EXPANDING OUR SCOPE

23 ANNUAL REPORT 24

Occupational Cancer Research Centre

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FUNDING

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LAND ACKNOWLEDGEMENT

The land on which the OCRC operates has been the traditional land of the Huron-Wendat, the Seneca, and the Mississaugas of the Credit for thousands of years. Today, this land is still home to many Indigenous people from across Turtle Island, and we are grateful to have the opportunity to work here.

Produced by the Occupational Cancer Research Centre

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TABLE OF CONTENTS

A MESSAGE FROM THE

OCRC LEADERSHIP TEAM

When the Occupational Cancer Research Centre (OCRC) was founded in 2009, it answered a crucial need in Ontario for a dedicated centre of research expertise focused on occupational cancer. Our vision was clear: to create a research hub capable of conducting rigorous research to inform prevention strategies and ultimately reduce cancer risks for Ontario's workers. Today, we have numerous ongoing research projects that continue to generate reliable and timely evidence essential for occupational cancer prevention.

The theme of this report is "Expanding our Scope." Over the last decade, we have gradually increased our scope in response to the needs of our stakeholders and to leverage our analytical platforms to study a wide range of diseases. For example, our Occupational Disease Surveillance System, established for occupational cancer surveillance, has investigated health outcomes ranging from chronic lung diseases to COVID-19 and opioid-related harms. Now, we are advancing occupational exposure surveillance, increasing capacity to safeguard worker health. We have our sights set on extending our understanding of the burden of occupational cancer and other diseases on a national scale. We remain committed to our national and international collaborations and are connecting with our health and safety partners throughout the province. Additionally, we are intensifying our focus on understudied and marginalized workers, ensuring our efforts benefit all sectors of the workforce.

Our new Strategic Plan, which was launched this past year, reflects our expanded scope. As our mission has evolved, we considered changing our name but ultimately decided to retain the OCRC brand, recognizing its strong reputation and the trust it has built over the years. You may see us using the acronym more frequently, but our dedication to leading occupational cancer research in Ontario remains unchanged.

In 2023, we were pleased to welcome Dr. Peter Smith as the new Chair of our Steering Committee. As President and Senior Scientist at the Institute for Work and Health, Dr. Smith brings extensive experience in occupational health research to help guide OCRC's future initiatives over the coming years. We would like to thank Dr. Christine Williams, our past Chair, for her leadership, inspiration and support. Dr. Williams was a longtime supporter of the centre. Under her guidance, we achieved significant milestones and strengthened our commitment to occupational health research. Dr. Williams' strategic insights were critical to OCRC's success, and we wish her the best as she continues her work advancing cancer research in other spheres.

Looking ahead, a key objective is to nurture a strong community of occupational health researchers in the province, ensuring sustained support for our important mission. To this end, we are excited to partner with the newly established Centre for Occupational Disease Prevention, launched in 2023 at the University of Toronto's Dalla Lana School of Public Health.

None of our achievements would be possible without our fantastic team of dedicated research and administrative staff, our collaborators, the ongoing support from our key funders, and the support of Ontario Health. We are deeply grateful for their contributions and remain committed to advancing our research to protect the health and safety of Ontario's workers. Thank you for being part of our journey.

Sincerely,
Paul Demers, Director, **Tracy Kirkham**, Associate Director, and **Jill MacLeod**, Manager

> **The activities and outputs outlined in this report represent both important progress and knowledge generation on the relationships between work environments and occupational disease in Ontario, and a great return to investment of the research funding.**

Peter Smith
Chair, OCRC Steering Committee

EXPANDING OUR SCOPE

The 2023-2024 year has been focused on expanding our scope, with the ultimate objective of expanding our impact on Ontario's occupational health system. When it was first established in 2009, OCRC aimed to address a significant evidence gap limiting Ontario's capacity to identify, prevent, and compensate work-related cancers. Since then, OCRC has generated valuable evidence on historical, ongoing, and emerging occupational carcinogenic hazards. This remains a key focus of our work.

However, workers are frequently exposed to a wide range and combination of hazards in the workplace, contributing to a broad variety of potential health risks. We recognized that the tools we have developed to examine occupational cancer could also be effectively leveraged to expand evidence on a broader array of exposures and health conditions. In 2023, we officially expanded the scope of our research mandate. With the support of our Steering Committee, we launched a new five-year strategic plan and a new vision: the elimination of occupational disease.

The past year has also brought an expansion in our capacity to both perform research and share it broadly. Our research program now operates in three interconnected streams: Epidemiology, Surveillance, and Exposure. Each stream is composed of a Scientific Lead and dedicated research staff and is supported by core administrative staff. The creation of the Knowledge Translation and Exchange team has expanded our ability to produce knowledge translation products and share them through our updated website and social media channels. With a drive to empower access to information, foster data-driven decision-making, and increase transparency in our research initiatives, we are committed to making our research more accessible.

As OCRC expands, our focus extends beyond delivering quality research to cultivating the core values we envision for our research centre – emphasizing equity, diversity, and inclusion. We are committed to ensuring that our research is relevant and applicable to diverse groups, including those who have historically often been excluded from research studies.

- In our Surveillance work, we are examining the differences between sexes and their risks of occupational disease, with a particular focus on identifying groups of female workers who may be at disproportionate risk.
- Our Exposure study examining respirator fit has implications for female workers, who may be at increased risk for poor respirator fit. We are also initiating a related study looking at the efficacy of an intervention to improve respirator fit among bearded members of the Sikh community.
- In our Epidemiology and Surveillance research, we are integrating additional data sources to examine impacts of race, ethnicity, and sociodemographic information.

There is more to be done in this area, which is why one of our 5-year strategic objectives is to collaborate with under-represented communities and groups to identify research priorities. Eventually, this research may inform prevention policies and practices to reduce occupational health inequities. These changes are reflected in the theme of this report, “expanding our scope.” The report outlines the Centre’s progress in 2023/2024, guided by our Five-Year Strategic Plan that spans across 2023 to 2028 and centers around four strategic objectives.

OCRC’S STRATEGIC OBJECTIVES

Build capacity for occupational disease and exposure research

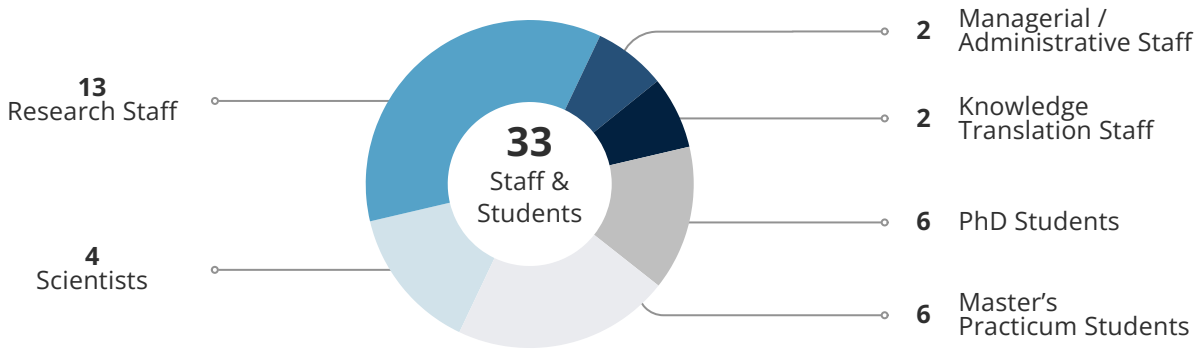
Enable informed decision-making/action by sharing timely evidence and recommendations

Lead occupational disease and exposure surveillance in Canada

Collaborate with under-represented communities and groups to identify research priorities

2023-2024 BY THE NUMBERS

OUR PEOPLE



RESEARCH PROJECTS

8 Active grant-funded projects
- **2** Surveillance projects
- **3** Exposure projects
- **3** Epidemiology projects

2 Complete grant-funded projects

4 Advisory committees

4 Key international collaborations

10+ Grant applications submitted

ENGAGEMENT

OCRC Website

12K users

32K page views

2K file downloads

Media and Social Media

60 media mentions

193 followers

165 followers

KNOWLEDGE DISSEMINATION

1 Public Workshop

2 Major reports

7 Fact sheets

16 Scientific publications

50+ Presentations by OCRC Staff

Opioids and Work data tool launched

OUR RESEARCH

OCRC conducts research through three interconnected programs:

SURVEILLANCE

To identify groups of workers where the risks of occupational exposure and disease are highest by developing large-scale data platforms that integrate population, exposure, and disease records.

Scientific Lead: Dr. Jeavana Sritharan

EXPOSURE

To investigate occupational exposures and their sources, develop innovative exposure assessment tools, and conduct field studies.

Scientific Lead: Dr. Tracy Kirkham

EPIDEMIOLOGY

To identify and better understand the causes of occupational disease by conducting new studies, synthesizing results across studies, and predicting the impact of exposures or prevention efforts.

Scientific Lead: Dr. Nathan DeBono

SURVEILLANCE HIGHLIGHTS

Over the past decade, OCRC has been at the forefront of innovation in occupational disease surveillance, notably with the establishment of the Occupational Disease Surveillance System (ODSS). The ODSS is a cohort of over 2.3 million Ontario workers, linked to provincial health data sources. First established to examine occupational risks for cancer through linkage to the Ontario Cancer Registry, the ODSS has since expanded and is now being used by OCRC researchers to identify and monitor trends in dozens of diseases.

For the first time, the ODSS was used to detect occupational risks for infectious disease transmission through its application to COVID-19. OCRC also collaborated with the Institute for Work and Health (IWH) to examine occupational trends in opioid-related harms using the ODSS.

EXPANDING SURVEILLANCE IN 2023-2024

- Added approximately 200K workers to the ODSS
- First application of the ODSS to surveillance of infectious disease
- First application of the ODSS to study opioid-related harms

THE OCCUPATIONAL DISEASE SURVEILLANCE SYSTEM: A POWERFUL TOOL FOR PREVENTION

The Occupational Disease Surveillance System (ODSS) represents a significant advancement in capacity for occupational disease surveillance, owing to its extensive scope, potential for expansion, and efficient use of existing data. This approach leverages limited resources while enabling the rapid generation of vast amounts of statistical results. Importantly, it allows us to generate relevant and accurate statistics for groups previously lacking evidence, such as female workers and small subsectors. The system's data span nearly four decades, capturing significant shifts in the Ontario population, workforce, and risk factors.

The system's broad scope and ability to generate timely results has strengthened our capacity to address key stakeholder requests for data. For example, OCRC recently leveraged the ODSS to respond to a query from Workplace Safety North (WSN) about disease risks in Ontario's mining, forestry and pulp and paper industries. WSN used the ODSS data to develop posters that raise awareness about the top occupational disease risks in each industry.

This novel approach to occupational disease surveillance has become a model for other jurisdictions, such as the Manitoba Occupational Disease Surveillance System pilot project, which will be completed in 2024.

2.3M workers linked to:

Cancer Records
Ontario Cancer Registry

Hospital Records
Discharge Abstract Database

Emergency Department Visits
National Ambulatory Care Reporting System

Doctor Visits
Ontario Health Insurance Plan

Lab Test Results
Ontario Laboratories Information System

300+ industries &
500+ occupations

Identified through Workplace Safety and Insurance Board accepted lost-time compensation claims records from formerly injured workers since 1983.

The following projects leverage the ODSS to investigate various disease risks among Ontario workers.

The ODSS is supported by core funding from the Ministry of Health and the Ministry of Labour, Immigration, Training and Skills Development for continued maintenance, updates, and expansion. The views expressed are the views of the research team and do not necessarily reflect those of the Province.

OPIOID-RELATED HARMS AMONG ONTARIO WORKERS

Over the past four years, OCRC has partnered with the Institute for Work & Health (IWH) to investigate opioid-related harms among Ontario workers. This study monitored three opioid-related harms among workers in the ODSS.

Opioid-related harms monitored:

- Poisonings
- Mental and behavioural disorders
- Adverse reactions

The study found that, compared to the general Ontario population, workers in the ODSS have higher risks of experiencing opioid-related poisonings and mental and behavioural disorders. Occupational groups that perform physically demanding work were particularly at risk.

OCCUPATIONAL GROUPS AT HIGHEST RISK

Construction & Trades

Mining & Quarrying

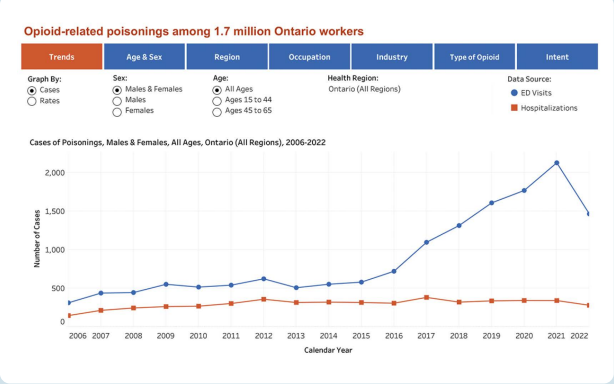
Forestry & Logging

This study lends evidence to the potential role of work-related injuries as a contributor to opioid-related harms and highlights the importance of workplace prevention and harm reduction programs.

This study was funded by the Public Health Agency of Canada. The views expressed herein do not necessarily represent the views of the Public Health Agency of Canada.

OPIOIDS AND WORK DATA TOOL

An online data tool was launched by IWH and OCRC in December 2023, which allows users to explore the study results in more detail. This supports our commitment to enhancing data accessibility, ensuring open information, and fostering evidence-informed decision-making throughout Ontario's health and safety system.



opioidsandwork.ca/data-tool

INVESTIGATING COVID-19 RISKS AMONG ONTARIO WORKERS

The COVID-19 pandemic highlighted disparities in work-related risk factors for COVID-19, with significant attention on risks faced by healthcare and manufacturing workers. In response to the concerns raised during the peak of the pandemic, OCRC used the ODSS for the first time to monitor occupational trends of an emerging infectious disease.

To leverage the ODSS for COVID-19 outcomes, the System was expanded to incorporate a new database: Ontario Laboratories Information System (OLIS). This allowed us to link Ontario workers in the ODSS to COVID-19 PCR test results. We also collaborated with Public Health Ontario to integrate information from their Occupational Exposure to COVID-19 Risk Tool. This expansion of data sources and methods enabled OCRC researchers to examine the role of various occupational characteristics and their impact on COVID-19 risk.

Based on our study results, higher risk of COVID-19 may be linked to indoor, close-contact work operations. Workers living in densely populated areas, like Toronto, had higher risks of COVID-19, possibly reflecting background community risks.

To view the study summary sheets, visit:

odsp-ocrc.ca/covid/

This project was funded by a grant provided by the Workplace Safety and Insurance Board (WSIB, Ontario). The provision of grant support by the WSIB does not in any way infer or imply endorsement of the content by the WSIB.

Occupations with higher risk of COVID-19 infection

in comparison to other occupations

CANCER RISKS AMONG EMERGENCY SERVICES WORKERS IN ONTARIO

Paramedics may be exposed to several cancer-causing hazards during their work, including vehicle exhaust, shiftwork, and solar radiation. However, only a few previous studies have examined their cancer risk. To fill this knowledge gap, the ODSS was used to assess cancer risks among Ontario paramedics. The study found higher risks of melanoma and prostate cancer, and lower risks of lung cancer, among paramedics compared to other workers in the ODSS.

Firefighting is a known cause of cancer. To align with the inaugural Firefighter Cancer Awareness Month in January 2024, OCRC released a bulletin on cancer risks among Ontario firefighters. Firefighters in the ODSS showed higher risks of developing several cancers including testicular cancer, melanoma, mesothelioma, and prostate cancer. In January 2024, OCRC also released report on firefighter cancer research priorities in collaboration with Health Canada.

Read the paper on cancer risks among Ontario emergency services workers:

bit.ly/cancerriskemerg

View the bulletin on cancer risks among Ontario firefighters:

odsp-ocrc.ca/flamesandrisks/

REPRODUCTIVE CANCER RISK AMONG FEMALE WORKERS IN ONTARIO

Women's occupational health issues are often understudied, including research into work-related risk factors for reproductive cancers. Women are broadly underrepresented in occupational health research studies. The ODSS includes approximately 835,000 female workers, supporting the study of even rarer cancers to help address this gap. OCRC used the ODSS to investigate female reproductive cancers, and released a bulletin highlighting some occupational groups with increased risk of ovarian, cervical, and uterine cancers based on findings from the ODSS.

Occupational groups with higher risks of reproductive cancers include:

Managers and administrators

Construction workers

Product fabricating, assembling, and repairing workers

Metalworkers

Teachers

View the bulletin on cancer risks among Ontario female workers:

odsp-ocrc.ca/female-reproductive-cancers/

EXPOSURE HIGHLIGHTS

OCRC's Exposure team doesn't just work in the office – our dedicated group of researchers and students frequently travel across Ontario to conduct studies in the field. With a focus on characterizing exposures, evaluating workplace controls, and developing and applying exposure assessment tools for epidemiology and surveillance studies, our exposure team is furthering the understanding of hazards in Ontario workplaces to better inform the prevention of occupational disease.

OCRC has an ongoing focus on evaluating exposures among emergency workers. This continued and expanded in 2023-2024 through:

- A report on research priorities related to cancer among firefighters
- A study evaluating respirator fit testing protocols
- A study on methods for measuring exposure to flame retardants and PFAS

EXPANDING EXPOSURE RESEARCH IN 2023-2024

- Updated techniques for mapping occupation and industry codes across various systems
- First successful application of job-exposure matrices to the ODSS to investigate exposure-response relationships
- New research to advance exposure and control methods for emergency workers

The Exposure team has made significant progress in developing and applying exposure assessment estimates to both surveillance and epidemiology projects, expanding the ability to evaluate exposure-response relationships. In 2023, the team began laying the groundwork for a significant exposure measurement repository, aimed at enhancing Ontario's capacity for exposure surveillance. The OCRC remains dedicated to leading Canadian efforts in occupational exposure surveillance.

USING U.S. EXPOSURE DATA TO ESTIMATE ONTARIO EXPOSURES

A key gap for exposure surveillance in Ontario is the lack of high-quality, current, accessible exposure data. The U.S. has several large exposure databases from workplace compliance agencies that may help fill the exposure measurement gap in Ontario. However, feasibility studies are needed to assess:

- The comparability of U.S. and Ontario data
- The resource needs and challenges in preparing the U.S. data for exposure surveillance of Ontario workplaces

In the past year, OCRC began a feasibility study to address these questions.

Accomplishments in 2023-2024:

Gathered over **11 million** U.S. exposure measurements

Identified **four priority chemicals** in consultation with stakeholders to test feasibility:

1. carbon monoxide
2. manganese fumes
3. silica
4. tetrachloroethylene

This project was funded by a grant provided by the Workplace Safety and Insurance Board (WSIB, Ontario). The provision of grant support by the WSIB does not in any way infer or imply endorsement of the content by the WSIB.

The pilot work for this project is funded by the Ontario Ministry of Labour, Immigration, Training and Skills Development. The views expressed are the views of the research team and do not necessarily reflect those of the Province.

THE EXPOSURE DATA SYSTEM

In 2023-2024, OCRC began developing the Exposure Data System (EDS), a repository of current and historical exposure measurement data from across the province. The long-term vision for the EDS is to develop a free and dynamic online tool that will allow users to query the data and produce exposure estimates for workplace hazards.

The EDS may be used to:

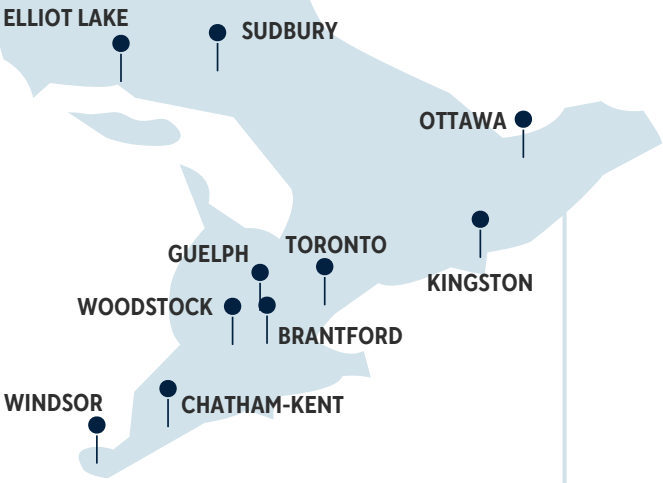
- Identify priorities for prevention
- Drive policy change to reduce occupational exposures
- Inform workers' compensation claims and adjudication
- Support future research

Accomplishments in 2023-2024:

- Began pilot work to collect data from the Ontario Ministry of Labour, Immigration, Training and Skills Development
- Initiated engagement with stakeholders to inquire about exposure data holdings
- Identified Canadian workplace exposure data in research studies through a literature review

The EDS will be a cornerstone of OCRC's exposure surveillance initiative over the coming years.

RADON SURVEY OF ONTARIO WORKPLACES



In 2023-2024, OCRC completed a survey of radon levels in small- and medium-sized Ontario businesses and public buildings.

WHAT WE DID

- Recruited 453 businesses in 10 cities
- Collected 687 radon measurements

WHAT WE FOUND

- Overall, 2.4% of the measurements exceeded Health Canada guidelines
- On average, basement samples tended to have higher radon levels than ground level samples

KNOWLEDGE TRANSLATION

Organized a webinar on *Radon in Ontario Workplaces*

100+ participants

3 presentations

- Results of the radon survey of Ontario workplaces study | *Occupational Cancer Research Centre*
- Radon mitigation | *Radiation Safety Institute of Canada*
- A workplace perspective on responding to radon test results | *City of Greater Sudbury*

Released two infographics to share results.
To view the infographics, visit:

occupationalcancer.ca/resources/radon-resources/

EVIDENCE TO ACTION

Following the release of our results, the City of Greater Sudbury took immediate steps to reduce radon levels

View the press release from the City of Greater Sudbury

Read the news coverage from CTV News

This project was supported by a grant from the Ontario Ministry of Labour, Immigration, Training and Skills Development. The views expressed are the views of the research team and do not necessarily reflect those of the Province.

VALIDATION OF RESPIRATOR FIT TESTING FOR EMERGENCY WORKERS

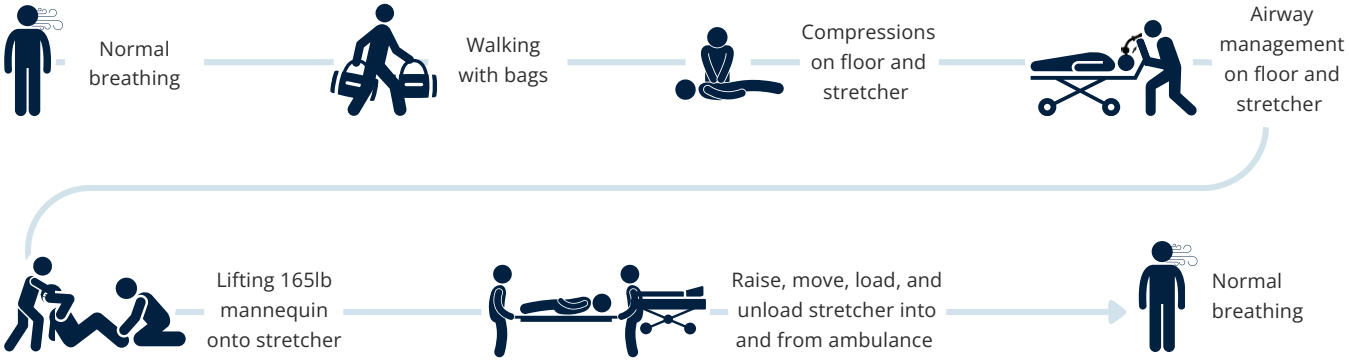
Current respirator fit testing protocols may not adequately represent patient handling and life support task movements, putting emergency workers at risk for poor respirator fit and exposure to airborne hazards. OCRC's respirator fit testing study aims to test how well standard respirator fit testing protocols work to evaluate fit for emergency workers by comparing fit testing results during simulated work tasks.

In 2023-2024, OCRC expanded the scope of this project to recruit firefighters. We also expanded to include testing locations across Ontario. Recruitment will continue into the next year, with the goal of recruiting 200 participants.

Participant image used with consent.

RECRUITMENT **79** Paramedics **60** Firefighters

SIMULATED WORK FIT TEST EXERCISES



This project was funded by a grant provided by the Workplace Safety and Insurance Board (WSIB, Ontario). The provision of grant support by the WSIB does not in any way infer or imply endorsement of the content by the WSIB.

NEW METHODS FOR MEASURING OCCUPATIONAL EXPOSURE TO FLAME RETARDANTS AND PFAS

Flame retardants and PFAS (per- and polyfluoroalkyl substances) are chemicals that are widely used in many consumer products. Exposure is widespread, and there are emerging concerns about their health effects. Firefighters are expected to have higher levels of exposure as these chemicals may be present in their turnout gear or released into the air during a fire. However, there is little information on what levels of exposure are hazardous, in part because we lack reliable and easy methods to measure these chemicals.

Led by Dr. Victoria Arrandale at the University of Toronto, this study aims to test two new methods for measuring exposure to flame retardants and PFAS among firefighters, paramedics and office workers.

STUDY PARTICIPANTS

40 Firefighters

12 Paramedics

13 Office Workers

Method 1: Silicone wristbands that provide a measure of the amount of flame retardants and PFAS present in the air

Method 2: Metabolomics methods that measure contaminants and their metabolites inside the body

The study is nearing completion and finalizing statistical analyses will be the focus of the coming year.

This project was funded by a grant from the Canadian Cancer Society and the Canadian Institutes of Health Research.

THE ONTARIO MINING EXPOSURE DATABASE

The Ontario Mining Exposure Database (OMED) contains historic exposure measurement data from Ontario mines for over 200 hazards. The database is a useful tool for ongoing exposure surveillance, epidemiology, and prevention activities.

Achievements in 2023-2024:

- Developed the first job-exposure matrix (JEM) based on OMED data (a silica JEM from over 18k silica measurements)
- Developed silica exposure prediction models to estimate individual exposure for miners in ongoing cohort study
- Characterized acid mist exposures in Ontario mining refineries
- Extracted mining exposures for four priority hazards in the U.S. Exposure Data project

APPLYING JOB EXPOSURE MATRICES TO THE ODSS

In 2023-2024, OCRC explored approaches for integrating exposure data into the ODSS, as this system doesn't include direct measurement data. These methodologies enable the ODSS to be used to evaluate occupational health risks associated with specific exposures, and to investigate exposure-response relationships.

JEMs were applied to the ODSS to investigate the following exposure-disease relationships:

- Risk of lung cancer, silicosis, idiopathic pulmonary fibrosis, and rheumatoid arthritis due to silica exposure
- Risk of lung cancer, bladder cancer, COPD, and ischemic heart disease due to diesel engine exhaust exposure
- Risk of COVID-19 due to specific occupational characteristics

EPIDEMIOLOGY HIGHLIGHTS

OCRC's epidemiological studies aim to identify and better understand the causes of occupational disease.

The Epidemiology Program has a well-established focus on mining. In 2023-2024, this research continued through analyses of health outcomes among mining industry workers and nickel refinery workers.

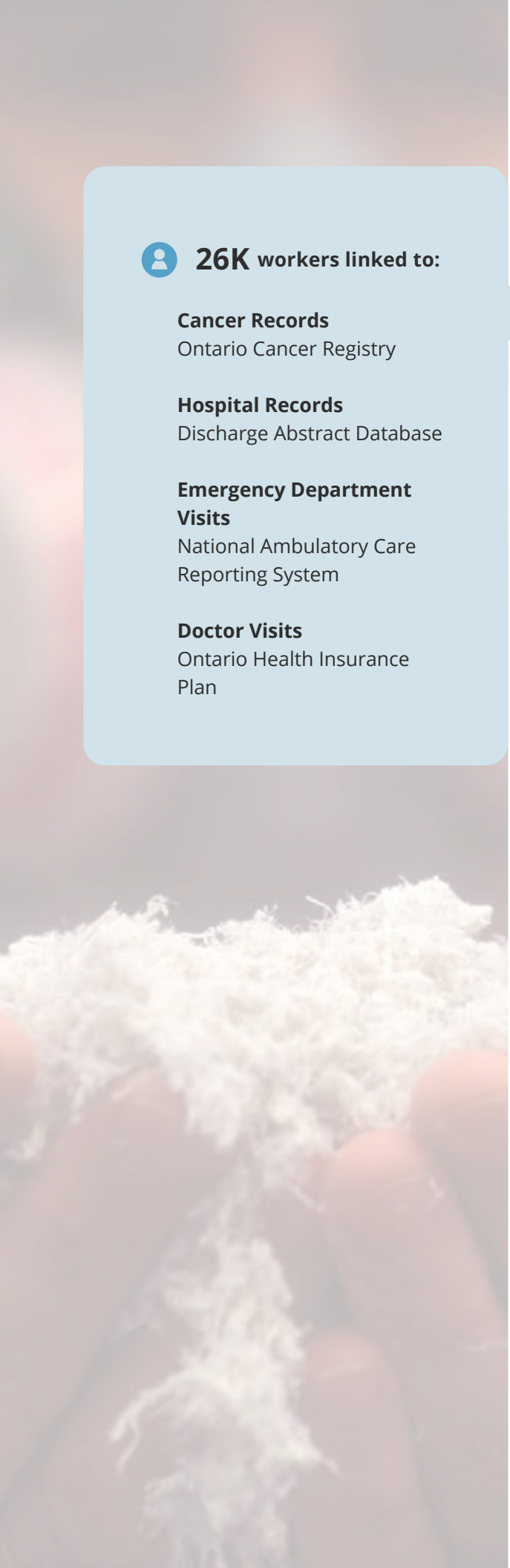
The Epidemiology team has also made significant progress to advance epidemiological methods in 2023-2024. A study of asbestos-exposed workers is being expanded through new methodologies to assess the potential impacts of policy changes on health outcomes. The team is also developing methods to assess the impact of bias on systematic reviews and other evaluations of epidemiological evidence, in partnership with researchers at McGill University.

EXPANDING EPIDEMIOLOGY RESEARCH IN 2023-2024

- Assessment of exposure-response relationship for silica exposure and respiratory disease in mining
- Application of new methods to assess the impact of policy changes on health outcomes
- Progress to develop and apply new methods to assess the impact of bias in occupational cohort studies

Several new initiatives are in the early stages:

- A study to assess the feasibility of evaluating cancer risk among Ontario border service officers has been initiated at the request of the Public Service Alliance of Canada, due to concerns around two potential cancer clusters.
- Options to assess the risk of breast and prostate cancer due to occupational exposure to PFAS and phthalates, two pervasive groups of chemicals in consumer products and the environment, were explored in 2023.
- A cohort study of cancer and chronic disease risk among U.S. autoworkers is underway in partnership with the United Autoworkers (UAW) union and researchers at University of California Berkeley.



26K workers linked to:

Cancer Records
Ontario Cancer Registry

Hospital Records
Discharge Abstract Database

Emergency Department Visits
National Ambulatory Care Reporting System

Doctor Visits
Ontario Health Insurance Plan

INSIGHTS FROM ONTARIO'S ASBESTOS WORKERS REGISTRY

The Asbestos Workers Registry (AWR) monitors exposure to asbestos-containing materials among workers in Ontario. In past years, OCRC has examined the risk of cancer and chronic respiratory disease due to asbestos exposure by linking over 26,000 workers in the AWR to Ontario's administrative health records.

Ongoing work is now focused on addressing policy questions about the use of the AWR for surveillance and medical monitoring. Specifically, the AWR currently notifies workers when they have reached 2000 hours of reported work with asbestos-containing materials and advises them to notify their physicians. OCRC is investigating the impact of reducing the 2000-hour threshold.

Progress in 2023-2024:

- Assessed the exposure-response relationship between asbestos work hours and respiratory disease
- Identified industry subsectors with the highest risk of respiratory disease to support targeted prevention
- Corrected missing exposure information using an imputation method to improve data quality
- Evaluated the impact of reducing the 2000 work hour threshold for notifying workers about their exposure

INVESTIGATING HEALTH OUTCOMES AMONG ONTARIO MINING WORKERS

The Mining Master File (MMF) is a database that contains information on Ontario mining workers employed between 1928 and 1988. It has been linked to provincial health records to provide a platform to study health outcomes among Ontario mine workers, initially focused on cancer and chronic respiratory diseases. Ongoing work is aimed at expanding the MMF as a research platform to study a broader range of outcomes, such as cardiovascular and autoimmune diseases. We are also using the MMF to examine the risk of rare cancers that have been understudied, such as salivary gland cancer in uranium miners, and nasal cancer in nickel workers.

In 2023-2024, OCRC began incorporating exposure estimates into the MMF using the Ontario Mining Exposure Database (OMED). Exposure-response relationships have been assessed for several silica-related health outcomes:

1. Silicosis
2. COPD
3. Pulmonary fibrosis
4. Sarcoidosis
5. Rheumatoid arthritis

Future work will use OMED data to examine health outcomes related to nickel and arsenic exposure among mine workers.

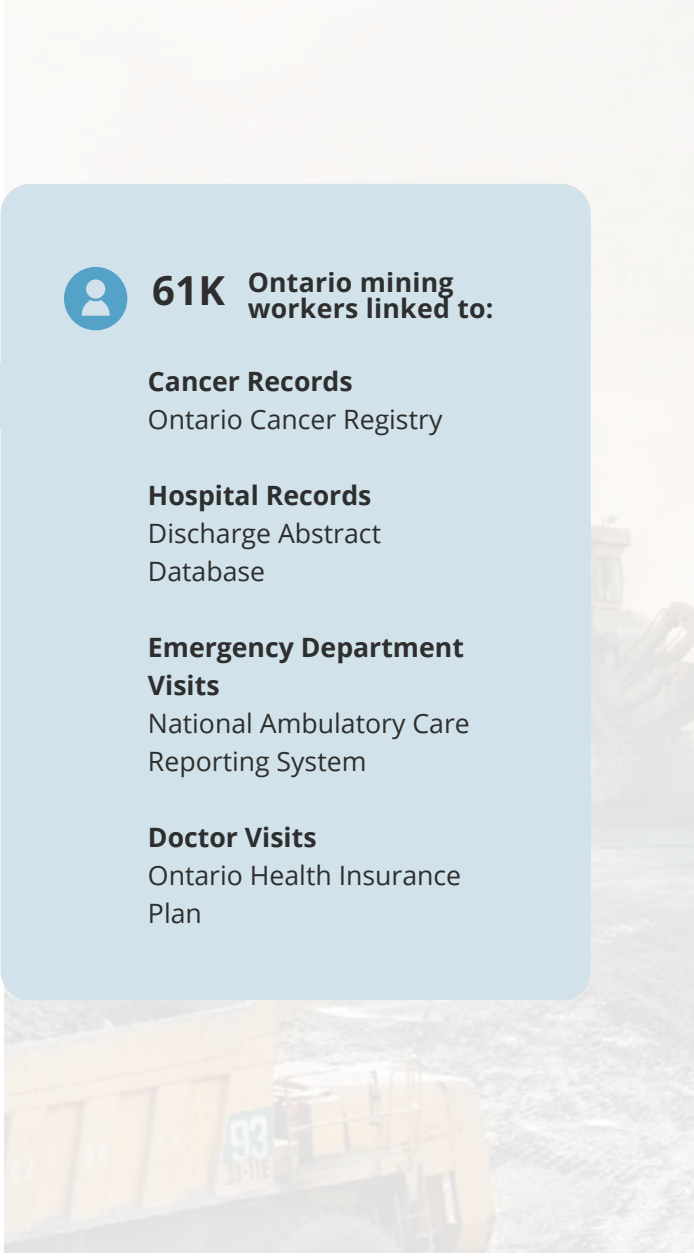
61K **Ontario mining workers linked to:**

Cancer Records
Ontario Cancer Registry

Hospital Records
Discharge Abstract Database

Emergency Department Visits
National Ambulatory Care Reporting System

Doctor Visits
Ontario Health Insurance Plan



Progress in 2023-2024:

- Added five additional years of follow-up for cancers and chronic diseases
- Incorporated silica exposure estimates into the MMF for the first time
- Completed first analyses of cardiovascular and autoimmune disease risk using the MMF

CANCER, CARDIOVASCULAR DISEASE AND RESPIRATORY DISEASE AMONG NICKEL REFINERY WORKERS

The Vale Nickel Refinery Cohort, part of a much larger cohort of Vale workers, includes current and former refinery and electrowinning workers from Sudbury, Ontario's Copper Cliff Nickel Refinery. OCRC is examining the risks of cancer, cardiovascular disease, and respiratory disease among these workers. The study was initiated due to concerns raised by the Vale Ontario Operations Joint Occupational Health Committee.

In the past year, the cohort has been successfully linked to provincial health records and exposure data has been received from Vale. Analyses will begin in 2024-2025.

3.4K workers linked to:

Cancer Records
Ontario Cancer Registry

Hospital Records
Discharge Abstract Database

Emergency Department Visits
National Ambulatory Care Reporting System

Doctor Visits
Ontario Health Insurance Plan

This study is the first to independently examine this specific subset of workers.

ACHIEVEMENTS IN 2023-2024:

Obtained employment records for 3,800 refinery workers

Successfully linked employment records for 3,400 refinery workers to provincial health records

Obtained exposure data from Vale for 1977-2019 for approximately 20 different hazards

This study was initiated at the request of the Joint USW/Vale Health and Safety Committee and funded by Vale Canada.

NATIONAL & INTERNATIONAL COLLABORATIONS

Though OCRC is based in Toronto and much of our research has an Ontario focus, we strengthen our research and broaden our impact through national and international collaborations.

NATIONAL COLLABORATIONS

OCRC is involved in three national collaborations focused on exposure. The first, led by researchers at Health Canada and the University of Ottawa, is evaluating firefighters' exposures using biomonitoring techniques. The second aims to characterize multi-exposure situations in Quebec workplaces using exposure databanks, led by Dr. Jérôme Lavoué at the Université de Montréal. The third, led by researchers at CAREX Canada, aims to update estimates of the number of Canadian workers exposed to carcinogens.

Two studies aim to develop new research platforms. OCRC is involved in a collaboration to link the National Dose Registry (a repository of dose records for Canadian workers exposed to ionizing radiation) to Statistics Canada's national cancer records, to develop a platform to study cancer risks among these workers. This study is being led by Dr. Paul Villeneuve at Carleton University. OCRC is also sharing expertise developed in establishing the ODSS to support the formation of an Occupational Disease Surveillance System for Manitoba, led by Dr. Allen Kraut at the University of Manitoba.

OCRC is involved in a series of systematic reviews and meta-analyses in partnership with researchers at the University of British Columbia, Carleton University, and other national and international groups. The studies are investigating the risk of gastrointestinal cancer and lung cancer due to asbestos exposure, and the risk of lung cancer due to silica exposure. Dr. Nathan DeBono from OCRC is leading a study using artificial intelligence to extract and classify financial conflicts of interest from studies on carcinogenic hazards in collaboration with researchers at McGill University.

Future national work will focus on investigating options and seeking funding to update OCRC's Burden of Occupational Cancer study and expand it to health outcomes beyond cancer.

INTERNATIONAL COLLABORATIONS

OCRC is a collaborator on two major international studies that pool data from multiple countries. The SYNERGY project, led by the International Agency for Research on Cancer, assesses the joint effects of occupational lung carcinogens and smoking. The Pooled Uranium Miners Analysis (PUMA) is the largest study of uranium miners to date, involving researchers from Germany, France, Czech Republic, the U.S., and Canada, and explores the health outcomes of uranium miners, including the risk of lung cancer due to radon exposure.

KNOWLEDGE TRANSLATION & EXCHANGE HIGHLIGHTS

In 2023, the Knowledge Translation and Exchange (KTE) team was officially created, highlighting our commitment to broadly share our research and to engage effectively with diverse stakeholders and communities.

The KTE team has made notable strides in enhancing OCRC's research communications over the past year. Key accomplishments include the publication of two significant reports stemming from large-scale workshops, which garnered attention nationwide. Seven fact sheets have been published, drawing insights from our Occupational Disease Surveillance System (ODSS) results and our *Radon Survey of Workplaces in Ontario* study. Additionally, a collaboration with Workplace Safety North resulted in three posters on the top occupational disease risks in the mining, forestry, and pulp and paper industries, enhancing dissemination of our ODSS findings. A collaboration with the Institute for Work and Health on opioid-related harms culminated in an impactful workshop held in March 2024, focusing on opioids in the workplace. The event featured a diverse panel of speakers who shared evidence, perspectives, and insights on navigating Canada's ongoing opioid crisis.

The KTE team uses several websites and digital platforms to share OCRC's research findings. A major focus of the KTE team throughout the past year has been to revamp OCRC's primary website to enhance its functionality and accessibility. The updated site was successfully launched in the fall of 2023. Now, we are working on enhancing our Occupational Disease Surveillance Program (ODSP) website. Alongside our established X (formerly Twitter) account, we have strengthened our digital presence by establishing a new LinkedIn page, adding over 200 followers in the past year.

EXPANDING KTE IN 2023-2024

- Launched the redesigned OCRC website and new LinkedIn page
- Co-hosted a workshop on opioids in the workplace in partnership with IWH
- Released two major reports on priorities for exposure surveillance and cancer among firefighters
- Collaborated with Workplace Safety North to enhance dissemination of occupational disease surveillance findings for high-risk sectors

ADVANCING WORKPLACE EXPOSURE SURVEILLANCE IN CANADA

Exposure surveillance is recognized as a major gap in occupational disease prevention in Canada.

In the fall of 2023, OCRC released a report on *Advancing Workplace Exposure Surveillance in Canada*, motivated by a workshop held in March 2023. The report identified the lack of accessible, current, high-quality exposure measurement data as a key gap for exposure surveillance in both Ontario and Canada.

IDENTIFIED NEEDS

Skills in:

- Data collection and storage
- Job coding
- Statistical analysis

Resources:

- Standard protocols
- Centralized data repositories
- Publicly available exposure tools

To view the report, visit:

occupationalcancer.ca/awesc-report/

Recommended actions to advance occupational exposure surveillance in Canada:

SHORT TERM

- Identify existing Canadian exposure data holdings and priority hazards
- Develop a standardized database format and data sharing agreements
- Engage with relevant stakeholders

MEDIUM TERM

- Digitize existing exposure data
- Create centralized repositories
- Develop a strategic plan to define goals and objectives

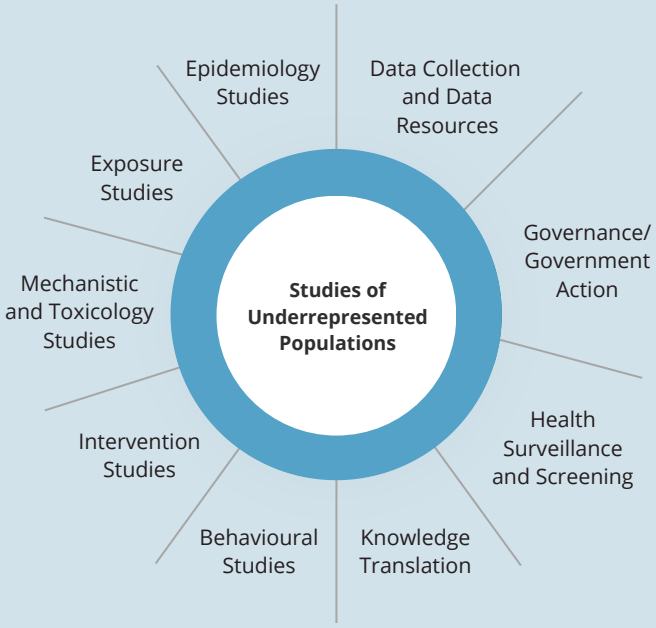
LONG TERM

- Develop a national occupational exposure surveillance program
- Secure sustainable funding to maintain the program
- Use the data to support research and occupational disease prevention

IDENTIFYING RESEARCH PRIORITIES FOR CANCER AND FIREFIGHTING

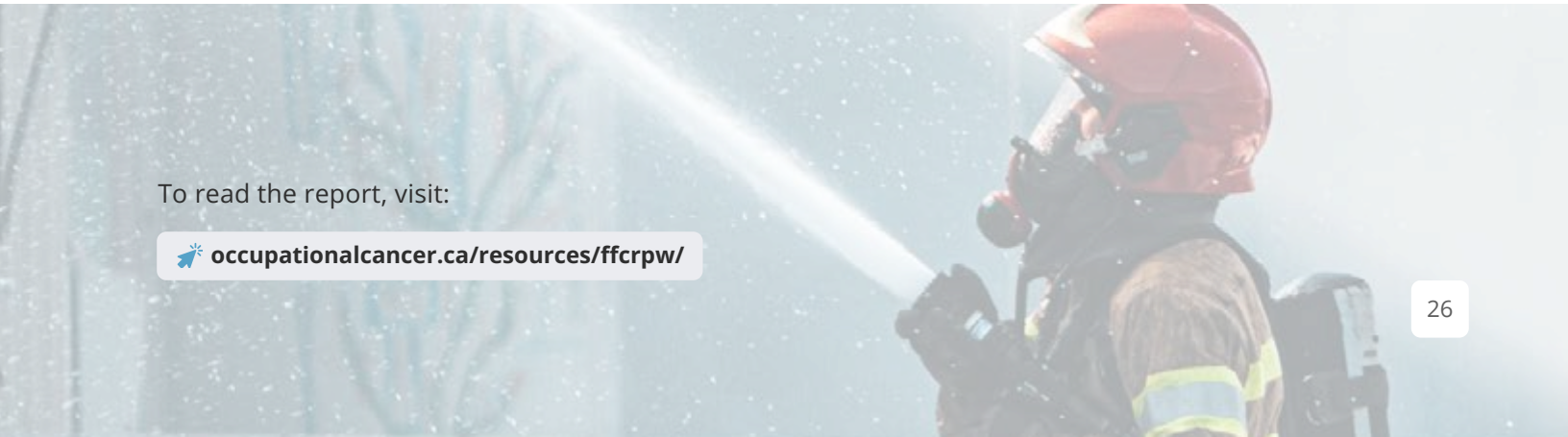
In January 2024, OCRC released a report on the gaps and priorities for firefighter cancer research in Canada. The report was based on findings from a workshop hosted by OCRC and Health Canada in December 2022 and attended by provincial, national, and international stakeholders and scientists.

RESEARCH GAP THEMES IDENTIFIED AT THE WORKSHOP



FOUR PRIORITY RESEARCH AREAS FOR CANADA:

- Studies investigating underrepresented populations, particularly wildland firefighters
- Studies on the mechanisms of cancer
- Studies of exposure interventions, including those that examine the effect of control strategies on biomarkers of exposure and effect
- Studies investigating exposure, including improved exposure assessment for epidemiology research



To read the report, visit:

occupationalcancer.ca/resources/ffcrpw/

OPIOIDS AND WORK: EVIDENCE, PERSPECTIVES, AND LOOKING AHEAD

In March 2024, OCRC and IWH co-hosted a workshop to explore the current knowledge on opioid-related harms among workers, examine the factors contributing to these issues, and strategize on pathways forward. The workshop brought together diverse voices, including researchers, occupational health professionals, policy makers, employers, workers with personal lived experience, and healthcare providers.

Top 3 motivations for workshop attendance

74% responded that the information could be relevant to their work in the future

41% are involved in developing or implementing programs/policies to prevent and reduce opioid-related harms among workers

31% reported that opioids have affected them or someone they know

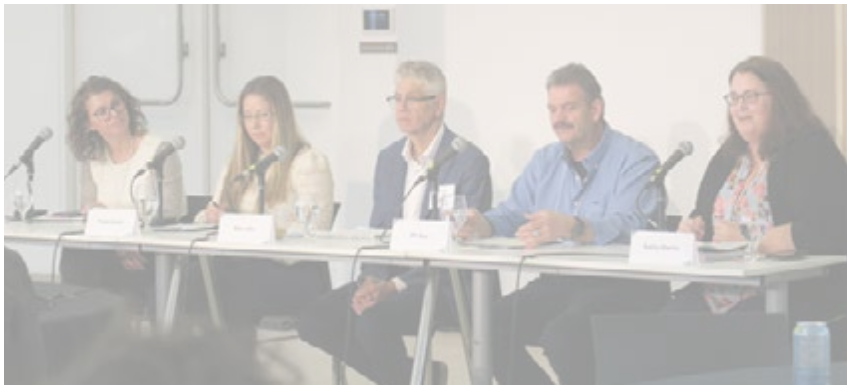
PRIORITY ACTIONS IDENTIFIED BY PARTICIPANTS INCLUDED:

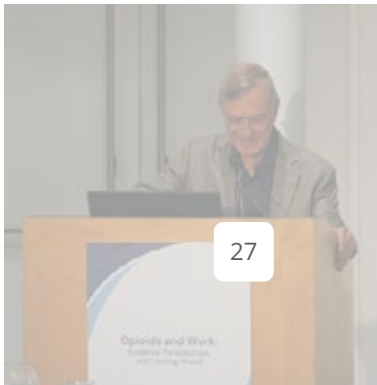
Identify and address modifiable risk factors in high-risk workplaces

Provide supervisors and employers with training on mental health and substance use

Promote peer support initiatives

Address barriers to accessing treatment programs





OCRC FACT SHEETS RELEASED IN 2023-2024

Radon study of Ontario workplaces

Protecting the workplace from radon

COVID-19 infection among Ontario workers

Severe COVID-19 risk among Ontario workers

Risk of COVID-19 related hospitalization & emergency department visits

Flames and risks: Firefighting causes cancer

Female reproductive cancers: Is work a risk factor?

OUR PEOPLE | 2023-2024

OCRC LEADERSHIP

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Jeavana Sritharan, Scientist, Surveillance

Nathan DeBono, Scientist, Epidemiology

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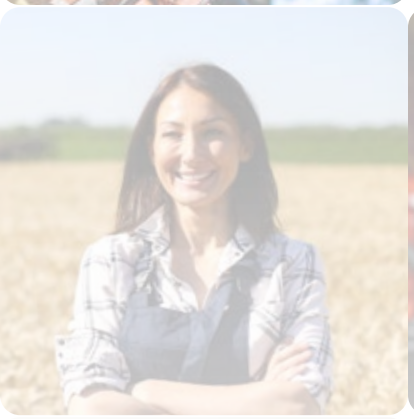

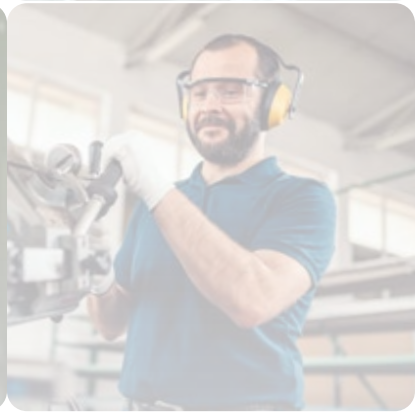

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