



***Prevention of
Occupational and Environmental
Cancers in Canada:***

***A Best Practices Review and
Recommendations***

Executive Summary

May 2005

This Report prepared by the members of the **National Committee on Environmental and Occupational Exposures**, a tripartite and multi stakeholder sub-committee of the Primary Prevention Action Group of the Canadian Strategy for Cancer Control. Original research and data gathered for this report completed by Ms. Anne Wordsworth, Environmental Consultant. Funding for this project provided by the Canadian Strategy for Cancer Control (CSCC).

Foreword

Since 1999, Health Canada (now the Public Health Agency of Canada) has been working in partnership with the Canadian Association of Provincial Cancer Agencies, the Canadian Cancer Society and the National Cancer Institute of Canada and other stakeholders to develop the Canadian Strategy for Cancer Control (CSCC).

The CSCC is a collective effort by the major cancer players to present an integrated and national approach to fight cancer. Led by a Council selected from the major stakeholders, health service providers, and non-governmental organizations and supported by a secretariat, the CSCC addresses all the components of the cancer control continuum, not just the therapeutic care of cancer patients. It includes efforts for preventing cancer, as well as supporting cancer patients and their families by way of psychosocial and palliative services. The CSCC implements its key priorities through six Action Groups, whose innovative projects will lead to major changes and improvements in the current cancer control system in Canada.

The CSCC seeks to optimize the benefits of current knowledge and available resources for cancer control, while enhancing the sustainability of the health care system through more collaborative planning, priority setting, public policy development and implementation. Integration and coordination of activities under the CSCC is expected to help reduce cancer incidence, morbidity and mortality rates and enhance the quality of life for those living with cancer. The CSCC aims to bring about the sustained, co-ordinated and comprehensive approach needed to meet the challenge of Canada's growing and aging population. In particular, the strategy focuses on the need for improved surveillance and the identification and implementation of best practices in prevention and control. More information on the CSCC available at www.cancercontrol.org.

EXECUTIVE SUMMARY

The prevention of occupational and environmental exposures associated with cancer has received limited attention in the arenas of research and public policy, relative to other exposures such as tobacco, exercise, and nutrition.

Although the exact proportion of all cancers due to environmental and occupational exposures is the subject of debate, it is clear that the risk can be high among people who are exposed to these carcinogens and that these cancers are therefore preventable.

At its initial meeting on January 14, 2003, the NEOEC endorsed the application of the precautionary principle as part of an essential strategy in primary prevention. The precautionary principle forms the basis for public policy addressing environment and human health and has been referenced in Canadian environmental legislation and throughout the European Community:

*Whenever reliable scientific evidence is available that a substance may have an adverse impact on human health and the environment but there is still scientific uncertainty about the precise nature or the magnitude of the potential damage, decision-making must be based on precaution in order to prevent damage to human health and the environment.*¹

The committee has also focused on confirmed and probable human carcinogens as classified by the International Agency for Research on Cancer (IARC). Evidence of carcinogenicity is based on thorough scientific reviews of epidemiologic and experimental data on carcinogenicity of chemicals, groups of chemicals, industrial processes, other complex mixtures, physical agents, and biologic agents to which humans are known to be exposed. See Table 1 below for a list of Class 1 and 2A carcinogens.

This report describes best practices in the primary prevention of exposures to occupational and environmental cancer-causing agents (i.e., carcinogens) in Canada and to compare them with initiatives in the United States and Europe.

Best practices include: the identification and surveillance of hazards and exposed populations; the transmission of information through labeling and disclosure laws; education of the public, workers and communities; the reduction of exposures to carcinogens through substitution or process changes; and, legislation and regulation that contribute to cancer prevention.

¹ Resolution of the European Council of Nice, December 2000
COM (2000) 1, 2.2.2000

The results of this review indicate that it is necessary to take action in the following key areas:

- To raise the profile of the primary prevention of the environmental and occupational exposures as a priority issue within provincial cancer control agencies/programs.
- Disclosure of the presence, use and release of classified carcinogens is a necessary prerequisite to primary prevention in workplaces, the environment and the home.
- Further legislative, regulatory and policy development processes are required in primary prevention.
- Primary prevention of exposures to occupational and environmental carcinogens requires more focused and active efforts nationally and provincially.
- Elimination, when possible, and minimization of exposure at all times, should be an objective pursued by primary stakeholders, and governments for classified 1 and 2A carcinogens.
- Opportunities for inter-sectoral collaboration should be exploited in order to maximize our effectiveness and focus activity on primary prevention strategies

The National Committee on Environmental and Occupational Exposures (NCEOE) has developed 7 priority recommendations, which seek to begin to address the main gaps in Canadian practice. These recommendations cover a broad range of activities, and will require our sustained commitment, concerted efforts, and resources. In addition, future activities, articulated in 12 additional recommendations, continue to target the key areas of surveillance; public disclosure; community education; and government policy. The NCEOE looks forward to working towards the implementation of these recommendations, in collaboration and partnership with governments, non-governmental and community organizations, industry, and labour organizations.

Surveillance

Surveillance is the ongoing or systematic collection of data for the purposes of planning interventions to reduce the amount of, or consequences of, disease. The surveillance of confirmed cases of cancer is one approach that can help identify carcinogens and their role in causing cancer, be it in an occupational or environmental setting. However, because of the long latency period for cancer, these examinations of cancer cases reflect exposures that were experienced as much as twenty to forty years ago.

In contrast, the surveillance of carcinogens offers an opportunity to intervene to prevent cancer. This process collects information on exposure to carcinogens. This information can be collected in registries or databases that track workers or communities, and offer an approach to documenting the extent of exposures to carcinogens.

In Canada, the best ongoing surveillance program of this kind is the National Dose Registry, which monitors workers' exposure to a confirmed carcinogen, ionizing radiation. In Europe, Finland has a registry (the ASA) that documents workers' exposures to classified and listed carcinogens. The intention of these registries is to monitor trends in levels of exposure and take action to reduce them.

In the European Union, the Finnish Institute for Occupational Health developed the International Information System on Occupational Exposure to Carcinogens (CAREX) to estimate the burden of occupational cancer. Studies to estimate occupational cancers in Ontario and British Columbia, using this system, are underway.

Environmental databases – such as the Northern Contaminants Program and the Alberta Community Exposure and Health Effects Assessment Program – also provide information on health indicators and environmental carcinogens that can be used for preventative intervention.

Examples of best surveillance practices in the United States and Europe – SENSOR, THOR, and the Centers for Diseases Control biomonitoring studies -- are not focused on cancer, but have been selected to show the possibilities of monitoring and reporting that can be used to identify emerging problems. These programs for reporting illnesses provide models that could be adapted to focus on or include cancer. In the case of national biomonitoring studies, this research can indicate trends in chemical exposures over time.

Information Disclosure and Labeling

Information disclosure laws give the public access to information held by government and industry. They make it possible to identify substances that may potentially cause cancer by providing information in safety data sheets, labeling hazards in workplaces and in consumer products, the labeling of ingredients in products, and the disclosure of specific monitoring results of drinking water or industrial releases.

A number of laws incorporating information disclosure provisions have been developed over the last 20 years. The United States -- both federal and state governments -- has been in the forefront of developing this kind of legislation. In Canada, information disclosure laws generally mirror American legislation, but are more limited in their scope.

In Canada the two most important information disclosure provisions are both federally mandated -- the Workplace Hazardous Materials Information System and the National Pollutant Release Inventory.

In the workplace, the Workplace Hazardous Materials Information System, known as WHMIS, guarantees workers the right to information about hazardous substances that they are exposed to, including information indicating whether a substance can cause cancer. It is a system of integrated provincial and federal laws that requires disclosure of hazard information to workers through labeling requirements, in material safety data sheets and through training programs.

Under the Canadian Environmental Protection Act, the federal government has established the National Pollutant Release Inventory (NPRI), a national inventory of chemicals released by companies to land, air and water. The inventory provides information on the releases and transfers of 268 key pollutants, including many confirmed and probable carcinogens. It is the only national, legislated and publicly accessible inventory.

Although provincial laws do require companies or employers to monitor workplace air, as well as their discharges to outside air and water, that information is not generally made public. An exception is information on drinking water testing. In Ontario, and everywhere in the United States, safe drinking water laws entitle citizens to know which chemicals have been found in their drinking water.

In the United States, the most important federal information disclosure law is the Emergency Planning and Community Right to Know Act (EPCRA). This Act ensures that firefighters and communities know what hazardous materials are used and stored in facilities near them. Although the National Pollutant Release Inventory is the best practice in Canada, the American version, the Toxics Release Inventory, part of EPCRA, is more comprehensive and allows more access to information.

As well, the United States has the Fair Packaging and Labeling Act, an act that requires the listing of ingredients in personal care products and other consumer goods. This means that chemical ingredients, including carcinogens, which are used in these products, are disclosed on the label.

States, such as California and New Jersey, have legislated expanded rights to information. California's Proposition 65 is the most directly relevant to primary cancer prevention. This legislation requires the identification of cancer-causing chemicals in drinking water and in all products available in the state through explicit warnings.

Another way to approach primary cancer prevention is to seek out labeling that identifies products that are free of hazardous chemicals, including carcinogens. This is a much more popular and widespread practice in Europe than in the United States or Canada.

Community Education and Action

Community groups, environmental organizations and committed groups of cancer survivors, particularly organizations of women affected by breast cancer, all across Canada have initiated their own public education and action campaigns around “everyday carcinogens” – carcinogens found in food, automobile exhaust, schools, air, water, and products such as cosmetics and household cleaners.

Often working with minimal financial support and with volunteer labour, they have been successful in raising public awareness of the link between exposures to environmental carcinogens and possible health effects, and they have helped the public recognize carcinogens and reduce their personal exposures to them. These educational efforts and action campaigns illustrate the best practices of community-based groups in Canada to minimize the public’s exposures to carcinogens.

In their educational efforts, groups such as the Labour Environmental Alliance Society, the Environmental Association of Nova Scotia, the Canadian Coalition for Green Health Care and the Saunders-Matthey Cancer Prevention Coalition, publish reports and brochures, and maintain websites.

These groups also conduct seminars, conferences and workshops. And, many of them, like the Toronto Cancer Prevention Coalition and Reach for Unbleached, strive to influence government decisions to restrict or remove carcinogens from the environment and the workplace.

The most effective action in Canada, however, has been the cumulative success of many local campaigns in cities and towns across the country to ban or phase out the “cosmetic” use of pesticides.

In persuading municipalities to adopt bylaws restricting pesticide use, effective public education has translated into effective action. The coalitions promoting the pesticide bylaws have received broad support not only from labour and environmental groups but also from physicians’ groups, women’s and children’s health groups, and the Canadian Cancer Society. Although some communities in other parts of the world have restricted pesticides, the momentum behind this movement is unique to Canada.

In both Europe and the United States the most effective environmental groups and community organizations have similarly focused their efforts on raising public awareness and the relationship between environmental carcinogens and cancer.

U.S. groups like The Breast Cancer Fund have carried on campaigns lobbying for protective legislation in places like California and Massachusetts. In Europe, groups such as Greenpeace and Friends of the Earth have done their own monitoring of carcinogens and other toxins as a way to support the need for stronger chemicals regulation.

At the same time that they are mounting legislative campaigns and raising public awareness, these groups have also enlisted the public in consumer campaigns aimed at retailers.

Worker Education and Action

Union and workers' concerns over lung cancer, mesothelioma, and other work-related diseases significantly influenced the introduction of health and safety laws everywhere in Canada in the late 1970s. These laws gave them the right to know about workplace dangers, the right to participate in decisions affecting health and safety and the right to refuse unsafe work.

In the 1990s, disturbed by the apparent sustained prominence of cancer on their friends and co-workers, unions initiated cancer prevention campaigns. They were successful in reducing or eliminating exposures to many carcinogens by working with employers through joint health and safety committees and through collective bargaining.

There have been many health and safety activists and unions focusing on removing carcinogens from the workplace --the Canadian Auto Workers, the United Steelworkers of America, the Communications, Energy and Paperworkers that represent workers in the chemical industry, as well as a broad range of public sector and service sector unions such as Public Service Alliance of Canada, Canadian Union of Public Employees, and United Food and Commercial Workers.

They started with intensive education programs and the development of strategies for carcinogens, followed up by action in the workplace. These campaigns targeted at reducing or eliminating exposures to carcinogens are examples of best practices in the workplace. The educational campaigns included workshops and training conducted by unions. They have used the information available to them through Material Safety Data Sheets to identify carcinogens in their workplaces and to use their influence to reduce or eliminate them.

Unions and health and safety activists are also using provisions in health and safety laws to reduce their exposures and to promote substitution by working with employers to replace one substance with a less hazardous one, to make process modifications, or through process substitution.

In the big auto making plants, unions and the companies have agreed to reduce exposures to metalworking fluids by replacing them with canola oils and creating

their own acceptable levels of exposure. Through collective agreements several carcinogens including asbestos and vinyl chloride have been banned from these workplaces. Other workplaces have replaced solvents with water to clean metal parts. Less hazardous paints have been substituted for paints with heavy solvents at Canada Safeway after workers became ill. Unions representing mineworkers have made progress in reducing diesel exhaust emissions underground, and in substituting grease for lubricating oil in underground equipment. Workers in western Canada have been educated about cleaning products and they have switched to safer products in long-term care facilities, processing plants, hotels, restaurants, offices and schools.

In Europe, workers face the same issues and are similarly looking for substitutes to carcinogens in their workplaces. However, the Directives of the European Union and national occupational health and safety legislation facilitate this.

Non-Governmental Organizations' Work in Cancer Prevention

Organizations such as the Workers' Health and Safety Clinics and the Canadian Cancer Society have taken up the challenge of preventing cancer. Because of their direct relationship with people who have been diagnosed with cancer, they are not only helping people with cancer but they are also trying to prevent the exposures that might have caused their disease.

The Workers Occupational Health Clinics in Ontario offer inquiry services, medical diagnoses by doctors trained in occupational medicine, group services for workplace health and safety committees, and conduct research on occupational illness and injury. In addition to helping workers determine whether their cancer has been caused by their exposure at work, they play an active role in visiting workplaces and intervening to prevent more exposures.

The Canadian Cancer Society has publicly supported the use of the precautionary principle, and been active in the campaign to ban the ornamental use of pesticides on lawns and gardens. They have also called for the discontinuation of the use of pressure-treated lumber for domestic and recreational structures such as decks and playgrounds, and promoted the reduction of other exposures to environmental and occupational carcinogens.

Employer/Industry Reductions of Carcinogens

Many Canadian companies have eliminated or made significant reductions in the levels of carcinogens they release to the environment or in the workplace, as a result of government regulation or through pollution prevention programs.

Although government regulations are the most effective means of implementing broad based and more uniform environmental improvements, the federal government and many provincial governments have chosen to emphasize voluntary pollution prevention programs. Pollution prevention is defined as

processes or practices that avoid or minimize the creation of pollutants and reduce the overall risk to human health and the environment.

Even though pollution prevention strategies have resulted in concrete reductions of carcinogens, they benefit workers and communities where they are applied, and penalize them where they are not.

The public interest in safer products has also stimulated some companies to create products such as heat-treated wood and industrial cleaners that eliminate the use of carcinogens or other toxins.

Companies that have instituted pollution prevention programs, that are considered to be examples of best practices, include:

- Novopharm, a pharmaceutical manufacturing company in Scarborough, modified their manufacturing process, switching from a solvent-based pill coating process using methylene chloride to an aqueous-based process.
- Interface, the world's largest flooring company, adopted an objective worldwide of committing the company to zero emissions to air and water. In Belleville, where it manufactures nylon carpet tiles, it changed its manufacturing processes and eliminated the need for dyes that were the products of heavy metals.
- The Campbell River Gold Mine, in northwestern Ontario near Red Lake, prior to 1992 operated a roaster to separate the gold from the ore, releasing high levels of arsenic into the air. They replaced the roaster with an autoclave that resulted in the company reducing its discharges of arsenic into the air and water by 99 per cent.
- Alcan in Quebec introduced a new low-level PAH coal tar pitch for its Soderberg plants. The new coal tar pitch reduced PAH levels inside their Quebec plants by 30 to 70 per cent and reduced emissions to the outside by 35 to 50 per cent.
- The Ottawa Hospital stopped incinerating their biomedical waste, replacing it with a hydroclave system that is considered the best environmental technology for the decontamination and reduction of biomedical waste.
- The Carriage Trade Cleaning Centre was one of the first large cleaning plants in Canada to convert completely from using perchloroethylene for dry cleaning to wet cleaning.

However, for the most significant examples of best practices in primary cancer prevention – initiatives that have a broader impact on industry, it is necessary to look beyond Canada.

In the United States, the Massachusetts Toxics Use Reduction Act has led to dramatic reductions in the use, emissions and disposal of toxic chemicals throughout the state of Massachusetts. It has led the way in reducing the use of toxic chemicals through the introduction of mandatory pollution prevention planning.

The Massachusetts experience also demonstrates the importance of technical advice and support programs in helping industries make those reductions. There are only two programs in Canada that offer this kind of help.

In Sweden, the principle of substitution has become a working and workable strategy and an example of best practice that is an integral part of all industrial and commercial activity. Companies operating in that country for many years have practiced it, and now the European Union has incorporated the principle of substitution into several important pieces of legislation.

Moreover, Europe has recently introduced legislation that makes industry responsible not only for the way in which they manufacture products but for taking the products back at the end of their useful life. Complementary legislation also restricts the electric and electronics industry from using certain toxic chemicals in the manufacturing process.

Government Intervention: Legislation/Regulation and Policy

Legislation and regulation are key tools for reducing or eliminating exposure to human carcinogens. Where they have been introduced, they have been effective in reducing carcinogens in the workplace, eliminating their use in products and limiting their dispersal into the environment.

There are only two occupational health and safety legislation statutes in Canada that have explicit provisions for substitution -- the federal Labour Code and British Columbia's Workers Compensation Act. The substitution provisions in these Acts is a direct way in which workers, unions and companies are able to work towards the use of less harmful alternatives in the workplace. These two occupational health and safety laws represent the best practices in Canada because of their potential application to the reduction or elimination of carcinogens.

In the environmental field, the Canadian Environmental Protection Act and its regime for managing toxic chemicals is the most effective legislative tool in Canada for controlling carcinogens in the environment, and another example of a best practice. Once a substance is declared toxic, the federal government has a range of control options available to them. Options include controlling chemicals through mandatory pollution prevention plans or by regulation. Although very few carcinogens have been regulated, regulations have reduced releases to the environment and, in some cases, almost eliminated them from designated sources. Dioxins and furans, for example, have been almost completely eliminated from the effluent of pulp and paper mills.

If there is willingness to act, even municipalities can use regulations/by-laws/legislation to control carcinogens. The City of Toronto has used its Sewer Use By-law to require toxics use reduction planning, modeled after Massachusetts' Toxics Use Reduction Act. As a result of this bylaw, for

example, cadmium releases to the sewage treatment plant from metal finishing companies have been reduced. This is another example of a regulatory best practice – in this case, at a municipal level.

In Europe, the Nordic countries, Sweden and Denmark in particular, have led the way in their efforts to eliminate carcinogens. They have focused on instituting bans or restrictions, and influencing the European Union to follow their lead. The Swedish government has adopted a policy objective of achieving a non-toxic environment by 2020, and this has stimulated many innovative programs aimed at eliminating hazardous chemicals.

The most important new legislative development in chemicals management is the regulation proposed by the European Union, known as REACH -- the Registration, Evaluation and Authorisation of Chemicals. Europe is the largest producer of chemicals in the world and its desire to reform the way in which chemicals are introduced and managed in our society will have a far-reaching effect on future chemicals policy.

Table 1: IARC Confirmed and Probable Occupational and Environmental Human Carcinogens*

Group 1: Carcinogenic to humans	Group 2A: Probably carcinogenic to humans
4-Aminobiphenyl	Acrylamide
Arsenic & arsenic compounds	Benz[a]anthracene
Asbestos	Benzidine-based dyes
Benzene	Benzo[a]pyrene
Benzidine	1,3-Butadiene
Beryllium & beryllium compounds	Captafol
Bis(chloromethyl)ether & chloromethyl methyl ether	-Chlorinated toluenes
Cadmium & cadmium compounds	4-Chloro-ortho-toluidine
Chromium[VI] compounds	Creosotes (from coal-tars)
Coal-tar pitches	Dibenz[a,h]anthracene
Coal-tars	Diesel engine exhaust
Erionite	Diethyl sulfate
Ethylene oxide	Dimethylcarbamoyl chloride
Formaldehyde	1,2-Dimethylhydrazine
Gallium arsenide	Dimethyl sulfate
Mineral oils, untreated & mildly treated	Epichlorohydrin
2-Naphthylamine	Ethylene dibromide
Neutrons	Glycidol
Nickel compounds	Indium phosphide
Phosphorus-32, as phosphate	Lead compounds, inorganic
Plutonium-239 & its decay products	4,4'-Methylene bis(2-chloroaniline)(MOCA)
Radioiodines, short-lived isotopes, incl. iodine-131	Methyl methanesulfonate
Radionuclides, - & -particle-emitting	N-Nitrosodiethylamine
Radium-224, 226 & 228 & decay products	N-Nitrosodimethylamine
Radon-222 & its decay products	Non-arsenical insecticides (spraying and application)
Shale-oils	Polychlorinated biphenyls
Silica, crystalline	Styrene-7,8-oxide
Involuntary smoking	Tetrachloroethylene
Solar radiation	ortho-Toluidine
Soots	Trichloroethylene
Talc containing asbestiform fibres	1,2,3-Trichloropropane
2,3,7,8-Tetrachlorodibenzo-para-dioxin	Tris(2,3-dibromopropyl) phosphate
Vinyl chloride	Ultraviolet radiation A, B & C
Wood dust	Vinyl bromide
X- & Gamma ()-Radiation	Vinyl fluoride

*As of November, 2004. An up-to-date list can be found at <http://www.iarc.fr>. This table excludes pharmaceuticals and infectious agents that may be encountered by health care and pharmaceutical workers. Work place exposures to health care workers also need to be specifically addressed.

Table 1 of IARC listings are confirmed and presumed human carcinogens. The recommendations in tables 2-7 seek to address both occupational and environmental exposures to these substances.

Occupational exposures are targeted through a number of recommendations:

- The application of ALARA occupational exposure limits to these substances.
- Surveillance recommendations which seek to begin to profile current occupational exposures to these substances.
- Worksite audits conducted by prevention agencies and employers
- Regulatory action including MSDS audits, exposure notification (CAREX is one program being piloted now)
- Occupational histories

Environmental exposures are targeted through:

- Linkage to CEPA NPRI data
- Pollution prevention programming through CEPA; Provincial and Municipal governments
- Control of cosmetic pesticide use and exposures through municipal bylaws; purchasing policies; public education
- Labeling of consumer products containing known Class 1 and 2A carcinogens

Tables 2-7: Gaps and Priority Recommendations to governments and institutions for action on cancer prevention in Canada

1. Surveillance

Gaps	Recommendations by NCEOE
<ul style="list-style-type: none"> • Limited funding for occupational and environmental cancer/ carcinogen research • Provincial cancer treatment centres do not routinely record information about the occupational histories or environmental exposures • No central agency responsible for disseminating information to affected occupational groups and communities • No systematically collected publicly available information on current occupational exposures to classified carcinogens in Canadian workplaces • No registry of chemical carcinogens in the workplace comparable to the National Dose Registry for radiation or the Finnish ASA 	<ol style="list-style-type: none"> 1. In order to properly identify individual cases of environmental and occupational cancer it is necessary to collect a thorough occupational and environmental history. Provincial cancer control agencies/ programs should actively promote the collection of this information. 2. Encourage the development and application of an International Information System on Occupational Exposure to Carcinogens (CAREX) and carcinogen exposure worker registry program in Canadian jurisdictions. <ol style="list-style-type: none"> 2.1 Workplace monitoring and collection of data should be required by regulators for all Class 1 and 2A carcinogens listed in Table 1, in use or produced. 2.2 There should be a harmonization of exposure limits for Class 1 and 2A carcinogens (listed in Table 1) in workplaces throughout Canada. The ALARA principle should be applied.

2. Information Disclosure

Gaps	Recommendations
<ul style="list-style-type: none"> • *Consumer Chemical Regulations do not require carcinogen disclosure • No central repository or audit for workplace MSDS • No community and limited first responder information disclosure • *Limited NPRI data (Thresholds, exemptions pesticides, transport, maintenance) 	<ol style="list-style-type: none"> 1. Health Canada's WHMIS Division should develop a national program for auditing the accuracy and completeness of MSDS in collaboration with HMIRC and the provinces. <ol style="list-style-type: none"> 1.1 Regulators must look at better enforcement of WHMIS requirements for accurate MSDS, and training of the workforce regarding the significance of MSDS disclosure information pertaining to classified carcinogens.

* See Table 6 for recommendations addressing these gaps

3. Community Education and Action

Gaps	Recommendations
<ul style="list-style-type: none"> • Lack of infrastructure and linkage between community organizations • Few expert resources and funding sources • Secondary focus on primary cancer prevention: multiple issues, weak priority setting • Little media attention and poor linkage between “health care crisis” and primary prevention 	<ol style="list-style-type: none"> 1. Municipalities should develop and implement primary prevention activities, such as: <ol style="list-style-type: none"> a. Community exposure profiles should be developed in collaboration with NPRI and community organizations. b. Support for collaborations such as that between the Toronto Department of Health and the Toronto Cancer Prevention Coalition should be encouraged. c. Community pollution prevention bylaws should be encouraged and BP examples disseminated.

4. Worker Education and Action

Gaps	Recommendations
<ul style="list-style-type: none"> • Lack of resources and technical expertise to evaluate chemicals in use and to find information on safer substitutes • Little knowledge of best practices in Canada and EU and lack of harmonization across provinces • Different regulatory regimes prevent common prevention efforts • Most collective agreements do not address primary prevention and occupational cancer controls. 	<p>See Appendix 1: Future Proposed Activity</p>

5. Employer/Industry Action

Gaps	Recommendations
<ul style="list-style-type: none"> • Limited focus by employer/industry associations • Limited information sharing regarding alternatives and substitutes • Limited technical assistance programs to assist companies to make substitutions for particular chemicals or processes. • Weak coordination with OSH agencies or Ministries of the Environment: elimination and substitution • Limited financial incentives or fiscal policies promoting pollution prevention for carcinogens 	<p>See Appendix 1: Future Proposed Activity</p>

6. Government Intervention: Legislation/Regulation and Policy

Gaps	Recommendations
<ul style="list-style-type: none"> • Substitution and ALARA requirements lacking in most jurisdictions • No harmonization of exposure limits and implementation of the precautionary principle in establishing Canadian limits for carcinogens • No registration and evaluation prior to import or sale (PMRA exception) • No requirement to report and audit workplace use of carcinogens • Toxic Use Reduction Planning is not mandatory • CEPA enforcement and regulatory tools unclear or voluntary • No requirement to disclose carcinogens in consumer products labeling or domestic use pesticides • Consumer Chemical Regulations do not require carcinogen disclosure • Limited NPRI data (Thresholds, exemptions pesticides, transport, maintenance) 	<ol style="list-style-type: none"> 1. Federal legislation should require disclosure of all Class 1 and 2A carcinogens (listed in Table 1) through labeling on all consumer products, including pesticides. I.e. Hazardous Products Act (Health Canada (CCCR)), Pest Control Products Act (PMRA) etc. <ul style="list-style-type: none"> • Use of standard hazard phrase and symbols should be adopted which indicate a product contains classified carcinogens, as recommended by the GHS. The use of a standard symbol to indicate a product does not contain classified carcinogens should be explored. There should be an expansion of the environmental choice program of Environment Canada and its application in the consumer field. 2. CEPA 1999 should be updated and require pollution prevention programs for federally regulated sites using or producing Class 1 and 2A carcinogens. 3. There should be a public review and gap analysis of the EU Directives and proposed REACH legislation with ongoing Canadian activities. The Federal government should pursue international harmonization concerning disclosure, use, registration, authorization, and prohibition of classified carcinogens.