

# Overview and Assessment of the Key Databases Health and Air, for Health Studies

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- Chairman, Technical Advisory Committee,Karnataka State Pollution Control board.
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- Founder, Chairman Environment and Health group of Indian Academy of Pediatrics
- Chairman: Health Section. State of Environment action plan. World Bank Project, Karnataka

# LIFETIME EXPOSURES OF POLLUTANTS

- Air



Drinking Water



- Domestic Environments



Soil : Dermal



Soil : Ingestion



“Normal” Food



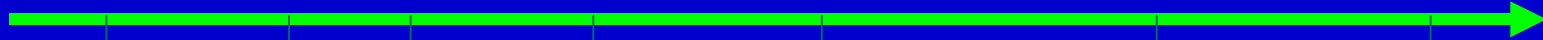
Breast-feeding



Intra-uterine



- Occupational Exposure



Birth

6mths

1yr

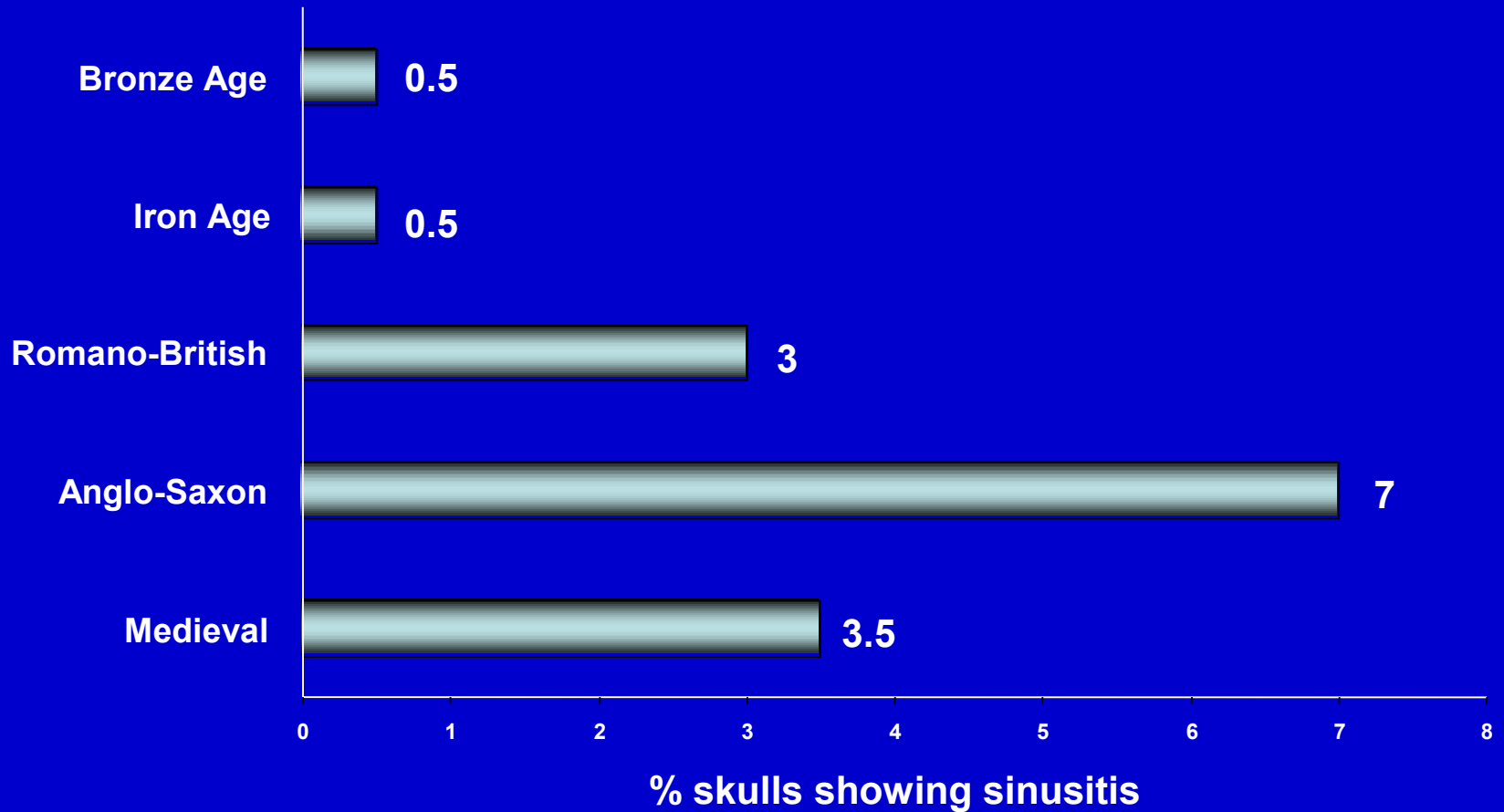
5yrs

16yrs

45yrs

65

# Sinusitis frequency in Britain through the ages



# LUNGS: THE ORGAN OF RESPIRATION

## Vulnerability of children to environmental exposures

- Children are especially vulnerable to the effects of **pollutants**
  - Breathe more air relative to body weight
  - Greater physical activity than adult (124 min Vs 21 min)
  - During exercise there is 5 times more deposition of particles in the lungs (Chaiupa .D.C et al Env.Health Project.2004;112:879-882)
  - Small airways favours deposition
  - Rapid growth and development
  - Different metabolism
- Developmental stage at exposure determines outcome

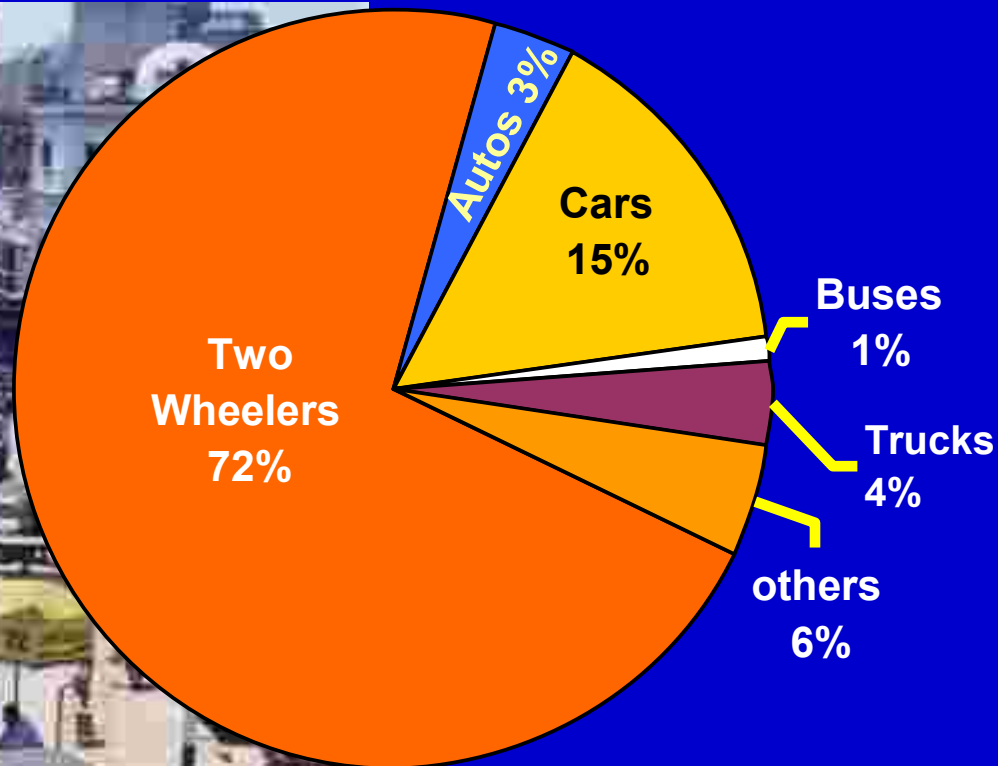


# Environmental impacts on respiratory diseases

- **ETS Intrauterine Smoking – Decrease birth wt, small airways at birth (Nicotine, CO)**
- **ETS exposure associated with lower lung function throughout childhood**
- **Allergens (HDM) & irritants (Ozone) result in altered airway growth (*Plopper et al*)**
  - Decreased branching, thickened walls
- **Strict allergen reduction (*Woodcock et al*)**
  - Greater lung function at 3y
- **Increase O.M; Asthma.AR (*Paramesh.H*)**
- **Increase Sudden infant death syndrome**
- **Increase Sinusitis (*Paramesh.H*)**
- **Increase acute respiratory infection in ill ventilated huts in rural children under 5 years (*Paramesh.H,Cherian.E*)**
- **Indoor pollution altered gender prevalence (*Paramesh.H,Cherian.E*)**
- **Urban children suffer more allergy and rural children more of infection (*Paramesh.H*)**

# Bangalore - Vehicles

Total No. of vehicles as on 31 March 2005 - 25.6 Lakhs

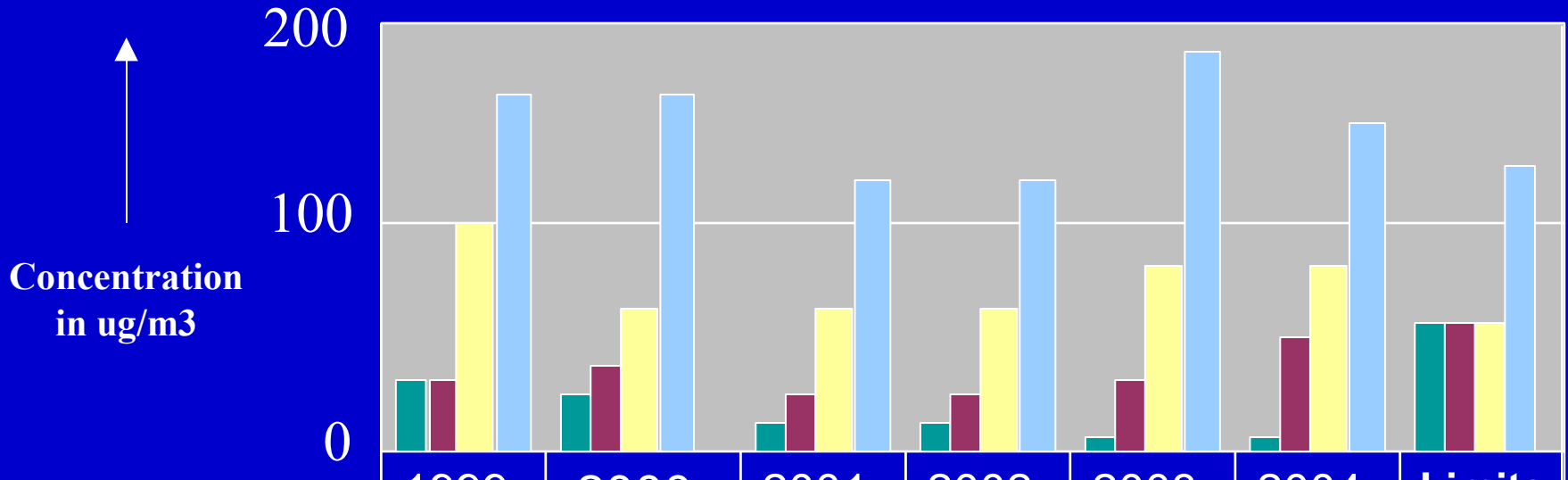


Two Wheelers - 72 %  
Three Wheelers (Autos) - 3 %

Two Wheelers  
Cars  
Trucks  
Autos  
Buses  
others

About 900 new vehicles are being registered in Bangalore everyday

# AMBIENT AIR QUALITY;AMCO BATTERIES



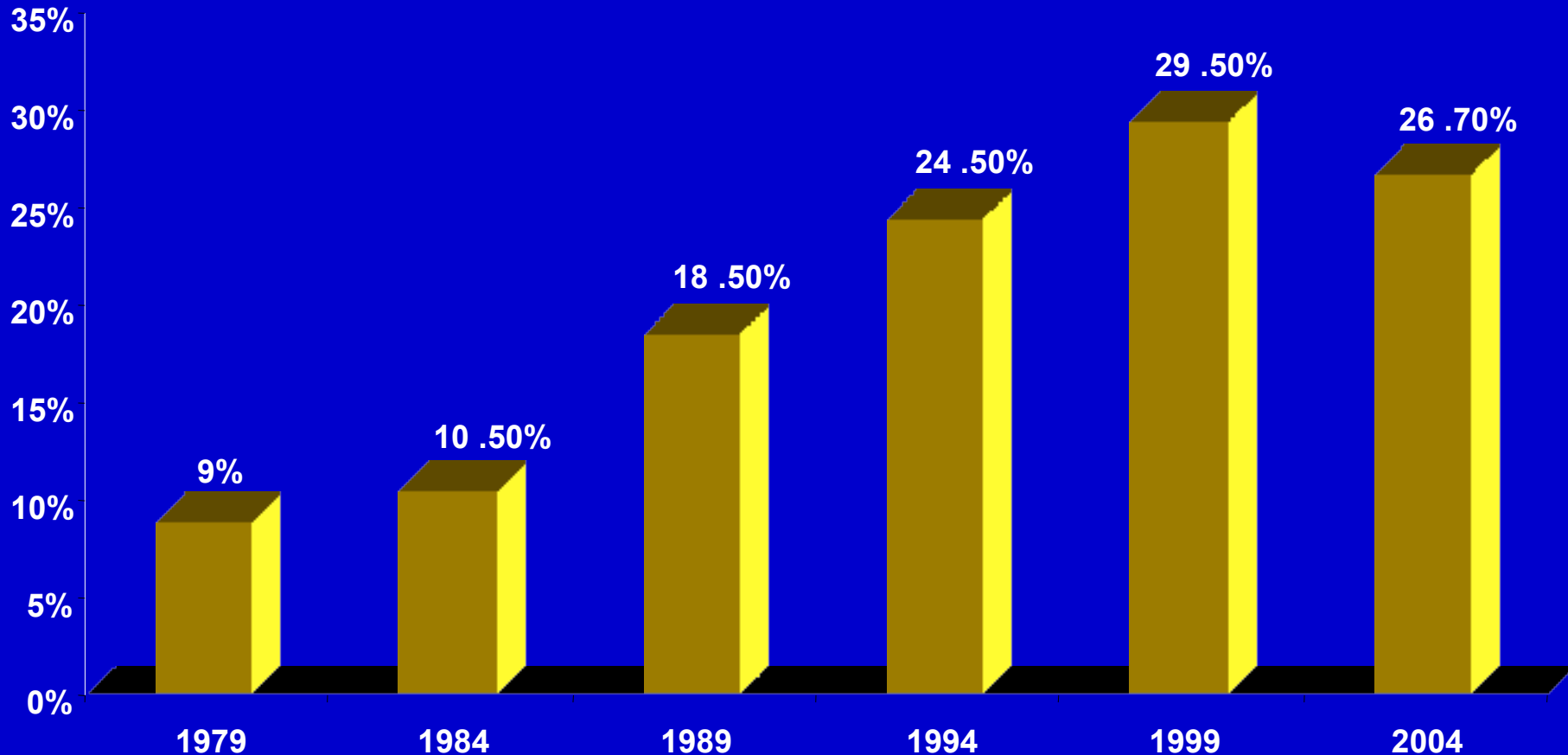
YEAR	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	Limits
SO2	32	26	11	12	6.7	8	60
Nox	31	34	25	26	28.4	54	60
RSPM	98	56	53	55	78.1	75	60
TSPM	160	162	122	119	181.4	150	140

# Indoor Pollutants / Asthma Triggers

Aero-biologicals	Irritants
<ul style="list-style-type: none"> <li>❖ <b>Dust mite</b> - 4000/g</li> <li>❖ <b>Cockroach</b> - 25.00%</li> <li>❖ <b>Fungi Pollens</b> - 07.50%</li> <li>❖ <b>Pets</b> - 05.00%</li> <li>❖ <b>Viruses/Bacteria</b> - 40.00%                             <ul style="list-style-type: none"> <li>○ RSV</li> <li>○ Para influenza</li> <li>○ Corono</li> <li>○ Adeno</li> <li>○ Legionella *</li> </ul> </li> <li>❖ <b>Food</b> - 19.90%</li> </ul>	<ul style="list-style-type: none"> <li>❖ <b>Cigarette smoke</b> <ul style="list-style-type: none"> <li>○ 1994 - 6.0%</li> <li>○ 1999 - 7.5%</li> <li>○ 2004 - 7.9%</li> </ul> </li> <li>❖ <b>Mosquito Coil</b> - 5.0%</li> <li>❖ <b>Other smokes</b></li> <li>❖ <b>Formaldehyde</b></li> <li>❖ <b>Volatile organic compounds</b></li> <li>❖ <b>Asbestos</b></li> <li>❖ <b>Radon</b></li> </ul>

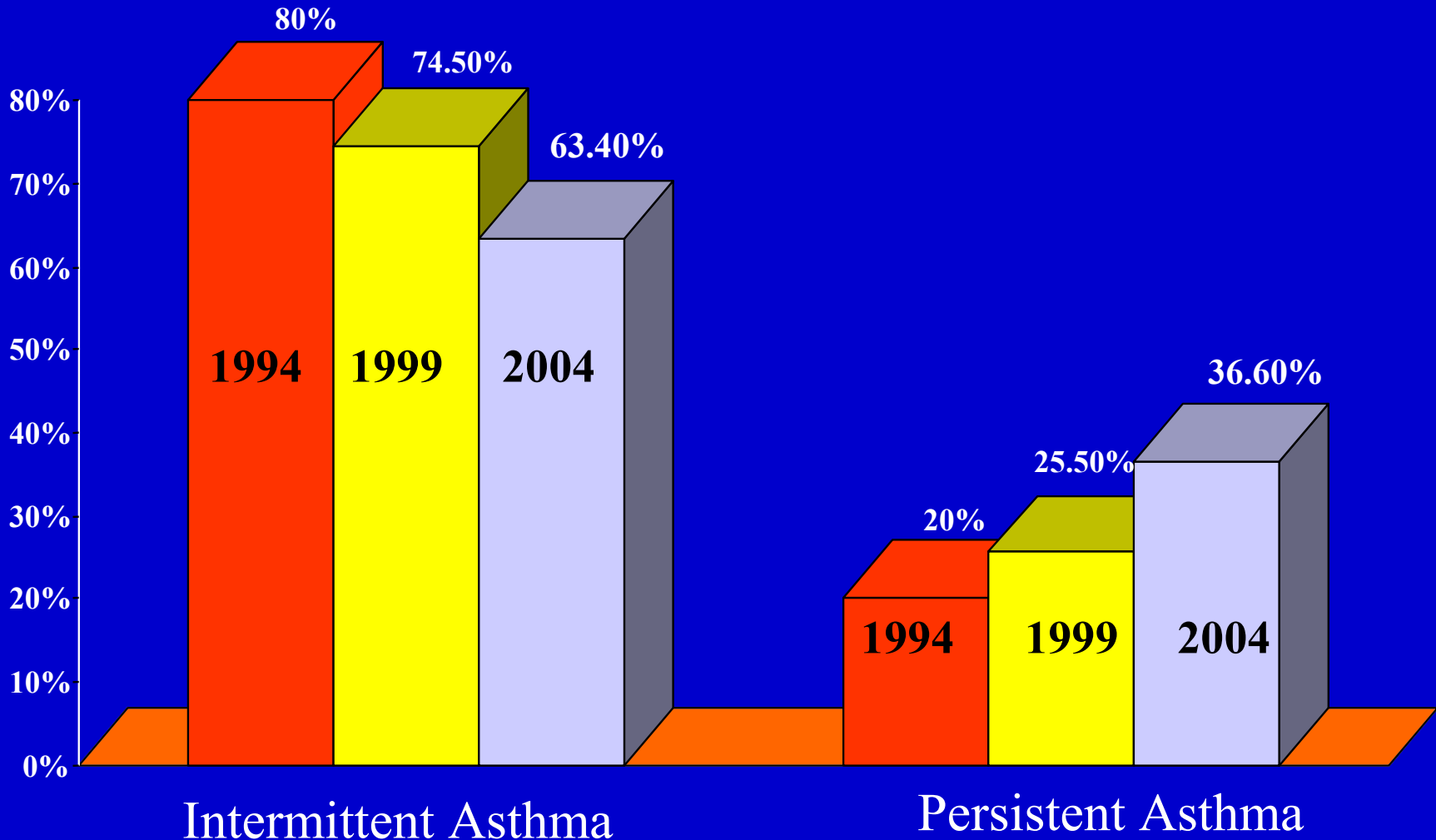


# Asthma Prevalence 1979-2004

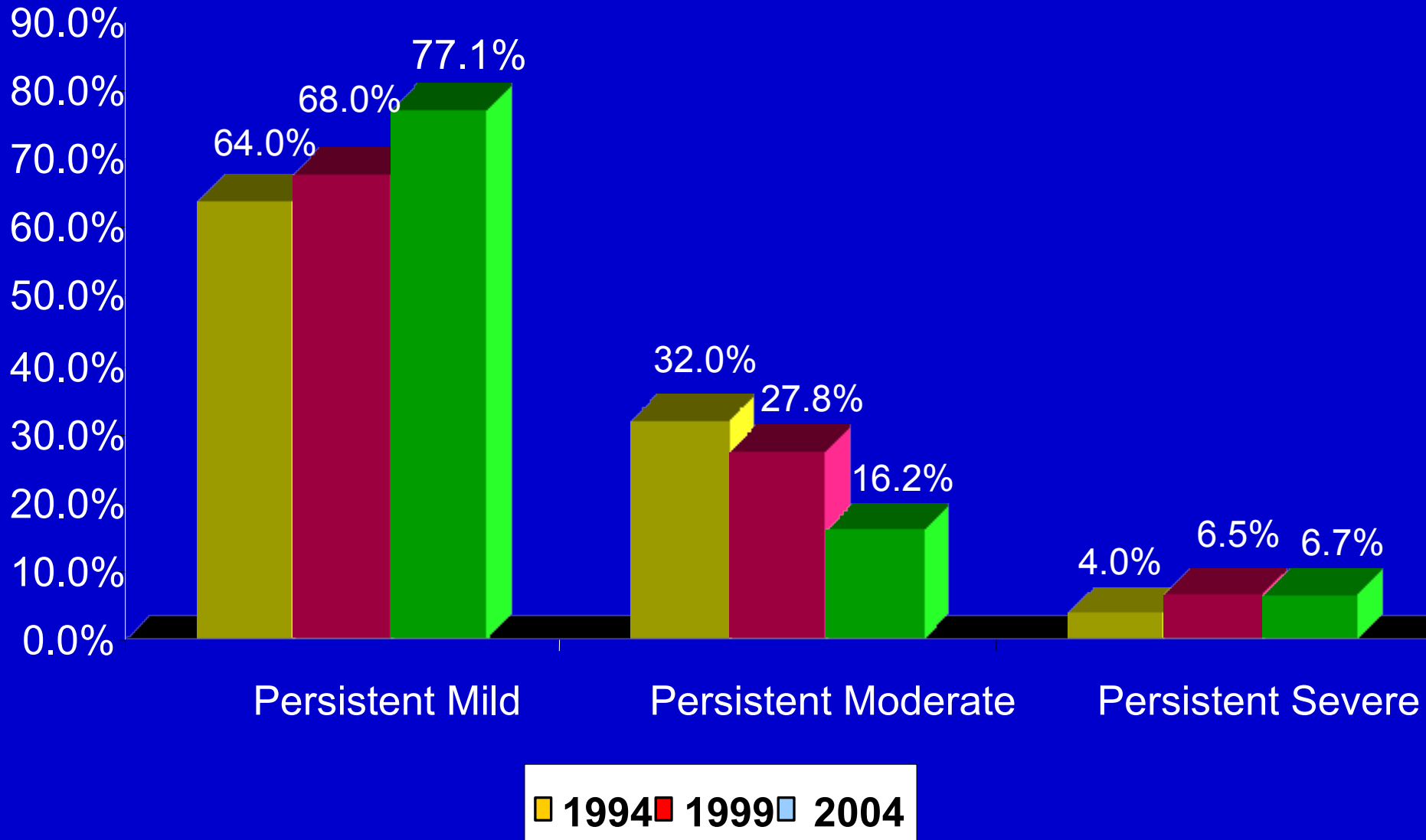


# Prevalence of Persistent Asthma

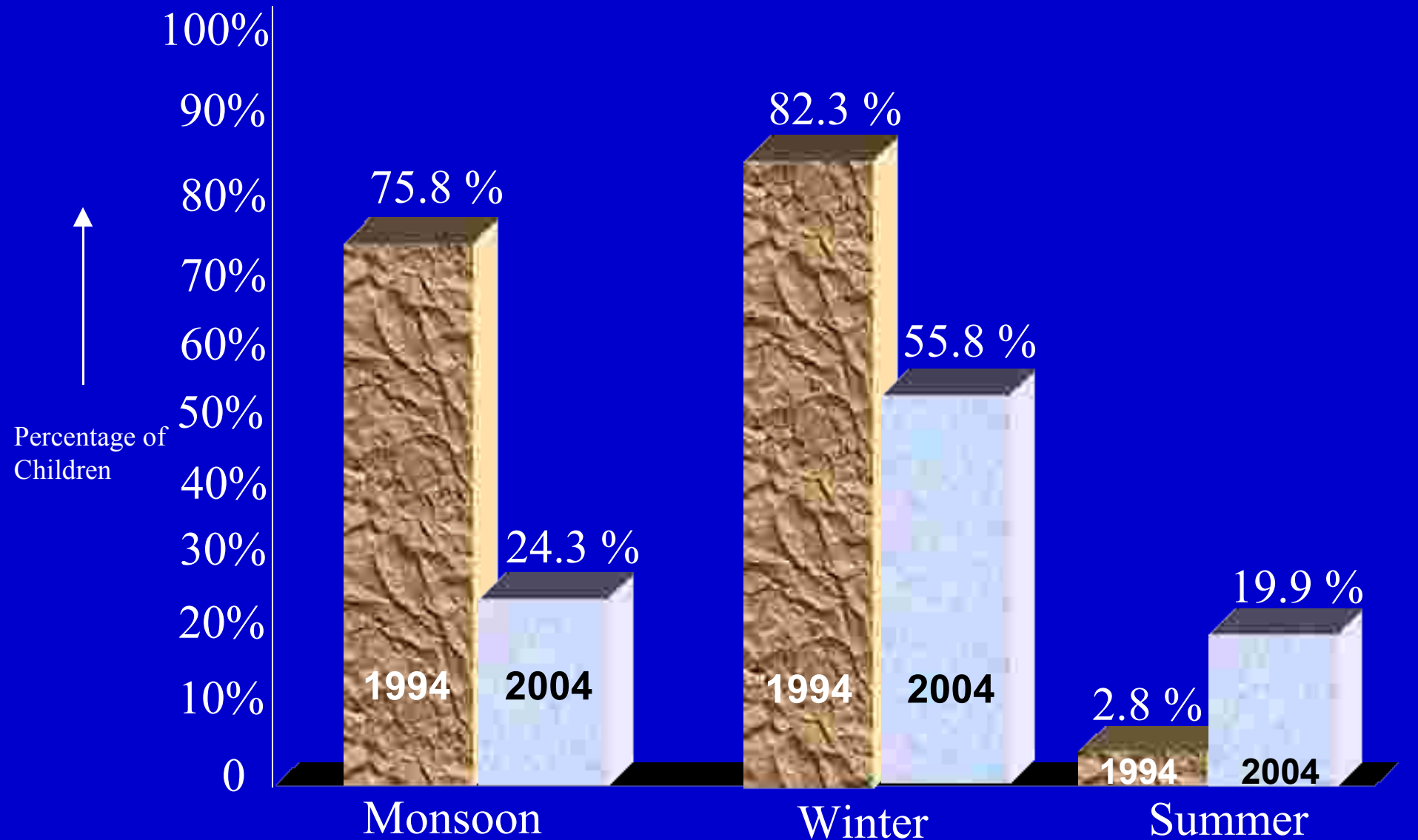
HP



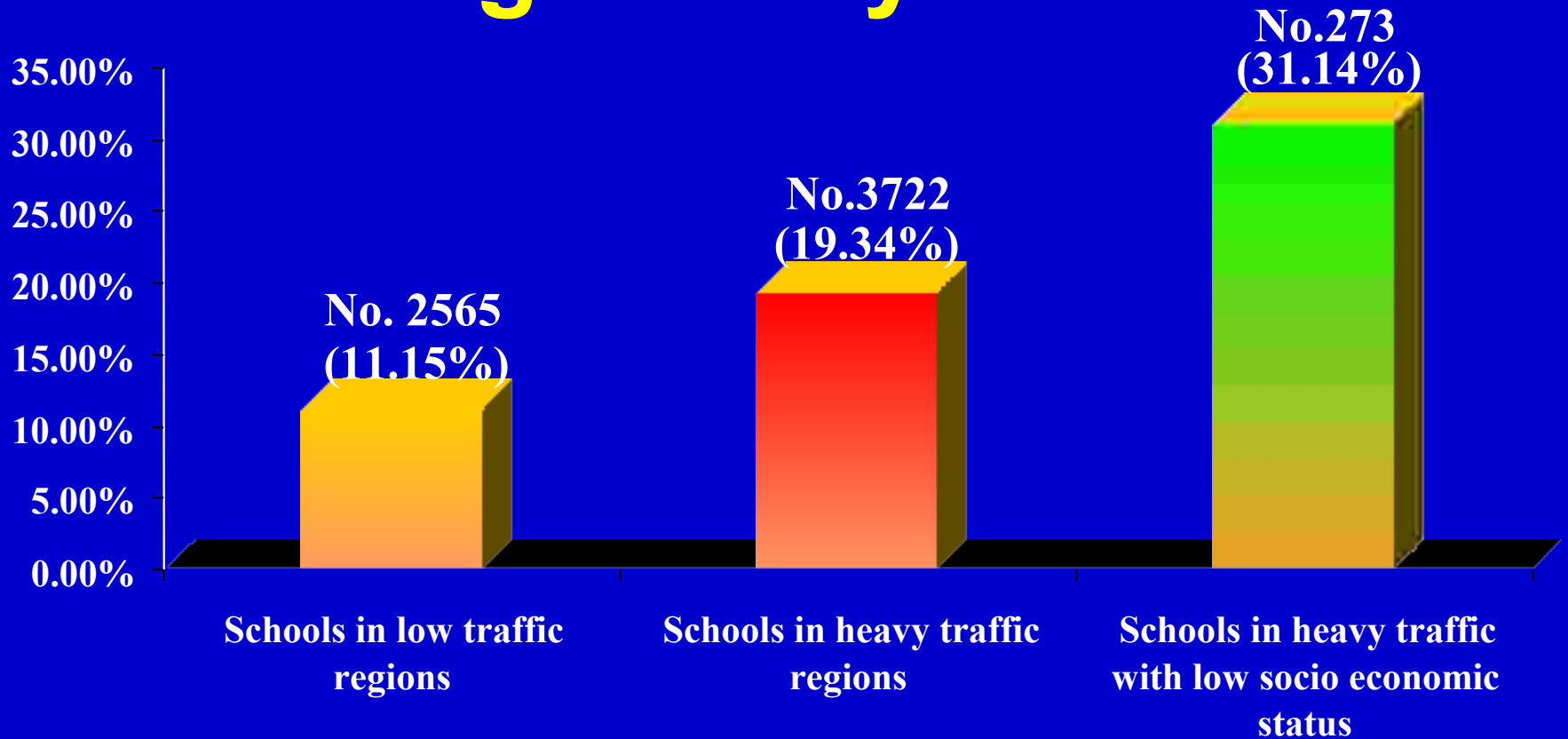
# Persistent Asthma grades and Prevalence



# Seasonal Variation of Asthma



# Prevalence of asthma in school children Age 6-15 years



P. Value I, II & III < 0.001.

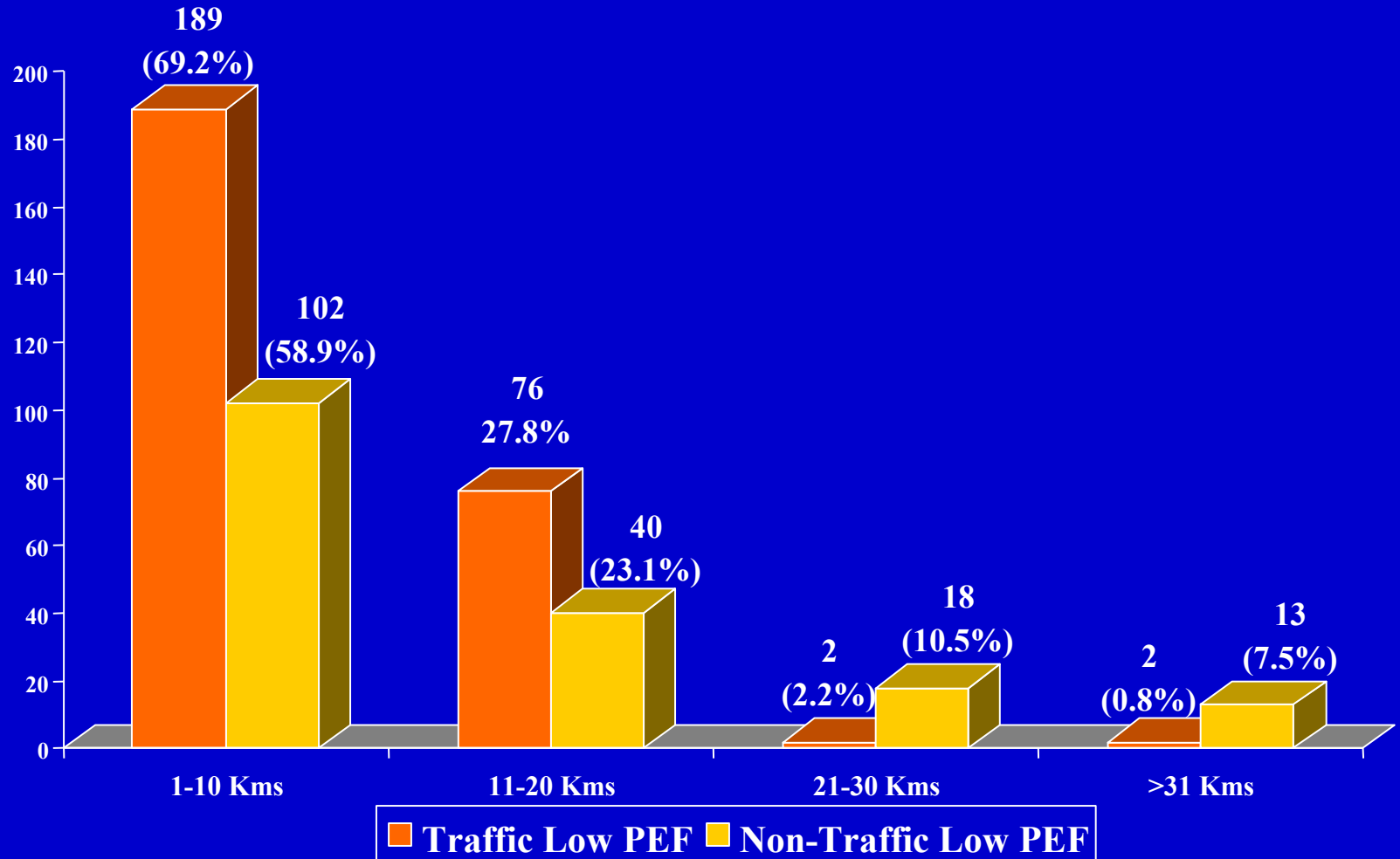
H. Paramesh, Down to earth - 2001

# Symptoms related to air pollution / police Personnel

Symptoms	Traffic (1045)	Non Traffic (1160)
Asthma	26.12%	14.9%
Cough	27 %	14.4 %
Breathlessness	7.8 %	3.6 %
Rhinitis	10.7 %	4 %
Urticaria	11 %	0.1 %
Feverishness	0.57 %	0.17 %
Conjunctivitis	1.4 %	0.0 %

# Distribution of distance from the home to work place

Traffic=1045(273) Non-traffic=1160(173)



# Lead Poisoning

- Ingested, inhaled or absorbed thru skin
- Source
  - 86% of atmospheric lead – auto exhaust, leaded petrol, water pipes, paint, battery storage, crystal glass, ceramic glaze, enamel jewelry etc.
  - Lead concentration in dust is directly proportional to the volume of traffic
  - Children absorb 50% and adults 10-20% of ingested lead.
  - Lead in tissue, cord blood correlate with air levels.
- Effect
  - GIT, peripheral nerve, central nervous system
  - Saudi Arabia study – 5000 children – 1989 – using 0.8 G/L of lead in petrol showed no alarming lead poisoning
  - Bangalore study – **863 children** – using 0.59 G/L of lead in petrol showed – **4.6% of increased lead level over 10µg/dl\***
- Trend
  - Use of unleaded petrol will reduce lead pollution. No cause for fear psychosis, however there should not be any complacency in preventive measures

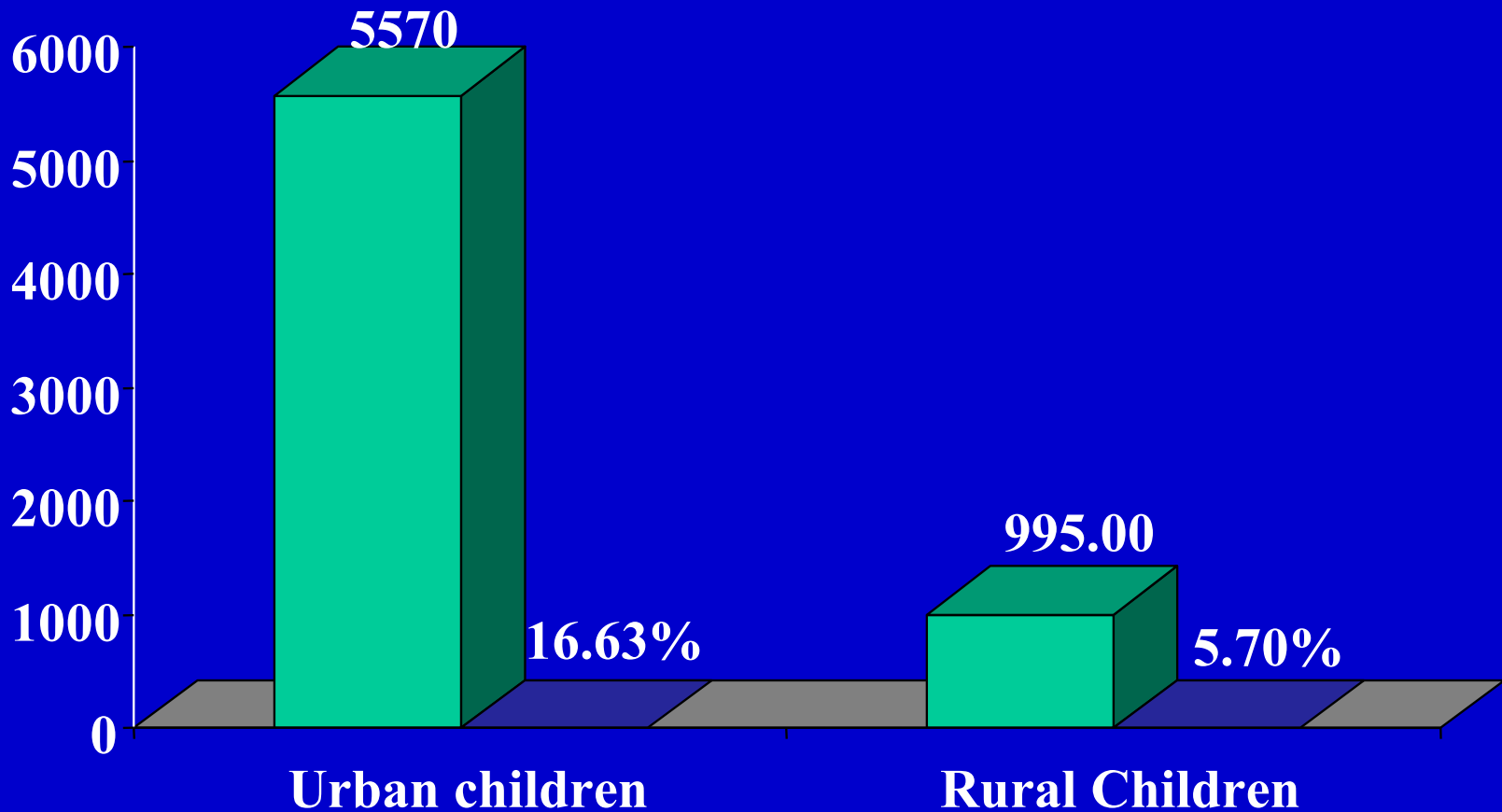
Avoid Mediagenic Disease



# Tobacco smoking habit

- 41% of urban children – 10-17 yrs (3078)
- 21.8% of rural children – 10-17 yrs (2194)
- 36.0% of urban club going women
- 2.0% of rural farm worker women
- 30.6% of traffic police
- 34.0% of non traffic police
- 14.0% of Poultry farm workers
- 28.0% of Agriculture farm workers

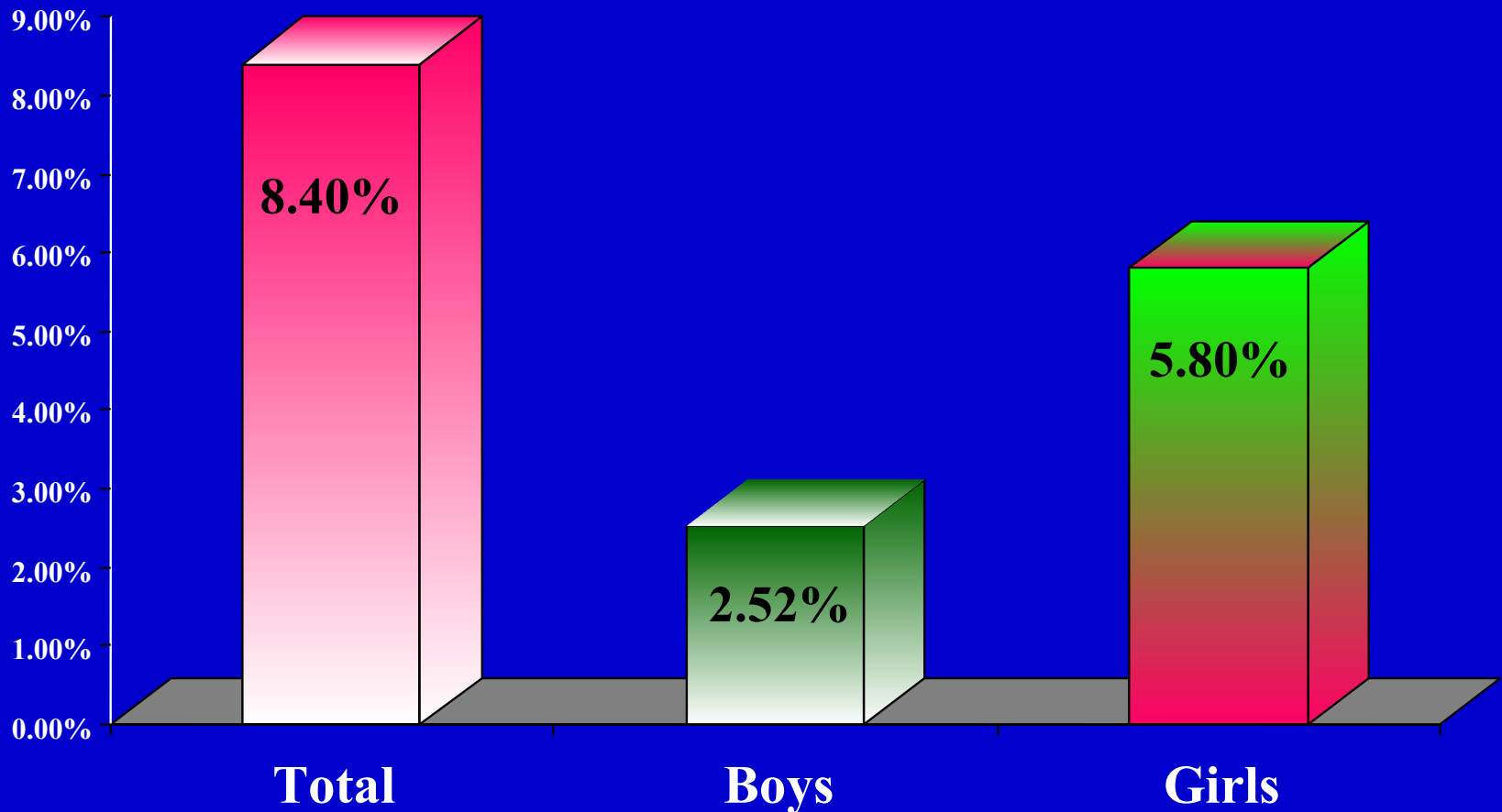
# Asthma urban / rural children Age 6-15 years Year - 1998



# Gender/Asthma

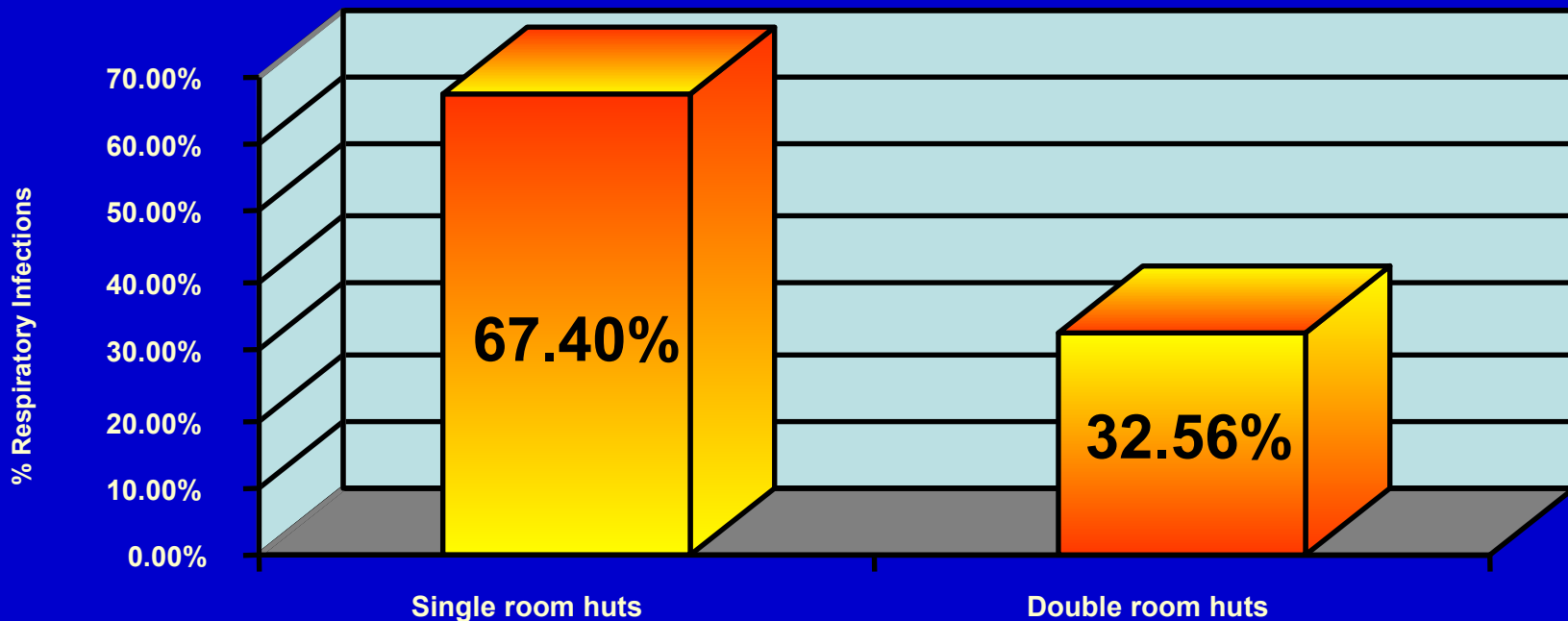
□ M:F = 1.8-1.0 %

**Asthma / Indoor air pollution rural children**  
**Year – 2001, No – 119, Age – 06-15 yrs, Ratio –**  
**M:F – 1:2.3**



# Point prevalence of respiratory infection / indoor pollution no. 612 < 5 years. Rural study

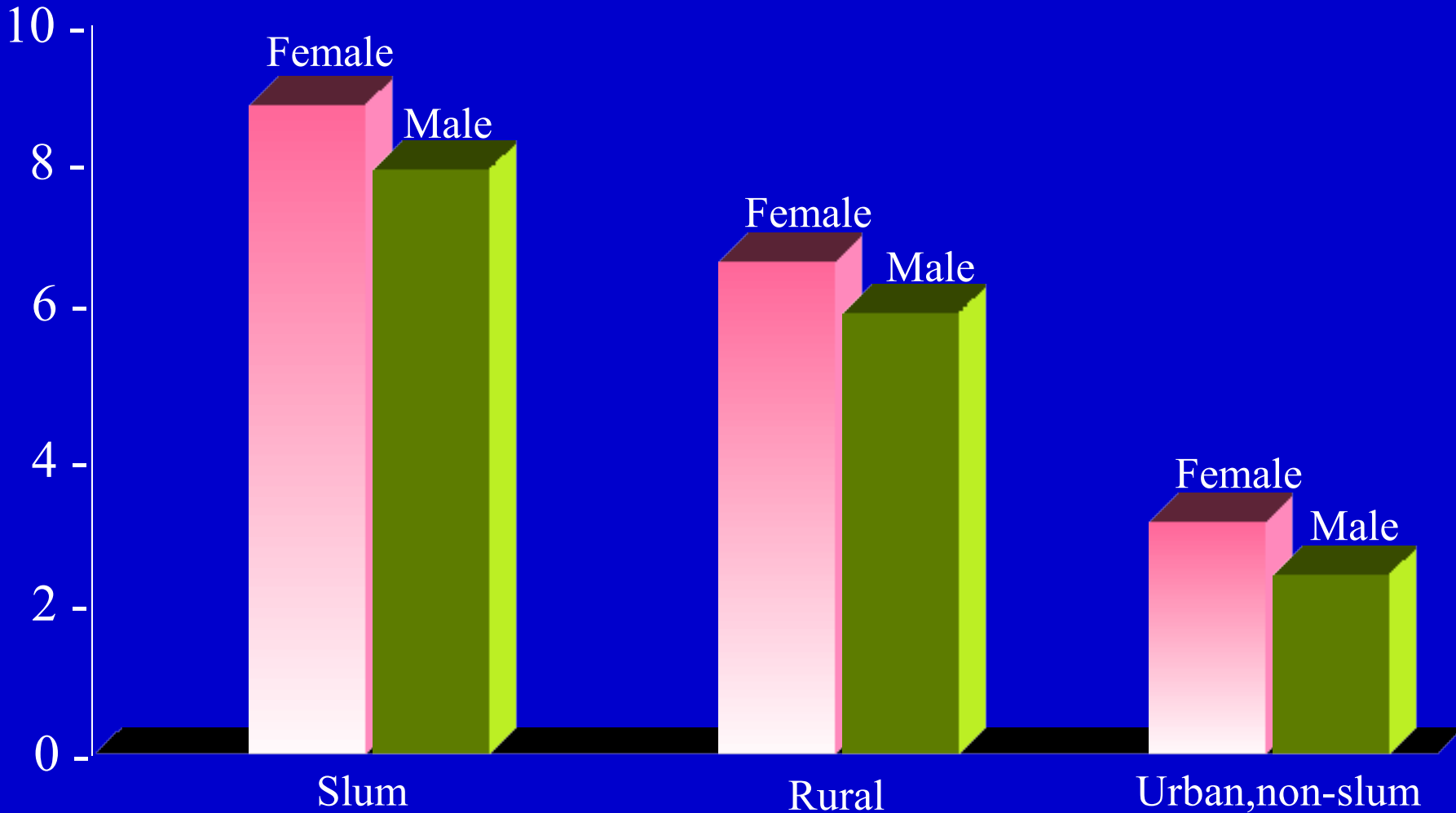
Cooking fuel – Agriwaste, dung cakes



Source - E.Churian, H.Paramesh, Asian Ped Conf Bangkok - 2003

# Women and children bear the brunt of air pollution; those living in slums are the worst affected

Milligram-hour/cubic metre

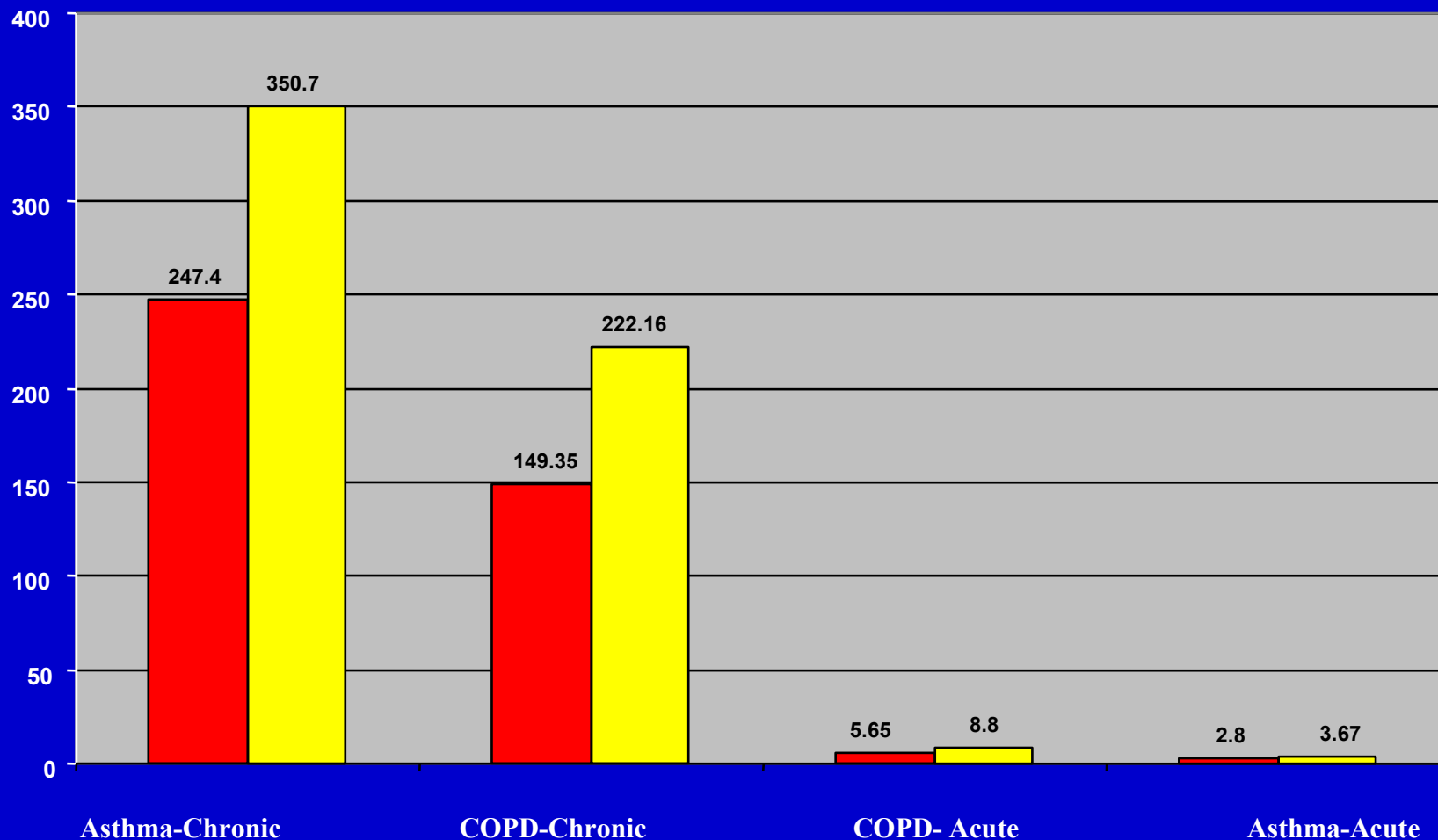


Mean exposure to respirable particulate matter

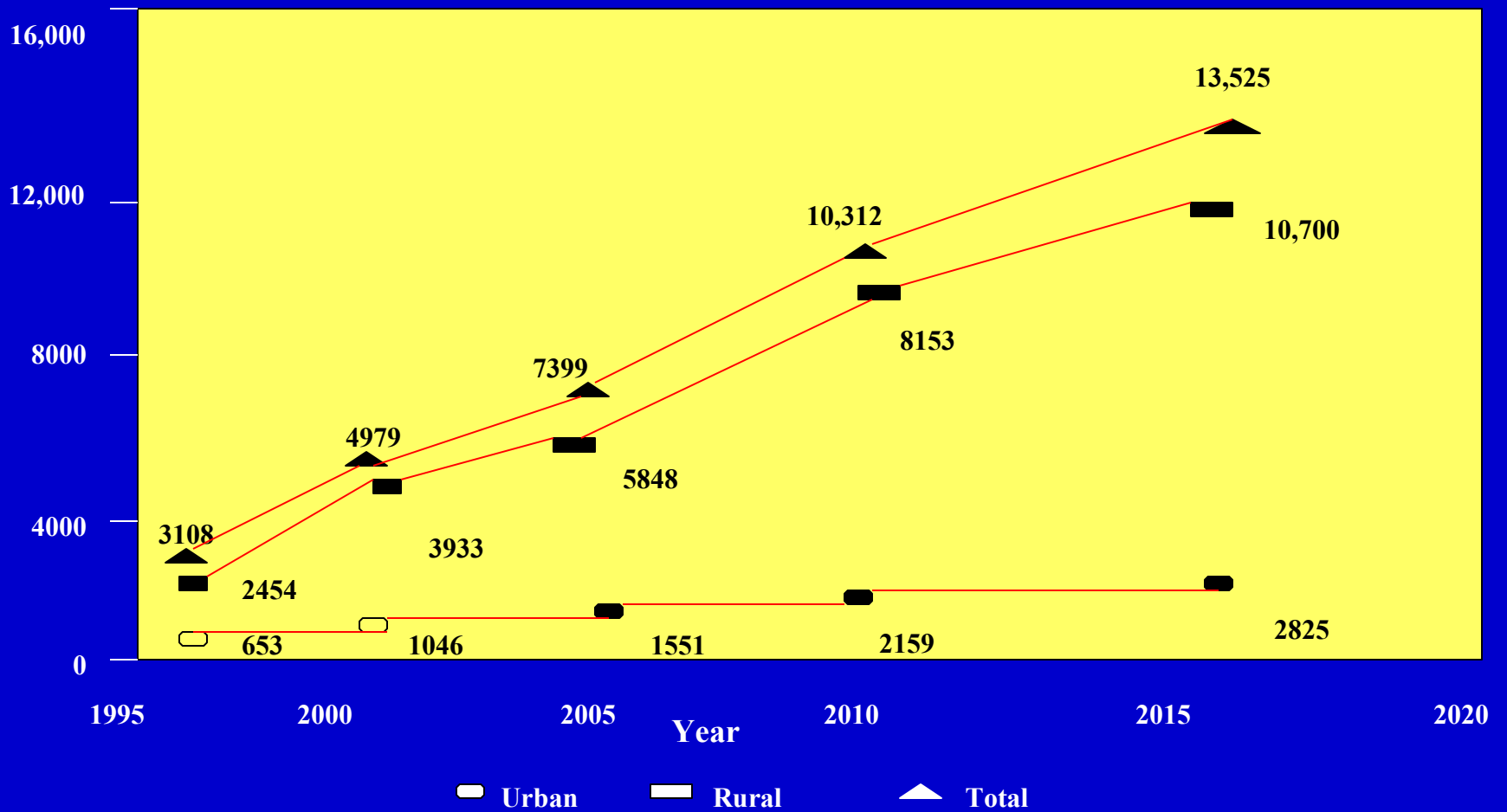
Courtesy: Teri, Green India – 2047; 2003

# Burden of disease in India due to Asthma and Chronic Obstructive Pulmonary Disease (COPD)

## No of Cases in Lakhs



2001 2016



**Commission on Macroeconomics and Health Sept 2005**

# Environmental awareness of Prevention of respiratory diseases

- Long term urban, transport, traffic, monitoring planning
- Co-ordination of various municipal utility services
- Better technology, alternate fuel.
- Build mite retardant houses / good ventilation to suit our needs
- Sun dry the blankets, pillows and mattresses once a week
- Use indoor plants and exposure to sunlight once a week
- Control E.T.S, cockroach menace, over crowding
- Clean fuel for cooking
- Breast feed for at least 6 months
- Offer solid food after 6 months in atopic children
- Traditional foods .



**Thank you**

