

Mesothelioma Surveillance & Prognosis in Ontario

Research Brief | December 2020

BACKGROUND

Mesothelioma is a cancer of the tissue that lines internal organs (e.g. lungs, digestive organs, heart, sex organs). It has very poor survival, and the annual number of newly diagnosed cases in Canada has been steadily increasing for many decades. Approximately 80-85% of mesotheliomas are associated with occupational asbestos exposure. Despite the ban on asbestos use in Canada, asbestos-related diseases such as mesothelioma will persist for many decades due to long latency periods. This project was started because statistics on mesothelioma incidence and survival in Ontario and Canada overall are outdated. Studying factors associated with mesothelioma incidence and survival will help us better understand this rare and highly fatal cancer.

OBJECTIVES

The objectives of this project were to:

1. Increase our understanding of how rates of mesothelioma have changed over time, by sex, age, geographical region and tumour characteristics.
2. Evaluate survival and factors such as geographical location, sex, and age, that may impact mesothelioma survival in Ontario and British Columbia.
3. Predict when the epidemic of mesothelioma will peak in Ontario, British Columbia, and Canada overall.

This summary focuses on the Ontario results of this project.

METHODS

This project used data from the Ontario Cancer Registry for 1993-2017, accessed through Ontario Health, and the Canadian Cancer Registry, accessed through the Research Data Centre at the University of Toronto. Data were used to examine demographic patterns, tumour characteristics and trends over time. Geographic patterns were examined by Census Division and Public Health Unit in Ontario. We examined length of survival and the relative contribution of different factors on survival, while controlling for others. Ethics approval for the Ontario piece of this project was obtained from the Research Ethics Boards of the University of Toronto.

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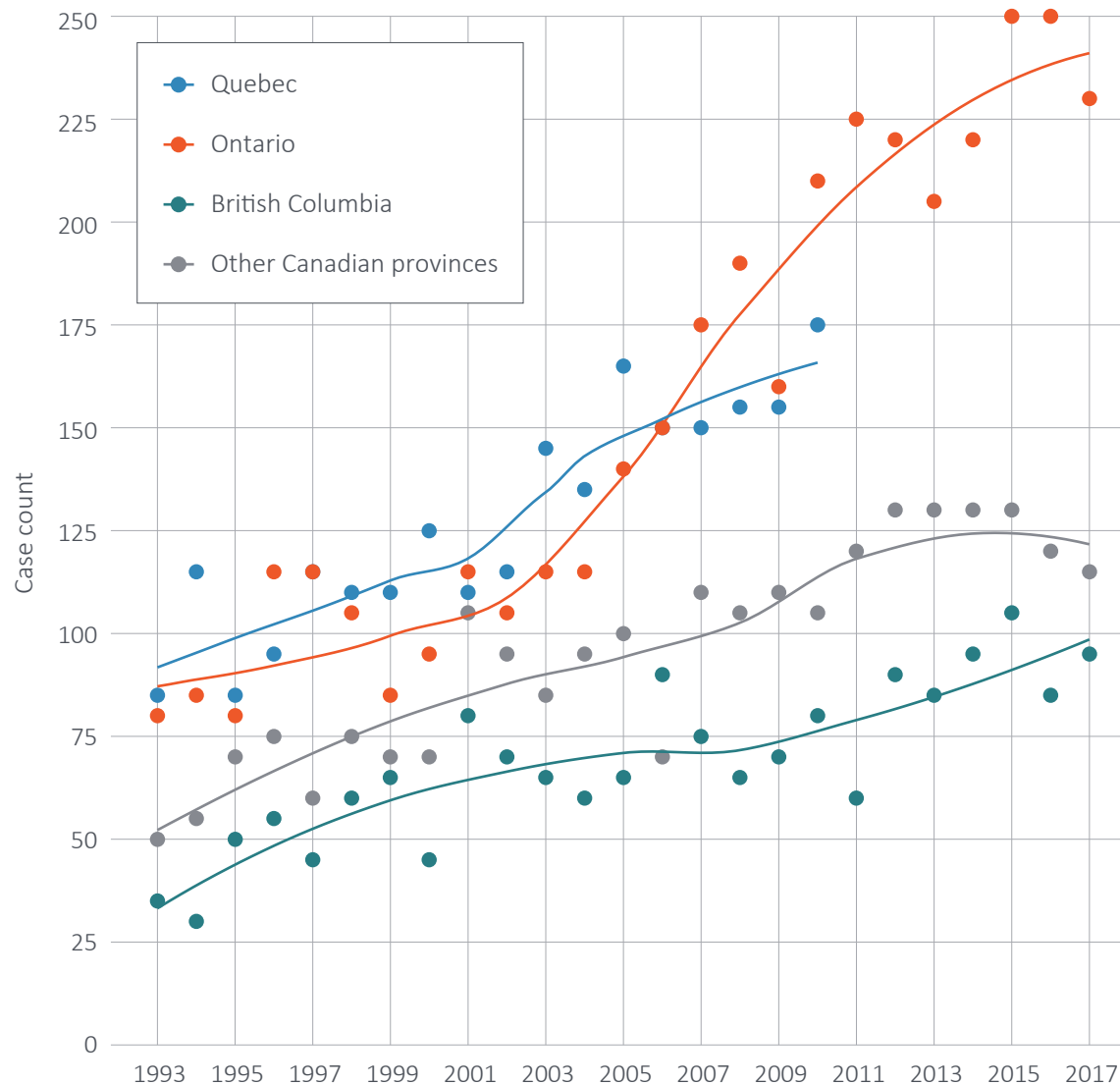


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TRENDS IN NUMBER OF CASES

The number of cases of mesothelioma in Ontario has risen annually from 75 cases diagnosed in 1993 to nearly 250 cases diagnosed in 2017 (see graph at right). Over 4,000 total cases were diagnosed during this period. The majority of cases identified in Ontario were male (80%) and over the age of 60 when diagnosed (83%).

The large number of cases in Ontario compared to other provinces is driven by the province's large population. Data for Quebec is not available after 2010, but its rate (per 100,000 population) is much higher than Ontario's. The current rate in Ontario is similar to the national average and to British Columbia's rate.



TRENDS IN INCIDENCE RATES BY AGE AND SEX

Overall in Ontario, the rates in men are much higher than in women, reflecting their much higher levels of occupational asbestos exposure in the past. However, in the most recent years the rates in men appear to have dropped slightly (see graph at right). On the other hand, although rates in women are lower, they appear to be steadily rising.

Approximately 90% of people who developed mesothelioma in Ontario were born prior to 1950 and would likely have entered the labour force before the early 1970's when per capita usage of asbestos peaked and began to drop in Canada. Similarly, the rates of mesothelioma among people over the age of 70 have risen dramatically, while the rates have declined among populations in their 50's and 60's. When age-adjusted rates were examined by decade of birth in Ontario, the rates for men peaked for those born in the late 1930's and generally dropped for those born since then, while the risk in women continues to slowly rise.

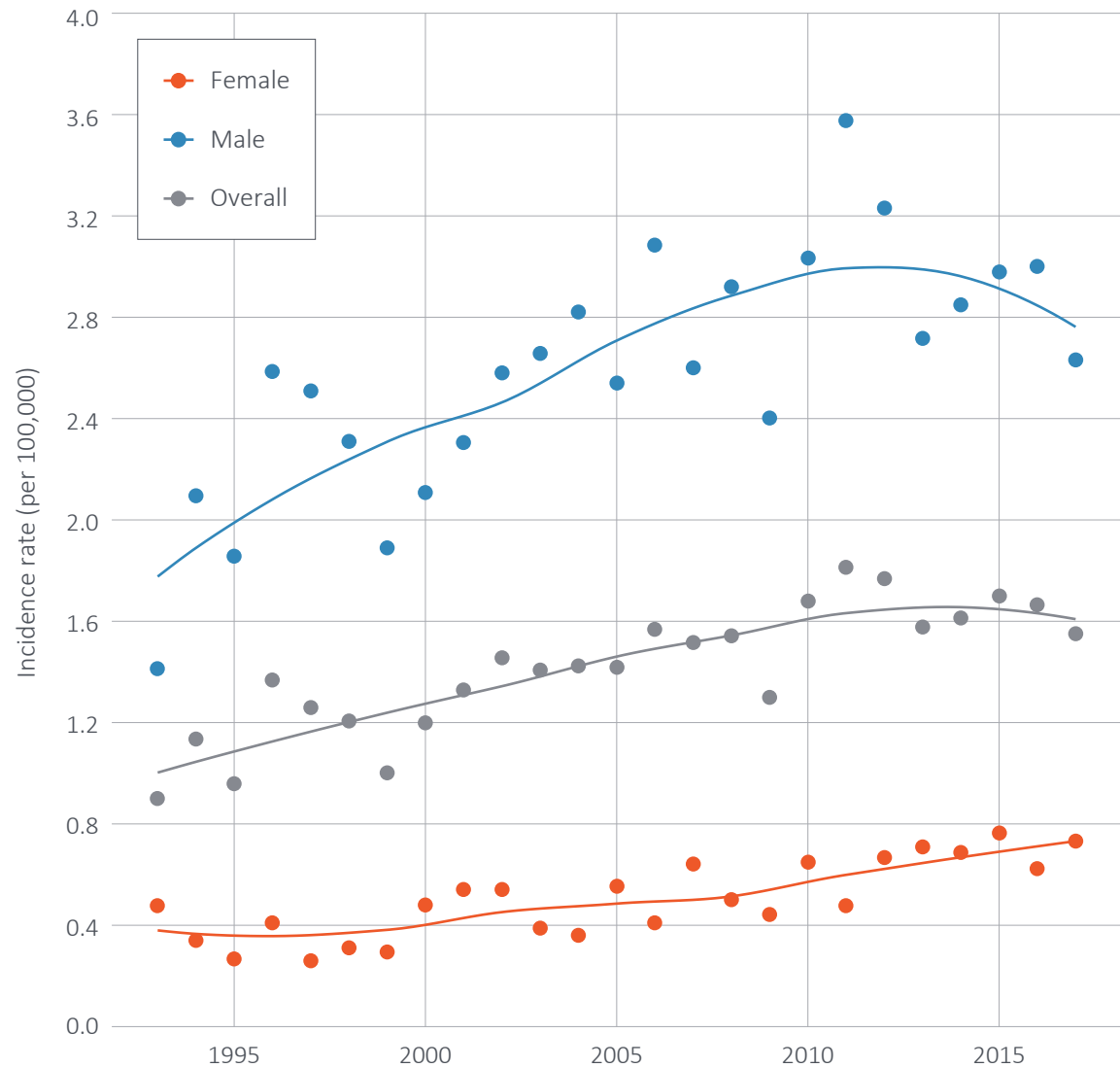


FIGURE 2. MESOTHELIOMA INCIDENCE RATES PER 100,000, 1993-2017, BY SEX

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INCIDENCE RATES OF PLEURAL AND PERITONEAL MESOTHELIOMA

The great majority of cases in Ontario were diagnosed in the pleura (the lining of the lungs, 75% of cases), followed by the peritoneum (the lining of the digestive organs, 8.1% of cases). The incidence rate patterns for pleural mesothelioma are similar to mesothelioma overall, although the apparent drop among men is more pronounced. The trends for peritoneal cancer in Ontario are quite different. Until approximately 2005, the rates were relatively steady, with men having roughly twice the risk compared to women. After that point the rates begin rising for both, but faster for women.

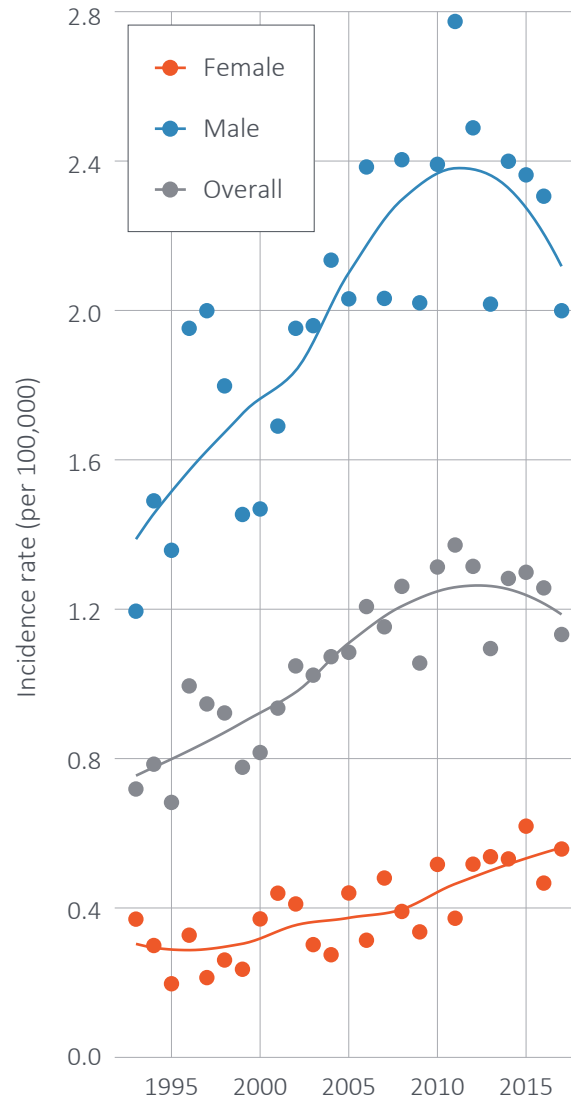


FIGURE 3A. PLEURAL MESOTHELIOMA INCIDENCE RATES PER 100,000, 1993-2017

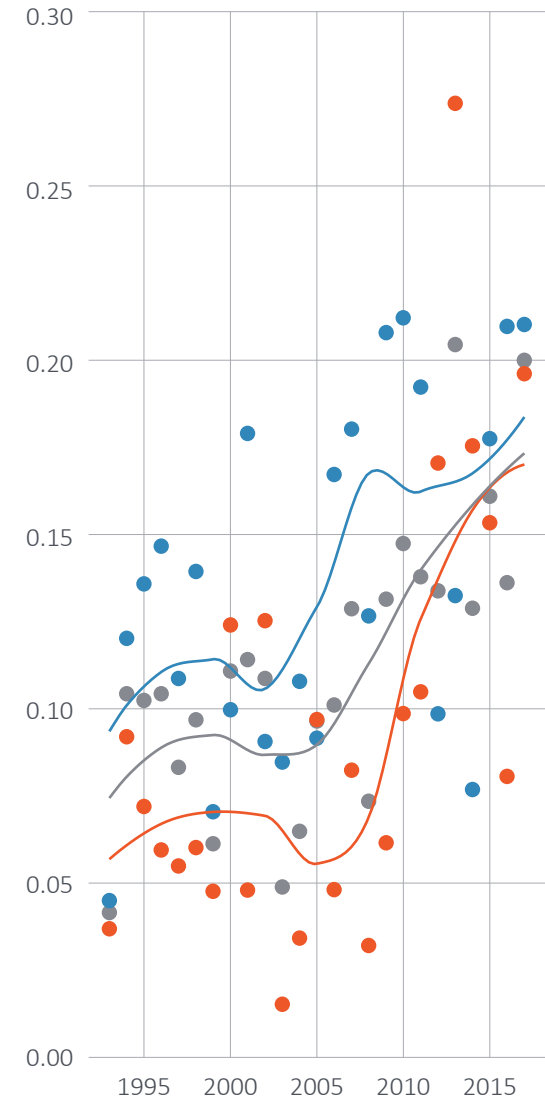


FIGURE 3B. PERITONEAL MESOTHELIOMA INCIDENCE RATES PER 100,000, 1993-2017

INCIDENCE RATES BY GEOGRAPHICAL REGION

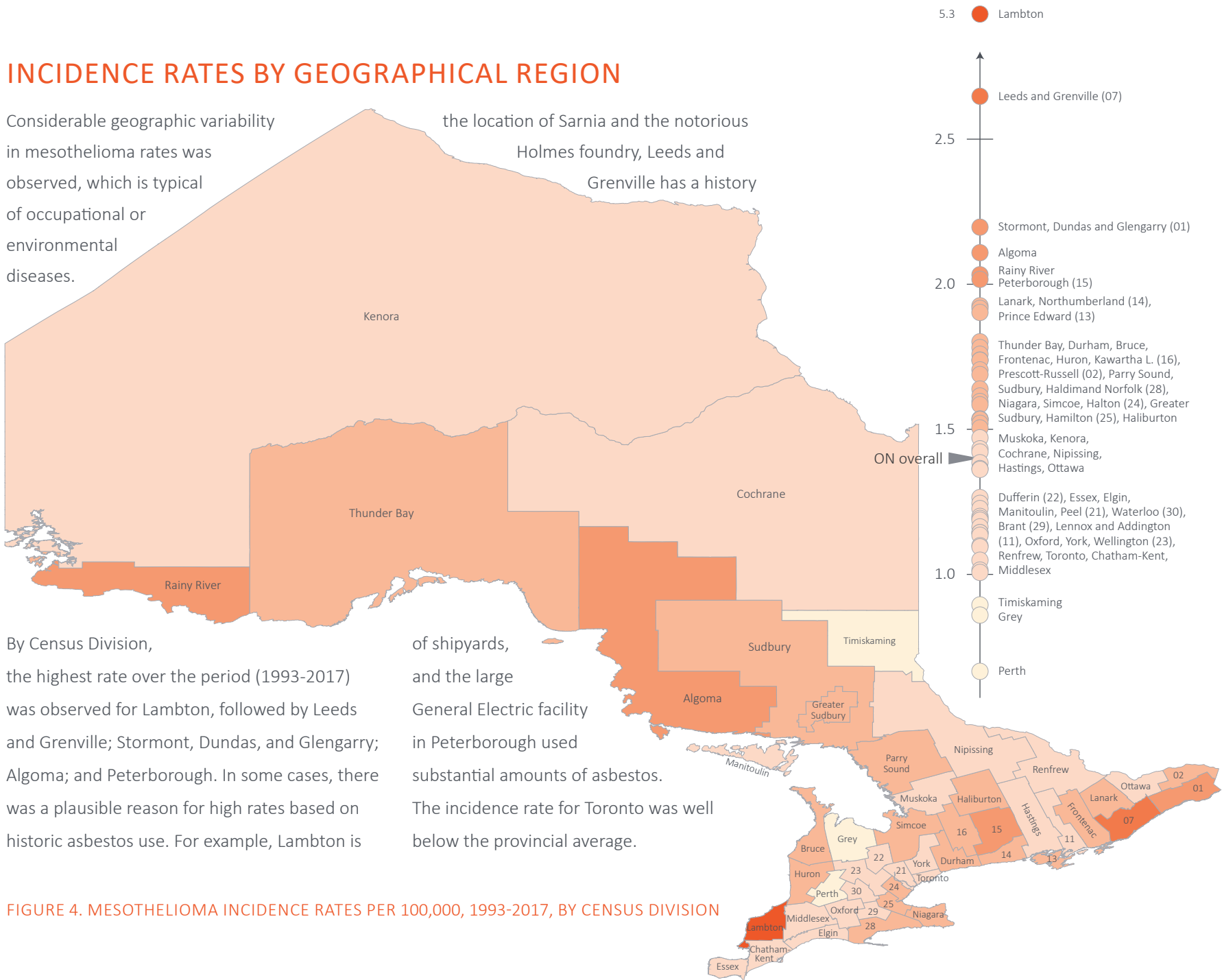
Considerable geographic variability in mesothelioma rates was observed, which is typical of occupational or environmental diseases.

the location of Sarnia and the notorious Holmes foundry, Leeds and Grenville has a history

By Census Division, the highest rate over the period (1993-2017) was observed for Lambton, followed by Leeds and Grenville; Stormont, Dundas, and Glengarry; Algoma; and Peterborough. In some cases, there was a plausible reason for high rates based on historic asbestos use. For example, Lambton is

of shipyards, and the large General Electric facility in Peterborough used substantial amounts of asbestos. The incidence rate for Toronto was well below the provincial average.

FIGURE 4. MESOTHELIOMA INCIDENCE RATES PER 100,000, 1993-2017, BY CENSUS DIVISION



SURVIVAL

In Ontario, median survival between 1993 and 2017 was 8.6 months, with 38% survival at one year and only 4.7% at five years. When adjusting for other factors, survival was somewhat better in women than men, much better for people diagnosed at younger ages, somewhat better for people with peritoneal rather than pleural cancers in Ontario and better for certain types of mesothelioma (epithelioid rather than fibrous or biphasic cancers). Overall survival has improved little over the 25-year study period and in 2013-2017 was 9.3 months, with 40% survival at one year and 6.3% at five years.

IMPLICATIONS FOR RESEARCH, POLICY AND PREVENTION

There is a continuing need to monitor mesothelioma trends to better understand changes related to latency, levels of exposure and both occupational and environmental sources of exposure.

This study did not address workers' compensation, which remains an important issue. In the last five years for which we have data available, there were approximately 240 cases diagnosed annually in Ontario, while approximately 80 cases were compensated annually. This discrepancy is mostly because claims are not filed. Although overall rates may have plateaued, case numbers are unlikely to decrease soon and may even increase as the Ontario population ages and grows. The increasing numbers and rates in women also have important implications for compensation.

There is a continuing need to raise awareness of the hazards of asbestos. [CAREX Canada](#) estimates that approximately 50,000 workers in

Ontario are occupationally exposed to asbestos, with most exposure taking place among workers in the construction industry and the building trades who maintain, renovate, and demolish older buildings containing asbestos. These workers will be at risk for mesothelioma in the future. The Occupational Disease Surveillance System is tracking high-risk groups in Ontario (see <https://www.odsp-ocrc.ca/mesothelioma/>).

A mesothelioma registry, with better information on occupational and environmental exposure history, patient and tumour characteristics, and treatment would greatly increase Canada's ability to study this deadly occupational cancer. Successful registries have been developed in other countries, such as Australia and Italy, and could be models for Canada.

It is very important to conduct further research to identify more effective treatment of mesothelioma.

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PROJECT DETAILS

This project was funded through a grant from WorkSafeBC's Innovation at Work program with additional support from OCRC's Occupational Disease Surveillance Program, which is funded by the Ontario Ministry of Labour, Training, and Skills Development (MLTSD) and Ministry of Health. The views, findings, opinions and conclusions expressed here do not represent the views of WorkSafeBC or our other funders. All inferences, opinions, and conclusions drawn in this presentation are those of the authors, and do not reflect the opinions or policies of the Data Stewards.

The principal investigators of the project are Dr. Paul Demers and Dr. Christopher McLeod. Paul Demers is the director of the OCRC, which receives core funding from the MLTSD, the Canadian Cancer Society, and Ontario Health. Christopher McLeod is head of the Occupational and Environmental Health Division of the UBC School of Population and Public Health. He is also the co-director of the Partnership for Work, Health and Safety, which is funded by WorkSafeBC.



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