, as required by legislation.

Division of Blood Diseases and Resources

Blood diseases, including both acute and chronic disorders, resulted in 268,000 deaths in 1995; 259,000 of them were due to thrombotic disorders and 9,000 were due to diseases of the red blood cells and bleeding disorders. In 1997, thrombotic disorders and other blood diseases will cost an estimated \$74 billion, of which \$45 billion will be for health expenditures and \$29 billion for lost productivity. Blood resources include nearly two dozen products derived from more than 14 million units of whole blood collected from almost 9 million American donors that are subsequently transfused annually to patients. In 1992, an estimated 23 million units of blood products were transfused to 5 million patients. Adverse effects following blood transfusion include development of hepatitis C—the risk being about 1:103,000 per unit of blood or blood product transfused. The risk of being infected with HIV is estimated to be 1:493,000 per unit. Universal screening of donor blood for antibodies to human immunodeficiency virus (HIV) began in 1985, and universal screening for antibodies to hepatitis C virus began in 1990. The screening tests, which have been improved over the years, have greatly reduced the risk of infection to transfusion recipients.

The DBDR develops, administers, and coordinates programs that will reduce morbidity and mortality caused by blood diseases and lead to their primary prevention. These programs include hemophilia, Cooley's anemia, sickle cell disease, and disorders of hemostasis and thrombosis. The Division also has a major responsibility to ensure the adequacy and safety of the Nation's blood supply. A full range of activities, including studies of transmission of disease through transfusion, development of methods to inactivate viruses in donated blood, improvement of blood donor screening procedures, research to reduce human error in transfusion medicine, and studies of emerging diseases that may be transmitted by blood transfusion, are used to achieve this goal.

Finding an effective therapy for sickle cell disease remains a high priority. Despite progress in the area of treatment for the disease, no universal effective therapeutic agent exists. The drug hydroxyurea, although promising, may have long-term side effects, and its safety and efficacy in children are unknown. Following the

announcement of an RFA in 1996, eight highly meritorious applications were awarded in areas such as computer-generated antisickling compounds, removal of pathological iron from sickle red blood cells, methods for gene transfer, and transgenic models of sickle cell disease.

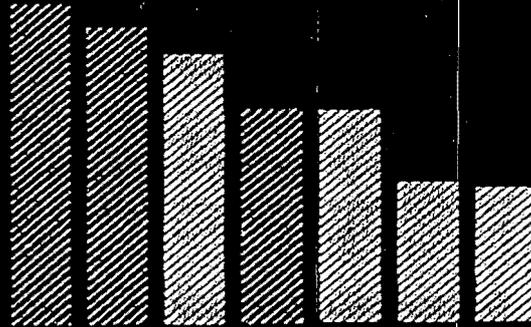
Dissemination of research findings to the medical community through workshops, conferences, and consensus development conferences is an important function of the Division. Topics covered include plasma transfusion, platelet transfusion therapy, diagnosis of deep-vein thrombosis, impact of routine HIV antibody testing of blood and plasma donors on public health, infectious disease testing for blood transfusions, stem cell therapy, and immune function in sickle cell disease.

To meet its overall responsibilities, the Division maintains an integrated and coordinated program of grants, contracts, training and career development awards, and academic awards. SCORs in thrombosis, transfusion medicine, and hematopoietic stem cell biology and Comprehensive Centers in sickle cell disease are currently being supported.

Division of Epidemiology and Clinical Applications

The DECA has the primary responsibility for epidemiologic studies, clinical trials, prevention studies, and demonstration and education research in heart and vascular, lung, and blood diseases and for basic and applied research in behavioral medicine. The Division identifies research opportunities; stimulates and conducts research on the causes, prevention, diagnosis, and treatment of these diseases; and assesses the need for technologic development in the acquisition and application of research findings in these areas. It evaluates and uses basic and clinical research findings in defined populations (such as occupational groups, school children, health professionals, and minorities) and community settings, with an emphasis on studies of primary and secondary prevention in nonhospitalized patients or populations.

Understanding the significant role that risk factors have in the development of CVD is a major focus of the Division. Epidemiological studies of CVD risk factors in Native Americans and middle-aged blacks, population-based



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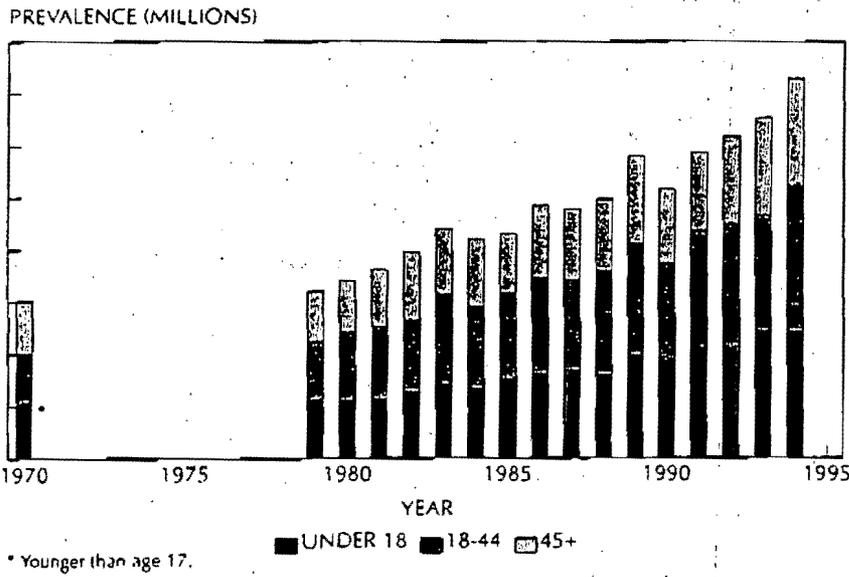
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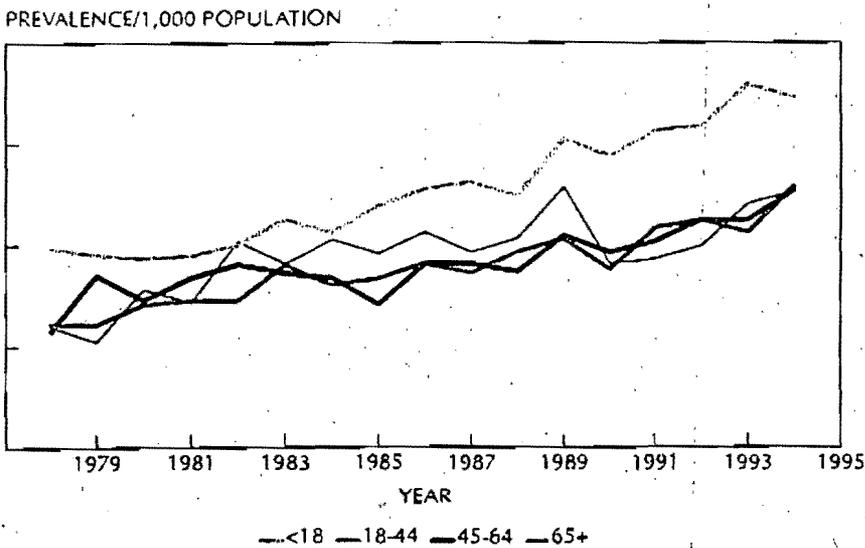
Asthma

CHART 4-15
PREVALENCE OF ASTHMA BY AGE,
NHIS, U.S., 1970-1994



Total prevalence of asthma increased appreciably between 1979 and 1994, reaching 14.6 million persons in 1994. The increase occurred in all three age groups shown.^{13,35,42}

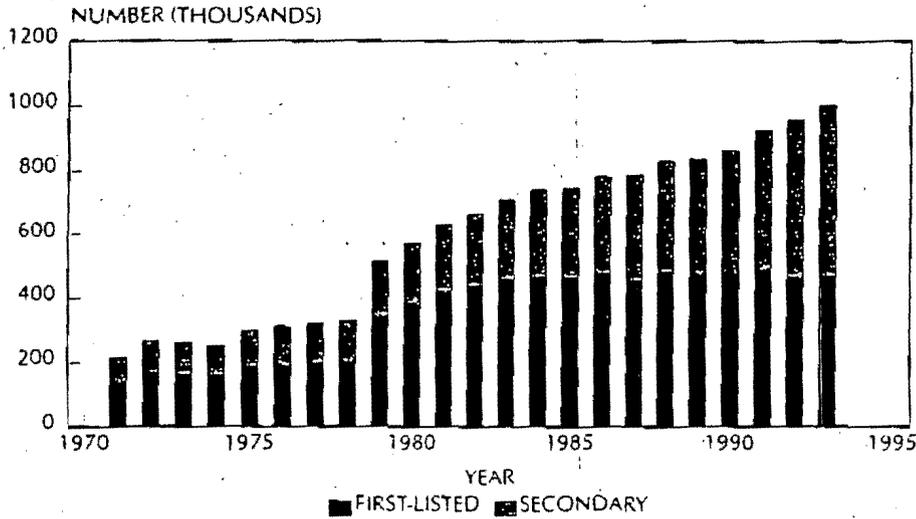
CHART 4-16
PREVALENCE RATE OF ASTHMA
BY AGE, NHIS, U.S., 1978-1994



The prevalence rate of asthma is slowly increasing in most age groups, especially younger than age 18.^{13,35}

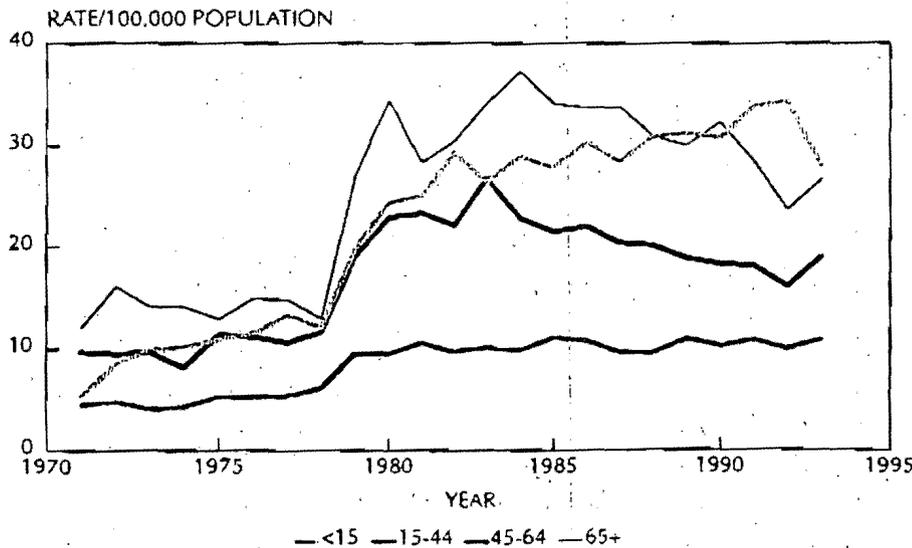
Asthma

CHART 4-17
NUMBER OF HOSPITALIZATIONS FOR ASTHMA,
U.S., 1971-1993



The number of hospital discharges for asthma as the first-listed discharge on the hospital face sheet has held relatively steady at just over 400,000 per year from 1981 to 1993. Asthma as a secondary diagnosis increased steadily during that period so that by 1993, asthma was the primary or secondary diagnosis in 1 million hospitalizations.^{26,36}

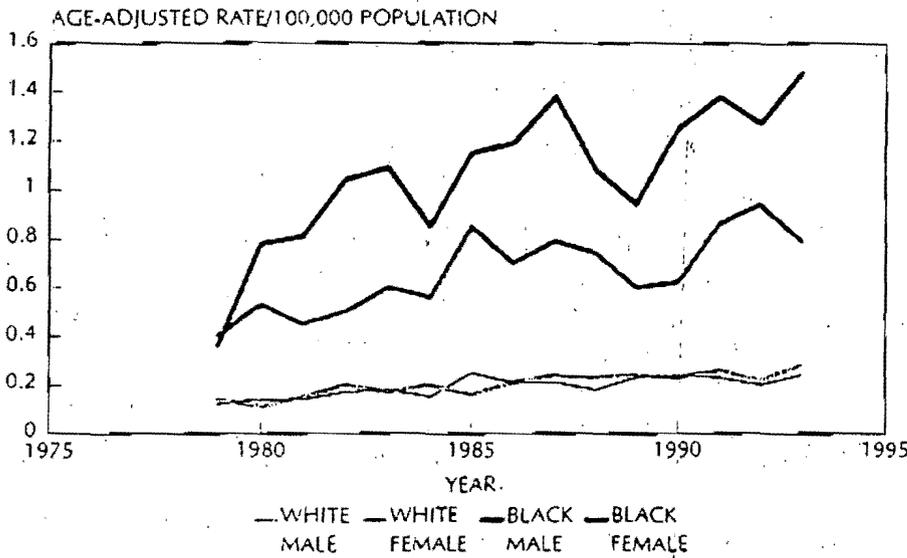
CHART 4-18
HOSPITALIZATION RATES FOR ASTHMA
BY AGE, U.S., 1971-1993



Hospitalization rates for asthma by age tended to increase from 1971 to 1993.^{26,36}

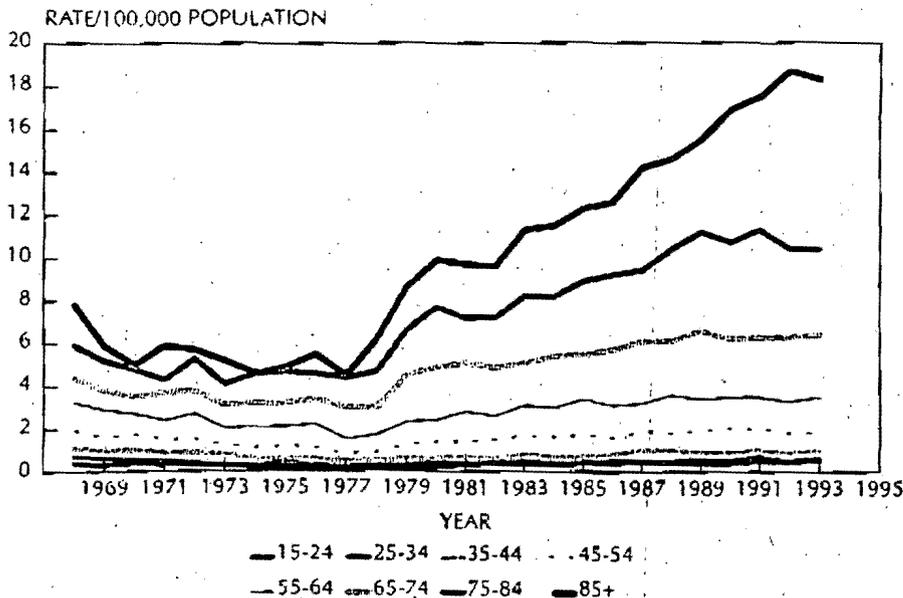
Asthma

CHART 4-19
DEATH RATES FOR ASTHMA AGE 1 TO 24
BY SEX AND RACE, U.S., 1979-1993



Death rates for asthma in persons for age 1 to 24 increased during the 1979-1993 period in the four race-sex groups shown. Because rates are higher in blacks than in whites, the absolute increase was greater in blacks, but the rates of increase were about the same. Essentially no change occurred in the black-white gap in death rates as calculated from the black/white ratios of the death rates.⁷

CHART 4-20
DEATH RATES FOR ASTHMA
BY AGE, U.S., 1968-1993

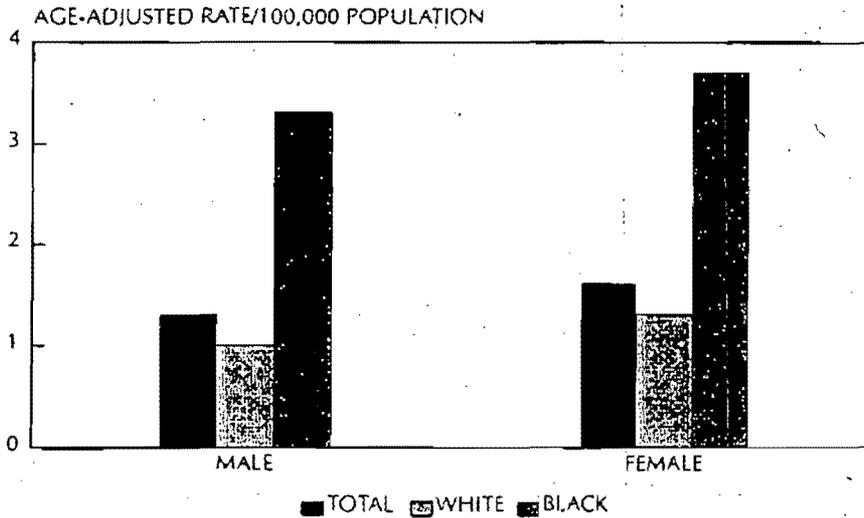


The fall and rise in asthma mortality since 1968 has occurred in all age groups.^{7,17}

2.2.4 = 1990

Asthma

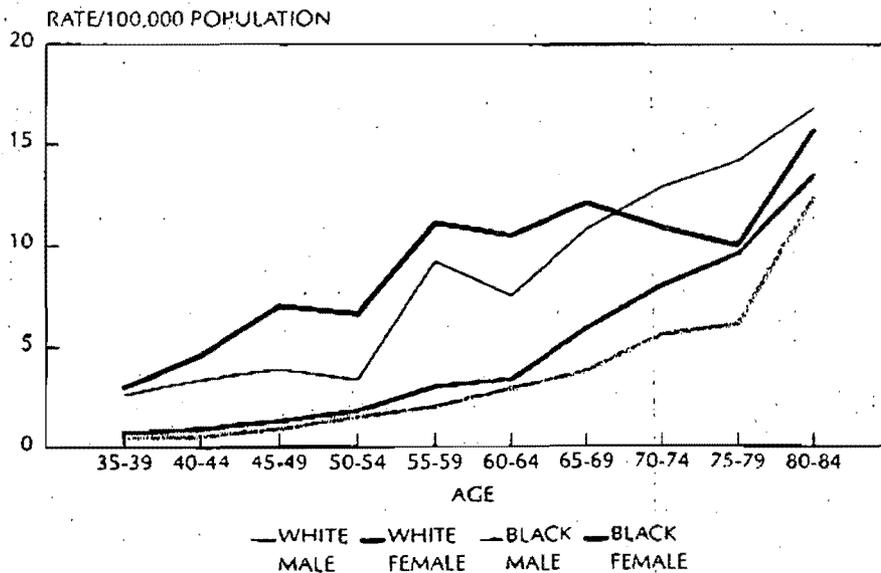
**CHART 4-21
DEATH RATES FOR ASTHMA
BY RACE AND SEX, U.S., 1993**



Age-adjusted death rates for asthma are:¹⁷

- Three times higher in black males than in white males.
- Almost three times higher in black females than in white females.
- Slightly higher overall in females than in males.

**CHART 4-22
DEATH RATES FOR ASTHMA
BY AGE, RACE, AND SEX, U.S., 1993**



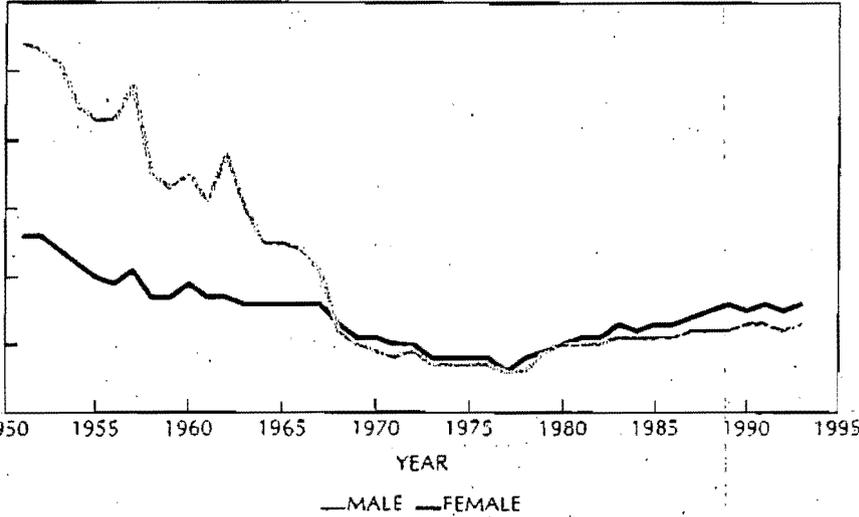
Age-specific death rates for asthma are much higher in blacks than in whites in nearly every age group.¹⁷

The rates are higher in white females than in white males.

Asthma

**CHART 4-23
DEATH RATES FOR ASTHMA
BY SEX, U.S., 1951-1993**

AGE-ADJUSTED RATE/100,000 POPULATION

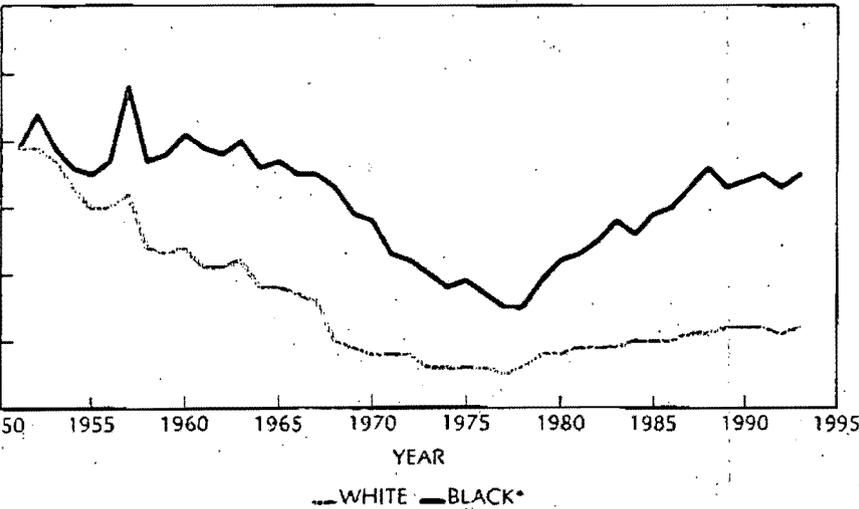


Asthma mortality shows a steep decline up to 1968 and is then followed by an increase.⁷

Rates had been much higher in males than in females before the mid-1960s but are now about the same for both sexes.

**CHART 4-24
DEATH RATES FOR ASTHMA
BY RACE, U.S., 1951-1993**

AGE-ADJUSTED RATE/100,000 POPULATION

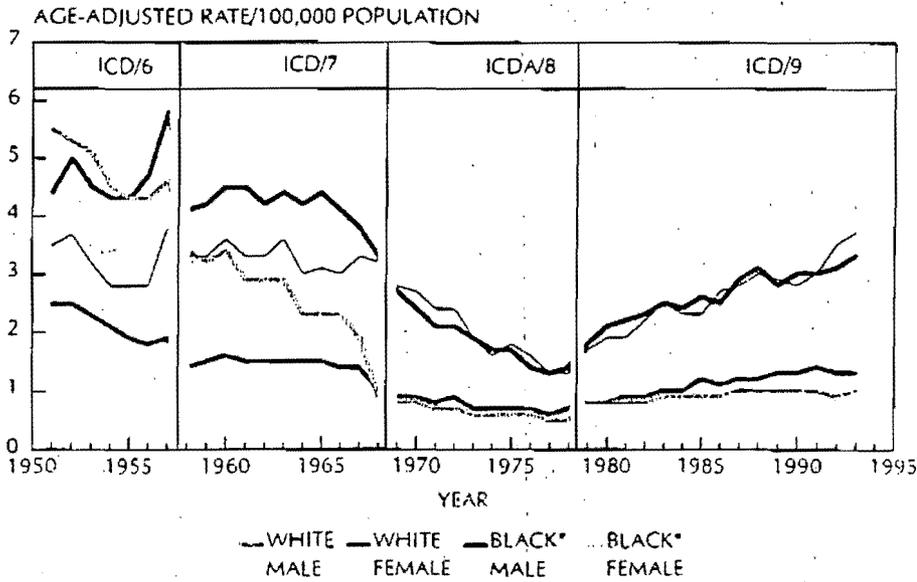


The black-white gap in asthma mortality is widening, with rates much higher in blacks than in whites.⁷

* Nonwhite from 1951 to 1967.

Asthma

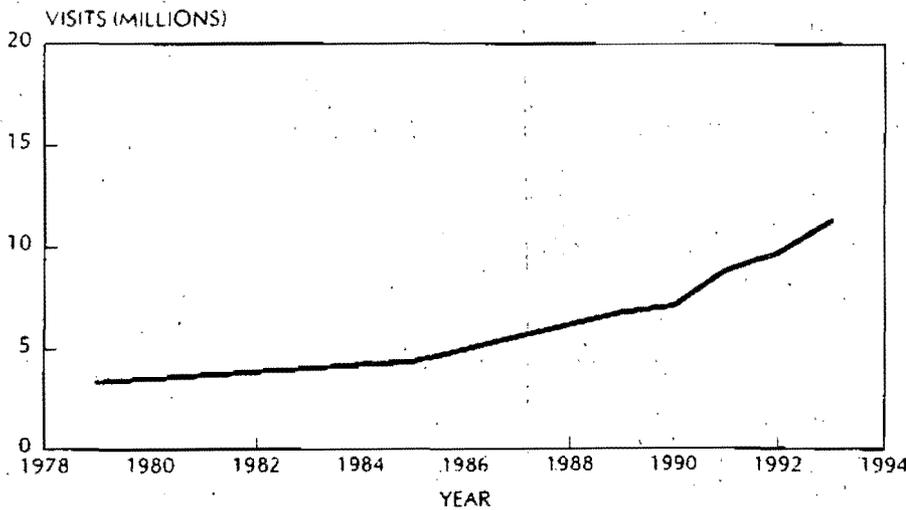
**CHART 4-25
DEATH RATES FOR ASTHMA
BY RACE AND SEX, U.S., 1951-1993**



* Nonwhite from 1950 to 1967.

Trends in asthma mortality are much more uniform across sex-race groups since 1970 as compared with the 1950-1970 period.⁷

**CHART 4-26
PHYSICIAN OFFICE VISITS FOR ASTHMA,
U.S., 1979-1993**



The number of physician office visits for asthma increased substantially during the 1979-1993 period and rapidly since 1990.⁴⁵