



Diesel Engine Exhaust

Burden of Occupational Cancer Fact Sheet for Mining



WHAT IS DIESEL ENGINE EXHAUST?

The combustion of diesel fuel in engines produces diesel engine exhaust, a **complex mixture of gases and particulates**. This mixture can contain other known and suspected carcinogens such as benzene, polycyclic aromatic hydrocarbons (PAHs), metals, and particulate matter.

Diesel engine exhaust levels can be high when diesel engines are used in enclosed spaces such as underground mines.

The International Agency for Research on Cancer classifies diesel engine exhaust as a **known carcinogen** (IARC 1).

WHAT ARE ITS HEALTH EFFECTS?

- Lung cancer
- Irritation to eyes, throat, and bronchi
- Light-headedness, nausea, cough, and phlegm
- Allergic reactions

THE BURDEN OF LUNG CANCER FROM WORKPLACE EXPOSURE TO DIESEL EXHAUST 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.

220
Lung cancers caused by diesel exposure in mining

Results show that approximately 560 lung cancers and 200 suspected bladder cancers are attributed to occupational exposure to diesel engine exhaust each year in Canada, based on 2011 cancer statistics. Of these, approximately **220 lung cancers** and **20 suspected bladder cancers** are estimated to occur among workers in the mining industry.

CAREX CANADA ASSESSMENT OF OCCUPATIONAL EXPOSURE TO DIESEL ENGINE EXHAUST

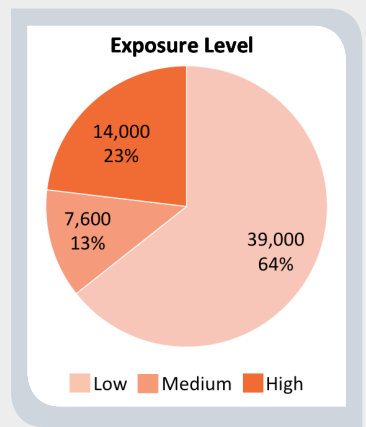
Inhalation is the most common route of occupational exposure to diesel engine exhaust.

Approximately 61,000 Canadians are exposed to diesel engine exhaust in mining.

Occupations with the largest number of exposed workers in mining include:

- **Heavy equipment operators** (13,000 exposed)
- **Underground production and development miners** (9,900 exposed)
- **Truck drivers** (9,600 exposed)

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



HOW CAN EXPOSURE BE REDUCED?

There is currently no appropriate occupational exposure limit for diesel engine exhaust, apart from a few provinces where diesel particulate matter is regulated in underground mines. However, diesel-related cancers can be prevented by reducing the number of workers exposed and ensuring that the levels of exposures are as low as reasonably achievable (ALARA). Organizations should evaluate the risk of exposure in the workplace and implement the hierarchy of controls to address the safety needs of workers.

MINING INDUSTRY IN CANADA

In 2006, the mining and oil and gas extraction industry employed approximately 240,000 workers. For the purpose of this fact sheet, the mining industry is defined broadly to include all of underground and surface mining, quarrying, oil and gas extraction, as well as support workers for these activities.

ABOUT THE BURDEN OF OCCUPATIONAL CANCER STUDY

The Burden of Occupational Cancer Study aims to quantify the number of cancers that are caused by exposure to carcinogens in the workplace in order to identify priority areas for prevention. It is a collaboration between researchers at OCRC, CAREX Canada, the Institute for Work & Health, 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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