

THE SOUTHERN CALIFORNIA CHILDREN'S HEALTH STUDY: RECENT FINDINGS

February 21, 2002

Air Resources Board



California Environmental Protection Agency

Thank you Mr. Kenny. Good morning Dr. Lloyd and members of the Board. I will be presenting two recent and important findings from the Children's Health Study. This study, which has been underway for 10 years now, continues to provide valuable information on the link between air pollution and respiratory health in children.



I have included a map of the 12 communities chosen for the study. Communities were chosen because of their varying levels of particulate matter (measured as PM10), ozone, oxides of nitrogen, acid vapor, and ultrafine particles.

PREVIOUS RESULTS



- O_3 increases school absences
- PM10 increases bronchitis in asthmatics
- PM10, NO_2 , acids reduce lung function growth



Important results previously released from this study include the following:

Days with higher ozone concentrations result in significantly higher school absences due to respiratory illness. Recent calculations indicate that decreases in ozone in the South Coast Air Basin have avoided 2.9 million school absences over an 8 year period.

Children with asthma who are exposed to higher concentrations of particles are much more likely to develop bronchitis.

Children living in communities with higher concentrations of particulate matter, nitrogen dioxide, and acid vapor have lungs that develop more slowly and are less able to move air through them. Deficits in lung function growth average about 1% per year. This decreased lung development could have permanent adverse results.

I want to focus my discussion on the two most recent findings of the study and their implications for public health protection. The findings provide confirmation of these previous results and add to our knowledge of the adverse effects of air pollution on children's respiratory health.

ASTHMA, AIR POLLUTION AND SPORTS

Relative Asthma Risks		
Pollutant	Plays 3 or More Team Sports	Plays No Team Sports
High ozone communities	3.3 X increased risk	no increased risk
Low ozone communities	no effect of sports	
Nitrogen dioxide, PM10, acid vapor	no effect of sports	



The first of these findings that has received much media attention is based on examining asthma incidence in high and low ozone communities. The investigators divided children into two groups: those participating in 3 or more team sports and those not participating in team sports. The team sports group was used as a way to identify those children most active in physical activities. The results indicate that children in high ozone communities who play 3 or more sports are 3.3 times more likely to develop asthma than children who play no sports. In communities with low ozone concentrations, there was no relationship between the number of team sports played and the development of asthma. Additionally, none of the other pollutants, including nitrogen dioxide, particulate matter, or acid vapor, showed a relationship with the development of asthma. While it is known that air pollution can exacerbate existing cases of asthma, this study is important because it is one of the first to indicate a possible causal role of air pollution in asthma development.

RELOCATION STUDY



- Re-tested lung function
- Moving to cleaner areas (PM10) was associated with improved lung function growth



The Children's Health Study investigators released another finding in late December that did not get as much media attention but also has important impacts on public health protections. The second finding is based on an analysis of children in the study who moved away from their original study communities. These children experienced changes in air pollution exposures after moving. Some moved to cleaner communities, some moved to dirtier communities. The goal of this analysis was to determine whether these children's average annual lung function growth rates were related to the changes in their air pollution exposures. The changes are related; the children's lung function growth rates tended to increase if the new location had lower PM10 as compared to the old location. This finding provides evidence that children's lung growth responds to changes in air pollution exposures.

IMPLICATIONS



- Causal role of ozone in asthma development
- Reduction in air pollution exposures has immediate health benefits



As I mentioned previously, the results of these latest findings have important impacts on our work to protect the public health of Californians and children. The results of the sports, air pollution, and asthma study provide evidence of the possible causal role of air pollution in asthma development. Findings from this study underline the importance of ozone health advisories and the need to continue to reduce ozone in our communities throughout the State. Results of the relocation study are important because they are consistent with previous results reported from the Children's Health Study indicating that children living in higher ambient PM10 areas have lower rates of annual lung function growth. The relocation study indicates that during the teen years of development, the rate of lung function growth can be altered by a large change in exposure to air pollution. Results of this study highlight the importance of reducing exposure to particulate matter and that immediate benefits to children's health can be obtained.

We look forward to sharing future results of this important study with you. Thank you.