CAREX
CANADA

2013-2014 Annual Report

Background

CAREX (CARcinogen EXposure) Canada is the only national surveillance system of its kind in Canada, focusing on exposures to carcinogens in workplace and community environments. By integrating and distilling data collected by federal, provincial, and territorial agencies, the CAREX project offers a better understanding of which known and suspected carcinogens Canadians are exposed to and where in Canada such exposures may occur.

The 2013-14 fiscal year marks the second year of our renewed mandate to translate our results and support Canadian organizations in their efforts to reduce or eliminate exposures to carcinogens. The translation initiatives and new resources we've highlighted in this report are made possible by exchanges with users from those organizations, whose feedback and suggestions help us to distill our results in ways that inform their important work.

CAREX Canada is based at Simon Fraser University and funded by the **Canadian Partnership Against Cancer (CPAC).**

CAREX CANADA

CANADIAN **PARTNERSHIP** AGAINST **CANCER**

PARTENARIAT CANADIEN CONTRE LE **CANCER**

SFU SIMON FRASER UNIVERSITY
ENGAGING THE WORLD

Table of Contents

Team Members

CAREX Canada is a multidisciplinary team of researchers based at the **Faculty of Health Sciences at Simon Fraser University**, working in collaboration with researchers at the **School of Population and Public Health at the University of British Columbia**, and **Spatial Sciences Research Lab (SSRL), based in the Geography Department at the University of Victoria.**

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

CAREX team members (left to right): Calvin Ge, Cheryl Peters, Joanne Telfer, Anne-Marie Nicol, Alison Palmer, Karla Poplawski, and Paul Demers.

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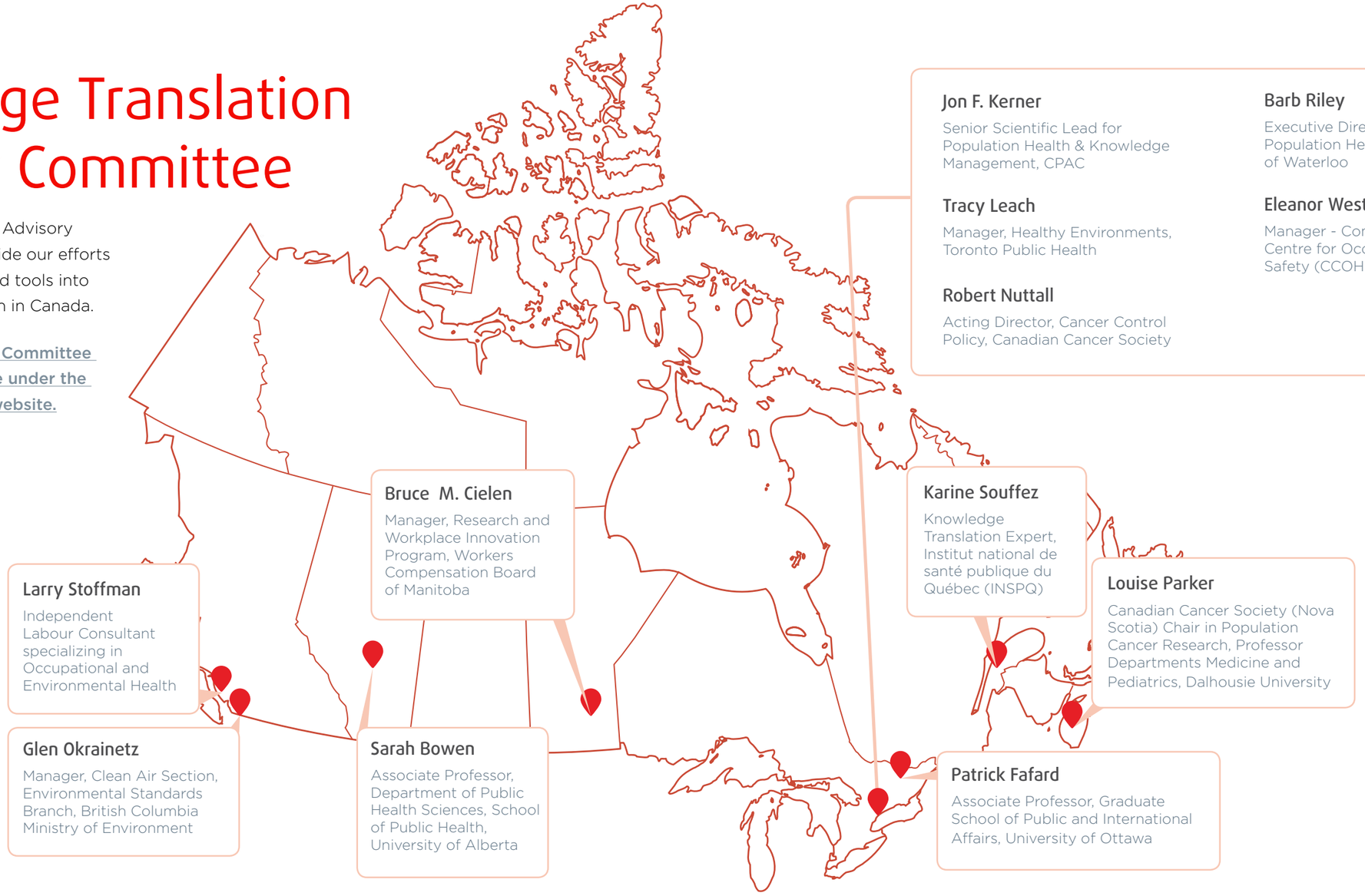
Knowledge Translation Advisory Committee

Our Knowledge Translation Advisory Committee is helping 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.



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CAREX
by the numbers 2013-2014

27,888 unique visits to our website
a 16% increase from last year
(top hits include our Tools page and crystalline silica profile, which saw page views increase 70% & 363%, respectively)

25 reports and official documents
referencing CAREX resources in the past year

652 quarterly e-bulletin subscribers
a 40% increase from last year

244 followers on Twitter (@CAREXCanada)
a 56% increase from last year

307 participants
who attended the 16 targeted knowledge translation events put on by CAREX such as webinars and face-to-face meetings

40 information requests
22% academic, 19% provincial and territorial government, 19% industry, 16% NGOs, 11% other, 5% federal government, 5% media, 3% associations

Highlights

Enhancing Capacity:
Call answered for First Nations pilot projects

In partnership with the First Nations Environmental Health Innovation Network (FNEHIN) and our First Nations Knowledge Translation Advisory Committee, CAREX Canada team members and collaborators at the UVIC Spatial Sciences Research Lab (SSRL) put out a call in October 2013 to co-develop pilot training projects on CAREX tools. These projects, intended to support efforts to manage resources and environmental quality, will ultimately help to protect the health of First Nations communities.

> " We want to move forward in improving environmental quality: the air we breathe, and the land we walk on, the water we drink, the food we eat, that's who we are as a people. If our earth is healthy, we are healthy. "
>
> - First Nations Knowledge Translation Advisory Committee statement

Enhancing Capacity:
Call answered for First Nations pilot projects (Cont.)

The call was distributed to over 650 First Nations organizations and communities across Canada. Out of 16 proposals, five projects – spanning across five provinces – were chosen. Environmental concerns raised by project groups include contaminated soil, drinking water quality, and existing and potential impacts of development. The goal of the projects is to develop training to use the CAREX Canada tools to better understand local concerns, and use that understanding to identify priorities for reducing or eliminating exposures to carcinogens in the environment.

Collaborators from the **Propel Centre for Population Health Impact at the University of Waterloo** will evaluate the training. This work is supported by a Knowledge to Action grant from the Canadian Institutes of Health Research.

SSRL

PROPEL
CENTRE FOR
POPULATION
HEALTH IMPACT

CIHR IRSC
Canadian Institutes of Health Research / Instituts de recherche en santé du Canada

FNEHIN
FIRST NATIONS ENVIRONMENTAL HEALTH INNOVATION NETWORK
RÉSEAU D'INNOVATION EN SANTÉ ENVIRONNEMENTALE DES PREMIÈRES NATIONS

Addressing key topics: Compilations and symposium presentation on lung carcinogens

For Lung Cancer Awareness Month in November 2013, we compiled a list of priority lung carcinogens that Canadians are exposed to at work and in the community. The list was drawn from the **International Agency for Research on Cancer (IARC)** List of Classifications with sufficient evidence of carcinogenicity in humans and filtered for priority exposures according to our exposure estimate results.

For more information about how we selected priority lung carcinogens, including links to the profiles and exposure estimates for each, visit our Announcements page.

Priority environmental lung carcinogens include:	Priority occupational lung carcinogens include:
asbestos, diesel engine exhaust, hexavalent chromium, outdoor air, particulate matter, and radon.	asbestos, diesel engine exhaust, hexavalent chromium, nickel, radon, and crystalline silica.

Our team raised these occupational priorities via a presentation and tailored summary handout package at the Occupational Cancer Research Centre (OCRC)'s symposium on occupational lung cancer. The all-day event, which took place in February 2014 in Toronto, focused on recent research into the burden and prevalence of major exposures and explored the emerging advances in lung cancer screening, including logistical and ethical issues of targeting screening to exposed workers. Event presentations are posted on the **OCRC's website.**

Addressing key topics: Outdoor air webinar offered in response to new classification

In October 2013, the **International Agency for Research on Cancer (IARC)** classified outdoor air pollution as a known carcinogen, alongside substances such as asbestos, arsenic, and the recently upgraded outdoor air pollution component, diesel engine exhaust.

> " We consider this to be the most important environmental carcinogen, more so than passive smoking. "
>
> - Dr. Kurt Straif, head of the IARC department that evaluates cancer-causing substances, was quoted as saying to CBC.ca.

We offer **profiles and estimates of exposure to the various components of outdoor air pollution**, including particulate matter, radon, and diesel engine exhaust, and have a package summary of our outdoor air exposure results available by request. We also offered a webinar in the fall on outdoor air exposures, and a video recording of that webinar is posted online. This video presents the exposure estimates and methods and proposes some ways these estimates could be used to set priorities for exposure reduction. **It is available under the Videos tab of our website.**

International Agency for Research on Cancer

World Health Organization

International Engagement: IDRC grant awarded for research partnership

CAREX Canada is a collaborator on a new project designed to exchange knowledge in occupational exposure surveillance with Latin America and the Caribbean. Funded by the **International Development Research Centre's (IDRC) Canadian Partnerships Program,** the project connects CAREX team members with international researchers to support the development of national CAREX projects in Latin America and the Caribbean.

> " Cancer is one of the leading causes of disease and death in Latin America and the Caribbean. It is estimated that 8% of lung cancer cases alone are due to exposure to carcinogens in the workplace, such as asbestos, crystalline silica, and diesel engine exhaust. "
>
> - Dr. Julietta Rodriguez-Guzmán, Regional Advisor on Workers' Health at the Pan American Health Organization (PAHO)

"There is limited data on the prevalence and levels of exposure to occupational carcinogens, particularly among informal workers," Dr. Rodriguez-Guzmán explains. "Addressing this data gap is very important for raising the profile of the workplace causes of cancer and preventing it at the source." This funding opportunity allows CAREX Canada to partner with project lead the **Occupational Cancer Research Centre (OCRC), PAHO, and the National Cancer Institute of Colombia** to provide practical guidance for building national CAREX projects.

OCRC Occupational Cancer Research Centre

Por el control del cáncer

Pan American Health Organization
Regional Office of the World Health Organization

IDRC | CRDI
International Development Research Centre
Centre de recherches pour le développement international

Informing Priorities:
Priority exposures in Quebec workplaces

A collaboration with the **Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST)** has helped estimate the extent of exposure to occupational carcinogens in Quebec. The IRSST team, led by Dr. France Labrèche (a member of our Occupational Exposures Advisory Committee), used CAREX estimates in combination with several national and international sources to assess the proportions of Quebec workers exposed to 38 known and suspected carcinogens. Those with the largest proportions of exposed workers were solar radiation (6.6% of workers), night shift work/rotating shift work including nights (6.0%), diesel engine exhaust (4.4%), wood dust (2.9%), and polycyclic aromatic hydrocarbons (2.0%).

" This is a first effort to produce such figures for Quebec workers and it has already started raising awareness of stakeholders," explains Dr. Labrèche. " Without the involvement and work of the CAREX Canada team, it would have been much more difficult (and costly) to produce a credible and useful assessment of occupational carcinogen exposure. "

The results are summarized in a peer-reviewed paper in the *American Journal of Industrial Medicine* entitled "**Estimating occupational exposure to carcinogens in Quebec**", which is posted on our **Publications page.**

Institut de recherche Robert-Sauvé en santé et en sécurité du travail

Identifying data gaps:
Environment team releases data priorities report

Our environmental exposures team released a new report in August outlining important data gaps they encountered in estimating the number of Canadians exposed to substances associated with cancer in community environments.

The new report, "**Indicators of exposure to known and suspected carcinogens in the environment: Data priorities and recommendations**", is one of many CAREX resources designed to support actions towards reducing or eliminating Canadians' exposure to known and suspected carcinogens.

Examples of high priority data gaps across five environmental exposure pathways include:

- **Drinking water** – measured levels of contaminants are not easily accessible for drinking water from treatment systems or private wells;
- **Foods and beverages** – there is a lack of standardization within and between studies that measure contaminants and studies that measure consumption;
- **Consumer products** – very little data exists on levels in products and frequency of use;
- **Indoor and outdoor air** – diesel engine exhaust and asbestos are known carcinogens but few data exist on current levels in Canada.

More information about these and the other gaps identified in the report, as well as recommendations for addressing them, can be found via our Reports page.

Assessing emerging risks: Veterinary workers' exposures to ionizing radiation and cancer drugs

CAREX team members performed the first national assessment of Canadian veterinary workers' exposures to ionizing radiation and antineoplastic agents (drugs used to treat cancer and other conditions). The results of this assessment are published in the November/December 2013 issue of the *Canadian Journal of Public Health*.

Ionizing radiation, a known carcinogen, is commonly used for X-ray scans in veterinary practice. CAREX estimates showed that <10% of all veterinarians and veterinary technicians were exposed to an annual ionizing radiation dose above 0.1 mSv (the minimum detectable level) in 2006, representing a total of between 536 and 1450 workers.

Although none of these exposures was over regulatory limits, accumulated low levels of ionizing radiation may present a health hazard. In addition, since only 37% of veterinary workers in Canada are monitored under the program, higher exposures could potentially have been missed. Exposure estimates were calculated using a combination of Census statistics and data from the Radiation Protection Bureau of Health Canada's National Dose Registry.

For antineoplastic agents, increasingly used to treat cancer in dogs and cats, **exposure was predicted in up to 23% (5,300) of all veterinary workers**, with an estimated prevalence range of 22% to 24% of veterinarians and 20% to 21% of veterinary technicians.

Estimates were developed using statistics on employment by practice type obtained from veterinary licensing bodies, and agent usage rates obtained from peer-reviewed literature.

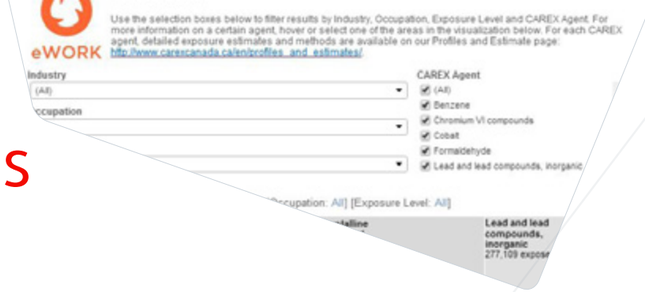
The full journal article, which includes further detail on how these exposures are monitored in Canada, is posted on our Publications page.

More information about ionizing radiation and antineoplastic agents, and how Canadians are exposed to these at work, can be found via our Profiles and Estimates page.

Other Highlights

- CAREX is a project supporter for the "**Sun at Work: A sun safety program initiative for outdoor workers**" project led by Dr. Thomas Tenkate at Ryerson University and funded through the Coalitions Linking Action and Science for Prevention (CLASP) program of the Canadian Partnership Against Cancer. The project used the CAREX exposure estimate for UV radiation at work to convey the significance of their initiative and to prioritize target industries.
- Two working group meetings took place with WorkSafeBC and the Partnership for Work, Health and Safety this year. These interactions focused on **developing our eWORK Online tool, supporting WorkSafeBC's strategic planning on occupational disease prevention, and identifying and addressing gaps in outreach materials**. The working group also plans to co-develop summary packages tailored for workers next year.
- CAREX team members attended the Assembly of First Nations Special Chiefs Meeting in December 2013 in Gatineau, Quebec, speaking to Chiefs from across the country about local environmental concerns and demonstrating CAREX tools such as the Emissions Mapping Project that **could help investigate differences in environmental quality**.
- Through the Canadian Association of Radon Scientists and Technologists (CARST), we engaged in **training and educating radon measurement and mitigation professionals on radon exposure**. This involved supporting interpretation of our indoor air exposure resources to help target CARST's outreach efforts with health authorities and school boards.

Updates on tools and resources



eWORK tool: Now available in two flavours

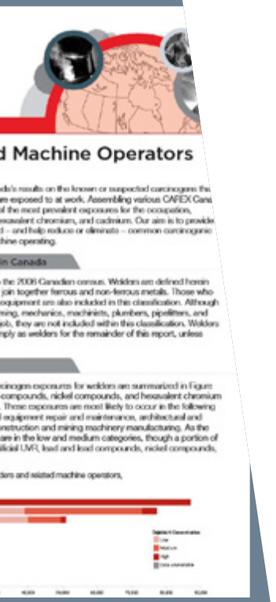
Users who beta-tested our Microsoft Excel-based prototype of eWORK last year expressed interest in an online means to access our warehouse of occupational exposure results. Our occupational exposures team responded by offering a set of tools for conducting custom queries of the CAREX results database: **eWORK Excel and eWORK Online**. The first of the two, eWORK Excel, can handle complex filters and queries, and is available by request. The newly developed eWORK Online is for users seeking quick and accessible – yet high quality – statistics on occupational exposures to carcinogens.

Emissions Mapping Project and eRISK tools: More updates

The ranking files for the Emissions Mapping Project (EMP), based on total toxic emissions to air, were recalculated based on 2011 data from the National Pollutant Release Inventory and other sources for major cities, provinces, health regions, and watersheds. Our environmental exposures team also added a new means to explore the files, via eco-regions, and updated the methods manual.

The Microsoft Access-based eRISK tool was updated with the latest cancer potency factors, as well as updated concentration data for 2011 for outdoor air, indoor air, indoor dust, drinking water, and food concentration and consumption data.

Access details for eWORK, EMP, and eRISK are available under the Tools tab of our website.



Package project:
Providing tailored snapshots of CAREX results and resources

Many CAREX users kindly beta-tested our Quick Summaries project, an effort to create one-pagers of the carcinogen profiles currently featured on our website, in 2012-13. We gathered that feedback and revised the summary concept to better address user needs. Our new knowledge translation products, called **Package Summaries**, assemble various CAREX Canada data, tools, and resources by topic of interest. They provide a useful guide for those looking to better understand – and help reduce or eliminate – exposures in particular contexts, such as a province, industry, occupation, environmental exposure pathway, and cancer site.

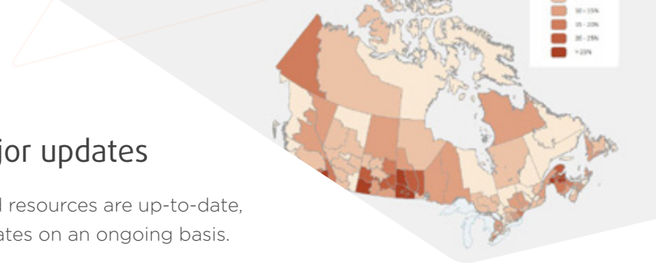
The eight prototypes developed thus far are listed below.
If you're interested in viewing these packages and providing some feedback, please get in touch with us.

Occupational exposures:
Wood Product Manufacturing, Welding, British Columbia, Lung Cancer

Environmental exposures:
Outdoor Air, Indoor Air, Nova Scotia, Quebec (French)

Exposure reduction resources:
Creating a source of potential next steps

This fall, we launched a repository on our website called "**Exposure Reduction Resources**" that compiles key publications and reports from a detailed scan of exposure control resources, and organizes them by type of exposure and by carcinogen. This compilation was developed to address feedback from users looking for support in identifying next steps to address exposures of concern. Though not an exhaustive source of exposure control resources, we hope that it can serve as a starting point to exploring ways to reduce the priority exposures identified by our estimates.



Profiles and estimates:
Environmental estimates get major updates

In order to ensure that CAREX Canada data and resources are up-to-date, our team reviews carcinogen profiles and estimates on an ongoing basis.

For example, a total of 11 profiles were updated this year to reflect changes in occupational exposure limit legislation in Ontario, Quebec, and the Yukon. These profiles include: 2-nitropropane, acrylamide, antimony trioxide, arsenic, cadmium, hexavalent chromium, coal tar, cobalt, epichlorohydrin, ethylbenzene, and ethylene oxide. The CAREX occupational team also updated the exposure estimates for hexavalent chromium and diesel engine exhaust.

The environmental exposures team made **significant changes to the risk estimates, incorporating updated data from various sources**. These include data that apply across pathways, such as cancer potency factors from Health Canada, the US Environmental Protection Agency and the California Office of Environmental Health Hazard Assessment. Also called oral or inhalation slope factors, these values allow us to make comparisons between substances and across pathways.

The following data was incorporated into the risk estimates, by specific exposure pathway (as outlined under the Data tab for each substance):

- **Outdoor air**: 2011 data from Environment Canada's National Air Pollution Surveillance Program;
- **Indoor air and indoor dust**: updated information from literature reviews where available;
- **Drinking water**: 2011 data from the Ontario Drinking Water Surveillance Program;
- **Food and beverages**: new data from the Canadian Food Inspection Agency's National Chemical Residue Monitoring Program 2009/10 Annual Report, US Food & Drug Administration – Total Diet Study on Element Results 2008, and the US FDA Total Diet Study (2003/4).

Our team is currently analyzing these estimates for trends in the new risk levels compared to 2006. Information on trends will be summarized under the Trends tab for each substance. Additional updates include incorporating Phase 2 of Health Canada's Cross Canada Radon Survey into the map of radon exposure via indoor air.

All updated profiles and exposure estimates are available via the Profiles and Estimates tab of our website.

Activities

Targeted webinars and presentations were made to the following groups:

- Cancer Care Nova Scotia and Department of Health and Wellness – Prevention Staff and Chief Medical Officer of Health, April 3, 2013
- Workers Compensation Board Manitoba – Research Program, Prevention and Compensation Staff, May 14, 2013
- Fraser Health Authority – Environmental Health Officers, May 15, 2013
- Canadian Cancer Society – Cancer Information Service Staff, November 20, 2013
- Occupational Health Clinics for Ontario Workers, January 8, 2014
- BC Federation of Labour – Health and Safety Committee, January 22, 2014
- BC Building Trades – Health and Safety Committee, February 14, 2014
- Occupational Cancer Research Centre - Occupational Lung Cancer Symposium, February 24, 2014
- BC Building Trades – Staff, March 13, 2014
- Canadian Labour Congress – Health and Safety Committee, March 27, 2014

The following one-hour webinars were offered on various CAREX topics:

- Occupational Exposures – Overview: October 10, 2013
- Environmental Estimates – Outdoor Air: November 21, 2013
- Occupational Estimates – eWORK: January 16, 2014

Video recordings of these webinars are available on our website under the Videos tab.

A list of some of the 28 conference and workshop presentations our team made this year is available under the **Presentations tab**.

Acknowledgements

CAREX Canada is based at Simon Fraser University and supported by the Canadian Partnership Against Cancer, an independent organization funded by the federal government to accelerate action on cancer control for all Canadians. Several activities described within this report were made possible through additional support from the Canadian Institutes of Health Research, the Government of Canada's health research investment agency.

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