The Effect of the OSHA Lead Exposure in Construction Standard on Blood Lead Levels Among Iron Workers Employed in Bridge Rehabilitation

Citation

Levin, S., Goldberg, M., & Doucette, J. (1997). The effect of the OSHA lead exposure in construction standard on blood lead levels among iron workers employed in bridge rehabilitation. *American Journal of Industrial Medicine*, *31*(3), 303–309.

Highlights

- The study's objective was to examine the effect of the Lead Exposure in Construction Standard imposed by the Occupational Safety & Health Administration (OSHA), which was introduced in May 1993, on the blood lead levels of iron workers employed in the renovation of a large, lead-painted, steel bridge in New York City in 1993 and 1994.
- The study compared the blood lead levels of iron workers in 1993 and 1994, before and after the introduction of OSHA's Lead Exposure in Construction Standard.
- The study found that there was no significant difference in the maximum blood lead levels of iron workers from 1993 to 1994, but there was a decline in the increment in blood lead levels, defined as the difference between the maximum and minimum levels.
- The quality of causal evidence presented in this study is low. This means we are not confident that any differences in blood lead levels of iron workers before and after the introduction of the OSHA Lead Exposure in Construction Standard were attributable solely to the introduction of the standard.

OSHA Enforcement Activities and Outcomes

The study examined the effect of OSHA's Lead Exposure in Construction Standard, which was introduced in May 1993, on the blood lead levels of iron workers employed in the renovation of a large, lead-painted, steel bridge in New York City in 1993 and 1994. Most of the bridge contractor's efforts to comply with the standard were in place by December 1993. The study examined workers' baseline and maximum blood lead levels, and the maximum increment in blood lead levels, defined for each year as the difference between each individual's minimum blood lead level and the maximum blood lead level that postdated the minimum.

Features of the Study

The study compared the blood lead levels of iron workers in 1993 and 1994, before and after the introduction of OSHA's Lead Exposure in Construction Standard. Analyses were conducted for the entire sample of iron workers, those present in both 1993 and 1994, and new hires in 1993 or 1994.

The authors collected baseline and follow-up data on blood lead levels, demographics, and job tasks for 191 iron workers from February 1993 to December 1994. Baseline data for new employees were collected before, or as soon as possible after, they began work at the site. Blood lead testing was conducted either biweekly or monthly, depending on the study period and workers' previous blood lead levels.

Findings

- There was no significant difference in the maximum blood lead levels of iron workers from 1993 to 1994.
- Iron workers newly hired onto the project in 1994 had significantly lower baseline blood lead levels than those hired in 1993.
- The maximum increments in blood lead levels were significantly lower in 1994 than in 1993 for the entire sample of ironworkers and those present in both years, but not for the new hires.

Considerations for Interpreting the Findings

In this study, the estimated differences in the blood lead levels of iron workers from 1993 to 1994 levels could reflect other changes in lead exposures over time, rather than the impact of the OSHA Lead Exposure in Construction Standard. For example, exposure to lead paint in houses and lead in drinking water or air could have changed over time and cannot be disentangled from changes in occupational lead exposure.

Causal Evidence Rating

The quality of causal evidence presented in this study is low. This means we are not confident that the differences in blood lead levels of iron workers before and after the introduction of the OSHA Lead Exposure in Construction Standard are attributable solely to the standard. To provide more convincing causal evidence that meets CLEAR criteria, the study could have compared the changes in blood lead levels for iron workers with those in a similar comparison group of individuals who would not have been affected by the introduction of the OSHA Lead Exposure in Construction Standard. This would give us confidence that the changes in the outcomes of the comparison group were a valid representation of what would have occurred in the treatment group in the absence of the standard.