



Exposure to Small Air Particulates (PM_{2.5}) among Asian and Pacific Islander Americans

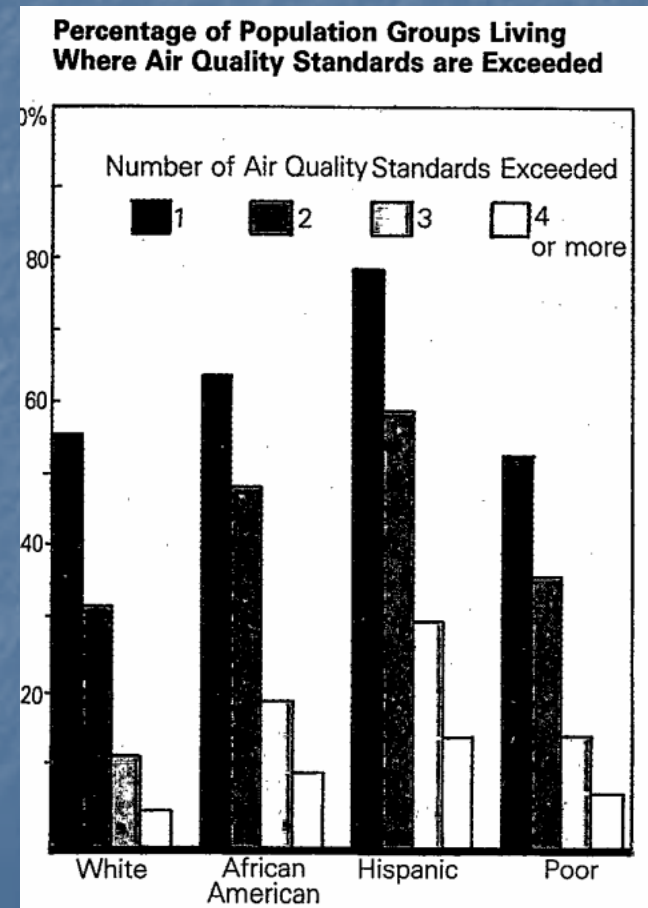
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U.S. Environmental Protection Agency

Today's Talk

- EJ and Exposure to air pollutants
- Criteria Air Pollutants and Health effects
- Data Sources and Methods
- Results
- Implications
- Future steps

"Environmental Protection: Has it Been Fair?"



Percentage of children living in counties in which any air quality standard was exceeded

	All Races	White	Black	Hispanic	AI / AN	Asian or PI
1999	15.0%	10.6%	16.2%	31.4%	7.6%	24.5%
2005	60%	37%	66%	71%	33%	76%

Sources: U.S. Environmental Protection Agency, Office of Air and Radiation, Aerometric Information Retrieval System and ACE 2003 report and 2007 website

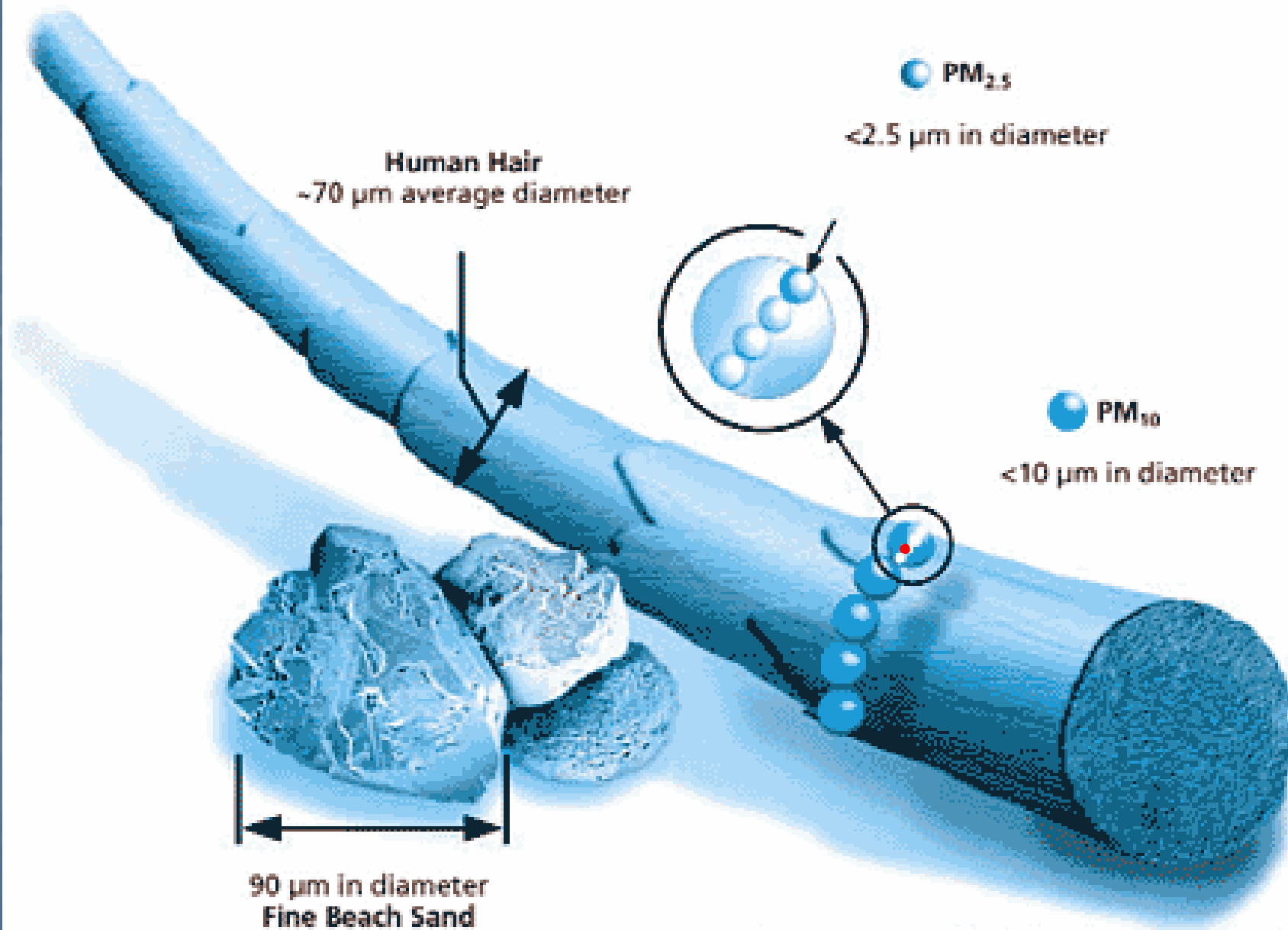
National Ambient Air Quality Standards

- Ozone
- Lead
- Nitrogen dioxide
- Sulfur dioxide
- Carbon monoxide
- Particulate matter (PM)

Particulate Matter (PM)

- Primary
 - PM₁₀ (e.g. agriculture, construction)
 - PM_{2.5} (e.g. motor vehicles, industry)
- Secondary
 - Oxidized phosphates & nitrates in the atmosphere

Comparison of PM sizes.



<http://www.epa.gov/region09/air/pm25-story.html>

Public Health Risks of PM_{2.5} Are Significant

- Contributes to premature death
- Aggravates respiratory & cardiovascular diseases
 - Hospital admissions
 - Doctor and ER visits
 - Medication use
 - School and work absences
- And possibly linked to
 - Lung cancer deaths
 - Infant mortality
 - Developmental problems, such as low birth weight, in children

Some Groups Are More at Risk

- People with heart or lung disease and diabetes
- Older adults
- Children

National Ambient Air Quality Standards for PM

- **PM_{2.5} Standards**
 - 15.0 $\mu\text{g}/\text{m}^3$ Annual
 - 35 $\mu\text{g}/\text{m}^3$ 24-hour

- **PM₁₀ Standards**
 - 150 $\mu\text{g}/\text{m}^3$ 24-hour
 - No longer an annual standard

Data Sources

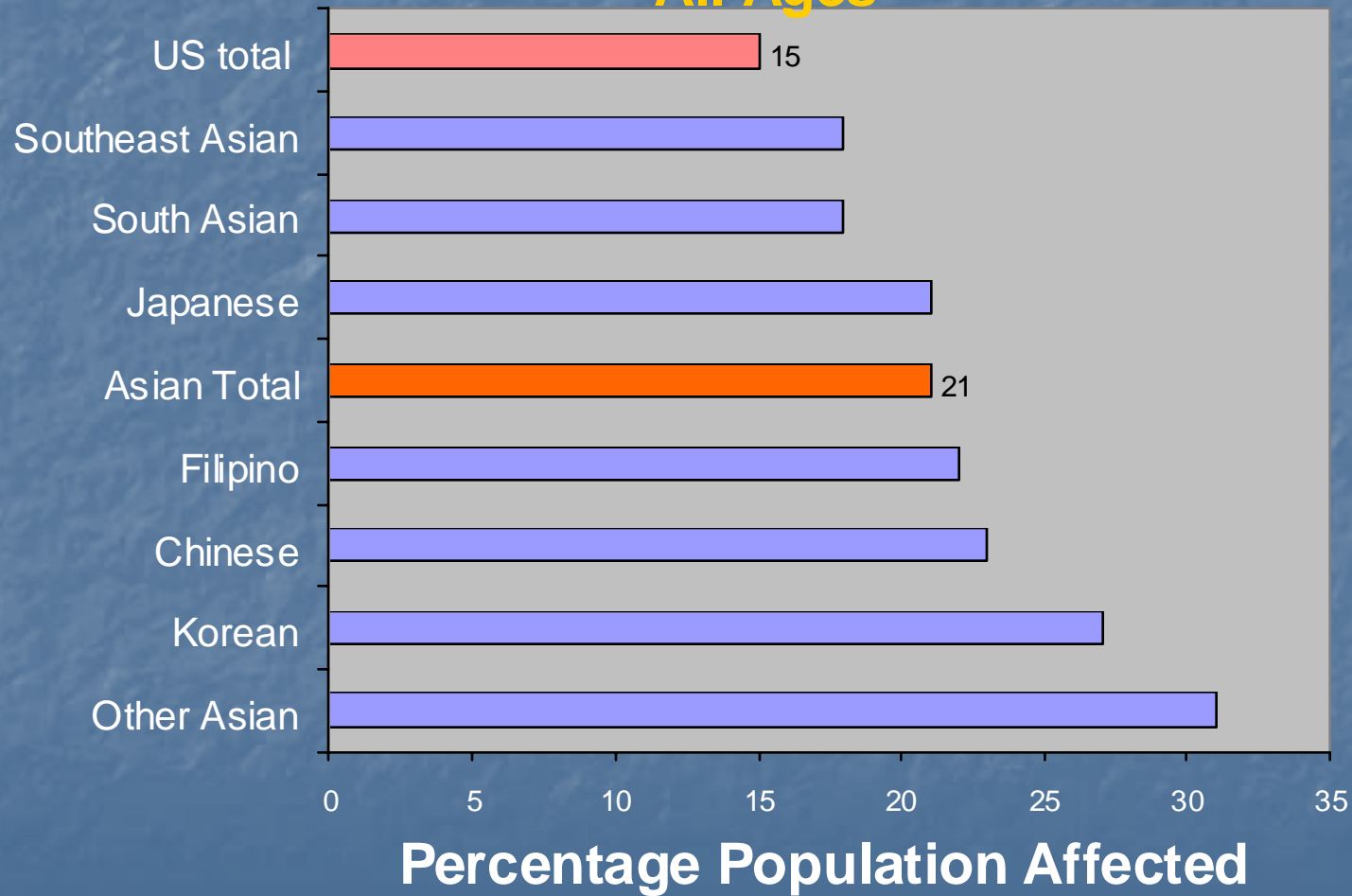
- Air data for PM_{2.5} for 2004 obtained from www.epa.gov/air/data and OAQPS
- Census data by county, race/ethnicity and age-group for 2000 were obtained from www.census.gov

Methods

- Take total number of population (defined by race/ethnicity and age) living in a county exceeding PM air quality standard at any time during the year, divided by the total number of the population (defined by race/ethnicity and age) in the US.

Proportion of Asian Population Living in Counties Exceeding Air Quality Standards in 2004

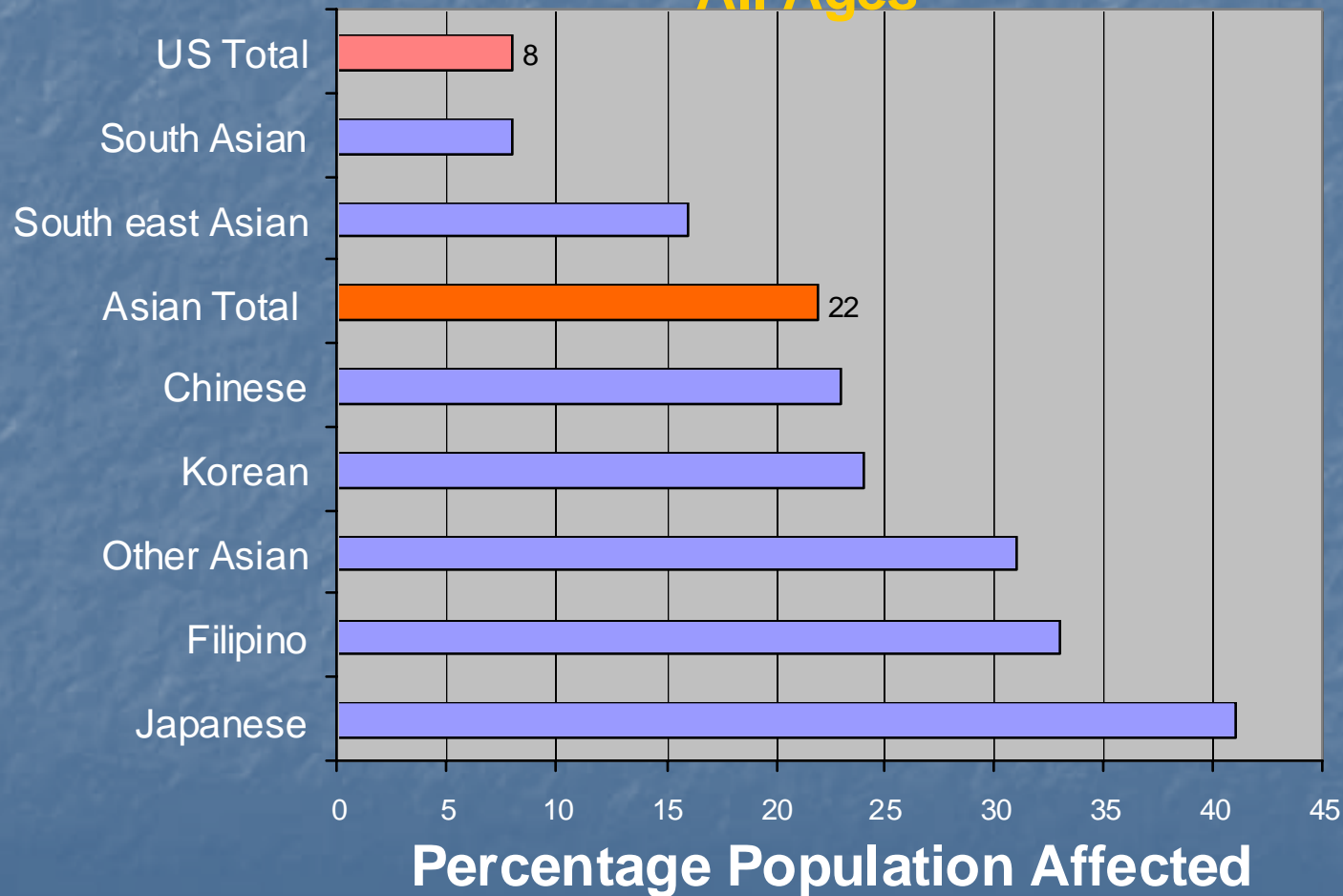
PM_{2.5} Annual Standard-Weighted All Ages



Based on Census 2000 county population estimated and EPA AQS ambient air quality data

Proportion of Asian Population Living in Counties Exceeding Air Quality Standards in 2004

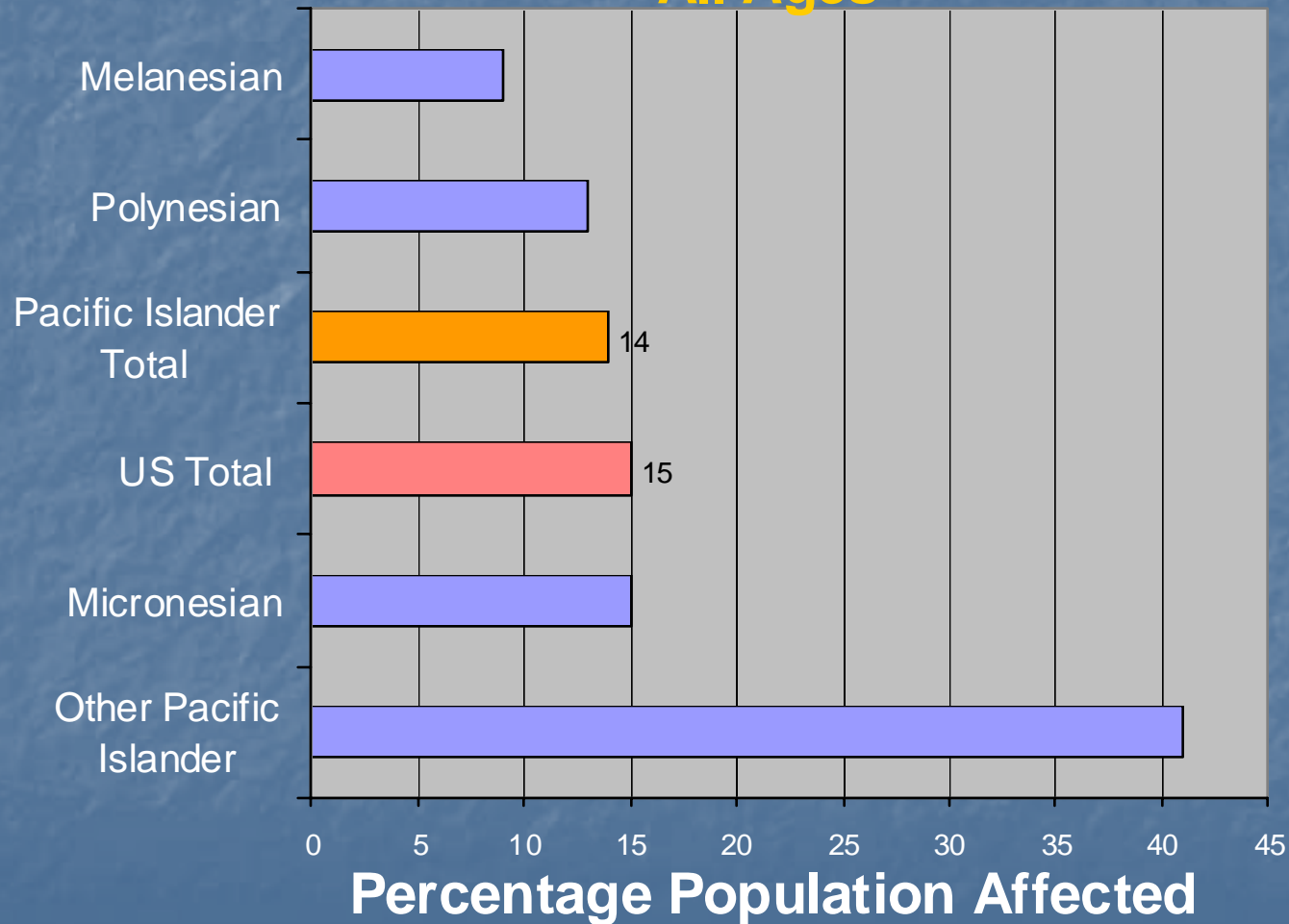
**PM_{2.5} 24-hr Standard
All Ages**



Based on Census 2000 county population estimated and EPA AQS ambient air quality data

Proportion of Pacific Islander Population Living in Counties Exceeding Air Quality Standards in 2004

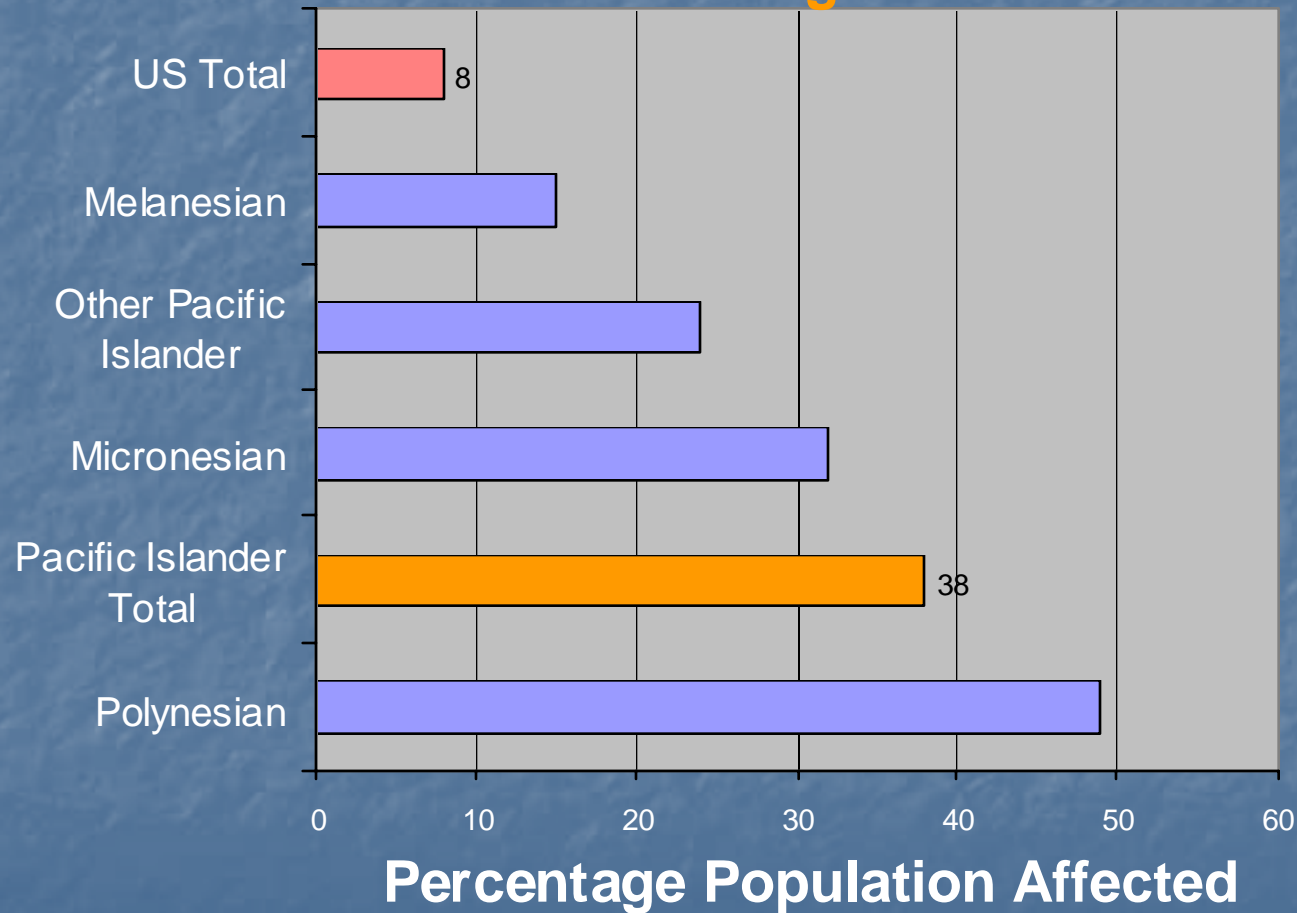
PM 2.5 Annual Standard-Weighted All Ages



Based on Census 2000 county population estimated and EPA AQS ambient air quality data

Proportion of Pacific Islander Population Living in Counties Exceeding Air Quality Standards in 2004

PM 2.5 24-hr Standard All Ages



Based on Census 2000 county population estimated and EPA AQS ambient air quality data

Implications

- Pacific Islanders and Asian Americans may be at disproportionate risk of breathing unhealthy air.
- More research is needed to verify findings & establish mechanisms.
- These findings highlight the need to research APIAs and to disaggregate subgroups.

Ongoing work

- Examine
 - Other criteria air pollutants
 - Hazardous Air Pollutants
- Investigate the explanations for APIAs
- Explore health outcomes

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Thank You!

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Visit OCHPEE website at

<http://yosemite.epa.gov/ochp/ochpweb.nsf/homepage>

Extras

Asian Groups In Census 2000

- Asian Indian
 - Bangladeshi
 - Cambodian
 - Chinese
 - Filipino
 - Hmong
 - Japanese
 - Korean
 - Laotian
 - Pakistani
 - Sri Lankan
 - Vietnamese
 - Indonesian
 - Malaysian
 - Thai
 - Other Specified Asian
- South Asian
 - Asian Indian
 - Bangladeshi
 - Pakistani
 - Sri Lankan
 - South East Asian
 - Cambodian
 - Hmong
 - Laotian
 - Vietnamese
 - Other Asian
 - Indonesian
 - Malaysian
 - Thai
 - Other Specified Asian

Pacific Islander Groups

- Pacific Islander total
 - Polynesian
 - Native Hawaiian (not used)
 - Samoan (not used)
 - Tongan (not used)
 - Micronesian
 - Guamanian or Chamorro (not used)
 - Melanesian
 - Fijian (not used)
 - Other Pacific Islander

Total Asian, Native Hawaiian, or Other Pacific Islander (API) Population Per County

