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CHAPS



Children's Health & Air Pollution Study

4991 E. McKinley Avenue, Suite 109 • Fresno, CA 93727 • www.chapssjv.org

The Children's Health & Air Pollution Study (CHAPS) aims to understand and reduce the risks of air pollution exposure to children's health in the San Joaquin Valley of California.

To accomplish this mission, we:

- ◆ investigate the impact of air pollution on children in Fresno during critical growth stages;
- ◆ assess the effects on birth outcomes, development, immune health, and inflammation;
- ◆ and sustain active partnerships with community organizations that prioritize air pollution, environment, and health in their work.



Why Is It Important To Study Children?

Children are more vulnerable to environmental hazards than adults. Children breathe more air (and are therefore more exposed to pollution) per body weight unit. They also may be more vulnerable to environmental risks because they are still developing their immune, neurological and other bodily systems.

Study Participants:

We are studying children at important stages in development in the Fresno metropolitan area. The study will include:

- ◆ 220 pregnant women and their babies
- ◆ 320 children
- ◆ 100 young adults.

Most participants will be seen 2-3 times during the study. Building on our team's previous work, the young adults were recruited from the Fresno Asthmatic Children's Environment Study (FACES) that was conducted from 2000-2008 and other prior studies. Our preterm birth and birth defects research is based on other data and not from our recruited participants.

Thank you to everyone who has volunteered to participate in this important study!

Air Pollution Research Questions:

All of our research is focused on better understanding various health outcomes and their relation to air pollution exposures at various stages of child development from before birth to adolescence. We are especially interested in Polycyclic Aromatic Hydrocarbons (PAHs) in the air which most often come from the burning of fuels (especially diesel fuels).

Project 1: Exposures to Air Pollutants and Birth Outcomes

Does exposure to air pollution increase the risk of birth defects or premature birth?

Project Lead: Gary Shaw, PhD, Stanford University

Project 2: Immune Function and Allergic Conditions **How does air pollution contribute to allergic diseases?**

Project Lead: Kari Nadeau, MD, PhD, Stanford University

Project 3: Exposure to Air Pollutants and Obesity

How does air pollution impact metabolism, diabetes and obesity?

Project Lead: John Balmes, MD, University of California, Berkeley



Project 4: Transit Exposures of Pregnant Women

Do neighborhood characteristics affect transit patterns of pregnant women? How do the transit patterns of pregnant women impact the health of their developing fetuses?

Project Leads: S. Katharine Hammond, PhD, University of California, Berkeley and John Capitman, PhD, California State University, Fresno

Why Fresno?

The San Joaquin Valley, and Fresno in particular, is heavily burdened by many different environmental hazards such as poor water quality, toxic waste, high pesticide use and poor air quality year round. Air pollution in the San Joaquin Valley often reaches unhealthy levels. Many of the cities, such as Fresno, in the 8-county region are classified as the most-polluted cities in the United States for both particulate matter and ozone pollution. The health costs of the region's polluted air include high levels of hospital admittance and emergency room visits linked to asthma complications, increased cardiovascular disease risks and even premature death.



Exposure Core

The CHAPS Exposure Core is a team of experts that works to analyze historical air quality in the San Joaquin Valley, collect PAH (polycyclic aromatic hydrocarbon) and black carbon air pollution data and estimate air pollution exposures with sophisticated data analysis and modeling. This develops models to predict pollution levels in specific neighborhoods on specific days and times.



CART High School students visit Garland air monitoring station with CHAPS mentors.

It was an eye-opening experience to see how our everyday lives impact the Valley's air. I know for a fact that I will take away from this project a greater awareness of what I do and how it affects the quality of the air we breathe every day.

– Cassidy Larsen
CART student 2016

Community Outreach and Translation Core

To maintain strong community relationships, capture valuable community input, and share research activities and results, the CHAPS **Community Outreach & Translation Core (COTC)** facilitates a *Community Advisory Board (CAB)*. The CAB represents a network of diverse organizations with knowledge and experience in improving the environmental health and quality of life in Fresno and throughout the region. This team also conducts general communications and translates study results to promote the protection of children from environmental hazards.

The COTC team also aims to build youth leadership around environmental health in the Fresno/Clovis area. We partner with the Center for Advanced Research and Technology (CART), a local joint-venture high school between Fresno and Clovis Unified school districts, to engage youth from their environmental science lab in our research processes and provide opportunities to work in the fields of environmental and public health research.

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CHAPS SJV Team in Fresno April 2016

Contact Us!

Our team is happy to answer questions about the research or make presentations about our field of expertise.

Principal Investigators:

- ◆ S. Katharine Hammond, PhD
UC Berkeley
- ◆ John Balmes, MD
UC Berkeley
- ◆ Gary Shaw, PhD
Stanford University

CHAPS SJV Community Outreach and Translation Core

4991 E. McKinley Ave, Suite 109
Fresno, CA 93727

Sarah Sharpe
Director of Outreach and
Communication
(559) 272-4874
sarahsharpe@berkeley.edu

For more info,
visit us on the web:
www.chapssjv.org



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Strong Collaborations for Sound Science

CHAPS is a partnership between:

- University of California, Berkeley
- Stanford University
- Sonoma Technology, Inc.
- California State University, Fresno
- University of California San Francisco-Fresno



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