

US EPA ARCHIVE DOCUMENT

Developing Indicators for Asthma or Other Respiratory Problems

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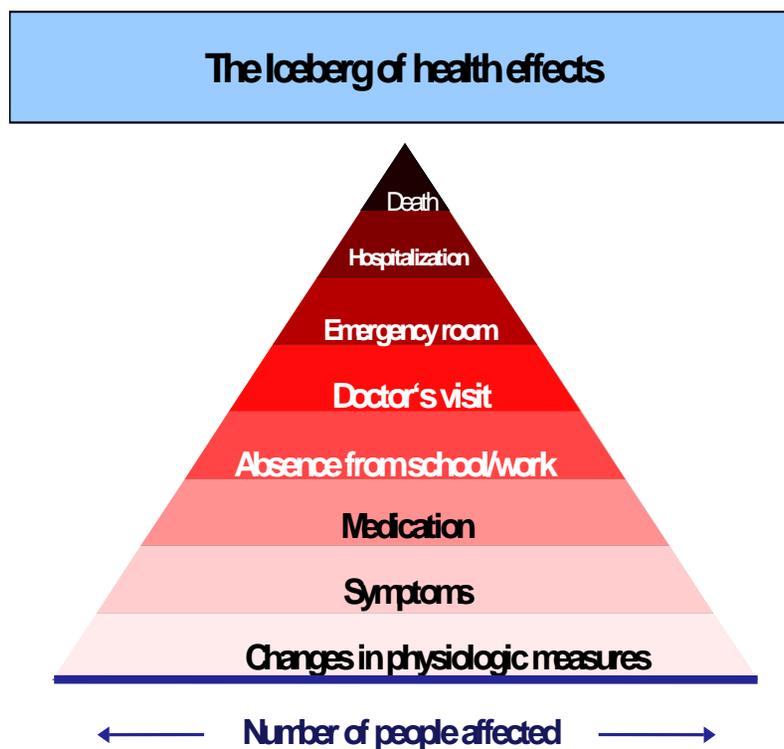
Objectives

- To investigate the feasibility of combining existing environmental monitoring and health survey data (California Health Interview Survey (CHIS)) to develop health outcome indicators.

California Health Interview Survey

- A two-stage, geographically stratified random-digit-dial (RDD) telephone survey conducted biannually since 2001 in California;
- Interviews conducted in five different languages;
- Information collected on more than 54,500 non-institutionalized Californians in each survey;
- Many standard health questions, including asthma-related questions from the National Health Interview Survey;
- Geocodable residential address information, as well as duration of residence in the same neighborhood.

Health Outcome Indicators



For those with asthma:

- Asthma-related ED visits,
- Doctor visits,
- Absences from school/work,
- Medication use, and
- Frequency of asthma symptoms

For those without asthma diagnoses:

- Asthma-like symptoms,
- Doctor visits and
- Absences from work/school due to breathing problems

Exposure indicators

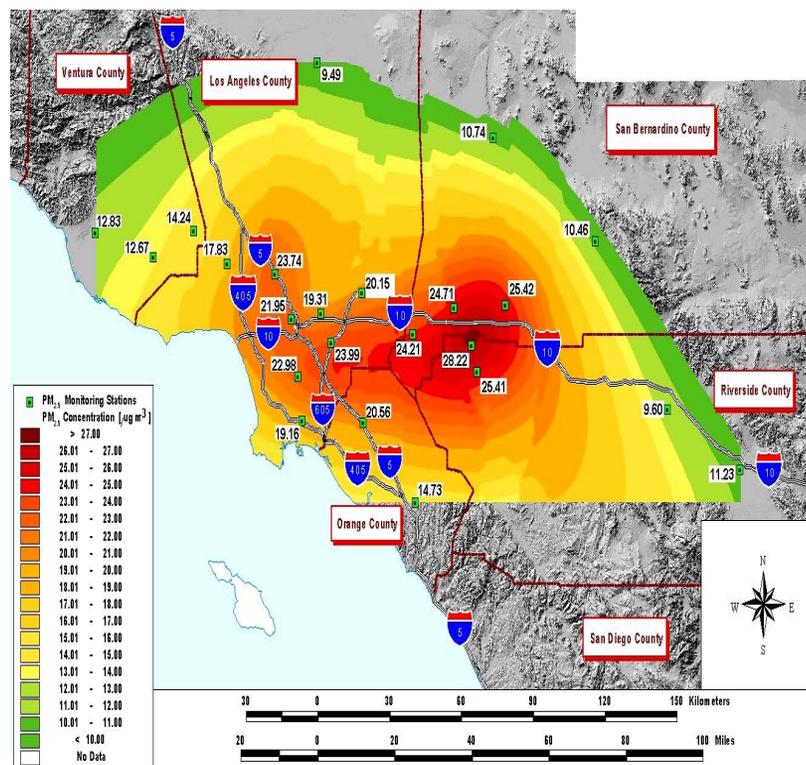
For all CHIS 2003 respondents and CHIS 2005 asthmatic respondents:

- Long-term (12-, 24- and 36-month) **criteria air pollutant exposure indicators** using existing measurement data for O₃, NO₂, PM₁₀, and PM_{2.5}.

Geostatistical Exposure Modeling

For CHIS 2005 respondents with asthma in Los Angeles:

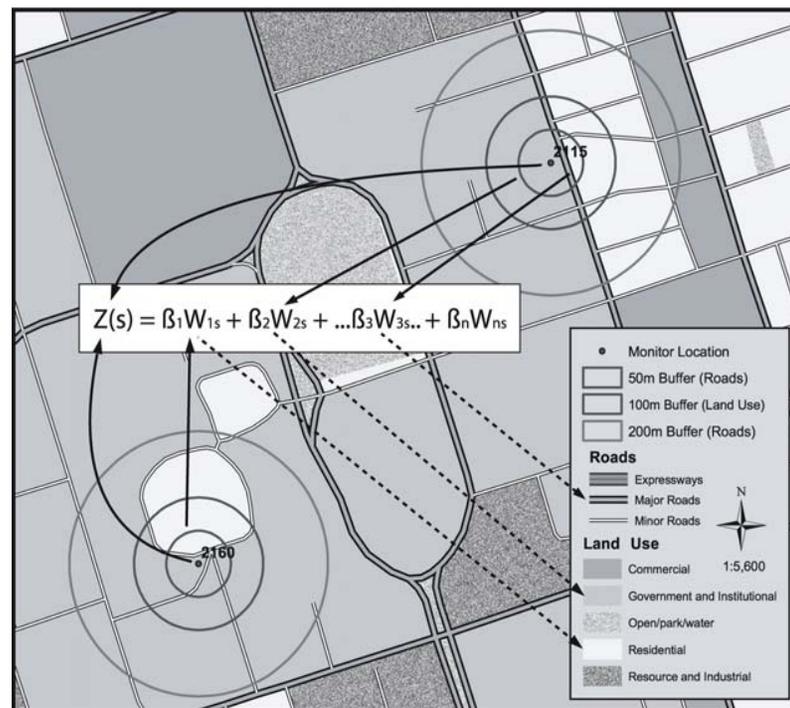
- Kriging for O_3



Geostatistical Exposure Modeling

For CHIS 2005 respondents with asthma in Los Angeles:

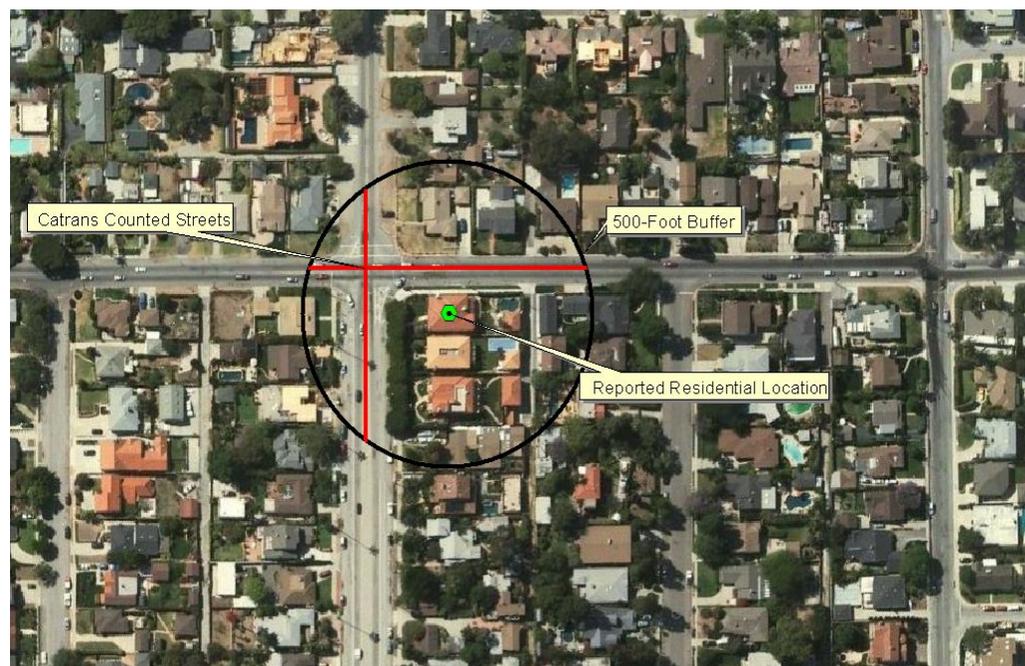
- Land use regression (LUR) for PM_{10} , $PM_{2.5}$, NO_x , NO and NO_2



Traffic-related Exposure Indicators

For all CHIS 2003 respondents and 2005 asthmatic respondents:

- Traffic Density;
- Proximity to roadways.



Data Analyses

- With this combined data, we will use statistical modeling to quantify spatial and temporal links between the exposure indicators and health outcome indicators after adjusting for other risk factors, such as smoking and secondhand smoking.
- We will also evaluate whether the estimated associations differ by geographic region (e.g., rural or urban) and for potentially susceptible sub-populations (e.g., children and the elderly).