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Data Bulletin

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Occupational Exposures in Construction

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OVERVIEW

Construction workers are exposed to a wide range of hazards, including harmful substances (lead, asbestos, silica dust), risky working positions (heights, cramped/confined spaces), and environmental conditions (noise, extreme heat, working outdoors). These exposures can lead to injuries and chronic conditions that affect construction workers throughout their lives.

This Data Bulletin examines occupational, environmental, chemical, ergonomic, and physical exposures that construction workers face, including *exposure scores* by industry, common chemical substances, and blood lead levels. Data for exposure scores comes from the O*NET OnLine Database, which collects data on work conditions and contexts for all occupations on a rolling basis and represents a baseline. Other exposure data comes from the U.S. Bureau of Labor Statistics' Occupational Requirements Survey (ORS), the U.S. Centers for Disease Control and Prevention National Health Interview Survey (NHIS), Occupational Safety and Health Administration Occupational Chemical Exposure Health Data, and National Institute for Occupational Safety and Health Adult Blood Lead Epidemiology and Surveillance (ABLES) data.

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THIS ISSUE

This issue examines common occupational exposures faced by construction workers, including hazardous equipment, working conditions, and materials by industry and year.

KEY FINDINGS

Over one in three (37.8%) construction and extraction workers reported constantly working outside in 2024.
Chart 2

Construction workers are at greater risk of encountering harmful contaminants than non-construction workers, with an average exposure score 70% higher (73.2 versus 43.6).
Chart 6

In 2024, 22.9% of construction workers reported exposure to hazardous chemicals for four or more hours per week compared to 6.7% of non-construction workers.
Chart 7

From 2010 to 2023, there was a 37.0% decrease in the percentage of construction workers with elevated blood lead levels.
Chart 9

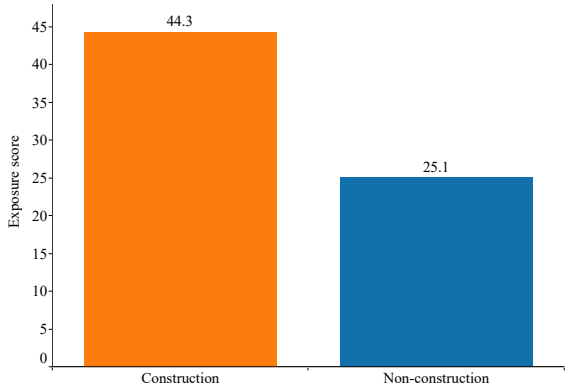
Construction workers were more likely to be exposed to high places (54.9 versus 14.0) than other workers.
Chart 10

NEXT DATA BULLETIN

Transportation Injuries in Construction

On average, both construction workers and non-construction workers reported being exposed to hazardous conditions (e.g., high-voltage electricity, flammable material, explosives, or chemicals) once or more a year but not every month (Chart 1). The average exposure score in the construction industry was 44.3, compared to 25.1 in all other industries.

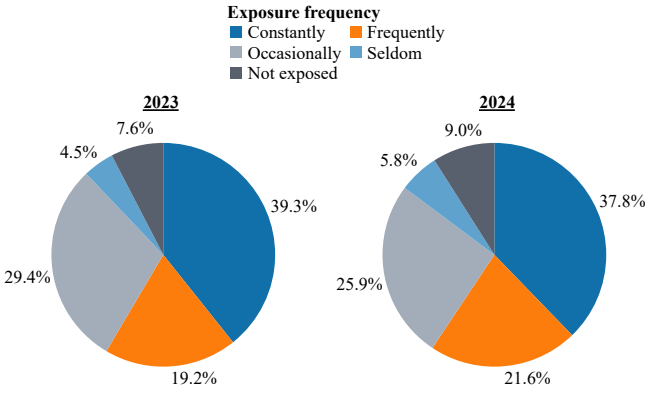
1. Exposure to hazardous conditions, by industry



Source: *2024 O*NET OnLine Database.*

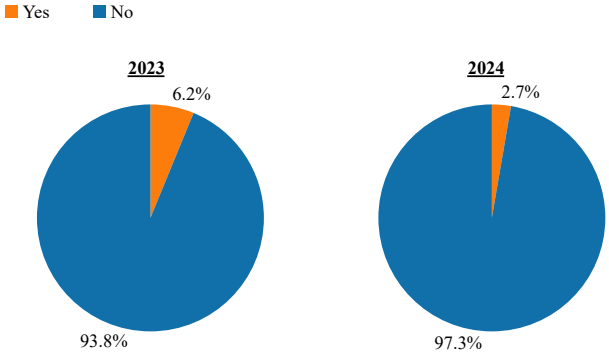
Next, exposure to outdoor conditions and extreme heat among *construction and extraction workers* was examined (Charts 2 and 3). In 2024, 37.8% of construction and extraction workers were constantly outdoors, down slightly from 39.3% in 2023. Conversely, 12.1% of these types of workers said they were seldom or never exposed to the outdoors for work in 2023, with this percentage increasing to 14.8% in 2024. That year 2.7% of construction and extraction workers reported being exposed to extreme heat, down from 6.2% in 2023.

2. Exposure to outdoors among construction and extraction occupations (2023-2024)



Source: *BLS, 2023-2024 Occupational Requirements Survey.*

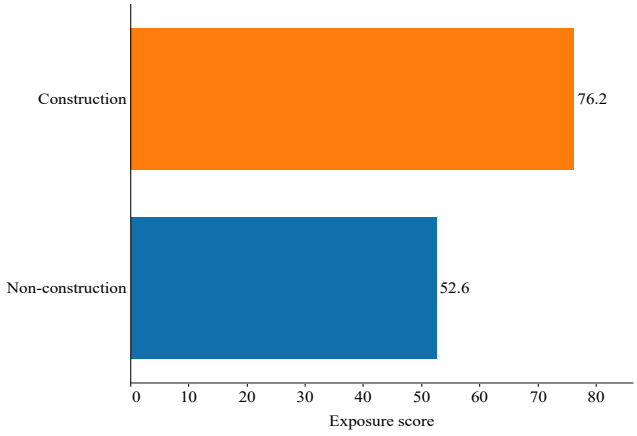
3. Exposure to extreme heat among construction and extraction occupations (2023-2024)



Source: *BLS, 2023-2024 Occupational Requirements Survey.*

Exposure to uncomfortable sounds and noise levels were then examined (Chart 4). Construction workers were more likely to be exposed to noise hazards. The average exposure score for the construction industry was 76.2, indicating an exposure frequency of once a week or more but not every day. Meanwhile, the average exposure score for all other industries was 52.6, indicating a less frequent exposure of once a month or more but not every week.

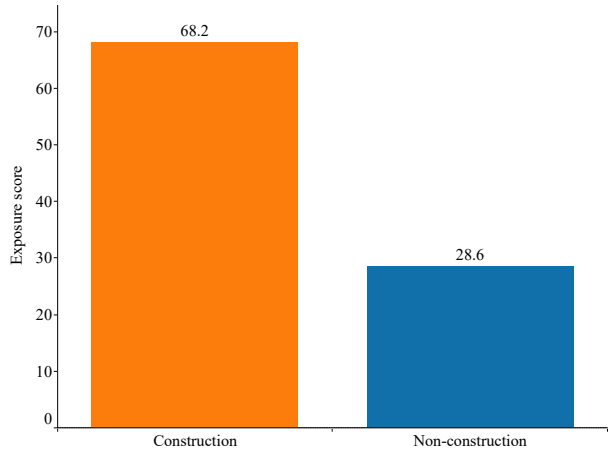
4. Exposure to uncomfortable sounds and noise levels, by industry



Source: *2024 O*NET OnLine Database.*

Construction workers are also at greater risk of exposure to hazardous equipment (e.g., ladders, power tools, trucks, heavy machinery) than non-construction workers, with an average exposure score 2.4 times higher (68.2 to 28.6; Chart 5).

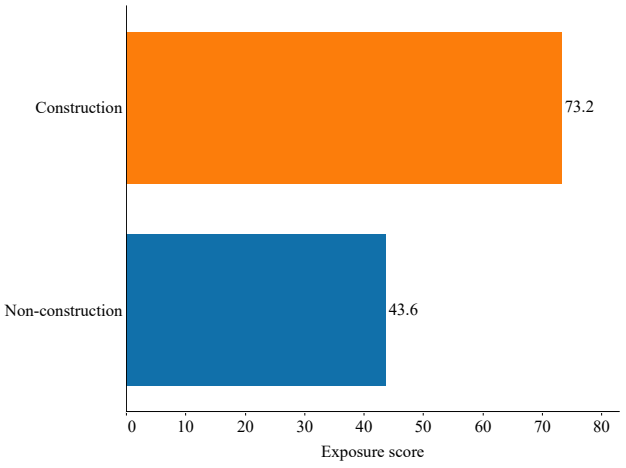
5. Exposure to hazardous equipment, by industry



Source: *2024 O*NET OnLine Database.*

Construction workers were also more likely to be exposed to harmful contaminants (e.g., pollutants, gases, and dusts; Chart 6). The average exposure score among construction workers was 1.7 times greater than the average exposure score among non-construction workers (73.2 versus 43.6). As a result, construction workers can be at greater risk of long-term health impairments, such as respiratory diseases and cancer, resulting from exposures to hazards such as crystalline silica dust.

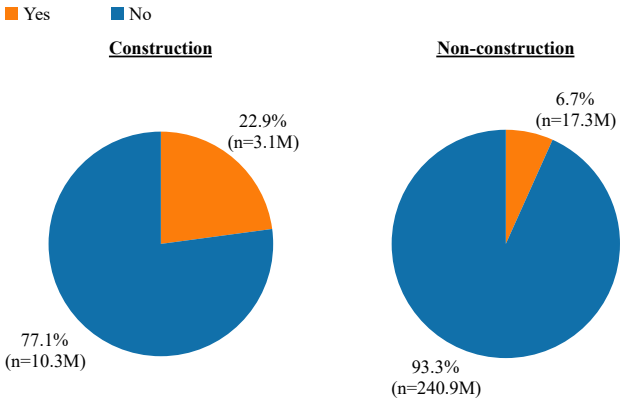
6. Exposure to hazardous contaminants, by industry



Source: *2024 O*NET OnLine Database.*

Occupational chemical exposure (e.g., solvents, industrial glues, heavy metals, pesticides, motor fuels) for four of more hours per week within the last year was then examined (Chart 7). The percentage of construction workers who reported occupational exposure was 3.9 times greater than the percentage of non-construction workers (22.9% vs. 6.7%).

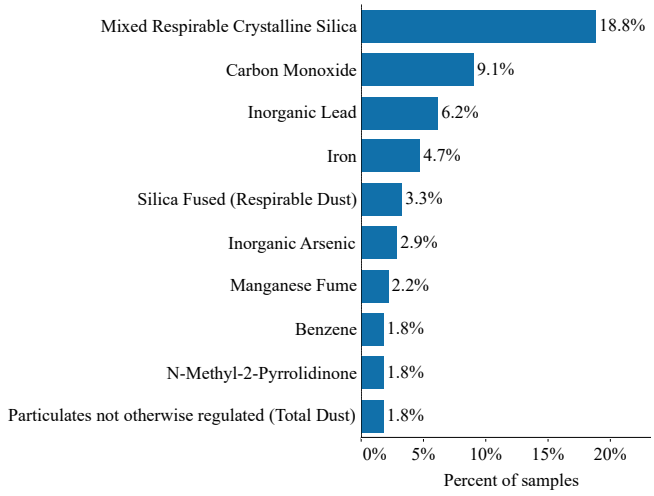
7. Percent of workers who had occupational chemical exposure for 4 or more hours per week within the past 12 months, by industry (2024)



Source: *U.S. Centers for Disease Control, 2024 National Health Interview Survey.*

The 10 most common substances in OSHA's Chemical Exposure Health Database for personal samples were then identified for construction (NAICS 23; Chart 8). The three most common were silica (quartz; 18.8%), carbon monoxide (9.1%), and inorganic lead (6.2%).

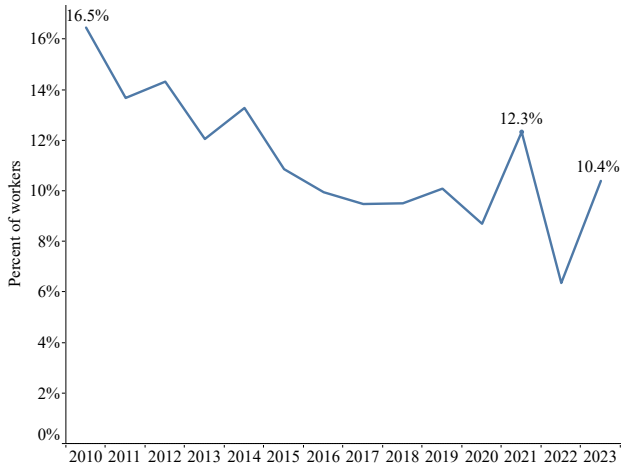
8. The 10 most common substances in OSHA's Occupational Chemical Database (2024)



Source: *OSHA, 2024 Occupational Chemical Exposure Health Data.*

From 2010 to 2023, *elevated blood lead levels* in construction workers decreased 37.0% (16.5% to 10.4%; Chart 9). During this period, there were year-to-year increases from 2020 to 2021 (+41.4%; 8.7% to 12.3%) and from 2022 to 2023 (+62.5%; 6.4% to 10.4%).

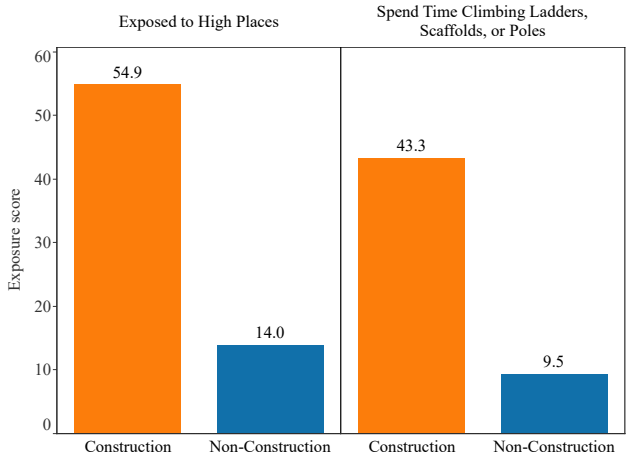
9. Percent of construction workers with a blood lead level ≥25µg/dL (2010-2023)



Source: *NIOSH, 2010-2023 Adult Blood Lead Epidemiology and Surveillance.*

Exposure risks to falls—including high places and time spent climbing ladders, scaffolds, or poles—were then analyzed by industry (Chart 10). Construction workers were three times more likely to be exposed to high places than non-construction workers (54.9 versus 14.0). Because of the time construction workers spend climbing ladders, scaffolds, or poles, they also had a higher exposure score (43.3 versus 9.5) for this activity.

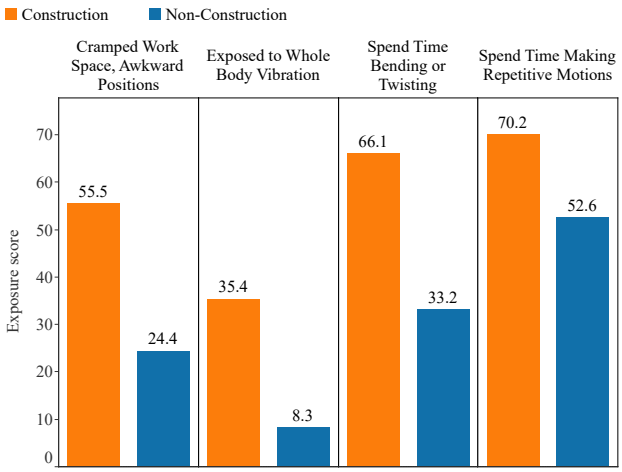
10. Exposure risks to falls, by industry



Source: *2024 O*NET OnLine Database.*

Exposure risks for *musculoskeletal disorders (MSDs)* were then examined (Chart 11). Construction workers were twice as likely to report spending time in cramped workspaces and awkward positions (55.5 versus 24.4 for non-construction workers). Construction workers were also more likely to be exposed to whole body vibrations (35.4 versus 8.3), time spent bending or twisting (66.1 versus 33.2), and time spent making repetitive motions (70.2 versus 52.6). For more information on MSD exposures and injuries, see Chapter 34: O*NET reported Exposure Risks for Musculoskeletal Disorders and Related Injuries/Illnesses and Chapter 45: Musculoskeletal Disorders of our recently published 7th edition Construction Chart Book.

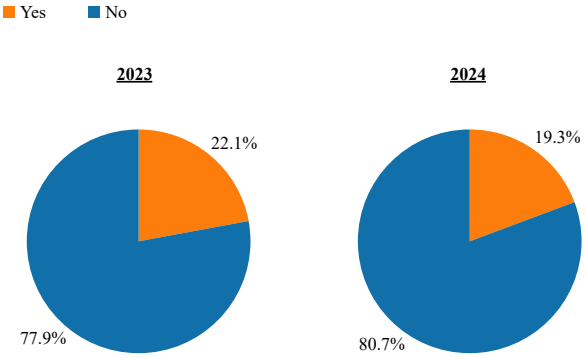
11. Exposure risks for MSDs, by industry



Source: *2024 O*NET OnLine Database.*

Lastly, exposure to heavy vibrations that can occur from vehicles, machinery, or power tools and result in muscle, joint, or nerve injuries were analyzed (Chart 12). In 2023, over one in five (22.1%) construction and extraction workers were exposed to heavy vibrations. This percentage decreased to 19.3% the following year.

12. Exposure to heavy vibrations among construction and extraction occupations (2023-2024)



Source: *BLS, 2023-2024 Occupational Requirements Survey.*

Workers in construction face a diverse array of hazards: toxic chemicals, dangerous working conditions, and risky body positions, among others. They face these exposures more often than their non-construction counterparts. Understanding these patterns is critical to mitigating exposures.

The decrease in elevated blood lead levels since 2010 represents encouraging progress, but construction workers are still regularly exposed to hazardous chemicals and for longer periods than in all industries combined. Continued efforts are necessary to ensure that construction workers are protected when exposed to hazards like heights, dangerous equipment, and job tasks that increase the risk of MSDs.

CPWR provides hazard specific resources and training to help address dangers like these, aiming to reduce potential injuries and illnesses with good practices. OSHA and NIOSH both publish resources for hazard mitigation and injury prevention in the construction industry.

ACCESS THE CHARTS & MORE

View the charts in PowerPoint and the data underlying the charts in Excel. Downloading will start when you click on each link. These files can also be found under the Data Bulletin at: https://www.cpwr.com/research/data-center/data-reports/.

DEFINITIONS

- ***Construction*** –
  - ***NHIS/NIOSH/OSHA*** – *Reported industry construction under the North American Industry Classification System (NAICS 23).*
  - ***O*NET*** – *Occupations in which 50% or more of employees reported work under NAICS 23 (Construction) for private industry employment. Occupations are reported by their Standard Occupation Classification (SOC) code.*
- ***Construction and extraction workers*** – *Those who work in construction or mining. Due to data availability mining workers cannot be separated from construction workers.*
- ***Elevated blood lead levels (BLL)*** – *Cases with BLL> 25 µg/dL.*
- ***Exposure score*** – *Indicates the frequency of exposure.*
  - ***Exposure A (charts 1, 4, 5, 6, 10: Exposed to high places):***
    - ***0*** – *Never.*
    - ***25*** – *Less than half the time.*
    - ***50*** – *About half the time.*
    - ***75*** – *More than half the time.*
    - ***100*** – *Continually or almost continually.*
  - ***Exposure B (chart 10: Climbing ladders, scaffolds, or poles; chart 11):***
    - ***0*** – *Never.*
    - ***25*** – *Less than half the time.*
    - ***50*** – *About half the time.*
    - ***75*** – *More than half the time.*
    - ***100*** – *Continually or almost continually.*
- ***Musculoskeletal disorders (MSDs)*** – *Affect muscles, nerves, blood vessels, ligaments, and tendons, such as carpal tunnel syndrome, tendinitis, muscle strains, and back injuries.*

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- 2024 data is from a preliminary data release.

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ABOUT THE CPWR DATA CENTER

The CPWR Data Center is part of CPWR–The Center for Construction Research and Training. CPWR is a 501(c)(3) nonprofit research and training institution created by NABTU, and serves as its research arm. CPWR has focused on construction safety and health research since 1990. The Data Bulletin, a series of publications analyzing construction-related data, is part of our ongoing surveillance project funded by the National Institute for Occupational Safety and Health (NIOSH).

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  https://covid.elcosh.org/index.php
- Electronic Library of Construction Occupational Safety and Health
  https://www.elcosh.org/index.php
- eLCOSH Nano
  https://nano.elcosh.org/
- Exposure Control Database
  https://ecd.cpwrconstructionsolutions.org/
- Nano Safety Data Sheet Improvement Tool
  https://nanosds.elcosh.org/
- Safety Climate–Safety Management Information System (SC-SMIS)
  www.scsmis.com
- Stop Construction Falls
  https://stopconstructionfalls.com/
- Work Safely with Silica
  https://www.silica-safe.org/

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