Occupational cancer risks among male and female workers: enhancing knowledge translation and prevention

World Cancer Day 2025 Webinar

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The Occupational Cancer Research Centre (OCRC)

- The OCRC's mission is to enhance understanding of health effects of hazardous occupational exposures and use this knowledge to support improvements in occupational disease prevention and compensation

  - Increase occupational cancer research capacity in Ontario
  - Initially focused only on cancer, but more recently broadened to occupational disease

Ontario Ontario Health

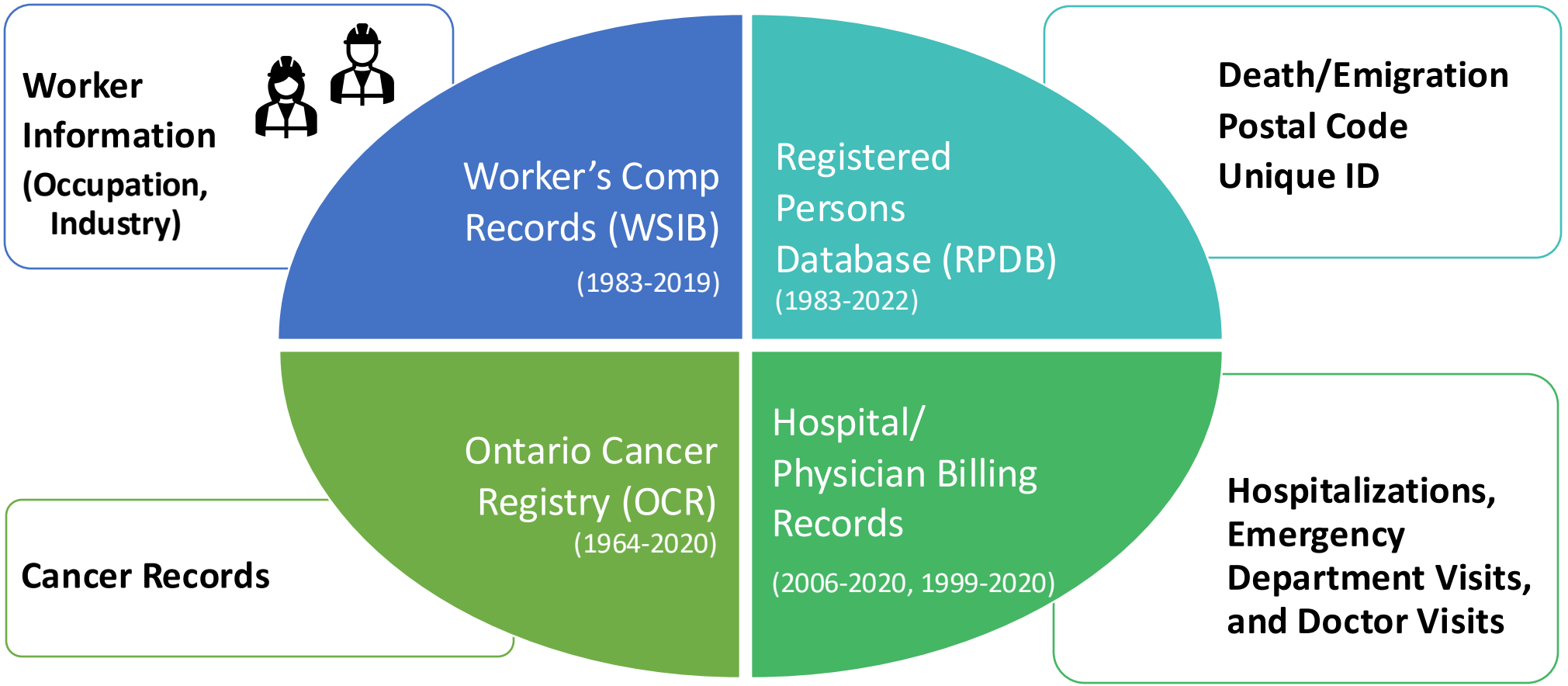
Development of the Occupational Disease Surveillance System (ODSS)

- At its conception, no other system in Canada included both work and health information to examine the risks of occupational diseases among workers

- Purpose is to identify at-risk workers and occupational risk factors to inform prevention activities

Occupational Disease Surveillance System

Total cohort of 2.37 million workers



Examples of cancers monitored in the Occupational Disease Surveillance System (ODSS)

- Bladder
- Breast
- Colorectal
- Kidney
- Laryngeal
- Leukemia
- Liver
- Lung
- Mesothelioma
- Non-Hodgkin Lymphoma
- Prostate
- Salivary Gland
- Sinonasal
- Stomach
- Thyroid
- Testicular
- Ovarian
- Uterine

Statistical Analysis

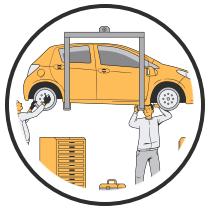
- We use cox proportional hazards models to estimate hazard ratios and 95% confidence intervals by occupation compared with all other workers in the ODSS
  - Coded using the Canadian Classification Dictionary of Occupation (CCDO 1971)
  - Examined at 3 levels: division, major, and minor groups

- All models adjusted for age at start of follow-up and birth year; some models indirectly adjusted for smoking

Leukemia

Sales Occupations in Commodities

Females: 1.17



Mechanics and Repairers except Electrical

Females: 1.20
Males: 1.10

Motor Transport Operating

Females: 1.21
Males: 1.14

Protective Services

Males: 1.17

Metal Machining

Females: 1.17
Males: 1.23

Interpretation: Hazard Ratio (HR) > 1.0 means the risk of cancer is elevated among workers in the specific occupation compared to the rest of workers in the ODSS

	Acute Myeloid	Chronic Myeloid	Acute Lymphocytic	Chronic Lymphocytic
Motor transport operating	↑	↑		↑

www.occupationalcancer.ca/resources/risk-of-leukemia-among-ontario-workers/

Non-Hodgkin's Lymphoma

Elementary & Secondary School Teaching

Females: 1.18

Protective Services

Females: 1.01
Males: 1.19

Mineral Ore Treating

Males: 1.92

Nursing Therapy

Females: 1.09
Males: 1.22

Mining and Quarrying

Males: 1.22

Motor Transport Operating

Females: 1.29
Males: 1.12

Interpretation: Hazard Ratio (HR) > 1.0 means the risk of cancer is elevated among workers in the specific occupation compared to the rest of workers in the ODSS

Melanoma

University Teaching
Females: 1.87

Architects & Engineers
Females: 1.97
Males: 1.62

Other Farming, Horticultural and Animal Husbandry
Males: 1.08

Elementary & Secondary School Teaching
Males: 1.74

Nursing Therapy
Females: 1.37
Males: 1.39

Railway Transport Operating
Males: 1.83

Other Teaching
Females: 1.29
Males: 2.10

Protective Services
Males: 1.94

Motor Transport Operating
Males: 1.28

Interpretation: Hazard Ratio (HR) > 1.0 means the risk of cancer is elevated among workers in the specific occupation compared to the rest of workers in the ODSS

Lung Cancer

Food & Beverage Preparation Services

Females: 1.19

Metal Processing

Females: 1.22
Males: 1.26

Excavating, Grading & Paving

Females: 2.25
Males: 1.36

Printing & Related

Females: 1.51

Metal Machining

Females: 1.56

Other Construction Trades

Females: 1.54
Males: 1.11

Chemicals, Petroleum, Rubber, & Plastic Material Processing

Females: 1.35
Males: 1.01

Mechanics & Repairers, Except Electrical

Females: 1.39
Males: 1.02

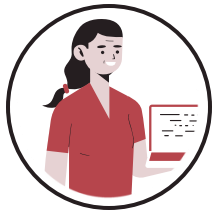
Motor Transport Operating

Females: 1.69
Males: 1.42

Interpretation: Hazard Ratio (HR) > 1.0 means the risk of cancer is elevated among workers in the specific occupation compared to the rest of workers in the ODSS

www.frontiersin.org/journals/environmental-health/articles/10.3389/fenvh.2023.1325197/full

Female Reproductive Cancers



Managerial, Administrative
Uterine: 1.39
Ovarian: 1.22

Other Teaching
Uterine: 1.70

Metal Machining
Ovarian: 2.24

Elementary & Secondary School Teaching
Uterine: 1.35
Ovarian: 1.09

Wood Machining
Uterine: 1.60
Ovarian: 1.72

Interpretation: Hazard Ratio (HR) > 1.0 means the risk of cancer is elevated among workers in the specific occupation compared to the rest of workers in the ODSS

www.occupationalcancer.ca/resources/female-reproductive-cancers/

Knowledge Translation at OCRC

Sharing evidence to drive change

Ontario Occupational Disease Statistics

- Interactive data tool developed in partnership with CCOHS
- Explore ODSS data by sector or exposure


Construction


Food & Beverage


Healthcare


Metal Manufacturing


Mining

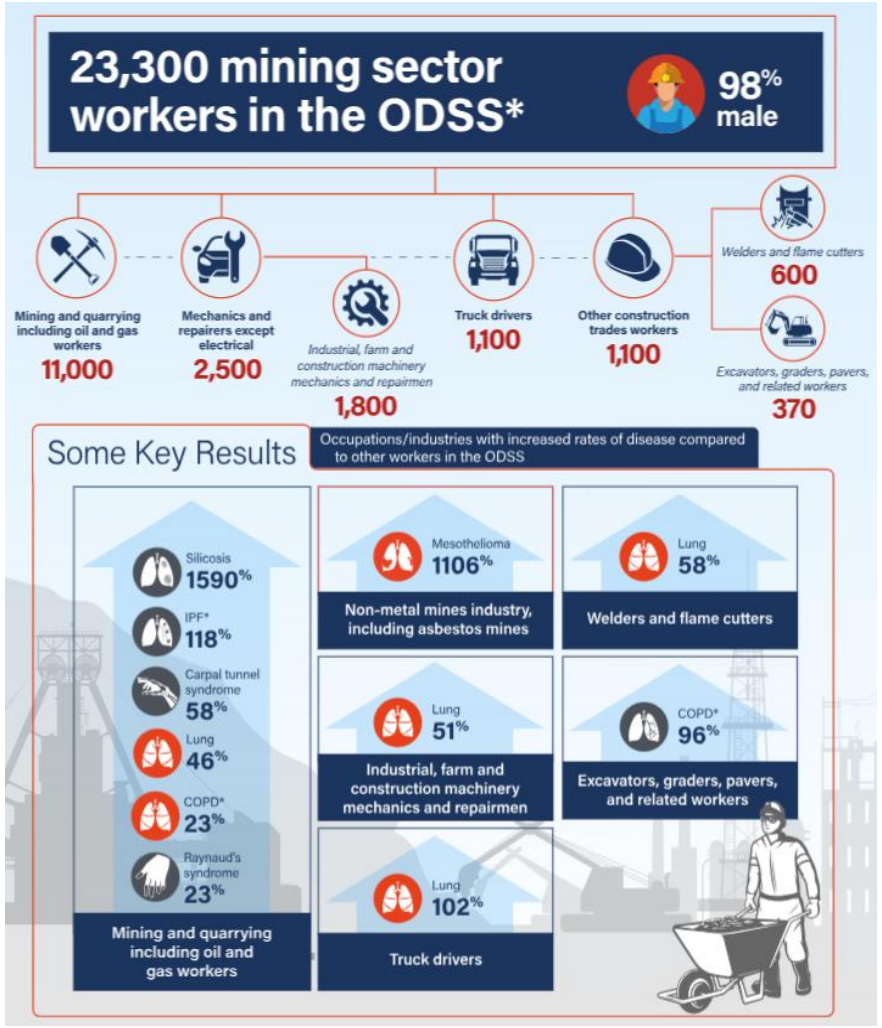

Plastic Products


Protective Services

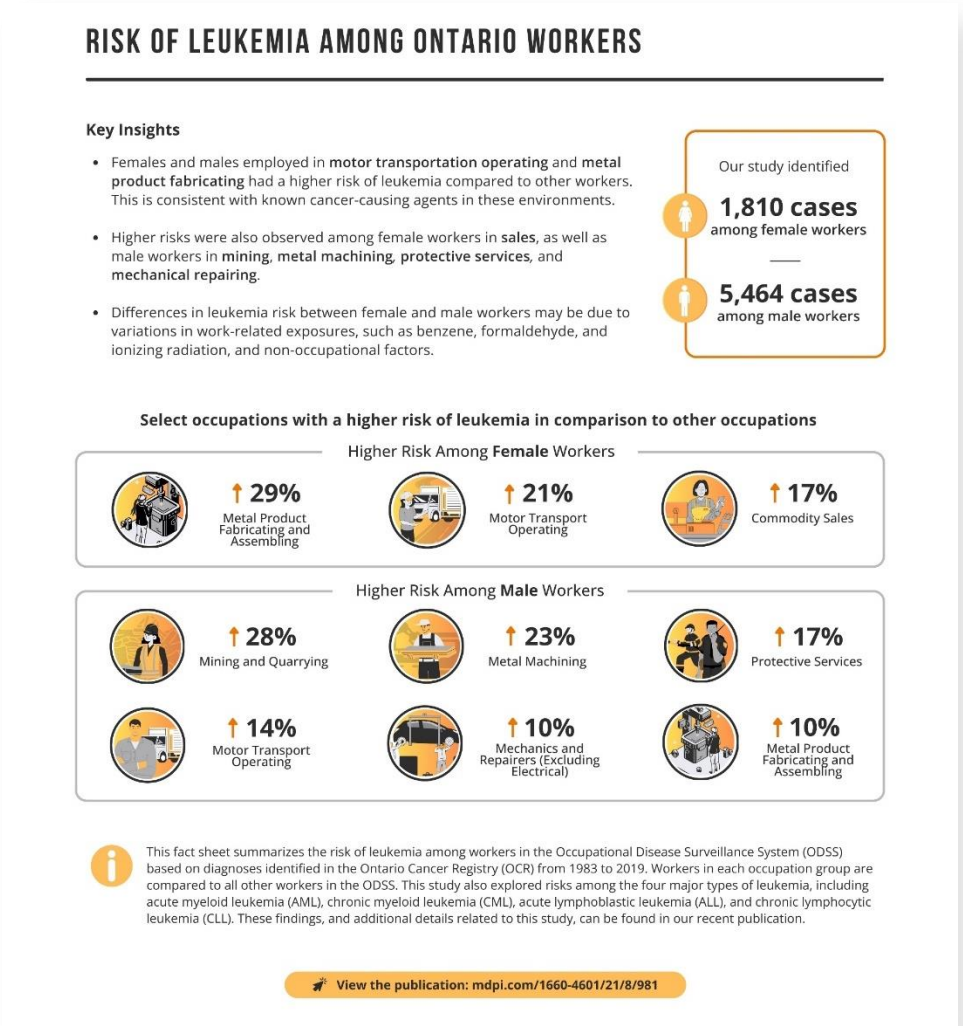

Rubber Products

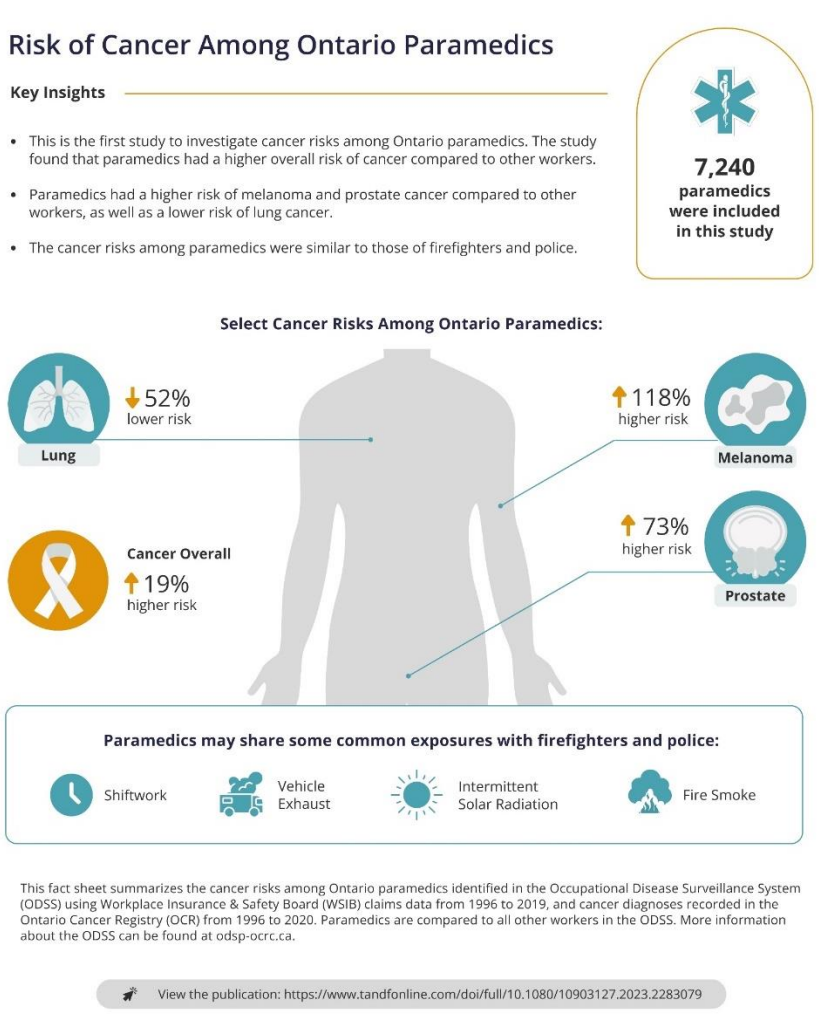

Transportation

occdiseasestats.ca



OCRC Infographics



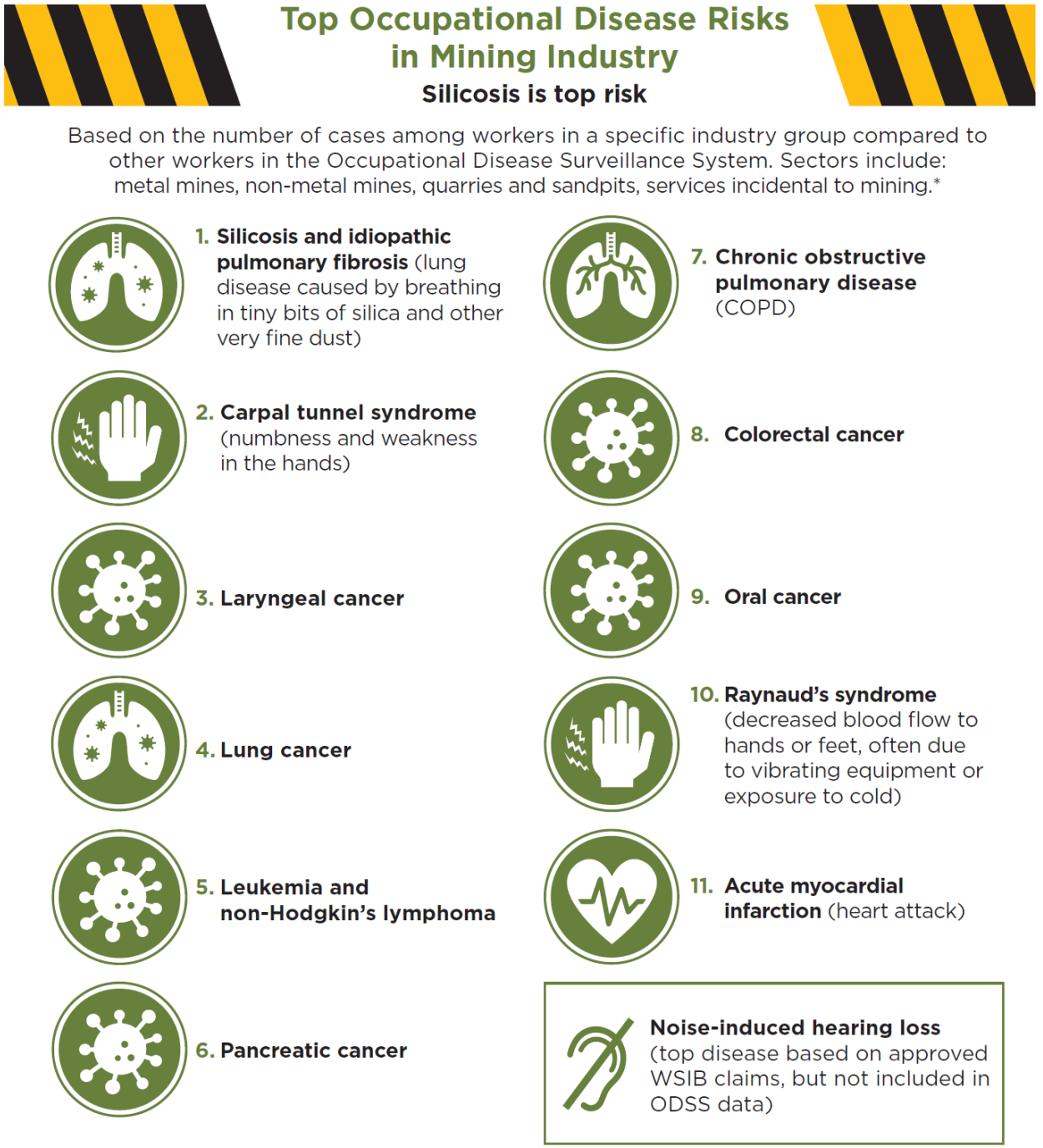


www.occupationalcancer.ca/resources/risk-of-leukemia-among-ontario-workers/
www.occupationalcancer.ca/resources/risk-of-cancer-among-ontario-paramedics/

Fact Sheets on Top Disease Risks

- Collaboration with Workplace Safety North

- Top occupational disease risks in:
  - Mining
  - Forestry
  - Pulp & paper



Ontario's Asbestos Workers Registry (AWR)

- Employers are required to report workers' hours of Type II and Type III work with asbestos-containing materials
- Workers are notified when they reach 2,000 reported hours (~1 year)

Study Aims:

- Evaluate the risk of asbestos-related cancer & respiratory disease among workers in the AWR
- **Assess the utility of the AWR for occupational disease surveillance**

onlinelibrary.wiley.com/doi/10.1002/ajim.23668

Study led by:
Victoria Arrandale, University of Toronto
Nathan DeBono, OCRC
Paul Demers, OCRC

Improving the AWR as a tool for prevention

Research finding:

- Increased rates of asbestos-related disease seen among workers with as little as 500 cumulative work hours

Opportunity for prevention:

- Consider lowering the 2000-hour threshold for notification

onlinelibrary.wiley.com/doi/10.1002/ajim.23668

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Radon in Ontario Workplaces

- Measured radon levels in small-medium sized Ontario workplaces and public buildings
- Over 450 workplaces in 10 cities across Ontario participated

Onaping Falls Community Centre basement closed due to radon

Radon levels in the west side of the basement at the Onaping Community Centre read at 263 becquerels per cubic metre, which exceeds the maximum Canadian guideline of 200

Sudbury.com Staff
Jul 22, 2023 11:00 AM

Radon issue getting resolved at Onaping Falls Community Centre

The city has an estimated completion date for radon mitigation at the Onaping Falls Community Centre of Jan. 31, which is just in time for the Onaping Falls Winter Carnival

Tyler Clarke
Jan 3, 2025 5:00 PM

PROTECTING THE WORKPLACE FROM RADON

Exposure to radon can cause lung cancer.
All buildings are susceptible to radon.
The only way to know if radon is a problem is to test.

What is radon?

Radon is a gas that is...

radioactive | invisible | odorless

Why is radon a concern?

Radon is the leading cause of lung cancer for non-smokers, and exposure to radon greatly increases the risk of lung cancer for smokers.

Where is radon found?

- Naturally found in rocks and soil
- Basement and ground floors are at most risk of radon gas buildup

How to test for radon:

Health Canada recommends placing radon monitors for 90+ days.
Radon testing can be done by:

- hiring a certified radon testing professional, or
- buying a do-it-yourself radon test kit at select hardware stores.

Reduce radon if levels test above 200 Bq/m³

The Canadian guideline for indoor radon levels is **200 Bq/m³**

The OCRC tested Ontario workplaces for radon. For more information about the study and for radon reduction resources, **visit our project summary page:**

VIEW PROJECT SUMMARY

Additional measures workplaces can take:

- Increase air circulation (open windows, if able)
- Seal cracks in basements
- Install sump pump covers

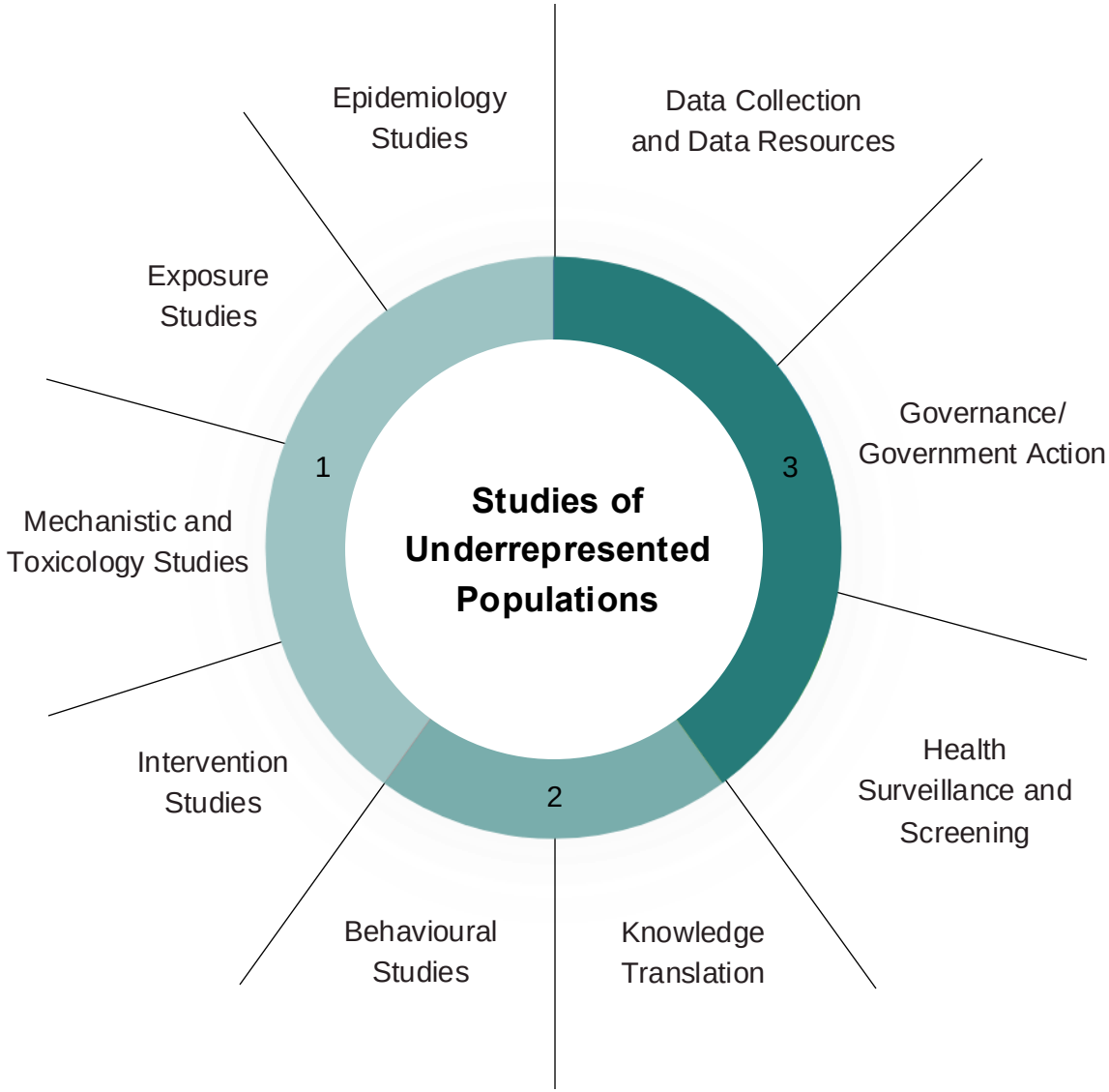
Visit the project summary page at **https://www.occupationalcancer.ca/project/radon-in-ontario-workplaces/**.
This project was funded by the Ministry of Labour, Immigration, Training and Skills Development (MLITSD).
The views expressed in this publication are those of the OCRC and do not necessarily reflect those of the Province.

www.occupationalcancer.ca/resources/radon-resources/

Firefighter cancer research priorities workshop report

- Workshop of ~70 industry, research, and government stakeholders
- Identified 10 key gaps
- Four Canadian priorities
  - Underrepresented populations
  - Exposure interventions
  - Mechanistic studies on cancer risk
  - Studies measuring exposure and improved exposure assessment for epidemiology studies

www.occupationalcancer.ca/ffcrpw/



OCRC research related to firefighting

- Diesel engine exhaust exposures and controls in Ontario fire halls
- Validation of respirator fit testing for emergency workers during simulated life support tasks
- Assessing new methods for measuring occupational exposure to flame retardants and PFAS*
- Exposure to PFAS and cancer prevalence by occupation and industry

www.occupationalcancer.ca/project/

*Led by Dr. Victoria Arrandale, University of Toronto

2023-2024 Annual Report

- Highlights progress and accomplishments
  - Research programs
  - Projects
  - KTE initiatives & products
- Theme: Expanding our Scope
- Available at:

  www.occupationalcancer.ca/resources/ocrc-annual-report-2023-2024/

Resources

- OCRC Website:
  - www.occupationalcancer.ca

- ODSS:
  - ODSS webpage: www.occupationalcancer.ca/odss/
  - Occupational Disease Statistics: occdiseasestats.ca
  - Opioids and Work: opioidsandwork.ca

- Firefighting:
  - www.occupationalcancer.ca/resources/ff-resources/
  - www.occupationalcancer.ca/area_of_focus/high-risk-groups/firefighters/

Thank you

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