

# **Social Determinants of Asthma: From Data to Action**

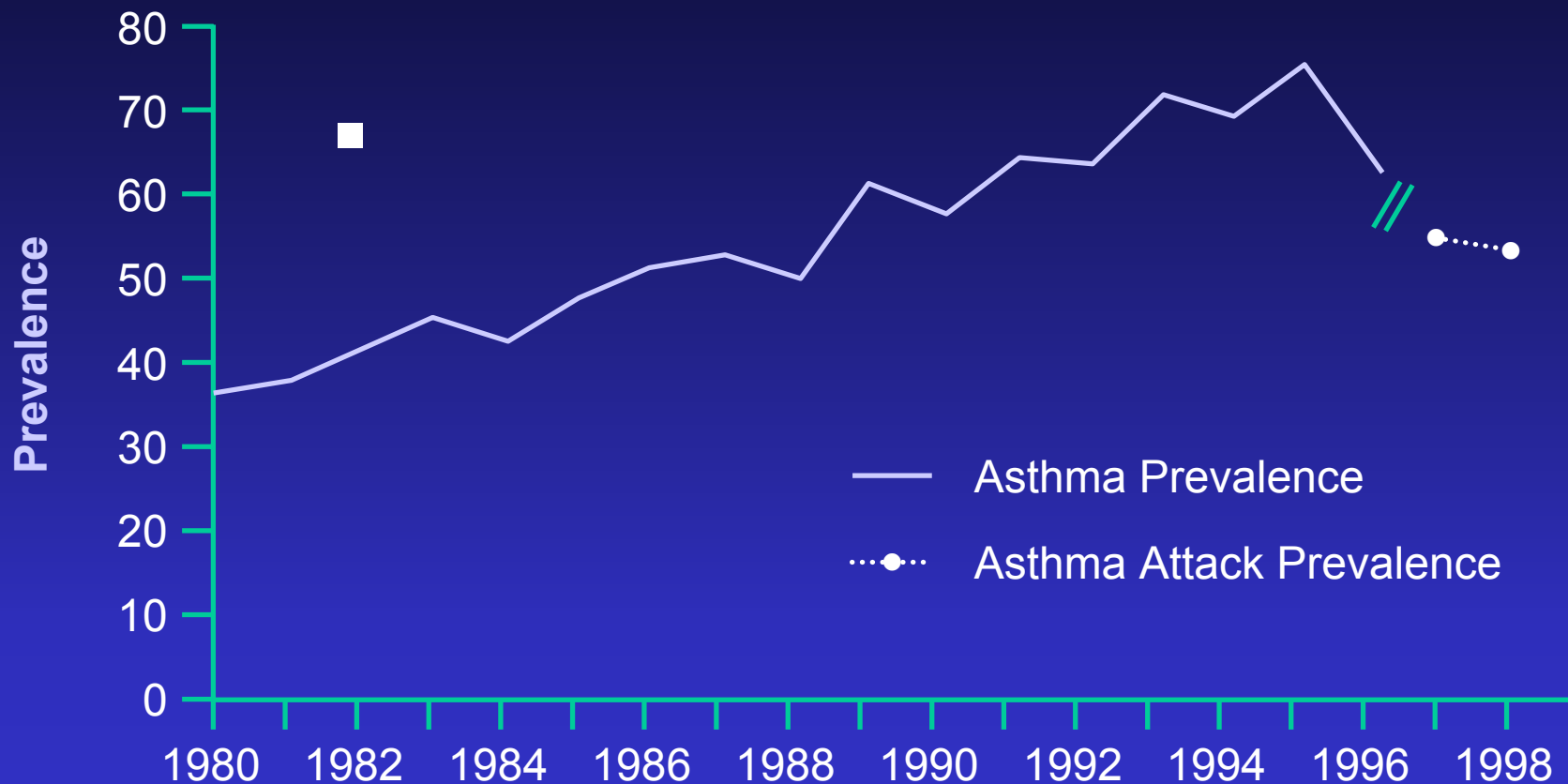
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**May 8, 2003**

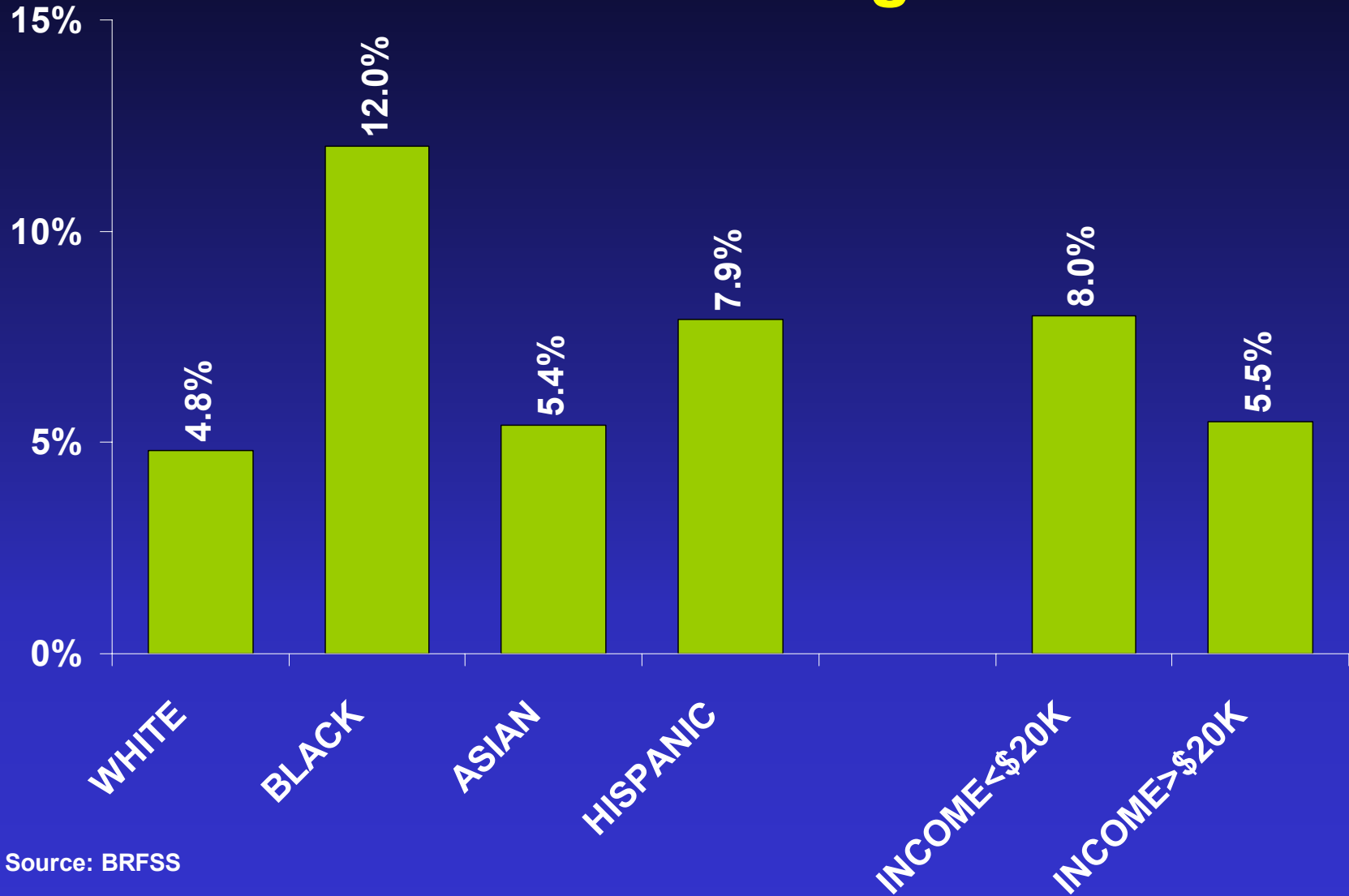
# Asthma Prevalence: Children in US, 1980-98



\*Per 1000 population.

†NHIS was redesigned in 1997, resulting in a discontinuation of the trend.

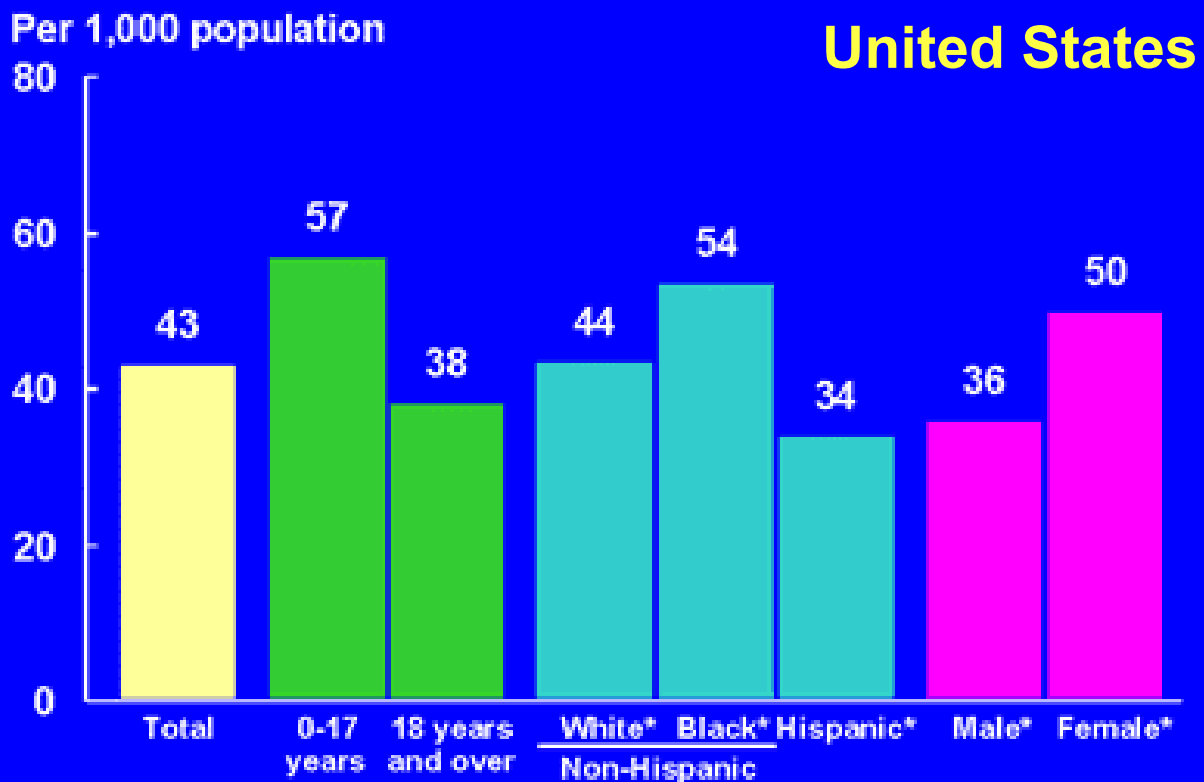
# Current Asthma Prevalence Among King County Children Age 0-17 1999-2001 Averages



Source: BRFSS

# Asthma Attack Prevalence

**Figure 3. Asthma attack prevalence, 2001**



\* Age adjusted to the 2000 population

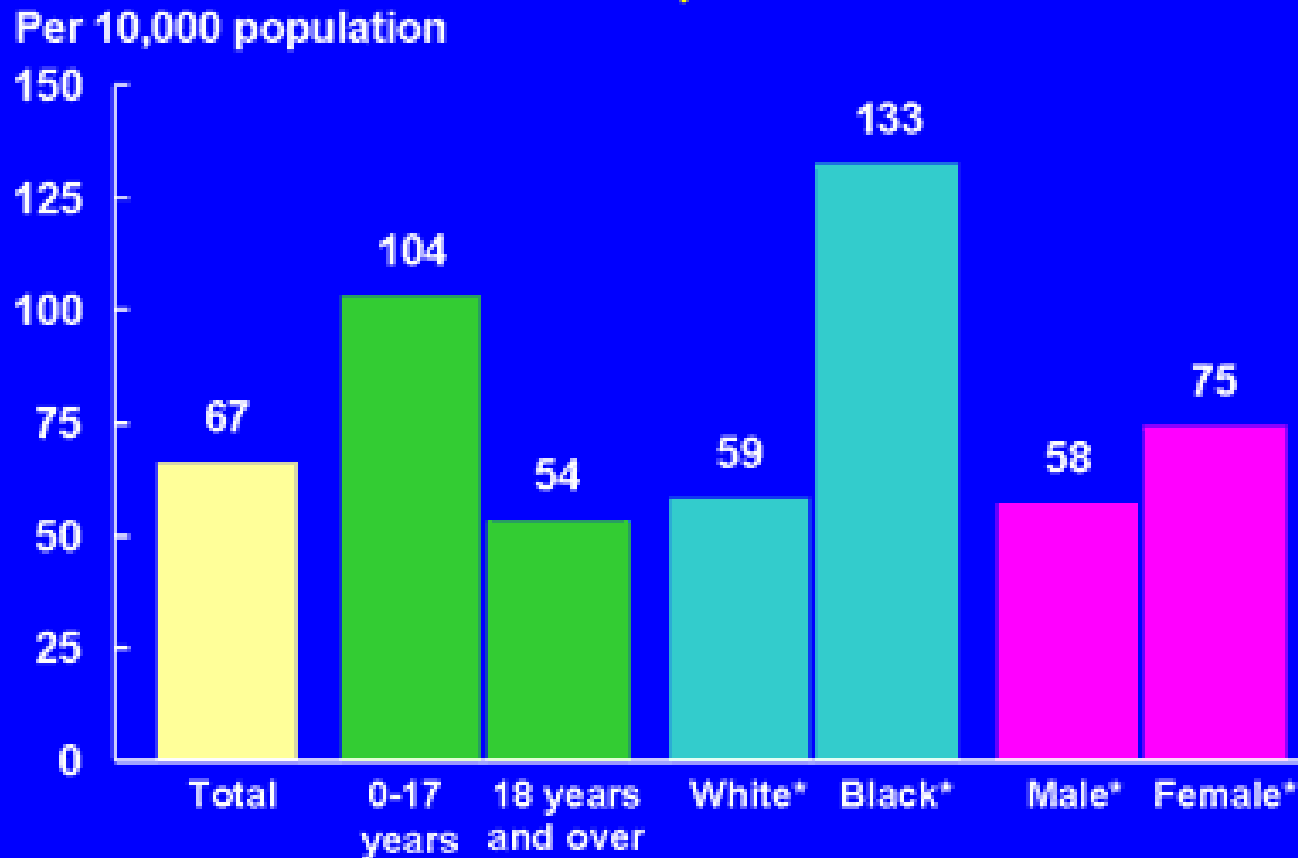
## 4th Graders in Munich:

- Severe asthma (>10 attacks/yr) more prevalent in low SES vs. high SES
- OR = 2.37 (1.28-4.41)

Mielck 1996

# Asthma Emergency Department Visits, US

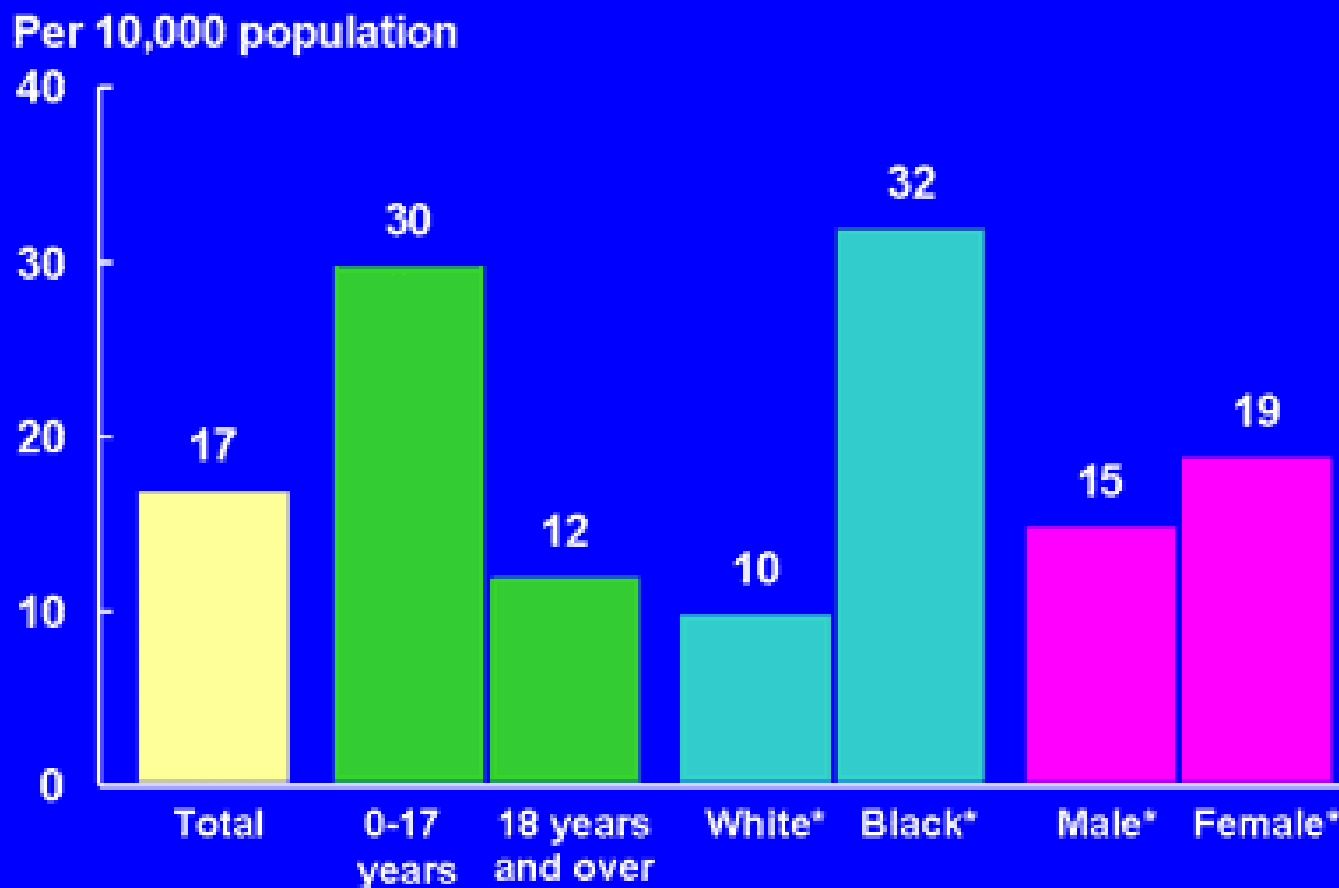
Figure 5. Asthma emergency department visits, 2000



\* Age adjusted to the 2000 population

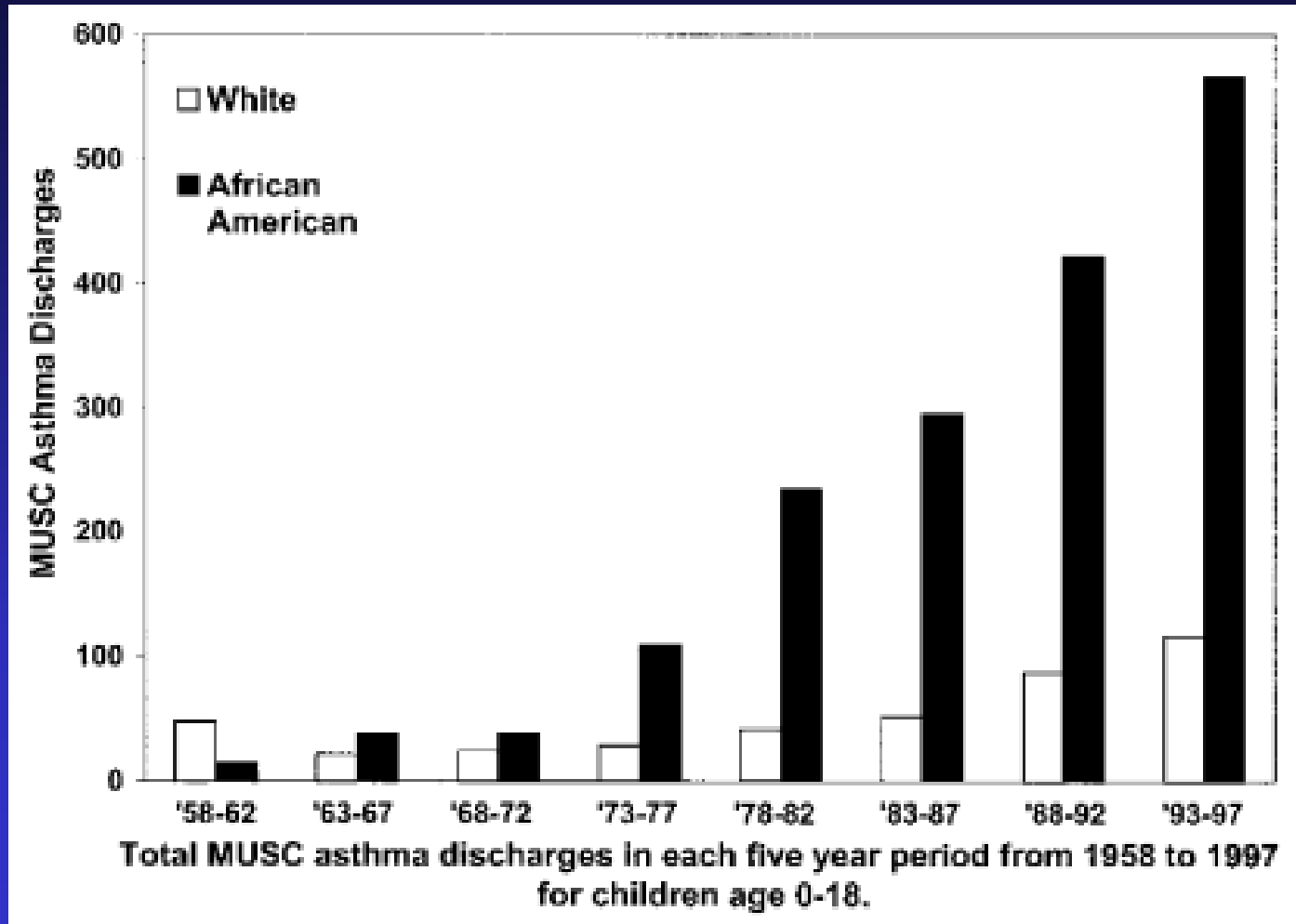
# Asthma Hospitalizations, US

Figure 6. Asthma hospitalizations, 2000



\* Age adjusted to the 2000 population

# Asthma Hospitalizations Increase 20x among Black Children Medical University of S. Carolina



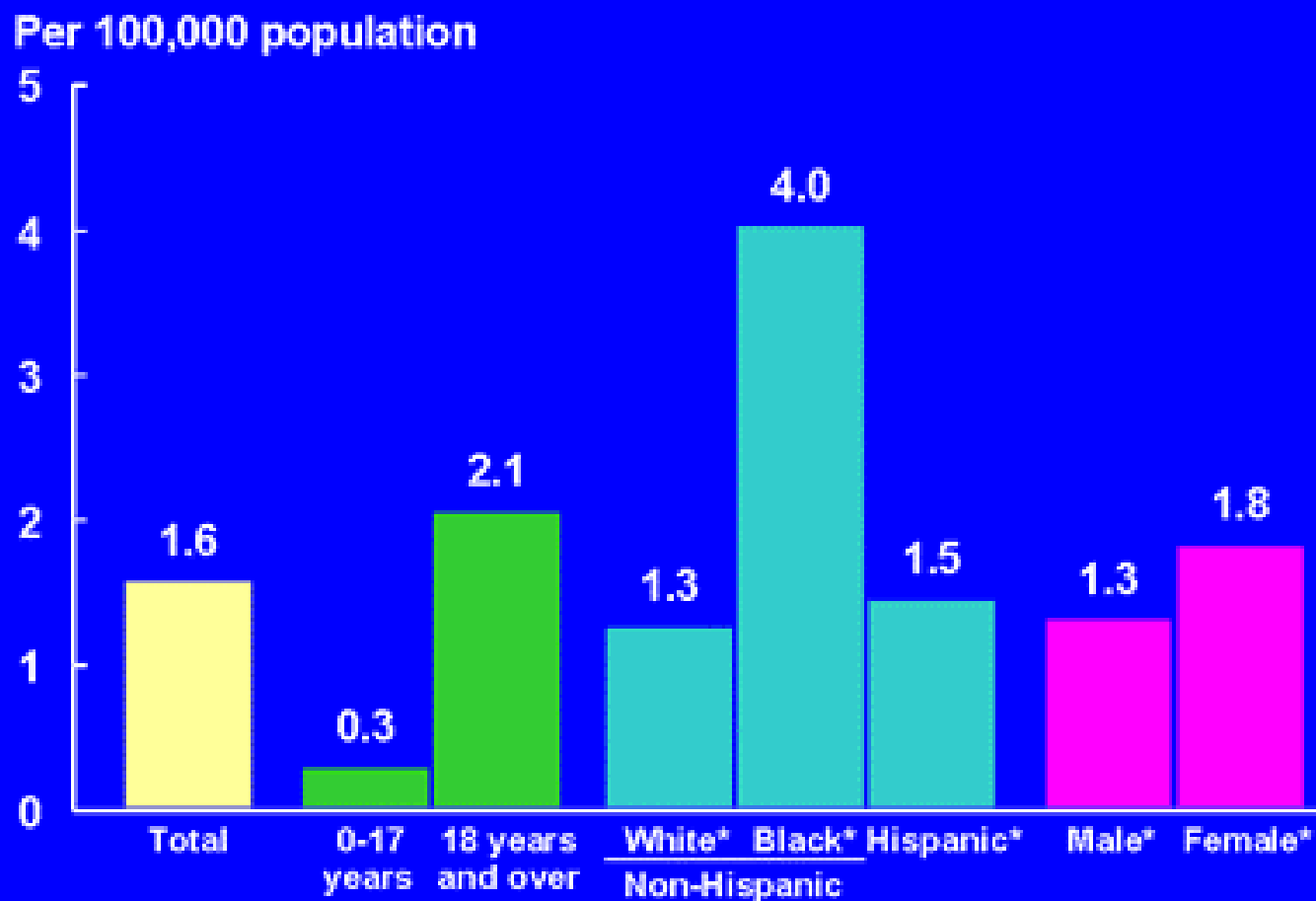
# TRENDS IN U.S. ASTHMA HOSPITALIZATION RATES PER 10,000 POPULATION, BY SELECTED CHARACTERISTICS, 1984-95

	Asthma Diagnosis			All Dx
	1984-86	1993-95	% Change	% Change
All ages	19.7	18.4	- 7	-27
under 15	29.6	31.8	7	-46
Male	17.6	15.6	-13	-44
Female	22.0	21.1	- 4	-26
White	15.6	11.3	-38	-29
Black	32.8	37.8	13	-25



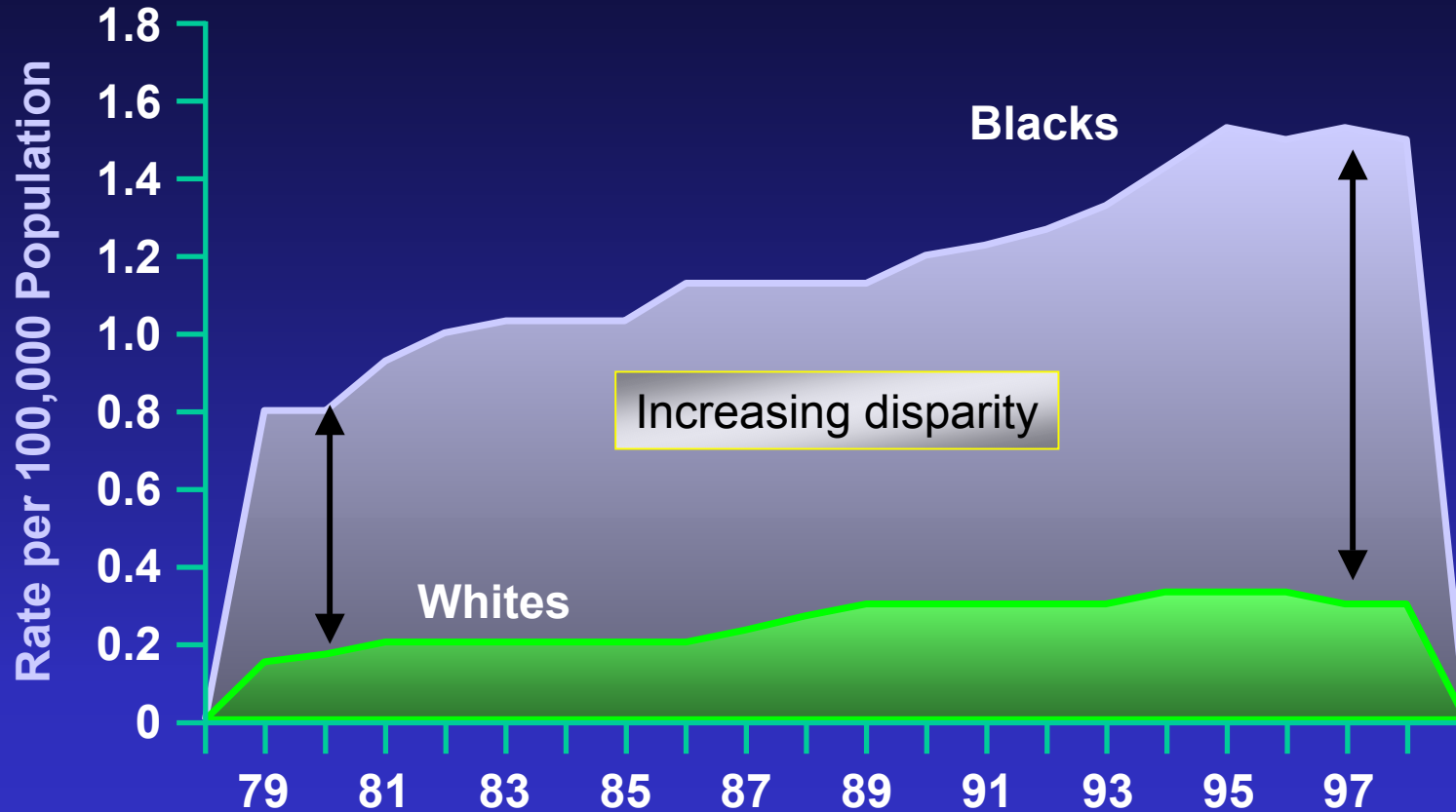
# Asthma Mortality, US

Figure 7. Asthma deaths, 2000



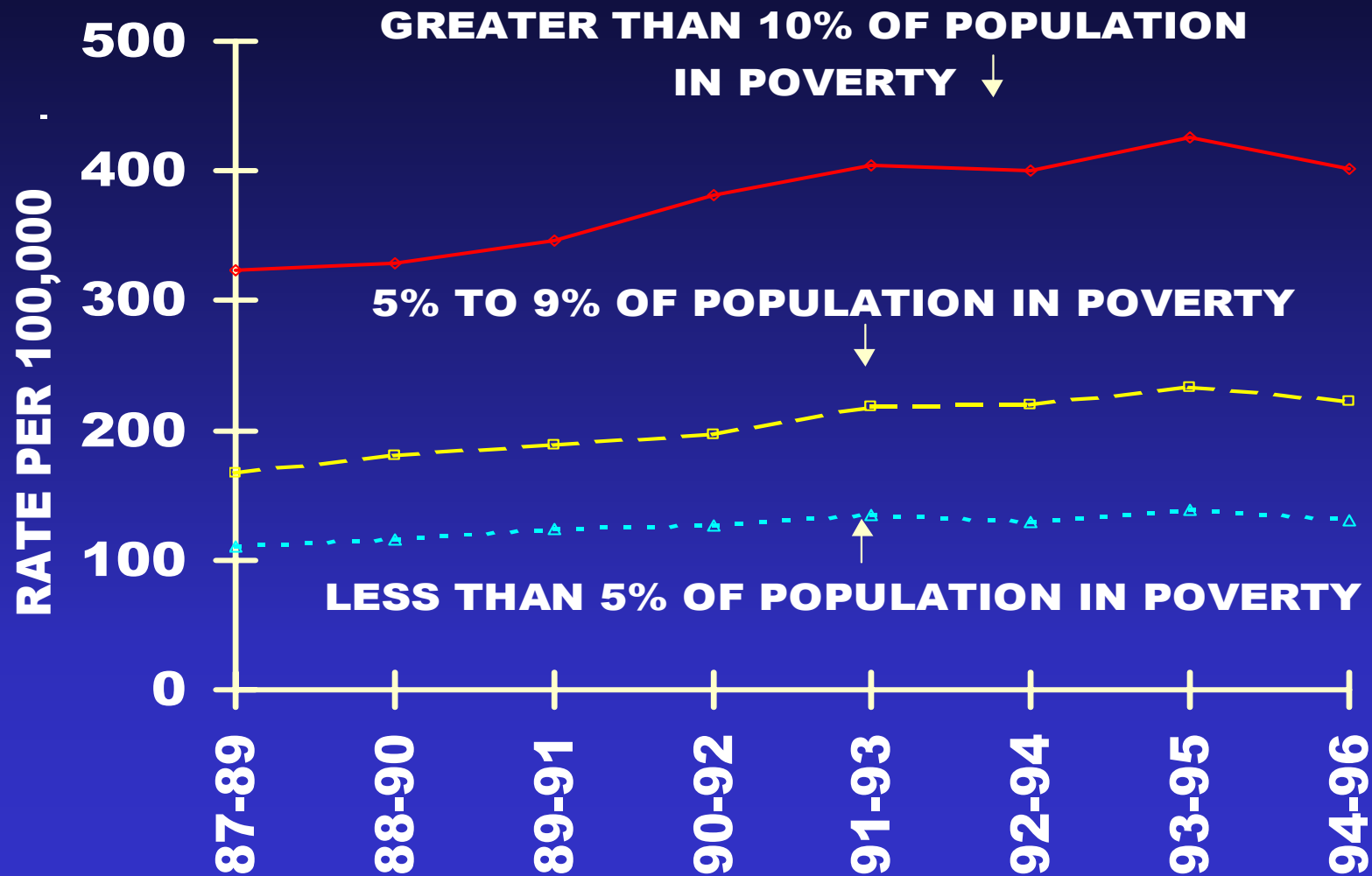
\* Age adjusted to the 2000 population

# TRENDS IN US ASTHMA MORTALITY RATES PER 100,000 POPULATION, PERSONS UNDER 35 YEARS, 1979-98

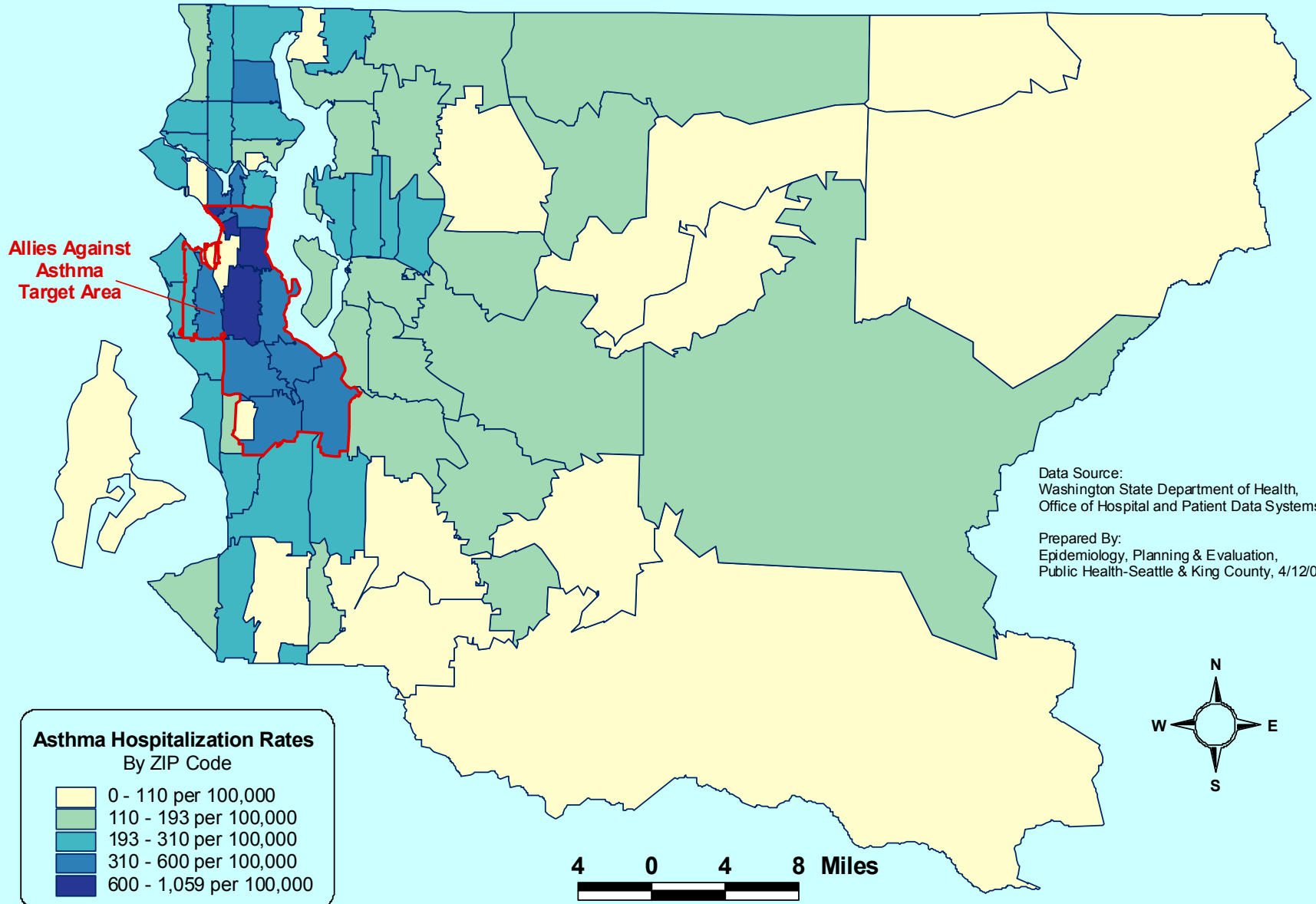


US mortality data, CDC, WONDER System.

# Hospitalization rates are highest in neighborhoods with the greatest poverty



# Asthma Hospitalization Rates Among Children Age 1-17 By ZIP Code in King County, 1995-1999



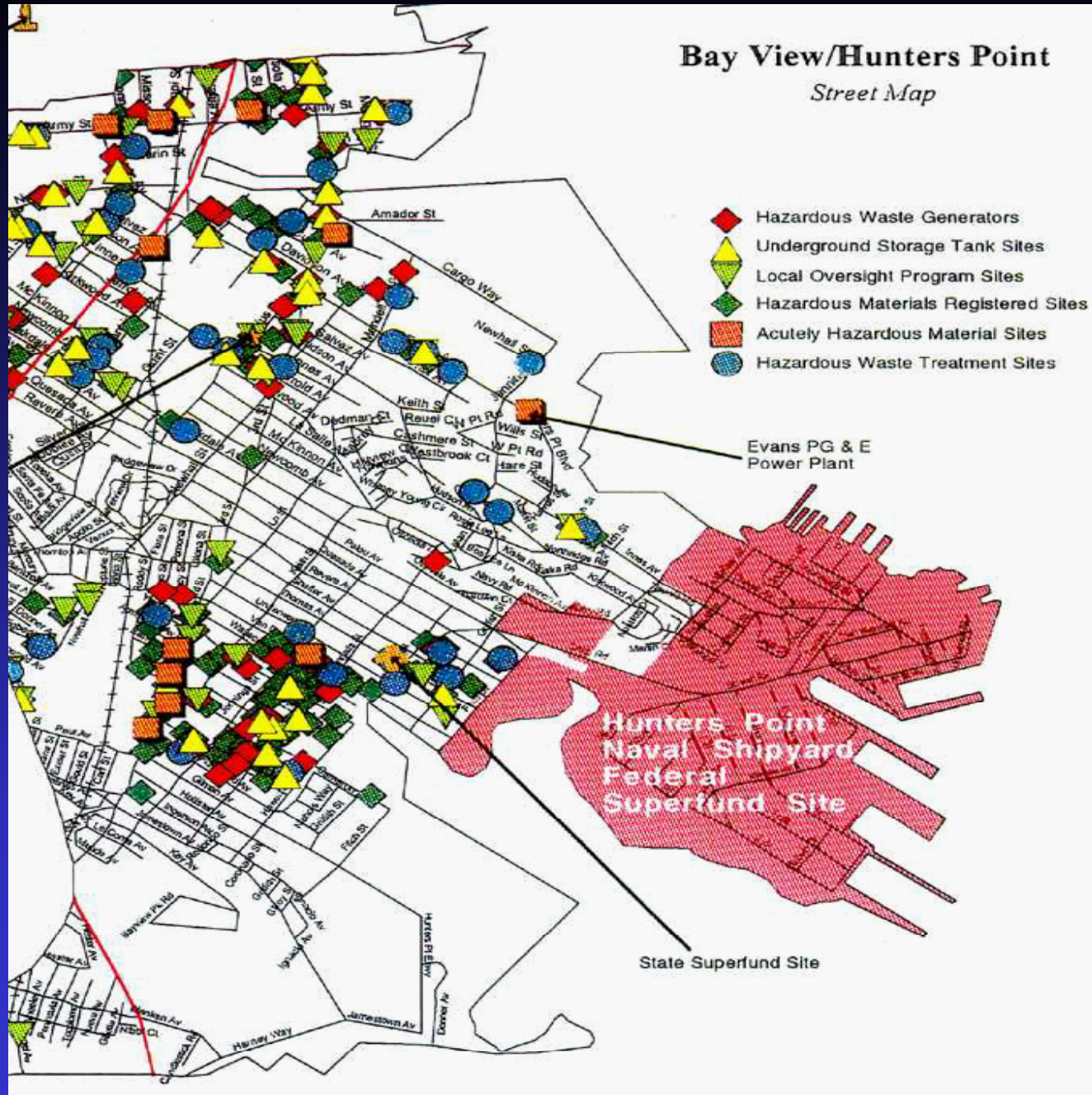
# Asthma in Harlem

- Hospitalization rates in East Harlem are 21 times greater than on upper East Side (Claudio, 1999)
- Prevalence among children may be as high as 25% (Harlem Children's Zone, 2003)

# **Social Factors Associated with Disparities in Asthma**

- **Poverty**
- **Differential exposure to environmental triggers**
  - Substandard housing
  - Diesel exhaust and other air pollutants
  - Environmental tobacco smoke
- **Stress**
- **Lack of social support**
- **Neighborhood violence**
- **Medical care**
  - lack of access
  - inadequate quality of care

# Bay View/Hunters Point Street Map



# Stress

- **Caregiver stress in first 2-3 months of life associated with increased risk of repeated wheezing during first 14 months of life (RR = 1.4, CI = 1.1-1.9).**
- **Prospective birth-cohort study (n = 496).**
- **Controlled for parental asthma, SES, birth weight, race, smoking, breast feeding, allergen exposure and LRIs.**



# Inadequate Quality of Care

- Of 900 school age inner-city children with asthma in Detroit, Houston and Birmingham, 2/900 had a written Asthma Treatment Plan (National Inner City Asthma Study).
- Among Medicaid children with asthma in five managed care plans, Black (RR = 0.69) and Latino (RR = 0.58) less likely to use inhaled anti-inflammatory medications (Lieu 2002).
- Inner city children used inhaled anti-inflammatory medications at less than half the rate of the general population (Eggleston 1998).

# Housing

- **Substandard housing is related to increased exposure to asthma triggers**
  - **Moisture (mites, mold)**
  - **Roaches**
  - **Poor ventilation (higher allergen and ETS levels)**
- **Substandard housing also associated with other health problems**
  - **Lead exposure**
  - **Injury hazards**

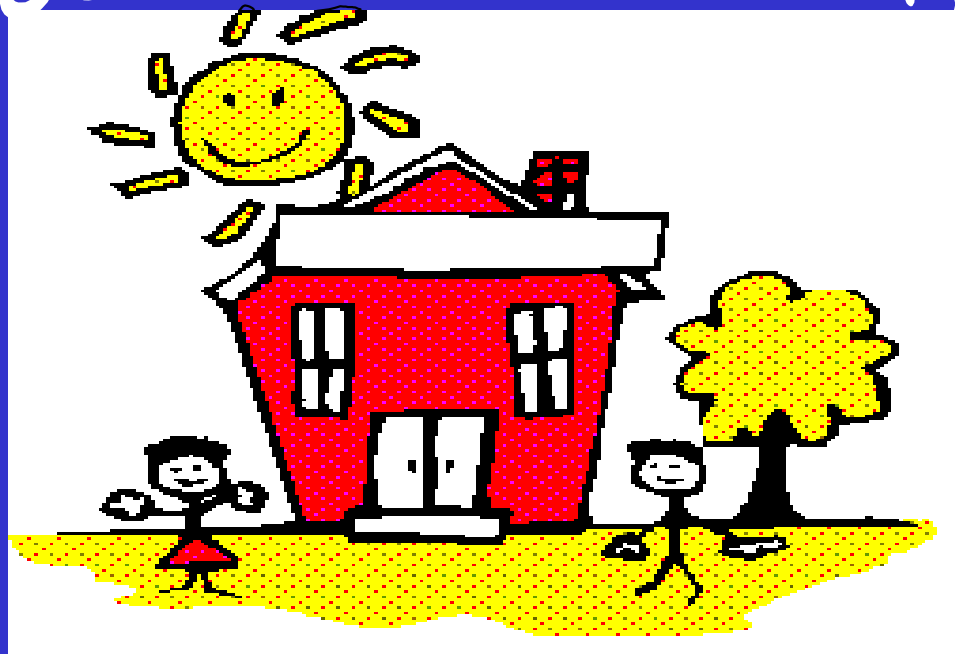
# Public Health Approaches to Housing and Health

- Addressing housing through the lens of asthma is a potent public health strategy
- Health education and client advocacy
  - Community health workers
- Assessment
  - Housing inspections
- Research
- Epidemiology
  - Conducting Housing and Health surveys

# Public Health Approaches to Housing and Health

- **Policy**
  - Updating housing code to reflect Healthy Homes principles
  - Incorporating Healthy Homes and Healthy Communities design principles in new public housing construction
  - Assisting public housing tenants with special health needs in obtaining appropriate units
- **Advocating for availability of healthy and affordable housing for low income families**
- **Community organization**
  - Housing and Health Work Group

# Seattle-King County



# Healthy Homes Project

## STAFF:

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# Methods: Community Health Worker Home Visits

- Make 5-9 visits over one year
- Assess home environment & develop specific Action Plan
- Offer client education and encourage behaviors to implement plan (e.g. dust control, ventilation, smoking)
- Provide social support
- Offer advocacy/referral (housing, food, furniture, jobs, etc.)



# Methods: Provision of Trigger Control Resources

- Allergy control bedding covers
- Low-emission vacuum cleaner with dirt finder sensor
- 1-Year supply of microfiltration vacuum bags
- Commercial doormat
- Cleaning supplies (green kit, mop, pail, scrub brushes, bleach)



Using a low-emission vacuum



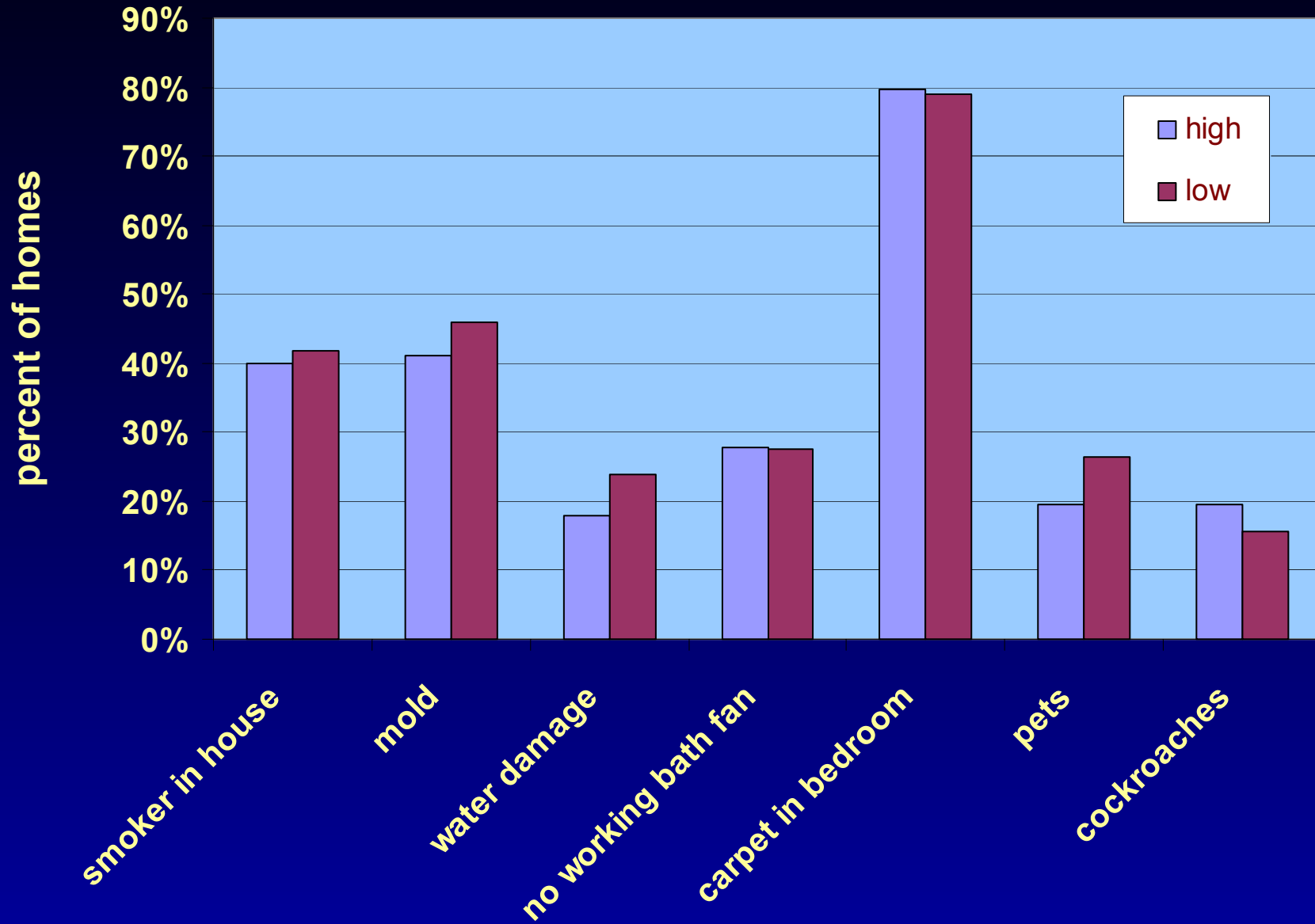
Putting on a mattress cover

# Recruitment and Research Design

- **Eligibility**
  - household income below 200% poverty
  - child age 4-12 with asthma
  - speak English, Spanish or Vietnamese
- **Randomized controlled design: participants randomized into high (n=138) and low (n=136) intensity intervention groups.**
  - High group: full intervention
  - Low group: one visit, follow-up call, bedding covers only
  - Low group crosses over to high group after one year
- **Community-based participatory research methods**

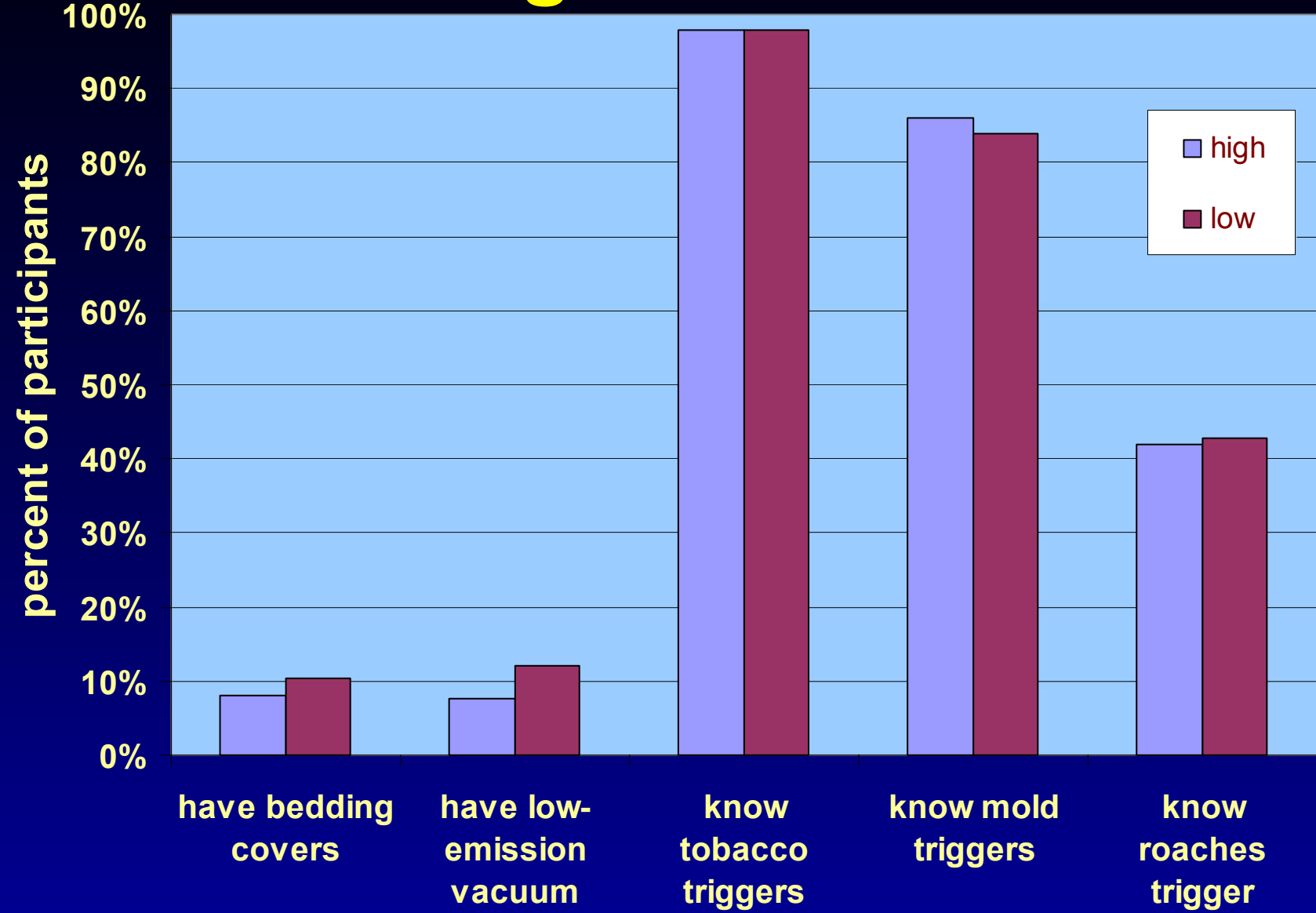


# Baseline: The Home Environment

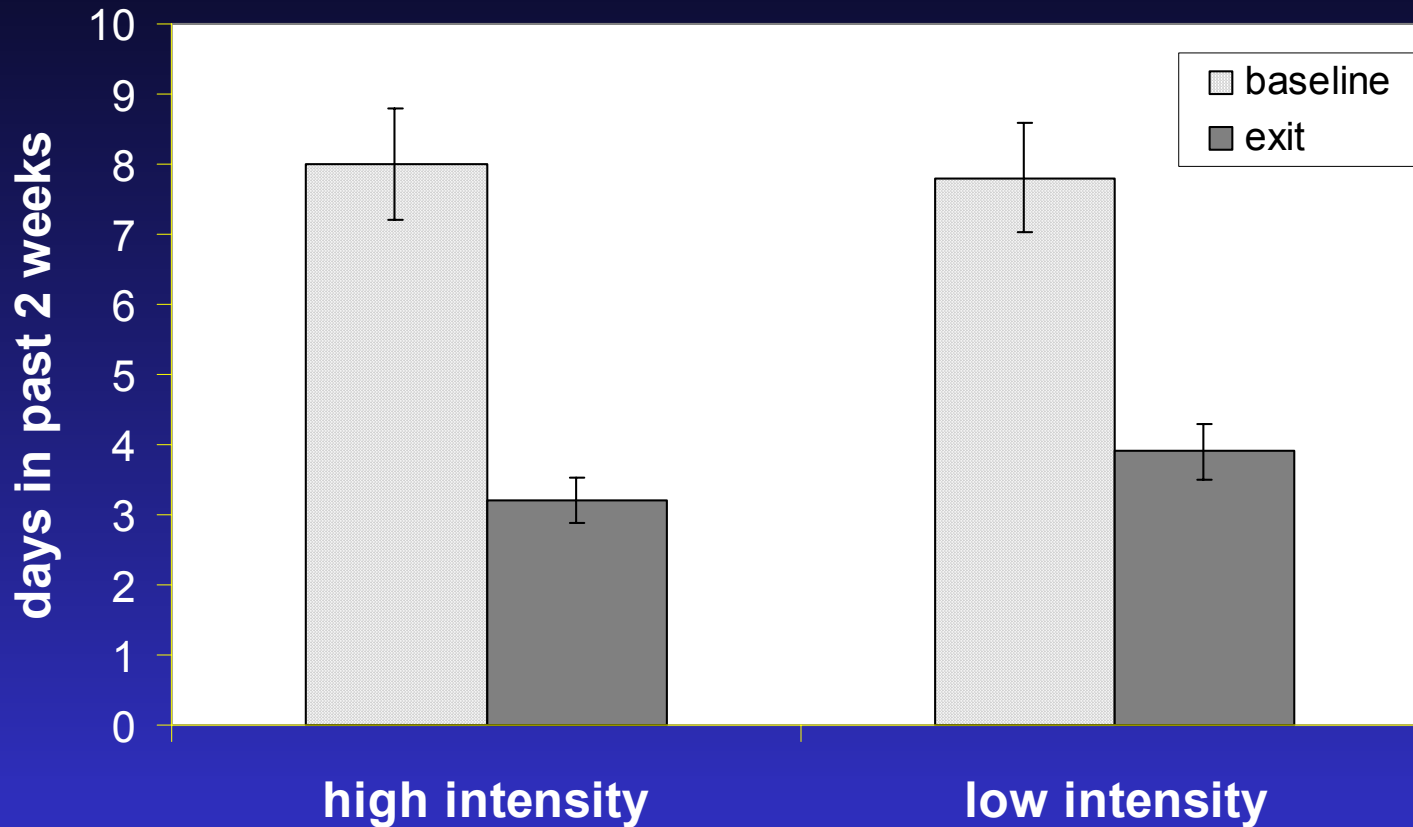




# Baseline Findings: Resources and Knowledge



# Outcome: Symptom Days



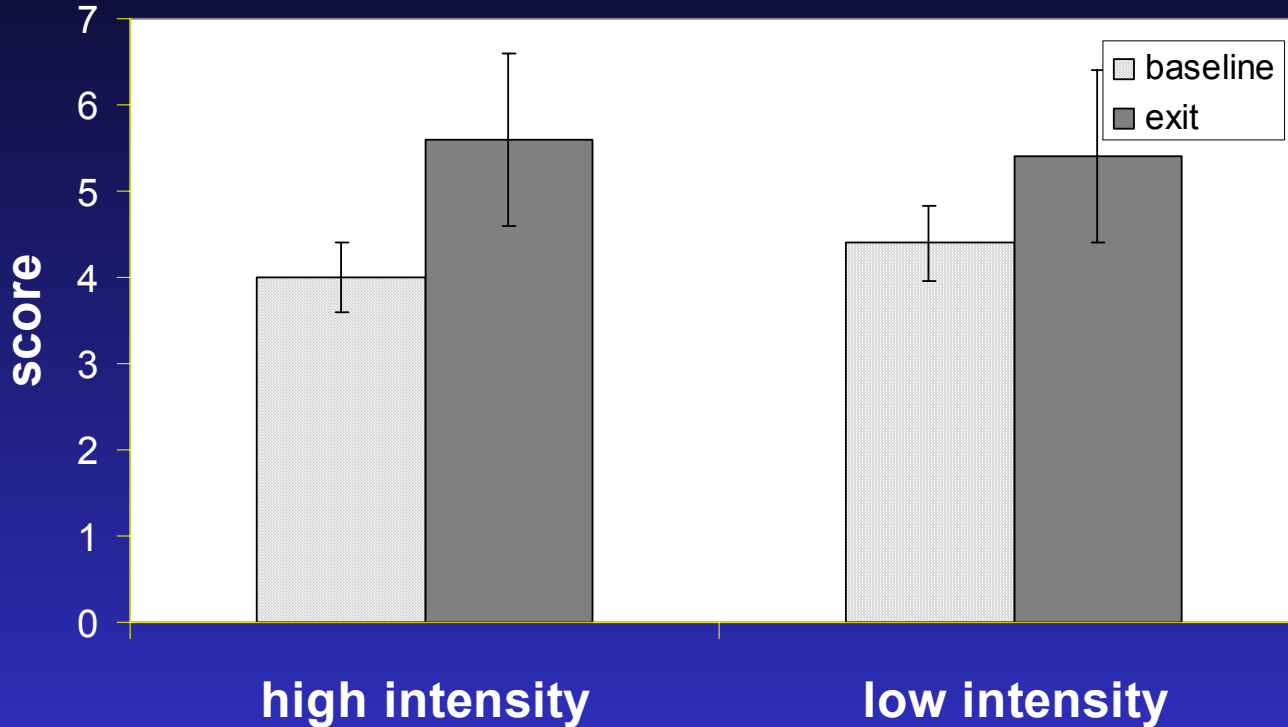
p-values:

0.000 (high intensity, baseline vs. exit, chi-square)

0.000 (low intensity, baseline vs. exit, chi-square)

0.123 (exit, low vs. high intensity, regression adjusted for baseline score)

# Outcome: Caregiver Quality of Life



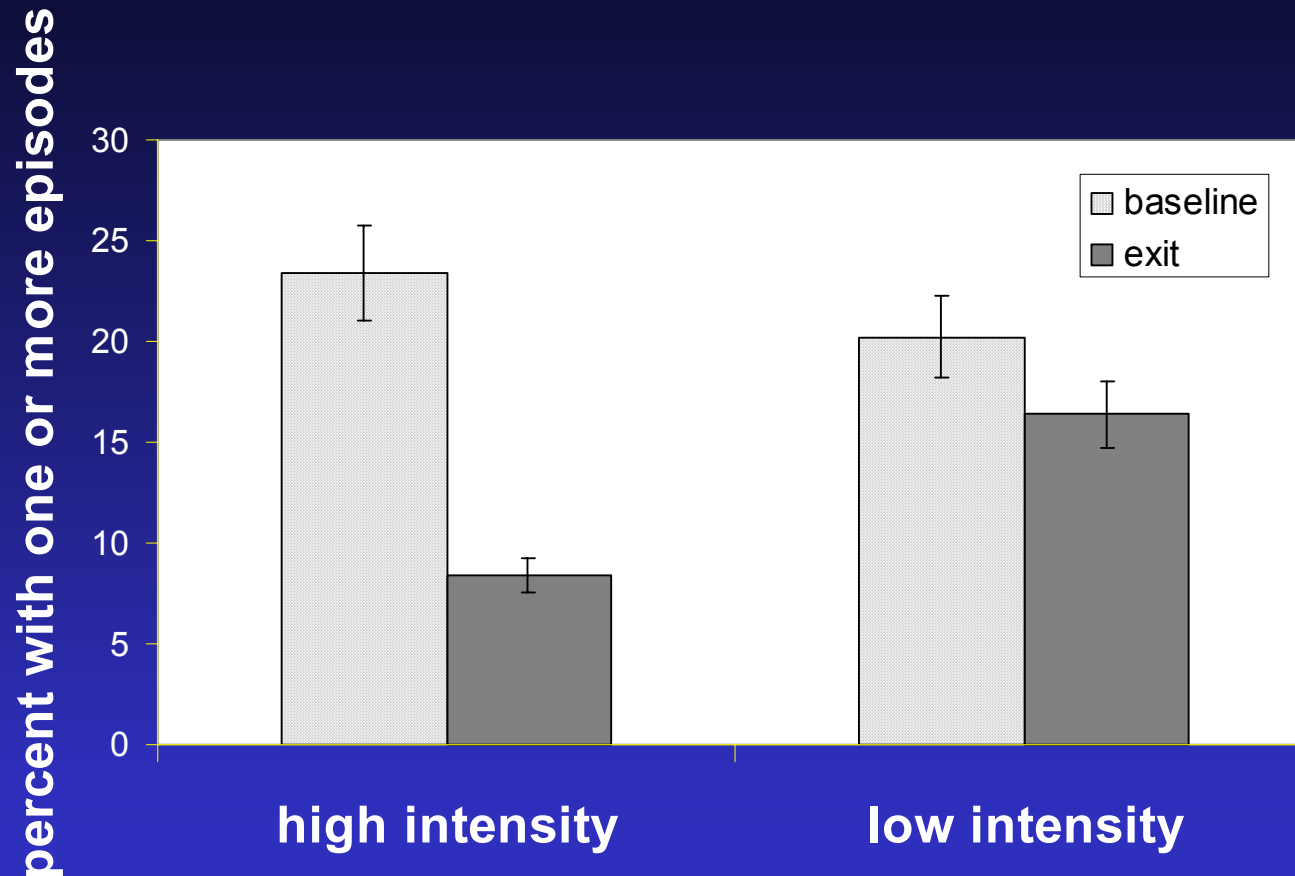
p-values:

0.000 (high intensity, baseline vs. exit, chi-square)

0.006 (low intensity, baseline vs. exit, chi-square)

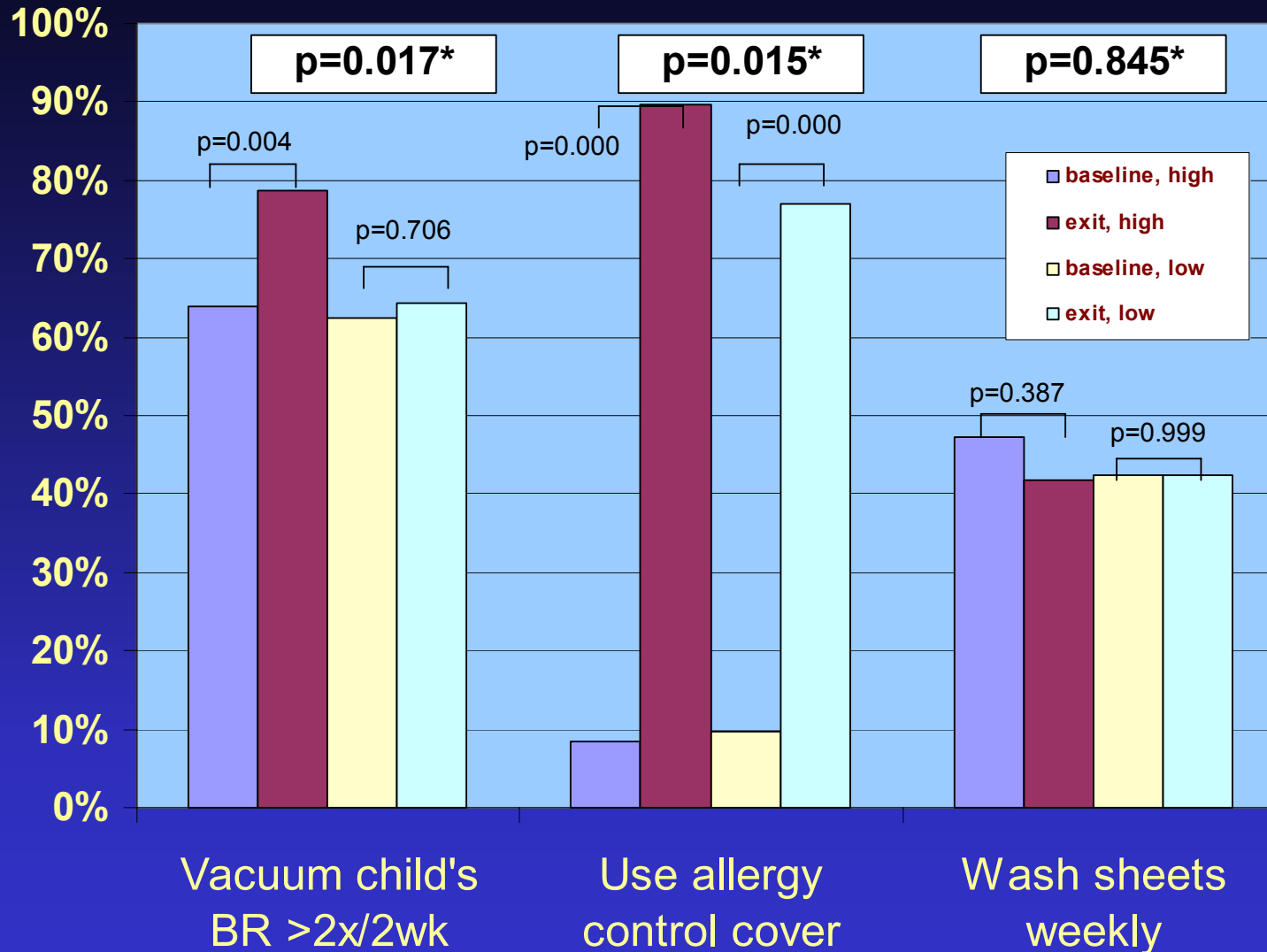
0.001 (exit, low vs. high intensity, regression adjusted for baseline score)

# Outcome: Urgent Health Services



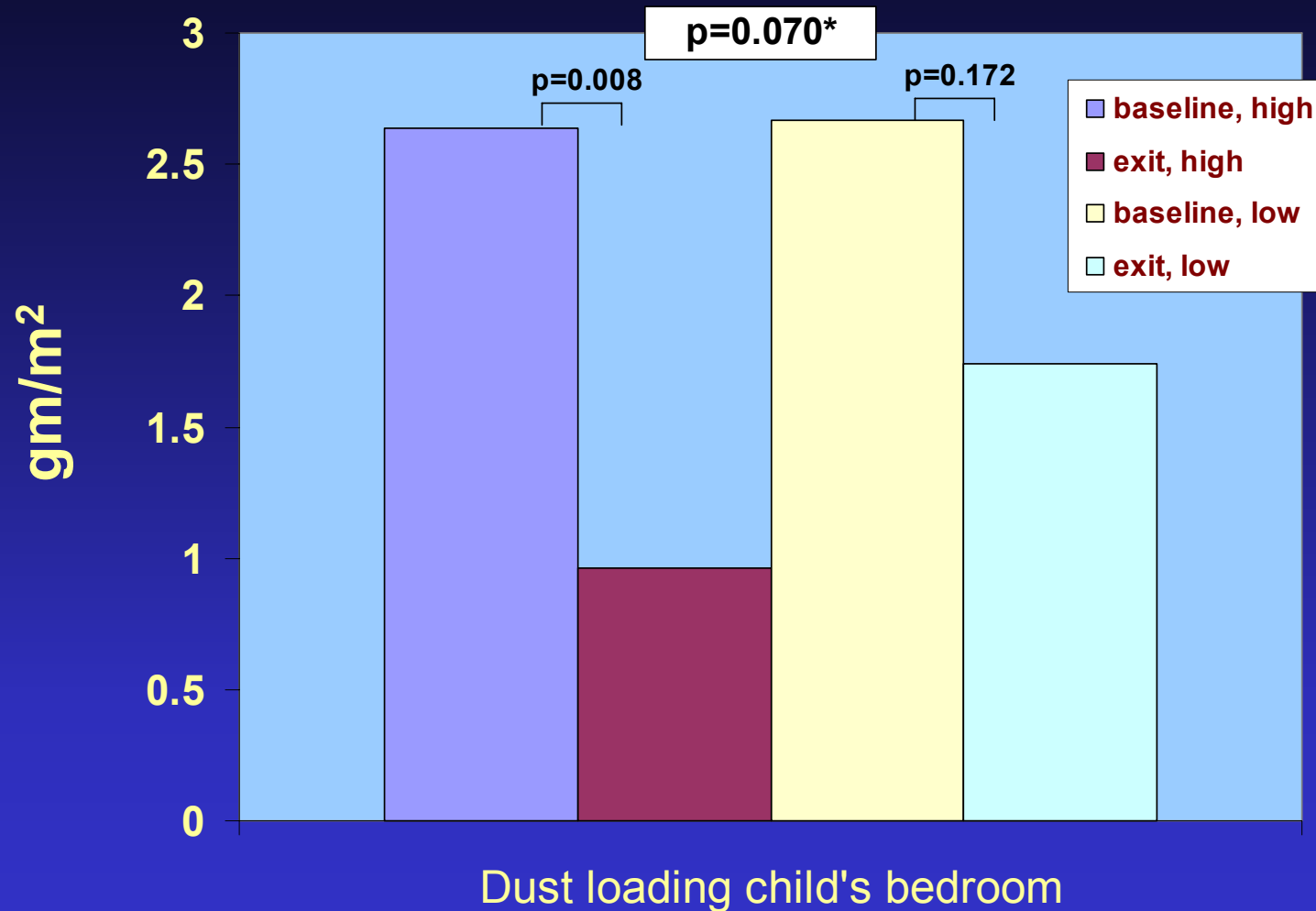
p-values:  
0.000 (high intensity, baseline vs. exit, chi-square)  
0.414 (low intensity, baseline vs. exit, chi-square)  
0.041 (exit, low vs. high intensity, regression adjusted for baseline score)

# Outcomes: Participant Actions



\* p value comparing high vs. low exit values after adjustment for baseline values using logistic regression

# Outcomes: Floor Dust Loading





# Conclusions

A community health worker intervention addressing multiple exposures reduced asthma symptom days, improved caretaker quality of life and reduced urgent health services utilization:

Outcome	High Intensity	Low Intensity
Symptoms	↓	↓
Quality of Life	↑	↑
Urgent utilization	↓	

# **Next Steps: Healthy Homes II**

- **Need to demonstrate value of in-home interventions to health care payors**
- **Compare effectiveness of CHW in-home asthma support to clinic-based education**
- **CHW intervention combines support for medical aspects of asthma self-management with reduction of indoor triggers**
- **RCT of 380 low-income households with children with asthma funded by NIEHS**
- **Sponsored by local asthma coalition**

# Next Steps:

## Better Homes for Asthma

- Remediate 70 substandard homes with conditions associated with asthma and other health risks:
  - improve ventilation
  - remove old carpet
  - eliminate water intrusion
  - install lighting and barriers to prevent falls
  - address lead paint if present
- Assess impact of remediation on asthma-related health outcomes and exposures to asthma triggers with RCT
- Compare marginal value of remediation relative to community health worker intervention

# Healthy Public Housing Communities: High Point

- Redevelop 1600 units
- Incorporate features to promote health
  - Network of open spaces and trails
  - Increase access to transit to decrease auto use
  - Develop spaces for social interaction
  - Incorporate healthy homes approaches into construction of new units
  - Designate tobacco-free units and zones
  - Design buildings to promote physical safety
  - Neighborhood market providing healthy, affordable food
  - Community gardens



*Map overview of the High Point redevelopment.*

# Healthy Public Housing Communities: Resident Participation

- **Assessment and planning by youth and adult teams** ■
- **Community discussions**
- **Community outreach and education**
- **Youth team environmental health projects**
- **Mutual housing agreements**

# Healthy Public Housing Communities: Evaluation

- **Process**
  -
- **Pre-post community surveys**
- **Qualitative impact assessment**
- **Outcomes among families with asthma**
  - **changes in home environment**
  - **changes in asthma-related health outcomes**

# Healthy Housing Guidelines

- **Dissemination of guidelines for construction of healthy new homes**
- **Consensus conference to develop healthy homes guidelines for existing units**
- **Review of local housing codes**
  - **Assess for inclusion of healthy homes principles**
  - **Develop model language to address gaps**
  - **Promote adoption of healthy housing codes**
  - **Train housing inspectors, housing advocates, builders, etc.**

# Moving from Data to Action

- **Essential ingredients**
  - Long-term vision
  - Partnerships
  - Time, patience and commitment
- **Challenges**
  - Politics
  - Exigencies of academia
  - Funding