

A PAPER PRESENTATION  
ON  
**PEDIATRIC ASTHMA**

BY  
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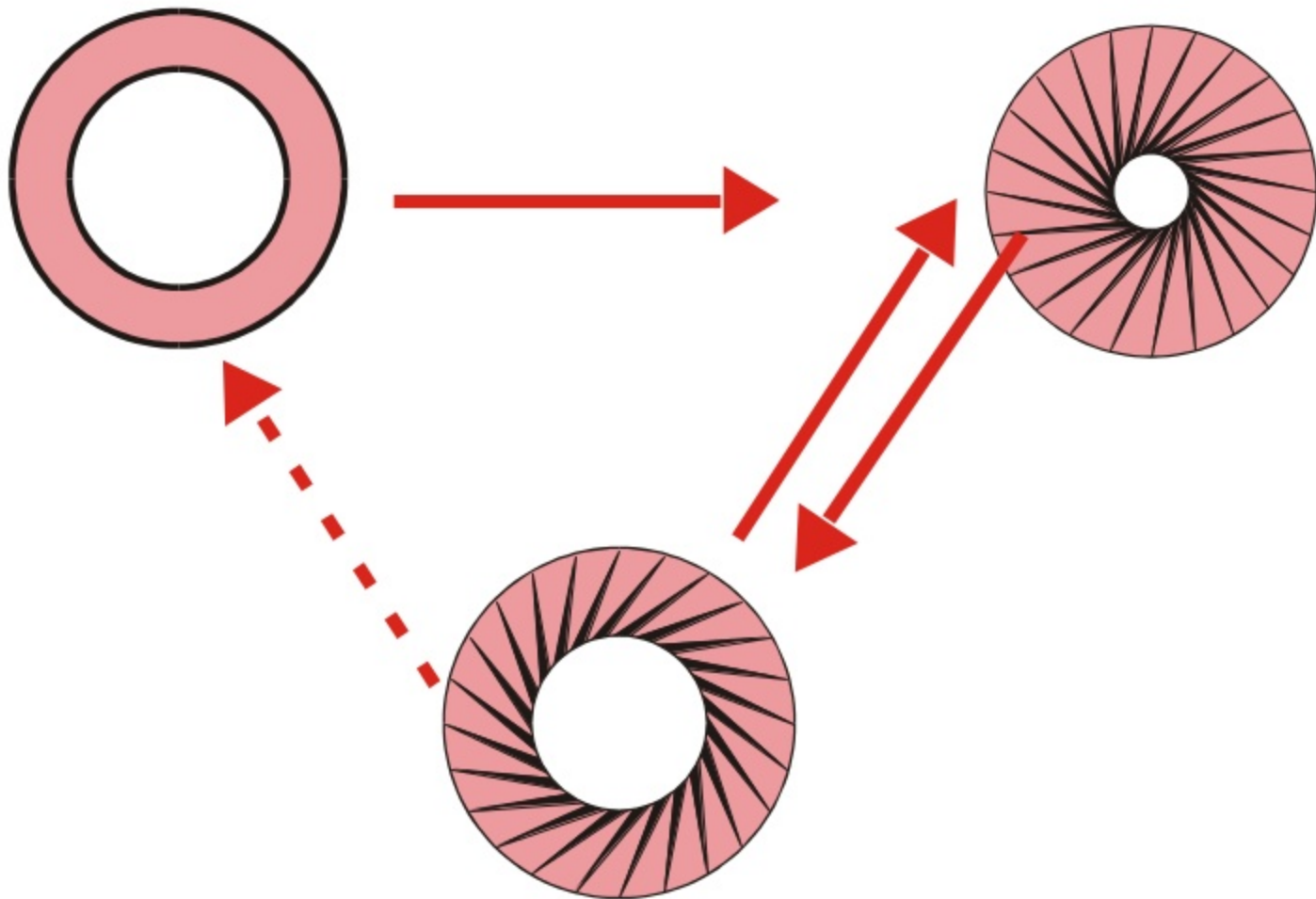
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# ASTHMA - DEFINITION

- A disease characterized by an increased responsiveness of the airways to various stimuli resulting in **airway obstruction** that is reversible either spontaneously or as a result of treatment
- **Acute asthma** - presence of active symptoms from airway obstruction and/or inflammation
- **Chronic asthma** - absence of extended periods free of symptoms without treatment

## What is asthma?

Asthma is a chronic respiratory disorder in which there is primarily swelling of airways in the lungs. The airways are therefore narrowed making it difficult to breathe



## Why focus only on asthma?

- As per WHO, India has 30 million asthmatics which is 10% of the global asthmatic population
- The prevalence of asthma is higher in children. Today, up to 1 out of 10 children in India has asthma.
- Asthma is the most common chronic condition in children
- As per a study, Asthma in children has doubled over the past 5 years and is rapidly increasing
- There will be an additional 100million asthmatics worldwide by 2025

# Kashmir lockdown claims the life of a young asthma patient

*Indian Express, 9th July 2010*

## Mohali boy dies of asthma attack

*Tribune, 16<sup>th</sup> April 2010*

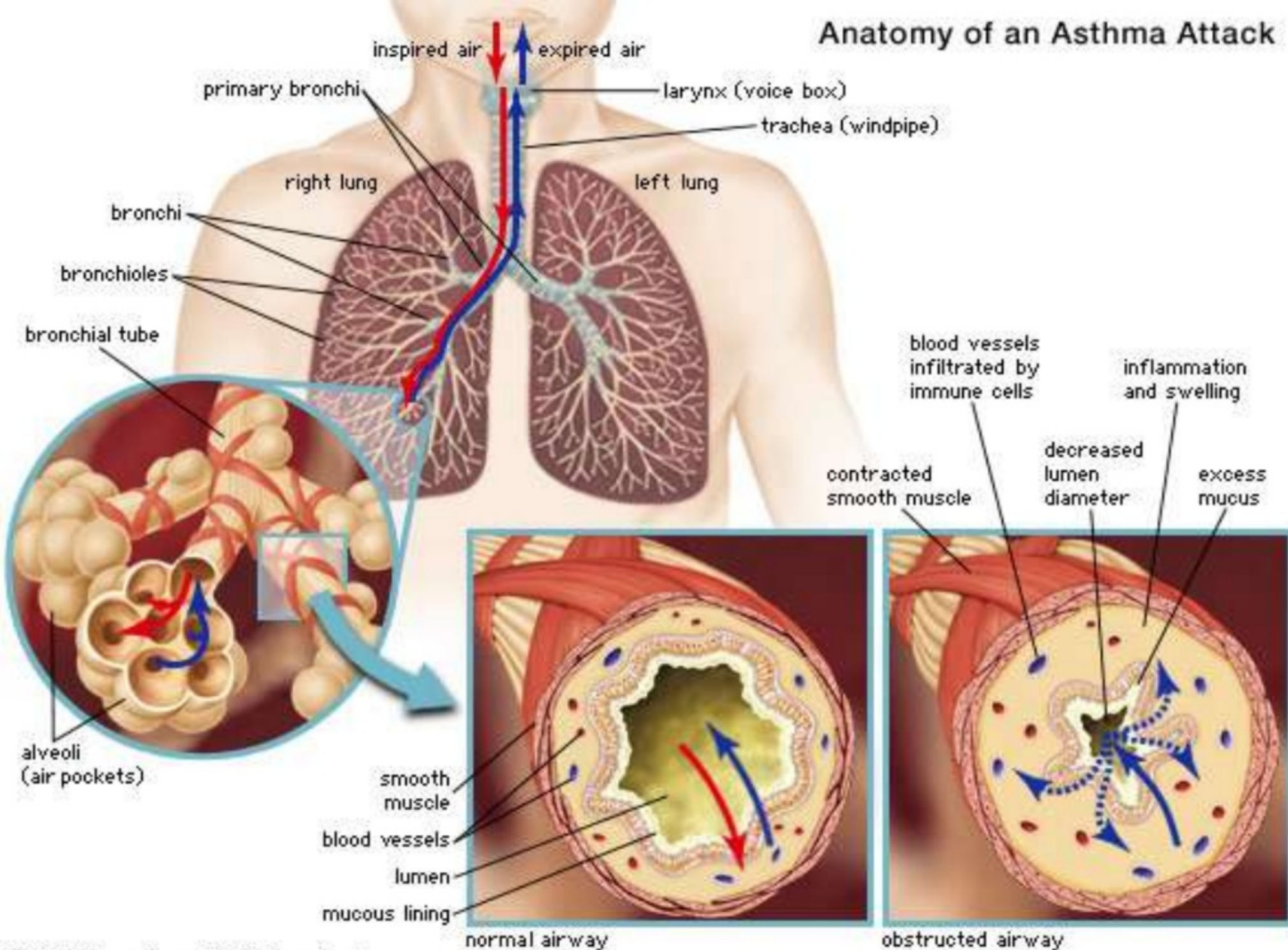
>1 year after the death of Akruti Bhatia in Delhi



~ 180,000 people die of asthma each year  
.....almost all of these are **preventable**



# Anatomy of an Asthma Attack



# Asthma Inflammation

## Inflammatory cells

Mast cells  
Eosinophils  
Th2 cells  
Basophils  
Neutrophils  
Platelets

## Structural cells

Epithelial cells  
Sm muscle cells  
Endothelial cells  
Fibroblast  
Nerves



## Mediators

Histamine  
Leukotrienes  
Prostanoids  
PAF  
Kinins  
Adenosine  
Endothelins  
Nitric oxide  
Cytokines  
Chemokines  
Growth factors



## Effects

Bronchospasm  
Plasma exudation  
Mucus secretion  
AHR  
Structural changes



# Factors Influencing the Development and Expression of Asthma



## Host factors –

- Genetic
  1. Genes predisposing to atopy
  2. Genes predisposing to airway hyper responsiveness
- Obesity
- Sex



## How does a child get an asthma attack?

Asthma is the swelling of the airways and excessive mucus production which causes cough and difficulty in breathing. When the swollen lungs come into the contact with any of the following, an asthma attack is triggered



**Dust and smoke**



**Pollen from plants**



**Chalk dust in school**



**Physical exertion  
and exercise**



**Change in weather**



**Strong emotions  
such as laughing  
and crying**



**Furry animals &  
bird feathers**

## Other Challenges



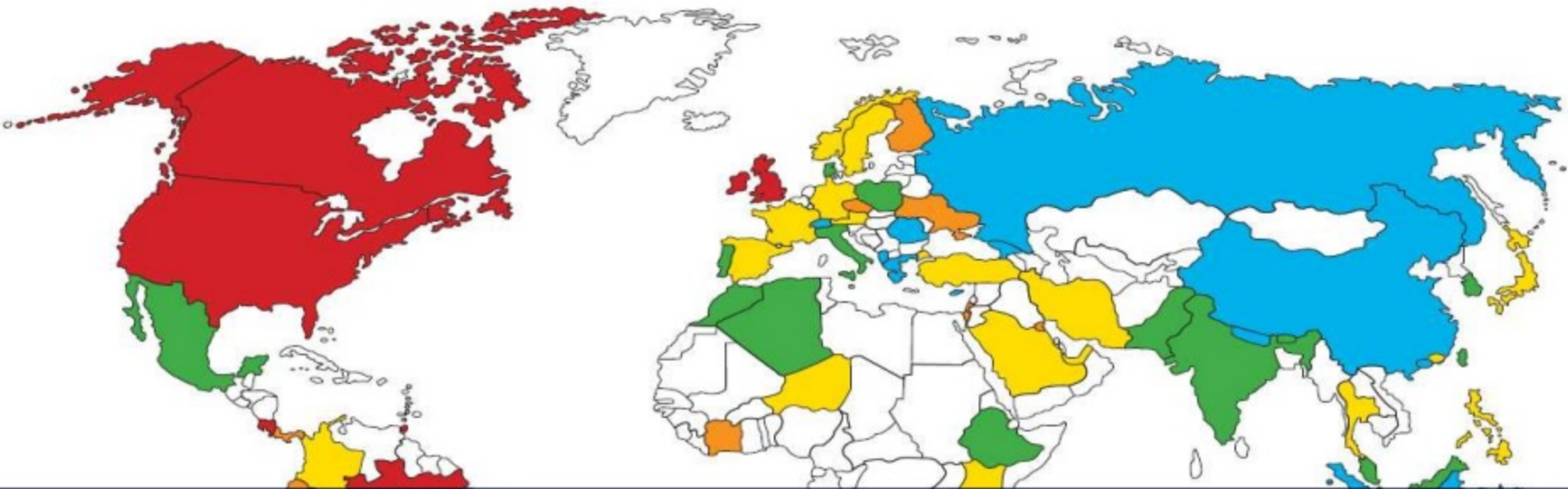
- Most of the children are below 5 years of age, who cannot tell their problems
- Parents are proxy story teller, who may mislead the doctor
- PEF cannot be performed in children below 5 years of age
- Fear of addiction to inhalation therapy
- Physicians lack of knowledge and time

# Risk factors of Asthma in younger children

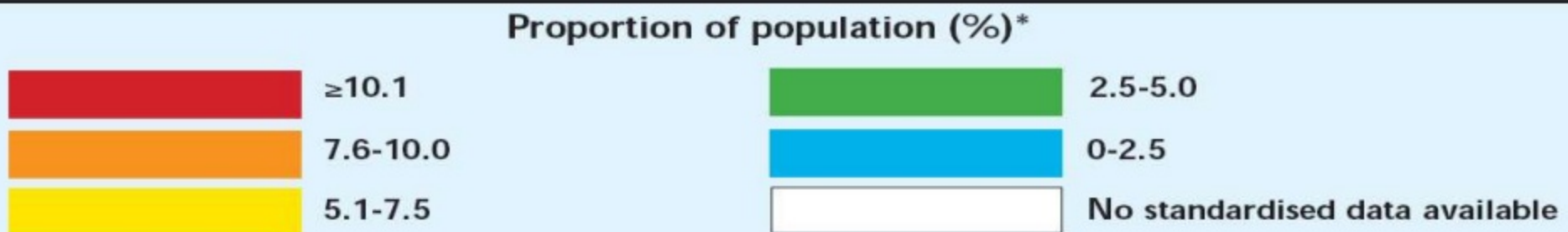


- Sensitization to allergen.
- Maternal diet during pregnancy and/ or lactation.
- Pollutants (particularly environmental tobacco smoke).
- Microbes and their products.
- Respiratory (viral) infections.
- Psychosocial factors.

# World Map of the Prevalence of Clinical Asthma



The prevalence of childhood asthma has continued to increase on the Indian subcontinent over the past 10 yrs  
*ISAAC Phase 3 Thorax 2007;62:758*





## Symptomatology

- **Cough – 90%**
- **Wheezing – 74%**
- **Exercise induced wheeze or cough – 55%**

# When does Asthma begin?

- By 1 year – 26%
- 1-5 years – 51.4%
- > 5 years – 22.3%

**77% Of Asthma Begins  
In Children Less Than 5  
Years**



# Physical Examination (Look)

- General Attitude And Well Being
- Deformity Of The Chest
- Character Of Breathing
- Thorough Auscultation Of Breath Sounds
- Signs Of Any Other Allergic Disorders On The Body
- Growth And Development Status

## What all features one should look for specifically?

### ✓ Cough

- Persistent/ recurrent / nocturnal/ exercise-induced

### Associated conditions

- Eczema
- Allergic Rhinitis

### ✓ Weight/Height



## What all investigations can be performed in asthmatic children? (PERFORM)

**Peak expiratory flow rate:** It is highly suggestive of asthma when:

- >15% increase in PEFr after inhaled short acting  $\beta_2$  agonist
- >15% decrease in PEFr after exercise
- Diurnal variation > 10% in children not on bronchodilator

# Differential diagnosis

Age	Common	Uncommon	Rare
<b>Less than 6 months</b>	Bronchiolitis Gastro-esophageal reflux	Aspiration pneumonia Bronchopulmonary dysplasia Congestive heart failure Cystic fibrosis	Asthma Foreign body aspiration
<b>6 months - 2 years</b>	Bronchiolitis Foreign body aspiration	Aspiration pneumonia Asthma Bronchopulmonary dysplasia Cystic fibrosis Gastro-esophageal reflux	Congestive heart failure
<b>2 - 5 years</b>	Asthma Foreign body aspiration	Cystic fibrosis Gastro-esophageal reflux Viral pneumonia	Aspiration pneumonia Bronchiolitis Congestive heart failure Gastro-esophageal reflux

## Confirm Asthma if,

If the child is having 3 attacks of airway obstruction in last 1 yr.

If the child gets 1 attack of asthmatic symptoms after the age of 2 yrs.

Irrespective of age in an attack in children with allergy (eczema, food allergy etc.) or history of atopy.

If the child does not become free of symptoms when infection has ceased or has persistent symptoms for more than a month.

# Impact of Asthma on Children

- 3rd-ranking cause of hospitalization among children under 15
- Almost 13 million school days missed each year
- Affects sleep patterns, concentration
- Impairs ability to enjoy & partake in physical activities

**If not managed properly may contribute to significant morbidity and mortality**

*Advance data from Vital and Health Statistics, NCHS, 2003  
Asthma Prevalence, Health Care Use and Mortality, CDC, 2003-2005*