PLAYING IT SAFE:

Service Provider Strategies to Reduce Environmental Risks to Preconception, Prenatal and Child Health

A collaborative project of:

Best Start: Ontario's Maternal, Newborn and Early Child Development Resource Centre

and the

Canadian Partnership for Children's Health and Environment

best start
meilleur départ

Ontario's maternal, newborn and early child development resource centre

Centre de ressources sur la maternité, les nouveau-nés et le développement des jeunes enfants de l'Ontario

creating a www.healthyenvironmentforkids.ca

canadian partnership for children's health & environment

2006

Acknowledgements

The Best Start Resource Centre would like to thank **Kathleen Cooper**, Senior Researcher at the Canadian Environmental Law Association for her work in researching and writing this publication as well as the many other individuals who contributed their time and expertise. In particular, production of this *Playing it Safe* manual was guided by a team of advisors, many of whom also served as key informants. This manual also benefited from the experts who contributed to the development of the companion document, *Child Health and the Environment – A Primer* and the more comprehensive report: *Environmental Threats to Children: Understanding the Risks, Enabling Prevention*, published by Toronto Public Health. **Wendy Burgoyne** was the project lead from the Best Start Resource Centre for the development of the *Playing It Safe* manual.

The **advisory group** included:
Nancy Bradshaw, Environmental Health Clinic, The New Women's College Hospital, Toronto
Susanne Burkhardt, Environmental Working Group, Ontario Public Health Association
Dianne Chopping, Toronto Public Health
Paul Filteau, Ontario Healthy Communities Coalition, Thunder Bay
Laurie Fraser, Sudbury & District Health Unit
Ann Phillips, South Riverdale Community Health Centre, Toronto
Tonya Surman, Canadian Partnership for Children's Health and Environment
Kim Tytler, Canadian Child Care Federation
Loren Vanderlinden, Toronto Public Health

Key informants generously shared their wealth of experience. Examples of their work and ideas appear throughout this manual. Many thanks to:
Nancy Bradshaw, Environmental Health Clinic, The New Women's College Hospital, Toronto
Susanne Burkhardt, Environmental Working Group, Ontario Public Health Association
Dianne Chopping, Toronto Public Health
Heather Ferries, Ontario Regional Poison Information Centre, Sick Children's Hospital, Toronto
Paul Filteau, Ontario Healthy Communities Coalition, Thunder Bay
Karon Foster, Invest in Kids
Andrea Gingras, Child Care Providers Resource Network of Ottawa-Carleton
Hinda Goldberg, North Lanark County Community Health Centre
Dorothy Goldin Rosenberg, Women's Healthy Environments Network
Robin Kealey, Canadian Child Care Federation
Cheryl Nash, eco-Perth
Tim Paquette, My Daddy Matters Because…
Ann Phillips, South Riverdale Community Health Centre, Toronto
Anne Marie Ramsay, Region of Waterloo Public Health
Carrie Regenstreif, Junction Creek Stewardship Committee, Sudbury
Paul Steeves, Success By 6 Ottawa
Tonya Surman, Canadian Partnership for Children's Health and Environment

Kara Symbolic, Ontario Healthy Communities Coalition, Eastern Region
Loren Vanderlinden, Toronto Public Health
Sue Weststrate, Best Start Resource Centre

Many thanks to **Kim Tytler** for her assistance with editing, and to **Krista Friesen** at Pollution Probe for design and layout. Cover photos were kindly provided by **Mark Surman**.

Grateful thanks are extended as well to the following individuals for additional **critical review**:

- **Louise Aubin**, **Marie Traynor**, **Connie Uetrecht** and **Franca Ursitti** with the Environmental Working Group, Ontario Public Health Association
- **Monica Campbell**, **Jill McDowell**, **Rita Paul-Sengupta**, **Carol Mee** and **Dr. Fran Scott** of Toronto Public Health

This **Best Start** manual was developed in collaboration with the **Canadian Partnership for Children's Health and Environment (CPCHE)**. CPCHE is a multi-sectoral collaboration of organizations that are working to protect children's health from environmental exposures and toxic chemicals by moving children's environmental health issues into the minds of decision-makers, service provider organizations, individual practitioners and the public. For more information, see **www.healthyenvironmentforkids.ca**.

CPCHE PARTNERS

Canadian Association of Physicians for the Environment
Canadian Child Care Federation / Fédération canadienne des services de garde à l'enfance
Canadian Environmental Law Association
Canadian Institute of Child Health
Learning Disabilities Association of Canada (LDAC)
The New Women's College Hospital
Ontario College of Family Physicians
OPHA Ontario Public Health Association / l'Association pour la santé publique de l'Ontario
Pollution Probe
South Riverdale Community Health Centre
Toronto Public Health

Best Start: Ontario's Maternal, Newborn and Early Child Development Resource Centre
c/o Ontario Prevention Clearinghouse
180 Dundas Street West, Suite 1900
Toronto, ON M5G 1Z8
Phone: 416-408-2249 or 1-800-397-9567, Fax: 416-408-2122
email: beststart@beststart.org, www.beststart.org

best start / meilleur départ
Ontario's maternal, newborn and early child development resource centre
Centre de ressources sur la maternité, les nouveau-nés et le développement des jeunes enfants de l'Ontario

This document was developed primarily through funds provided by the Government of Ontario. Funding from the Public Health Agency of Canada supported some aspects of project development. The information herein reflects the views of the author and is not officially endorsed by the Government of Ontario or the Public Health Agency of Canada.

Table of Contents

photo credit: Mark Surman

chapter one

Introduction

An Important Issue

Environmental contaminants can have serious and long-term impacts on reproductive and child health. Information about these risks, and how to address them, is new to many service providers. As awareness increases, information about environmental risks will become an accepted part of standard care for preconception, prenatal and child health. This manual focuses on how to prevent or reduce environmental exposures via actions that can be taken at the community or societal level. It shares strategies that can be used to increase awareness and change behaviour and reflects on underlying conditions that create harmful exposures in the first place.

Who is This For?

There are many opportunities to address environmental risks to child health within the work that you already do. Your work may focus on preconception, prenatal and/or early child development, or it may look at broader community level health factors. You could be a health care provider, health promoter, environmentalist, community animator, prenatal educator or early learning and child care practitioner. You may be involved in raising awareness, conducting public education, working on policy, talking to parents, facilitating prenatal groups or caring for young children. If you work in any of these areas, you are well-placed to offer precautionary advice and to help prevent potentially harmful environmental exposures.

There are various reasons to address environment and child health, either as a large or small part of your work. Motivation may arise from:

- New research
- A growing level of awareness and desire to know more
- Recognition that your education/training did not include sufficient environmental health information
- Questions from clients, parents or co-workers that you were unable to answer
- Issues arising from a community needs assessment or survey
- Concerns about environmental issues
- Concerns about children's health issues
- Program mandates or funding guidelines

Building Your Skills and Comfort Level

Given the wide range of interests, skills and knowledge levels of the audience for this manual, some sections may not be relevant for you. Some service providers are very familiar with the language and techniques of health promotion and/or have a solid understanding of environmental risks to child health. For other service providers, this information may be new or less familiar. Basic information about environmental health risks and context for health promotion work in this field is provided in this manual, as well as more advanced information about specific strategies. Use the table of contents to choose sections of greatest relevance to your work.

photo credit: Mark Surman

The topic of children's environmental health covers a lot of ground. At issue are health concerns that can arise prior to conception, during pregnancy, or during childhood as a result of many different exposures. Initiatives can be designed for specific populations such as children, women and men of child-bearing age, pregnant women and their partners, parents and grandparents, or specific service providers, as well as a range of stakeholders with interests or concerns about children.

It is worth recognizing that this topic is enormous and complex. It is also an area of emerging science and considerable uncertainty, all of which can generate fear, denial and feelings of helplessness. Given the breadth of this topic, both in terms of the wide range of possible exposures and the many life stages of interest, this manual is intended to help build your awareness, comfort level and skills. It is focused on how to do the work and provides practical tools and links to more resources and information.

The area of child health and the environment is still relatively new. There are no best practices or widely accepted approaches to address this issue. This resource shares background information about the risks, and the context of this work. It provides helpful information to guide planning, implementation and evaluation of strategies. It also shares stories and step-by-step instructions for promising approaches to raising awareness and decreasing the environmental risks to preconception, prenatal and child health. Information in this resource will help service providers consider and direct their work to strategies that are more likely to be successful, however, we need to continue to be innovative, to test and to evaluate, in order to move towards best practices.

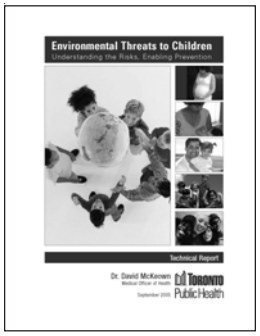
A Focus on Prevention

In creating awareness about environmental risks to prenatal and child health, we are dealing with uncertain but potentially serious risks. The prudent response is prevention, a precautionary approach. People, especially as parents, are practical. They tend to care less about the scientific debates than about what they can do – immediately – to prevent possible harm. Your job is two-fold: to convey the nature of environmental risks, and to provide practical tools for reducing or avoiding those risks. As well, since many environmental problems are beyond the control of individuals, a preventive, precautionary approach often includes strategies to address underlying factors and sources of environmental contaminants.

This manual is not designed to help service providers to assess, diagnose or attempt to find causes for illness or conditions in individual children, or in relation to individual concerns about fertility and pregnancy. Individuals with questions of this nature should be referred to their family physician.

Companion Resources

This manual is a companion to *Child Health and the Environment – A Primer* and the brochure *Playing it Safe: Childproofing for Environmental Health*, produced by the Canadian Partnership for Children's Health and Environment (CPCHE). The *Primer* was developed for a wide range of service providers, including the media and policy makers. It addresses the same life stages – preconception, prenatal and child development. Service providers are encouraged to use the *Primer* to access current background information, tips and simple action steps. The *Playing it Safe* brochure further summarizes key environmental childproofing strategies for individuals in an easy-to-read format. These resources complement the information provided in this manual. They focus primarily on individual actions, while this manual addresses service provider strategies.



The Primer is based on a larger technical report prepared by Toronto Public Health (TPH) entitled, *Environmental Threats to Children: Understanding the Risks, Enabling Prevention.*

Methods

The research focus for this manual was on strategies and activities employed by service providers to prevent and reduce environmental risks to preconception, prenatal and early child development. The advisory committee involved representatives from the fields of early learning and child care, public health, environmental protection and community development. Key informants included individuals working in these fields as well as environmental organizations, community health centres and other community-based and/or community health-focused organizations. Key informants were asked a range of questions within the thematic areas of planning, population of interest, messages, products, activities and evaluation techniques. Common themes and approaches were identified across key informant interviews, as well as from the research and/or direct experience of the author.

The *Primer* and the technical report upon which it is based (summarized in Chapter 2) provide the supporting literature review for the environmental health information in this manual. Throughout this manual, cross-references are provided to specific pages in the *Primer* for more detailed information.

CPCHE's *Child Health and the Environment – A Primer* and other children's environmental health resources for services providers and the public are available in print and online. To purchase or freely download these resources, see **www.healthyenvironmentforkids.ca**. Watch this website for additional new resources on this topic.

photo credit: Mark Surman

chapter two

Overview of Environmental Risks to Preconception, Prenatal and Child Health

This chapter summarizes important information about environmental risks to preconception, prenatal and child health. The information is adapted from the Executive Summary to *Environmental Threats to Children: Understanding the Risks, Enabling Prevention* and *Child Health and the Environment – A Primer*. For unfamiliar terms, please consult the Glossary. If you are already familiar with this topic, you may want to skim this chapter or move directly to Chapter Three.

Note: Cross-references are provided to specific pages in the Primer*, for more detailed reading.*

Summary of Key Points – Environmental Risks

The environment is a determinant of health.

- Exposure to environmental hazards can create consequences during preconception and pregnancy, and can directly impact on child health.
- Precautionary advice about environmental risks builds on traditional information about supporting healthy child development (such as ensuring folic acid intake or avoiding exposure to kitty litter).

Children are more vulnerable to harm from environmental exposures.

- Kilogram for kilogram, children eat, drink and breathe more than adults.
- Children behave differently than adults, contributing to greater exposure.
- Children's developing systems are more vulnerable to contaminants.
- The time of greatest risk is likely in the womb.

Health impacts from prenatal or childhood environmental exposures:

- Are inherently complex and difficult to verify with scientific certainty.
- Are most commonly measured following widespread exposure of the child population.
- Are increasingly apparent at the population level but are subtle and hard to isolate from other contributing factors.
- Can include chronic conditions, such as asthma and impacts on brain functioning and behaviour.
- Can include lifelong impacts such as birth defects, effects on learning and/or behaviour, or development of later life cancers.

Exposure to contaminants:

- Can occur from many sources, indoors and outdoors, including via air and dust, soil, pesticides, food, water and consumer products.
- Varies in significance with some exposures being more serious than others.
- Is of greatest significance for substances that are known or suspected of being associated with multiple effects, such as lead, mercury and PCBs.

Preventing harm to children:

- Requires action and behaviour change by individuals alongside change at the community and broader societal level.
- Is prudent and precautionary when there is incomplete information about complex environmental risks.
- Is a shared responsibility.

Children are at Risk – Overview

(Primer: Chapters 1–4)

The developing fetus, infants and children up to age three years can experience greater exposure than adults to substances in the environment. Risks continue throughout childhood to the end of adolescence as the respiratory, nervous and reproductive systems continue to develop and mature. The degree of risk arising from environmental exposures is often poorly understood because the evidence may be lacking, incomplete or inconsistent. Risks vary across different contaminants, age groups and individual circumstances. The period of prenatal development appears to be the most sensitive. In addition, parental exposure to environmental contaminants, prior to conception, can have reproductive consequences.

There are associations between environmental hazards and asthma, cancer, learning, behavioural and developmental effects, low birth weight and birth defects. There is also emerging evidence for additional health consequences such as impaired functioning of the immune system and interference with the hormones of the endocrine system.

In our environment, there are many thousands of contaminants. Hundreds are suspected of contributing to negative child health outcomes although only a small number have been fully evaluated for their effects on preconception, prenatal and child development. Nevertheless, multiple exposures continue to women during pregnancy and throughout the early years of a child's development. Exposures that occur to men and women prior to conception are also of concern. There is an urgent need for more research into the consequences of environmental exposures on children. We need a better understanding of these consequences before widespread exposure is allowed to occur. *(Primer: Chapter 1, Table 1)*

The strongest scientific evidence has come from population health studies, where widespread exposure to lead from gasoline or old paint, have demonstrated negative effects on brain development. Likewise, there is strong evidence that air pollution triggers asthma attacks in people with asthma and there is now suggestive evidence that some outdoor air pollutants can cause the onset of asthma. There is increasing evidence of many other serious effects from air pollution in the developing fetus and child.

photo credit: Mark Surman

Environment as a Determinant of Health

Figure 2.1 shows the twelve determinants of health, including the physical environment, as identified by Health Canada. These factors are understood to interact in complex ways to influence the health of everyone, including children. *(Primer: Chapter 1)*

Environmental influences on children's health need to be considered alongside other risks to preconception, prenatal and child health. For example, it is standard practice to advise pregnant women to take prenatal vitamins, in part to ensure adequate folic acid intake. They are also told to avoid contact with kitty litter which can contain the toxoplasma parasite. This advice derives from an understanding that folic acid helps to prevent neural tube defects (birth defects of the spine and brain) and that a toxoplasmosis infection can cause miscarriage, stillbirth or neonatal death. Precautionary advice is provided since there is a greater risk of health consequences when prenatal vitamins are not taken or if contact occurs with kitty litter.

Figure 2.1: Determinants of Health

Source: World Health Organization, undated.

In the field of children's environmental health, similar precautionary advice is prudent. For example:

- Fish is a nutritious source of protein and omega-3 fatty acids, important for healthy fetal and child brain development as well as brain functioning in all humans. Fish is contaminated with methylmercury to varying degrees, which can be toxic to the developing brain. Pregnant women who eat fish need good precautionary information about choosing fish species wisely.

- Risks to a developing fetus can arise from the mother's exposure to common household products including pesticides, solvents, and the contaminants in household dust. Renovation activities may lead to maternal exposures that present significant risks to the fetus. Although expectant parents often plan home renovations in preparation for a baby's arrival, pregnant women should not be doing renovations and should not be exposed to dust from renovations.

Relating environmental health information to pregnant women should be as commonplace as the advice about prenatal vitamins and avoiding kitty litter. *(Primer: Methylmercury Poisoning, page 25; Fish Advisories: Limiting Methylmercury Exposure, pages 60–61; Safe Renovations, pages 108–109)*

Children are More Vulnerable

(Primer: Chapter 2)

Differences between children and adults combine to explain a child's greater vulnerability to environmental exposures. Experts note that children are not "little adults." They are conceived, born and grow up in a world that is vastly different from that of their grandparents. Their rapid growth and development occurs while they are exposed to contaminants and synthetic chemicals. We know that growth and development is mediated by natural chemical processes. There is concern that toxic exposures may be interfering with these natural developmental processes or otherwise harming immature or delicate structures and systems in a fetus or growing child.

Children are proportionally different from adults. Because of their smaller size, kilogram for kilogram, children eat, drink and breathe more than adults. Their metabolism is also faster. To support their rapid growth, the baseline rate of breathing is faster. Activity levels are often much greater. A child's digestive system is more efficient at absorbing food and therefore any associated contaminants. As a result, children are exposed to proportionally more contaminants in food, water or air.

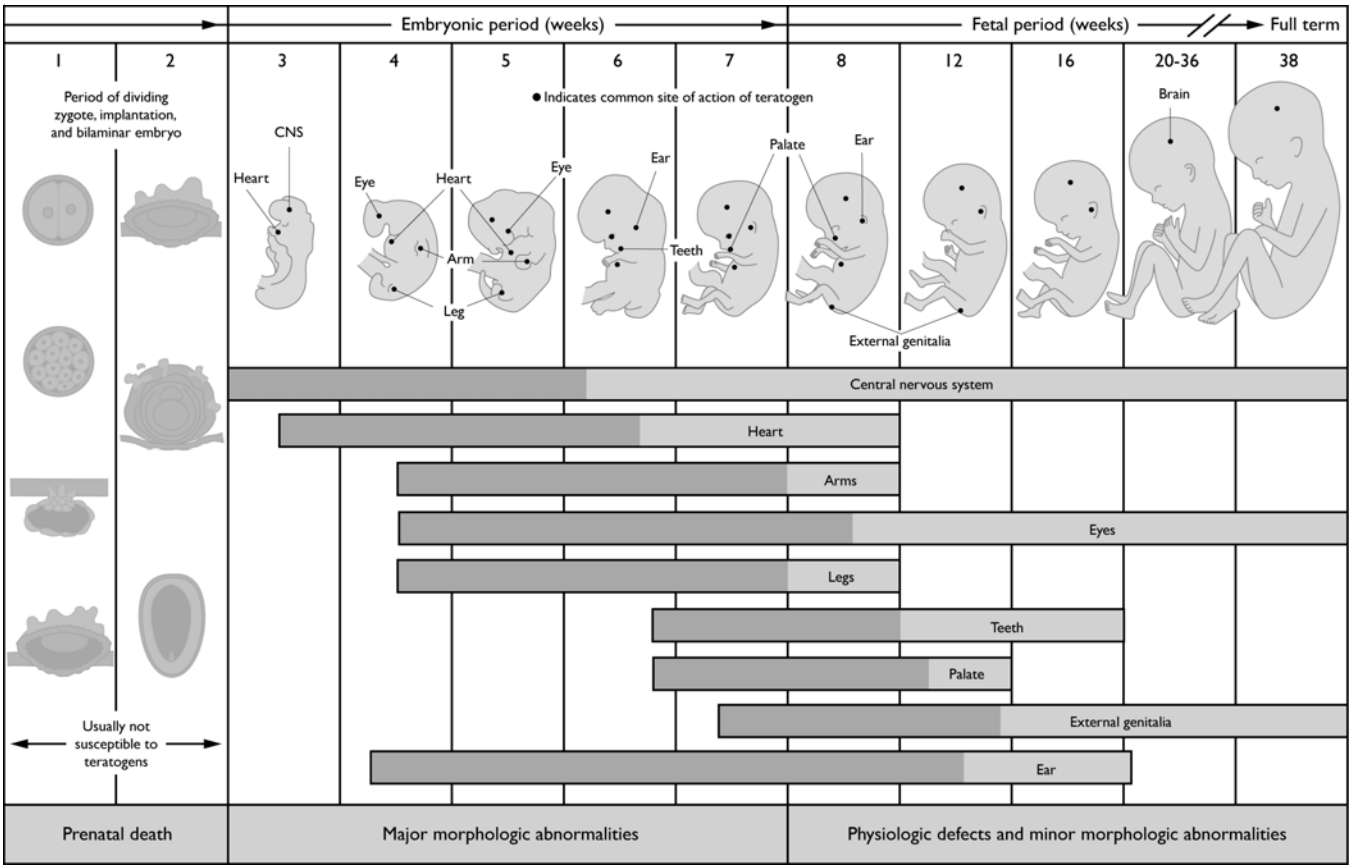
Children behave differently than adults. Children are closer to the ground where some contaminants tend to concentrate. They are in greater contact with the ground, touching potentially contaminated surfaces. Their hand-to-mouth and exploratory behaviour can greatly increase contaminant exposure and intake. They also have a longer life expectancy than their parents and grandparents, providing more opportunity for latent effects of some contaminants, such as carcinogens, to manifest.

Children's bodies are still developing. An infant's skin is more permeable than in later life. The lungs continue to develop until the teen years. Air pollution exposure during a child's long period of lung development can cause temporary or even permanent lung deficits. At birth, a child's immune, digestive and nervous systems are immature. The brain continues to develop until the end of adolescence and the reproductive system develops from late childhood into the teen years. During the reproductive years, men and women may be exposed to contaminants that can affect their ability to conceive or carry a healthy pregnancy. *(Primer: The Body Protects Itself, pages 21–22; Building the Human Brain, page 38)*

Risk is greatest in the womb. The time of greatest sensitivity to environmental contaminants is likely in the womb (see Figure 2.2). Numerous periods of vulnerability exist during pregnancy when the major organs and systems are developing. In general, toxic exposures during early pregnancy are more likely to create structural impacts such as birth defects, since this is the time when the form and structure of the body develops.

Toxic exposures during late pregnancy are more likely to result in functional impacts, such as learning difficulties resulting from impacts on fetal brain development. The impacts of toxic exposures will vary depending on which developing body system is affected.

Figure 2.2: Critical Windows of Vulnerability. This figure shows critical periods of fetal vulnerability. The dark grey bars denote highly sensitive periods; light grey bars indicate stages that are less sensitive to teratogens. The concept of vulnerability is complex, and this figure does not provide sufficient information to attribute causes of a particular health outcome such as stillbirth or cancer.



Reprinted from *The Developing Human: Clinically Oriented Embryology*, Moore and Persaud, page 98, Copyright (1973), with permission from Elsevier.

Some Children are at Greater Risk Than Others

Finally, some children are at greater risk than others. Children living in poverty can be especially affected since poverty is a known risk factor for both poor health and greater exposure to environmental contaminants. Poor nutrition, often associated with low income, can also result in a greater uptake of contaminants. For example, lead uptake is greater when calcium levels are insufficient. *(Primer: Chapter 2, pages 28–30)*

When children are exposed to environmental tobacco smoke they are at significant risk for respiratory impacts. Environmental tobacco smoke is also associated with impacts on brain development and contains over 40 known carcinogens. Since environmental tobacco smoke is explored fully in numerous other resources, it is not addressed in this manual. See the resources listed in Appendix A.

Parental occupations can place some children at greater risk. Before conception and during pregnancy, there can be reproductive and fetal developmental risks associated with occupational settings where workers can be exposed to organic solvents or other toxic substances. Some occupations can result in "take-home" exposures that are of concern for children and parents. Examples include use of pesticides on farms or in the nursery, horticultural or landscaping trades. Pesticides can be carried home on skin, hair, clothing, shoes and equipment. Parents involved in renovation activities, particularly where demolition work includes older buildings, can bring home lead and other toxic substances. For additional information on workplace reproductive risks, see Appendix A.

There are also differences in vulnerability across the child population due to natural genetic variability.

photo credit: Mark Surman

Health Effects and Trends

(Primer: Chapter 3)

Patterns of disease among children have changed dramatically in the last 100 to 200 years. Infant mortality is substantially lower and the historically common illnesses of early childhood are very rare in the developed world. Life expectancy has nearly doubled. However, chronic diseases and other debilitating conditions are on the rise among children. Several of these conditions have suspected or known associations with environmental exposures.

Health outcomes seen in large numbers of children include respiratory conditions, particularly asthma, and a range of conditions related to cognitive and neurobehavioural functioning. Respiratory effects are linked to indoor and outdoor air pollutants. There are associations between increased air pollution and increased respiratory illness among vulnerable populations including children. We are a long way from understanding the impact of most contaminants on the developing nervous system. Effects are well documented for some of the more extensively studied substances, including lead, mercury, dioxins, PCBs and some solvents. Increasing concern exists about the effects on the nervous system as a result of exposure to organophosphate insecticides and polyhalogenated compounds such as the flame retardants (polybrominated diphenyl ethers or PBDEs). As well, there is mounting evidence of neurological development concerns from early life exposure to environmental tobacco smoke. *(Primer: Chapter 3, pages 34–40)*

For each of the major health concerns with known or suspected links to environmental exposures, it is possible to assemble some data on health outcome trends. However, drawing a direct relationship between these outcomes, and exposures to environmental contaminants, is difficult. It is well known that multiple factors contribute to most health outcomes. It is challenging to establish the relative contribution of each. Understanding of the contribution of environmental factors to health outcomes is hampered by lack of good data and an inherently complex set of variables to consider.

In Canada:

- Child asthma rates have increased dramatically in Canada.
- National data from the mid-1990s indicates that for children aged 6 to 11 years, 26% have one or more learning or behavioural problems.
- Birth defects are the leading cause of infant death, followed by premature birth and sudden infant death syndrome.
- Low birth weight and birth defects may result in long-term disability.
- Childhood cancer is very rare but is the leading cause of illness-related death in children over 1 year.
- Several cancers are rising among adults aged 20 to 44 years. The causes for these increased cancer rates are unknown, but researchers hypothesize that early childhood, prenatal or parental preconceptional exposures, could be contributing factors.

(Primer: Moulds, page 34; Asthma, page 35; Learning and Developmental Disorders and Disabilities, page 36; Chapter 3, Table 2)

When describing the trends in chronic disease or other conditions in children, it is important to recognize that not all children are affected. Rather, there is an array of chronic conditions in the child population that may have been influenced by the environment. Many factors contribute to these conditions. Also, data are limited, making it difficult to know if the incidence and prevalence of these conditions is increasing over time. The asthma prevalence data show a clear increase. However, data are insufficient to know if other conditions are on the rise. Researchers look for associations between specific exposures and health outcomes in individual children, as well as population-wide effects.

photo credit: Mark Surman

Understanding Exposure

(Primer: Chapter 4)

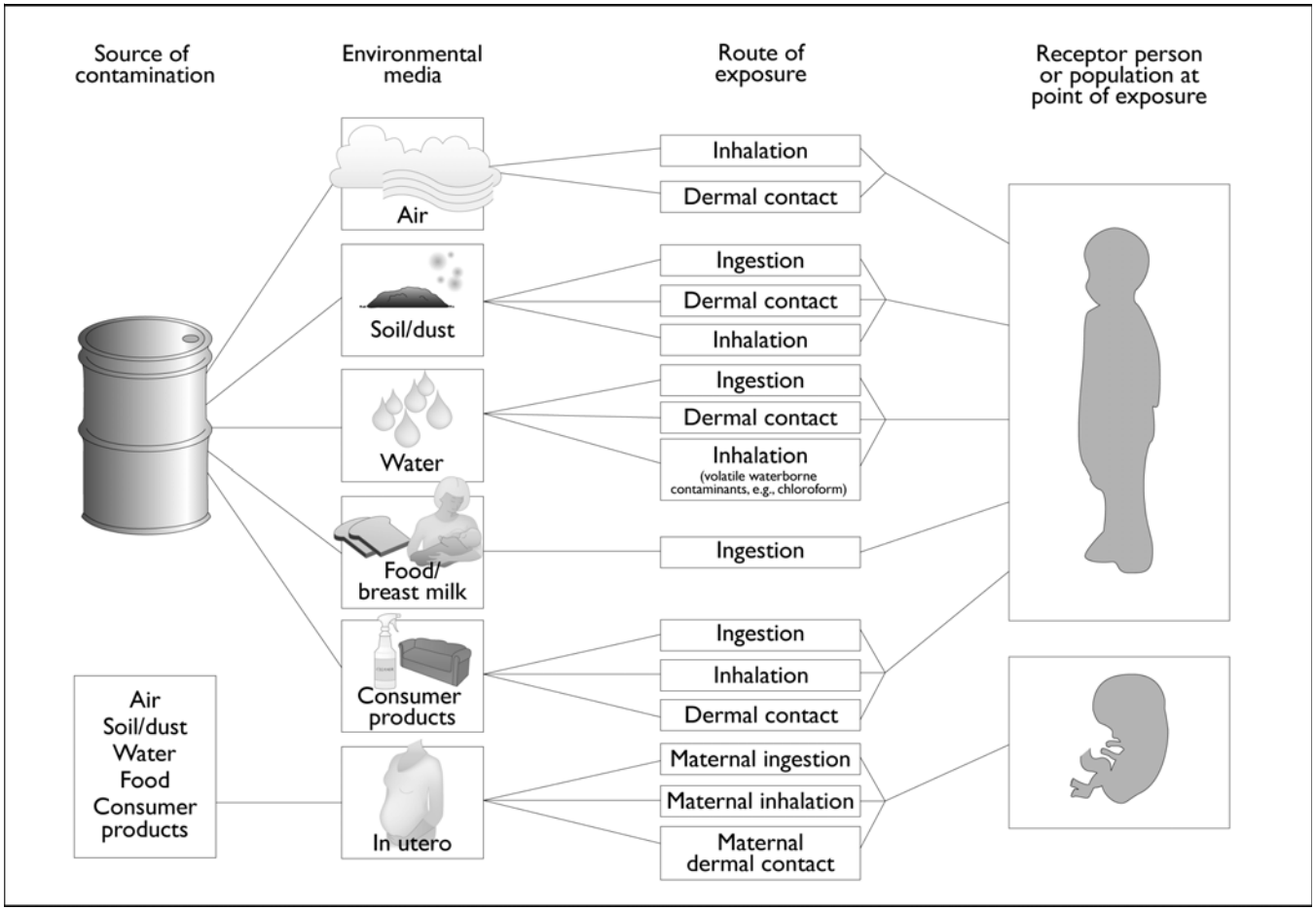
It is challenging to describe the range of substances to which children are exposed. There are many exposures of concern and numerous sources or settings where exposure can occur (see Figure 2.3). The gaps in information are even more profound for exposure data than for the scientific investigation of possible health effects. Moreover, many of the substances of greatest concern are known or suspected of being associated with multiple effects. The dose or amount of exposure is important. The timing of exposure is also considered critically important given our knowledge of the many windows of vulnerability during prenatal development and the stages of childhood.

Measurement of exposure to most pollutants is limited. Since exposure can occur via several possible pathways, measurement should include various sampling techniques. Sampling should be done through a survey of a large group of people, over an extended period of time and across different media. Measurement would need to include levels of contaminants in environmental media (such as air, food, water, soil or dust) as well as in people (such as in their urine or blood).

Biomonitoring is one way to measure exposure. It involves measuring and analyzing chemicals or other substances in blood or urine. Biomonitoring can help evaluate trends in exposures over time and assess differences in exposures among groups of people. Individual tests are considered with specific exposures or illnesses such as lead

poisoning. Biomonitoring studies in the US indicate that most people are currently being exposed to a cocktail of environmental contaminants. These studies also give an idea of a person's body burden from lifetime exposure to contaminants that accumulate in body tissues. The health significance of most of these exposures is unclear. Biomonitoring studies indicate the pervasiveness of environmental contamination. *(Primer: Chapter 2, Results of Biomonitoring, page 23)*

Figure 2.3: Major Pathways of Human Exposure to Environmental Contaminants



Adapted from Health Canada. 1998. *The Health and Environment Handbook for Health Professionals*. Ottawa: Health Canada.

Exposure Sources and Settings

(Primer: Chapter 3, Health Effects of Concern; Chapter 4: Children's Exposures)

Air and Dust

(Primer: Organic Solvents, page 49; Indoor Dust, page 65; Carpeting, page 66; Volatile Organic Compounds, page 67; Riding in Cars and Buses, page 68; Urban Air Contaminants of Concern, page 70; Atlanta Olympics, page 71)

Air – indoors and outdoors – remains one of the most significant media for environmental exposures. Alongside the range of pollutants that make up smog, other toxic air pollutants are also a concern. For example, volatile organic compounds (VOCs) and mercury are emitted by vehicles and coal-fired power plants.

Children are exposed to outdoor air pollution while travelling and playing outdoors. The air inside cars and buses is its own microenvironment and can be more contaminated than outdoors, particularly the air inside diesel-fuelled school buses.

Indoor air is a largely unregulated source of exposure to a variety of contaminants. Children's exposures in schools, child care and indoor recreational facilities are as much a part of the indoor exposure picture as the home environment. Indoor air contaminants of concern for children include environmental tobacco smoke, inhalable particles from combustion products (from woodstoves and wood-burning fireplaces), nitrogen dioxide (from poorly vented gas furnaces or stoves), VOCs (from building materials, floor coverings and furniture) and biological allergens (moulds, pet dander, house dust mites and cockroach feces). In addition, contaminant levels in indoor dust are of increasing concern and present a significant exposure pathway for children. Exposure to various indoor air contaminants is believed to increase the risks of developing asthma or other respiratory health problems.

Pesticides

(Primer: Pesticide-exposed Children in Mexico, page 37; Arsenic in Pressure-treated Wood, page 41; Dealing with Pests, page 50; Children Eating Organic Food Less Exposed to Pesticides, page 72; Pesticide By-laws – Blazing a Trail in Hudson, Quebec, page 83; Pest Management in Schools, page 84; Personal Insect Repellents, page 105)

Home and garden use of pesticides creates an exposure risk for children from direct contact with treated lawns and plants or with treated wood surfaces. In addition, residues can be tracked inside where they persist longer. In agricultural communities, pesticide exposure can occur from drift or overspray during farming applications. Indoor use of pesticides is of particular concern for children's exposure. The concern for potentially exposing children from home and garden uses of pesticides has led to greater restrictions on the use of pesticides in areas frequented by children.

Food

(Primer: Chapter 2: Nutrition, page 28; Methylmercury Poisoning, page 25; Phthalates, page 54; PBDEs – The New PCBs, page 56; Children Eating Organic Food Less Exposed to Pesticides, page 72; Multimedia Exposure: PBDEs in Food, Air and Dust)

Children's exposure via food includes trace levels of pesticides, heavy metals and persistent organic pollutants (POPs) such as PCBs, dioxins, organochlorine pesticides or their breakdown products. Such contaminants are all at very low levels and long-term downward trends are evident. For example, there is a long-term downward trend of PCB levels in breastmilk since these chemicals were phased out in the late 1970s. Other contaminants in food, of uncertain health significance, include phthalates from plastic food packaging or bisphenol A from hard plastic containers or the lining of cans. Food is also contaminated with trace levels of PBDEs (flame retardants) and levels of these chemicals are increasing in food and breastmilk.

Most of these contaminants are lipophilic, meaning "fat-loving." They bind to fat molecules and migrate from plastic packaging into fatty foods. Likewise, levels of these contaminants bind to fat in organisms and can concentrate up the food chain reaching their highest levels in high fat foods such as milk, cheese, fatty meats and oily fish. Precautionary advice for avoiding these food exposures includes following a diet low in fatty foods. Low fat does not mean no fat. A low fat diet as understood by many adults, is not appropriate for children. A balanced diet that includes

photo credit: Mark Surman

necessary fat levels from a variety of foods would include 2% milk after two years of age, a variety of lower fat cheeses, fish from the lower risk varieties and meat and poultry trimmed of excess fat/skin. For more information on nutrition guidelines for very young children, see Appendix A.

Methylmercury contamination is of particular concern. This substance is not lipophilic but it does concentrate up the food chain in animal flesh, particularly in fish. Because water-based food chains can support more levels than land-based food chains, fish can be more highly contaminated than land-based animals.

Minimizing exposure to methylmercury from fish is important for children and women in their childbearing years. Health Canada guidelines for fish consumption recommend that pregnant women, women of child-bearing age and young children limit their consumption of certain high mercury species of fish, such as shark, swordfish and fresh or frozen tuna, to no more than one meal per month. Advisories from the US Environmental Protection Agency (EPA) recommend that this group completely avoid shark, swordfish, king mackerel and tilefish but the EPA limit is less precautionary about fresh or frozen tuna, at one meal per week.

Canned tuna is an affordable, widely available form of fish. Although on average canned tuna does not exceed the Health Canada guidelines, it may contribute substantially to mercury intake, particularly for children who can be frequent consumers. Canned white tuna (also known as albacore tuna) has substantially higher amounts of methylmercury than is found in light tuna and therefore should be limited for children and women in their childbearing years. The US EPA and US Food and Drug Administration recommend eating up to one meal per week of albacore tuna and no more than two meals per week of light tuna. In fact, the US consumption guidelines state that even low mercury fish (such as light tuna, salmon, shrimp and many others) should be consumed within an overall limit of two meals of fish per week. Because of these differences in advisories, some local public health departments give more detailed and more precautionary advice to the public than is included in Health Canada's guidelines. For more information on fish advisories, see Appendix A. *(Primer: Fish Advisories – Limiting Methylmercury Exposure, pages 60–61)*

No data are available to characterize exposure to mercury among Canadians. Information on fish consumption patterns is limited, however fish consumption is higher among certain cultures, particularly Asian-Canadians, and in Aboriginal and northern communities. If fish advisory limits are exceeded, these populations can receive a relatively high exposure to methylmercury.

Water

(Primer: Lead in Drinking Water, page 74; Drinking Water – Risks and Benefits, page 75)

Chemical contaminants such as pesticides, metals and industrial chemicals can be present in drinking water, although they are generally at very low or non-detectable levels. Lead can enter drinking water from lead service lines, from solder containing lead or from brass fixtures. In older city or town neighbourhoods with homes built in the early part of the 20th century, older lead supply lines (i.e., from the street, not in the home) are gradually being replaced. Homes built prior to the 1950s may, rarely, include lead pipes. The use of lead solder for incoming water pipes was banned in Ontario in 1989. If you have solder-based plumbing or plumbing that includes brass fixtures, the risk of lead exposure can be minimized by "flushing out" the water standing in the pipes. Let the water run for a full minute or until it runs very cold first thing in the morning or if the home is

vacant all day. Toilet flushing and other non-consumptive water uses also help to flush the system. Water from the hot water tank should not be used to prepare food or drinks.

The Ontario Regulation 173/03 under the *Safe Drinking Water Act* requires public schools, private schools and day nurseries to flush the water in their system on a weekly basis and to keep a log of all flushing events. Local health units check these logs. The Ontario Public Health Association recommends daily flushing, instead of weekly flushing.

Across Canada, chlorine treatment is the most common method of treating drinking water to remove infectious microbes that can be of serious concern to child health. Disinfection by-products (DBPs) are substances created by the reaction of chlorine with naturally-occurring organic material in raw water. Where the water source has a low level of organic material, DBPs will be at very low levels. Some DBPs are suspected of associations with spontaneous abortion, low birth weight and certain birth defects.

Consumer Products

(Primer: Arsenic in Pressure-treated Wood, page 41; Organic Solvents, page 49; Phthalates, page 54; PBDEs – The New PCBs, page 56; Indoor Dust, page 65; Carpeting, page 66; Volatile Organic Compounds, page 67; Personal Insect Repellents, page 105; Lead in Consumer Products, page 107)

An increasing number of indoor exposures originate directly from the routine use of a wide range of consumer products. For many of these substances, there is emerging or increasing concern about health consequences, persistence and bioaccumulation.

For example, several chemicals within the group of substances called polybrominated diphenyl ethers (PBDEs) are widely used as flame retardants in consumer products such as computers, hand tools, furniture, mattresses and carpets. They are suspected of contributing to health concerns including cancer, and impacting on reproductive health and the developing nervous system. These substances are released during normal use and have been measured at high levels in indoor dust. They are also measurable in indoor air and on the organic film collected from window surfaces. PBDE levels in indoor dust account for the largest contribution to exposure among toddlers and most life stages except infancy. PBDE levels in breast milk have been rising dramatically in recent decades and the highest levels are found in North American women.

Phthalates are another example of chemicals originating indoors from consumer products. These chemicals are used to soften PVC plastic and are found in many soft vinyl products such as shower curtains, flooring and toys. They are also used in some personal care products and cosmetics. Laboratory or animal research indicates effects on development or reproduction that may result from endocrine-mediated changes with exposure to phthalates. Levels are slightly higher among children compared to adults and are higher among women compared to men.

Overall, there is not enough evidence to fully understand the potential for harm in humans from these and other chemicals in the indoor environment. Indoor air or dust is not subject to environmental regulation and there are no legal requirements in Canada to provide information about these substances on product labels.

Multimedia Exposures

(Primer: Chapter 1, Table 1; Multiple Health Effects, page 57; Multimedia Exposure: PBDEs in Food, Air and Dust, page 73; The Stockholm Convention on Persistent Organic Pollutants, page 81; Risk Assessment of Toxic Substances, page 91; Assessing Multiple Effects and Multiple Exposures, page 93; Definitions for "Real-World" Exposures, page 93)

Exposures to toxic substances often occur through several media. For example, pesticide exposure can occur through house dust, in water or in food depending on its origin and specific chemical characteristics. A child may be exposed to pesticide residue through direct contact with treated surfaces or tracked-in contamination (on shoes, pets, stroller wheels) in homes, schools or recreational facilities. Children may ingest minute amounts of pesticides via the residues that remain in food and, to a lesser extent, in drinking water.

Some exposure sources are more significant than others, underlining the need for public awareness about where risks are greatest, and the necessary precautionary response. For example, lead exposure can occur via water, food, soil or air. However, exposure to lead in indoor dust now appears to be the single greatest exposure pathway for children due to its greater presence in dust than in other media and because of children's exploratory and hand-to-mouth behaviour. There is a need for greater awareness of dust as an important exposure pathway for children alongside information about how to minimize exposure.

photo credit: Mark Surman

Prevention

(Primer: Chapter 5)

For most environmental exposures, control measures occur after-the-fact. Demands for solid proof of harm often result in unnecessary delays or opposition. Delays can also occur because the activities in question, such as automobile use, are part of entrenched societal patterns that are difficult to change.

Some progress has occurred in terms of revising regulatory approaches to take into account child health concerns. However, widespread exposure to thousands of potentially hazardous substances continues. There are an enormous number of substances that have never been fully evaluated for toxicity in pregnancy and childhood. These substances may be in commercial use, or may result from industrial emissions. It can be far more difficult to address environmental problems after the fact compared to preventing their occurrence in the first place. There is a need for increased political efforts to regulate substances suspected or known to cause child health concerns.

There is much to learn from past experience. Waiting until there is absolute proof of harm can result in unnecessary exposure and health impacts. The lesson from well-studied toxic substances, such as lead in gasoline, is the need to act sooner when serious risks are suspected, such as permanent health impacts on children. Taking action earlier, despite scientific uncertainty, is an approach that seeks to prevent harm. *(Primer: Lead – The Cautionary Tale, pages 87–89)*

There will never be full scientific certainty in environmental debates. The approach of waiting for proof of harm before controlling or eliminating harmful exposures will continue to place the developing fetus and child at unnecessary and avoidable risk. This precautionary approach speaks directly to the reality of forever having incomplete information. It denotes a duty, on all members of society, to prevent harm, even when the evidence is uncertain or unattainable.

In making recommendations for policy change to address children's environmental health issues, the overarching objective is to choose an effective course of action in the face of uncertainty and to apply a precautionary approach. A related objective is to evaluate the policy or interventions to ensure they are protective of children by preventing or reducing harm, in both the short- and long-term. *(Primer: The Precautionary Principle: Better Safe than Sorry, pages 94–95)*

photo credit: Mark Surman

chapter three

Context and Overarching Considerations

When addressing environmental risks to child health, there are background issues and considerations to take into account. Work on this topic is founded in the principles of health promotion and the precautionary approach. It is helpful to spend time thinking about how this topic fits with your current work and about your role as a messenger. Before starting to plan your initiatives, consider the underlying factors for environmental exposures and how best to involve and engage the population of interest on this complex, emotionally charged topic. This chapter covers information that can help guide your work, even before you start to plan your initiatives. These discussions are introductory and relevant to many health promotion activities. For guidance that is specific to planning and implementing environment and child health initiatives, see Chapters Four and Five.

Summary of Key Points – Context and Overarching Considerations

Health promotion includes:
- A holistic view of health with a focus on the determinants of health, participatory approaches, prevention of harm and building upon existing strengths and assets.
- The use of multiple strategies and supports to enable education and behaviour change.

The precautionary approach focuses on:
- Prevention of harm and participatory decision-making.
- An examination of the full range of alternatives, including no action, choosing safer alternatives or lower-risk options.

Participatory approaches:
- Embrace the values of empowerment, social justice, equity and inclusion.
- Recognize and respect differences and diversity.
- Are sensitive to the impact of poverty.

Messages about child health and the environment should be built into existing programs because:
- Building on existing work makes good use of limited opportunities, time and resources.
- There is a need for and value in consistency across services.

The messenger is as important as the message.
- Environmental health is a controversial and emotionally-charged topic.
- A trustworthy source of information is important.
- Retain passion in your topic but don't overdo it.
- Vary your style to suit the needs of different audiences.

Adult education techniques are used in addressing environmental health.
- Recognise that adults have their own experience, knowledge, beliefs, values, opinions and learning goals.
- Successful adult learning results in knowledge being retained, transferred and applied to new situations and ultimately results in changes in behaviour.

Health Promotion

Strategies for addressing environmental risks to child health can occur within the framework of health promotion. Health promotion is focused on ensuring the health and well-being of individuals and communities. Health promotion approaches include:

- A holistic view of health
- Use of participatory approaches
- A focus on the determinants of health (the social, behavioural, economic and environmental conditions that are the root causes of health and illness)
- Building on existing strengths and assets, not just addressing health problems and deficits
- Using multiple, complementary strategies to promote health at the level of the individual and the community

The Ottawa Charter for Health Promotion (1986) emphasises the need to strengthen community action and develop healthy public policies. In the Charter, traditional individual-oriented approaches to illness prevention are still seen as important but are supported by policy approaches oriented to the larger community. Health promotion activities seek behaviour change among individuals, and through policy-makers, in addition to addressing the underlying factors for health concerns, for example, poverty, low literacy etc. Health promotion requires cooperation and collaboration among health professionals and other sectors (Campbell, 1998).

Attempts to inject health promotion advocacy into public policy discussions on the environment occurs within such groups as the Ontario College of Family Physicians, the Ontario Public Health Association and the Canadian Association of Physicians for the Environment (CAPE). Public health experts describe the "prevention-treatment" continuum that exists for healthcare professionals (Campbell, 1998). Broadly, this continuum can include medical treatment, health protection, local collective action, policy and regulatory reform and global action. This continuum mirrors the range and scale of issues at play within most environmental problems.

The Ottawa Charter for Health Promotion identifies five action areas where multiple strategies can be employed to:

- Build healthy public policy
- Create supportive environments
- Strengthen community action
- Develop personal skills
- Re-orient health services

These five action areas are approached via multiple, complementary strategies. These strategies are explored further in Chapter 5. The strategies include:

- Health Communication
- Health Education
- Self-Help/Mutual Aid
- Organizational Change
- Community Development and Mobilization
- Advocacy
- Policy Development

Program Example: A Health Promotion Response to the Risks of PBDEs

The example of PBDEs (flame retardant chemicals) illustrates an environmental issue in need of a health promotion response. PBDE levels reflect the mother's body burden, and are rising in breast milk in North American women. The fetus and nursing infant are exposed through the mother. Multiple health impacts on fetal and early child development, particularly healthy brain development, are suspected. Women can follow a wide range of precautionary actions to reduce exposure including dust control measures, a low-fat diet, or purchasing PBDE-free products. These actions alone are insufficient. Levels of these persistent and toxic substances continue to rise in the environment and in breast milk. Viewed within the framework of health promotion, more players and activities are needed to prevent or reduce PBDE exposure via policy and regulatory action. It should not be the exclusive role of breastfeeding women to take precautionary actions to avoid exposure to chemicals that may cause reproductive or developmental health effects. *(Primer: pages 56, 62–65 and 73)*

For additional sources of information on health promotion practices, the Ottawa Charter and the prevention-treatment continuum, see Appendix A.

The Precautionary Approach

An overarching message running through all of the work on the topic of child health and environment is the precautionary approach. This approach speaks directly to the uncertain but troubling nature of the information base. It fully acknowledges statements such as:

- We aren't sure.
- The science is incomplete.
- The risks are not fully measured or measurable.

Like health promotion, the precautionary approach is holistic and focuses on prevention of harm and participatory decision-making. *(Primer: pages 16 and 94–95)*

The precautionary approach confronts the ever-present scientific uncertainty of environmental risks. In decisions about whether environmental risks are present, the precautionary approach states that the proponent of an activity, rather than the public, should bear the burden of proof. Under a precautionary approach, the safety of chemical or other exposures would have to be demonstrated *before* widespread exposure was allowed to occur.

A precautionary approach demands the evaluation of environmental risks within an open, informed and democratic process, involving affected parties.

When determining if an environmental exposure can cause harm, openness is important because:
- There are many uncertainties.
- Value judgements may be placed on the risks and the benefits of the environmental issue.
- There is an uneven distribution of risks and benefits resulting from decisions about whether or not an exposure is harmful.

Equally important, the precautionary approach requires an examination of the full range of effective alternatives, including no action. It is important to select an alternative that reduces the risk of specific harmful exposures and does not inadvertently create additional unforeseen risks. For example, if alternatives to chlorine disinfection of drinking water do not adequately kill harmful bacteria or micro-organisms, then children would be at risk of harm from water-borne diseases.

The precautionary approach is fundamental to health promotion messages about preventing harm from environmental contaminants. You can use strategies (discussed further in Chapter 5) to educate people about uncertain risks and enable them to reduce or prevent exposure.

For additional sources of information on the precautionary approach, see Appendix A.

Participatory Approaches

Health promotion and the precautionary approach both use participatory approaches. Health promoters are focused on addressing health issues by doing things with people rather than doing things for them. Participatory approaches enable people to take greater control over the conditions affecting their health. They embrace the values of:
- Empowerment
- Social justice and equity
- Inclusion
- Respect

Respecting Diversity

To increase awareness and enable behaviour and/or policy change, health promotion work starts with an understanding and respect for what people know, what they are ready for, and what actions they may be prepared to take.

When planning child health and the environment initiatives, we need to take into account factors such as:
- Socio-economic status
- Rural versus urban realities
- Northern versus southern norms
- Cultural considerations
- Gender issues
- Levels of education
- Literacy skills
- Personal motivations
- Optimistic versus pessimistic outlooks
- Variations in how people learn

In health promotion work, it is important that cultural diversity be considered. Respecting the diversity of families is also important. Family structures include single parent families, children cared for by extended family, pregnant women with non-male partners, parents of the same gender, etc. You can be inclusive of diversity when choosing illustrative examples or selecting images for resources, presentations or campaigns.

There can also be specific cultural considerations that affect levels of risk. For example, eating fish is an important part of Asian cultural heritage and diet. Likewise, eating fish and other country foods is extremely important among Canada's Aboriginal population. All pregnant women need to know about fish advisories. Information needs to be conveyed in a manner that is respectful of traditional ways of life and acknowledges the cultural significance and prevalence of these practices.

In rural or remote areas, issues of importance can be different than in an urban environment. Health promotion and outreach work needs to recognize the physical differences in how people and communities are organized. It must also be reflective of issues that are important and relevant in these settings.

Here are some examples that are specific to northern communities:

- Local industries in northern or remote communities can be significant polluters but may also be the single largest employer or provide the best paying jobs in an area. Raising awareness about these environmental risks must address this economic reality directly.

photo credit: BoAnne Tran

- Homes built in northern Ontario prior to the 1960s were often sided with asbestos shingles. In a fire-dominated landscape with homes built in or near forests, these shingles help to prevent fire losses. If asbestos shingles are undisturbed, they are low risk. However, if they are broken up or sanded, they can become a significant asbestos hazard.
- Homes built on bedrock, especially if they have basements, can have problems with water movement and drainage, contributing to indoor mould growth. This is a serious problem in many Aboriginal communities.

In rural and northern communities there is a saying: "Use it up, wear it out, do without, before you throw it out." Community members tend to fix their own vehicles and make, build or rebuild all kinds of things out of recycled materials. They also tend to burn their garbage. This approach to life can be highly creative, economical and self-sufficient. However, in some cases it can also result in toxic exposures or emissions. Children can be exposed to toxic substances through vehicle repairs, making lead fishing sinkers, reusing pressure-treated wood or old painted wood. Toxic substances can enter the home on footwear, hair and work clothes. Burning waste oil, scrap pressure-treated wood, old painted wood or mixed garbage, especially any garbage containing plastic, can result in highly toxic emissions in the smoke. Farming communities have concerns about the use and storage of pesticides. In the north, tailing ponds around mine sites or other industrial facilities can present significant exposure risks. In any health promotion work in rural or northern communities, it is important to be knowledgeable about unique exposure risks and to incorporate these issues into communications about avoiding exposures and adopting alternative practices.

People working in health promotion, or related fields, particularly in rural areas, often have many different responsibilities and may be employed part-time. As a result, they may have limited time to work on environmental health issues. Some respond to this constraint through use of networks with other service providers.

Poverty and Ability to Act

The effect of poverty or limited income on pregnant women and families is an extremely important consideration for environment and child health. Very large numbers of children in Canada live in poverty (more than one million children or about one in every six). Poverty is also a known risk factor for greater exposure to environmental contaminants both indoors and outdoors. Children who live in poverty can be doubly impacted by environmental contaminants since they may be the most seriously exposed and their parents may be the least able to respond or adapt. These parents can also be an audience that is hard to reach. Families living in poverty or with limited incomes should be given high priority in health promotion efforts on this topic. *(Primer: pages 28–29)*

Practical measures to reach this audience include:

- Focus on cost-saving or revenue-neutral alternatives and highlight these features when conducting outreach to attract this audience. Be sensitive to the cost implications of recommended changes in behaviour (i.e. changes in purchasing or changes in health practices).
- Bring messages and activities to existing local gathering places. All audiences appreciate the convenience and comfort of familiar surroundings but this can be particularly important for those with limited mobility and/or who may experience social isolation.
- During planning, ask this audience, or service providers familiar with this audience, about their needs for obtaining information,

implementing change, barriers to action, etc. and tailor your activities accordingly.
- Offer to provide child care for parents who attend workshops or other sessions.
- Provide transit tickets, pay for gas or arrange for car-pooling or other transportation options to enable attendance at your activities.

Poverty can result in living conditions that are impossible or very difficult to change. Sensitivity is required in raising issues or suggesting changes that are beyond a person's control. If suggestions are not feasible, they may create anxiety, frustration or even anger. For example, a standard message about childproofing indoors includes avoiding mould growth and taking precautions during renovations to prevent lead exposure. Where families are living in a damp basement or have several people sleeping in a room with old peeling paint, such messages are not appropriate. The situation needs to be addressed in terms of areas where it is feasible for families to make changes. Where living conditions cannot be addressed by personal actions alone, the focus can shift to strategies for working together to deal with irresponsible landlords, finding someone to donate a dehumidifier or working with colleagues and other service organizations to help families find better housing. For detailed information on tenants rights in Ontario, see www.ontariotenants.ca. This is an example where the holistic framework of health promotion comes into play. Strategies for addressing such situations must expand to include policy changes at a broader societal level.

Literacy and Language

Literacy issues are important to consider when seeking to attract and engage any audience. Among your audience, there could be people whose literacy skills are very limited even in their own language. With a large immigrant population in Canada, English is a second language for many people. Literacy levels for written materials in public educational work need to be at about a grade five reading level. Consider using radio or TV public service announcements to reach individuals with literacy challenges.

If you are translating materials into other languages, remember that translation often results in text that is overly formal in the second language. It is helpful if a second translator, or someone fluent in the second language, reviews the translated text for accuracy and readability and to ensure that they obtain the same meaning from the translated text as exists in the original. Also, consider the population of interest when translating resources. It may be helpful to adapt the text to suit the learning styles, interests and knowledge levels of specific groups.

Integration into Existing Programming

Most service providers are able to take on a specific role within a broader comprehensive approach to environment and child health, such as raising awareness, working on advocacy or policy change. For practical reasons, it makes sense to integrate environmental health into existing programs. Everyone is very busy and there are many conflicting demands on our time and attention. Health promotion programs that reach expectant and new parents are already in place and reach broad audiences or specific higher risk groups such as teen mothers or low income families. The existing range of services is the most logical and practical mechanism for providing information about environmental health risks.

The Need for Consistency

Environmental health messages also need to be integrated across existing programs to ensure consistency of messages. For example, if expectant parents are told in a prenatal class about fish advisories and this information is conveyed differently by a columnist in a newspaper or dismissed as unimportant by a health care provider, the result can be dismay and confusion. Women may continue to eat high risk types or amounts of fish, or may choose to avoid fish entirely, thus losing out on the nutritional benefits of eating fish (Oken, et al, 2003).

While many organizations offer both prenatal and postnatal services, parents will likely interact with different service providers after the baby is born. If environmental health messages across these two educational settings are not consistent or coordinated, parents can be confused or miss out on useful information.

Program Example: CPCHE as a Trusted Source of Information

The issue of trust in the messenger has been central to the Canadian Partnership for Children's Health and Environment (CPCHE) in the development of educational materials. CPCHE brings together key organizations from health, environmental and child care settings that agree to work together on environment and child health projects. They ensure that all of their health promotion strategies and advocacy messages arise from work that has scientific integrity. The issues of integrity and trusted sources of information continue to arise in response to the release of the CPCHE *Primer* and the associated *Playing it Safe* brochure. Focus groups, media coverage and feedback from many people across the country who have read these resources confirm that people are open to the information for many reasons but key among them is their trust in the messenger. The messages about health risks and childproofing are considered trustworthy because they originate from reliable health-focused organizations that are working together to provide consistent messages.

The Role of the Messenger

Children's environmental health can be, for parents in particular, an emotionally-charged topic. New and surprising information can generate scepticism or fear. The messenger can be as important as the message in terms of trust and credibility, both of which can be influenced by the style or format of message delivery.

Trust in a messenger arises from different places for different people. In general, people listen to those they already know and trust, either through direct contact or by reputation in their community. Health care providers, (e.g., doctors, nurses, public health departments) are often considered the most trustworthy sources of health information.

Despite the fact that this topic can generate strong feelings, people are rarely receptive to an emotional rant. On the other hand, passion for the topic can make the difference between a dull speaker and one who is engaging and inspiring. The enthusiasm or passion a speaker brings to the work is greatly appreciated by the audience.

Fundamentals of Adult Education

A final overarching issue to consider in planning for health promotion strategies is adult learning and education. While some of your health promotion work on this topic will include children, more often your audience will be adults. The adults may be parents, expectant couples, couples planning a pregnancy, service providers, business owners, municipal staff, politicians, etc.

Adult learning styles vary. The Canadian Child Care Federation (CCCF) *Guide to Successful Facilitation* provides an excellent summary of how adults learn (www.cccf-fcsge.ca/subsites/familytp/english/toolbox_en.htm). This guide provides the following points to consider when planning and running activities that enable adult learning:

- Adults have their own experience and knowledge and will relate new information to their existing experience and knowledge.
- Adults have their own beliefs, values and opinions and they are self-directed in terms of what they choose to learn.
- Adults are goal-oriented, with specific learning goals that tend to be problem-focused. They want to see a reason for learning something.
- Successful adult learning techniques will help adult learners retain or remember the knowledge or skills being taught, make them able to transfer or apply the information to new situations, and motivate them to change practice.

In order to meet the needs of adult learners:

- Use many different modes of teaching
- Vary the pace
- Encourage questions
- Discuss and respect values
- Listen and try to understand needs and motivations
- Emphasize the practical
- Link to past experiences of learners
- Share your own experiences
- Discuss real-life problems
- Use real-life stories to illustrate points
- Be sensitive to anxiety and pride
- Promote self-confidence
- Learn from your students and help them learn from each other
- Make it clear what is most important, and why it is most important
- Laugh and celebrate

Try to Avoid:

- Lecturing too much
- Trying to have all the answers
- Judging others' ideas or values

photo credit: Mark Surman