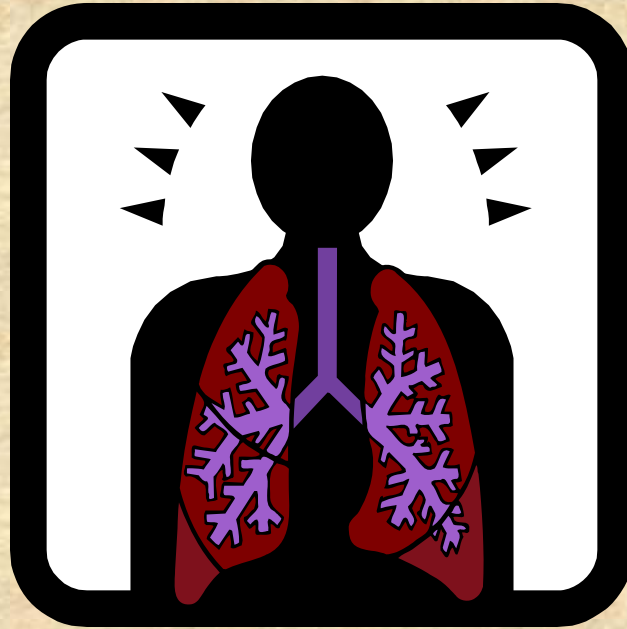


# **Air Quality and Health**



**Eric Frykman, MD, MPH**

**Public Health Officer**

**Riverside County**

# Thanks:

**Marci Aguirre, MPH, CHES**

**Marshare Penny, MPH**

**Andrea Rodriguez, MS**

**Wayne Harris, BS**

**Noelle Hartwick, BSN**

# California Health Interview Survey

## San Bernardino County

- Estimated 228,000 persons have asthma
- Of these, approximately 76,000 are under the age of 18 years (underestimated ?)



# California Health Interview Survey Riverside County

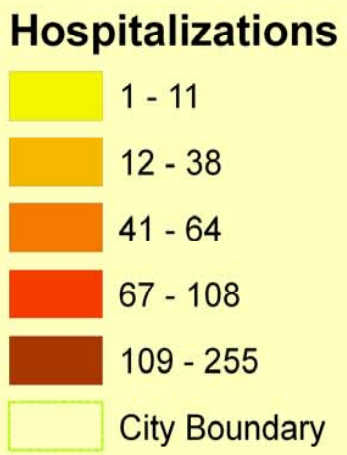
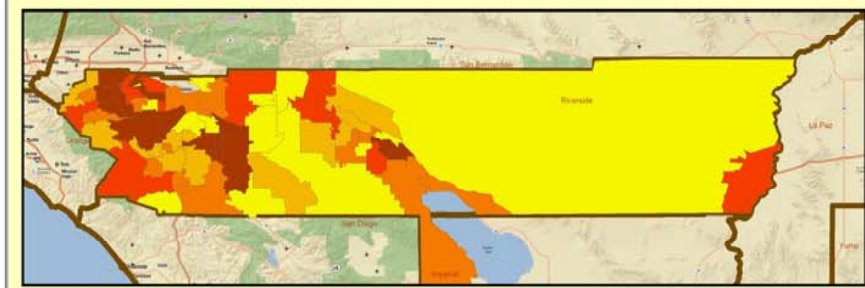
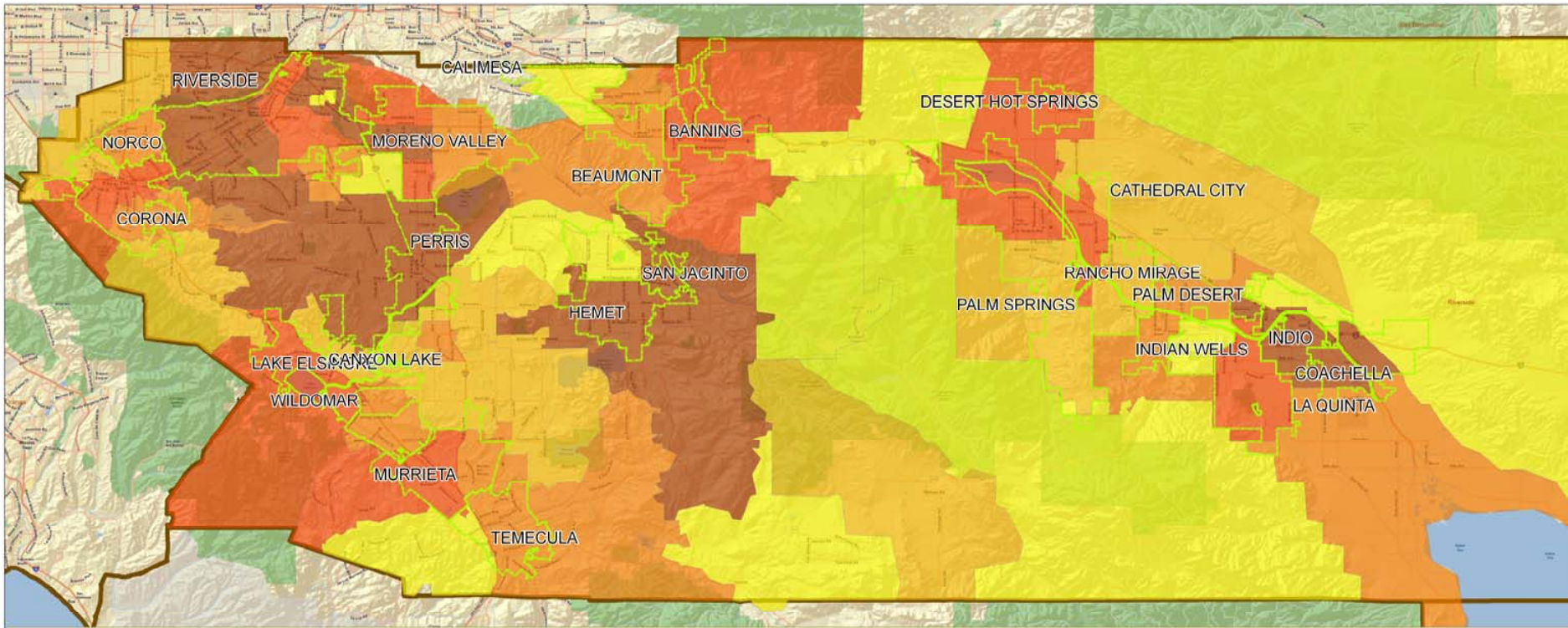
- **Estimated 258,000 persons have asthma**
- **Of these, approximately 76,000 are < 18 y/o**



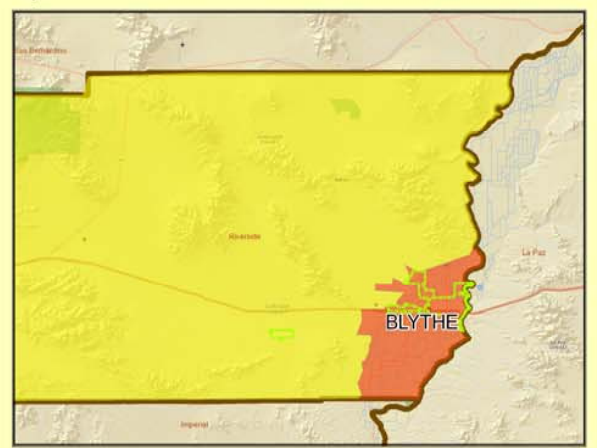
# **Asthma Hospitalizations in Riverside County**

- **38% of those hospitalized were under the age of 18**
- **Blacks had hospitalization rates more than twice that of Hispanics and whites.**

# Count of Hospitalizations for Asthma by Zip Code: Riverside County, 2003-2005



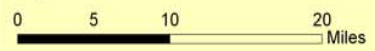
Blythe



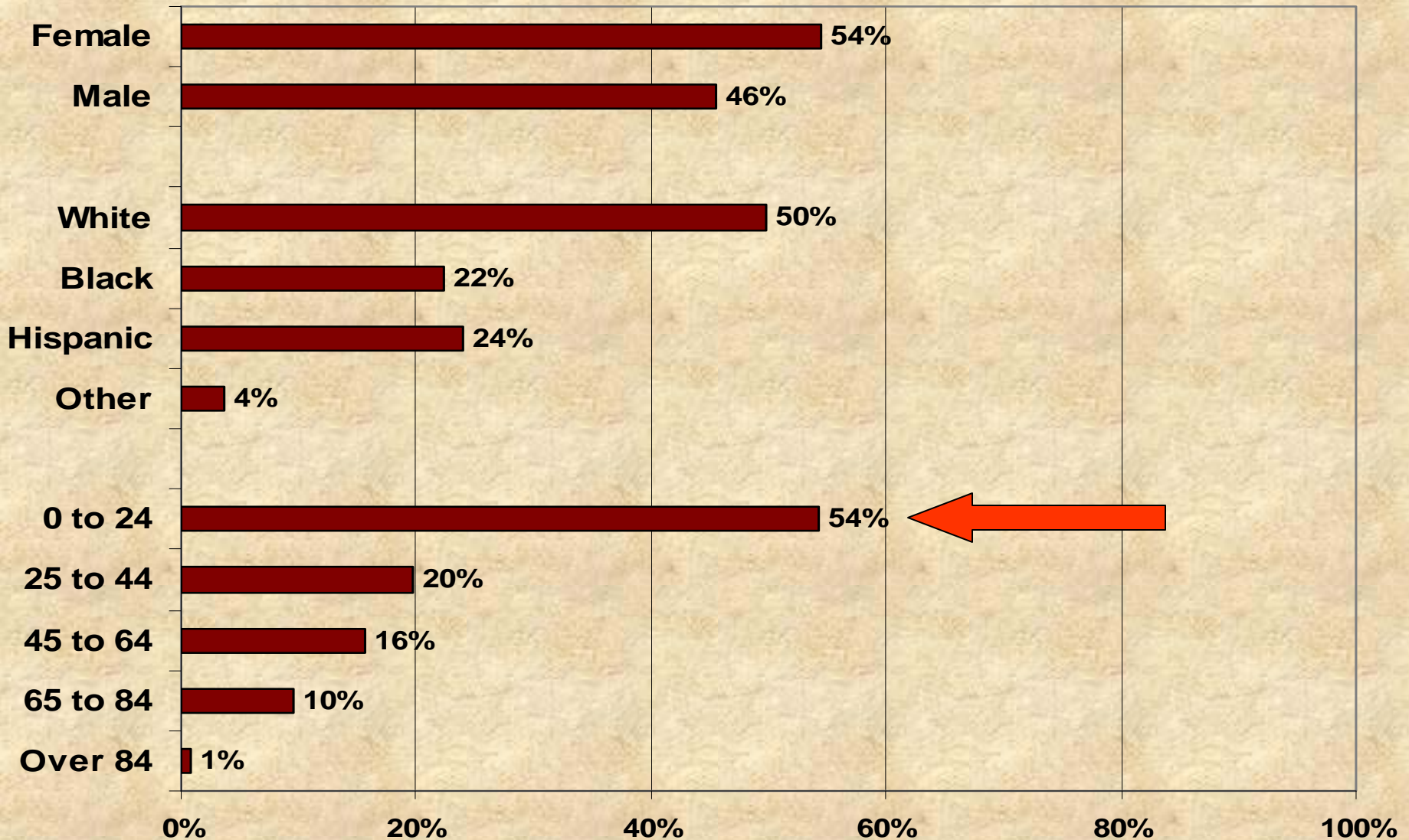
Data Source:  
Office of Statewide Health Planning  
and Development (OSHPD): 2003, 2004, & 2005  
Riverside County

Map Created by Wayne Harris, Research Specialist  
Riverside County Department of Public Health,  
Epidemiology and Program Evaluation Branch

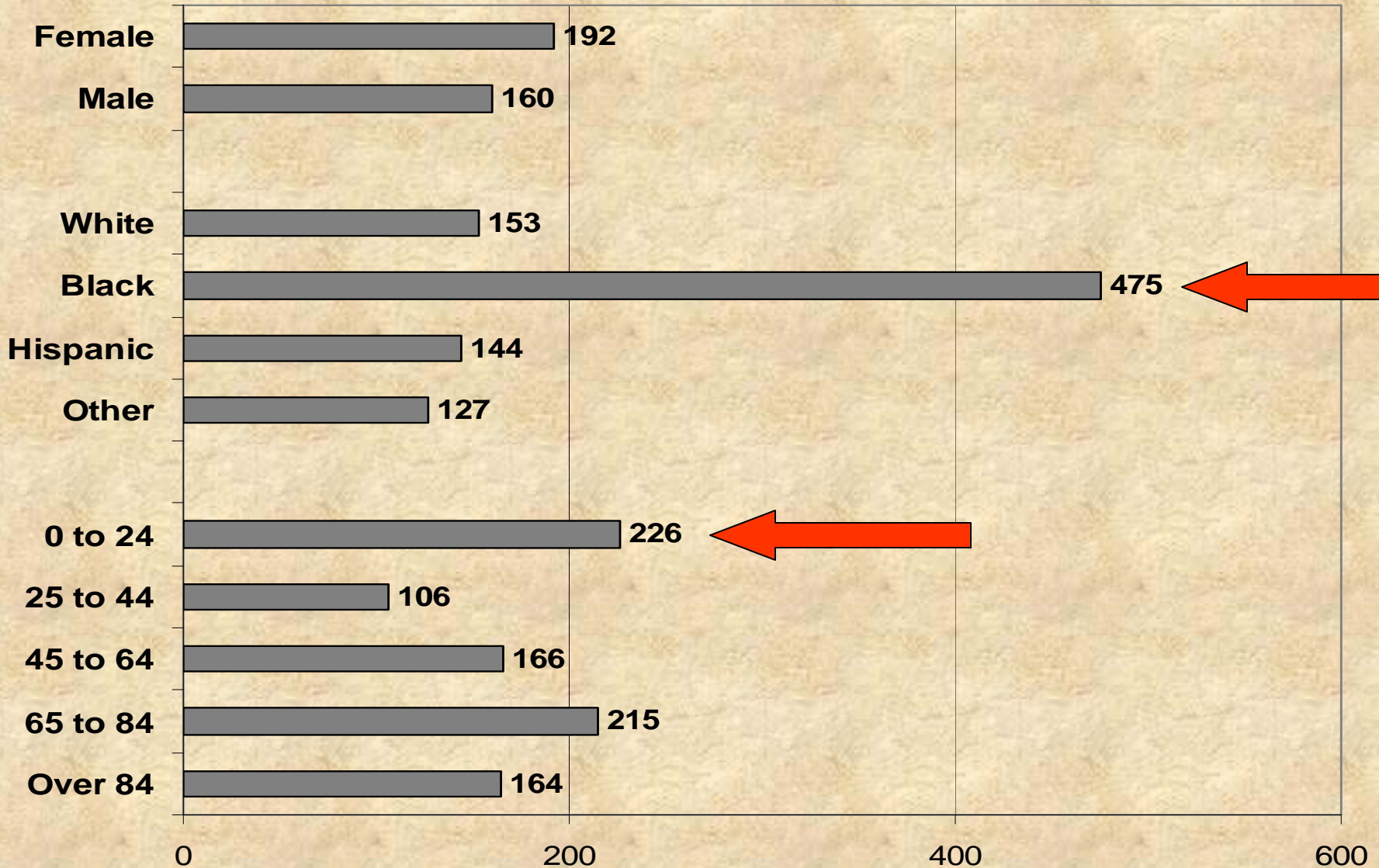
May 2008



# Distribution of Hospitalizations 1990-1999, By Gender, Race, and Age

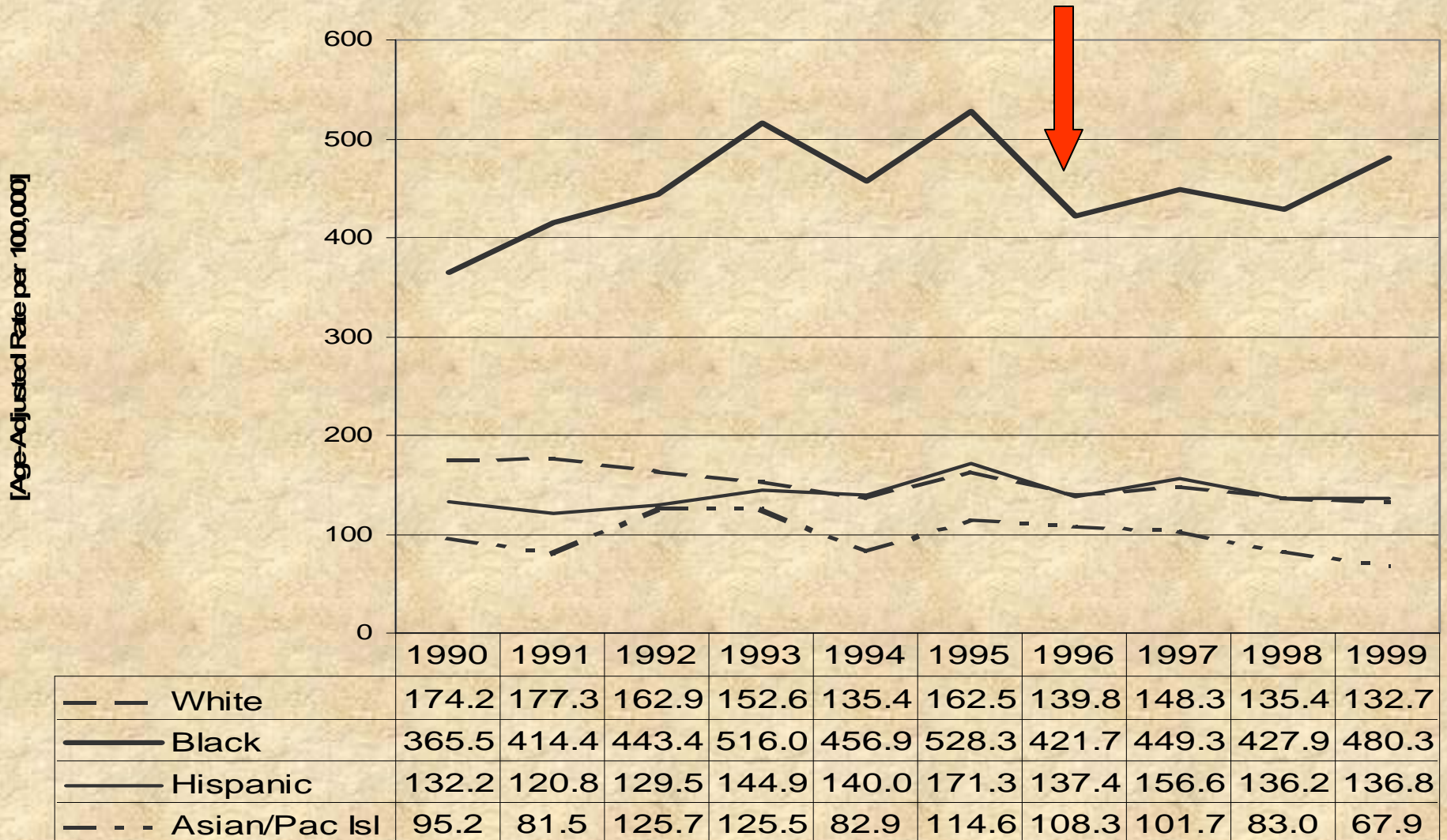


# Hospitalizations per 100,000 Persons 1990-1999, By Gender, Race, and Age





## Age-Adjusted Hospitalization Rates by Race/Ethnicity Asthma, 1990-1999



Note: Number of Hospitalizations for American Indians was considered too small to calculate a reliable rate.

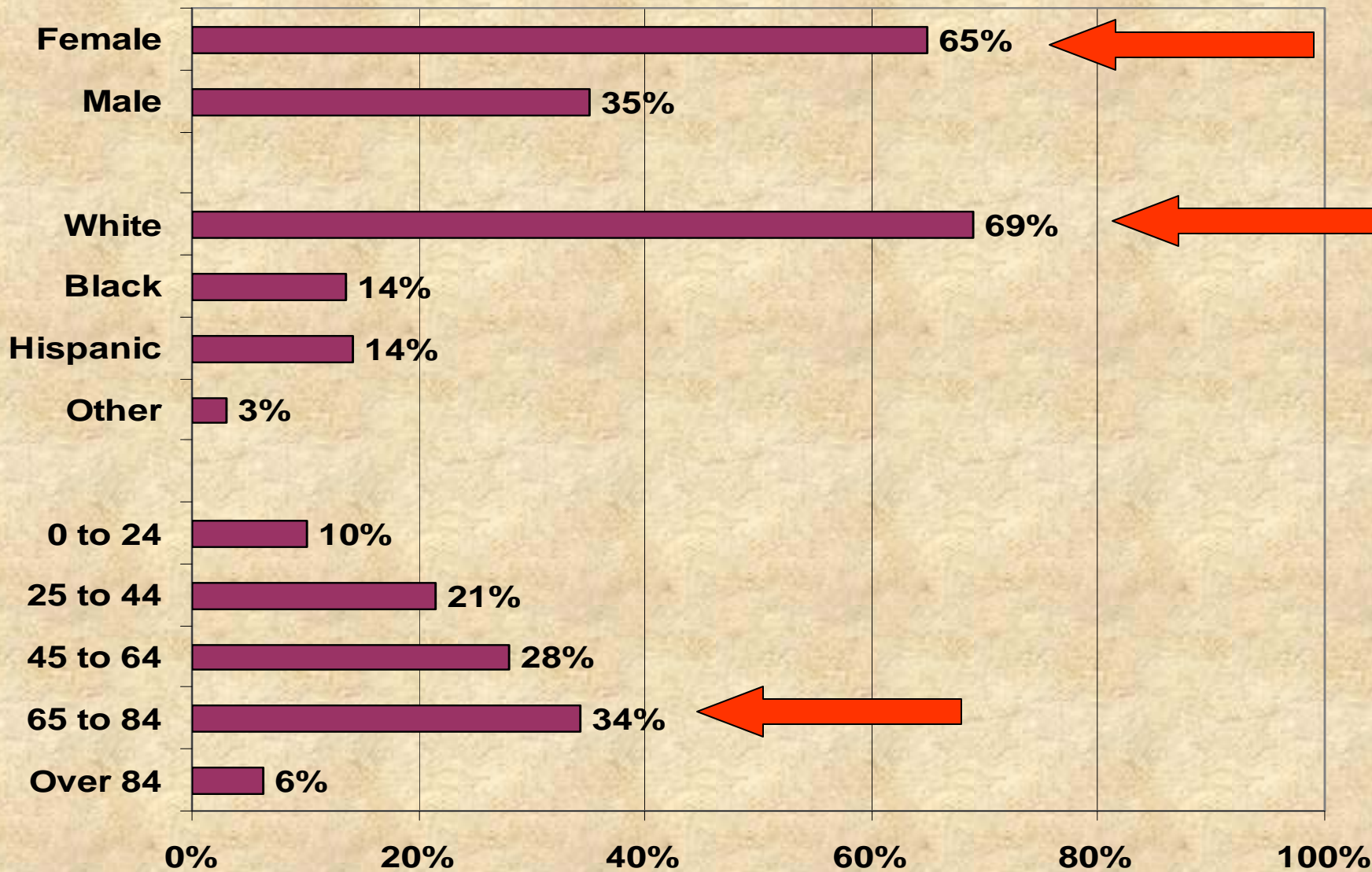
White
  Black
  Hispanic
  Asian/Pac Isl

# Summary of 1990-1999

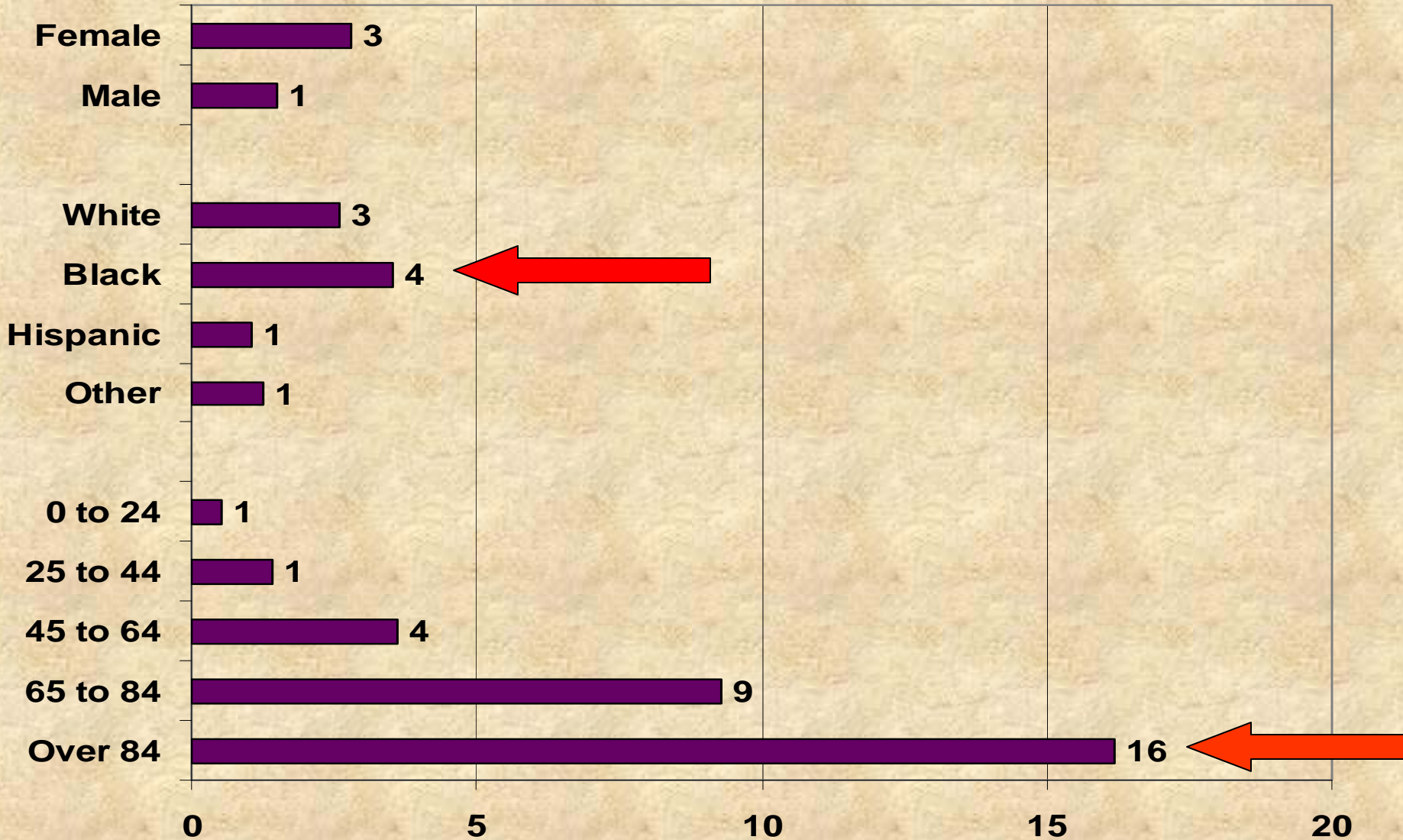
Number of Hospitalizations:	27,593
Hospitalizations per 100,000 Persons:	176
Number of Hospital Days:	98,885
Average Length of Stay (Days):	4
Total Hospital Charges:	\$218,678,712

**Yes, that's 274 years!**

## Distribution of Deaths 1990-1999, By Gender, Race, and Age



# Deaths per 100,000 Persons 1990-1999, By Gender, Race, and Age

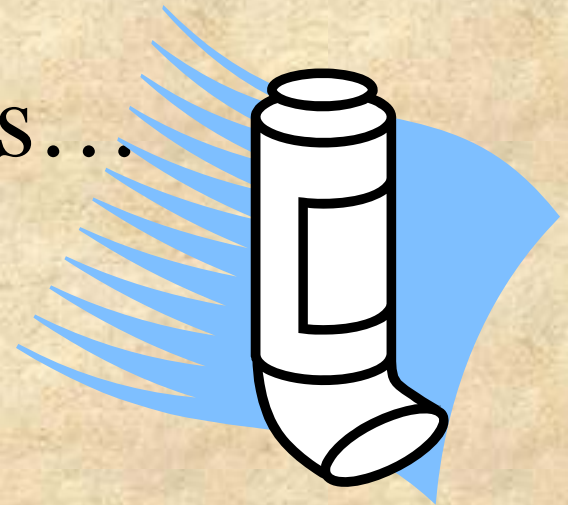


# Some Good News for the Inland Empire

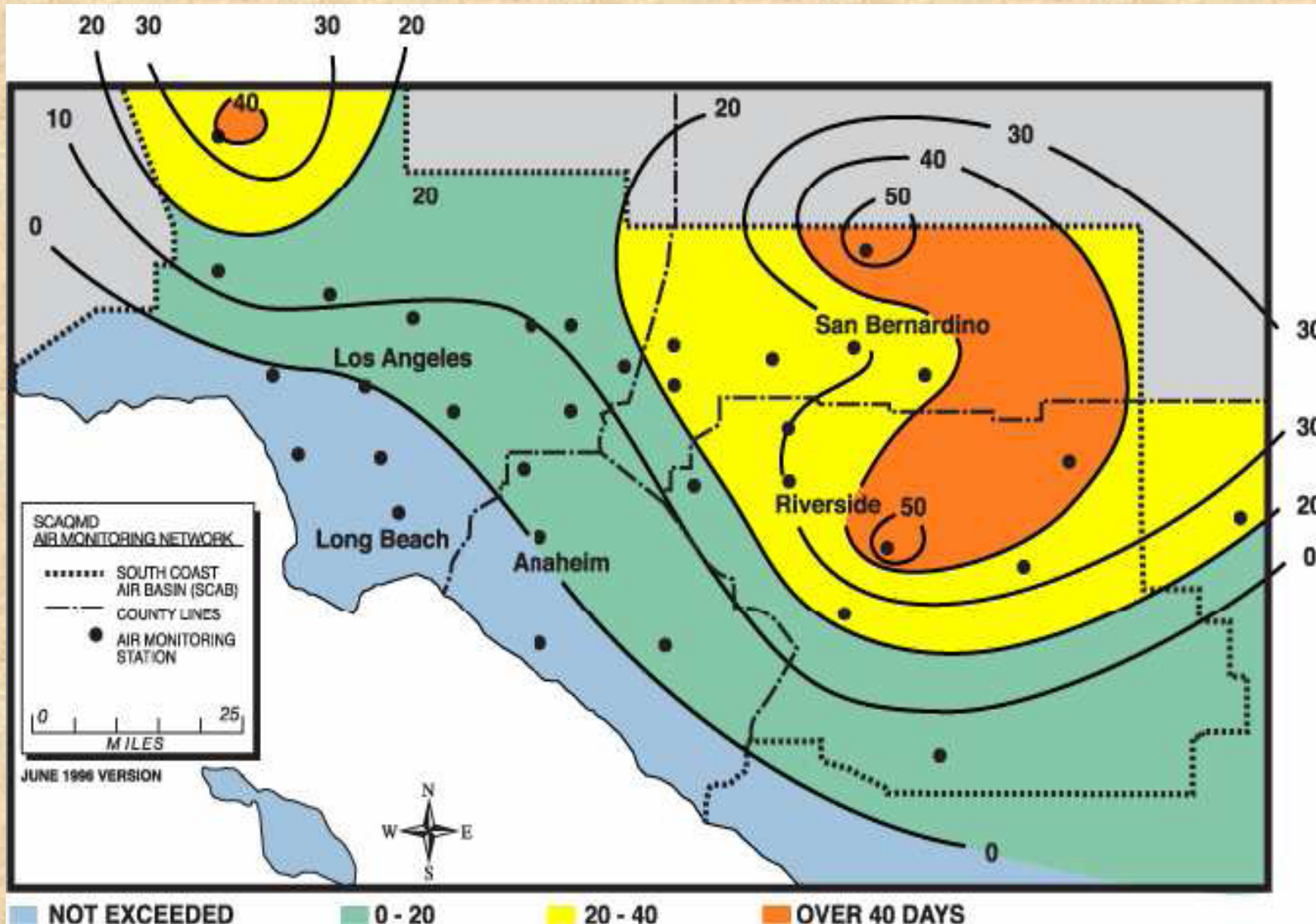
- 70% of asthmatic children state that their physical activity is rarely or never limited by asthma.
- 74% of adults has symptoms less than twice per month

But...the bad news...

- Nearly 1/3 are limited at least sometimes...



# Ozone Days



# So how does the air affect asthma?

- Dust
  - Allergens
- Smog
  - Allergens
  - NO<sub>x</sub>, SO<sub>2</sub>, CO, Ozone
  - PM<sub>2.5</sub>
  - PM<sub>10</sub>

# Further Lung Effects...

- Triggers or enhances inflammatory responses
  - Acute and subacute increase in hospitalizations and death
  - Heart effects

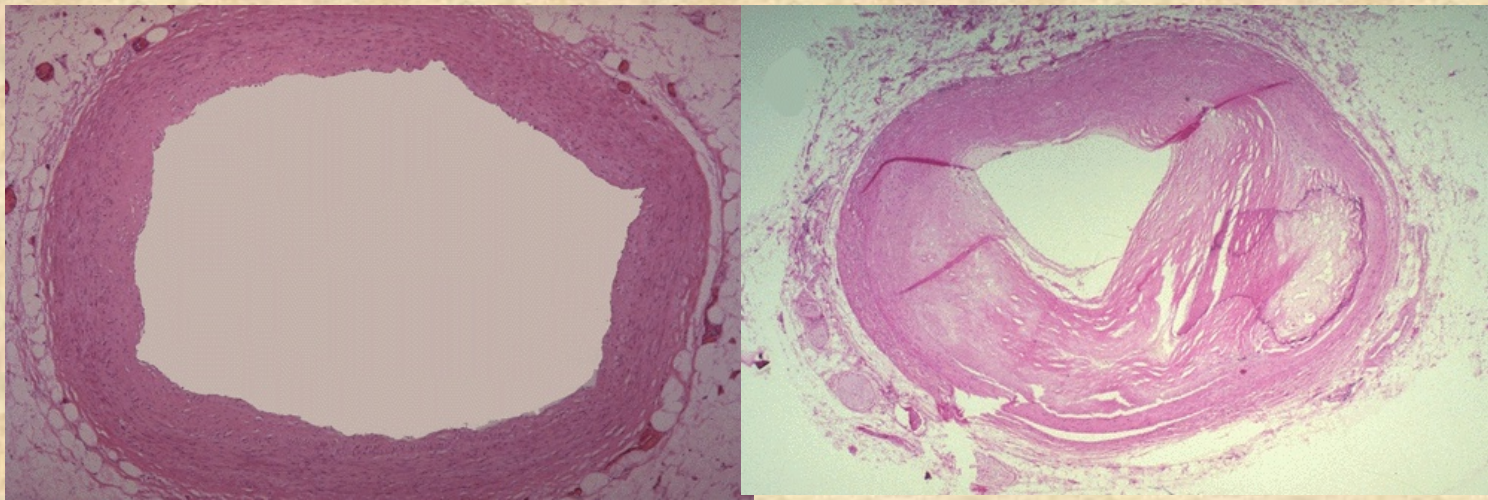


# Heart Disease

- Approximately 136,000 persons in Riverside County state that they have been diagnosed with heart disease
- Another 416,000 have been diagnosed with high blood pressure
- If the level of  $PM_{2.5}$  was sustained at  $20\mu g/m^3$  above desired/baseline: long-term increased CPD death rate increases by 12%

# How does the air affect our hearts?

- Through absorption
  - Systemic effects
- Through “reflexes”
  - Rhythm problems
- Through inflammation
  - Leads to further narrowing of vessels and instability of the “vessels”



# Is there much to debate?

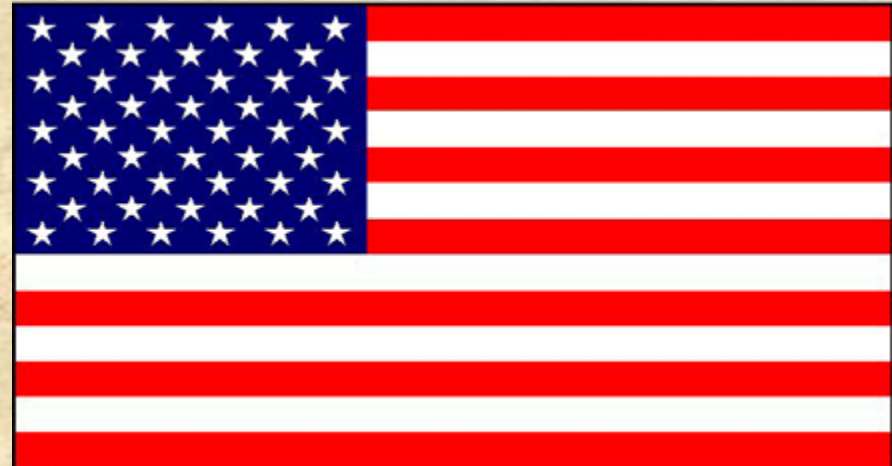
- No:
  - Multiple studies supporting same relationships
    - Both long-term and short-term effects
  - Epi data and animal models point the same direction
  - Deaths will be prevented with less air pollution
    - 23,000 annually in the US
- Yes:
  - Measurements and confounders
  - Whose responsibility is this?
  - How much are we willing to pay for clean air?
  - By when do we want clean air?
    - How many lives are we willing to affect?

# Bright Spots

- Pollution levels are improving
- Heart disease death rates decreasing
  - But asthma rates moving upward
- A larger portion of society seems to care
- The Global warming/Greening movement

# How much choice do we really have?

- Individualism
  - Freedom to create ones path without outside interference
- Transportation Options:
  - Walk
  - Bike
  - Train
  - Bus
  - Plane
  - Other
  - Combination
  - Car



**Thank You**

**Call me for further questions...**

**(951) 358-5058**