

## Environmental Street Audits and Black Carbon Measurements in Vietnamese Immigrant Communities

Thu Quach, PhD, MPH<sup>1</sup>, Erika Garcia, MPH<sup>1</sup>, Julie Von Behren, MPH<sup>1</sup>, Jacqueline Tran, PhD<sup>2</sup>, Tina Duyen Tran, MPH<sup>3,4</sup>, Lisa Fu, MPH<sup>3</sup>, Scarlett Gomez, PhD<sup>1</sup>, Vinh Luu<sup>3,5</sup>, Thanh Ahlfenger<sup>6</sup>, Peggy Reynolds, PhD<sup>1</sup>

(1) Cancer Prevention Institute of California; (2) Stanford University, School of Medicine, Department of Health Research and Policy; (3) California Healthy Nail Salon Collaborative; (4) Orange County Asian & Pacific Islander Community Alliance, Orange County; (5) Community Action Marin; (6) Vietnamese American Community Center of the East Bay

### What Is the Problem?

- Asian-American communities may face many of the hazards that other communities of color and low-income communities face, but there have been few research studies that document environmental hazards in Asian American communities.
- The Vietnamese population has grown significantly in California and has clustered in geographic areas with potential higher exposures to environmental stressors.
- Inspired by the lack of community engagement around environmental health in the Vietnamese population, a number of organizations worked together to conduct a research study to promote environmental health awareness.

### What Is the Purpose of the Study?

- To understand what Vietnamese Americans in California consider as environmental concerns in their neighborhoods. There have been no studies focusing on this issue.
- To gather information on environmental hazards in neighborhoods where Vietnamese people live, work, and socialize. This information would be used to guide future environmental health research.
- To engage community partners in environmental health research and raise awareness about how environmental hazards may affect health.

### Participating Organizations

- California Healthy Nail Salon Collaborative
- Asian Health Services
- Cancer Prevention Institute of California
- Community Action Marin
- Vietnamese American Community Center of the East Bay
- Immigrant Resettlement & Cultural Center
- Orange County Asian and Pacific Islander Community Alliance

### Where

- The study was conducted in Alameda, Marin, Orange, and Santa Clara counties. We only selected some neighborhoods in each of the four regions and did not cover the full counties.

## How

- Vietnamese community members conducted audits in neighborhoods where they live, work, and socialize. During the “community audit”:
  - The community members walked around parts of their neighborhoods and completed a survey about neighborhood characteristics such types of businesses, presence of schools, parks, community buildings and bus stops, sidewalk conditions, graffiti, litter, trash, and numbers of cars and trucks driving on the street.
  - They took photographs of things they felt were important to document when describing the community.
  - They carried an instrument that measured an air pollutant called black carbon. Black carbon comes from diesel engines, which are mainly found on trucks and buses. Diesel exhaust is known to cause cancer.

## What Are the Findings?

- Air pollution from traffic, litter, and smoking, and neighborhood safety were the major issues of concern for Vietnamese community members.
- Community audits conducted in Alameda County reported the highest percentage of metal bars on windows, litter, and liquor stores, as well as the highest percentage of pedestrian crosswalk/signals relative to other counties.
- Marin County audits reported the highest percentage of highway/freeway noise, and a higher percentage reported people smoking compared with the average across all counties, but they also had lowest percentage of reported graffiti, metal bars on windows, and litter.
- Santa Clara audits reported the highest average car count, and higher graffiti and litter compared with the average across all counties, but the lowest percentage of people smoking and tobacco ads.
- Community audits conducted in Orange County reported the highest percentage of fast food restaurants, bus and truck noise, and highest average truck count, but the lowest percentage of highway/freeway noise.
- Compared with the statewide average black carbon concentration of  $0.75 \mu\text{g}/\text{m}^3$ , our results showed much higher concentrations at the regional and neighborhood levels.
- The average black carbon concentration across audits in all four regions was  $1.8 \mu\text{g}/\text{m}^3$ , and ranged from  $1.7 \mu\text{g}/\text{m}^3$  for audits in Santa Clara County to  $2.0 \mu\text{g}/\text{m}^3$  for audits in Orange County
- When we looked at specific neighborhoods in the four regions, we found many of differences in the black carbon levels, with one neighborhood in Alameda County having the highest neighborhood mean black carbon concentration at  $7.7 \mu\text{g}/\text{m}^3$ .
- This project helped to begin a dialogue about environmental health issues in Vietnamese communities and participants enjoyed the opportunity to work with others in their community.

## Next Steps

- We can explore how these issues may affect health in the Vietnamese community.
- We will continue to engage the Vietnamese communities in environmental health research to address these issues.

## Who Should Care Most?

- Community residents living in county areas included in the study (Marin County, Alameda County, Santa Clara County, and Orange County).
- Policymakers representing these counties.
- Environmental health advocates.

### Recommendations for Action

- It is important to examine the link between environmental exposure and health in the Vietnamese population, especially around air pollution. More research studies should focus in this area and should use more accurate data to inform how exposure is measured.
- Vietnamese community members can use some of the findings to discuss with local policymakers about changes needed to improve their local environment.