

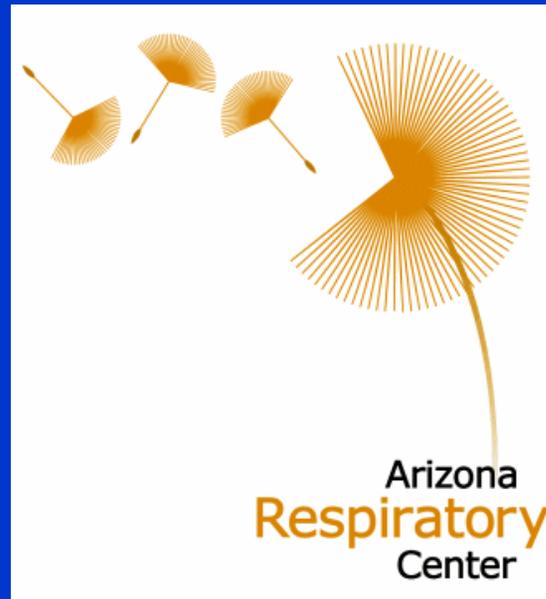


# Arizona Children's Environmental Health Project

# How Does the Environment Influence Children's Asthma?

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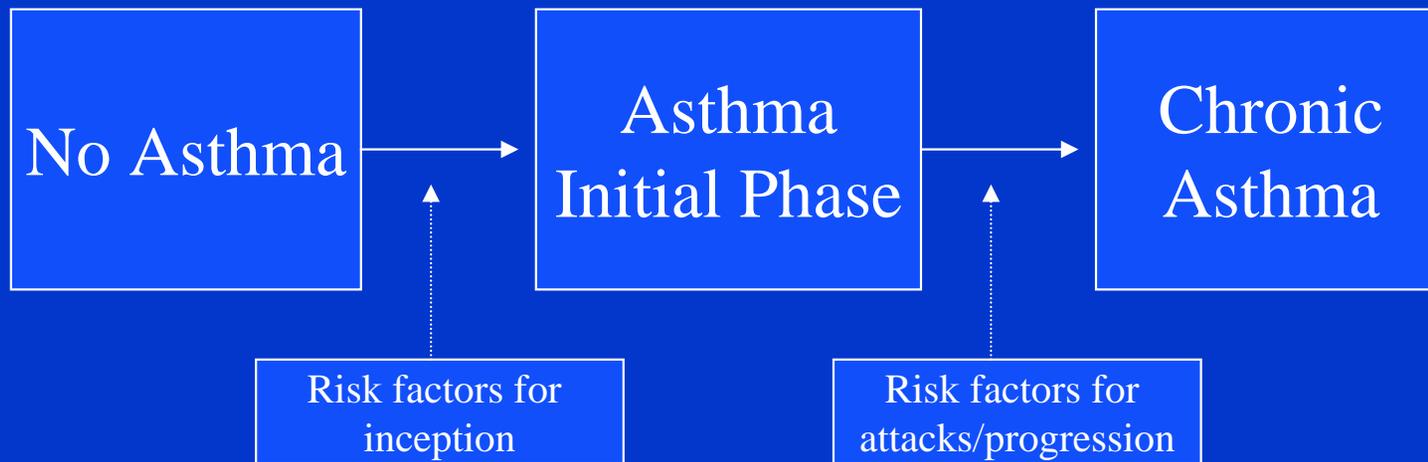


# The Problem of Asthma in Arizona

- **Asthma is the most frequent chronic disease of childhood in Arizona**
- **Depending on how asthma is defined, anywhere between 12% and 25% of all children in Arizona have the disease**

# What is Asthma?

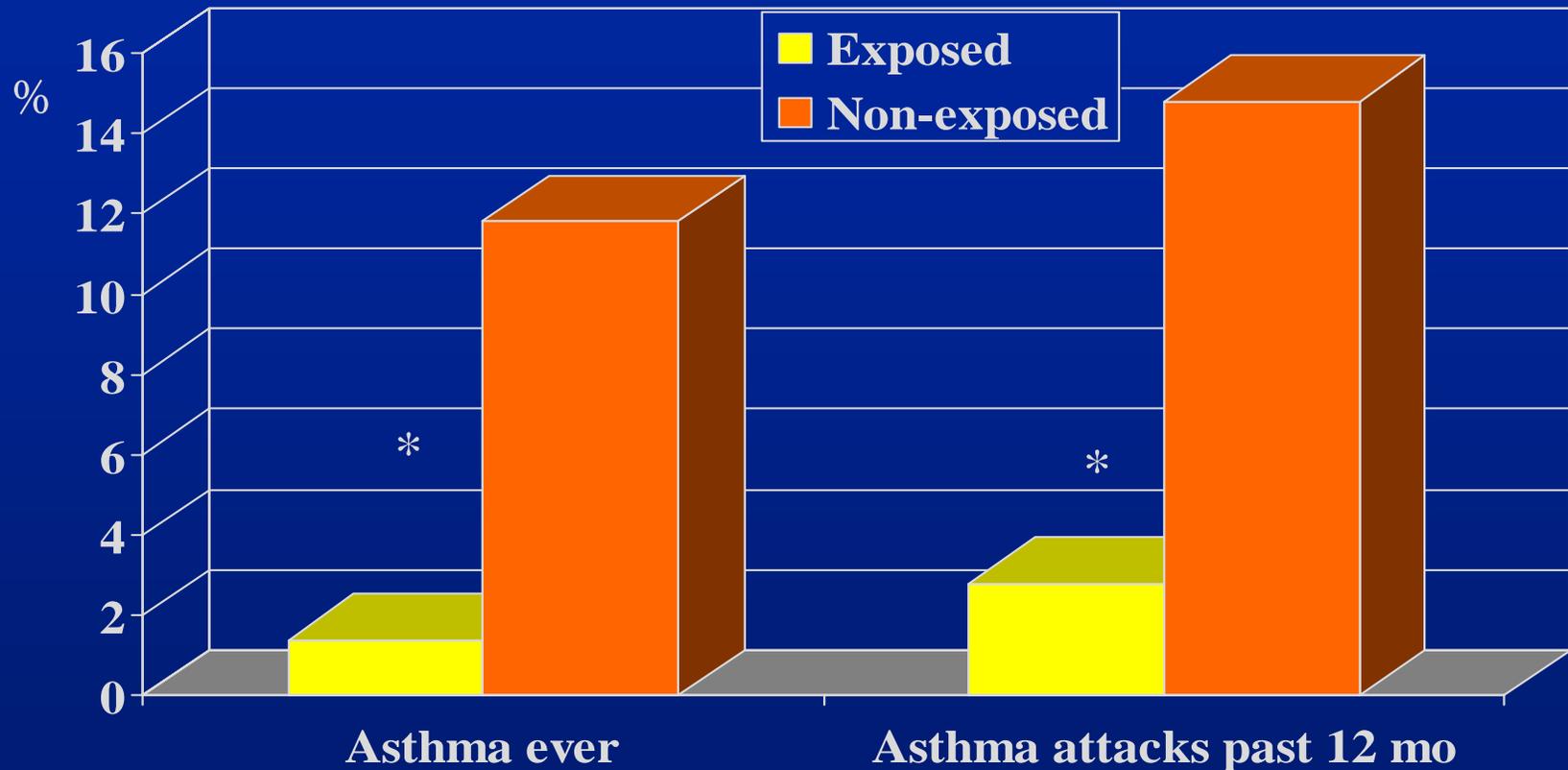
- Asthma is a disease characterized by an altered reaction of the lungs and bronchi to exposures that usually cause only mild, cold-like symptoms or no symptoms at all in individuals who do not have the disease.
- The most common symptoms of asthma are wheezing, cough, shortness of breath, attacks of chest tightness. Asthma may be severe enough to cause significant respiratory distress and lack of oxygen going to the tissues



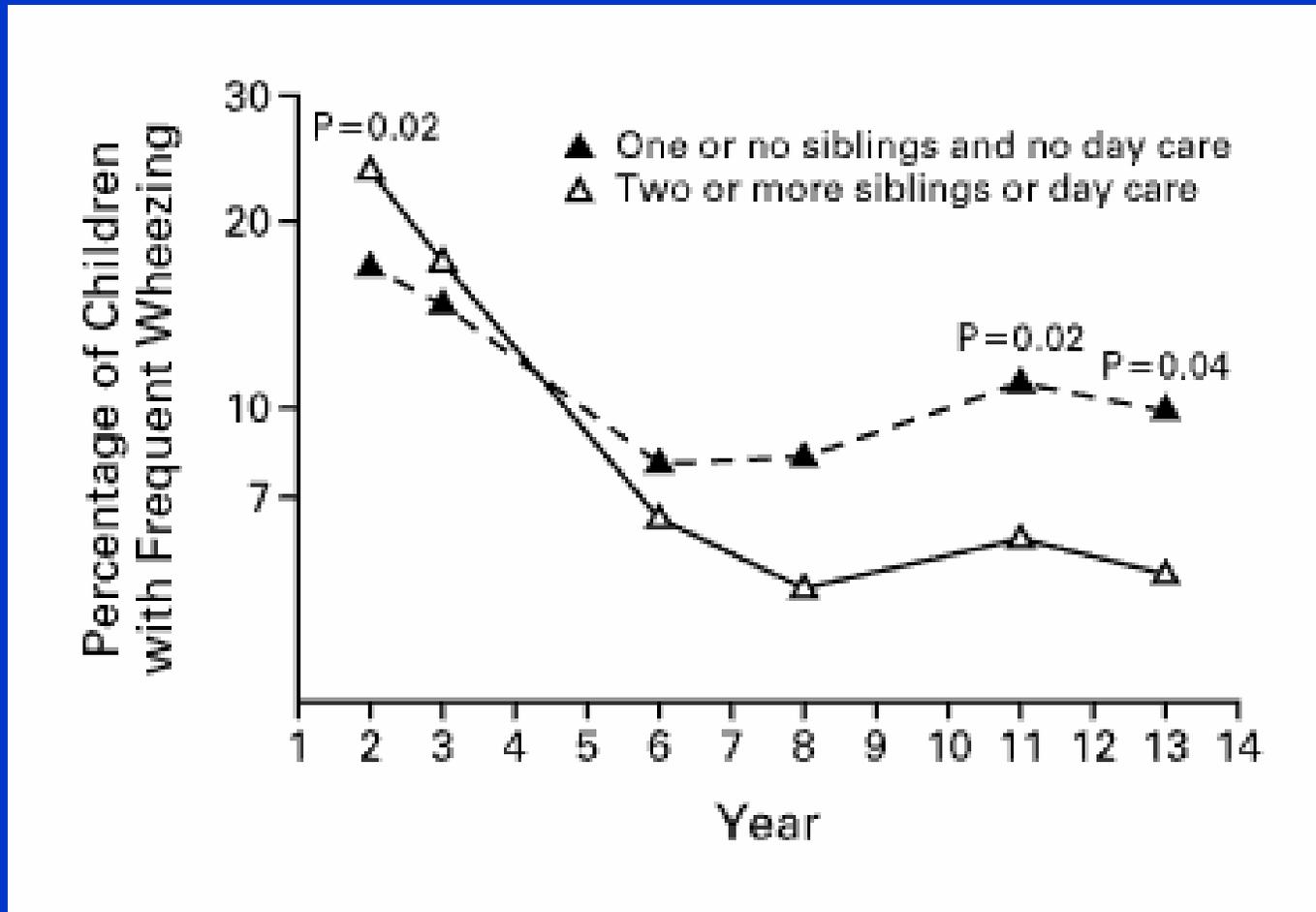
# What Causes Asthma?

- **We know that asthma is the result of complex interactions between genes and the environment, with BOTH playing approximately equal roles**
- **It is not known which environmental factors cause asthma, but many researchers believe that the lack of certain exposures in early life delays the development of a mature immune response and opens a window of opportunity for asthma to be established (the “hygiene hypothesis”)**

# Exposure to Stables and/or Farm Milk in the First Year of Life.

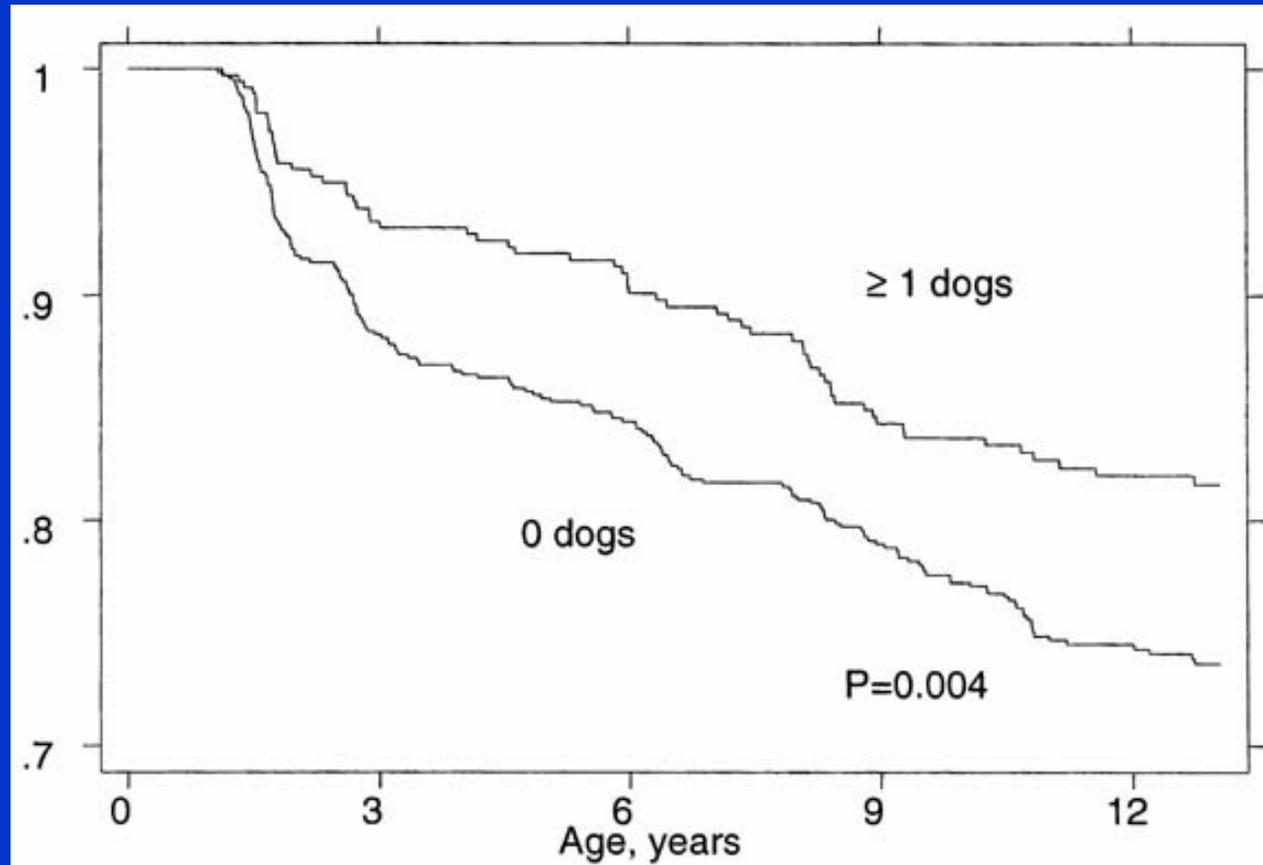


# Risk of Asthma among Subjects Exposed to Other Children as Infants



# Asthma and Pet Exposure in Early Life

Probability  
of not having  
Asthma



Remes et al, J Allergy Clin Immunol 2001;108:509

# What Triggers Asthma Attacks?

- Viral infections
- Allergens
- Weather changes
- Emotions

- Cold air
- Chemicals
- Air pollution
- Tobacco smoke

# Why is there so much Childhood Asthma in Arizona?

- It has been suggested that people with asthma (and thus with “asthma genes”) have chosen to move to Arizona with the hope that their asthma will get better
- Environmental exposures have also been incriminated, but there is no proof that they are more prevalent here than in other states
- The true answer: we do not know!

# What those Who Care for our Children Should Know

- **There is currently no cure for or proven way to prevent asthma**
- **However, we have treatments and therapies available today that would allow >90% of children with asthma to lead a PERFECTLY normal life**
- **However, studies done by our group show that over 50% of all children with asthma in the US (and in our State) do not receive optimal therapy and live with limitations that they do not need to endure**

Adams et al, J Allergy Clin Immunol 2002 Jul;110(1):58-64

# Why Does this Happen?

- **Not all asthma caregivers have the necessary information (or the time to apply it) about childhood asthma**
- **Not all parents understand the importance of controller therapy, which needs to be given every day, even when the child does not have symptoms**
- **The role of environmental control, especially indoors, is not recognized**

# Controlling the Indoor Environment

- **Our group in Tucson is one of only 8 U.S. Centers involved in the Inner City Asthma Study, funded by NIH**
- **This Consortium studied inner city children for whom practicable measures were taken in homes to decrease exposures known to trigger asthma attacks and compared results with controls**

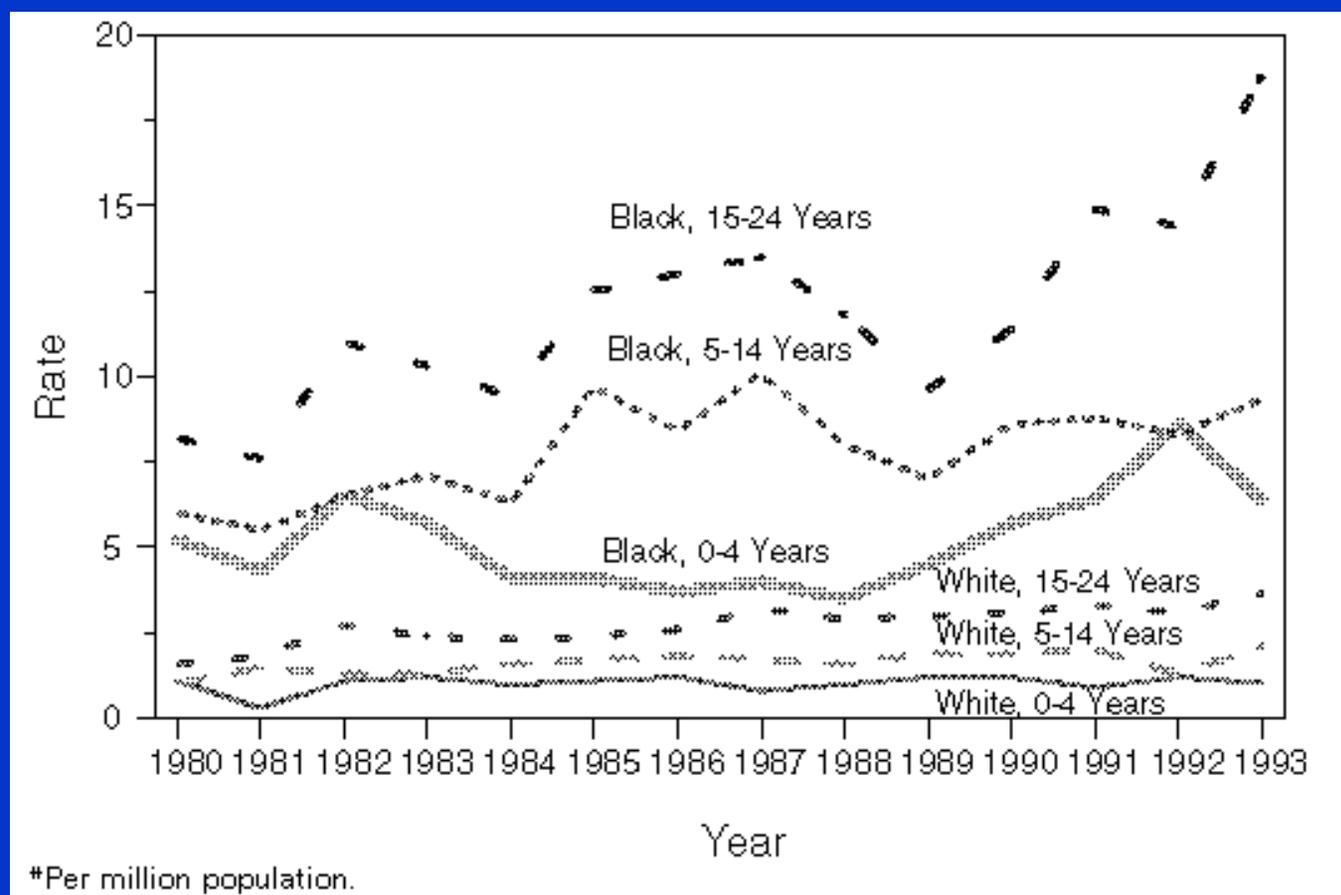
# Controlling the Indoor Environment (cont)

- **Environmental measures specifically addressed allergens to which the children were sensitized and tobacco smoke**
- **Authors reported that children in whom these measures were taken improved as much as those who are placed on low dose controller meds**

# Controlling the Outdoor Environment

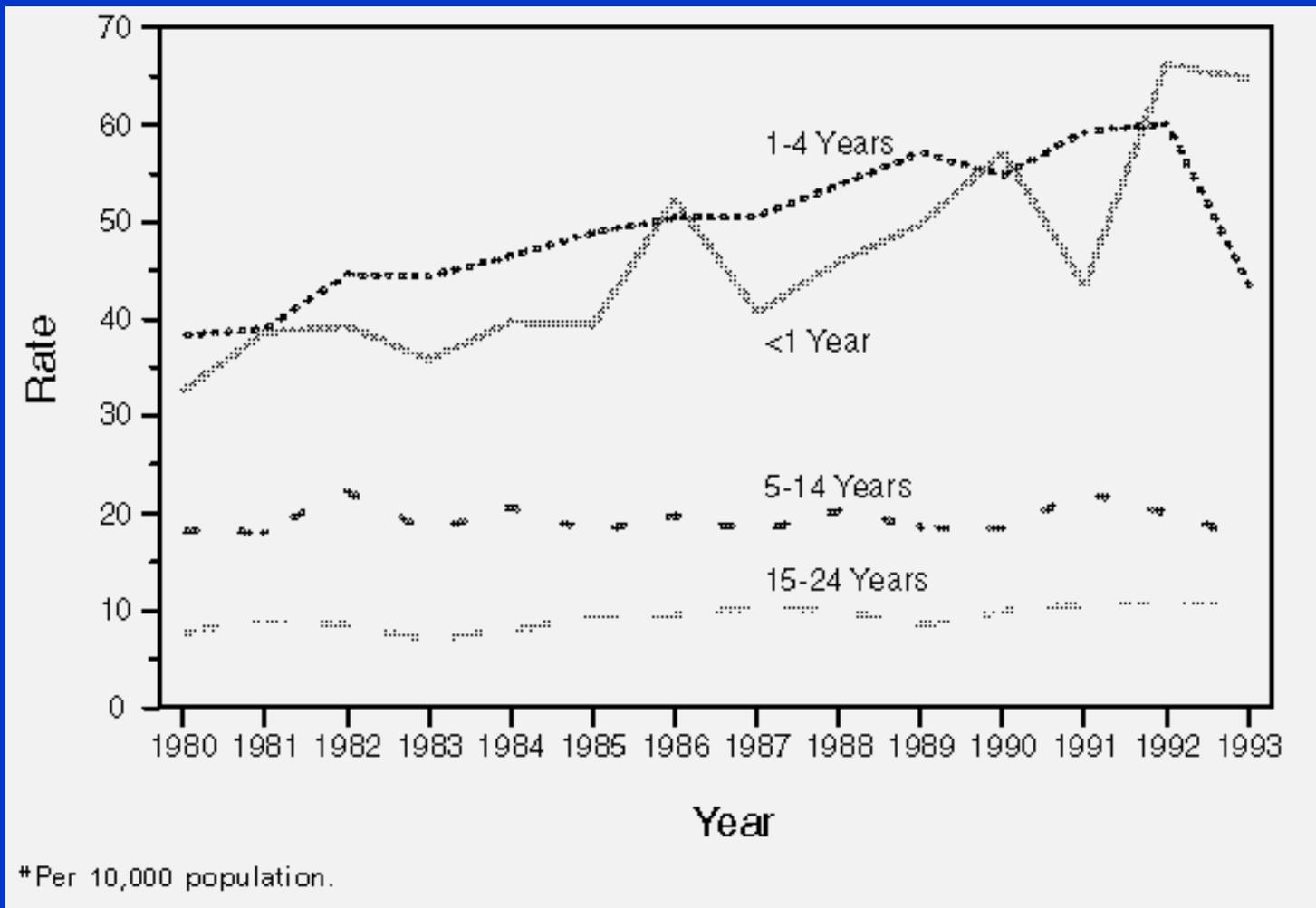
- **There is no proof that PM or ozone or other pollutants CAUSE asthma**
- **However, there is unmistakable evidence that asthma ATTACKS in children who already have asthma are caused by high ozone levels and high exposure to PM**

# Asthma Death Rates by Race and Age



MMWR Morb Mortal Wkly Rep. 1996;45:350-3.

# Asthma Hospitalization Rates by Race and Age



MMWR Morb Mortal Wkly Rep. 1996;45:350-3.

# Especially Vulnerable Populations

- **Very young children are especially prone to develop severe symptoms and to be hospitalized for asthma**
- **However, it is adolescents who more often deny their symptoms and only consult when it is very late to do something useful; they are at the highest risk for death due to asthma**

# What Could be Done Right Now?

- **One of the best ways to inform and educate less advantaged parents and children are school-based health centers (SBHC)**
- **Children enrolled in SBHC were 50% LESS LIKELY to be hospitalized for asthma and missed 3 days less of school/year (from 21 to 18) than those who were not**

Webber et al, Arch Pediatr Adolesc Med 2003 Feb;157(2):125-9



# Conclusions

- **Asthma causes unnecessary suffering to thousand of Arizona children**
- **There are fruitful things that can be done right now to prevent asthma attacks and to improve the lives of these children**
- **Very young children, adolescents, and children living in poverty are particularly vulnerable**