

Students' research addresses air quality in nail salons

April 3 2014, by Bill Schaller



An environmental health survey of 15 nail salons in the greater Boston area found high levels of volatile organic compounds at some of the salons, according to a report Brandeis students presented to the Boston Public Health Commission last month.

The students conducted their research last fall as part of the Professor Laura Goldin's Environmental Health and Justice Program, which was offered through the Justice Brandeis Semester program and taught in collaboration with [environmental health](#) scientists James Stewart, Joseph

Allen, Matt Fragala, and Ted Myatt.

The Justice Brandeis Semester program is part of Brandeis' commitment to creating and supporting intensive learning experiences with enduring impact, a central goal of the university's strategic plan.

The study was designed to assess nail salon workers' exposure to [volatile organic compounds](#) (VOC) and chemicals that are common in nail polishes, polish removers and acrylic and gel nails. This includes acetone, toluene, formaldehyde and ethyl methacrylate, which are known to cause short- and long-term health effects, from respiratory and eye irritation to reproductive effects to cancer. It also sought to determine which ventilation methods are best for reducing VOC levels and whether "green and clean" certification reduces workers' chemical exposure.

The students conducted their research in collaboration with Viet-AID, a Vietnamese-American community development organization based in Dorchester, Mass. (many of the estimated 350,000 nail salon workers in the U.S. are Vietnamese women and other immigrants), the Boston Public Health Commission, the Healthy Cosmetology Committee, and Talena Thu Ngo, a Vietnamese business directory.

Madeline Rosenberg '16, whose responsibilities included serving as a testing equipment manager, said conducting the research in the salons required her and her colleagues to address issues as they arose – and outside the comfort of the classroom. "We were using equipment that wasn't familiar to us, and we had to explain what the equipment did to people whose native language wasn't English. It was a challenge to figure out what key words to say and what not to say. Also, we also had to try to make the equipment look less daunting. All of this required us to think on our feet and learn as we go."

The research expanded on the work conducted by prior Brandeis

Environmental Health and Justice students. The data captured last fall were obtained during an eight-hour period, as opposed to the 30-minute period used in the previous study. The students tracked an individual's exposure by having the workers wear passive diffusion badges in addition to measuring general exposure within the salon. They monitored exposure to four specific toxic chemicals (the past study looked at general VOC exposure). The students also videotaped the workers while they did their jobs, enabling them to assess levels of [chemical exposure](#) to workers during particular salon procedures, and determine at what point of each recorded task were the workers at greatest risk.

The students found that, in addition to high levels of formaldehyde, carbon dioxide was at greater than acceptable levels in nearly a third of the salons and just under acceptable levels for most of the other salons, an indication of poor ventilation. The results also underscored a strong correlation between effective mechanical ventilation and low acetone concentration.

Based on their data, the students recommended a number of changes to improve environmental health at the salons:

- Substituting safer products and practices (when possible) rather than relying on personal protective equipment, which places the burden on the worker;
- Installing proper mechanical ventilation and making sure the workers understand when the system is operating properly;
- Installing table vents that remove contaminants from the breathing zones of workers and customers; and
- Evaluating further the occupational exposure to formaldehyde, including short-term exposure testing, task monitoring and product analysis.

"The work the students undertook has the potential to make a

meaningful impact on working conditions and customers in nail salons," says Goldin. "It stands to benefit the health of nail salon workers and customers and to illuminate real concerns of environmental justice, the need for better scrutiny of products and the public's 'right-to-know.'"

Case in point, last year, Boston and the Boston Public Health Commission revised its nail salon regulations based in part on findings and recommendations from the previous Environmental Health and Justice Program study.

Although the program finished last fall, most of the students are still engaged in the issue. Two students currently have internships with the Boston Public Health Commission, where they are following up with salons, [workers](#) and others to address the health and safety issues the study identified. Others have planned related summer internships and additional independent research. This June, some of the [students](#) will present their findings at the Academy of Sciences Annual International Conference on Environmental Science and Technology in Houston.

Provided by Brandeis University

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