Addressing the Links Between

Early Environmental Exposures and Chronic Disease Prevention in Ontario:

A Network-to-Network Collaboration

Introduction

The **Canadian Partnership for Children's Health & Environment (CPCHE)** and the **Ontario Chronic Disease Prevention Alliance (OCDPA)** are collaborating on a two-year joint initiative on early environmental exposures and chronic disease prevention in Ontario, with support from the Ontario Trillium Foundation (OTF). The project will build the relationship between the children's environmental health sector (CPCHE) and the chronic disease prevention sector (OCDPA) in support of positive changes, in policy and in practice, to protect children's environmental health and prevent chronic disease. The interest of the networks to collaborate on this joint initiative is in recognition of the potentially important role that early exposures – from preconception through adolescence– can have in lifelong health.

Project Objectives

The overall objectives of the joint initiative are:

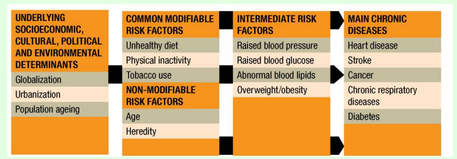
1. To draw upon the capacities and expertise of the two networks to (a) raise awareness among governmental decision-makers and other stakeholders of the links between early environmental exposures and chronic disease and (b) influence practices and policies in support of child health protection and chronic disease prevention in Ontario.
2. To build capacity within the networks, including within their respective memberships, to address chronic disease prevention and children's environmental health in an integrated way, through knowledge translation/exchange and other means.
3. To develop experience with and evaluate lessons learned from this network-to-network collaboration to inform future collaborative efforts.

Project Highlights

Key deliverables of the 2-year project include:

- A multi-stakeholder **Forum** to raise awareness of the links between early environmental exposures and chronic disease, and explore policy options for Ontario.
- A **Report** that summarizes the links between early environmental exposures and chronic disease, analyzes the current policy infrastructure and presents opportunities for improvement.
- A **Policy Strategy** to promote policies that integrate and strengthen children's environmental health protection and chronic disease prevention in Ontario.
- An **Evaluation** to document project progress and outcomes.

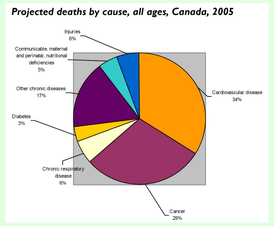
Causes of Chronic Diseases (1)



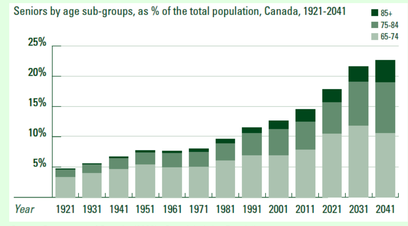
Chronic Disease in Ontario

Today, one in three Ontarians has one or more chronic diseases. Of those over the age of 65, almost four out of five have one chronic disease, and of those, about 70 percent suffer from two or more (2).

Chronic diseases place an enormous burden on Ontario, in social, economic and personal costs. In fact, at least 60% of Ontario's health care costs are due to chronic diseases (3); it is therefore important for Ontario to focus on the prevention of chronic diseases. Moreover, investing in chronic disease prevention could save Ontario over $350 million annually (4). While chronic diseases are often associated with aging, they are not inevitable. With the proportion of older adults in our population growing due to increased longevity and lower birth rate, it becomes increasingly important to address the preventable risk factors of chronic diseases and promote lifelong health.



Source: WHO. (2005). *Preventing chronic diseases: a vital investment*.



Source: Government of Canada. (2002). *Canada's Aging Population.*

Environmental Exposure and Health

Environmental exposure is one of several health determinants. Common physical and chemical exposures include: radiation, metals; polychlorinated biphenyls (PCBs); dioxins; pesticides and other contaminants. Exposure to these substances can occur from a variety of media/settings such as: outdoor and indoor air; house dust; soil; drinking water; and chemical contaminants in foods or originating in consumer products (5).

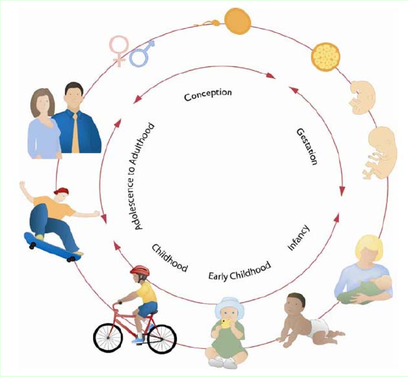
Why Focus on Children?

Children are more vulnerable to the effects of environmental exposures because of differences in size, intake and behaviour, and because their organs and detoxification systems are not fully developed. Numerous studies link environmental exposures to negative health impacts in childhood (6). The timing as well as the dose of the exposure can determine its health impact. Children's exposures to persistent substances can lead to build-up in their bodies over time. Hence, exposures during pregnancy or childhood may not result in health effects until adulthood. Children exposed to chemicals or radiation that have latent delayed) effects, such as with most cancer-causing chemicals, are more at risk than adults for these exposures to lead to harmful health effects later in life.

Early Environmental Exposures and Chronic Disease

A number of risk factors can play a role in the development of chronic diseases. While some are not modifiable, exposure to contaminants is often preventable. A growing body of evidence indicates that exposures early in life (in the womb and in the early years of childhood) may contribute to the development of chronic disease. Early exposures have been linked to cancer, respiratory and cardiovascular disease, diabetes, and some neurodegenerative diseases.

Some early exposures can cause permanent and irreversible damage, such as the effects of lead on brain development, or lifelong effects on lung function from early exposures to air pollution (7). This damage can then lead to the development of adult chronic diseases. Some animal research indicates that early lead exposure can increase the risk of developing Alzheimer's disease (8). Air pollution that affects lung function in early life could lead to cardiovascular issues later in life. Many pesticides are capable of causing a range of acute effects and have also been linked to one or more of the following chronic effects: increased risk of cancer, neurological deficits, respiratory problems, immune system dysfunction, and endocrine and reproductive disruption (9). Early exposures can also "re-program" gene expression and lead to chronic diseases.



The Continuum of Human Development. (10)

With the exception of stages that are unique to one gender or for those individuals who do not have children, all human beings pass through the developmental stages illustrated here. In addition to the prenatal "windows of vulnerability", sensitive stages continue through these developmental processes. Hence, at all times across the human population, a window of vulnerability is always open.

Joint Constellation Partner Organizations

Canadian Partnership for Children's Health & Environment

- Canadian Association of Physicians for the Environment
- Canadian Child Care Federation
- Canadian Environmental Law Association
- Environmental Health Clinic - Women's College Hospital
- Environmental Health Institute of Canada
- Learning Disabilities Association of Canada
- Ontario College of Family Physicians
- Ontario Public Health Association
- Pollution Probe
- South Riverdale Community Health Centre
- Toronto Public Health

Ontario Chronic Disease Prevention Alliance

- Alzheimer Society of Ontario
- Association of Local Public Health Agencies
- Canadian Cancer Society (Ontario Division)
- Canadian Diabetes Association
- Cancer Care Ontario
- Centre for Addiction and Mental Health
- Health Nexus
- Heart and Stroke Foundation of Ontario
- The Kidney Foundation of Canada
- Ontario Public Health Association
- Osteoporosis Canada

Contacts

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Ontario Chronic Disease Prevention Alliance — Website: www.ocdpa.on.ca

Acknowledgement

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References

1. WHO. (2005). *Preventing chronic diseases: a vital investment*. available at www.who.int/chp/chronic_disease_report/en/
2. Ontario Health Quality Council. (2007). *2007 Report on Ontario's Health System.*
3. Ibid
4. Ministry of Health and Long-term Care. (2005). Presentation to Ontario Chronic Disease Prevention Alliance.
5. CPCHE. (2005). *Child Health and the Environment – A Primer*
6. Ibid
7. Ibid
8. See video at http://disease-alzheimers.blogspot.com/2008/05/does-lead-exposure-lead-to-alzheimers.html
9. CPCHE. (2005). *Child Health and the Environment – A Primer*
10. Ibid

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