

A PAPER PRESENTATION
ON
PEDIATRIC ASTHMA

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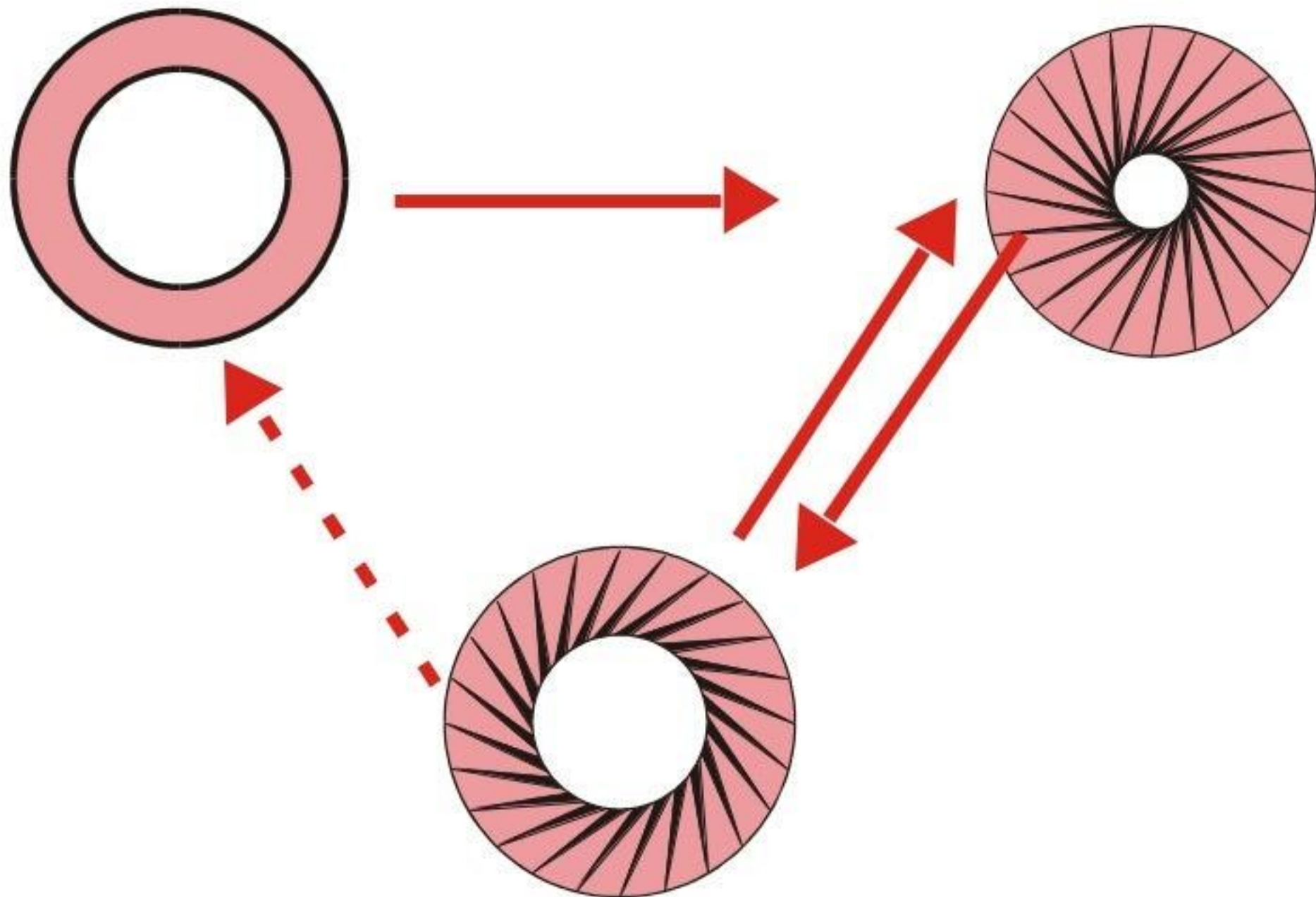
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ASTHMA - DEFINITION

- 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

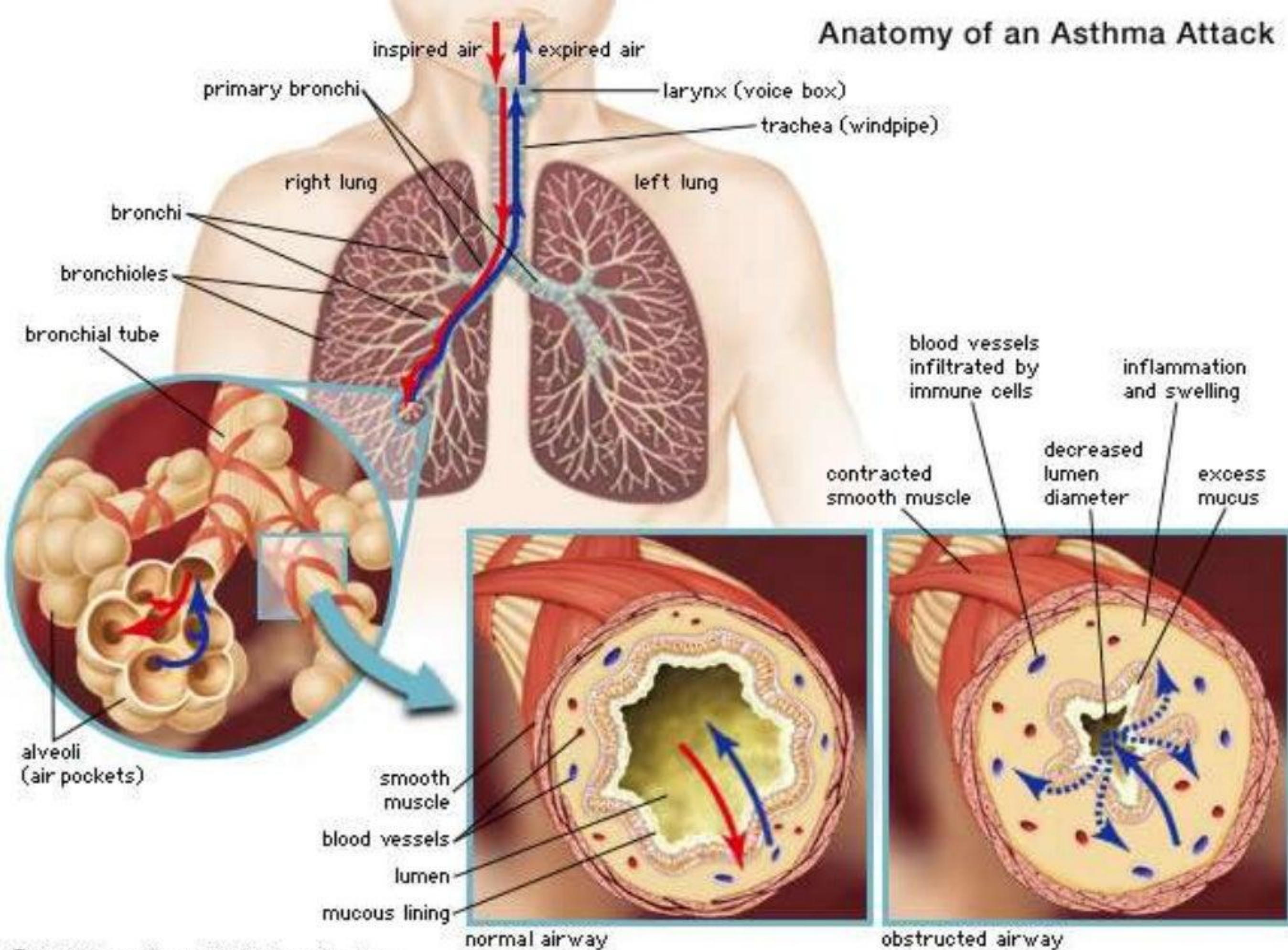
Tribune, 16th April 2010

>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



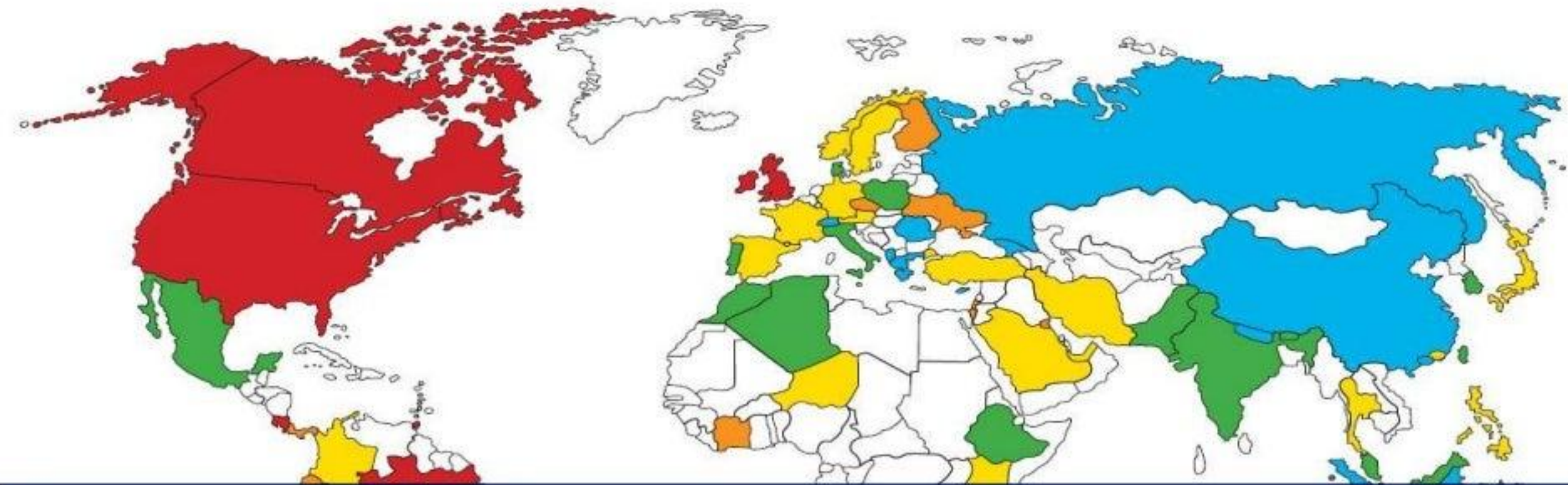
- Most of the children are below 5 years of age, who cannot tell their problems
- Parents are proxy story teller, who may mislead the doctor
- PEF cannot be performed in children below 5 years of age
- Fear of addiction to inhalation therapy
- Physicians lack of knowledge and time

Risk factors of Asthma in younger children



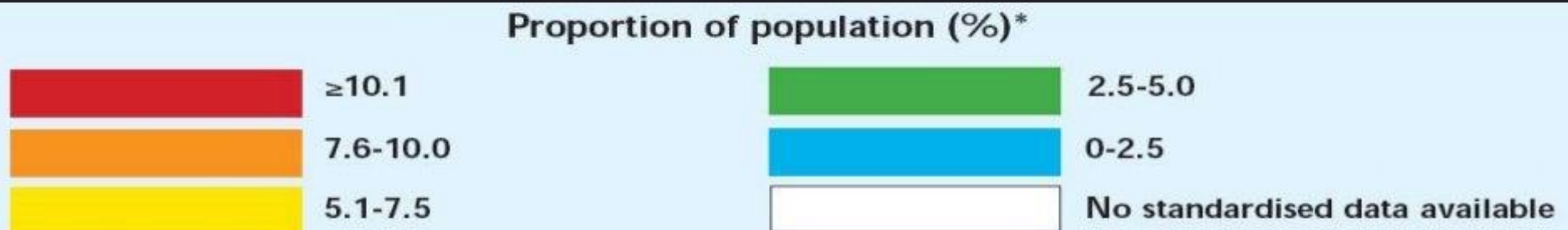
- Sensitization to allergen.
- Maternal diet during pregnancy and/ or lactation.
- Pollutants (particularly environmental tobacco smoke).
- Microbes and their products.
- Respiratory (viral) infections.
- Psychosocial factors.

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 β_2 agonist
- >15% decrease in PEFr after exercise
- Diurnal variation > 10% in children not on bronchodilator

Differential diagnosis

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