



Occupational  
Cancer  
Research  
Centre

# Using Scientific Evidence to Drive Prevention and Compensation

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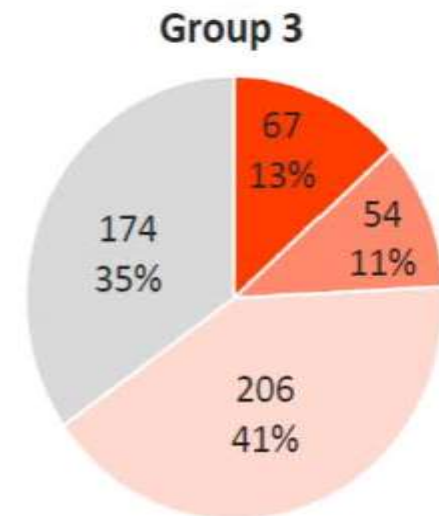
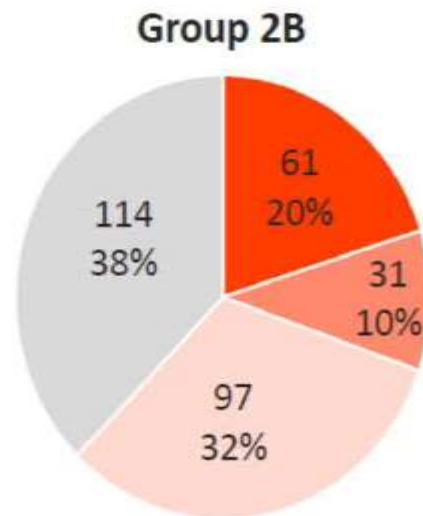
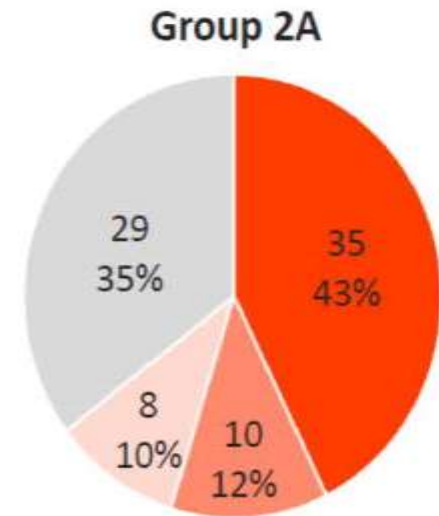
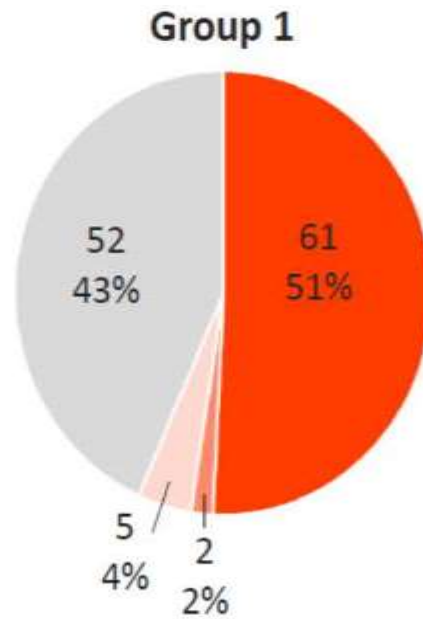
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In January 2019, the Ontario Ministry of Labour (now MLTSD) requested an independent review to provide advice to the Ministry on the following questions:

- How can scientific evidence best be used in determining work-relatedness in an occupational cancer claim, particularly in cases with multiple exposures?
- Are there any best practices in other jurisdictions that Ontario should consider adopting?
- What scientific principles should inform the development of occupational disease policy?

# Workplace Carcinogens based on the International Agency for Research on Cancer



Basis for Classification

■ Epidemiologic Data 
 ■ Exposure Data 
 ■ Use/Occurrence Data 
 ■ Non-Occupational

# IARC Lung Carcinogens



Lung Carcinogens (IARC Group 1)	Probable Lung Carcinogens (IARC Group 2A or suspected sites for Group 1)
<p>Arsenic, <b>Asbestos</b>, Beryllium, BCME, CME, Cadmium, Chromium(VI), <b>Diesel engine exhaust</b>, <b>Nickel</b>, <b>Painting</b>, Particulate matter in outdoor air pollution, Plutonium, <b>Radon</b>, Coal-tar pitch, <b>Crystalline silica</b>, Soot, Tobacco smoke (secondhand), <b>Welding fumes</b>, X-radiation, gamma-radiation</p>	<p>Strong inorganic acid mists, Bitumens, Alpha-Chlorinated toluenes and benzoyl chloride (combined exposures), Cobalt metal with tungsten carbide, Creosotes, Diazinon, Fibrous silicon carbide, Hydrazine insecticides, 2,3,7,8-Tetrachlorodibenzopara-dioxin</p>





# Compensation of Cancer in Ontario



In determining entitlement to compensation for cancers or diseases, the key adjudicative question to be resolved is that of causation (i.e., is the disease work-related?). Three general principles govern how causation is evaluated and entitlement is determined:

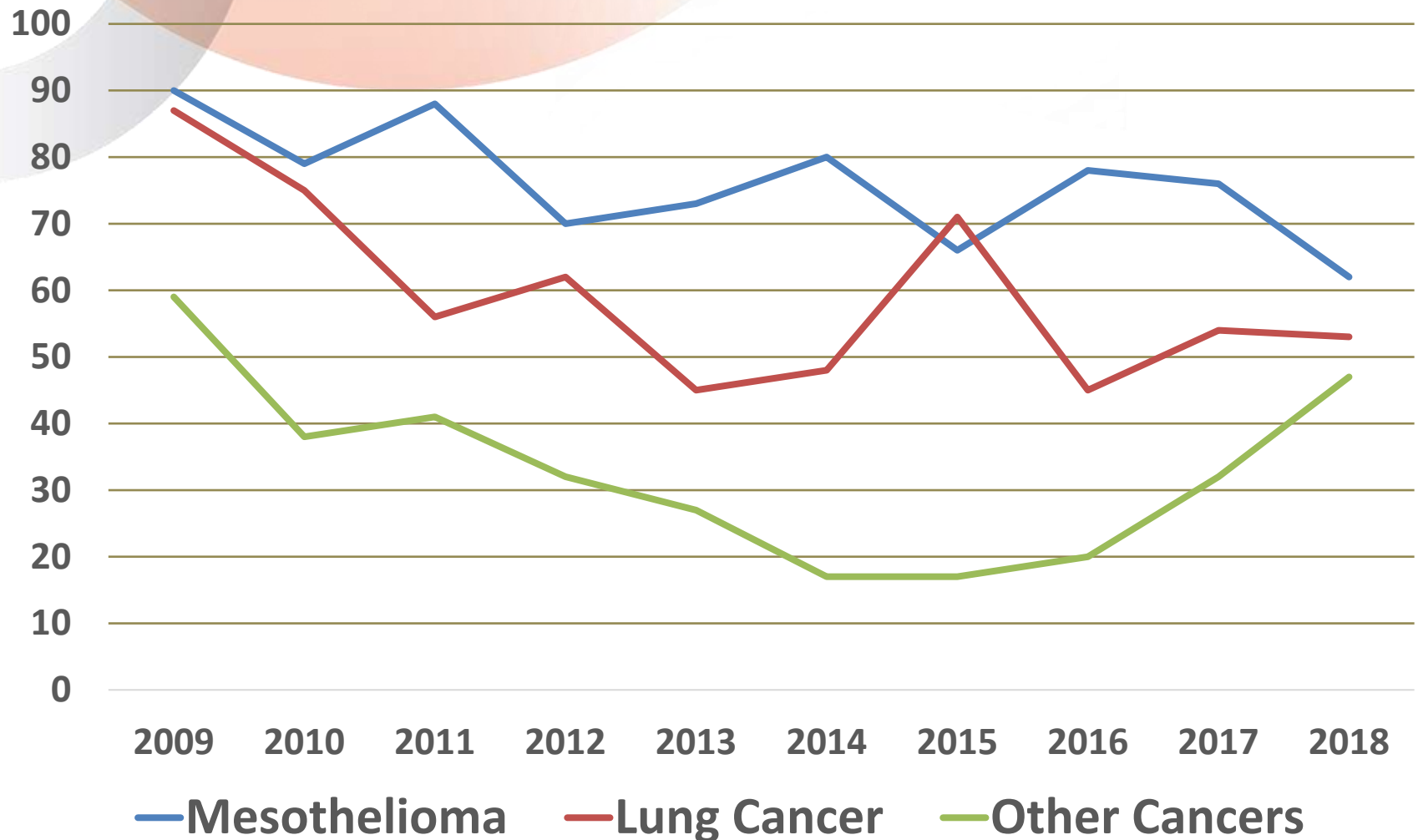
1. Employment does not have to be the predominant or primary cause.
2. Absolute certainty is not required.
3. The worker is afforded the benefit of the doubt.

# Occupational presumptions listed in Ontario Reg 175/98



Description of Disease	Description of Process
<b>Cancers listed in Schedule 3, with rebuttable presumption of work-relatedness</b>	
Cancer — epitheliomatous (skin) cancer	Any process involving use or handling of tar pitch, bitumen, mineral oil or paraffin or any compound, product or residue of these substances
Cancer — primary cancer of the nasal cavities or of paranasal sinuses	Concentrating, smelting or refining in the nickel producing industry
<b>Cancers listed in Schedule 4, with non-rebuttable presumption of work-relatedness</b>	
Primary malignant neoplasm of the mesothelium of the pleura of peritoneum [sic]	Any mining, milling, manufacturing, assembling, construction, repair, alteration, maintenance or demolition process involving the generation of airborne asbestos fibres
Primary cancer of the nasal cavities or of paranasal sinuses	Any process at the Copper Cliff sinter plant of Inco Limited
Primary cancer of the nasal cavities or of paranasal sinuses	Any process in the Port Colborne leaching, calcining and sintering department of Inco Limited that was practised before January 1, 1966

# Allowed WSIB Cancer Claims by Primary Diagnosis/Cause of Death\*



\* Excluding firefighter presumptive claims



# Compensation of Cancer in Ontario



- On average, approximately 400 claims are submitted and 170 accepted (42%) (excluding claims related to the firefighter presumptions).
- Accepted claims (2009-2018): 45% mesotheliomas, 36% lung cancers, 4.2% skin cancers, 2.4% bladder cancers & 12% other.
- Over half of all claims were for cancer due to asbestos and 63% were accepted.
- 19% of all other claims were accepted.



# Burden of Occupational Cancer in Ontario

Major Workplace Carcinogens and Prevention of Exposure



This report is available online at  
<http://www.occupationalcancer.ca/2017/news-occupational-burden-ontario-report>



Towards a cancer-free workplace

# Occupational Cancer in Ontario

Carcinogen	Annual Occupational Cancers	Current Exposure*
Solar UV at Work	1400 non-melanoma skin	449,000
Asbestos	630 lung, 140 mesothelioma, 15 larynx, <5 ovarian, (? digestive)	52,000
Diesel Exhaust	170 lung, (45 bladder)	301,000
Crystalline Silica	200 lung	142,000
Welding Fumes	100 lung	169,000
Nickel	80 lung	48,000
Chromium VI	25 lung	39,000
ETS at work	50 lung, 10 pharynx, 5 larynx**	125,000
Radon	60 lung	34,000
Arsenic	20 lung	8,000
Benzene	10 leukemia, <5 multiple myeloma	147,000
PAH's	(60 lung, 15 skin, 30 bladder)	134,000
Shiftwork	(180-460 breast)	833,000

\* CAREX Canada    \*\* Among never smokers (probable cancers)

# Primary causal agent for accepted cancer claims in Ontario (2009-2018)



Primary Causal Agent	Compensated	Expected*
Asbestos	1,291	7,850
Defoliants and herbicides	38	---
Crystalline silica	23	2,000
Benzene	21	125
Solar & ultraviolet radiation	24	14,000
Coal Tar	14	[950 for all PAHs]
Foundry emissions	13	
Coke oven emissions	11	
Nickel & sinter plant emissions	18	800
Welding fumes	9	1000
Uranium [presumed to be radon]	8	600
Exhaust gases - diesel	7	1700

\* Expected based on the Burden of Occupational Cancer Project [Towards a cancer-free workplace](#)

# Ontario Compared to Other Provinces

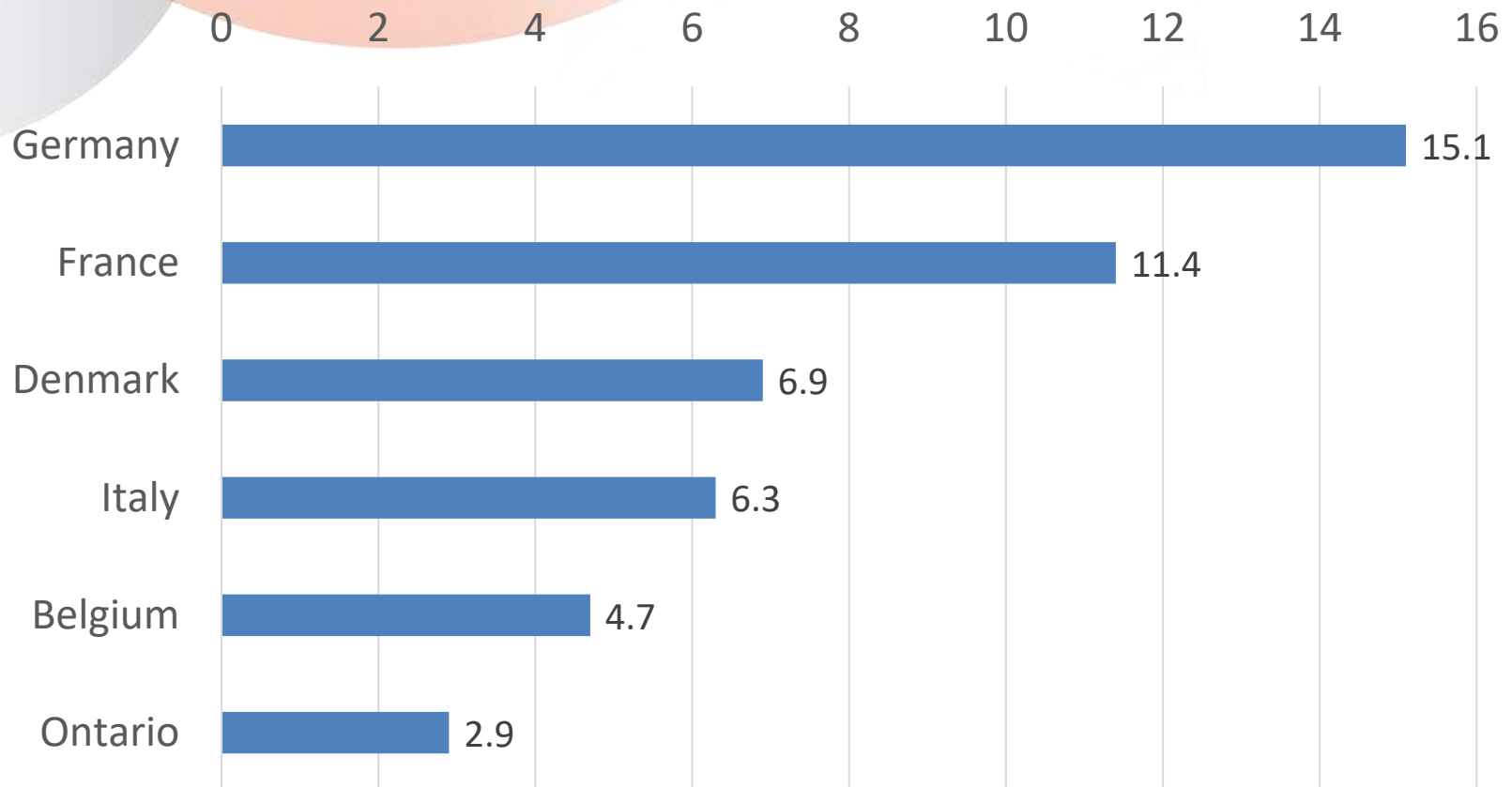
- Based on AWCBC, there were 161 fatal cancer claims accepted in Ontario in 2015 (3.1/100,000 covered workers).
- The overall rate for Canada that year was 2.5, similar to BC (2.4), Quebec & Manitoba (both 2.5).
- Newfoundland and Labrador had the highest rate (at 5.2), while Alberta had the lowest (at 1.2).
- Mesothelioma was 46% of all fatal Canadian claims.
- Mesothelioma was 36% of the fatal claims in Ontario and Alberta, 58% in Quebec & 65% in BC.



# Ontario Compared to Europe\*



Accepted claims rate, per 100,000 insured workers, 2016



*\* Incidence and detection of occupational cancer in nine European countries. EUROGIP 141/E, Paris, 2018.*

# Ontario Compared to Europe



- Ontario accepted 42% of submitted claims in 2018. The highest acceptance rates were Austria (87.2%) & France (79.1%), Denmark was lowest (28.2%).
- Almost all recognized cases for Germany and France were on the presumptive lists. Germany accepted only 28 “off-list” cancers (0.43%) and France 94 (4.44%).
- 77% of all accepted claims in Ontario were asbestos-related in 2018. 75% or more of all claims were asbestos-related cancers in all countries but Germany.
- France was the only country to compensate more asbestos-related lung cancer than mesothelioma.
- In 2015, Germany added skin cancer caused by UV radiation to its list. By 2016, 58% of accepted claims were for skin cancer.

# Challenges for workers compensation



- Physicians under-recognize and under-report occupational cancers
  - Cancers with different causes look the same
  - Few clinicians take an occupational history
  - Many diseases have long latency/induction periods
  - Almost all diseases are multi-factorial
- Information on historical exposures is often lacking
- Clusters, complex workplaces & new hazards require systematic approaches & special resources
- Epidemiologic evidence may have limitations when applied to individual attribution

# Best Practices in Other Jurisdictions

- Comparison with other Canadian, US, and some international jurisdictions
- Use of presumptive lists
- Targeted compensation programs (US DOE and World Trade Centre)
- Use of scientific advisory panels
- Internal and partnered scientific capacity

# Scientific evidence and their implications

- Multi-stage models, causal theories & scientific evidence show:
  - All cancers have multiple causes
  - Different causes can have different induction/latency
- The combined impact of multiple causes may be independent, synergistic or, rarely, antagonistic

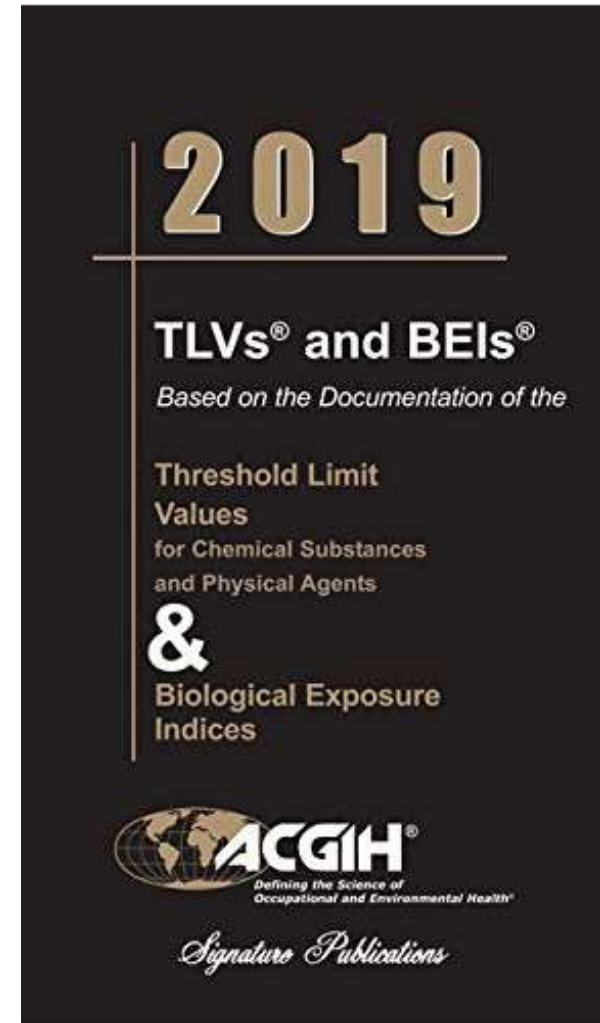


# Exposure to Mixtures is Common and the implications are rarely considered



“When two or more hazardous substances have a similar toxicologic effect on the same organ or system, their combined effects, rather than that of either individually, should be given primary consideration. In the absence of information to the contrary, different substances should be considered as additive where the health effect and target organ or system are the same.”

- This has been the recommendation for over 30 years



# Scientific evidence and their implications

- Independent, scientific assessments from IARC & others could be used to help expand presumptions
- Some flexibility should be applied in applying minimum duration and latency criteria
- Good exposure data is an important part of making scientific decisions on causality

# Recommendations to update presumptive lists and cancer-relevant policies



- **The WSIB should update and greatly expand the list of presumptions regarding cancer** to reflect the current state of scientific knowledge. **Presumptions should be based on exposure to carcinogenic agents or processes**, and not specific employers.
- **The WSIB should update and expand all of the policies relevant to adjudication of cancer claims.** New policies are needed for:
  - Exposure to multiple occupational carcinogens
  - Relative weighting of non-occupational carcinogens

# Recommendations to update presumptive lists and cancer-relevant policies



- **The WSIB should create an independent, standing Scientific Review Panel to review and recommend changes to the schedules and policies, to review and approve scientific reports, and to assist in the selection of external consultants and researchers.** It should be composed of independent scientists with a broad range of scientific expertise and the process for choosing members should allow for stakeholder input.

# Recommendations to enhance scientific capacity



- **The WSIB needs to increase its internal scientific capacity.** This should include scientists with graduate level training in epidemiology, toxicology and exposure science.
- **Stronger partnerships with external research centres, including those already funded by MLTSD/WSIB are needed for research on emerging issues and gaps of importance to Ontario.** Encourage surveillance systems to support decision making in adjudication and to identifying emerging issues.
- **Provincial capacity needs to be developed to investigate cancer clusters and other emerging issues.** Ideally in the MLTSD



# Recommendations to improve access to exposure data for compensation (and prevention)

- **Adjudication should be improved by better access to electronic exposure data.** The WSIB should partner with the Canadian Workplace Exposure Database (CWED).
- **MLTSD should lower data access barriers and create better mechanisms to provide exposure-related data to WSIB.** Exchange of data in both directions could also contribute to prevention.
- **MLTSD should collect copies of exposure monitoring results from employers at the time of inspections and computerize those results to facilitate access to exposure monitoring data.**
- **WSIB should explore opportunities to work with external research organizations to digitize historical exposure or employment records for high-risk industries**

# Recommendations to improve recognition through medical education

- Physician education is a challenging area that deserves more investigation. While a detailed review of this issue was beyond the scope of this report, **it is important that medical education be improved in Ontario to increase the recognition of occupational cancer.**



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# Thank you!

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