



First Steps in Lifelong Health

A Vision and Strategy for Children's Health and Environment in Canada

December 2008



CPCHE’s National Policy Consultation on Children’s Health and Environment

The National Policy Consultation (NPC) provided a forum for diverse stakeholders to exchange information on the scope and nature of known and suspected environmental threats to fetal and child health and development, and to generate ideas about how best to reduce exposures and risks through policy and practice. While recognizing that there are many determinants of health, the focus of the National Policy Consultation was on toxic chemicals and air pollution. The workshop themes were as follows:

- Context for Children’s Health and Environment (Ottawa, January 2007)
- Air Pollution: Implications for Children’s Health (Toronto, February 2007)
- Research Informing Policy (Edmonton, April 2007)
- Environmental Risks to Brain Development (Moncton, May 2007)
- Toxic Substances in Consumer Products (Montreal, September 2007)
- Putting It All Together (Vancouver, November 2007).

The *National Policy Consultation Report* is available on the CPCHE website at: www.healthyenvironmentforkids.ca

Preface

The development of this **Vision and Strategy for Children’s Health and Environment in Canada** builds on years of work by the partner organizations of the Canadian Partnership for Children’s Health and Environment (CPCHE) to gather and synthesize scientific evidence about the links between environmental exposures and fetal/child health outcomes, translate it into user-friendly information and tools for broad dissemination, and engage in dialogue with decision-makers, professionals and the public about the evidence and its implications.¹

More recently, this Vision and Strategy has been informed by the **National Policy Consultation on Children’s Health and Environment**, a year-long dialogue convened by Pollution Probe and CPCHE on opportunities for strengthening the protection of children in Canada from known and suspected health risks posed by exposures to pollutants and hazardous chemicals in products (see side bar).

The outcomes of the National Policy Consultation underscored the need for a proactive national strategy to protect the developing fetus and child from exposures to hazardous chemicals and pollutants. The federal government and some provinces and municipalities are taking positive actions, but much more remains to be done. **The aim of this Vision and Strategy is to describe a continued path forward for child-protective policies, specifically in the areas of chemicals management and consumer product safety.** While aimed primarily at the federal level, many of the recommendations contained herein are also relevant to provincial, territorial and local levels of government, as well as to decision-makers and practitioners outside of government.

Over the coming months and years, CPCHE partners will work to advance the elements of this Vision and Strategy through our individual and collective efforts. We look forward to collaborating with government decision-makers at all levels, industry leaders, non-governmental organizations, public health and health care professionals, the research community and others to achieve an integrated vision of children’s environmental health protection in Canada for the benefit of present and future generations.

For further information, contact:

Erica Phipps, Partnership Director
Canadian Partnership for Children’s Health and Environment (CPCHE)
erica@healthyenvironmentforkids.ca



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Our Vision for Children’s Health and Environment in Canada

CPCHE envisions an equitable society that recognizes the critical links between the physical environment and human health, and in which...

- **All children breathe clean air**, both indoors and out, and consume **safe food** and **drinking water**;
- **Precautionary policies and programs** are in place which prevent environmental exposures from harming the vulnerable stages of fetal development, infancy and childhood, in recognition of the fact that exposures during the earliest stages of life are powerful determinants of health in later years;
- **Children are protected from the risks posed by environmental contaminants** including toxic substances associated with the production, use and disposal of consumer products; and
- The **body burdens** of environmental contaminants in each subsequent generation of children born in Canada are **progressively reduced**.

Box 1: Many factors contribute to health

There are many factors or “determinants of health” that contribute to child health and well-being. *In addition to addressing environmental risks*, as a society we need to create *all* of the necessary conditions for healthy child development by taking decisive action to ensure...

...the ability of families to earn enough money to meet their needs;

...the availability of safe, affordable housing within communities that promote physical activity and social interaction;

...ready access to quality health care;

...supportive learning environments in which children are able to pursue their highest potential; and

...the inclusion and celebration of all racial and cultural groups.

Box 2: The Precautionary Principle: Better safe than sorry

CPCHE supports the robust application of precaution as the guiding principle for children’s environmental health protection. There are numerous definitions of precaution in use, including the “Rio” definition, adopted by heads of state at the Earth Summit in 1992, which states: “In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.” CPCHE uses the “Wingspread” definition because it emphasizes the duty to act and encompasses both human health and environmental protection:

“Where an activity raises threats of harm to the environment or human health, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. In this context, the proponent of an activity, rather than the public, bears the burden of proof.”

The bottom line is this: Lack of scientific certainty about the ability of a substance or activity to cause harm should not be used as an excuse to delay action. **When it comes to the health and development of children, it is better to be safe than sorry.**

Box 3: Where to start?

There is a huge array of chemicals and pollutants to which children and pregnant women may be exposed. Building on an approach developed by the Children’s Environmental Health Network in the United States, CPCHE seeks to maximize its impact by focusing on:

- health outcomes that potentially affect large numbers of children and that are serious and/or irreversible in nature; and
- the most significant pathways of exposure to the key chemicals or contaminants that are or may be associated with the identified health concerns.

Applying these criteria in Canada leads to a focus on **respiratory disease, neurodevelopmental effects, effects on reproduction and development, and cancer in children and in young adults. Air pollution (indoor and outdoor), contaminants in food, and hazardous chemicals found in consumer products, packaging and house dust** are among the most important routes of exposure. The obvious urgency of focusing on issues affecting many children underscores the importance of placing priority on **children in poverty**, a known risk factor for greater exposure to environmental contaminants.

CPCHE’s Call for Action

Children are particularly vulnerable to environmental threats because of differences in size, intake, and behaviour, and because their organs and detoxification systems are not fully developed. Some children are at even greater risk due to where and how they live, and/or as a result of their genetic inheritance.

While the overall health of children in Canada is improving, **certain childhood disorders are on the rise**, including asthma, learning and behavioural disorders, obesity and several cancers among young adults. Environmental exposures, within a broader range of contributing factors (see Box 1), are associated with all of these health outcomes.

Harm from environmental exposures is largely preventable. While some steps are being taken, more needs to be done to prevent pollution and eliminate/reduce fetal and childhood exposures to harmful chemicals in home, school and community environments and via consumer products. At present, many chemicals are not regulated and most have been inadequately evaluated for safety.

Canada has an opportunity to take decisive and world-leading action to better protect the developing fetus and child from exposure to environmental contaminants and toxic chemicals. The momentum is building: we are seeing an increased commitment to act within the federal government on chemicals and pesticides, and an unprecedented level of stakeholder engagement and public support for action (see “Canada Stepping Up,” page 10).

In the following pages, the CPCHE endeavors to:
...paint the current picture of children’s environmental health in Canada to underscore the need for immediate and protective action; and
...enumerate specific actions needed in the three priority areas of (1) research, (2) law and policy and (3) on-the-ground protection, with a specific focus on chemicals management and consumer product safety.

There is much to do. Some progress is being made, but Canada must continue to step forward.



CPCHE believes that there are **core policies and principles** that must be adopted if Canada is to have an effective, prevention-oriented and world-leading approach to children’s environmental health protection. CPCHE calls upon the federal government to:

- Pursue a **precautionary approach** to chemicals management and consumer product safety.
- **Reverse the “burden of proof”** so that the producer or importer of a chemical has to provide governmental evaluators with sufficient data to support a claim of acceptable risk before gaining or retaining access to the marketplace.
- Require that **chemicals be tested for potential effects on fetal/child development**, including neurodevelopment.
- Adopt the **substitution principle**, to ensure that hazardous chemicals are replaced with safer alternatives whenever possible.
- Ensure **transparency** in regulatory decision making, including public access to the information used to inform governmental priority setting and decision making.
- Ensure comprehensive, coordinated and timely **implementation and enforcement of all federal laws** that are of relevance to children’s environmental health.
- Position Canada as a **global leader** and collaborator on children’s environmental health protection, including toxics use/release reduction and action on climate change.

CPCHE also calls upon the federal government, in collaboration with provincial/territorial governments, to complete the following **priority actions** by 2010:



- **Commit to supporting Canadian longitudinal cohort research on child health–environment linkages** in general (see Box 8) and, specifically:
 - Provide immediate funding to **expand upon the Maternal-Infant Research on Environmental Chemicals (MIREC) study** so that the health of the babies born to the participating mothers is evaluated and tracked over time.
- **Eliminate or reduce fetal and childhood exposures to all substances that have been declared “CEPA-toxic.”**
- **Address risks posed to fetal/child health by toxic substances in consumer products:**
 - Create a **comprehensive consumer product safety regulatory scheme** in Canada that more effectively **controls** the use of hazardous chemicals in consumer products, empowers the public to make safer choices by requiring **labeling** of ingredients and corresponding information on potential health effects, and provides the federal government with **product recall powers**.
 - Place an immediate ban on the sale in Canada of consumer products containing non-essential **lead** and **mercury**, in light of the well-documented harm that these substances can cause to children’s developing brains.
 - Ban the sale of children’s products containing **phthalates** — synthetic plasticizers used in vinyl and many personal and cleaning products that have been linked to developmental impacts and cancer — following the lead of Europe and the United States.

- Ban the manufacture, import, use and sale of *all* **polybrominated diphenyl ethers (PBDEs)** and PBDE-containing products. PBDEs are chemicals associated with reproductive and other health effects that are used as flame retardants in a host of consumer products.
- Significantly reduce exposures to hazardous **volatile organic compounds (VOCs)** from consumer products by requiring manufacturers to avoid their use or substitute with safer alternatives.

- **Require that workplace exposures be explicitly considered when assessing potential exposures to the developing fetus and child** and ensure that chemical risk management approaches are integrated with occupational health and safety regulations and programs to better protect reproductive and fetal/child health.
- **Promote the incorporation of environmental health into academic and vocational curricula and on-the-job training** so that environmental health protection is mainstreamed into the everyday practices of health care professionals, educators, child care providers, public health nurses and inspectors, urban planners, architects/designers, industrial managers, contractors and salespeople and others on the “front-line.”

In addition to these immediate priorities, CPCHE urges the federal government to provide decisive **leadership** in implementing the full suite of priority actions outlined in the following pages. CPCHE also calls upon other levels of government and all sectors of society to consider ways in which they can contribute to and support a robust national strategy for children’s environmental health protection.



Children’s Health and Environment

What we know...

Children are particularly vulnerable to environmental threats. Developing infants and children are more exposed than adults to environmental chemicals and pollution because of differences in size, intake (e.g., more rapid breathing rate), and behaviour (e.g., hand-to-mouth activity). Human biomonitoring results often show higher levels of metals, pesticides and chemicals in children than in adults. Children are also more susceptible to adverse health impacts because their brains, other organs and detoxification systems are not yet fully developed. If crucial developmental stages — from preconception through childhood — are disrupted by exposure to toxicants, permanent damage can result. Some children are at even greater risk due to where and how they live, and/or as a result of their genetic inheritance.

Box 4: Defining the scope of “childhood”

Throughout its work on children’s health and environment, CPCHE focuses on the developmental stages from conception through adolescence. Given the ability of some environmental contaminants to affect human reproduction, pregnancy outcomes and subsequent child development, pre-conception exposures for both parents are also of concern.

Certain childhood disorders are on the rise. While the overall health of children in Canada is improving, as judged by parameters such as life expectancy and the decline in certain infectious diseases, there are worrying trends in certain diseases affecting children. Asthma prevalence has risen dramatically over the past few decades. Learning and behavioural disorders and obesity affect large numbers of children and are increasing, as are several cancers among young adults. Environmental exposures, within a broader range of contributing factors, are associated with all of these health outcomes.

Many chemicals are not regulated and most have been inadequately evaluated. Scientific knowledge of the health effects of many chemicals — particularly the potential effects on child health and development — remains insufficient. The potential for chemicals/pollutants to permanently harm the developing brain, to cause cancer and to adversely affect endocrine and immune function are areas of particular concern. Although some progress has been made in how pesticides are assessed, most chemicals continue to be tested one at a time, despite the fact that all people — including the particularly vulnerable fetus and child — are exposed on a daily basis to small amounts of many different chemicals. Current chemical assessment protocols fail to fully account for this real-world complexity.

Environmental exposures are largely preventable. As a society, we have the power to protect children from known and suspected environmental health risks through regulation and exposure prevention. While some factors that influence health cannot be changed, such as a child’s genetic make-up, the physical environment is a determinant of child health that we **can** do something about.

“Over the last number of years, there has been an explosion of allergies. Asthma rates have skyrocketed and chronic disease rates have increased. Many factors contribute to this escalation in chronic disease among children. The environment is believed to be a substantive factor which, following further research, should lead to appropriate clinical and environmental changes that will positively impact the health of Canadian children and youth.”

— Dr. Kellie Leitch, Advisor to the Federal Minister of Health on Healthy Children and Youth, 2007.²

Box 5: A vast toxicological experiment

In 1998, the US Environmental Protection Agency (EPA) determined that 43 percent of the 3,000 high production volume (HPV) chemicals (i.e., chemicals imported or produced in the US at more than 1 million lbs/yr) had no basic toxicity data and only seven percent had a full set of basic test data. Despite the progress that has since been made in increasing the amount of test data that is available for these chemicals, most notably through a suite of voluntary industry initiatives,* the data gaps remain unacceptably large, particularly for health effects of greatest relevance to the developing fetus and child. Results from a more recent EPA analysis suggest that the problem of inadequate testing of chemicals has yet to be solved. In 2006, EPA conducted a data gap analysis of 235 chemicals from among a list of some 600 chemicals that reached high production volume status since the late 1990s. EPA found that these “recently emerged” HPV chemicals had even less publicly available data than did the original HPV list examined in 1998, with more than half (52 per cent) lacking publicly available screening-level hazard data.³ Although Canada has made important progress recently in setting priorities for dealing with chemicals of high concern, the overall data gap in Canada, and indeed worldwide, is similarly deficient.

It is in the context of our vast ignorance about the potential health effects of many of the chemicals that we produce, use and release into the environment, as well as the slowness of regulatory agencies to act in the face of initial evidence of harm that Dr. Herbert Needleman, a well-respected physician-researcher in the United States, remarked:

“We are conducting a vast toxicological experiment in which our children and our children’s children are the experimental subjects.” — Dr. Herbert Needleman, Professor of Psychiatry and Pediatrics, University of Pittsburgh.⁴

* See section 3 of the Report of the National Policy Consultation (available at www.healthyenvironmentforkids.ca) for a description of these programs.

Children’s Health in Canada Today

“Today the most serious diseases confronting children in... industrially developed nations are a group of chronic conditions of multifactorial origin that have been termed the “new pediatric morbidity.” Examples include asthma...; childhood cancer...; neurodevelopmental and behavioral disorders; and certain congenital defects. — Philip J. Landrigan, et al. 2002.⁵

Growing concerns

There are growing concerns about certain increasingly common chronic diseases and developmental challenges among children in Canada.

- **Asthma** affects 12 percent of children in Canada, according to Statistics Canada data from 2000. Levels quadrupled in just two decades.⁶ While the causes of asthma are not fully understood, most researchers agree that indoor and outdoor air pollution play a role.
- The prevalence of **neurobehavioural and neurodevelopmental disorders** among children in Canada is strikingly high, with more than a quarter of children aged 6-11 years affected by at least one identifiable learning or behavioural problem, according to data from the 1997 National Longitudinal Survey of Children and Youth.⁷ Statistics Canada has since reported a large increase in learning disabilities between 2001 and 2006, among both children and adults.⁸
- The National Cancer Institute of Canada reports that an average of 1,289 children aged 0 to 19 years are diagnosed with **cancer** every year.⁹ While survival from childhood cancer has improved, the incidence rates have not declined and cancer remains the leading cause of illness-related death for children more than one year of age.¹⁰
- Since the 1970s, there has been a steady increase in **cancer incidence among young adults** (aged 20 to 44 years), including: thyroid cancer; non-Hodgkin’s lymphoma; lung and

brain cancers (among women); and testicular cancer.¹¹ This worrying trend raises concerns about early life exposures, particularly in the womb, given that cancer normally takes years to develop and is more likely to be initiated during periods of rapid cell division.

- Given the vital role of hormones as the body’s chemical messengers, **disruption of normal endocrine function** can have a wide range of outcomes, including effects on neurodevelopment, the reproductive system and immune function. Birth defects of the male reproductive tract, including hypospadias (a defect in the male urinary tract) and cryptorchidism (undescended testicles), appear to be on the rise.¹² Cancer of the thyroid, another endocrine site, is the fastest growing cancer among young adults in Canada.¹³
- In 2004, more than one in four children in Canada (26 per cent) aged 2 to 17 were **overweight**, including eight per cent who were classified as **obese**, with levels even higher among Aboriginal* children.¹⁴ While insufficient exercise and dietary factors are major contributors to childhood obesity, some emerging evidence suggests that ongoing exposure to certain chemicals may play a role.¹⁵

* CPCHE acknowledges that use of the term “Aboriginal” gives insufficient recognition to the individual cultures and histories of the First Nations, Inuit, Métis and off-reserve indigenous peoples in Canada. Its use here is intended to ensure accurate reporting of the data that are being referenced.

Some children are at greater risk

Children living in poverty, children who are poorly nourished, children who live in substandard housing or whose families don’t receive the social supports and services they need are often more exposed to and/or more at risk from the adverse effects of toxic chemicals and air pollution. Children also may be differentially affected due to their genetic make-up, gender and/or geographic location.

Over 11 percent of children in Canada live in low-income families (Statistics Canada, 2006 data).¹⁶ Poverty is a known risk factor for environmental exposures. It can also add to or exacerbate the other challenges faced by children living in disadvantaged circumstances, such as inadequate nutrition, that independently have a negative influence on health.¹⁷ Children living in poverty, for example, are more likely to live in homes with mould or deteriorating lead paint, where landlords may frequently use pesticides to control insects or rodents, or that are near major transport corridors where air pollution levels are higher. Children who are undernourished — often a corollary of poverty — may be at greater risk. Poor nutrition, for example, can lead to greater uptake of toxic substances such as lead.¹⁸

Aboriginal children often experience poverty and related risk factors to a much greater extent than other children in Canada. Low quality and poorly maintained housing, polluted drinking water and inadequate sewage disposal, along with poor nutrition, high rates of obesity, infectious and chronic diseases, particularly diabetes, and a range of social problems all contribute to the greater risks for Aboriginal children. Traditional food sources, such as fish, marine mammals and game, can be much more contaminated with persistent toxic substances, such as organochlorine pesticides, PCBs and certain metals, compared to store-bought foods. The Inuit living in the North have unparalleled exposure to persistent contaminants, as evidenced by measurements in fish, marine mammals and breast milk.¹⁹ Despite concerns about contamination, experts from within and outside indigenous communities are quick to note that consumption of traditional diets and breastfeeding have important benefits and should not be discouraged. Proximity to pollution sources can also be a concern for Aboriginal communities. A marked shift in recent years in the sex ratio of children born in the Aamjiwnaang First Nation community near Sarnia, Ontario, with significantly more girls than boys being born, is raising concerns that pollution from the heavy concentration of petrochemical plants in the area is altering hormonal function in the parents and/or causing sex-specific mortality *in utero*.²⁰

Box 6: Early exposures set the stage for health outcomes later in life

For example, lead exposures in early childhood can affect not only the intellectual capacity of the child, but may also accelerate loss of cognitive function later in life, according to recent scientific research.²¹ Emerging evidence about the effects of some pesticides raises similar concerns about toxicity to the developing nervous system and a possible role in diseases of the elderly brain, such as Parkinson’s disease.²²

“Few tragedies can be more extensive than the stunting of life, few injustices deeper than the denial of opportunity to strive or even to hope, by a limit imposed from without, but falsely identified as lying within.”

— Stephen Jay Gould, quoted by Dr. Bruce Lanphear at the CPCHE National Policy Consultation workshop in Moncton, NB, May 2007.

In addition to the substances that we know can damage children’s developing brains, such as lead, mercury, certain solvents, PCBs and PBDEs, there are many other chemicals in use that are suspected of having neurotoxic properties. The human brain requires about 20 years to fully develop, leaving open a wide “window of vulnerability” to damage from environmental toxicants.

Canada Stepping Up

CPCHE’s National Policy Consultation process revealed that there is a diverse array of **stakeholders** in Canada who are committed to better understanding environmental risks to child health and to ensuring that children are adequately protected. The **federal government** is taking some decisive steps, particularly in the areas of chemicals management and environmental health research and tracking, and some **provinces** and **municipalities** are developing precedent-setting policies to protect their citizens from environmental health risks (see Box 7). The **public’s** attention to chemical hazards and consumer product safety has been dramatically heightened as a result of the recent large-scale recalls of lead-contaminated toys and the federal government’s announcement of a ban on plastic baby bottles containing bisphenol A.

We have a collective opportunity to capitalize on this momentum by building a decisive national strategy that will protect the vulnerable fetus and child from the threats posed by hazardous chemicals and pollutants now and into the future.

Box 7: Building the momentum: Recent policy developments in Canada

Following are examples of recent policy developments in Canada relevant to children’s environmental health protection, both within and outside of government:

- The new *Pest Control Products Act*, which came into force in 2006, explicitly requires that children and pregnant women be protected from risks posed by pest control products, including aggregate and cumulative risks.
- The federal government completed categorization of the 23,000 substances on the Domestic Substances List in 2006 and launched the Chemicals Management Plan to address risks posed by priority toxic chemicals.
- The comprehensive report of the Advisor to the federal Minister of Health on Healthy Children and Youth (the “Leitch report”), published in 2007, contains a chapter dedicated to children’s environmental health with policy-focused recommendations aimed at strengthening research, tracking and regulatory measures to reduce children’s exposure to toxic substances.²³



- Increased funding was provided in the 2008 federal budget for environmental health research and monitoring, including expansion of the Canadian Health Measures Survey to include biomonitoring of environmental chemicals in children under six years of age. In addition, the Public Health Agency of Canada was provided with funding to improve the surveillance of congenital anomalies and neurodevelopmental disorders.
- Proposed new federal legislation on consumer product safety was introduced in 2008.
- The federal government proposed a ban on plastic baby bottles containing bisphenol A in 2008.
- Province-wide bans were legislated in Quebec (2003) and Ontario (2008) on the sale and use of cosmetic pesticides, following on similar bans put in place by 135 municipalities across Canada.
- New legislation is anticipated in Ontario to reduce the use and release of toxic substances.
- Nova Scotia, British Columbia and Ontario have passed laws prohibiting smoking in cars when children are present. New Brunswick and Prince Edward Island are considering similar legislation.
- Provincial and federal funding bodies and universities across Canada are funding critical research, such as the MIREC study (see Box 10).
- The Canadian Chemical Producers Association (CCPA) recently revised its Responsible Care® Ethic and Principles for Sustainability, to which all member companies must subscribe. Notable changes include a greater emphasis on proactively engaging stakeholders, a broadening of the scope beyond chemicals management to other aspects of sustainability, and a commitment to take preventative action to protect health and environment.²⁴

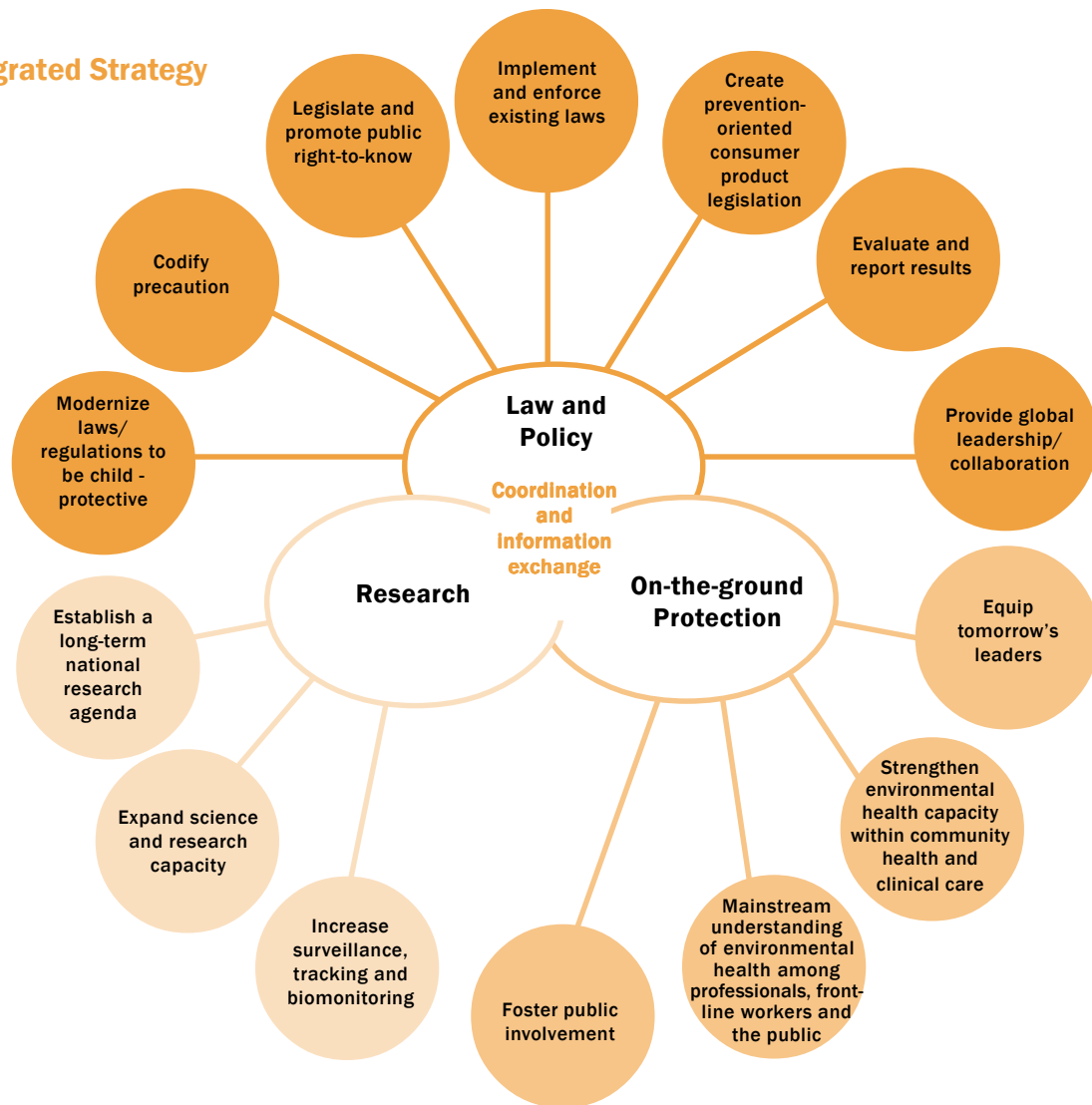
Additional governmental and non-governmental policies and programs are described in the Report of the National Policy Consultation, available on the CPCHE website at www.healthyenvironmentforkids.ca



Achieving the Vision: An Integrated Strategy

Figure 1: An Integrated Strategy

The following pages outline CPCHE’s proposed strategy for achieving this vision of children’s environmental health in Canada, with specific action steps suggested in the three strategic priority areas of (1) research, (2) law and policy, and (3) on-the-ground protection, as summarized in Figure 1. Uniting all of these actions is a central need for co-ordination and information-sharing.



Strategic Priority Area #1: Research

Goal: Sustained and coordinated research on the health effects of individual and multiple environmental exposures, with a particular focus on fetal and childhood developmental stages.

To meet this goal, there must be a clear policy commitment to, and a robust infrastructure for, environmental health research and tracking. Despite recent progress made by the federal government, institutional infrastructure, human resources and funding remain insufficient to meet the challenge of filling important gaps in our knowledge about how environmental exposures affect the health of the developing fetus and child. National Policy Consultation (NPC) participants across the board stressed the need for more environmental health research, sustained funding, and the fostering of multidisciplinary approaches. All sectors represented in the NPC strongly supported the need for national longitudinal cohort research.

Action Steps:

CPCHE calls upon the federal government, in collaboration with provincial/territorial governments, the research community and other stakeholders, to:

1. Establish a long-term national research agenda to address gaps in our knowledge base

- Expedite scientific research on key health outcomes and related exposures (see Box 3) in order to support evidence-informed policy.
- Support national longitudinal cohort research on the determinants of child health, including the role of environmental exposures (see Box 8).
- Foster innovation in chemical risk assessment methodologies and screening tools to more effectively address the complexities of real-world exposures (see Box 9).
- Support research on the health significance of low-level exposures to, and body burdens of, ubiquitous and potentially hazardous chemicals/pollutants.
- Support research on the burden of environment-related illness among children in Canada and associated economic and societal costs.²⁵
- Invest in “green chemistry” initiatives that will foster the substitution of hazardous chemicals with inherently safer alternatives (see also Box 16).

Research

- Establish a long-term national research agenda
- Expand science and research capacity
- Increase surveillance, tracking and biomonitoring

Box 8: National Longitudinal Cohort Research – It’s not a cost: It’s an investment

“There are enormous health care costs that can be averted if we can learn what makes healthy babies and implement those lessons.... the economy would directly benefit and considerable human suffering could be avoided.” — Chapin, R.E. and Buck, G.M., 2004.

CPCHE believes that sustained investment in longitudinal cohort research is a critical component of a national strategy to address environmental risks to child health.

Longitudinal cohort research involves tracking various factors or “determinants of health” (e.g., socio-economic status, environmental exposures, personal behaviours, diet) along with health outcomes in a group or “cohort” of individuals over time. It is an essential research tool for attaining a better understanding of how environment and other factors affect health and development.

- The World Health Organization (WHO) is actively encouraging countries around the world to undertake longitudinal cohort studies.
- A number of countries, including Denmark, France, Germany, the Netherlands, Norway, Spain, the United Kingdom and the United States, have already embarked on longitudinal cohort studies on the environmental influences on child health.
- Dr. Kellie Leitch, the Minister of Health’s Advisor on Healthy Children and Youth, included a longitudinal cohort study among her top five priorities for Canada.

Given its importance and the relative dearth of such research in Canada, **CPCHE calls upon the federal government to:**

- ensure that the next cycle on the National Longitudinal Study of Children and Youth (NLSCY) is expanded to include collection of environmental data, biomonitoring samples and tracking of the priority health concerns noted in Box 3.
- collaborate with the U.S. National Children’s Study²⁶ with a Canadian cohort.
- increase support for the equally important smaller, targeted studies such as MIREC (see Box 10).



Box 9: The challenge of evaluating chemicals in a real-life context

Chemicals are typically evaluated one-by-one despite the complex reality of our daily exposures to myriad chemicals. Human exposures are often at very low but continuous levels, with variations in the mixtures depending on time, place, and activities. Historically, chemical toxicity testing has been dominated by relatively high doses administered to adult animals. Although some limited progress has been made with the increased use of low dose tests on immature animals and in multigenerational studies, it remains the case that there are scant data on most chemicals. There is a corresponding heavy reliance on modeling and assumptions to bridge the gaps between available animal test data and the need to understand potential effects during immature life stages in humans, particularly given the complexity of the developing brain and other organs/body systems. While it is traditionally assumed that most non-carcinogenic substances have a “threshold” below which adverse effects are unlikely or negligible, previous conclusions about thresholds that are protective of adults have been found to inadequately recognize fetal or child vulnerability.

Progress is being made in developing new approaches to the chemical toxicity tests that are used to inform the assessments of risk conducted by governmental agencies, but significant challenges remain. Fully accounting for the complexities of real-world exposures will require:

- the development and application of techniques to evaluate the health significance of exposure to chemical mixtures;
- the aggregation of all possible routes of exposures to a chemical (including via consumer products and house dust);
- the effective use of epidemiological data, wildlife data and the results of human biomonitoring;
- continued innovation in rapid screening tools to expedite and prioritize chemical assessments and to reduce reliance, where possible, on laboratory animals;
- the employment of methods to test at lower levels of exposure and for a wider range of possible health endpoints, including latent effects as well as changes in the functioning of endocrine and organ systems;
- the development and application of new criteria for assessing persistence and bioaccumulation for human exposure, including the concept of “quasi-persistence,” used to describe substances to which we are continuously exposed and that are therefore continuously present in body tissues even if the body is capable of breaking them down; and
- vigilant recognition of inherent uncertainty and the corresponding need to incorporate wide safety margins when setting standards. This recognition and precautionary response are particularly crucial when child-relevant data are missing, but must continue to occur when extrapolating results of early-life and multigenerational animal studies to identify potential effects on the human fetus or child.

2. Significantly expand science and research capacity to address children’s environmental health concerns in Canada

- Ensure **sustained funding**.
- Create and/or expand **academic and postdoctoral programs** in environmental health toxicology and epidemiology.
- Create **multidisciplinary educational opportunities** in universities and stable career paths for young researchers.
- Ensure governmental and private sector support for **technological advances** in research methods.
- Increase **interaction between scientists and policy-makers**.

3. Increase surveillance and tracking of environmental hazards, children’s exposures and health trends. Integrate data collected by the provinces and territories on a national basis

- Ensure continued implementation of regular, **nation-wide biomonitoring** to measure “body burdens” of contaminants in people, including pregnant women, newborn infants and children, as well as contaminants in breast milk, through the Canadian Health Measures Survey and other studies (see Boxes 8 and 9).
- Improve **monitoring of contaminant levels in various environmental media** in indoor and outdoor environments and strengthen scientific understanding of **sources and patterns of children’s exposures** to toxic substances (e.g., exposures to contaminants via house dust, extent of lead contamination in pre-1976 housing stock, ambient air quality).
- Continue to improve **surveillance and reporting of birth defects and disease/disorder trends**, and investigate the associated contribution of environmental factors.



Box 10: Immediate Action Needed

Expand the Maternal-Infant Research on Environmental Chemicals (MIREC) study to include assessment of infant and child development

MIREC is Canada’s first national-level study designed to measure prenatal exposure to selected priority environmental chemicals and their impact on maternal, fetal and newborn health. Between 2008 and 2010, two thousand women are being recruited in the first trimester of pregnancy from ten cities across Canada. The women are being followed through their pregnancies and up to about eight weeks post delivery. They are completing questionnaires and providing samples of blood, urine, hair, breastmilk, cord blood and their infants’ meconium (first expelled feces) for exposure assessment and biomonitoring purposes. The data from the study will provide a national profile of exposure during pregnancy and lactation to priority environmental chemicals such as lead, mercury, cadmium, phthalates, bisphenol A, organophosphate pesticides, perfluorinated compounds, brominated flame retardants, other persistent organic pollutants, and cotinine. For more information, see www.mirec-canada.ca

CPCHE strongly supports the expansion of the MIREC study to include long-term assessment of the children born to the participating mothers. This is an opportunity to deepen our understanding of the possible connections between fetal/early life exposures and child health outcomes.

Strategic Priority Area #2: Law and Policy

“Accurate assessments of exposures and health outcomes are needed. The Maternal-Infant Research on Environmental Chemicals (MIREC) study is gathering biomonitoring information on fetal and early life environmental exposures. To date, the proposed second phase of this study that would track the incidence of endocrine, neurodevelopmental, immune, thyroid, and other health outcomes in these infants has not been funded. This extension of the study, MIREC-Infant Development, represents a very cost-effective and valuable opportunity to explore the possible links between the exposure data and these outcomes, as well as the roles of genetics, nutrition, psychosocial and other modifying factors.” — Barbara McElgunn, Learning Disabilities Association of Canada

Goal: Comprehensive, consistent and integrated legislation is in place for chemicals, pesticides, consumer products, food, air and water pollutants and contaminants in soil, within a national policy framework that (1) actively promotes the incorporation of child-protective measures in policy-making and regulatory decision making, (2) applies precaution in the face of scientific uncertainty, and (3) considers and seeks to reduce the multiplicity of hazardous exposures that prospective parents, pregnant women and children experience in their day-to-day lives.

Law and Policy

- Modernize laws/regulations to be child-protective
- Codify precaution
- Legislate and promote public right-to-know
- Implement and enforce existing laws
- Create prevention-oriented consumer product legislation
- Evaluate and report results
- Provide global leadership/collaboration

Notwithstanding the encouraging progress achieved or proposed in some areas — such as improvements in federal pesticide regulation, early results of Domestic Substances List (DSL) categorization, actions resulting from the Chemicals Management Plan, and proposals to reform the *Hazardous Products Act* — Canada does not yet have an integrated and modern legal infrastructure for protecting children and the developing fetus from the potential health risks posed by toxic chemicals, products and pollutants. Parallel to the need for legal reform, more rigorous implementation of existing laws is needed, as well as better integration with laws and policies at the provincial/territorial levels. Above all, precaution needs to be elevated as a core principle (see Box 2).

Action steps:

CPCHE calls upon the federal government, in collaboration with provincial/territorial governments, to:

1. Modernize federal and provincial legislation and regulations to include specific requirements to protect fetal and child health and development

- *At a minimum*, include in all relevant legislation the same measures that have been codified in the *Pest Control Products Act* (PCPA) including: (1) **legal recognition of pregnant women and children** as vulnerable populations; (2) the mandatory application, when assessing risks, of **uncertainty factors** in the absence of test data relevant to immature, including fetal, life stages; (3) **aggregation of exposures** from all sources, including air, water, food, soil, dust and consumer products; and (4) **assessments of cumulative exposures to chemicals** with similar modes of toxicity.
- Develop a **mandatory “children’s health” test battery** to be used in chemical risk assessment for priority chemicals* that includes laboratory tests to evaluate both acute and chronic immunotoxicity, developmental neurotoxicity and reproductive toxicity, with exposures and observations at various mammalian life stages (see Box 11).
- Require the **re-assessment of CEPA-toxic and other priority chemicals** periodically (at least every ten years) and/or when new scientific information becomes available.
- Require **workplace exposures to be explicitly considered** when assessing fetal and childhood exposures and risks associated with hazardous chemicals (see Box 12).

* CPCHE believes that priority chemicals should refer to substances, including pesticides, that have known or suspected health effects and that have the greatest potential for fetal/child exposures, taking into account potential exposures via any environmental media. The scope of criteria for identifying priority chemicals should be broader than those used to identify toxic substances under CEPA.



Box 11: Immediate Action Needed

Tests that evaluate the potential for chemicals to affect the developing fetus and child must become mandatory

With the exception of pesticides, tests relevant to children are not legally required in toxicity studies conducted by industry and submitted to Health Canada for either new or existing chemicals. In addition, neurotoxicity was not considered as a core health end-point in the recent categorization of the 23,000 substances on the Domestic Substances List in Canada. In the United States, the prenatal developmental toxicity test in mammals is an optional element of the voluntary high production volume (HPV) industry challenge program²⁷ and may be required, at EPA’s discretion, for new chemicals produced above 100,000 kg per year. In contrast to Canada and the United States, under the Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH) program, the European Union requires the prenatal developmental toxicity test involving laboratory animals for both new *and* existing chemicals produced above 100,000 kg per year.²⁸

Canada must establish a legal requirement for data from laboratory tests relevant to the developing fetus and child in evaluations of new and existing chemicals, that at a minimum would include a two-generation reproduction study in mammals, enhanced with some developmental neurotoxicity and developmental immunotoxicity endpoints.

Box 12: Caution! Fetuses at work

Workplace hazards need to be taken into account in assessing potential exposures to the developing fetus and child. With many women in the paid workforce, hazardous substances in the workplace pose risks to fetal development. “Take-home” exposures carried home on equipment, clothing, hair, shoes, or other personal effects by parents and caregivers who work with hazardous substances can also place the health of children at risk. In addition, there is increasing evidence to suggest that some exposures experienced even prior to conception by prospective parents — mothers *and* fathers — can potentially affect reproductive outcomes.

Workplace exposures must be explicitly considered when assessing fetal and childhood exposures and risks associated with hazardous chemicals. Furthermore, chemical risk management approaches need to be integrated with occupational health and safety regulations and programs to better protect reproductive and fetal/child health.

2. Codify the precautionary approach in federal and provincial legislation and policy, where not already in place, and ensure that governmental agencies:

- **Take timely action** to reduce or eliminate exposures when toxicological or epidemiological evidence emerges in the scientific literature to indicate a potential health threat (see Box 2).
- **Shift the “burden of proof”** from government to polluters and producers/importers of potentially hazardous substances (see Box 13).
- Adopt the **substitution principle** whereby hazardous substances are actively replaced with less hazardous alternatives (see also Boxes 14 and 15).
- Adopt additional measures to ensure **extended producer responsibility** for products such that full life-cycle analysis within a context of reducing the use and release of toxic substances is a mandatory part of decisions about product components, their production, use, packaging, disposal and/or recovery.
- Foster **corporate environmental stewardship** and reward initiatives that demonstrate corporate environmental leadership.

“Policy is a pattern in a stream of decisions.”

— (source unknown), quoted by Ken Ogilvie, Executive Director, Pollution Probe, at the National Policy Consultation workshop in Vancouver, BC, November 2007.

Box 13: Shifting the “burden of proof”

Recent changes to the *Pest Control Products Act* place the onus on industry to conduct extensive toxicity testing of pesticides to enable the federal regulatory agency to evaluate pesticides for “acceptable risk.” In a more modest approach to shifting this burden, the new Industry Challenge Program under the Chemicals Management Plan calls upon industry to provide existing data on uses and management (but, notably, not existing or new toxicity data) for 200 high priority substances to help determine if these substances can be adequately managed. While this is a first step, **more comprehensive changes are needed to truly “shift the burden” so that industry has to provide governmental evaluators with sufficient data to support a claim of acceptable risk before gaining or retaining access to the marketplace.**

Box 15: Tools for good decision-making

Life Cycle Assessment (LCA) is the comprehensive evaluation of environmental impacts associated with a product throughout its life cycle – from raw material extraction and consumption through manufacturing, energy consumption, product use and end-of-life management. As manufacturers and the society at large seek safer alternatives to hazardous chemicals in products, LCA can be a valuable tool for evaluating the potential trade-offs. It can help inform decision-making about the pros and cons of a proposed chemical substitution, for example, or shed light on the conservation attributes of various greener packaging alternatives. As such, analytical tools such as LCA can help prevent good intentions from resulting in bad decisions.

Box 14: Do we really need all these products?

Modern society, especially in North America, is incredibly wasteful. Vast amounts of consumer goods and packaging are produced, often from vital non-renewable resources, leading to equally vast amounts of materials that are ultimately landfilled or incinerated. CPCHE believes that we need to make critical and informed choices about what we continue to produce and consume. **If we are to get on a more sustainable path, we need to start asking the simple question: “Do we really need all of this stuff?”**



3. Develop the legal basis for, and foster a culture of, public right-to-know

- Strengthen the legal basis for, and proactively ensure, timely **public access to information** used in regulatory decision making, including removing the eligibility for health and safety data to be protected as Confidential Business Information (CBI).*
- Provide meaningful opportunities for **stakeholder engagement**.
- Ensure that the public has **ready access to site-specific data on the sources and amounts of chemicals/pollutants in the environment** through expansion and/or development of federal, provincial and local government programs such as the National Pollutant Release Inventory and regular public reports on drinking water quality (see also Box 16).



* It is important that the identity of a chemical not be masked, particularly if it will leave the facility in the form of releases to air, water or land or as a constituent in a product.

Box 16: Ontario poised to take important step forward with proposed Toxics Reduction Act

The Government of Ontario is introducing toxics reduction legislation that will require industrial facilities to track and publicly report their use and releases of toxic chemicals. Facilities will also be required to develop plans for toxics reduction. The Canadian Environmental Law Association (CELA), a CPCHE partner, has developed a model law to inform the deliberations on the scope, content and implementation of the proposed law and has commented on the provincial Discussion Paper.²⁹ Among the recommendations put forth by CELA and other environmental, health and labour organizations are that the new law should apply to a much larger list of chemicals than is thus far proposed. Further, the law should establish toxics reduction targets and require, not simply encourage, the substitution of safer alternatives to toxic substances. It should provide the legal authority for establishing an institute to provide technical assistance to industry and public outreach and education, similar to the Toxics Use Reduction Institute created by the State of Massachusetts under its Toxics Use Reduction Act of 1989. Central to the success of the Massachusetts law has been the requirement for toxics use reduction plans to be approved by state-certified planners trained by the institute.

CPCHE supports Ontario’s move to enact toxics reduction legislation and calls upon the Ontario government to ensure a comprehensive approach in this law that establishes clear toxics reduction targets, applies to a larger list of chemicals, requires substitution of safer alternatives, establishes an institutional framework that both facilitates and approves the preparation of toxics use reduction plans, and strongly supports public right-to-know.

4. Implement and enforce existing laws to protect the environment and child health

- Take **immediate action on known environmental threats** to children (see Boxes 17-22).
- Apply the *Canadian Environmental Protection Act (CEPA)* such that a **designation of a substance as CEPA-toxic automatically triggers action to evaluate its use in products** that may also come under the purview of the *Hazardous Products Act*, the *Food and Drugs Act* or the *Pest Control Products Act*, with a view to ensuring proper regulation/control.
- Implement the Chemicals Management Plan to **address the full life-cycle of chemicals** from production through to disposal, as provided for under CEPA.
- Set environmental **standards/guidelines** (e.g., for drinking water, air toxics) **at levels that are protective of children** and that apply precaution and wide margins of safety, recognizing the reality of **multiple chemical exposures**.



Box 17: Immediate Action Needed

Get lead and mercury out of consumer products

National Policy Consultation participants across the board called for **immediate action to eliminate all non-essential uses of lead and mercury from consumer products**, in light of the well-known effects of these toxic metals on the developing brain and other body systems.



Box 18: IMMEDIATE AND SUSTAINED ACTION NEEDED

Reduce air pollution and greenhouse gas emissions

Both air pollution and carbon emissions require immediate and sustained action, given the urgency of climate change and the vulnerability of children to its adverse effects,³⁰ as well as the close correlation between greenhouse gas emissions and major sources of air pollution. Such action should include further development and implementation of the federal government’s Regulatory Framework for Air Emissions, which encompasses greenhouse gas emissions, industrial and transportation sources, ambient air pollution and indoor air contaminants.

CPCHE calls upon the federal and provincial/territorial governments to:

- Establish **health-based and enforceable national ambient air pollution standards** for smog-forming air contaminants, heavy metals and emissions of other toxic substances using an air-shed approach and addressing cumulative exposures, along with corresponding regulatory action to control such emissions from all major sources according to clear reduction targets and deadlines.
- Adopt an **integrated policy framework** that includes an appropriate mix of: 1) pricing of carbon emissions (as recommended by the United Nations Intergovernmental Panel on Climate Change and successfully implemented by Sweden and

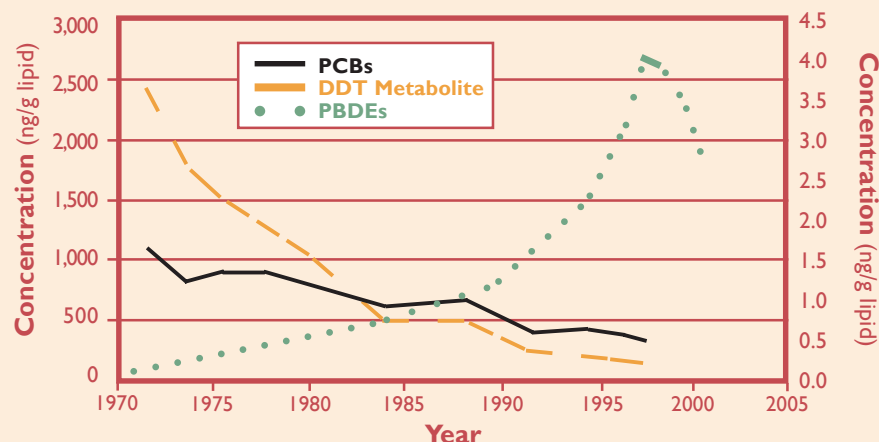
other European Union countries), 2) a mandatory and progressive cap-and-trade program for large industrial emitters of greenhouse gas emissions, and 3) strong incentive programs for investments in energy efficiency and renewable energy sources.

- **Aggressively reduce fossil fuel reliance** through diverse means of achieving greater energy efficiency, fostering the development and use of renewable energy supplies, and applying transportation, fuel efficiency and land use planning policies to reduce automobile dependence.
- **Prioritize investment in both climate change mitigation and adaptation measures**, in order to prevent and reduce the negative impacts on the environment and human health that are anticipated to occur as a result of human-induced changes in global climate, with an emphasis on particularly vulnerable regions, e.g., the far North and inner cities affected by the heat island effect.

Box 19: Regulation Works: Sweden’s experience in reversing a rising trend in PBDEs in breast milk

Sweden has a long history of monitoring environmental contaminants in breast milk. A disturbing upward trend in the levels of polybrominated diphenyl ethers (PBDEs) in human breast milk was successfully reversed in Sweden following a ban by the Government of Sweden in the late 1990s on the use of these chemical flame retardants, as shown in the figure below.

Trends in Chemicals in Breast Milk, Sweden



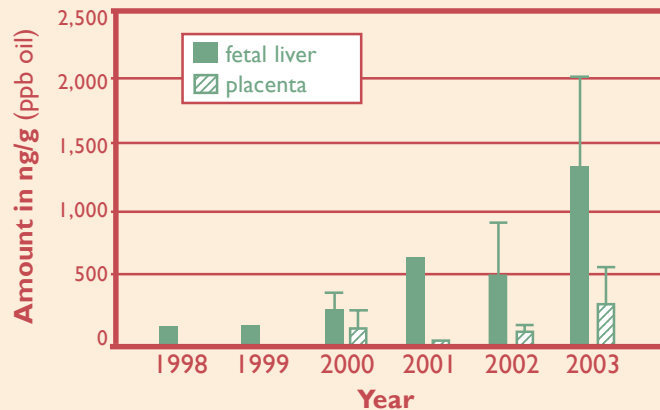
Source: Adapted from NRDC (www.nrdc.org/breastmilk/chems.asp) and Hooper and She, 2003.

In contrast, while Canada has declared PBDEs toxic under the *Canadian Environmental Protection Act*, the ban applies only to those PBDEs voluntarily phased out during 2004. Deca-BDE is still in widespread and increasing use as a flame retardant in electronics and a host of other consumer products manufactured, and in particular, imported into Canada. Increasing scientific evidence confirms that all PBDEs, including deca-BDE, are highly toxic, persistent, and bioaccumulative and that deca-BDE can break down in the environment into the other PBDEs that are banned. PBDEs have a suspected role in multiple health effects, including cancer and developmental neurotoxicity. Because PBDEs have been used in durable consumer goods for more than twenty years, they are creating a legacy of indoor contamination, mostly in dust, that will persist for many years into the future. As depicted in

...Box 19 continued

the following graph, levels of PBDEs in fetal liver and placental samples are rising in Canada. PBDE levels in the breast milk of women in Canada are among the highest in the world.³¹

Amount of Brominated Diphenyl Ethers (BDEs) in Canadian Fetal Liver and Placenta Samples



Source: Doucet J., D.L. Arnold, et al., 2004.

A recent biomonitoring study underscores the need to protect children from exposures to persistent bioaccumulative chemicals. Analysis of body burdens of deca-BDE in toddlers and their mothers in a population from eight US states showed that children are more highly exposed than adults. The levels found in the children’s bodies were typically three times greater than in their mothers’.³² Other human biomonitoring results consistently show higher levels of metals, pesticides and other chemicals in children as compared to adults.



Box 20: Immediate Action Needed

Catch up with Europe and the US and ban phthalates in children’s products

During the summer of 2008, in response to worldwide recalls of toys containing toxic chemicals, the United States passed legislation to restrict lead and phthalates in children’s products. The law will place restrictions on phthalates similar to those imposed in Europe several years ago. The law drastically restricts, and therefore essentially bans, three phthalates (DEHP, DBP and BBP) in children’s articles. It also applies to an additional three phthalates (DINP, DIDP and DnOP) on an interim basis while they can be comprehensively studied. Of note, this review will examine the full range of possible health impacts, including endocrine disruption, as well as the aggregate exposure and cumulative effects from multiple sources of phthalates in consumer products. Phthalates are synthetic plasticizers used in a wide variety of products, including vinyl and many personal and cleaning products, and have been linked to developmental impacts and cancer. In contrast to the actions taken by other industrialized countries, Canada remains far behind with a proposed ban on a single phthalate (DEHP) in children’s products.

Canada must take immediate action to ensure that children in Canada are protected from exposures to phthalates in consumer products by enacting measures that are at least as protective as those in place in Europe and the United States.

5. Develop comprehensive consumer product legislation that is proactive, prevention-oriented and supportive of public right-to-know (see Box 21)

- Adopt and publicize a **list of chemicals** associated with cancer, reproductive and/or developmental toxicity, along with a user-friendly database of information on such chemicals and which products contain them.
- Require that consumer product manufacturers, importers and retailers proactively disclose the presence of any of these chemicals in their products through comprehensive **labeling** requirements and the posting of detailed product information on company websites.
- Ensure that the federal government has the power to issue **product recalls**.

Box 21: Consumer products and the indoor environment: Focus on prevention

CPCHE believes that effective regulation of toxic substances in consumer products must be the centrepiece of a coordinated national effort to improve the health of the indoor environments in which children live, learn and play.

Children in Canada spend up to 90 percent of their time indoors. A diverse array of products routinely found in the home — ranging from vinyl shower curtains to home furnishings, from electronics to personal care products, from food packaging to products used in home cleaning or renovations — are important sources of toxic contaminants in food, indoor air and in house dust. Numerous recent studies and early results from the Canadian House Dust Study³³ confirm that significant amounts of contaminants end up in house dust, thus creating exposures of particular relevance to young children who have frequent hand-to-mouth activity and time spent on the floor.

Large-scale industry recalls of toys contaminated with lead and other products containing hazardous substances have heightened public concern, particularly about products imported into Canada. In recognizing that it did not have the legal basis to address these hazards and risks, the federal government introduced Bill C-52 in March of 2008. This proposed law fills some key gaps including product recall powers, improvements to information and reporting requirements across the supply-chain and increased fines, but fails to go as far as modern legislation in California and many European countries. Notably, this Bill would not get lead or other toxic substances out of consumer products before they are manufactured and sold; rather it would only provide legal tools to react after the fact when such products are discovered on the market. To live up to the promise of modernizing Canadian law on consumer product safety, new legislation must include additional provisions to **prevent the non-essential use** of toxic substances in consumer products and **provide better warning labels** when they are present.

6. Evaluate effectiveness of government policies and report results

- Evaluate the effectiveness of government policies in terms of reductions in fetal and childhood exposures and improvements in child health outcomes.
- Utilize information from tracking/surveillance, including biomonitoring data, as inputs when evaluating the effectiveness of policy interventions.
- Publish performance measures, indicators of children’s environmental health and a national **State of Environmental Health report** on a periodic basis.

7. Position Canada as a leader and collaborator on global issues relevant to children’s health and environment

- Provide leadership in addressing environmental health challenges that require global solutions, such as mercury and persistent organic pollutants (see Box 22).
- Fulfill and exceed international commitments on climate change (see Box 18).



Box 22: Immediate Action Needed

Ban all PBDEs, Expand global action on POPs and mercury

Canada should ban all PBDEs and actively support ongoing efforts to add several highly toxic chemicals and additional groups of chemicals to the Stockholm Convention on Persistent Organic Pollutants (POPs), including PBDEs, short-chain chlorinated paraffins (SCCPs), pentachlorobenzene and other substances recommended for listing in the POPs treaty by the Commission of the European Union.

Concerted global action is long overdue on mercury, a potent neurotoxicant that harms people and wildlife the world over. Canada should support and promote the proposed global treaty on mercury.

Strategic Priority Area #3: On-the-ground Protection

Goal: Prospective mothers and fathers, parents, caregivers, health care professionals, teachers and others are knowledgeable about fetal and child environmental health risks and able to take steps to reduce or prevent adverse exposures, recognizing that action at the individual level is often not sufficient; strong policy, regulation and enforcement must also be in place.

Myriad decisions — from urban planning, to school bus engine technology, to buying consumer goods — have implications for the health and safety of the environments in which our children live, learn and play. The full range of actors involved in everyday decisions that affect children’s lives — parents and caregivers, doctors, dentists, public health nurses, teachers, urban planners, community leaders, even retail sales people, and many more — must all be engaged in efforts to better protect children from threats to their health. A range of coordinated activities are needed, as outlined in the action steps below.

Action steps:

CPCHE calls upon government at all levels, along with other sectors of society, to:

1. Foster public involvement in children’s environmental health protection

- Provide parents and caregivers with information that enables them to make more informed choices to protect children from environmental health risks.
- Build the capacity of the public, public interest groups and health professional associations to engage effectively in

On-the-ground Protection

- Foster public involvement
- Mainstream understanding of environmental health among professionals, front-line workers and the public
- Strengthen environmental health capacity within community health and clinical care
- Equip tomorrow’s leaders

regulatory decision-making processes through information provision, skills-building, networking initiatives, and financial support.

- At all levels of government, ensure that there is an **identifiable entity** to which the public can direct questions and concerns about children’s environmental health (see also action step #3 in the Law and Policy section about public right-to-know).

“Even as we improve our laws we must be aware of the legacy of past mistakes. House dust can be contaminated with lead from paint applied in homes before 1976 or with flame retardants from sofas, mattresses or electronics bought as recently as 2003. Some of the mercury in fish may originate from the smokestacks of the 1970s — although mercury emissions from coal-fired power plants remain a serious problem. Our educational work will be successful when it becomes common knowledge that women and children should follow fish advisories, pregnant women should avoid home renovation projects, and that house dust, dryer lint and the contents of the vacuum cleaner can contain chemicals that are hazardous to a fetus or child. This increased awareness should be part of already well known childproofing techniques or advice to pregnant women about taking prenatal vitamins and avoiding smoking, alcohol or handling kitty litter.”*

— Kathleen Cooper, Canadian Environmental Law Association

2. Mainstream an understanding of environmental health among professionals, “front-line” workers and the public



- Promote the **incorporation of environmental health into academic and vocational training programs and on-the-job training** so that environmental health protection is mainstreamed into the everyday practices of health professionals, educators, child care providers, public health nurses and inspectors, midwives, urban planners, architects/designers, industrial managers, contractors and salespeople and others on the “front-line.” (See also Boxes 23, 24 and action step #2 in the Research section.)
- Ensure adequate funding for governmental departments and non-governmental organizations to **synthesize, translate and disseminate scientific evidence** for use by professionals, the media and the public.
- **Promote safe, non-toxic environments** including green hospitals and schools, “fragrance-free” public buildings, pesticide-free lawns, gardens and parks, and pedestrian-friendly communities.

* See, for example, CPCHE’s “Playing It Safe: Childproofing for Environmental Health” brochure, CPCHE’s *Child Health and the Environment — A Primer*, and the series of “Childproofing for Environmental Health” fact sheets on the CPCHE website at www.healthyenvironmentforkids.ca.

Box 23: The critical role of health professionals

Regulated health professionals, including doctors, nurses and public health workers, are highly-trusted members of the community and the people to whom most of us would turn for advice on how to protect ourselves and our children from environmental health risks.³⁴ There is much increased political and media activity and heightened public awareness on how the environment can affect human health,³⁵ which creates pressure on health professionals to respond to environment-related health concerns. Yet, most health professionals are not equipped with the knowledge, training or resources they need to adequately respond to environment-related health concerns.

In response to needs expressed during the planning meetings leading up to CPCHE’s National Policy Consultation, Health Canada’s Safe Environments Program commissioned a discussion paper³⁶ and held a “Health Professionals and Children’s Health and the Environment” Workshop in Ottawa in November, 2007. Participants from across the country and the United States examined the unique and overlapping roles of various health professions, and discussed how to improve their capacity. The recommended action steps in this section mirror those expressed at the Workshop.³⁷

3. Strengthen environmental health capacity within community health and clinical care

- Update the **curricula** in undergraduate and postgraduate health disciplines, as well as continuing education, to include knowledge and skills for preventing or managing the health impacts of environmental hazards.
- Encourage **inter-professional communication and collaboration**, particularly between clinical practitioners and public health professionals, through joint education and training, and the interdisciplinary development of evidence-informed tools, resource materials and programs.
- Foster the **engagement of public health agencies** in the development and implementation of federal children’s environmental health initiatives (see Box 24).
- Create a nation-wide protocol for **environmental-health history-taking** (see Box 25).
- Support front-line health professionals by providing **compensation** for the time needed for environmental health history-taking, and by establishing **referral centres** and ensuring access to expanded **laboratory testing** (see Box 25).



Box 24: Strengthening the role of public health professionals in children’s environmental health protection

Public health professionals – including Medical Officers of Health, inspectors, nurses, health promoters, community workers, epidemiologists, planners, toxicologists, applied researchers and policy analysts – work to promote health and prevent illness and disease at the population level through a range of activities including surveillance, hazard assessment, research, education, public awareness and advocacy.

Historically, local public health agencies have been responsible for protecting the public, including children, from environmentally mediated health risks, such as from contaminated water and food-borne illnesses. Increasingly, public health professionals are engaging with communities and policy makers on today’s environmental health challenges, including reducing exposures to toxic chemicals and pollution and combating the risks posed by climate change. For example, Ontario’s public health units successfully advocated to the Ministry of Environment for an air standard for lead that is among the most progressive in the world.³⁸

Public health professionals are well-positioned to foster awareness and prevention of environmental threats to healthy fetal and child development. They have direct interactions with community members, including prospective parents, pregnant women, new mothers and their babies, and families. They play a key role in promoting healthy behaviours and practices to support lifelong health.

CPCHE believes that there is a need and opportunity to strengthen the role of public health professionals in children’s environmental health protection by (1) fostering stronger collaboration between public health professionals and clinical health care providers; and (2) engaging public health agencies in the development and implementation of relevant policies and programs. When it comes to federal initiatives, public health agencies must have a place at the table. Local public health agencies, in coordination with their provincial/territorial counterparts, are well positioned to disseminate and implement federal initiatives in a targeted manner within their communities, resulting in a win-win situation.

“As a primary care physician, I remember that, until that winter, I had only seen the Smith family, Mary, John, 6-year-old Jason, and 4-year-old Julie, for checkups and vaccinations. But that winter they became one of my “revolving door families” (we all have them) where, every week or two I was seeing one or other of them for a variety of acute health problems. For example, within the previous month, Mary had complained of headaches, and severe bouts of fatigue, and John had come in saying he wasn’t sleeping well, had groggy thinking, and was annoyed that he could no longer tolerate even one beer without getting sick, whereas he had previously enjoyed several while watching hockey with his friends on Saturday nights. Jason had developed asthma and frequent ear infections, and his teacher said he had become “hyper” and inattentive. Julie had a continually runny nose, and a persistent itchy, cracking skin rash. When I realized I was treating them over and over, I asked them what had changed in their community, home, hobbies, work, school, personal habits/activities, or diet. It turned out that Mary, an artist, had taken up oil painting over the winter- in their dining room! Because of the odour from the paints and clean up solvents, she had installed fragranced air fresheners in the wall outlets. I was able to supply information about the known and suspected health hazards from exposure to volatile organic compounds in paints, solvents, and fragranced products. Mary chose to paint with water colours instead, to discontinue using air ‘fresheners,’ and to substitute unscented personal care and laundry products. I remember I missed seeing them sometimes.”

— Dr. Lynn Marshall,
Ontario College of Family Physicians
(a composite environment-associated case history)

Box 25: Strengthening the tool kit for health care professionals

Doctors and other health care professionals need to be better equipped to deal with environmental health concerns and to be effective agents of prevention. CPCHE recommends the following actions to build up the “tool kit” for clinical care to enhance the capacity of health care professionals to prevent, or swiftly identify and manage environment-related illnesses:

1. Create a national protocol for environmental health history-taking

Building on current resources,³⁹ the federal government, provinces and territories should work together to create a nation-wide updated protocol for environmental health history-taking, a set of basic questions about environmental exposures that would be integrated into current assessment tools and/or included in a comprehensive questionnaire framework to be tailored to local circumstances. Accompanying the questions would be information to aid in interpreting patient/client answers, as well as corresponding guidance on actions that can be recommended to eliminate or reduce specific types of hazardous exposures. The protocol would be a tool for health professionals, not only to aid in the identification of environmental exposures (e.g., lead-based paint in older housing, pesticide use indoors) that may be contributing to or exacerbating health effects in children, but also to help raise environmental health awareness among parents, caregivers and expectant parents.

2. Establish environmental health centres at the provincial/territorial level

The federal government should provide incentives for, and the provincial/territorial governments should actively pursue, the establishment of academically-affiliated environmental health centres. Such centres would support expert clinical care by serving as referral centres for children and their families, and would act as focal points for surveillance, collaborative research, and knowledge synthesis and translation. They could also play a key role in professional education by providing rotational and fellowship opportunities for undergraduate and postgraduate students in medical and public health disciplines. This one-roof approach to integrating environmental health clinical care with related surveillance, research, educational and information provision activities would aid in better understanding, preventing and managing complex, multi-system environment-associated health effects that all too often become chronic or recurring. There was enthusiastic multi-stakeholder support for such a centre in Ontario expressed by participants at an exploratory workshop sponsored by the Ministry of the Environment in April 2008.⁴⁰ As part of the fight against rising chronic disease rates in Canada, the development of such centres could draw on the model of provincial poison control centres that have played vital roles in understanding, preventing and managing acute poisonings.

3. Ensure access to expanded laboratory testing

Health care professionals need funded access to laboratory testing for measuring biomarkers of exposure as critical tools to evaluate potential environment-related dimensions of chronic illnesses.

4. Equip today’s children to become tomorrow’s leaders

- Foster among young people an ingrained understanding of the interconnections among personal/societal decisions, environmental quality and human health, through formal schooling and informal education in their homes and communities.

“People are often heard to say they are concerned about the kind of world we will leave to our grandchildren, but equally critical is the kind of grandchildren we shall leave to the earth. The values and attitudes imparted to the children and youth of today are crucial in building the political will for sustainable societies in the next century.”

— John Hoyt: *Politics for a Humane, Sustainable, Future*,
quoted by Dr. Donald Spady, Associate Professor,
Department of Pediatrics and Public Health Sciences,
Faculty of Medicine, University of Alberta,
speaker at the CPCHE National Policy Consultation
workshop in Ottawa, January 2007.



Achieving the Vision: Steps Forward

This document sets forth a long-term vision and an ambitious set of immediate actions and integrated strategies to protect the developing fetus and child from the known and suspected health risks posed by hazardous chemicals in consumer products and indoor and outdoor environments. Achieving this vision of children’s environmental health protection in Canada will require:

- **Political will and governmental leadership** at the local, provincial and federal levels domestically and on the global stage.
- **Sustained funding and human resources** within ministries of health and environment at the federal and provincial/territorial levels, and in the research sector.
- Strong **coordination** within and between levels of government, supported by a strong **regulatory framework** that includes effective enforcement of laws and regulations.
- **Accountability and transparency** on the part of governments and other stakeholders.
- **Industry leadership and action**, alongside enhanced industry-public collaboration.
- **Engagement and empowerment of the Canadian public**, facilitated by transparent and inclusive decision-making processes, robust “right-to-know” programs, information sharing and skills-building initiatives.
- **Ongoing dialogue and exchange** among stakeholders, across disciplines and across the science-policy divide.
- A sense of **shared responsibility and commitment** to act among all sectors of society.

CPCHE believes that achieving this Vision is not only possible, it is essential. Over the next few years, CPCHE will focus its energies on promoting the adoption of comprehensive and effective consumer product legislation and policy in Canada, implementing a collaborative project on early environmental exposures and chronic disease, and continuing and expanding our health promotion work through training workshops as well as website and materials development.

We thank the many groups and individuals who participated in the National Policy Consultation dialogue, which so greatly enriched our collective thinking. We look forward to seeing immediate and sustained action to implement the strategic steps suggested in this document, and will continue to work, both individually and collectively, to support those actions and make the Vision a reality.

National Policy Consultation participants expressed a desire to continue to engage on issues of children’s environmental health protection in Canada. CPCHE will seek the resources required to convene a symposium in 2010 to evaluate progress towards the attainment of the elements of this Vision and Strategy and to further identify areas of common purpose among stakeholders.

Endnotes

- ¹ Key milestones have included: the release in 2000 of *Environmental Standard-Setting and Children’s Health* by the Canadian Environmental Law Association (CELA) and the Ontario College of Family Physicians (OCFP); the publication by Toronto Public Health in 2005 of *Environmental Threats to Children: Understanding the Risks, Enabling Prevention*, prepared with involvement of CELA and other CPCHE members; and Pollution Probe’s launch in 2005 of CPCHE’s flagship publication, *Child Health and Environment: A Primer*, written by CELA’s Kathleen Cooper, with contributions and consensus from all CPCHE partner organizations.
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Much of the information in this document was drawn from the following publications, produced by CPCHE partners and available on the CPCHE website at www.healthyenvironmentforkids.ca:

- Toronto Public Health. *Environmental Threats to Children: Understanding the Risks, Enabling Prevention*. 2005.
- Canadian Partnership for Children’s Health and Environment, *Child Health and the Environment — A Primer*. 2005.
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The **Canadian Partnership for Children's Health and Environment (CPCHE)** is a multi-sectoral collaboration of eleven organizations with expertise in issues related to children, health, public health and the environment. CPCHE partners have been working together since 2001 to protect children's health from environmental pollutants and toxic chemicals by moving children's environmental health issues into the minds of decision-makers, service-provider organizations, individual practitioners, parents and the public.

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