

Construction workers at risk of unintentionally exposing families to multiple toxic metals

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Take-home exposures—toxic contaminants that are unintentionally brought from the workplace into the home, exposing children and other

family members—are a [documented](#) public health hazard, but the majority of research and interventions have focused on take-home exposure to lead. Much less is known about take-home exposures to other harmful metals.

Now, a new study led by a Boston University School of Public Health (BUSPH) researcher provides evidence that [construction](#) workers, in particular, are at high risk of inadvertently tracking a host of other toxic metals into their homes. The study identifies and measures the highest number of metals—30—in construction workers' homes, to date.

Published in the journal *Environmental Research*, the findings reveal that, in addition to lead, construction workers had higher levels of arsenic, chromium, copper, manganese, nickel, and tin dust in their homes, compared to workers in janitorial and auto repair occupations. The study also found that overlapping sociodemographic, work, and home-related factors can affect metal concentrations in the dust of workers' homes.

This new data underscores the need for more proactive and [preventative measures](#) that reduce these harmful exposures at construction sites.

"Given the lack of policies and trainings in place to stop this contamination in high-exposure workplaces such as [construction sites](#), it is inevitable that these toxic metals will migrate to the homes, families, and communities of exposed workers," says study lead and corresponding author Dr. Diana Ceballos, an assistant professor of environmental health and director of the Exposure Biology Research Laboratory at BUSPH. "Many professions are exposed to toxic metals at work, but construction workers have a more difficult job implementing safe practices when leaving the worksite because of the type of transient outdoor environments where they work, and the lack of training on these topics."

To better understand the sources and predictors of take-home exposure of metals dust, Ceballos and colleagues from BUSPH and Harvard T.H. Chan School of Public Health recruited 27 Greater Boston workers to participate in this pilot study from 2018-2019, focusing primarily on construction workers, but also including janitorial and auto repair workers. To assess the [metal](#) concentrations in workers' homes, the researchers visited the homes and collected dust vacuum samples, issued questionnaires to the workers about work and home-related practices that could affect exposure, and made other home observations.

The researchers found that higher concentrations of cadmium, chromium, copper, manganese, and nickel were associated with a range of sociodemographic and work- and home-related factors, including lower education, working in construction, not having a work locker to store clothes, mixing work and personal items, not having a place to launder clothes, not washing hands after work, and not changing clothes after work.

Further compounding the issue, Ceballos says, is that many [construction workers](#) live in disadvantages communities or substandard housing that may already contain toxic metals.

"Given the complexity of these issues, we need interventions on all fronts—not only policies, but also resources and education for these families," she says.

More information: Diana M. Ceballos et al, Metals dust in workers' homes and potential for take home in the Greater Boston area: Pilot study, *Environmental Research* (2022). [DOI: 10.1016/j.envres.2022.112893](#)

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