



INFORMING EFFORTS TO REDUCE CANADIANS'  
EXPOSURES TO KNOWN AND SUSPECTED CARCINOGENS  
IN WORKPLACES AND COMMUNITIES

2014-2015 Annual Report



# Background

CAREX (CARcinogen EXposure) Canada is the country's leading source of evidence on Canadians' exposures to workplace and environmental carcinogens. We aim to offer a better understanding of which known and suspected carcinogens Canadians are exposed to and where in Canada such exposures may occur. The ultimate goal of the project is to inform efforts to reduce these exposures and thereby help to prevent cancer.

Three years ago we embarked on a knowledge translation mandate to share our estimates of Canadians' exposures to carcinogens with those working to prevent them. This mandate spans federal, provincial, and local jurisdictions, and across government, labour, and non-governmental organizations. The activities highlighted in this report illustrate the relationships we've developed thus far, and the various ways we're establishing deeper connections to mobilize this data for the protection of Canadians.

CAREX Canada is funded by the **Canadian Partnership Against Cancer**.



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# Team Members

CAREX Canada is a multidisciplinary team of experts based at the **Faculty of Health Sciences (FHS)** at Simon Fraser University, working in collaboration with researchers at the **School of Population and Public Health (SPPH)** at the University of British Columbia (where the Canadian Workplace Exposures Database (CWED) is housed), the **Spatial Sciences Research Lab (SSRL)** in the Geography Department at the University of Victoria, and the **Occupational Cancer Research Centre (OCRC)** at Cancer Care Ontario.



For a full list of contributors and biographies, please visit the **About Us** section of our website.

## STAFF:

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# Knowledge Translation Advisory Committee

Our Knowledge Translation Advisory Committee helps to guide our efforts to put CAREX resources and tools into action for cancer prevention in Canada.



**Biographies for each Committee member are available under the Advisors tab of our website.**

## COMMITTEE MEMBERS IN 2014-15:

**SARAH BOWEN** Associate Professor, Department of Public Health Sciences, School of Public Health, University of Alberta

**GILLIAN BROMFIELD** Director, Cancer Control Policy, Canadian Cancer Society

**BRUCE M. CIELEN** Manager, Research and Workplace Innovation Program, Workers Compensation Board of Manitoba

**PATRICK FAFARD** Associate Professor, Graduate School of Public and International Affairs, University of Ottawa

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**BARBARA LACHAPPELLE** Environmental Health Specialist, Toronto Public Health

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**LOUISE PARKER** Canadian Cancer Society (Nova Scotia) Chair in Population Cancer Research, Professor Departments Medicine and Pediatrics, Population Cancer Research Program, Dalhousie University

**BARB RILEY** Executive Director, Propel Centre for Population Health Impact, University of Waterloo

**LARRY STOFFMAN** Independent Labour Consultant specializing in Occupational and Environmental Health

# CAREX by the numbers 2014-2015

<b>UNIQUE VISITS TO OUR WEBSITE</b> a 54% increase from last year (top hits include our Tools page, Crystalline silica profile, and Environmental radon estimate, which saw page views increase 85%, 78%, and 147% respectively)	<b>42,817</b>	
<b>ARTICLES, REPORTS, AND OFFICIAL DOCUMENTS</b> referencing CAREX resources in the past year	<b>51</b>	
<b>SUBSCRIBERS TO OUR NEWSLETTERS</b> which now include a quarterly e-Bulletin and monthly Carcinogens in the News digest (begun in September)	<b>795</b>	
<b>FOLLOWERS ON TWITTER</b> (@CAREXCanada) a 48% increase from last year	<b>362</b>	
<b>PRESENTATIONS ON VARIOUS TOPICS</b> made by team members via conferences, workshops, face-to-face meetings, and webinars	<b>45</b>	
<b>INDIVIDUALS</b> who attended the 45 CAREX presentations	<b>1,817</b>	
<b>INFORMATION AND TOOL REQUESTS</b> (23% provincial and territorial governments, 15% academic, 13% general public, 11% labour, 9% health authorities, 9% media, 8% NGOs, 7% associations/industry, 5% federal government)	<b>86</b>	

# Highlights

## Informing action:

Enhancing radon awareness among MLAs in Saskatchewan

In March 2015, CAREX was invited by the **Saskatchewan division of the Canadian Cancer Society** to speak to MLAs about exposures to radon. Health Canada measurements show that Saskatchewan, one of the world's most uranium-rich areas, is among the provinces with the highest percentage of homes registering levels above the radon guideline (radon is produced as uranium decays). While the Saskatchewan government has performed extensive testing for radon in public buildings and schools, like other provinces the rate of home testing is low at only 6%. This event was organized in partnership with the Lung Association of Saskatchewan, which handed out test kits to encourage MLAs to measure levels in their own homes.



**“Canadians need better legal protection from residential exposure to radon gas, which is the leading cause of lung cancer after smoking.”**

*– Kathleen Cooper, CELA*

CELA reviews radon policy and law, identifies how to address risks in Canada

Sparked by our results showing that radon is a top priority for exposure reduction, the Canadian Environmental Law Association (CELA) researched and released **Radon in Indoor Air: A Review of Policy and Law in Canada** in time for Radon Action Month in November 2014.



The CELA report makes 14 recommendations for addressing radon risks and filling gaps in research, policy, and law. The full report is available to download on the **CELA website**. To view our estimates of environmental exposure to radon, including maps summarizing Health Canada’s survey of Canadian homes, visit our **Environmental estimate page for radon**. Our team is currently developing an estimate of exposure to radon in Canadian workplaces and the results will be posted on our website in spring 2015.

## BC Teachers’ Federation recommends testing schools for radon

Radon gas can also be found in schools, exposing both teachers and students. We engaged the **British Columbia Teachers’ Federation (BCTF)** in discussions about this and other exposures to known and suspected carcinogens in BC schools. This resulted in the BCTF leadership making a recommendation to the British Columbia Ministry of Education for mandatory radon testing in schools across the province. We are currently working with the BCTF, led by President Jim Iker, on expanding this awareness and action to other provinces where our maps show that radon levels are high.

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“Public schools have historically been overlooked when it comes to health and safety issues. Fortunately, because of the work of unions in the education sector, the BC Federation of Labour, and organizations like CAREX, that has been changing. When it comes to known carcinogens, it is essential that public schools be safe places for workers, students, and other members of the school community.”

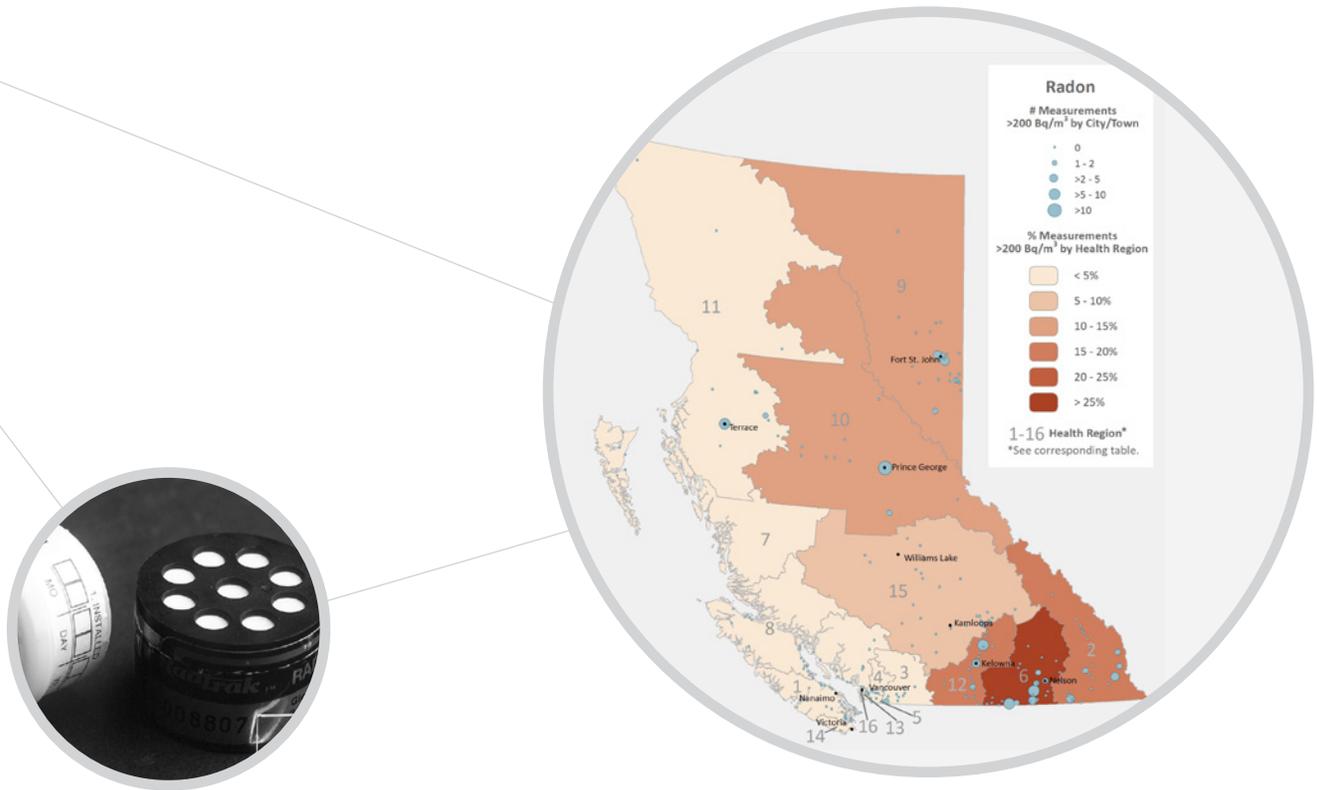
*– Jim Iker, BCTF*



**British Columbia  
Teachers’ Federation**

## Facilitating an exposure reduction network for radon in BC

In March 2015, the **BC Lung Association**, with support from CAREX, Health Canada and others, hosted a radon awareness workshop in Kelowna, BC. Health Canada's Cross-Canada Radon Survey shows that the southeastern region of BC is a priority for radon exposure in the province (see map below). The workshop facilitated a dialogue on the issue among a broad group of stakeholders, from public health professionals and radon testers and remediators, to real estate agents and home inspectors. The result is an engaged, community-level network working to address radon exposure in the area.



# Advancing research:

## OCRC releases estimates for occupational burden of cancer

Our partners at the **Occupational Cancer Research Centre (OCRC)** released preliminary results on the burden of workplace exposure to diesel engine exhaust. This work is part of a major project funded by the Canadian Cancer Society to apply CAREX Canada estimates to calculate the country's current burden of occupational cancers.

Estimates show that approximately 1.6 million Canadian workers were exposed to diesel engine exhaust at work (between 1961-2001). Preliminary calculations show that the proportion of new cancer cases attributed to this exposure is: 4.29% for males, 0.20% for females, and 2.38% overall. This difference across the sexes relates to more males working in industries where exposures to diesel are prevalent, such as mining, trucking, and others that involve operating heavy equipment. More information about this project can be found on **OCRC's website**.

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**“The importance of diesel exhaust has only recently been recognized. While 2.4% may seem small, that equates to 550 Canadians developing lung cancer each year.”**

*- Paul Demers, OCRC*



# Enhancing Capacity:

## Cancer 101 in First Nations, Inuit, and Métis communities

As part of our Cancer and the Environment projects with First Nations groups across the country, we offered a workshop in January with project stakeholders to address an identified need for general “What is cancer?” resources for project communities. Staff from **Cancer Care Ontario’s Aboriginal Cancer Control Unit** participated in this event, which informed their efforts to develop a Cancer 101 Toolkit for First Nations, Inuit, and Métis people in Ontario. This toolkit will describe the nature of cancer and include information on prevention and early detection. It is now being developed in partnership with the CAREX team via a working group that includes the Canadian Cancer Society and the Occupational Cancer Research Centre.

## Helping to reduce exposures to Sun at Work

CAREX Canada is an active collaborator in the Sun at Work CLASP project, a sun safety program for outdoor workers led by Thomas Tenkate, professor and director of the **School of Occupational and Public Health at Ryerson University** in Toronto. Our exposure estimate for UV radiation, which showed that approximately 1.5 million Canadians are exposed at work, informed the priority workplaces for the project. We have also developed outreach materials on this exposure targeted at employers and workers.

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“The project’s ultimate goal is to create a program to protect outdoor workers that would be sustainable for workplaces across Canada.”

*- Thomas Tenkate, Ryerson University*



## Carcinogens in the News becomes a monthly digest

For the past several years, the CAREX team has regularly compiled an internal digest of media articles, government reports, and academic literature related to the carcinogens we've classified as important for surveillance in Canada. After learning that this digest was being forwarded throughout the cancer prevention community, we developed a monthly version that users can sign-up for via our **Subscribe page**. Called Carcinogens in the News, this digest began in the fall of 2014 and already has over one hundred subscribers. It serves as a vehicle for increasing awareness of occupational and environmental exposures.



# Updating resources:

## Assessing workers' levels of exposure to diesel engine exhaust

Our exposure resources now include an estimate of workers' levels of exposure to diesel engine exhaust in Canada. Results show that approximately 897,000 Canadians are exposed to diesel exhaust at work, making it one of our most prevalent exposures. Levels estimates show the majority of workers exposed are in the low exposure category, with a significant number at risk for moderate to high exposure. The highest exposures occur in mining-related industries, where exhaust can accumulate underground, while the low exposures occur in transportation industries. For more information about this estimate, visit our **Levels of Exposure page** for diesel engine exhaust.



## Outdoor air webinar series confirms need for risk assessment tool

In fall 2014, we offered a series of webinars for air quality specialists, covering outdoor air exposures generally, traffic-related pollutants specifically, and how to use eRISK to explore outdoor air quality at the local level. These well-attended webinars confirmed a keen interest in our eRISK tool, as well as the need for a more accessible online version complete with data visualizations and support for interpreting results. A detailed needs assessment with current and future eRISK users, such as Medical Health Officer Marcus Lem of the Fraser Health Authority in BC, was undertaken in winter 2015, and the new online tool will be available later in the year. For more information about eRISK, visit our [Tools page](#).

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“The online eRISK tool will provide an accessible, valuable way to conduct screening-level investigations into exposures of concern in the Fraser Health Authority, such as arsenic in drinking water.”

*- Marcus Lem, Fraser Health Authority*



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### Interpreting differences in environmental estimates over time

Our environmental exposures team recently analyzed exposure trends for 30 substances in the CAREX Canada database. Summarized in a [Trends tab](#) for each substance on our website, this analysis compares lifetime excess cancer risk indicators for 2006 versus 2011 data. We found the greatest differences in risk indicators for indoor air and food and beverages, where data from new studies enabled more representative estimates for the Canadian population. For example, the majority of risk indicators for substances in food and beverages decreased (e.g. benzene, benzo[a]pyrene, lead) and for some substances in indoor air, the indicators increased (e.g. 1,3-butadiene, acetaldehyde, chloroform).

# Monitoring emerging issues:

## Offering information on substances of concern

As part of our ongoing surveillance of Canadians' exposures to known and suspected carcinogens, our team monitors substances of growing concern to the population and those scheduled for future evaluations by the **International Agency for Research on Cancer (IARC)**. We've summarized the status of many of these agents – and provided links to further information about their known or suspected health effects – on a new section of our website called **Emerging Issues**. Substances currently featured on this page include bisphenol A (found in some receipts, linings, and plastics), multi-walled carbon nanotubes (reviewed by IARC in fall 2014, summarized on page 15), glyphosate (the active ingredient in Roundup™), and polybrominated diphenyl ethers (a flame retardant).



## IARC assesses whether some nanomaterials and fibres cause cancer

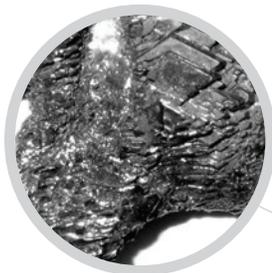
In October 2014, IARC evaluated the carcinogenicity of fluoro-edenite, silicon carbide fibres and whiskers, and carbon nanotubes. Many of these agents are suspected of having similar properties to asbestos, and were therefore investigated for their potential to cause mesothelioma and lung cancer.

**“The decision to classify multi-walled carbon nanotube-7 as a possible carcinogen – in combination with the lack of information available to classify other carbon nanotubes – indicates that we have to be cautious and try to limit human exposure.”**

*- Roel Vermeulen, Utrecht University, IARC Reviewer*



A combination of classifications were assigned, including known carcinogen (Group 1) for fluoro-edenite (a mineral mined in Italy and used to make unpaved roads and building materials) and occupational exposures associated with the Acheson process (which generates silicon carbide particles, used in industry as an abrasive). One carbon nanotube, multi-walled carbon nanotube-7, was classified as a possible carcinogen (Group 2B) due to evidence that exposure causes mesothelioma in rats. A full summary of this evaluation is available on our **Announcements page**.



## Maintaining scientific credibility: Publishing research methods and commentary on the record of workplace exposure

Our occupational exposures team published two peer-reviewed articles in academic journals last year. The first, released as an open-access article in *Occupational and Environmental Medicine*, outlines the CAREX Canada model for assessing occupational carcinogen exposure and how it builds on the methods of CARcinogen EXposure projects in the European Union. The second publication is a commentary in the *Canadian Journal of Public Health* on the diminishing record of workplace exposure in Canada. It looks at the establishment of the Canadian Workplace Exposure Database, a critical component of CAREX Canada's effort to estimate workers' exposures to carcinogens across the country, and what is required to ensure its future success. Both articles are available via our **Publications page**.

### International praise for CAREX Canada project

Our methods paper noted above was the focus of an article in *Occupational and Environmental Medicine* by Martie van Tongeren, Research Director at the international Institute of Occupational Medicine (IOM) in Edinburgh, U.K., which emphasizes the importance of projects such as CAREX Canada.

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**“In order to develop cost-effective and efficient policies to reduce and manage the health risks from exposure to hazardous agents at the workplace, it is essential that high-quality and comprehensive information on prevalence as well as intensity of occupational exposure to such agents is available at regional, national and international levels.”**

*- Martie van Tongeren, IOM*



This article was featured in our Carcinogen in the News digest and is posted on our **Carcinogens in the News page**.

# Training

- CAREX Training Workshop – Pan American Health Organization, National Cancer Institute of Colombia, and others
- The following 30 minute webinars were offered on various CAREX topics:
  - Traffic-related Outdoor Air Exposures
  - eWORK for Labour Groups
  - Occupational Lung Carcinogens
  - eRISK for Air Quality Specialists

A list of the many other conference and workshop presentations our team made this year is available on our website under the **Presentations tab**.



# Activities

Tailored webinars and presentations were made to the following groups across Canada:

## VANCOUVER

BC Teachers' Federation – Health and Safety Committee and Leadership

## KELOWNA

BC Lung Association, Health Canada and National Collaborating Centre for Environmental Health

## EDMONTON

Alberta Ministry of Jobs, Skills, Training and Labour

## REGINA

Government of Saskatchewan – MLAs



## TORONTO

Public Health Ontario – Environmental and Occupational Health

Ontario Office of the Worker Advisor – Occupational Disease Advisory Group

Toronto Cancer Prevention Coalition

GTA Clean Air Partnership

Elementary Teachers' Federation of Ontario

Canadian Environmental Law Association

Canadian Cancer Society – National Office



## OTTAWA

Canadian Union of Public Employees – Occupational Health and Safety Committee

## MONTREAL

Canadian Cancer Society – Quebec Division

## HALIFAX

Department of Health & Wellness and Cancer Care Nova Scotia

## ST. JOHN'S

Workplace Health, Safety and Compensation Commission and Service Newfoundland





# Acknowledgements

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## Photo Acknowledgements

All team portrait photos by Mark Whitehead, with the exception of Calvin Ge, which is subject's own, and Paul Demers, by Nick Menzies. Other portrait photos provided and owned by the subjects. Presentation photo of Anne-Marie Nicol on page 6 by Peter Scoular. Worksite photo of Paul Demers on page 9 by Caroline Gauthier Photography. Outdoor worker photo on page 11 courtesy of Queensland Health, 2010. All other photos Wikimedia Commons and Flickr labeled for reuse with attribution, where required, made at: <http://www.carexcanada.ca/en/reports/>

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