



Crystalline Silica

Burden of Occupational Cancer Fact Sheet



WHAT IS SILICA?

Crystalline silica is a **naturally occurring mineral found in soil, sand, and rocks**. Work processes such as breaking, grinding, or sawing these materials releases crystalline silica dust into the air. Workplace exposure to crystalline silica is common in several trades due to its presence in many handled materials such as concrete, mortar and brick.

The International Agency for Research on Cancer classifies crystalline silica as a **known carcinogen (IARC 1)**.

WHAT ARE ITS HEALTH EFFECTS?

- Lung cancer
- Silicosis (thickening and scarring of the lungs)
- Chronic obstructive pulmonary disease (COPD)
- Rheumatoid arthritis
- Tuberculosis

THE BURDEN OF LUNG CANCER FROM WORKPLACE EXPOSURE TO SILICA IN CANADA

The term 'burden' refers to the human impact (deaths, illness, years of life lost) and the economic costs (health care, productivity) associated with a cause or group of causes of disease.

570

Lung cancers due to workplace silica exposure

Approximately **570 lung cancers** are due to occupational exposure to crystalline silica each year in Canada, based on past exposures (1961-2001). This amounts to **2.4% of lung cancer cases** diagnosed annually.

WHAT IS THE ECONOMIC IMPACT?

Work-related silica exposure resulted in approximately **\$562 million in costs for newly diagnosed lung cancer cases** in 2011.

This includes approximately:

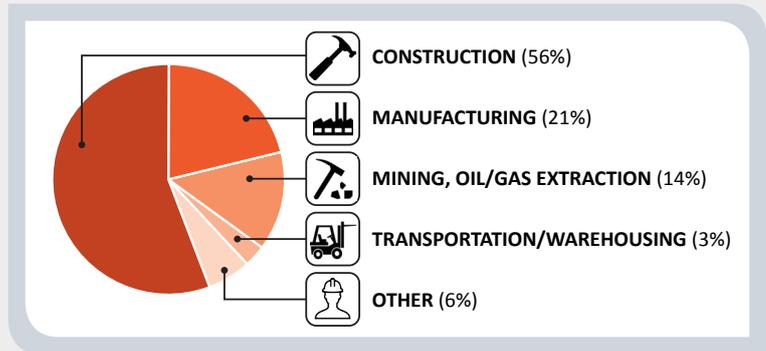
- 66% in health-related quality of life losses
- 7% in direct costs including health care, out of pocket expenses, family care giving, and workers' compensation administration
- 27% in indirect costs including output and productivity losses

\$562 million

Estimated yearly cost of lung cancer due to workplace silica exposure

WHAT WORKERS ARE MOST AFFECTED?

Most occupational lung cancers associated with crystalline silica occur among workers in the **construction sector** (see pie chart on right). These cancers also occur among workers in the manufacturing, mining and oil and gas extraction, and transportation and warehousing sectors. Some of the other sectors affected include wholesale trade, public administration, and utilities.



CAREX CANADA ASSESSMENT OF OCCUPATIONAL EXPOSURE TO SILICA

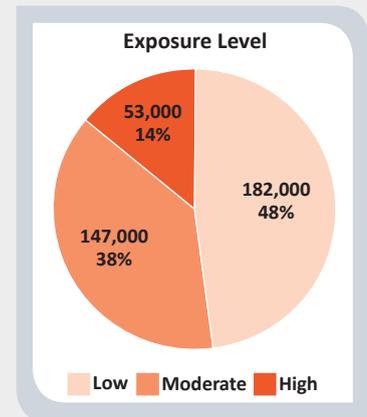
Inhalation is the most important route of occupational exposure to silica. Approximately 380,000 Canadians are exposed to silica at work.

Industries with the largest number of exposed workers in Canada include:

- **Specialty trade contractors** (141,000 people exposed)
- **Building construction** (65,000 exposed)
- **Heavy and civil engineering construction** (31,000 exposed)

Occupations with the largest number of exposed workers include:

- **Construction trades helpers and labourers** (105,000 exposed)
- **Heavy equipment operators** (41,000 exposed)
- **Plasterers and drywallers** (34,000 exposed)



Results show the majority of workers exposed to crystalline silica are in the low exposure level category, with a significant number at risk for moderate to high exposure (see pie chart above). To learn more about how these exposure levels are defined, visit the [CAREX Canada website](#).

HOW CAN EXPOSURE BE REDUCED?

For some applications, silica can be replaced with safer materials. For example, garnet or high pressure water can be used instead of sandblasting with silica. Other control strategies include eliminating processes that generate silica, implementing local exhaust ventilation, and using wet sweeping, cutting, and drilling methods. For more details, visit the [OCRC exposure controls webpage](#).

ABOUT THE BURDEN OF OCCUPATIONAL CANCER STUDY

The Burden of Occupational Cancer Study quantified the number of cancers that are caused by exposure to carcinogens in the workplace in order to identify priority areas for prevention. It was a collaboration between researchers at OCRC, CAREX Canada, the Institute for Work & Health (who led the economic analyses), University of British Columbia, Université de Montréal, Institut de recherche Robert-Sauvé en santé et en sécurité du travail, and Imperial College London.

 For more information, please visit OCRC at www.occupationalcancer.ca or CAREX Canada at www.carexcanada.ca.

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