

## Estimating the burden of occupational cancer in Canada

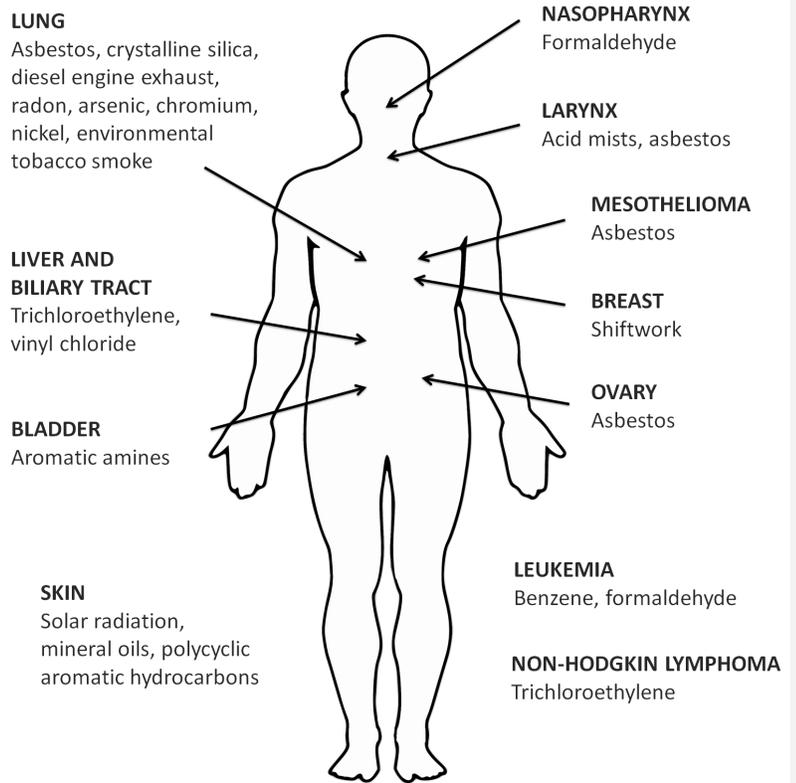
### What is burden?

The term 'burden' is used to refer to the human impact (deaths, illness, years of life lost) and the economic costs associated with a cause of disease.

The goal of the *Burden of Occupational Cancer in Canada* project is to estimate the **number of cancer cases** caused each year by workplace carcinogens, and the **economic impact** resulting from these cancers.

The project specifically aims to assess the burden of 27 different cancers associated with exposure to 44 workplace carcinogens. The burden will be described by sex, province, age group, and specific industries and occupations. This enables identification of groups where the impact is highest, allowing for targeted prevention strategies.

The figure above shows some of the cancer sites and associated workplace exposures that are included in this study. These exposures were chosen from the International Agency for Research on Cancer's evaluations of definite (Group 1) and probable (Group 2A) human carcinogens relevant to the Canadian context. They include industrial chemicals, dusts and fibres, radiation, metals, and exposure circumstances.



### Why is this information important?

Cancer is the leading cause of death in Canada. Millions of Canadians are exposed to a wide range of known and suspected carcinogens in the workplace. However, the impact of these exposures is less clear, which is why burden studies are important.

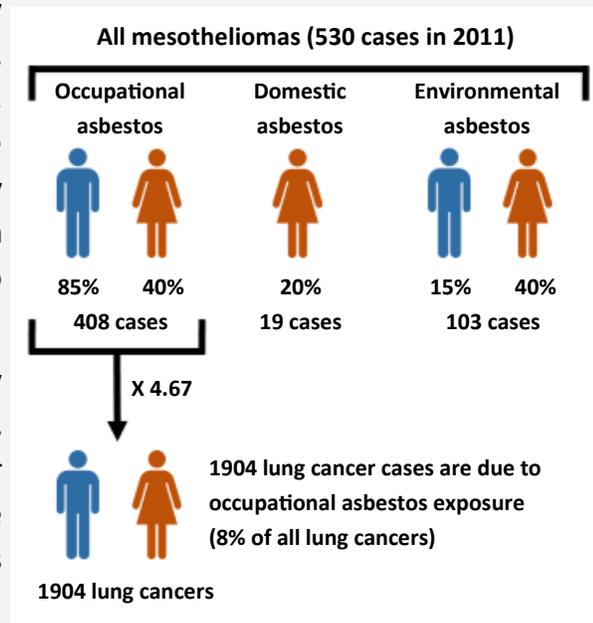
Occupational cancer burden has not been previously calculated for Canada on a national scale. Cancers in the future can be prevented by reducing current occupational exposure to carcinogens. Findings from this study will help identify priority workplace carcinogens and will provide policy makers and health advocates with much-needed information to prevent occupational cancers.

## Estimating the human burden of cancer associated with occupational asbestos exposure

Cancer can take years to develop. For most carcinogens in this study, we assume exposure occurring 10 to 50 years ago contributes to current cancers. We use exposure data to estimate the number of workers historically exposed and their level of exposure. Epidemiologic data and cancer statistics (for the most recent census year, 2011) are applied to determine the number of cancers caused by workplace exposure to the carcinogen.

For asbestos, it is hard to assess the number of people historically exposed, so this general approach is not possible. However, mesothelioma is relatively unique: asbestos causes almost all cases, and most (85% in men, 40% in women) are caused by workplace exposure. Approximately 20% of female cases are also caused by domestic exposure (asbestos carried home on workers' clothing; para-occupational). These proportions were applied to cancer statistics to estimate the number of cases caused by occupational asbestos.

Lung cancer is caused by asbestos, but it is also associated with many other carcinogens. Based on studies of asbestos-exposed workers, asbestos exposure causes approximately 4.67 excess lung cancers for each case of mesothelioma. This ratio was used to estimate the number of lung cancers attributable to occupational asbestos exposure based on the number of mesotheliomas.



## Estimating the economic burden

The economic burden of newly diagnosed occupational cancers in 2011 includes all current and future costs incurred by afflicted workers, their families, communities, employers and society at large. These include:

- **Health care and administrative costs:** are incurred by employers if a workers' compensation claim is accepted, otherwise paid by society at large.
- **Informal caregiving and out-of-pocket costs:** include out-of-pocket healthcare and travel costs associated with medical treatments incurred by the worker and their family, and informal caregiving time from family or community members.
- **Output and productivity losses:** include lost wages for the worker due to time loss associated with illness or death, if not covered by workers' compensation and/or disability insurance. Employers also incur costs from the lost output and productivity associated with lost time and worker replacement.
- **Health-related quality of life losses:** intangible costs incurred by the worker and their family.

## About the research team

The Burden of Occupational Cancer Project 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. The project is funded by the Canadian Cancer Society. For more information, visit [www.occupationalcancer.ca/2011/burden-of-occupational-cancer/](http://www.occupationalcancer.ca/2011/burden-of-occupational-cancer/).

