Occupational Cancer Research Centre

Institute for Work & Health

Future Burden of Cancer in Construction

Workshop Report
November 21, 2019

Ontario Health

Ontario

Future Burden of Cancer in Construction

Workshop Report

Context

A previous research study led by the Occupational Cancer Research Centre (OCRC), the Burden of Occupational Cancer project, estimated the current number and proportion of cancers caused annually by exposure to workplace carcinogens in Canada. The study found that, for the year 2011, approximately 10,000 new cases of cancer were due to occupational exposure (3.9-4.2% of all new cancer cases). The majority of these cases were due to solar UV radiation, asbestos, diesel engine exhaust, crystalline silica, and shiftwork – many of which are common in the construction industry.

The current project, the Future Burden of Cancer in Construction Project, arose as an extension of the Burden of Occupational Cancer project. Recent regulatory changes have removed exemptions for the construction industry, notably, construction must now comply with the provincial occupational exposure limits. These changes have drawn increased attention to issues of occupational exposure and disease among construction stakeholders and we felt they offered an opportunity to improve the prevention of occupational disease in construction.

The first goal of the Future Burden of Cancer in Construction study was to estimate the number of future cancer cases that will occur due to exposure to select carcinogens in the Ontario construction industry. The second goal was to evaluate a series of prevention strategies in terms of their implementation costs and their impacts on the future burden of occupational cancer. The study received funding from the Ministry of Labour, Training and Skills Development's Research Opportunities Program. Economic analyses were led by the Institute for Work & Health.

The Future Burden of Cancer in Construction Workshop

About the Workshop

As part of the grant, we received funding to hold a multi-stakeholder workshop at the end of the study to facilitate knowledge translation. The workshop took place on November 21, 2019 at the Centre for Health and Safety Innovation. The goal of the workshop was to share results from the study and discuss priorities for prevention (see Appendix 1 for agenda). Briefly, the day included a review of the Future Burden of Cancer in Construction project from Drs. Demers and Tompa, as well as presentations from Drs. Arrandale and Gorman-Ng that highlighted other ongoing occupational health projects in the construction sector. A panel discussion including Dr. Rajaram (Ministry of Labour, Training and Skills Development, MLTSD), Mr. Russo (Infrastructure Health and Safety Association, IHSA) and Mr. Tiano (Provincial Building and Construction Trades Council of Ontario) raised awareness of current issues in construction and initiatives led by these organizations. In total 27 people attended, representing 16 organizations (see Appendix 2).

Results of the Future Burden of Cancer in Construction Study

Crystalline Silica

Without intervention, exposure to silica dust in the Ontario construction industry will cause an estimated 3350 lung cancer cases between 2030 and 2060. Over the same time period, implementation of wet cutting methods could prevent 200 cases, while proper use of half-face mask respirators could prevent 180 cases. Fully eliminating exposure to silica by 2030 would prevent 860 cases over the 30-year period (the remaining cases are due to exposure prior to 2030). Based on the economic costs of implementation and the costs saved

through averted lung cancer cases, implementation of exposure controls would take between 22 to > 40 years to break even, depending on compliance and effectiveness.

Solar UV Radiation

Without intervention, exposure to solar UV radiation in the Ontario construction industry will cause an estimated 27,650 non-melanoma skin cancer cases from 2030-2060. Over the same time period, implementation of portable shade structures could prevent approximately 1960 cases, while PPE (hats with brims and long-sleeved shirts) could prevent 2500 cases. Fully eliminating exposure to solar UV radiation by 2030 would prevent 6030 cases between 2030 and 2060. Based on the economic evaluation of the implementation costs and savings from averted cases, implementation of exposure controls for solar UV radiation would take between 21 and 34 years to break even depending on effectiveness and compliance.

Asbestos

Without intervention, exposure to asbestos in the Ontario construction industry will cause an estimated 6020 lung cancer cases between 2030 and 2060. Over the same time period, implementation of an asbestos ban could prevent approximately 60 cancers, while a building registry could prevent an estimated 440 cancers. Fully eliminating all exposure to asbestos as of 2030 could prevent about 1400 cancers. The small impact of the ban reflects the fact that construction workers are more likely to be exposed to asbestos in existing materials and buildings, rather than new uses.

While it was not feasible to estimate the costs of the asbestos ban or a building registry as part of this study, the Government of Canada has estimated the costs of the national asbestos ban to be approximately $4 million in government administrative costs, with a further $8 million in substitution costs for cement pipe (over the period 2019-2035) for the construction sector Canada-wide.

Diesel Engine Exhaust

Without intervention, we estimated that exposure to diesel engine exhaust in the Ontario construction industry will cause approximately 400 lung cancers between 2030 and 2060. However, we believe this is an underestimate caused by limitations of the exposure data currently available. Due to the small number of estimated cases, we did not estimate the impact of any interventions.

Other Workshop Presentations

Other presentations at the workshop showcased research, tools and strategies aimed at preventing occupational exposure and disease (see Appendix 1). Highlights included a study of diesel exhaust exposure in the construction industry, examples of how the Occupational Disease Surveillance System can be used to identify groups where targeted prevention is needed, and ongoing work using the Asbestos Workers Register to track asbestos-related disease. Tools for workplace-level prevention included the BC Construction Safety Alliance's Silica Risk Assessment and Control tool, which helps workplaces implement appropriate exposure controls for silica; the Chemical Hazard Assessment and Prioritization (CHAP) tool, which helps small businesses better understand and prioritize the hazards associated with chemicals they are using; and Sun Safety at Work, which supports workplaces in implementing sun safety programs to prevent skin cancer.

Discussion Themes

In the morning and afternoon, a large portion of time was reserved for discussion, which was facilitated by Barbara Crawford (Slalom Consulting). In both small groups and together in the large group, workshop attendees provided feedback on the results of the study, as well as perspectives on challenges, priorities, and next steps for prevention in the Ontario construction industry. A number of themes arose during the discussion.

Challenges and barriers for prevention in construction

The participants identified four major challenges for prevention: lack of resources, lack of data, the issue of latency, and challenges around knowledge translation and implementation.

1. **Lack of resources:** Attendees noted that there are limited resources available for prevention. There is a need to leverage existing opportunities, as well as build on things being done in other jurisdictions in order to maximize impact. For instance, the BC Construction Safety Alliance's Silica Control Tool and OCRC's Occupational Disease Surveillance System are both currently being used in only one province but are adaptable to other jurisdictions. The lack of resources also indicates the importance of identifying very targeted groups for prevention investment.

2. **Lack of data:** Workshop participants identified a lack of exposure data as a key gap that limits the effectiveness of prevention programs. New exposure data would allow us to create more representative estimates of current exposure and identify which workers may be overexposed. It would also help us better understand how exposure may have changed over time, especially with the introduction of new legislation. However, participants also noted that in many cases we don't need to wait for data; we know how to protect workers and should act on this knowledge.

3. **Long latency of disease:** Participants reported that the long latency of many occupational diseases makes it difficult to build a business case for prevention; companies are motivated by immediate impacts (i.e., injuries). Ideas of ways to help make the results more compelling included looking at health effects that occur with shorter latency and using the power of personal stories.

4. **Knowledge translation and implementation:** Attendees noted that construction is a challenging industry for prevention. The industry is predominantly made up of small businesses and it is difficult to meaningfully engage with these companies individually to increase health and safety awareness. The Workplace Safety and Insurance Board (WSIB) may have the most complete list of active businesses and could be an important conduit for communication.

Opportunities to improve prevention

Workshop attendees identified three areas where there is opportunity to improve prevention across the Ontario construction industry: incentive programs, training programs, and legislation.

1. **Incentive programs:** Attendees identified incentive programs as a way to drive prevention by making it affordable and appealing for companies, who may not otherwise have the resources. Examples include the WSIB Excellence Program, COR™ program, Safety Groups, and rebates or tax credits (e.g., for upgrading from diesel to electric equipment).

2. **Training programs:** Workshop participants noted that health and safety training programs (e.g., WHMIS, PPE training, etc.) offer an opportunity to improve awareness, but need updating and alignment so that people learning the trades receive training that meets accepted standards.

3. **Legislation:** Participants agreed that legislative changes may help improve prevention, for example the adoption of an occupational exposure limit for particulate diesel engine exhaust. However, overall it was noted that there should also be a focus on ensuring compliance with the regulations already in place, particularly in small businesses.

Conclusions

The workshop was a success. Participants included representative of employers, workers, policy makers, researchers, and health and safety professionals who committed a day of their time to learn about occupational disease in construction. The discussion was lively and flowed freely, which is not always the case at events of this nature. We were grateful for the participation of all attendees.

The participants confirmed some things we already suspected about the construction sector, namely that there is low awareness of occupational health issues and limited resources for individuals, particularly those in small businesses, to rectify this. There was, however, consensus that this needed to be changed and that various mechanisms could be used including both incentives and enforcement.

Next Steps & Recommendations

Following the workshop the research team has worked to complete the final report for the study (including this workshop report) and is beginning to draft publications for submission to peer-reviewed journals. As part of the final report to the funder, the MLTSD, the research team has made several recommendations:

- Occupational cancer has a significant burden in the Ontario construction industry. The construction industry in Ontario is currently exempted from Regulation 490 (designated substances and associated medical surveillance). Improved medical surveillance could contribute to early detection of occupational diseases, including cancer. Steps should be taken to support medical surveillance in the construction industry to facilitate early detection of occupational disease, including cancer.

- The Ontario occupational exposure limits (OELs) do not reflect the current state of knowledge, particularly for respirable crystalline silica and diesel engine exhaust, known lung carcinogens. The Ontario silica OEL should be updated to align with the American Conference of Governmental Industrial Hygienists (ACGIH) health-based recommended limit of 0.025 mg/m^3. A DEE exposure limit should be adopted by Ontario, ideally a target of 5 $\mu g/m^3$ elemental carbon to reflect the current knowledge on the risk of lung cancer as well as feasibility concerns (based on recommendations from the Finnish Institute of Occupational Health).

- Despite the presence of many carcinogens in construction environments, there is very little exposure data to support risk assessment and epidemiology. New approaches for collecting exposure data in this industry are needed, and must be responsive to the rapidly changing environment that exists within construction.

- Discussions at the end-of-grant workshop centred on the need for better health and safety within the construction industry, including:
    - Incentive programs through the WSIB that incentivize employers to improve occupational disease prevention;
    - Improving and aligning the training on occupational disease and prevention that is offered through apprenticeship programs, unions and sector associations; and
    - Communicating information on occupational disease and occupational exposure to small businesses operating in Ontario through the WSIB, who is thought to have the most complete list of businesses.

Appendix 1: Workshop Agenda

Future Burden of Occupational Cancer in Construction Workshop November 21, 2019 Centre for Health and Safety Innovation 5110 Creekbank Road, Mississauga Room: Central Conference Centre		
TIME	**TOPIC**	**SPEAKERS**
8:00am-8:30am	**Breakfast**	
8:30am-8:45am	**Welcome and Introductions**	
8:45am-10:00am	**Assessing the Impact of Intervention on Future Cancer Burden among Construction Workers**	**Paul Demers**, Occupational Cancer Research Centre
	The Future Economic Burden of Cancer in Construction	**Emile Tompa**, Institute for Work & Health
10:00-10:30am	Break	
10:30am-12:00pm	**The Future Burden of Cancer in Construction**	Breakout Group Discussions
12:00pm-1:00pm	Lunch	
1:00pm-1:30pm	**Occupational Health Research in Ontario Construction**	**Victoria Arrandale**, University of Toronto
1:30pm-2:00pm	**A web tool for Silica Risk Assessment and Control**	**Melanie Gorman-Ng**, BC Construction Safety Alliance
2:00-2:30pm	Break	
2:30-3:15pm	**Panel: Status of Occupational Disease Prevention in Ontario Construction**	**Nikhil Rajaram**, Ministry of Labour, Training and Skills Development **Mike Russo**, Infrastructure Health & Safety Association **Carmine Tiano**, Ontario Building Trades
3:15-4:00pm	**Moving Forward: Challenges and Solutions for Occupational Disease Prevention**	Group Discussion
4:00-4:15pm	**Closing**	

Appendix 2: Affiliations of Workshop Attendees

BC Construction Safety Alliance

Crosslinx Transit Solutions/EllisDon

Infrastructure Health and Safety Association (IHSA)

Institute for Work & Health (IWH)

Interior Systems Contractors Association

International Union of Operating Engineers

Laborers' International Union of North America (LiUNA)

Occupational Cancer Research Centre (OCRC)

Occupational Health Clinics for Ontario Workers (OHCOW)

Ontario Ministry of Labour, Training and Skills Development (MLTSD)

Ontario Sewer and Watermain Construction Association

Provincial Building and Construction Trades Council of Ontario

Ryerson University

Slalom Consulting

University of Toronto

Workplace Safety and Insurance Board (WSIB)

Appendix 3: Research Team

Victoria Arrandale, Assistant Professor, University of Toronto

Hugh Davies, Associate Professor, University of British Columbia

Paul Demers, Director, Occupational Cancer Research Centre

Kate Jardine, Knowledge Translation Lead, Occupational Cancer Research Centre

Amir Mofidi, Post-Doctoral Fellow, Institute for Work & Health

Chaojie (Daniel) Song, Research Associate, Occupational Cancer Research Centre

Thomas Tenkate, Associate Professor, Ryerson University

Emile Tompa, Senior Scientist, Institute for Work & Health