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Five-Year UCI Study Into Chronic Santa Ana Lead Exposure Now Underway

By: **Karen Wang**



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UCI professors and community organizers of the Inequities in Childhood Life-Course Lead Exposure and Academic and Neurobehavioral Outcomes (I-CLEAN) will conduct an [environmental justice study](#) examining the health impacts of lead in children in Santa Ana. Researchers held their [first outreach training](#) on Nov. 28.

I-CLEAN will primarily focus on the systemic presence of lead in older homes and commonly frequented environments due to historical car emissions within Santa Ana. The study will be conducted in collaboration with [Orange County Environmental Justice \(OCEJ\)](#) and resident organization [Madison Park Neighborhood Association \(MPNA\)](#). [GREEN](#).

The National Institute of Environmental Health Sciences awarded a \$2.7 million grant in June 2023 for the prospective five-year study, under the UCI Program in Public Health. Led by UCI professors [Jun Wu](#) and [Alana LeBrón](#), as well as OCEJ Director Patricia Flores, the first two to three years of the study will be dedicated to recruiting children and collecting their biological samples, along with school records and survey data regarding the children's social behaviors. The latter two years will focus on analyzing these findings and developing a Public Health Equity Action Plan (PHEAP) for Santa Ana city planners to implement.

For now, the team's primary challenge is to recruit 600 7-10 year olds and their parents as participants in the study. Promotoras community health workers, individuals with similar demographics as a target research group, will play a crucial role in this recruitment process. They will serve as the bridge between communities and research analysts as they serve as Spanish-English interpreters.

According to Wu, the group of roughly 20 promotoras posed questions at the outreach meeting that will better prepare them to answer questions from the Santa Ana community about the study's goals in researching lead contamination. Other barriers to outreach still persist, however.

"It's a very big challenge. A lot of times people don't think that this [lead exposure] could be an issue," Wu said in an interview with the New University. "Even if they think it could be an issue, they don't want to commit their time. If they have undocumented status, they may worry that the government may trace them down."

In the following stages of the study, researchers will examine long-term impacts of exposure to lead on the young participants. [Lead exposure](#) in children can lead to the development of attention deficit disorder and other chronic hearing and speech issues. Researchers will collect blood and tooth samples so they may detect levels of lead and other metals. Tooth samples will measure chronic exposure from the second trimester of birth to the time the tooth was shed, while blood samples will measure recent exposure. According to Wu, samples will be collected once, and only children with high levels of detected lead concentration may be invited back for follow-up testing.

The I-CLEAN study will serve as the main follow-up to the [Plo-No! Santa Ana! \(Lead-Free Santa Ana\)](#) campaign conducted in 2018 as a part of a collaboration between the UCI Department of Public Health, OCEJ and Jóvenes Cultivando Cambios. According to Wu, the Plo-No team collected over 1,500 soil samples and found that lead-contaminated soil was disproportionately affecting individuals of lower household median incomes, Latino origin and limited English proficiency.

2021 UCI Mellon Humanities Faculty Fellow Juan Manuel Rubio spoke to the extent of lead exposure on the [UCI Podcast](#). Of the 1,500 collected soil samples, roughly half of them exceeded the California Office of Environmental Health Hazard Assessment's soil lead risk standard of 80 parts per million (ppm). Samples with up to 2,600 ppm were found in Santa Ana.

When the Plo-No study first began, researchers were unsure of the exact origin of pervasive lead contamination in Santa Ana. Based on Rubio's study into the history of lead, he hypothesized that lead within gasoline was the primary culprit. Rubio utilized historic maps and photographs of the city to create a digitized version of 20th century Santa Ana to compare with modern data about lead-contaminated soil. Rubio attested to the nature of community-based science in his role as a historian.

"We did find, for example, that old roads are better predictors of soil lead concentrations than current roads or traffic volume data from today, by a lot," Rubio stated on the UCI Podcast. "That means that there's something about the history of the city that is pointing to the older parts of town, and specifically roads, being related to the soil lead concentrations that we see today."

The I-CLEAN study has a number of goals related to further investigation of these past findings. According to the study's proposed [abstract](#), it will primarily focus on past studies' shortcomings of addressing varying levels of Pb, or lead, exposure in a way that encompasses public health interventions on multiple levels including community and intrapersonal interactions within immediate family.

Ultimately, the Plo-No study established the foundational research on disproportionately high levels of lead in Santa Ana compared to the rest of Orange County. Now, I-CLEAN will add children's academic performance and behavior into the equation to analyze the extent to which lead is harming the development of Santa Ana children.

The prospective PHEAP, which may include policy recommendations for increased and accessible soil and blood testing for residents, will build off a [2022 update to the Santa Ana General Plan](#) by city council officials. The update was announced following the [publication of 2017 findings](#) on the concentration of lead in Santa Ana soil. In the 2017 update, council members made an explicit commitment to consider "environmental soil and human health screening measures" and provide blood lead testing and other services, especially in lower-income or marginalized communities, in continued partnership with local organizations.

"A crucial component of a successful and effective community-academic partnership is to disseminate the knowledge we develop together to equip community members to advocate for structural changes to improve their health and well-being," LeBrón said to [UCI News](#). "Our public health equity action plan is intended to raise awareness of the health and academic implications of lead exposure and mitigation strategies."

In their 2022 update, council members further reaffirmed community partnerships to "collaborate to advocate for adjustment of the County and State policies for health and environmental screening levels to promote healthy outcomes related to lead contamination as recommended by health experts."

Regarding what community members can do to advocate for the environmental health of their communities, Wu emphasized the importance of awareness, especially for long-term research studies.

"People who know need to speak out and have their voices heard," Wu said. "And for those who don't know, we need to raise awareness and do more education for the people."

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