Environmental Health Sciences Training-At-Home During a Pandemic

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Abstract

As SARS-CoV-2 infections quickly rose in Spring 2020, summer internship program directors were challenged with restructuring conventional training activities. At Rutgers, the Summer Undergraduate Research Fellowship (SURF) program adapted their training to a virtual 6-week format that included monitored research projects conducted remotely with twice-weekly career development activities over Zoom. We sought to develop an interactive session that informed 20 SURF students about lead toxicity. The training activity included four components: 1) didactic lecture on lead toxicity, drinking water sampling, and quantitation by ICPMS; 2) community perspective on lead contamination and remediation; 3) a simulated test of unknown lead levels using a Science Takeout Kit; and 4) sampling of student’s home drinking water and measurement of lead levels. Kits and sampling materials were mailed to participants prior to the session. The activity was held on Zoom and included interactive polling questions to ensure real-time comprehension. Samples from home testing were returned to Rutgers for analysis. Students were asked to conduct a series of experiments that involved sampling their drinking water and compare to local and national drinking water standards. Instructors also discussed issues in testing of bottled water and incineration. The average accuracy of the activity yielded 90% of participants submitting samples for measurement of lead concentrations. Pre- and post-program self-assessments using 5-point Likert rating scales were conducted online. The ability of students to 1) simulate experiments at home (means pre: 3.1, post: 3.7, p=0.001) and 2) conduct field testing and analyze drinking water contamination (means pre: 3.1, post: 3.1, p=0.004) was improved over the following period. Similar increases were observed in students’ understanding of the impact of environmental chemicals on the health of communities (p<0.001) as well as the steps to test for heavy metal contamination in drinking water (p=0.001). Taken together, this multifaceted training activity can improve understanding of environmental chemical toxicity as well as increase skills in field sampling.

Components of Interactive Training Session

Care Packages Sent to Students Homes Including Two Kits for Environmental Health Science Activities

Sampling Home Drinking Water and Discussion of Other Lead Sources in NJ Homes

Assessment of Participant Knowledge

Entry of Lead and Other Environmental Chemicals into Drinking Water

Steps to Test for Chemicals in Drinking Water

Main Takeaway

An interactive training exercise can provide undergraduate students insights into the testing and toxicity of chemicals in our environment.

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