



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

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Project Title Wildfire Air Pollutants and Asthma Hospital Admissions: An Observational Study on the 2007 Southern California Wildfires	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The 2007 Southern California Wildfires induced high levels of air pollutants, causing asthmatics to be particularly at risk. To determine the specific effect wildfire air pollutants held on populations at risk for asthma, secondary data on the concentration of pollutants and the number of asthma hospital admissions for five age groups in the periods during and surrounding the wildfires were examined.</p> <p>Methods/Materials First, the associations between the fires and both ambient pollutant and asthma hospital admissions were assessed. Then, statistical regression was performed to determine the relationship between pollutant concentration and asthma hospital admissions. For control, the period before the wildfire was used as the baseline for comparison; in addition, daily pollutant concentrations during the 2007 fire period were compared with that of corresponding periods in 2006 and 2008 (non-fire years). Asthma hospital admission counts were also compared with total (asthma and non-asthma) hospital admission counts.</p> <p>Results PM(2.5) (particulate matter less than 2.5 micrometers) was found to be most correlated with the fire period; lack of data led PM(10) (particulate matter less than 10 micrometers) to be inconclusive; changes in nitric oxide, nitrogen dioxide, ozone, and sulfur dioxide concentrations had no significant relationship to the wildfires. For asthma hospital admissions, age group one (0-1 years old) was omitted due to insufficient data; group two (1-17 years old) experienced increase in admission after the fire; group three (18-34 years old) experienced decrease in admission both during and after the fire; group four (35-64) experienced greatest increase in admission after the fire; and group five (over 65 years) experienced greatest increase in admission during the fire.</p> <p>Conclusions/Discussion It was concluded that high levels of wildfire PM2.5 is most detrimental to the elderly. From these results, policy and prevention measures can be made to focus on sensitive age groups at the periods in which they are most vulnerable.</p>	
Summary Statement Using secondary data on pollutant concentration and hospital admissions from the periods during and surrounding the 2007 Southern California Wildfires, the relationship between wildfire pollution and serious asthma morbidity was analyzed.	
Help Received Mr. Nick Mangus provided pollution data from AQS data mart; Mr. Russell Gartz provided hospital admission data from OSHPD; Mother and Father helped with Excel; Mr. Brinn Belyea, Mrs. Julia Newman, and Dr. Harvey Checkoway reviewed paper and offered suggestions	