



NEWSLETTER HIGHLIGHTS:

- **CAFEH Advisory Board Meeting & Community Report Back—Dec. 12th 2011**
- **Somerville, MA Clean Air Project (CAP) Preliminary Findings**
- **Monitoring Ultrafine Particles (UFP) in Somerville, MA**
- **Particle Concentration in East Somerville Mobile**

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Explaining CAFEH: Through the Lens of a Novice

By Sophia Burks

Since August 2009, I have driven north- and southbound on interstate 93, between the Melnea Cass/Massachusetts Avenue and Somerville exits, 18 and 29 respectively. Traveling to and from Somerville, I always pass the Mystic Housing Development and think about discussions with classmates about urban renewal and public housing construction near major highways. Waiting for the red light to turn green at the intersection of Mystic Avenue and Temple Street I try to imagine the air quality residents, patrons, business owners, and pedestrians are inhaling in this immediate area near the I-93 inbound and outbound overpasses. The traffic congestion at this section of Mystic Avenue only contributes to the number of vehicles sitting idle and traveling near the residential and businesses in this area.

It was not until I began working as a

research assistant to Doug Brugge that I became interested in local environmental health issues. I immediately began working on tasks and attending meetings related to the Community Assessment of Freeway Exposure and Health (CAFEH) study. Evaluating the impact of exposure to near highway ultrafine particulate matter (UFP) on biomarkers of cardiovascular (CV)



Image Source: www.dipity.com

health in people over 40 years of age is the goal of the CAFEH study, which I understood. However, I did not understand what UFP or biomarkers were, or how the research team was going to gather and evaluate data on UFP and biomarkers of CV health. I found myself in a position where I had

to increase my knowledge of the unknown, in a short amount of time, to a level of comfort if I was asked the question: "Can you tell me about the CAFEH study?"

Somerville, Dorchester/South Boston, and Chinatown were selected as the 3 CAFEH study areas. Residents living within 400-meters along highway I-93 were selected to participate in the study. Malden served as the urban background for Chinatown. For the purpose of this study, an urban background is a location greater than 1000-meters from I-93. Environmental data collection related to ultrafine particulate matter (UFP) was collected in three forms: (1) mobile laboratory – consisting of a van driven along fixed routes within the study areas and the urban backgrounds. The mobile van measured near-highway air pollution gradients; (2) fixed sites in Somerville – a measuring instrument was installed on the roof of the Mystic Activity Center and at the Blessing of the Bay (Continue on page 3)

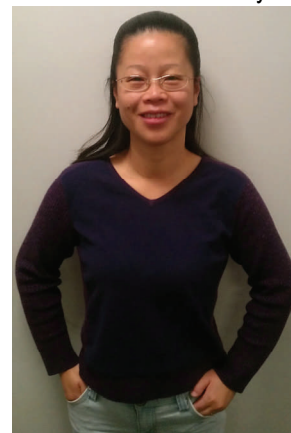
Chinatown Community Surveyors

What is the most interesting thing about working in Chinatown on the CAFEH study?



"Study participants want to know how to make changes. People started to think about how to make their community better and their family healthier."

- Fung Lin Yian



"I learned a lot of knowledge about pollution that I can use to educate more people within and outside of the Chinatown community. I am proud to share with people how to protect themselves and be healthy."

-Tina Wang

Indoor Air Study: Reduction of Particles with Filters

By Luz Pedro

The Clean Air Project (CAP) is a community-based participatory research pilot-scale study taking place in Somerville, MA. CAP investigates the impact of indoor air filtration on the cardiovascular health of the Mystic River Housing Development's residents, located next to Interstate 93.



Figure 1. HEPAiRx room air purification system (Air Innovations) used in the study with a) HEPA and b) Sham filter.

To evaluate the effectiveness of filtration, a room air purification system, shown in Figure 1, is installed in the participant's home for six weeks. During the six week period, participants agree to give three blood samples to test whether reducing the particles in the participant's home improves their cardiovascular health. Two filters are used during the six weeks: (a) A HEPA filter which removes particles from the air, and (b) A sham filter which does not remove the particles as efficiently as the HEPA filter.

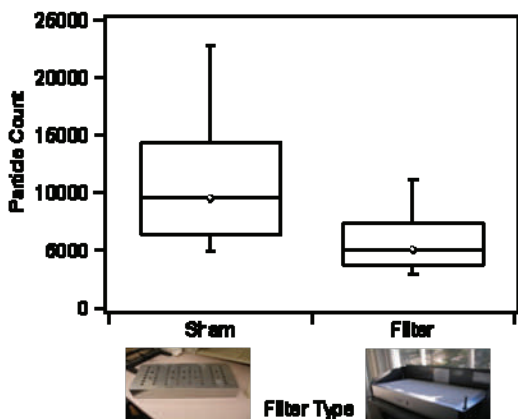


Figure 2. Range of particle counts observed with the sham (left) and HEPA filter (right).

Figure 2, displays the range of particle counts observed with both filters in a participant's home. As illustrated in the graph, placing a HEPA filter in the home reduced the particles significantly. Whether this reduction in particles is sufficient to improve cardiovascular health in our participants will be known once the blood samples are tested and analyzed.

Ultimately, the study wants to (1) investigate whether in-home air filtration reduces particle concentration in homes located near major highways, and (2) test whether this intervention could be a cost-effective way to reduce particle exposure and related cardiovascular health risks.

Luz Pedro is a Postdoc in the Civil Environmental Engineering department at Tufts Univ.

Indoor Exposure to Ultrafine Particles (UFP)

By Christina Hemphill Fuller

Two of the goals of the CAFEH study are to provide more information on the ability of ultrafine particles (UFP) to enter the indoor environment and to identify which factors are important determinates of indoor concentrations. CAFEH monitored indoor and outdoor UFP for 1-2 weeks during the warm months at a group of homes in Somerville. Participants engaged in normal activities such as cooking, cleaning and opening windows during monitoring. This is important because UFP can also be generated indoors. The data showed that the median indoor/outdoor ratio for all homes was 0.95, which means that levels of UFP indoors and outdoors were about the same. The most important factors that determined indoor concentrations were outdoor concentrations, weather and time of day.

As outdoor concentrations increased indoor concentrations would generally increase. In addition, there was also evidence that use of air conditioning lowered the ability of outdoor UFP to come indoors. Figure 3, shows

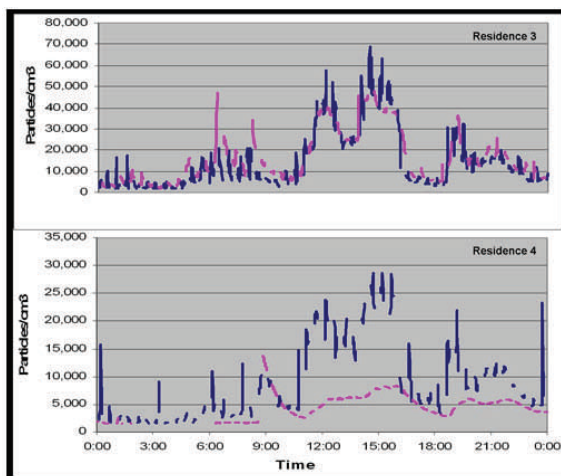


Figure 3. Continuous data for two homes monitored on June 14, 2010 for indoor (pink) and outdoor (blue) UFP.

continuous data at two homes of indoor (pink) and outdoor (blue) UFP from a single day. Residence 3 had windows open with no air conditioning in use and had similar indoor and outdoor UFP throughout the day. In contrast, Residence 4 used central air conditioning and indoor UFP was overall lower than outdoor UFP. When considering all this data together we conclude that UFP can easily migrate indoors, however, certain factors such as use of air conditioning may limit this migration.

Christina Hemphill Fuller, a Postdoc at Georgia State Univ., recently completed her PhD at Harvard School of Public Health.

Recent & Upcoming CAFEH Events



Photographed Left to Right: Alison Patton, Jessica Perkins, Caitlin Collins, Luz T. Padró-Martínez, Christina H. Fuller, and Kevin Lane

CAFEH student participants attended the 2011 meeting of the International Society of Exposure Science in Baltimore, MD this past October. They presented 5 posters and 2 oral talks about the CAFEH study at the conference.



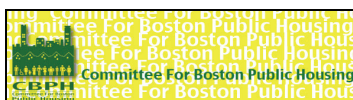
DECEMBER 12, 2011

**CAFEH Advisory Board Meeting
& Community Report Back**

This year's Advisory Board meeting and Community Report Back will take place **December 12, 2011 from 9am to 1pm** at the **Mystic Activity Center** located at **535 Mystic Avenue Somerville, MA 02145**.

CAFEH participants, community members, and volunteers are encouraged to attend.

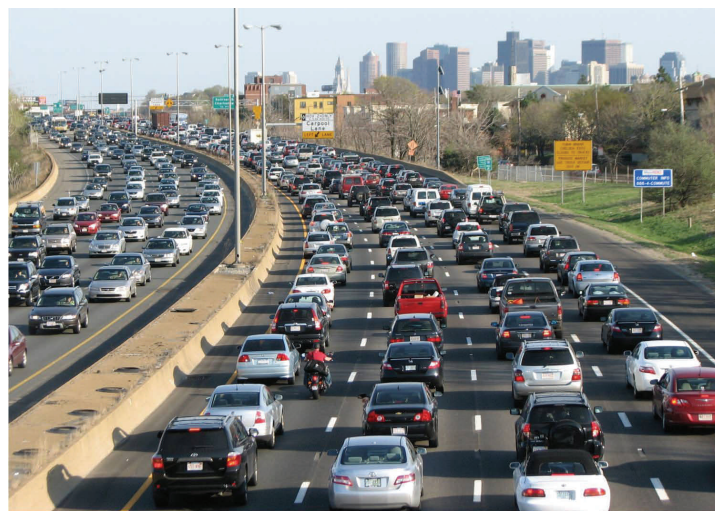
CAFEH Community Partners



CRA
Chinatown Residents Association

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Working together on a five-year study to examine the effect of air pollution of traffic on the health of people living near major highways.

NEW Website!
<http://sites.tufts.edu/cafeh/>

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