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Project Team

Patty Birkwood, Project Manager
Anji Nahas, Project Co-ordinator

Steering Committee⁽¹⁾

David Bennitz
Dan Bondy
Harry Conacher
Janet Connor
John Harrison
Jo Hauser
Roy Hickman
Mark Hudson
Frank Iverson
Dan Krewski
Leo Lehtinemi
Ernest G. Létourneau
Felix Li
Dan Longpre
Barry McBride
Catherine McCourt
Richard McKendry
Dorothy Meyerhof
Jeff Moore
Silvia Olivares-Guevara
Ed Overstreet
Andrew Payer
Dasha Pelka
Pierangela Pica
Byron Rogers
Tracy Schoales
Bruce J. Smith
Kathy Stewart
Brian Wheatley
Don Wigle

Working Group

Dan Bechtel
Patty Birkwood
Marta Caris
Janet Connor
Dawn Fowler-Graham
Mary Hegan
Mark Hudson
Raji Menon
Tony Myres
Anji Nahas
Pierangela Pica
Nick Previsich
Sandra Thompson

Other Health Canada Advisors and Contributors

Lorna Adcock
Brian Ahier
Anna Maria Alessi
Tye Arbuckle
Vic Armstrong
Pat Ashmore
Sheryl Bartlett
Beverly Bell
Steve Bly
Susan Bryan Reid
Rick Burnett
Stephanie Charron
Ih Chu
Sylvie Coad
Paul Cochrane
Liz Czanyo
Louise Damant
Yvon Deslaurier
Danièle Dionne
Brent Dixon
Laura Doliner
Kathleen Dugas

1. Action Plan on Health and the Environment (APHE)/Green Plan Implementation Committee.

Pavel Dvorak
Elaine Easson
Mark Feeley
Luc Fortin
Roger Foster
Warren Foster
Claire Franklin
Michèle Giddings
Carla Gilders
Andy Gilman
Paul Glover
Dave Green
Shalini Gupta
Joost Harwig
Mary Hill
Deborah Holbrook
John Horricks
Bev Huston
Glenn Irwin
Barry Jessiman
Marianne Joly
Sandra Jones
Deborah Jordon
André Juneau
Murray Kaiserman
Rasik Khakhria
Wendy Killeen
Diane Kirkpatrick
Jean-Pierre Lachaine
Robert Lafleur
Johanna Laporte
Bruce Lauer
Wesley Laughing
Jill Lava
Robert Liteplo
Sally Lockhart
Joseph Losos
Susan Mackenzie
Yang Mao
Ed McMullen
Louise McRae
Bette Meek
Marie-Danielle Menard
Geoff Middleton
Claire Miville
Lucinda Montizambeart
Richard Moody
Bill Murray
Phillip Neufeld
Ron Newhook
Jack Nickel
Elizabeth Nielson
Alan Nymark
Sylvain Paradis
George Paterson
Joel Paterson

Donald Popien
Ian Potter
Jennifer Rae
Rod Raphael
Dieter Riedel
Will Robertson
Brian Sammon
Jerry Shaw
Jackie Sitwell
Lynn Skillings
Bruce Smith
Joan Smith
Lloyd Smith
Herb Sooley
Dave Stieb
Art Thansandote
Barry Thomas
Ewen Todd
Ben Tom
Bliss Tracy
Dave Villeneuve
Slavi Vlahovich
Mike Walker
Jan Zielinski

External Advisors and Contributors

Denise Avard, Canadian Institute of
Child Health
Tom Balint, Canadian Environmental
Network
Ada Brown, Environmentally Sound
Packaging Coalition
Sondra Bruni, Consumers' Association
of Canada
Tom Brydges, Environment Canada
Janet Cooley, Environment Canada
Ray Copes, British Columbia Ministry
of Health
Rob Cross, Environment Canada
Lobie/David Daughton, Regional
Co-operative Development Centre,
P.E.I.
Richard David, Mohawk Council of
Akwesasne
François de Mers, Human Resources
Development Canada
Phil Deacon, Canada Mortgage and
Housing Corporation
Kayla Estrin, Environment Canada
Rosaline Frith, Environment Canada
Stephan Gabos, Alberta Health
Geoff Granville, Shell Canada
Chemical Company
Duncan Hardie, Environment Canada

Steve Hrudehy, University of Alberta
Colleen Hyslop, Environment Canada
Michael Keating, Canada and the State
of the Planet
Anne Kerr, Environment Canada
Myles C. Kitagawa, Toxics Watch
Society of Alberta
F. Henry Lickers, Mohawk Council of
Akwesasne
Ruth Lotzkar, Environmentally Sound
Packaging Coalition
Al Luck, Workers' Compensation
Board of British Columbia
Ed McCloskey, Ontario Ministry of
Labour
Christine Miskell, Consumers'
Association of Canada
Brent Moloughney, Ontario Ministry
of Health
Prem Nanda, Consumers' Association
of Canada
Sylvain Ouellet, Environment Canada
Wilfred Pilgrim, New Brunswick
Environment
Jim R. Poppow, Manitoba Health
Jean-Paul Robin, Métallurgie Noranda
Inc.
Fred W. Ruf, City of North York Public
Health Department
Jeff Scott, Nova Scotia Department of
Health
Jim Smith, Ontario Ministry of
Environment and Energy
Kathy Thompson, Federation of
Canadian Municipalities
Kelly Torck, Environment Canada
Kathryn Tregunna, Canadian Public
Health Association

Graphics Credits

Canadian Institute of Child Health
Health Canada
Pollution Data Branch, Environment
Canada
State of Environment Reporting
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Water Issues Branch, Environment
Canada

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Introduction



Chapter Highlights:

In 1992, Health Canada launched the Action Plan on Health and the Environment (APHE), a series of initiatives to identify environmental contaminants, investigate their effects on the health of Canadians and develop measures to reduce and prevent health risks. This report describes our current understanding of the relationship between human health and the Canadian environment, based on the findings from APHE, other Health Canada programs and other sources of information.

- Over the past century, our concept of *health* has broadened from the narrow view of health as the absence of disease or other physical problems to a more inclusive concept, emphasizing social and personal resources as well as physical capabilities. In recent years, the term *population health* has been used to describe an approach that focusses on the health of the whole population, and of subgroups within the population, by addressing the entire range of factors that determine health, as well as the complex interactions that exist among them.
- Since the 1970s, our concept of the *environment* has expanded to encompass both the natural environment—including air, land, water, vegetation and wildlife—and the human-built environment. At certain levels of exposure, contaminants present in our air, water, food and soil can cause a variety of adverse health effects, such as cancer, birth defects, respiratory illness and gastrointestinal ailments. In the built environment, factors related to housing, indoor air quality, the design of communities and transportation systems can influence our psychological and physical well-being.
- Canadians enjoy one of the safest food supplies on Earth, and the overall quality of our air and drinking water is very high. Despite this, we face a variety of potential threats to our health from the environment. Many of these health threats are of natural origin, such as the sun's ultraviolet rays. Other health threats result from voluntary behaviours, such as smoking. Canadians are also at risk as a result of involuntary exposure to contaminants present in air, water, food and soil.
- An *ecosystem* is a dynamic, self-regulating, natural community of plants, animals and micro-organisms, which interact with one another and with their non-living environment. People can affect the ecosystems they inhabit by using the environment in a sustainable or unsustainable manner.
- *Sustainable development* is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It combines economic, social and environmental goals, taking into account their effects on health. If our natural and built environments, our economy and our society are not sustainable, then the health of Canadians will inevitably suffer. Achieving sustainable development requires a balanced approach that promotes economic vitality, environmental integrity and social well-being. This balance must be achieved not only in a Canadian context, but also globally, so that our way of life is not maintained at the expense of other countries.

INTRODUCTION

In 1992, Health Canada launched the Action Plan on Health and the Environment (APHE), a series of initiatives to identify environmental contaminants, investigate their effects on the health of Canadians and develop measures to reduce and prevent health risks. APHE represented Health Canada's response to the government-wide Green Plan. APHE provided funding to monitor water, air and food; ensure that safety standards were met; enhance existing regulations; and develop new regulatory measures to prevent or reduce pollution. It also fostered individual, community and international health protection and health promotion initiatives. Although the APHE initiative has ended, much of this work, and more, is continuing under the new Health and Environment program.

This report describes our current understanding of the relationship between human health and the Canadian environment, based on the findings from APHE, other Health Canada programs and other sources of information. The report focusses on those contaminants that are of particular concern to the health of Canadians, notes the progress made in reducing levels of environmental contaminants and describes the impact that the human-made or "built" environment can have on our health. The report describes actions being taken by Health Canada and other agencies to protect and promote the health of Canadians, and it provides practical suggestions for things that individuals can do to protect and enhance their own health. The report also notes some emerging issues and future challenges related to health and the environment.

The remainder of this chapter sets the context for the report, describes some key terms used in the text and provides an overview of each chapter.

Health and the Environment

What Is *Health*?

Over the past century, our concept of *health* has broadened from the narrow view of health as the absence of disease or other physical problems to a more inclusive concept, emphasizing social and personal resources as well as physical capabilities. Health has recently been defined as a complete state of physical, mental and social well-being.¹ The term includes, for example, the ability to realize hopes, to satisfy needs and to change or cope with the environment. In recent years, the term *population health* has been used to describe an approach that focusses on the health of the whole population, and of subgroups within the population, by addressing the entire range of factors that determine health, as well as the complex interactions that exist among them.

What Is the *Environment*?

Since the 1970s, our concept of the *environment* has expanded to encompass both the natural environment—including air, land, water, vegetation and wildlife—and the human-built environment. This report examines the relationship between our health and the health of our natural environment by focussing on the quality of air, water, food and soil. These are the four principal media by which Canadians are exposed to environmental contaminants. The report also explores the connection between human health and the built environment, which is defined here as buildings, spaces and products that are created or significantly modified by humans. The built environment includes our homes, schools and workplaces, parks, business areas and roads. It extends overhead in the form of power transmission lines, underground in the form of waste disposal sites and across the country in the form of highways.



How Can the Environment Affect Our Health?

What we transfer to our environment may eventually be transferred back to us—in some cases with adverse consequences. At certain levels of exposure, contaminants present in our air, water, food and soil can cause a variety of adverse health effects, such as cancer, birth defects, respiratory illness and gastrointestinal ailments. In the built environment, factors related to housing, indoor air quality, the design of communities and transportation systems can influence our psychological and physical well-being. The extent to which natural resources, such as fuel, forests and wildlife, are protected for future generations can also have important consequences. Although the environment itself can have adverse effects on our health (e.g. floods, famine, spread of disease, natural disasters), these are not the subject of this report.

What Types of Health Risks Do We Face?

Canadians enjoy one of the safest food supplies on Earth, the overall quality of our air and drinking water is very high, and the built (human-made) environment is generally cleaner and healthier today than it was 100 years ago. For example, many surveys have shown that when contaminants are detected in municipal tap water, the levels are generally many times lower than the maximum acceptable levels set by federal–provincial–territorial guidelines. Despite this, we face a variety of potential threats to our health from the environment. Some of these health threats are of natural origin, such as the sun’s ultraviolet rays. Other health threats result from voluntary behaviours, such as smoking. Canadians are also at risk as a result of both involuntary exposure to contaminants present in air, water, food and soil and certain aspects of the built environment.

How Healthy Are We?

Based on a number of indicators, our health appears to be improving. Canadians are living longer, fewer infants are dying during the first year of life and premature deaths due to heart disease and injuries have declined. The death rates for many diseases have also declined—partly because the diseases now occur less often and also because of better medical treatments. Overall, the majority of Canadians have no disabling health problems for most of their lives.

In other areas, however, we are making little progress. For example, the proportion of low birth weight babies has not changed significantly since the 1980s. In recent decades, more Canadians have become overweight, more people have had to limit their regular activities for health reasons and more people experience higher levels of stress in their jobs.

Where Do We Fit In?

What Is an *Ecosystem*?

An *ecosystem* is a dynamic, self-regulating, natural community of plants, animals and micro-organisms, which interact with one another and with their non-living environment. The Canadian environment is composed of a large number of ecosystems, ranging from natural habitats, such as mountains, forests, lakes and grassland, to human-built spaces, such as cities, towns and farmers' fields.

How Do We Affect Our Ecosystems?

People can affect the ecosystems they inhabit by using the environment in a sustainable or unsustainable manner. Examples of unsustainable practices include the overexploitation of natural resources, such as fossil fuels, forests and fisheries, and the overproduction and reckless disposal of waste products. Perhaps the greatest challenge we face to ensure our long-term health and the health of our environment is to create a more sustainable society—or, in other words, to embrace the concept of *sustainable development*.

What Is *Sustainable Development*?

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It combines economic, social and environmental goals, taking into account their effects on health. It reflects the fact that development is essential to satisfy human needs and to improve the quality of human life, but that it must also be based on the efficient and environmentally responsible use of all our scarce resources: natural, human and economic. Sustainable development requires that we consider the impact of our country's current actions on the long-term well-being of the Canadian environment, as well as the impacts of the actions of all other countries on

the global environment. If our natural and built environments, our economy and our society are not sustainable, then the health of Canadians will inevitably suffer.

How Can We Achieve Sustainability?

If we opt for economic growth at the expense of our environment, then our natural resources will gradually disappear, pollution will increase and the health of future generations will suffer. On the other hand, if we treat the environment as pure and untouchable, then our economy and our health will suffer and our standard of living will decline. The middle road calls for a balanced approach that promotes economic vitality, environmental integrity and social well-being. This balance must be achieved not only in a Canadian context, but also globally, so that our way of life is not maintained at the expense of other countries.

Overview of the Report

The chapter entitled ***What Influences Our Health?*** provides an overview of the *population health* concept, discusses how health status may be measured using *indicators* and describes the types of factors or *determinants* that influence health. The chapter also provides some information on the current health status of Canadians and describes Health Canada's approach to population health.

The ***Assessing and Managing Health Risks*** chapter provides a description of the general process used to assess and manage risks to health and includes the framework developed by the Health Protection Branch of Health Canada as an example. The chapter also describes the importance of considering risk perception and undertaking risk communication within the risk assessment and management process, and it provides a few examples of broad risk management strategies used by Health Canada.

The ***Introduction to the Natural Environment*** chapter provides an overview of environmental contaminants as discussed in the four chapters that follow it. The ***Air*** chapter addresses major airborne contaminants, including tobacco smoke, common air pollutants, biological agents such as fungi and dust mites, hazardous organic compounds, metals and radiation. It also examines the potential health impacts of global warming and of incineration by-products. The ***Water*** chapter describes the health effects associated with water-borne organisms, water disinfection by-products, volatile organic compounds, pesticides, metals, fluoride, nitrates and radionuclides, as well as the relative importance of skin contact as a route of exposure to pollutants found in water. It also discusses water conservation. The ***Food*** chapter features sections on microbiological contaminants, persistent organic pollutants, heavy metals, radionuclides and food additives, and it describes the potential impacts of endocrine disruptors and biotechnology products on our health. The ***Soil*** chapter discusses the health problems associated with leaking underground fuel storage tanks, leaded paint and pesticides, and it explains the potential impacts of soil erosion and the use of micro-organisms for soil clean-up.

The chapter on ***The Built Environment*** explores how the human landscape affects our health. The topics covered include urban systems, housing and the home environment, work and school environments, transportation, waste management, human-made sources of radiation and environmental emergencies.

The ***Summary*** provides highlights from the report, describes the future challenge of achieving sustainable development in the context of health and the environment and notes efforts being made by Health Canada and other federal government departments in this regard.