



**CAREX**  
CANADA

**2012  
2013**  
ANNUAL  
REPORT

# Background

CAREX 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 insights into which substances pose the greatest risk to Canadians and serves as an important resource for efforts to reduce or eliminate exposures to those substances.

The World Health Organization estimates that globally, 19% of all cancers are attributable to the environment, including the work setting, resulting in 1.3 million deaths each year. The only way to reduce these cancers – and to minimize their impact – is to reduce the associated exposures.

The name “CAREX” stands for “CAR”cinogen “EX”posure and comes from a project developed by the Finnish Institute of Occupational Health looking to estimate exposures to known and suspected carcinogens in workplaces. WorkSafeBC funded a pilot CAREX project in 2003 at the University of British Columbia, and since 2007, the national project has been funded by the Canadian Partnership Against Cancer. What’s unique about CAREX Canada is that it includes an environmental focus, expanding the capacity of the project to identify exposures in both workplaces and communities.



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# Staff

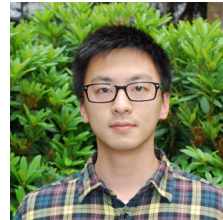
With over 70 known and suspected carcinogens in our database of profiles and exposure estimates, the CAREX Canada project is the result of a collaborative effort among many team members. Past contributors are too numerous to mention here but are listed on our website under About Us. Current staff members, who have been involved in the activities highlighted in this Annual Report, include:



Hugh Davies,  
Principal Investigator,  
University of British  
Columbia



Paul Demers, Scientific  
Director, Occupational  
Cancer Research  
Centre



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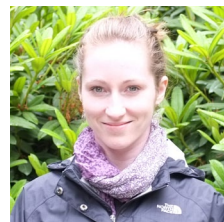
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# Message from the Scientific Director



*Dr. Paul Demers*

This past year marked a transition for the CAREX Canada project from a knowledge generation endeavour into a knowledge translation and exchange effort. After five years of intensive work, our project has become an established resource on exposures to known and suspected carcinogens in workplace and community environments in Canada. With renewed support from the Canadian Partnership Against Cancer we're now working to share this resource with those working in cancer prevention.

In April 2012, we began our renewed, five-year mandate to translate our results. We've engaged advisors to help us best target our efforts, are working hard to update and enhance our resources, and are publishing our results in peer-reviewed journals. We've reached out and engaged in dialogues with government agencies, the Canadian Cancer Society and other not-for-profit organizations, and various stakeholders via tailored and topic-specific webinars, conference presentations, face-to-face meetings, and working groups.

From these stakeholders we've sought feedback on our tools and ideas around how they might be applied. What we've found – and as you'll see in this report – is that groups are using our data to identify high risk groups, set priorities for prevention and identify exposure data gaps. There are many other potential applications to explore with users as we continue on our new mandate.

We look forward to the coming years of making Canadians' exposures to occupational and environmental carcinogens a priority in prevention work. As our renewed funding attests, we have a unique set of resources to offer and a unique opportunity to put them into action for reducing the risk of cancer.

Sincerely,

Paul Demers, Ph.D.  
Scientific Director, CAREX Canada  
Director, Occupational Cancer Research Centre, Cancer Care Ontario



29,177

visits to our website, a 42% increase from last year

156

followers on Twitter (@CAREXCanada), a 70% increase from last year

20

reports and official documents referencing CAREX resources in the past year

80

signups to the five one-hour webinars offered on various CAREX topics

1,180

individuals engaged through 20 conferences and workshops attended by CAREX, at which staff made 30 presentations on various topics

468

quarterly e-Bulletin subscribers

# CAREX

## by the numbers 2012-2013

5

comprehensive training videos created and added to our website

225

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

45

requests for information requests breakdown: 40% government, 23% NGOs and associations, 13% media, 13% industry and unions, 11% academic

102

letters sent out to Deputy Ministers, Workers' Compensation Board Presidents and Chief Medical Officers of Health informing them about CAREX resources and tools

# Highlights



## Building Capacity

### Piloting province-specific workshops in Ontario

In early March, 2013, the CAREX Canada team traveled to Toronto to present two workshops on Tools for Exposure Surveillance in Ontario, one for an environmental audience and one for an occupational audience. These workshops were an opportunity to showcase our tools and provide a hands-on experience to individuals working in cancer prevention in Ontario. Attendees represented various organizations, including Ontario Ministries of the Environment, Health and Long-term Care and Labour, the Canadian Cancer Society – Ontario Division, Canadian Auto Workers Union, and others.

“It was excellent to see so much availability and ease of access to data on carcinogen exposures.”

*Workshop attendee*

The workshops were a pilot event to build capacity for using CAREX tools and resources in provincial-level cancer policy and prevention work. The workshops were presented with support from our partner the Occupational Cancer Research Centre and a Dissemination Grant from the Canadian Institutes of Health Research.



## Enhancing our Resources

### Expansion of database on workplace exposures begins

CAREX Canada's occupational exposures team was awarded an operating grant through the Workers' Compensation Board of Manitoba last year to expand the Canadian Workplace Exposure Database (CWED) with data from Manitoba Labour and Immigration's Workplace Safety and Health Division. The CWED currently houses thousands of measurements of exposure to known and suspected carcinogens in Canadian workplaces. These additional measurements will allow us to refine our occupational exposure estimates in the future and

better identify vulnerable worker populations that are highly exposed.

Our occupational team is currently working with two other provinces, Saskatchewan and Alberta, to incorporate more data into the CWED, and is investigating potential contributions from the Atlantic provinces as well. For more information about the CWED, visit the Occupational Approach page under Profiles and Estimates on our website.

## Seeking Guidance

### First Nations Knowledge Translation and Exchange Advisory Committee struck

In late January 2013, the CAREX Canada team assembled individuals working in First Nations environmental health from across the country in Vancouver for an interactive workshop on approaches to CAREX training specific to First Nations. Workshop participants, including a local Elder, shared diverse perspectives around mechanisms and models for developing First Nations training on CAREX information and tools, potential key audiences for the training, and key characteristics of other successful training programs for First Nations groups.

“This was a great start to educating First Nations communities about existing and anticipated risks of cancer.”

*Committee member*

The group, now officially CAREX's First Nations Knowledge Transfer and Exchange Advisory Committee, will meet in early spring 2013 to prioritize the users and dissemination initiatives identified and agree on a knowledge translation strategy.

“Our ongoing partnership puts into practice the aims of FNEHIN of facilitating meaningful connections and relationships between First Nations and environmental health researchers.”

*Andrew Black,  
Policy Analyst,  
Environmental Stewardship Unit,  
Assembly of First Nations*

The Committee was created in partnership with the Spatial Sciences Research Lab at the University of Victoria, the Assembly of First Nations (AFN) Environmental Stewardship Unit, and the First Nations Environmental Health Innovation Network (FNEHIN). Funding for the workshop came through a Dissemination Meeting Grant from the Canadian Institutes of Health Research.



## Forging Partnerships

### Working group created with WorkSafeBC



*Colin Murray  
WorkSafeBC*

CAREX has now established a formal working group with WorkSafeBC's Prevention and Occupational Disease Initiatives team to help mobilize CAREX data and tools,

and share knowledge and expertise around workplace exposures to carcinogens. To start, our occupational exposures team provided B.C.-specific data on the numbers of workers exposed to carcinogens by industry and occupation. This information helped WorkSafeBC to prioritize their strategic planning on occupational cancer prevention.

The WorkSafeBC team also incorporated CAREX resources into their new occupational disease portal within the WorkSafeBC website, which serves as a one-stop-shop for resources on occupational exposures and associated diseases. The various links to CAREX throughout the new portal are proving useful to visitors; since the launch of that new portal in February, our website referral traffic from WorkSafeBC went up 171%.

“Our partnership with CAREX is helping to enhance our ability to identify and profile risk exposures to carcinogens – and ultimately help to prevent occupational disease.”

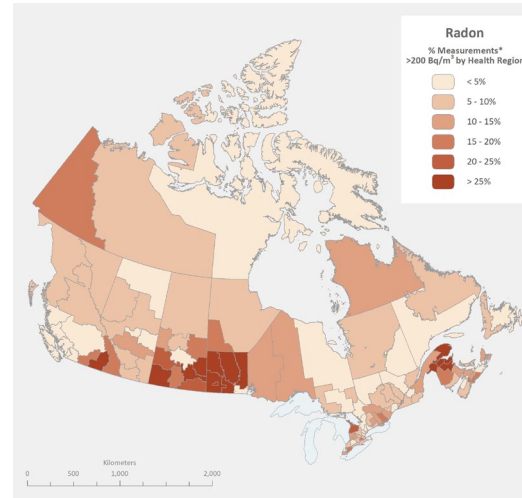
*Colin Murray  
Senior Manager of Prevention and  
Occupational Disease Initiatives,  
WorkSafeBC*

Our latest initiative through the working group brings data visualization experts from WorkSafeBC's Business Information and Analysis team into the partnership. Together, we're working to create an online version of our eWORK tool, which will help to mobilize this new platform for exploring our results database.

**WORK SAFE BC**

## Increasing Awareness

Helping raise the profile of priority carcinogens



This map summarizes the results of Health Canada's Cross Canada Radon Survey (Phase I), showing the percentage of home radon measurements in each health region above the current Canadian guideline.

Our estimates indicate that exposure to radon is one of the biggest priorities for environmental exposure reduction in Canada. A naturally-occurring radioactive gas produced as uranium breaks down in soils and rock, radon can accumulate in homes. Health Canada data shows that radon exposure is the second leading cause of lung cancer after smoking and is linked to approximately 16% of lung cancer deaths in Canada; in 2006 this amounted to an estimated 1,900 deaths. Given the significance of this exposure for cancer prevention, the CAREX Canada team has actively communicated radon exposure results to policy makers and health professionals across the country.

We have promoted awareness of radon exposures at academic conferences such as the Canadian Public Health Association 2012 Annual Conference, as well as a national meeting of air quality professionals, NGOs and the building industry organized through the B.C. Lung Association. CAREX expertise has also been integrated into radon-specific reports for Chief Medical Health Officers and the Canadian Association for Radon Scientists and Technologists.

The map above is available on our website under the Provincial Tables and Maps tab of our radon Environmental Estimate.

## Informing Research

OCRC launches occupational burden of cancer study



Sarah Bouma,  
Canadian Cancer Society,  
Ontario Division

A cross-Canada team of researchers coordinated through the Occupational Cancer Research Centre (OCRC) is applying CAREX data to assess the impact of cancer-causing agents in Canadian

workplaces. This four-year national study, the first of its kind in Canada, is funded by the Canadian Cancer Society and done in collaboration with its Ontario Division.

The study will estimate the number of new cancer cases and cancer deaths that can be attributed to workplace exposure to 44 known or suspected carcinogens. These include metals and industrial chemicals, as well as work-related factors like shiftwork. The estimates will help to determine the cost of work-related cancers on the country, taking into account direct costs such as medical care and indirect costs such as time off work.

“This important study will bridge the knowledge gap on exposures to workplace carcinogens and help guide our efforts to prevent workplace-related cancers.”

*Sarah Bouma, Senior Manager,  
Research, Canadian Cancer  
Society, Ontario Division*

The study will follow the approach taken in a similar study out of the United Kingdom. Media coverage about it, and other relevant research, is posted on the Carcinogens in the News page of our website, a source for the latest articles and reports on the known and suspected carcinogens studied by CAREX.



Canadian  
Cancer  
Society

Société  
canadienne  
du cancer

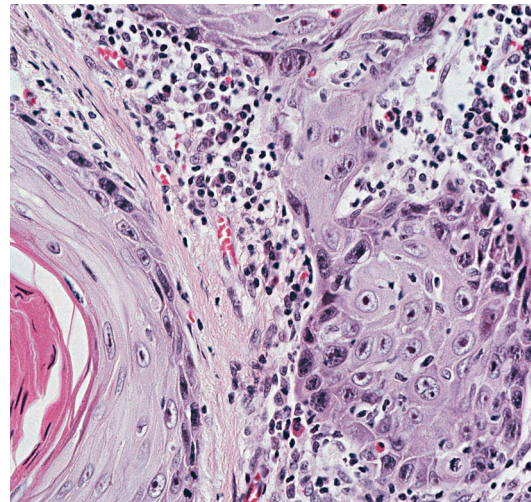


Occupational  
Cancer  
Research  
Centre



## Informing Research

BC Cancer Agency genetics group uses CAREX data to study lung cancer tumours



CAREX Canada is helping the BC Cancer Agency Research Centre's genetics group to explore links between the signatures of lung cancer tumors – the identifiable characteristics that distinguish one tumor from another – and different exposures to carcinogens. This collaboration was sparked after an in-person CAREX presentation to BC Cancer Agency researchers last spring.

Our team conducted an environmental exposure assessment on radon and air pollution for lung cancer cases in BC based on residential postal codes. The cancer genetics group, led by Dr. Wan Lam, is now using this information to

determine whether the tumor signatures they've identified might be linked to specific carcinogen exposures. The group also hopes to take this work to the patient level; the exposure-specific signatures could help to identify indicators for improved cancer screening and treatment options.



## Obtaining Peer Review

### Prevalence of Exposure to Solar Ultraviolet Radiation on the Job in Canada

Over one third of all newly diagnosed cancers in Canada in 2010 were skin cancer, despite the fact that skin cancer is largely preventable by limiting ultraviolet radiation (UVR) exposure. Our occupational exposures team was able to estimate the prevalence of this exposure for outdoor workers and found that solar UVR exposure is occurring on a large scale in Canadian workplaces.

The results, published in the May/June 2012 issue of *the Canadian Journal of Public Health*, indicated that over 1.5 million Canadian workers

are exposed to solar UVR at work, and approximately 897,000 of these workers were flagged as having “high exposure” (outdoors 75% of the workday). The largest occupational groups were farmers, construction labourers, and landscapers. Proportions of the workforce exposed by province ranged from 6.9% of workers exposed in Ontario to 17.3% in Prince Edward Island.

**1,498,000**  
WORKERS (EST.) **SOLAR RADIATION EXPOSURE IN CANADA**  
**FIVE LARGEST EXPOSURE GROUPS BY INDUSTRY**

Construction (all types)	<b>350,000</b>
Agriculture, forestry, fishing, hunting	<b>320,000</b>
Services to buildings and dwellings	<b>83,000</b>
Public administration	<b>75,000</b>
Other amusement and recreation industries	<b>42,000</b>

These exposure estimates serve as a support for primary skin cancer prevention efforts by helping to target high-risk groups, set priorities, and improve risk assessment. A link to this article is available on our website under Publications.



### Risk-based indicators of Canadians' exposures to environmental carcinogens

Our environmental exposures team published the results of their risk-based approach to estimating exposures in the February 2013 issue of *Environmental Health*. Using lifetime excess cancer risk as an indicator, which shows how many additional cases of cancer would be expected in a population of one million people given average exposure conditions in 2006, they identified a series of priority exposures for Canada.

Priorities were identified as carcinogens with moderate to high data quality and lifetime excess cancer risk greater than 1 per million; they include: benzene, 1,3-butadiene and radon in outdoor air; benzene and radon in indoor air; and arsenic and hexavalent chromium in drinking water. Important data gaps were identified for asbestos, hexavalent chromium and diesel exhaust in outdoor and indoor air, while little data were available to assess risk for all substances in dust, food and beverages.

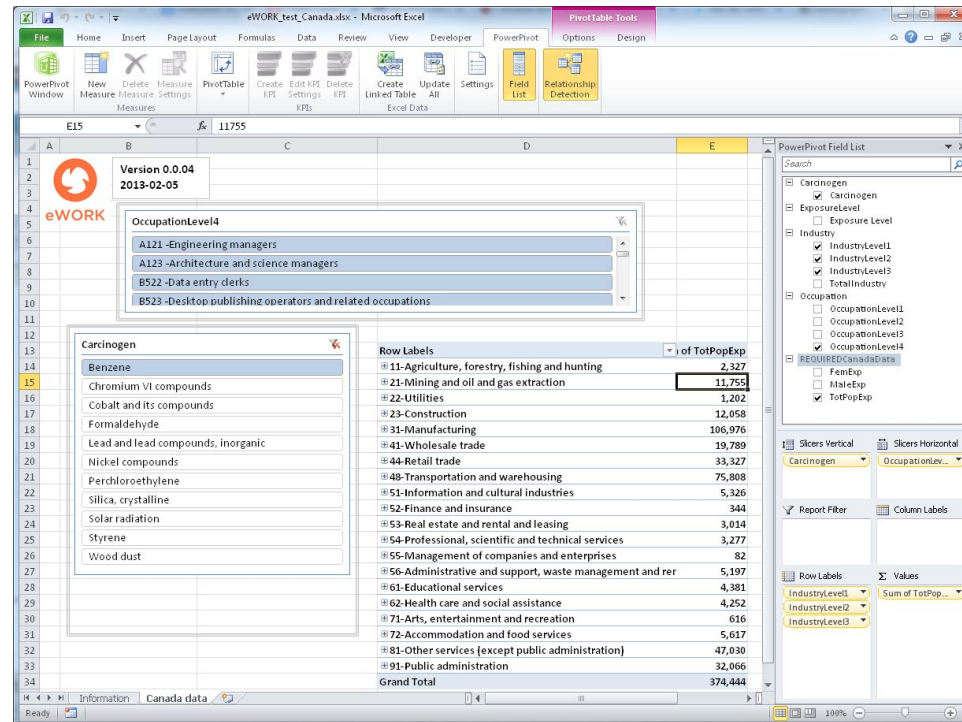
This publication provides a source of evidence for prioritizing future data collection and exposure assessment. A link to this article is available on our website under Publications.



# Updates on resources and tools

Visit the Training tab of our website to gain access and training on eWORK, eRISK and the Emissions Mapping Project.

## eWORK – Warehouse of occupational exposure results



Our occupational exposures team is currently beta-testing eWORK, a new tool that will allow users to conduct custom queries of the CAREX Canada results database. A Microsoft Excel-based tool, eWORK will make it easy for interested users to explore the CAREX exposure estimates and results in a variety of ways; the tool can be used to answer questions such as, *what*

*are the most prevalent carcinogen exposures for workers in the oil and gas industry? How many people are exposed to wood dust in B.C.? And what jobs have particularly high exposures to crystalline silica dust in Canada?* We are currently seeking beta-testers to provide feedback on the tool and training manual so that we can continue to improve usability and functionality.

## eRISK – Screening-level risk assessment tool

### eRISK

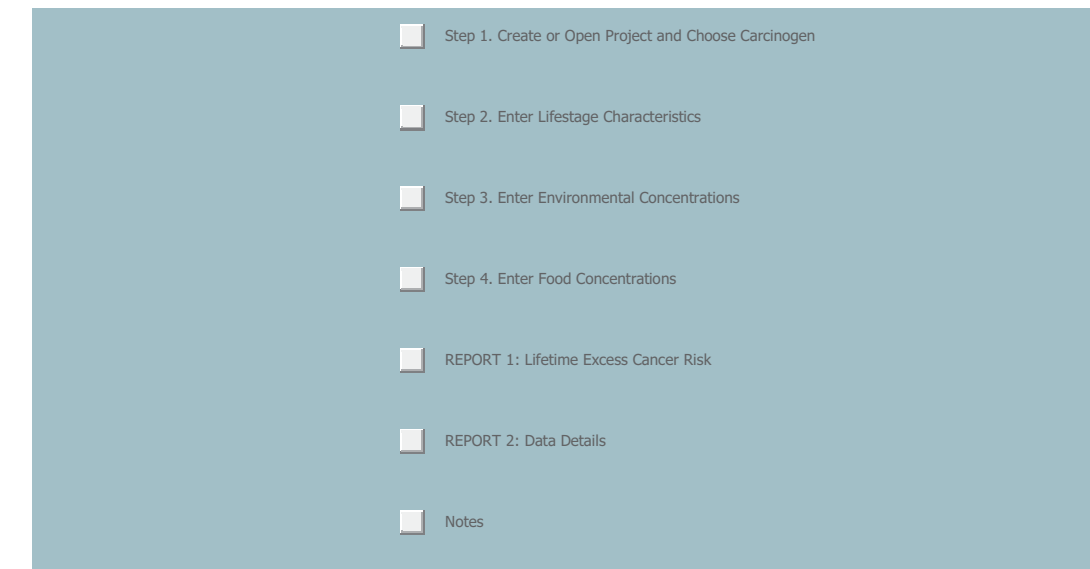


Calculate potential lifetime excess cancer risk using data collected by CAREX Canada or your own data and scenarios.

Version 1.0  
[Request latest version](#)

Developed by Eleanor Setton and Sean Chester

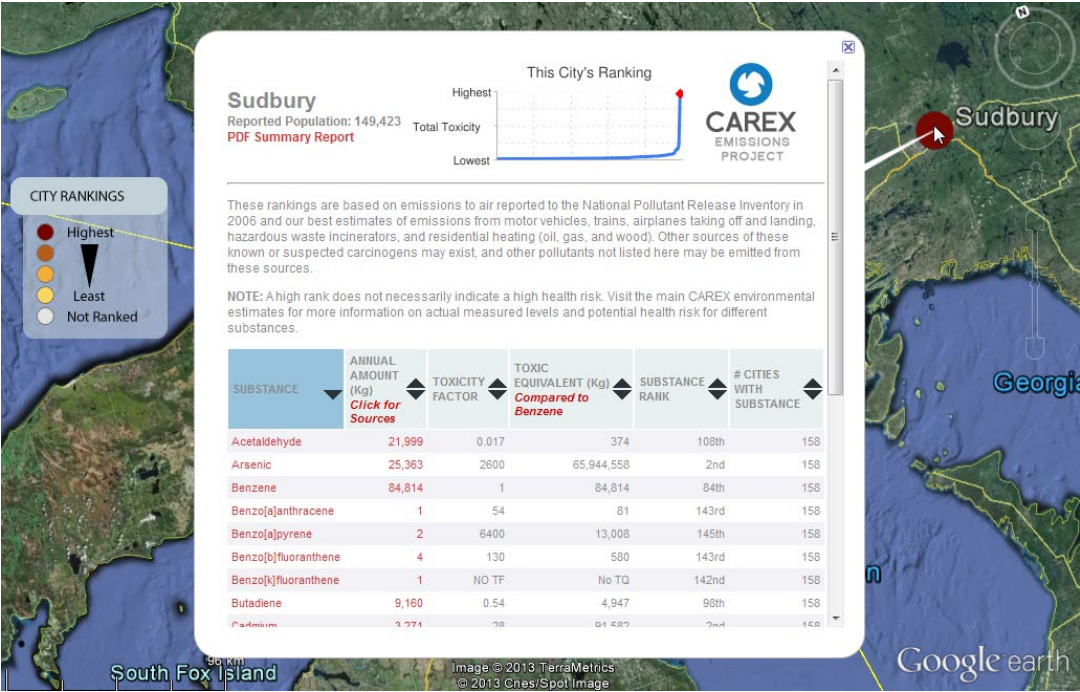
CAREX Canada University of Victoria Site



Our environmental exposures team spent this past year beta-testing the new CAREX Canada eRISK tool, a database application created for the environmental indicators. This tool is intended to provide a screening-level risk assessment for exposures to various known and suspected carcinogens in the CAREX database. Using lifetime excess cancer risk as the indicator, it allows users to explore the

CAREX data (as of 2006), to create new estimates using their own local data, to explore the sensitivity of the estimates to the input data, and to develop scenarios based on past or future predicted measured levels. It can also provide a starting point for local-scale assessments and identify exposure pathways of interest for further investigation.

# EMP – Dynamic maps of environmental quality across Canada



The Emissions Mapping Project (EMP) – launched last fall – is another new tool that allows users to visualize sources and concentrations of known and suspected carcinogens in the Canadian environment using Google Earth. Features of the tool include a ranking system that allows users to compare air emissions between watersheds, provinces, health regions and major cities. The tool also shows how different sources contribute to the rankings, and provides information on sources and levels of known and

suspected carcinogens in outdoor environments. The EMP is hosted as its own website, complete with tutorials and how-to resources, at the Spatial Sciences Research Lab at the University of Victoria. It was made possible with additional support from the Canadian Institutes of Health Research.

# Profiles and estimates – Managing and maintaining CAREX resources



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.

Diesel engine exhaust, trichloroethylene (a metal degreaser) and polychlorinated biphenyls (PCBs, used to manufacture electrical equipment) were upgraded to known carcinogens given sufficient evidence of their carcinogenicity in humans. Several polycyclic aromatic hydrocarbons (PAHs, by-products of fuel burning) were reclassified to probable and possible carcinogens. New profiles were created for TCDD (by-product of burning and chemical synthesis) and sulfuric acid mists (a by-product in industries such as pulp and paper processing).

As part of our regular review of exposure estimates, the CAREX occupational team also updated the exposure levels estimates for

Many profiles were modified over the past year to reflect upgrades in classification by the International Agency for Research on Cancer, an intergovernmental agency within the World Health Organization that conducts and coordinates research into the causes of cancer.

lead, nickel, chromium, styrene, formaldehyde, and benzene. These levels estimates are a complement to the exposure prevalence estimates in our carcinogen database.

More information about the methods used to estimate exposure levels can be found under the methods tab, a new feature of our website added for each known or suspected carcinogen in the CAREX database.

The environmental exposure estimates, which currently reflect 2006 exposure measurements, will be updated next year to incorporate data for 2011 from Environment Canada's National Pollutant Release Inventory and National Air Pollution Surveillance Program. The updated profiles and exposure estimates are available via the Profiles and Estimates tab of our website.

# Activities

The following one-hour webinars were offered on various CAREX topics. Recordings of these sessions are available under the Training tab of the website:

- Overview, October 25, 2012
- Environmental Estimates, November 8, 2012
- Occupational Estimates, November 22, 2012
- Emissions Mapping Project, January 24, 2013
- eRISK Tool, February 28, 2013

Three workshops on Tools for Exposure Surveillance, which included hands-on training for attendees and dialogue around potential applications, were piloted in Ontario with support from a Dissemination Grant from the Canadian Institutes of Health Research:

- Environmental Workshop, March 4, 2013, Toronto, ON
- Occupational Workshop, March 5, 2013, Toronto, ON
- Cancer Care Ontario, Occupational Cancer Research Centre, March 5, 2013, Toronto, ON

Targeted webinars and presentations were made to the following groups:

- BC Cancer Agency, Cancer Control Research Unit, June 4, 2012, Vancouver, B.C.
- WorkSafeBC, Various units, June 6, 2012, Richmond, B.C.
- Workers Compensation Board of Manitoba and Workplace Safety and Health for the Government of Manitoba, June 6, 2012, Webinar
- Urban Public Health Network, October 19, 2012, Edmonton, AB
- Government of Alberta Human Services, October 19, 2012, Edmonton, AB
- Canadian Cancer Society, Cancer Control Policy and Cancer Information Service, National and Regional Units, November 14, 2012, Webinar
- Medical Health Officers of Vancouver Coastal and Fraser Health, December 19, 2012, Vancouver, B.C.
- National Dose Registry, March 7, 2013, Ottawa, ON

A list of conference presentations is available on our website under the Publications tab.

# Advisors

To support our knowledge translation mandate, we assembled a new CAREX Canada Knowledge Translation Advisory Committee, which met for the first time in early February 2013. Composed of members from across the country with a broad range of backgrounds and experience, the Committee is helping to guide our knowledge translation strategy, ultimately helping to target our efforts to put CAREX resources and tools into action for cancer prevention in Canada.

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

Patrick Fafard  
Associate Professor, Graduate School of Public and International Affairs, University of Ottawa

Jon Kerner  
Senior Scientific Advisor for Population Health & Knowledge Management, Canadian Partnership Against Cancer (CPAC)

Tracy Leach  
Manager, Healthy Environments, Toronto Public Health

Glen Okrainetz  
Manager, Clean Air Section, Environmental Standards Branch, BC Ministry of Environment

Louise Parker  
Canadian Cancer Society (Nova Scotia) Chair in Population Cancer Research, Professor Departments Medicine and Pediatrics, Dalhousie University

Barb Riley  
Executive Director, Propel Centre for Population Health Impact, University of Waterloo

Karine Souffez  
Knowledge Translation Expert, Institut national de santé publique du Québec (INSPQ)

Larry Stoffman  
Labour Consultant, LDS Occupational Health and Safety Ltd.

Eleanor Westwood  
Manager - Communication, Canadian Centre for Occupational Health and Safety (CCOHS)



# Acknowledgements

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