

Wildfire Smoke and Respiratory Symptoms in Children

March 27, 2008



Air Resources Board

California Environmental Protection Agency

Background

- October 2003
S. California wildfires
 - Six counties
- Burned
 - 750,000 acres
 - 3,640 homes
 - 33 commercial properties
 - 1,141 other structures
- Smoke impacted six Children's Health Study sites



Kunzli N, et al. Health Effects of the 2003 Southern California Wildfires on Children. Am J Respir Crit Care Med. 174: 1221-1228, 2006. (Funded by: SCAQMD, NIEHS, Hastings Foundation, ARB).

Methods

■ Population

- 873 high school seniors
- 5,551 first graders

■ Exposure characterization

- Number of days smelled smoke indoors
- PM10 on 5 highest fire days

■ Health measures

- Respiratory symptoms or illness
- Eye irritation
- Asthma exacerbation

Results

- PM10: ~3 to 8 times historical average
- Risk of symptoms increased
 - 60 to 500% with >6 smoky days
 - 30 to 250% with 1-5 smoky days
 - 30 to 300% between high vs. low PM10 communities
 - For non-asthmatics compared to asthmatics
- Asthmatics
 - Had higher baseline symptoms rate
 - Were more likely to take preventive action
- Preventive actions reduced risk of symptoms

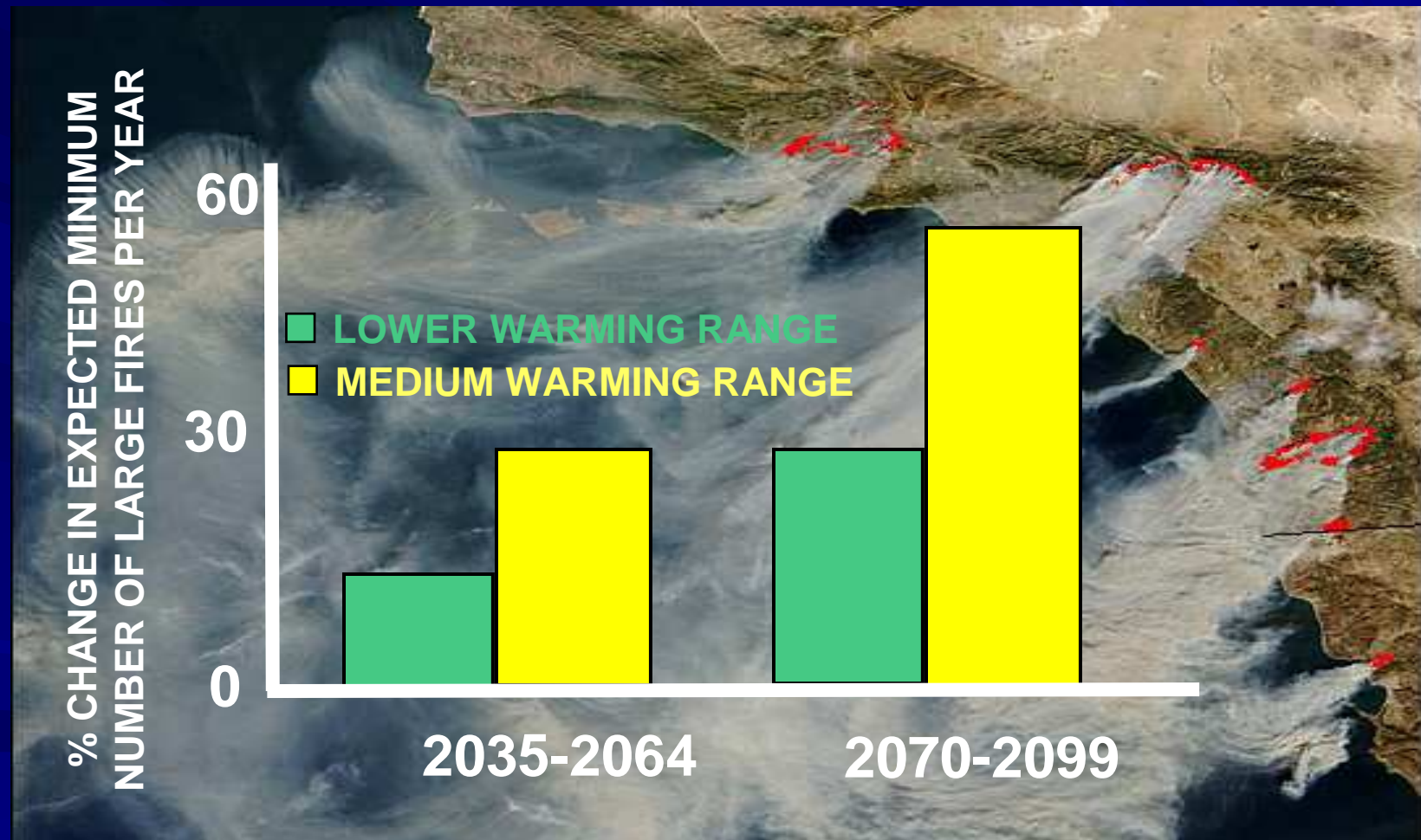
Implications

- Public health advisories can be based on PM10 level
 - Air Quality Index
- Preventive actions provide some benefit for asthmatics
 - Stay indoors
 - Wear masks when outdoors
 - Use air conditioner
- ARB Emergency Response Team

Air Quality Index	
0 to 50	Good
51 to 100	Moderate
101 to 150	Unhealthy for Sensitive Groups
151 to 200	Unhealthy
201 to 300	Vary Unhealthy
301 to 500	Hazardous



Climate Change and Increase in Wildfires



Source of data : Westerling and Bryant, "Climate change and wildfire in and around California: Fire modeling and loss modeling." 2006. www.climatechange.ca.gov