

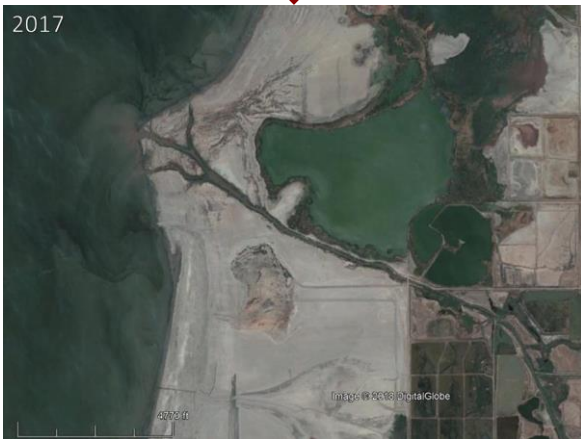
Air Quality & Health: Children's AIRE Study

Assessing Imperial Valley Respiratory Health
and the Environment

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Shrinking Salton Sea



Satellite images taken by the Landsat program, which is co-managed by NASA and the U.S. Geological Survey, show the Salton Sea beginning to shrink between 1995 and 2016.



Wind-blown dust

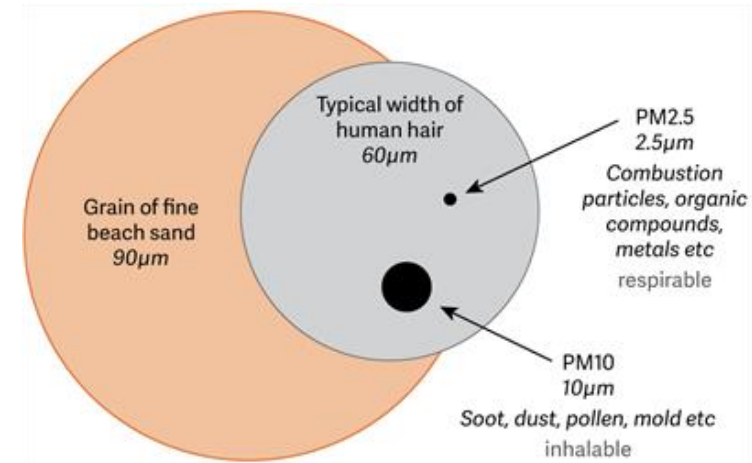
Shrinking sea, desertification & changing climate likely to increase wind-blown dust and dust events

Playa dust is associated with a higher proportion of PM_{10} , often with pesticides and heavy metals

- PM_{10} = Coarse dust
- $PM_{2.5}$ = Fine dust

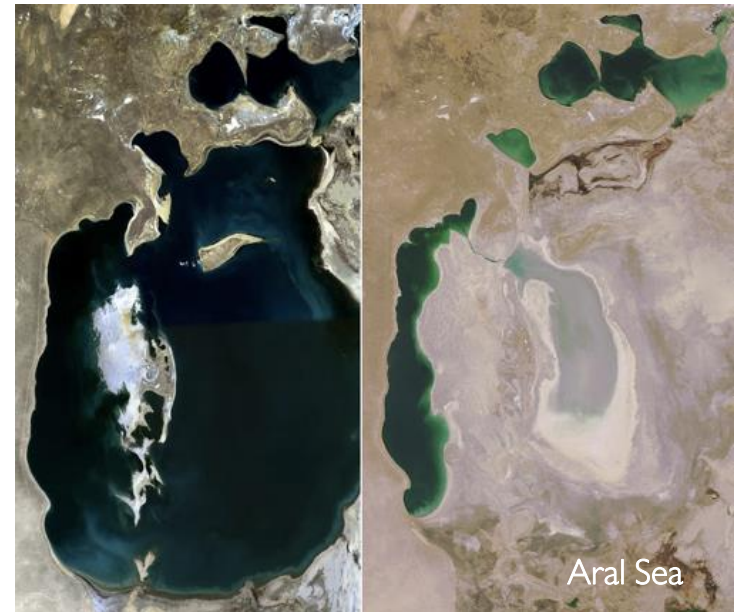
Impacts on respiratory health, quality of life

- Can harm lung development
- Exacerbate asthma risk
- Can affect brain health
- Lead to heart disease



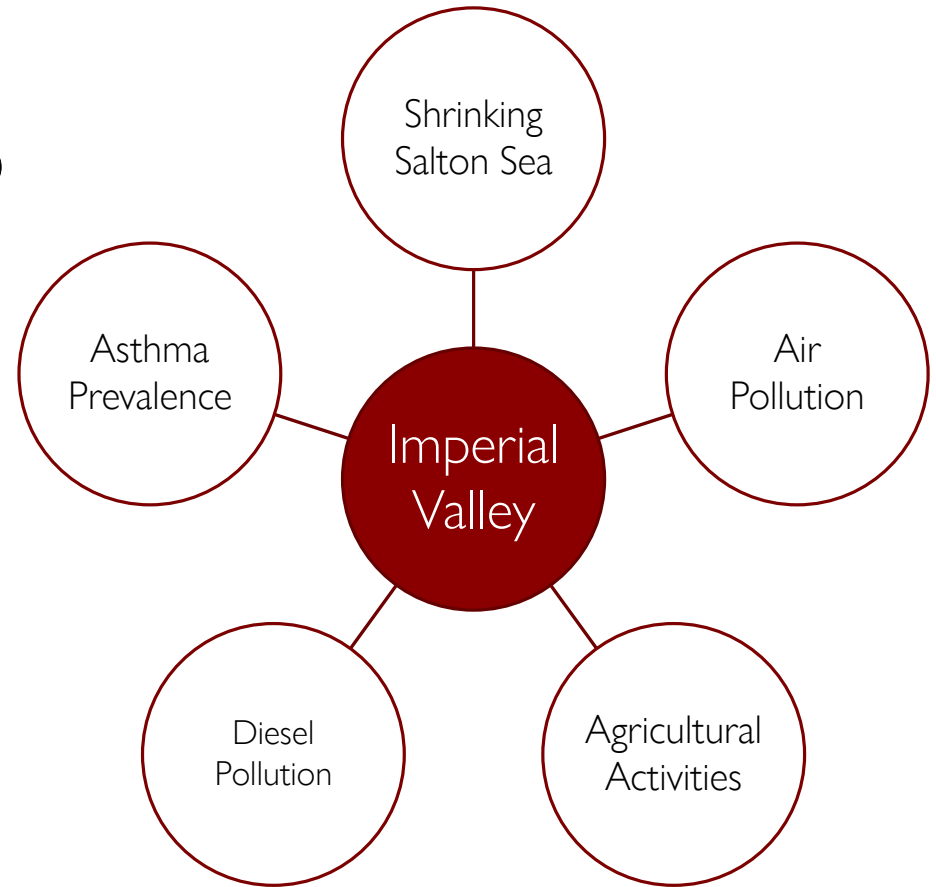
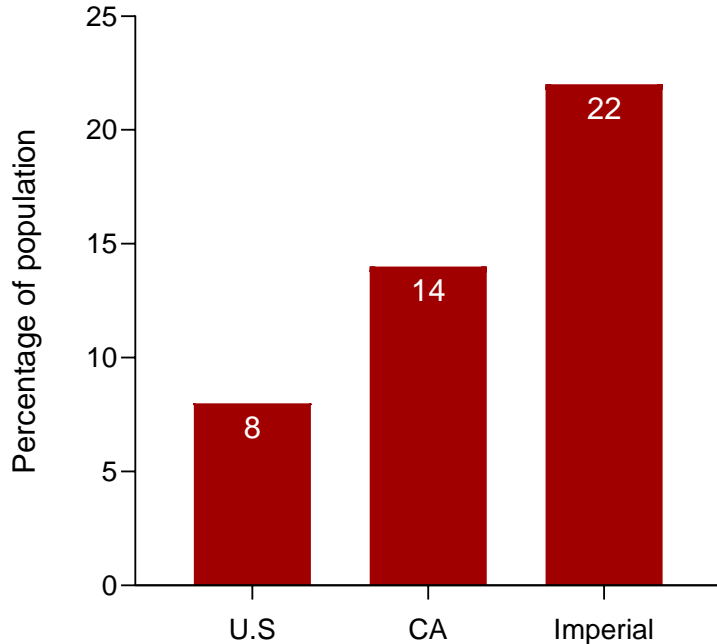
Lessons from the Aral Sea & Owens Lake

- Drying of lake → Increases in ambient dust → harm to health and quality of life
- Owens Lake was one of the largest source of PM₁₀ in the US until mitigation
- Dust from the Aral Sea found to harm kidney function, perhaps lung function



Environmental Health Concerns

Asthma Prevalence Among Children (2014)



The Children's AIRE Study





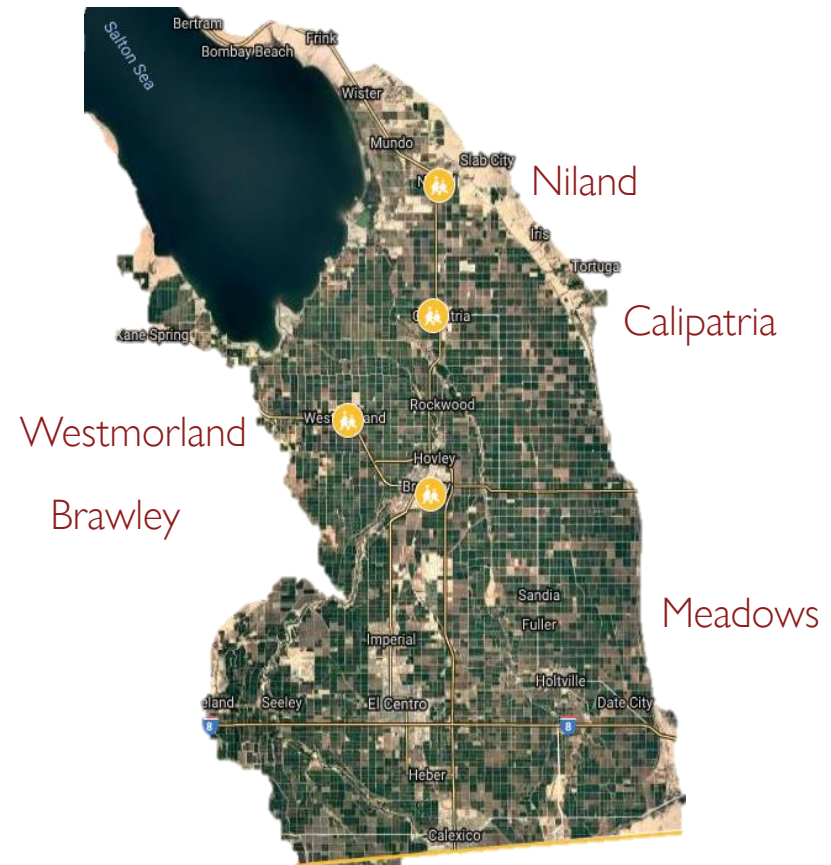
WIND
BLOWN
DUST

This block is a rounded rectangle containing the text 'WIND BLOWN DUST' in all caps, centered within the box.



Children's AIRE Study Aims

- Establish cohort of 500 children from the northern end of Imperial Valley to assess respiratory health
- Quantify and assess the impacts of children's exposures to particulate matter
- Administer a written questionnaire and collect data on weight, height, blood pressure, lung function
- Utilize data to establish a community health education and advocacy program



Assessing Air Quality

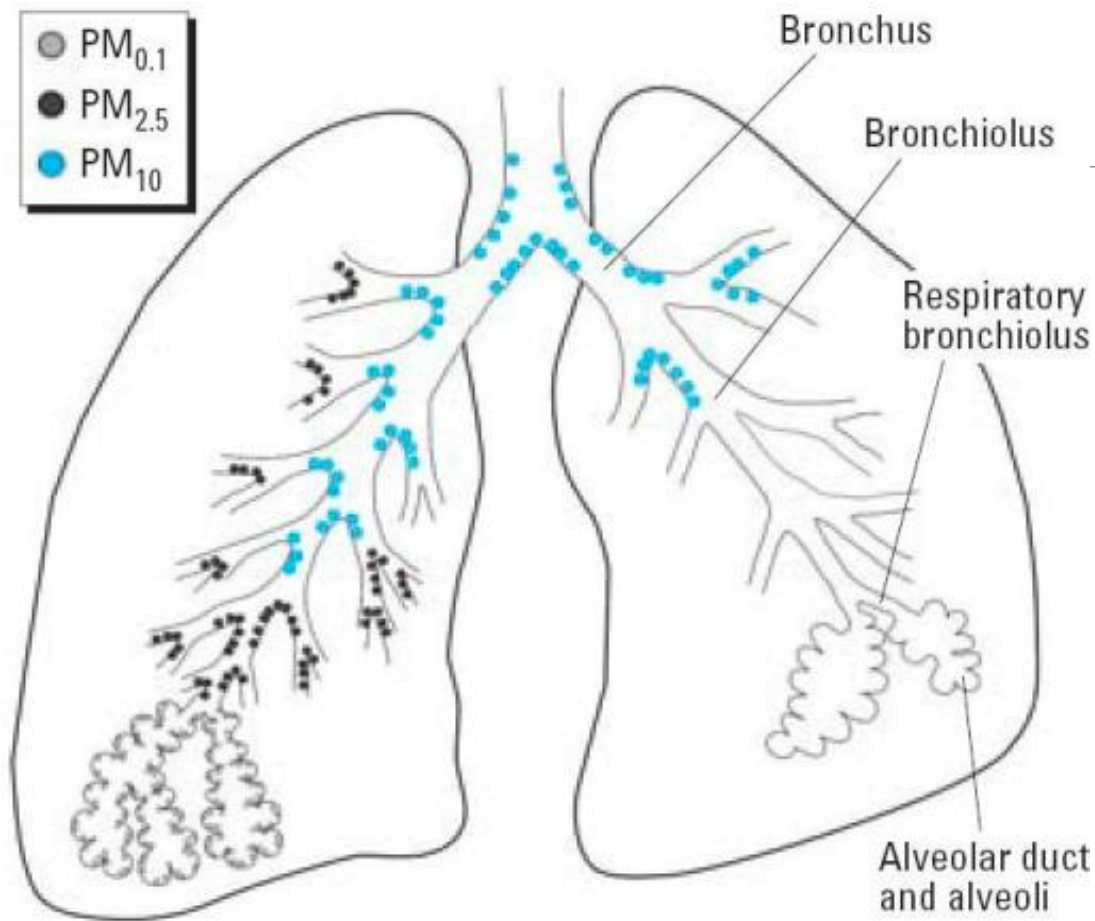


Community Air Monitoring



PM collection + Compositional Analysis





Assessing Lung Health

- Symptoms surveys
- Spirometry
 - Measures lung size and function
- Forced Exhaled Nitric Oxide (FeNO)
 - Inflammation in airways

Preliminary demographics

487 children

94% Latino/a

55% female

76% have public health insurance

12% have a biological mother with asthma

$\frac{3}{4}$ of parents finished 12th grade

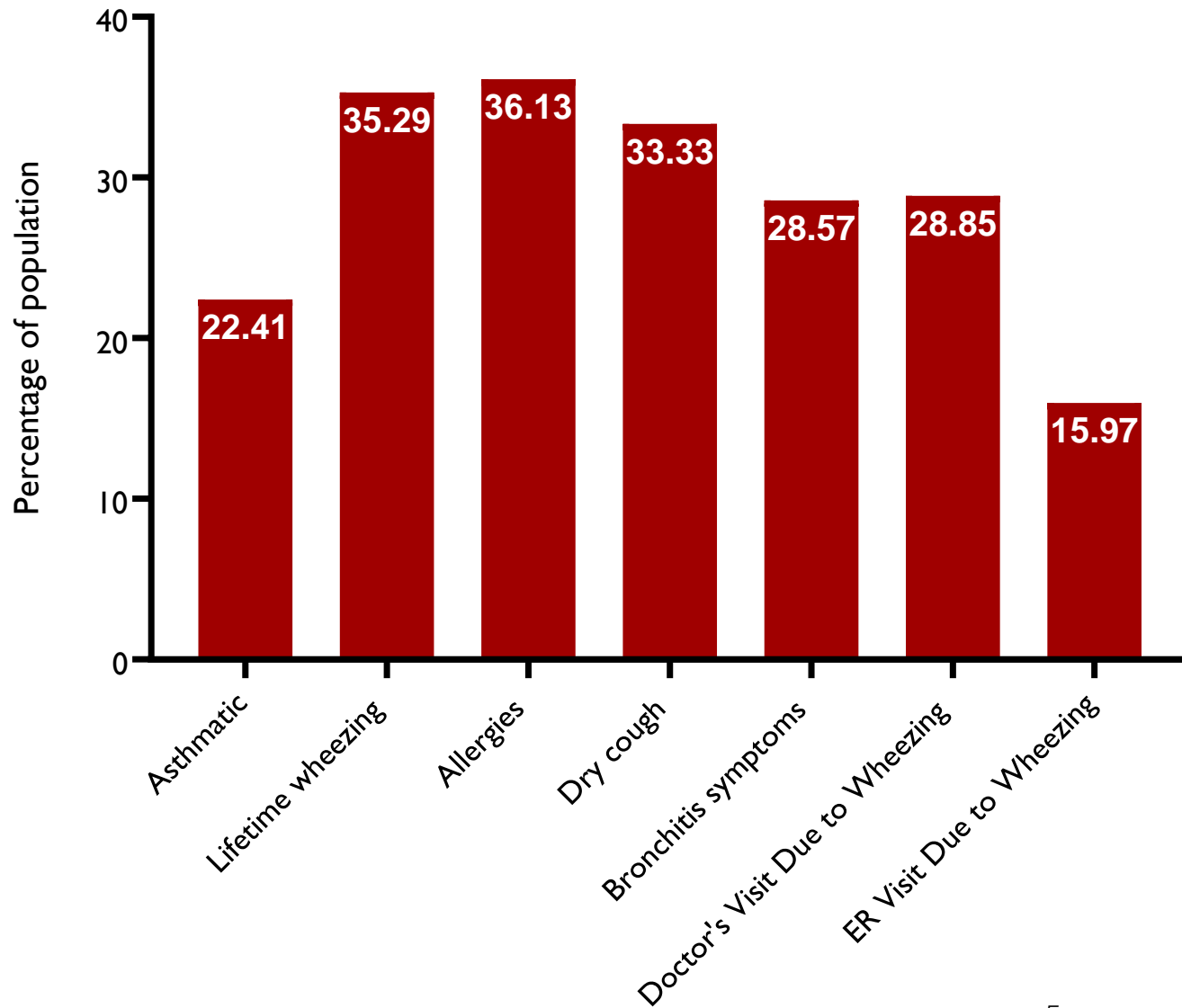
4% live with a smoker

29% have a household pet

38% play sports 2x week



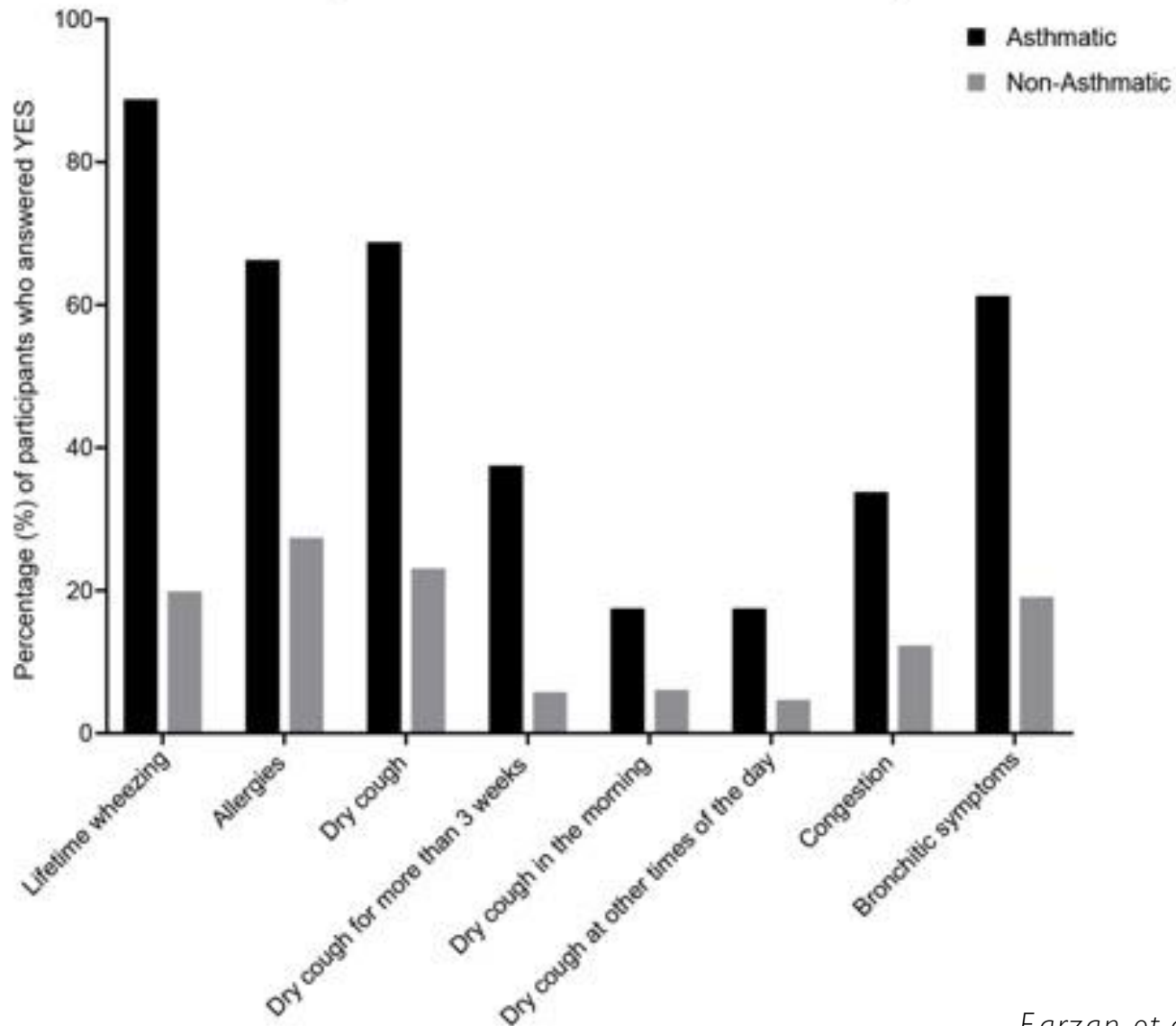
Prevalence of Respiratory Health Outcomes



Farzan et al, IJ ERPH 2019



Prevalence of Respiratory Symptoms Among School-Age Asthmatic and Non-Asthmatic Participants

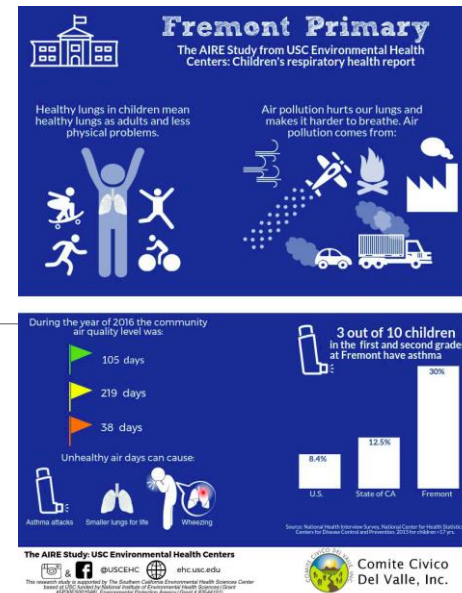


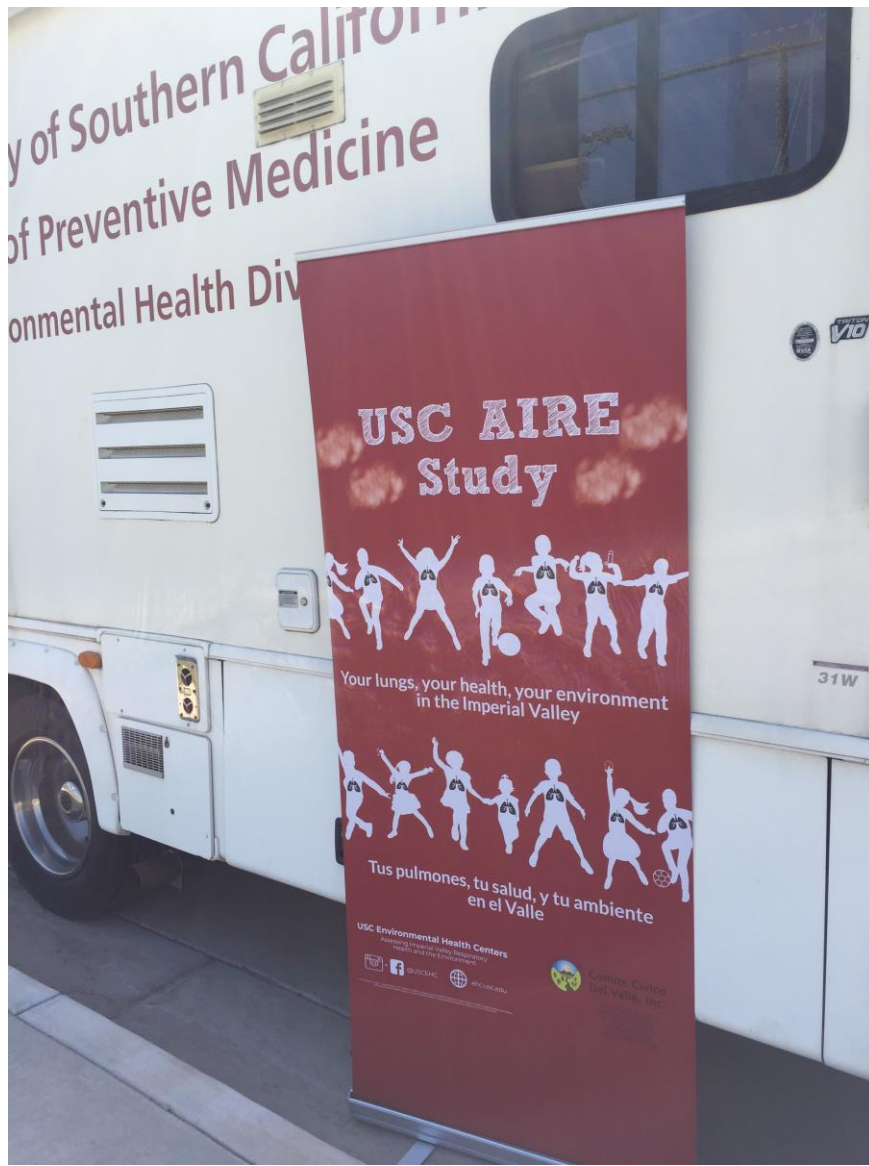
Farzan et al, IJERPH 2019



Ongoing Work

- Integration of air quality data into analyses to inform health risks for children
- Development of infographics to disseminate key information
- Understanding community health needs and develop community public health action plan
- Use of study data to help support health supportive school, local and state policy changes





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