

Mesothelioma Surveillance and Prognosis in BC

May 2021

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 This project was started because statistics on mesothelioma incidence and survival in BC and Canada overall are outdated.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 BC and Ontario, and;
3. Predict when the epidemic of mesothelioma will peak in BC, Ontario, and Canada overall.

This summary focuses on the BC results of this project.

Methods

This project used data from the BC Cancer Registry for 1992-2016, accessed through Population Data BC, and the Canadian Cancer Registry for 1993-2017, 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 health service delivery area in BC. We examined length of survival and the relative contribution of different factors on survival, while controlling for others. Ethics approval for the BC piece of this project was obtained from the Research Ethics Board of the University of BC.



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Trends in number of cases

The number of cases of mesothelioma in BC has risen annually from ~35 cases diagnosed in 1993 to nearly 100 cases diagnosed in 2017 (Figure 1). 1,600 total cases were diagnosed during this period. The majority of cases identified in BC were male (85%) and over the age of 60 when diagnosed (83%).

The large number of cases in Ontario compared to other provinces is driven by Ontario'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 BC.

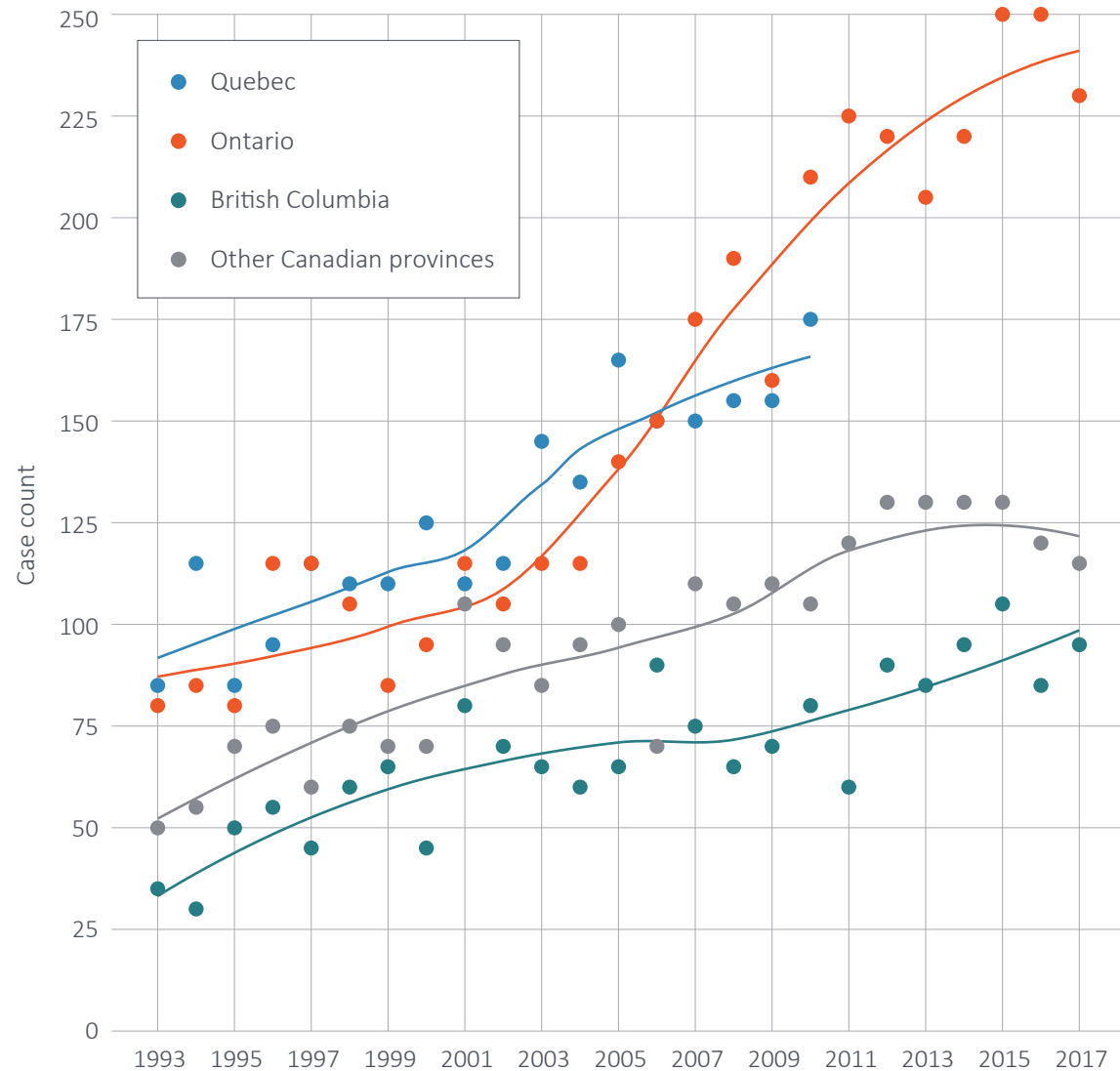


Figure 1 | Number of cases of mesothelioma diagnosed 1993-2017, by province

Trends in incidence rates by age and sex

Overall in BC, the rates in men are much higher than in women, reflecting their much higher levels of occupational asbestos exposure in the past. However, after 2002 the rates in men appear to have flattened (Figure 2). On the other hand, although rates in women are lower, they appear to be slowly rising.

Approximately 90% of people who developed mesothelioma in BC were born prior to 1950 and would likely have entered the labour force before the early 1970s 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 fifties and sixties.

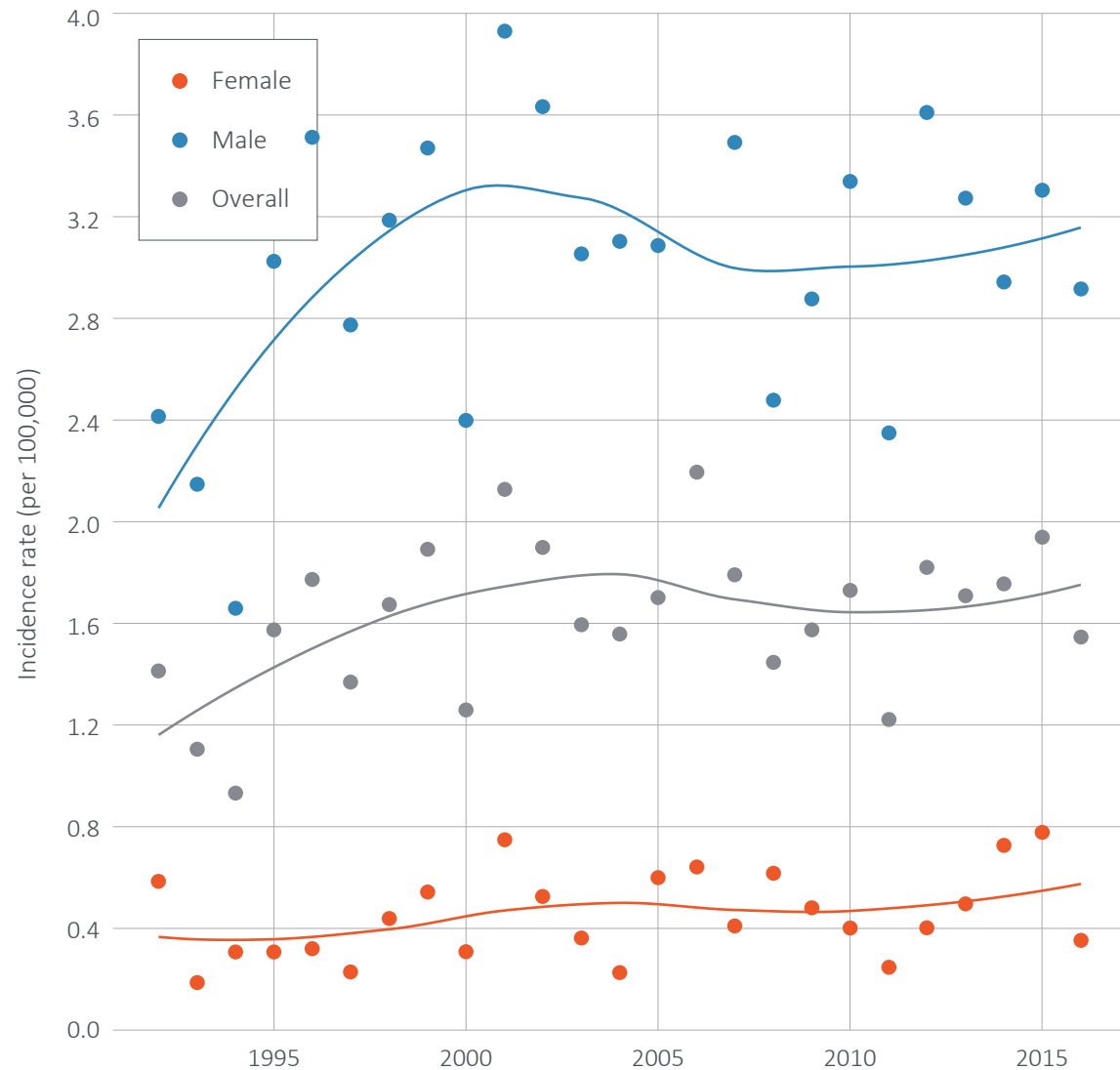


Figure 2 | Mesothelioma incidence rates per 100,000, 1992-2016, by sex

Incidence rates of pleural and peritoneal mesothelioma

The great majority of cases in BC were diagnosed in the pleura (the lining of the lungs; 87% of cases), followed by the peritoneum (the lining of the digestive organs; 7.2% of cases). The incidence rate patterns for pleural mesothelioma are similar to mesothelioma overall, although the rates in men appear to drop slightly after 2002. The trends for peritoneal cancer in BC are quite different. The rates, based on smaller numbers, appear to have slowly risen over the entire period. While the rates appear to have dropped a little for men after 2008, men have roughly twice the risk of peritoneal mesothelioma compared to women.

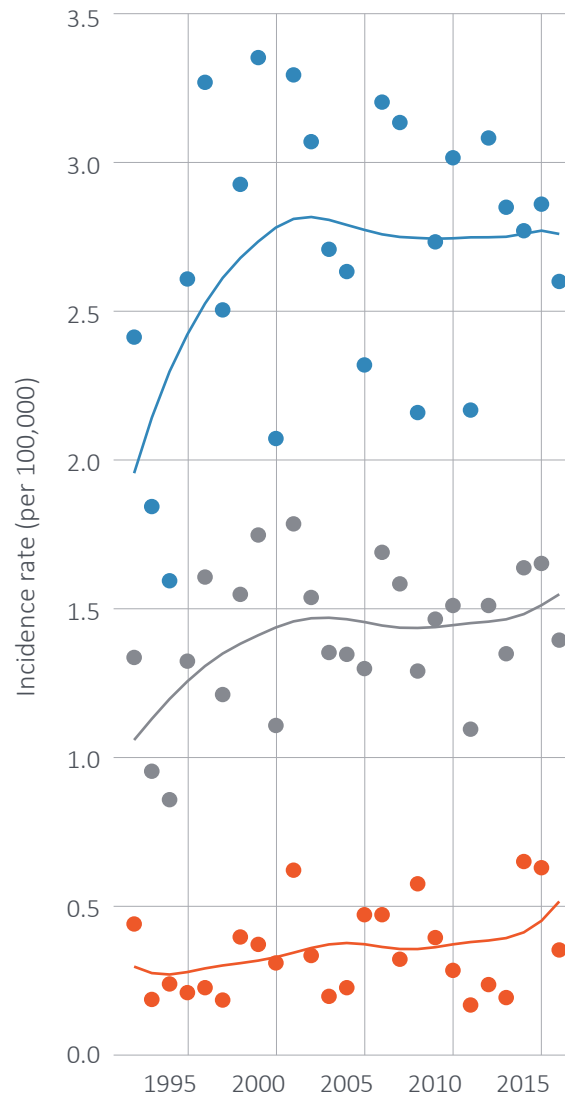


Figure 3a | Pleural mesothelioma incidence rates per 100,000, 1992-2016

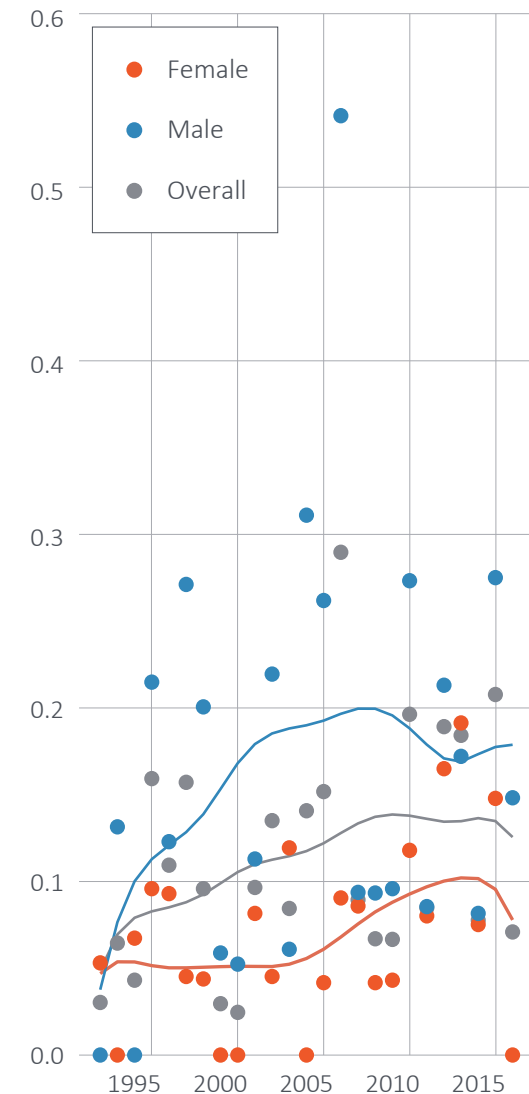


Figure 3b | Peritoneal mesothelioma incidence rates per 100,000, 1992-2016

Incidence rates by geographical region

Considerable geographic variability in mesothelioma rates was observed, which is typical of occupational or environmental diseases. By census division, the highest rate over the period (1992-2016) was observed for Kootenay-Boundary, followed by Peace River, Comox-Strathcona, and Columbia-Shuswap. In some cases, there may be a plausible reason for high rates based on historic asbestos use; for example, the history of smelting in Kootenay-Boundary or shipyards in Comox-Strathcona. However, workers from high-risk industries migrating after retirement may also play a role. The incidence rate for Greater Vancouver was well below the provincial average.

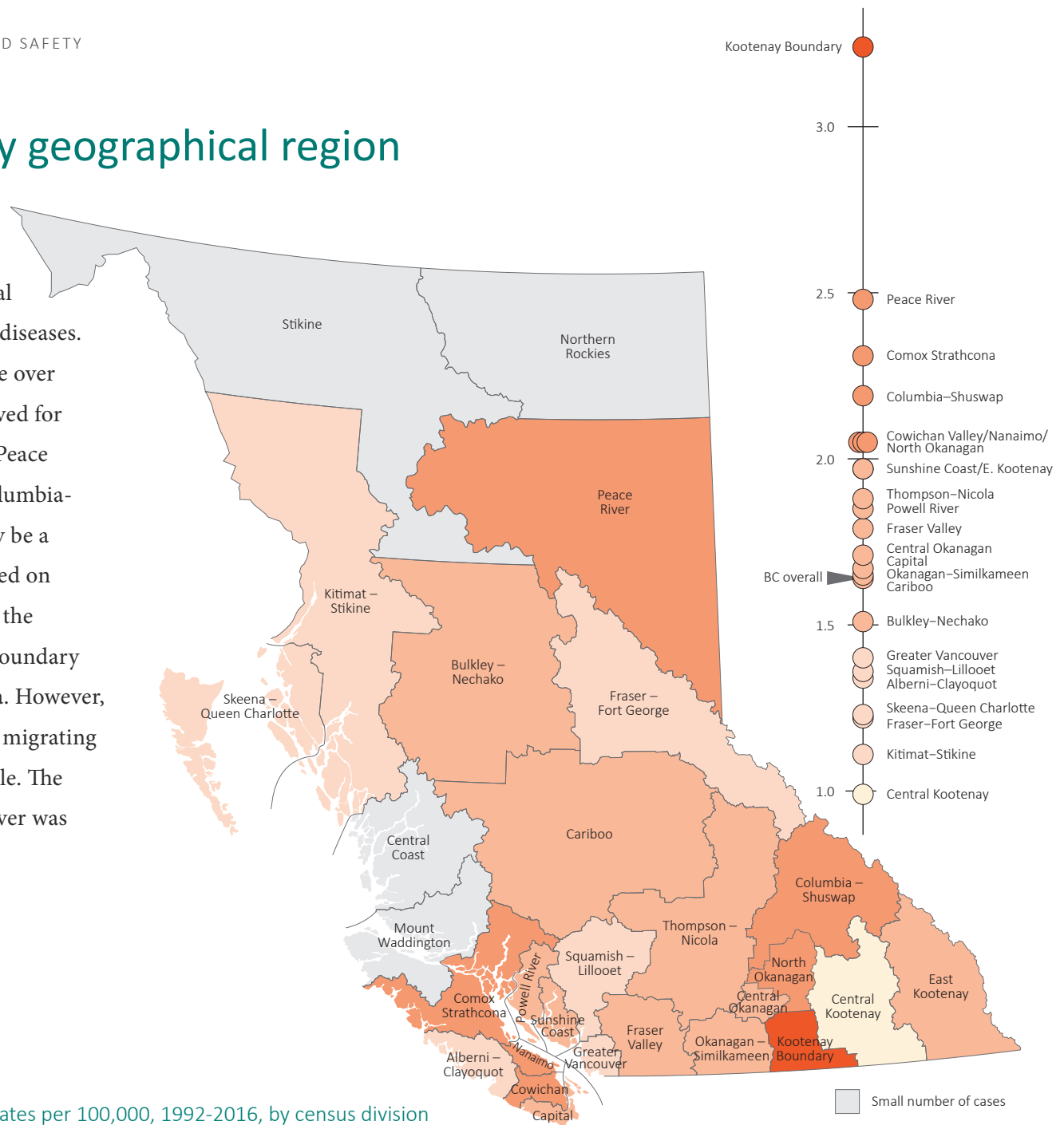


Figure 4 | Mesothelioma incidence rates per 100,000, 1992-2016, by census division

Survival

In BC, median survival between 1992 and 2016 was 8 months, with 39.2% survival at one year and only 3.5% at five years. When adjusting for other factors, survival was somewhat better in women than men, much better for people diagnosed at younger ages 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 2012-2016 was 8 months, with 39.1% survival at one year and 3.7% 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 100 cases diagnosed annually in BC. Although overall rates may have plateaued, case numbers are unlikely to decrease soon and may even increase as the 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 25,000 workers in Ontario are occupationally exposed to asbestos, with most exposures 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 Program 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.

Project details

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

The principal investigators are Drs. Paul Demers and Chris McLeod. Dr. Demers is the director of the OCRC, which receives core funding from the MLTSD, the Canadian Cancer Society, and Ontario Health. Dr. McLeod is head of the Occupational and Environmental Health Division of the UBC School of Population and Public Health and PWHS co-director.

About PWHS

The Partnership for Work, Health and Safety (PWHS), between WorkSafeBC and the University of BC, is an innovative research unit that combines rigorous work and health research with effective knowledge translation.

PWHS brings together policy-makers, researchers and data resources from national and international organizations to address current and emerging issues of work-related health in Canada. Our research is aimed at improving understanding of the causes and consequences of injuries and illness, identifying high-risk industries and occupations, and investigating the effectiveness of interventions that improve worker health, prevent occupational illness and injury, and reduce work-related disability.

Our collaboration, based on best practices of knowledge transfer, enables researchers and decision-makers to work together to identify relevant questions, understand data, and produce useful information to effectively inform policy and practice.