

## Asthma

### A Presentation on Asthma Management and Prevention



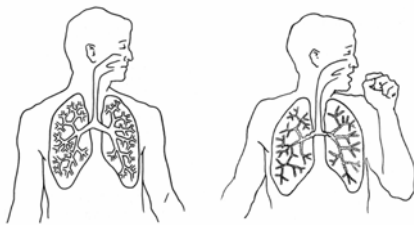
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## What Is Asthma?

- A chronic disease of the airways that may cause
  - Wheezing
  - Breathlessness
  - Chest tightness
  - Nighttime or early morning coughing

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## Pathology of Asthma



Normal Lungs

Asthma

Source: "What You and Your Family Can Do About Asthma" by the Global Initiative For Asthma  
Created and funded by NIH/NHLBI

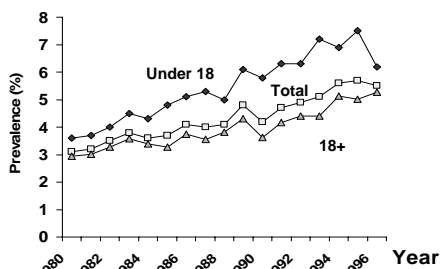
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## Epidemiology

The study of the distribution and determinants of diseases and injuries in human populations

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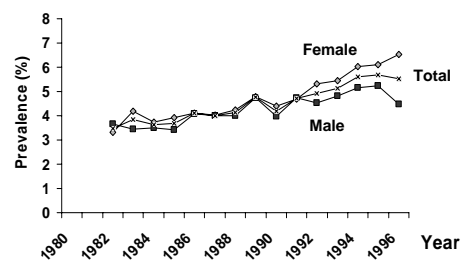
## Asthma Prevalence\* by Age United States: 1980–1996



Source: National Health Interview Survey  
\* 12-month prevalence

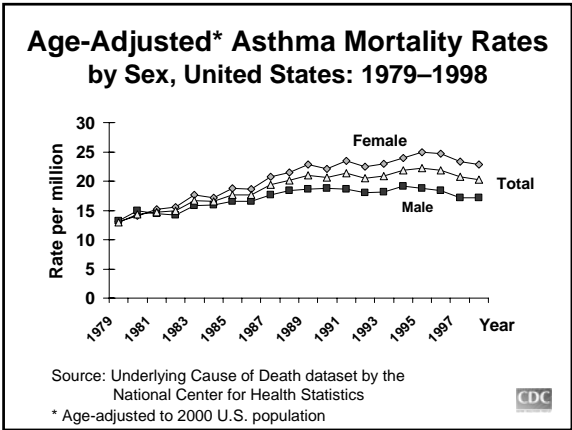
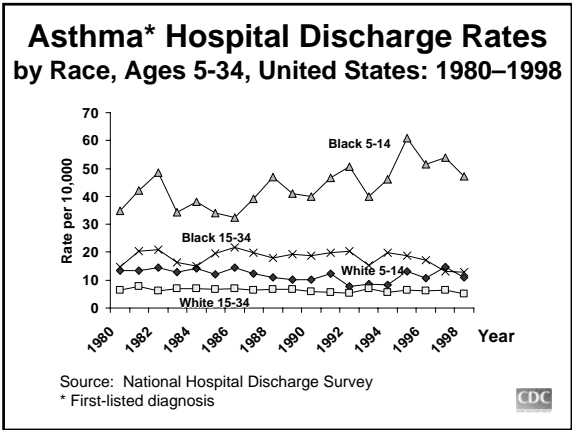
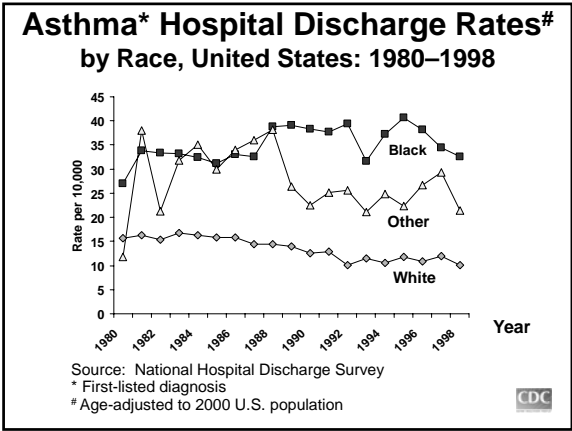
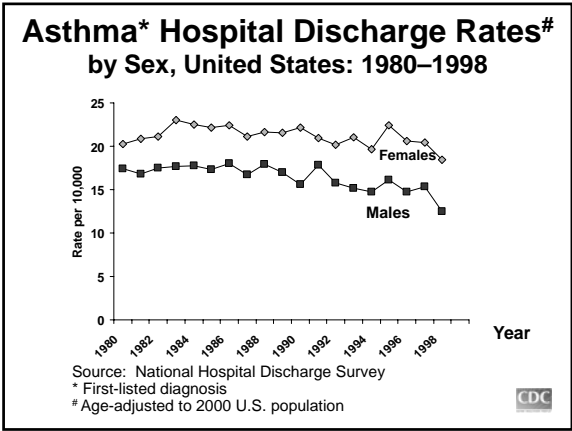
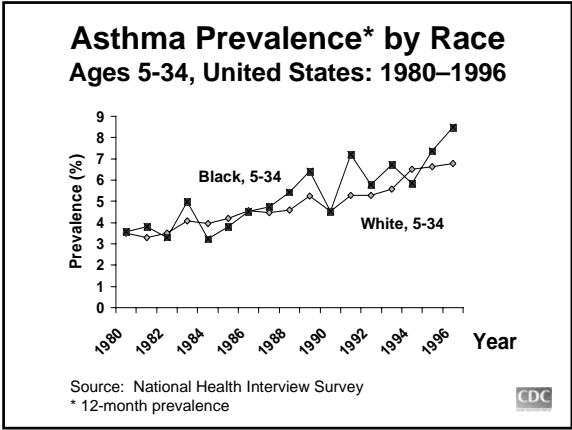
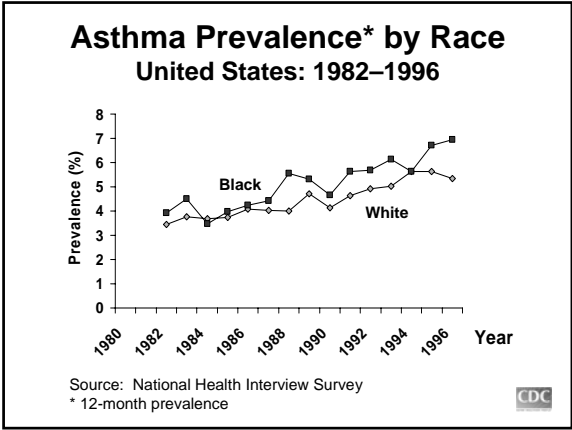
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## Asthma Prevalence\* by Sex United States: 1982–1996

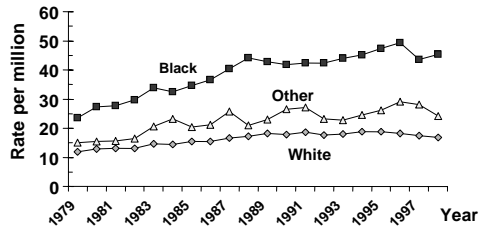


Source: National Health Interview Survey  
\* 12-month prevalence

CDC



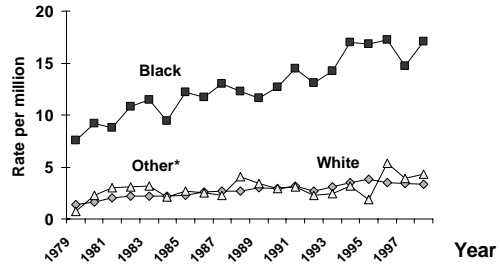
### Age-Adjusted\* Asthma Mortality Rates by Race, United States: 1979–1998



Source: Underlying Cause of Death dataset by the National Center for Health Statistics  
 \* Age-adjusted to 2000 U.S. population



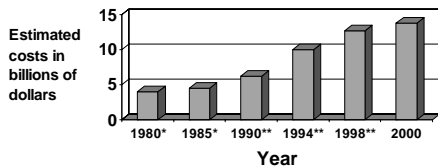
### Asthma Mortality Rates by Race Ages 5-34, United States: 1979–1998



Source: Underlying Cause of Death dataset by the National Center for Health Statistics  
 \* Unreliable (< 20 deaths) 1979–1995



### Costs of Asthma United States, 1980–1998 Projection for the Year 2000



Source: \* Weiss, et al. 1992  
 \*\* Weiss, et al. 2001



### Risk Factors for Development of Asthma

- Genetic characteristics
- Environmental exposures
- Contributing factors



### Risk Factors for Development of Asthma: Genetic Characteristics

#### Atopy

- The body's predisposition to develop an antibody called immunoglobulin E (IgE) in response to exposure to environmental allergens
- Can be measured in the blood



### Risk Factors for Development of Asthma: Environmental

#### Clearing the Air:

#### Asthma and Indoor Air Exposures

<http://www.iom.edu> (Publications)  
 Institute of Medicine, 2000

Committee on the Assessment of Asthma and Indoor Air


Review of current evidence regarding indoor air exposures and asthma



## Clearing the Air

### Categories for Associations of Various Elements


- Sufficient evidence of a causal relationship
- Sufficient evidence of an association
- Limited or suggested evidence of an association
- Inadequate or insufficient evidence to determine whether an association exists
- Limited or suggestive evidence of no association



## Clearing the Air

### Indoor Air Exposures and Asthma Development


<p><b>Biological Agents</b></p> <ul style="list-style-type: none"> <li>▪ Sufficient evidence of a causal relationship           <ul style="list-style-type: none"> <li>▪ House dust mite</li> </ul> </li> <li>▪ Sufficient evidence of an association           <ul style="list-style-type: none"> <li>▪ None found</li> </ul> </li> <li>▪ Limited or suggestive evidence of an association           <ul style="list-style-type: none"> <li>▪ Cockroach (in preschool-aged children)</li> <li>▪ Respiratory syncytial virus (RSV)</li> </ul> </li> </ul>	<p><b>Chemical Agents</b></p> <ul style="list-style-type: none"> <li>▪ Sufficient evidence of a causal relationship           <ul style="list-style-type: none"> <li>▪ None found</li> </ul> </li> <li>▪ Sufficient evidence of an association           <ul style="list-style-type: none"> <li>▪ Environmental tobacco smoke (in preschool-aged children)</li> </ul> </li> <li>▪ Limited or suggestive evidence of an association           <ul style="list-style-type: none"> <li>▪ None found</li> </ul> </li> </ul>
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## Clearing the Air

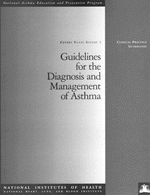

### Indoor Air Exposures and Asthma Exacerbation

<p><b>Biological Agents</b></p> <ul style="list-style-type: none"> <li>▪ Sufficient evidence of a causal relationship           <ul style="list-style-type: none"> <li>▪ Cat</li> <li>▪ Cockroach</li> <li>▪ House dust mite</li> </ul> </li> <li>▪ Sufficient evidence of an association           <ul style="list-style-type: none"> <li>▪ Dog</li> <li>▪ Fungi/Molds</li> <li>▪ Rhinovirus</li> </ul> </li> <li>▪ Limited or Suggestive Evidence of an Association           <ul style="list-style-type: none"> <li>▪ Domestic birds</li> <li>▪ Chlamydia and Mycoplasma pneumoniae</li> <li>▪ RSV</li> </ul> </li> </ul>	<p><b>Chemical Agents</b></p> <ul style="list-style-type: none"> <li>▪ Sufficient evidence of a causal relationship           <ul style="list-style-type: none"> <li>▪ Environmental tobacco smoke (in preschool-aged children)</li> </ul> </li> <li>▪ Sufficient evidence of an association           <ul style="list-style-type: none"> <li>▪ NO<sub>2</sub>, NO<sub>x</sub> (high levels)</li> </ul> </li> <li>▪ Limited or suggestive evidence of an association           <ul style="list-style-type: none"> <li>▪ Environmental tobacco smoke (school-aged, older children and adults)</li> <li>▪ Formaldehyde</li> <li>▪ Fragrances</li> </ul> </li> </ul>
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## Clinical Management of Asthma



**Expert Panel Report 2**  
National Asthma Education and Prevention Program  
National Heart, Lung, and Blood Institute, 1998





## Diagnosing Asthma:

### Medical History

- Symptoms
  - Coughing
  - Wheezing
  - Shortness of breath
  - Chest tightness
- Patterns to Symptoms
- Severity
- Family History







## Diagnosing Asthma:

### Patient Checklist

- Troublesome cough, particularly at night
- Awakened by coughing
- Coughing or wheezing after physical activity
- Breathing problems during particular seasons
- Coughing, wheezing, or chest tightness after exposure to allergens
- Colds that last more than 10 days
- Relief when medication is used



### Diagnosing Asthma: Physical Examination

- Sounds of wheezing during normal breathing
- Hyperexpansion of the thorax
- Increased nasal secretions or nasal polyps
- Atopic dermatitis, eczema, or other allergic skin conditions



### Medications to Treat Asthma

- Medications come in a variety of forms.
- Two major categories of medications are:
  - Long-term control
  - Quick relief



### Medications to Treat Asthma: Long-Term Control

- Taken daily, over a long period of time
- Used to reduce inflammation, relax airway muscles, and improve symptoms and pulmonary function
  - Inhaled corticosteroids
  - Long-acting beta<sub>2</sub>-agonists
  - Leukotriene modifiers



### Medications to Treat Asthma: Quick-Relief



- Used in acute asthma episodes
- Generally they are short-acting beta<sub>2</sub>-agonists



### Medications to Treat Asthma: How to Use a Spray Inhaler

Remember to breathe in slowly.



**Health-care provider should evaluate inhaler technique at each visit.**

Source: "What You and Your Family Can Do About Asthma" by the Global Initiative For Asthma  
Created and funded by NIH/NHLBI



### Medications to Treat Asthma: Inhalers and Spacers



Inhalers



Spacers

**Spacers can help patients who have difficulty with technique and can reduce potential side effects.**

Use of trade names does not reflect endorsement of these products.



## Medications to Treat Asthma: Nebulizers

- Uses compressed air machine to deliver medicine as a mist
- Good for small children or for severe asthma episodes



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## Managing Asthma: Asthma Management Goals

- Control symptoms
- Prevent exacerbation
- Maintain lung function as close to normal as possible
- Avoid adverse effects from medications
- Prevent irreversible airway obstruction
- Prevent asthma mortality

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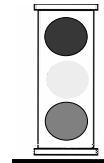
## Managing Asthma: Asthma Management Plan

- Develop with a physician
- Tailor to meet individual needs
- Educate patients and families on all aspects of the plan
  - Recognizing symptoms
  - Medication benefits and side effects
  - Proper use of inhalers and peak expiratory flow (PEF) meters

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## Managing Asthma: Sample Asthma Management Plan

Describes what medicines to use and actions to take



National Heart, Lung, and Blood Institute

CDC

## Managing Asthma: Peak Expiratory Flow (PEF) Meters

Allows the patient to assess the status of his or her asthma



Use of trade names does not reflect endorsement of these products

CDC

## Managing Asthma: Peak Flow Chart

People with moderate or severe asthma should take readings—

- Every morning and evening
- After an exacerbation
- Before inhaling certain medications

Source: "What You and Your Family Can Do About Asthma" by the Global Initiative For Asthma Created and funded by NIH/NHLBI

CDC

### Managing Asthma: Indications of a Severe Attack

- **Breathless at rest**
- **Hunched forward**
- **Talking in words rather than sentences**
- **Agitated**
- **Peak flow rate is less than 60% of normal**



### Managing Asthma: Things You Can Do

- **Have an individual management plan**
- **Educate yourself and others about—**
  - **Asthma management plans**
  - **Environmental interventions**
- **Seek help from asthma resources**
- **Join an asthma support group**

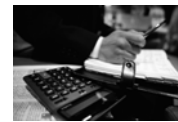


### A Public Health Response to Asthma

A call to action for organizations and individuals with an interest in asthma management to work as partners in reducing the burden of asthma within our nation's communities



### A Public Health Response to Asthma: Surveillance

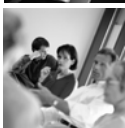


Over time...

- **How much asthma is there in the population?**
- **How severe is asthma across the population?**
- **How well is asthma controlled in the population?**
- **What is the cost of asthma?**



### A Public Health Response to Asthma: Uses of Surveillance Data



- **Education about asthma in the population**
- **Basis for planning and targeting intervention activities**
- **Evaluation of intervention activities**



### A Public Health Response to Asthma: Education



- Education programs can be targeted to—
- **People with asthma**
  - **Parents of children with asthma**
  - **Medical care providers**
  - **School personnel**
  - **General public**



### A Public Health Response to Asthma: Coalitions

Successful  
asthma  
campaigns  
need the  
cooperation of  
committed  
partners.



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### A Public Health Response to Asthma: Advocacy



Asthma needs to be addressed  
in a comprehensive manner  
by multiple government agencies.

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### A Public Health Response to Asthma: Interventions

- Medical management
- Environment
- Schools



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### A Public Health Response to Asthma: Medical Management Interventions



Ensuring people  
with asthma know  
about their  
disease and are  
empowered to  
demand  
appropriate  
management

CDC

### A Public Health Response to Asthma: Environmental Interventions



Help people create and  
maintain a healthy  
home and work  
environment.



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### A Public Health Response to Asthma: School Interventions

- Education
- Environment
- Resolution of school  
issues



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### A Public Health Response to Asthma: School Interventions

- #1 cause of school absence for a chronic disease
- Most common disease addressed by school nurses
- Affects teachers, administrators, nurses, coaches, and maintenance personnel



### A Public Health Response to Asthma: School Interventions

- Mold and mildew
- Animals in the classroom
- Carpets in the classroom
- Cockroaches
- Air quality
  - Fumes and vapors
  - ETS



### A Public Health Response to Asthma: School Interventions

- Put policies and procedures in place for managing children with asthma.
- Keep management plan on file at the school.
- Make medications available at all times:
  - During school hours
  - During pre-school and after-school programs
  - On field trips or when away from campus
- Train personnel to recognize signs of an asthma attack and to use appropriate medications.



### A Public Health Response to Asthma: Evaluation

- Are we doing the right thing?
- Are we doing things right?



### A Public Health Response to Asthma: Summary

- Asthma is complex and not yet preventable or curable.
- Asthma can be managed with medication, environmental changes, and behavior modifications.
- By working together, we can ensure that people with asthma enjoy a high quality of life.



### Resources

- National Asthma Education and Prevention Program
  - <http://www.nhlbi.nih.gov/about/naepp/index.htm>
- Asthma and Allergy Foundation of America
  - <http://www.aafa.org>
- American Lung Association
  - <http://www.lungusa.org>
- American Academy of Allergy, Asthma, and Immunology
  - <http://www.aaaai.org>



## Resources

- Allergy and Asthma Network, Mothers of Asthmatics. Inc.
  - <http://www.aanma.org/>
- American College of Allergy, Asthma, and Immunology
  - <http://allergy.mcg.edu>
- American College of Chest Physicians
  - <http://www.chestnet.org>
- American Thoracic Society
  - <http://www.thoracic.org>

