

## Mortality of construction workers at U.S. Department of Energy nuclear sites: a follow-up study

### **Mortality of older construction and craft workers employed at Department of Energy (DOE) nuclear sites: Follow-up through 2021**

*Knut Ringen, John Dement, Marianne Cloeren, Sammy Almashat, Stella Hines, William Grier, Patricia Quinn, Anna Chen, Scott Haas. American Journal of Industrial Medicine. 2024.*

#### **Overview**

The Building Trades National Medical Screening Program (BTMed) provides health examinations for workers employed in construction activities at U.S. Department of Energy (DOE) nuclear weapons facilities. This study focuses on 26,922 BTMed participants, including 22,747 construction workers, such as electricians, laborers, and pipefitters, who have been exposed to a range of hazards—including asbestos, radiation, and silica—during facility construction, maintenance, renovation, demolition, and cleanup, comparing them to 2,218 non-construction workers engaged in work activities like security and science. Previous studies have identified elevated mortality risks associated with construction work exposures, particularly for all cancers of the lung, kidneys, and mesothelioma, as well as chronic obstructive pulmonary disease (COPD). This follow-up study, using data from 1998 to 2021 and including 8,367 deaths, compares mortality rates among construction workers and non-construction subpopulations at the DOE sites.

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#### **Read the abstract:**

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#### **Key Findings**

- Former DOE construction workers had elevated mortality from all causes, including all cancers, mesothelioma, lung diseases such as chronic obstructive pulmonary disease (COPD), asbestosis, transportation injuries, and other injuries, such as accidental poisonings. Internal analyses comparing construction workers to non-construction workers found significant excess mortality for all causes, all cancers, lung cancer, and COPD while controlling for important confounders, including smoking.
- Workers first employed after 1990 experienced significant elevation in occupational mortality risk, challenging the common perception that after 1995, DOE facilities have been in full compliance with existing safety and health requirements.
- The risk of mortality from transportation injuries was significantly elevated, especially among teamsters, laborers, and other trades.
- Accidental poisoning mortality was significantly increased, attributed in part to the opioid epidemic, although the study noted a reduction in the overall risk of accidental poisoning deaths within the participants.
- The high cancer risks identified are aligned with the types of cancers which qualify for federal compensation due to radiation exposures.
- The study emphasizes the importance of ongoing health monitoring for early intervention and prevention of occupational illnesses--in particular, the importance of lung cancer screening.



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## Abstract

**Background:** To determine if construction and trades workers formerly employed at US Department of Energy (DOE) nuclear weapons sites are at significant risk for occupational diseases, we studied the mortality experience of participants in the Building Trades National Medical Screening Program (BTMed).

**Methods:** The cohort included 26,922 participants enrolled between 1998 and 2021 and 8367 deaths. Standardized mortality ratios were calculated based on US death rates. Cox models compared construction workers ( $n = 22,747$ ; 7487 deaths) to two nonconstruction subpopulations: administrative, scientific and security workers ( $n = 1894$ ; 330 deaths), and all other nonconstruction workers ( $n = 2218$ ; 550 deaths).

**Results:** Mortality was elevated for all causes, all cancers, cancers of the trachea, bronchus, lung, kidneys, and lymphatic and hematopoietic system, mesothelioma, chronic obstructive pulmonary disease (COPD), asbestosis, transportation injuries, and other injuries, particularly accidental poisonings. There were 167 deaths from coronavirus disease 2019 (COVID-19), which was lower than expected using US death rates. Overall cause-specific mortality was significantly higher among construction workers than for internal comparison groups.

**Conclusions:** Construction workers employed at DOE sites have a significantly increased risk for occupational illnesses. Apart from COVID-19 deaths, this update: (1) found that mortality among construction workers is significantly elevated compared to the US population and significantly higher than in the internal comparison populations, and (2) confirmed excess risk for these workers for first employment after 1990. Cancer mortality risks are similar to the cancers identified for DOE compensation from radiation exposures. The high lung cancer risk supports the value of early lung cancer detection. Continued medical surveillance is important.

## KEYWORDS

construction, DOE, mortality, occupational diseases, surveillance