



The Health and Environment Handbook
for Health Professionals



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The Health and Environment Handbook for Health Professionals

Prepared by:

The Great Lakes Health Effects Program, Health Canada
and
Public Health Branch, Ontario Ministry of Health

October 1997

Your feedback is welcome

A great deal of effort and care has been taken in the writing of this handbook. It is hoped that this document will be a resource and a reference that professionals can use when providing health programs and client services. Thus, your experience, ideas, feedback and questions are all very important. Please feel free to use the tear-out sheet on the last page of this document for providing written comments or suggestions. The Great Lakes Health Effects Program also welcomes letters.

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ALL THINGS ARE CONNECTED.
WHATEVER BEFALLS THE
EARTH BEFALLS THE CHILDREN
OF THE EARTH.

— CHIEF SEATTLE,
SUQWAMISH AND DUWAMISH

WE'RE SITTING ON OUR
BLESSED MOTHER EARTH
FROM WHICH WE GET OUR
STRENGTH AND
DETERMINATION, LOVE AND
HUMILITY — ALL THE
BEAUTIFUL ATTRIBUTES THAT
WE'VE BEEN GIVEN. SO TURN
TO ONE ANOTHER; LOVE ONE
ANOTHER; RESPECT ONE
ANOTHER; RESPECT MOTHER
EARTH; RESPECT THE WATERS
— BECAUSE THAT'S LIFE
ITSELF.

— PHIL LANE, SR., YANKTON
SIOUX, 1992

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PREFACE

In recent years, there has been a tremendous surge in public awareness of environmental issues and increasing concern about how human health is affected by environmental degradation. A growing body of scientific knowledge is offering Canadians new and better information and in some cases adding to their concern about the relationship between contamination of the physical environment and damage to the health of both wildlife and people.

Many approaches are being taken to address environmental health issues. Numerous stakeholders, including health agencies, are defining the problems and seeking solutions. At the societal level, the process of weighing the risks and benefits of potentially harmful substances is ongoing. Cross-sectoral collaboration is of utmost importance because these problems fall under numerous jurisdictions.

Health agencies are becoming more and more responsive to public concerns regarding the environment. Health professionals are being called on to communicate known health risks related to the environment in order to protect human health and prevent disease. Polls conducted for Health Canada show that while Canadians get most of their information regarding environmental health issues from the media, the majority look to health professionals for credible answers to their questions.

An Ontario report by the Premier's Council on Health, Well-being, and Social Justice noted that:

Exposure to high levels of hazardous substances through the contamination of air, water and soil has been linked to various adverse health conditions such as cancer, respiratory illness, reproductive problems and birth defects, nervous system disorders, allergic reactions, hypersensitivity, and decreased resistance to disease.

As science provides answers, it naturally generates many more questions. While exposure to high levels of toxic substances can affect people's health, links between health effects and long-term exposure to low levels of many environmental contaminants are difficult to measure and not fully understood. Formulating practical answers to public questions on the more subtle effects of certain environmental agents is a challenge when experts in the fields of toxicology, biology and epidemiology are still struggling to understand the links. Policy makers, scientists, labour leaders, media, educators, activists and health care professionals — all are striving to make decisions and/or to communicate health advice based on developing information about the nature and potential health effects of exposure to chemical and physical agents. In addition, resources on these emerging concerns are often scarce, scattered, or conflicting. With limited time and resources and while dealing with a host of other pressing health problems, health professionals responding to these new demands are requiring more varied and effective tools to help them educate and protect the public. It is our intention in this handbook to introduce basic environmental health concepts in a manner that can be easily understood by a health professional relatively new to the issues. Though this handbook is not intended as a



IT IS OUR INTENTION IN THIS HANDBOOK TO INTRODUCE BASIC ENVIRONMENTAL HEALTH CONCEPTS IN A MANNER THAT CAN BE EASILY UNDERSTOOD BY A HEALTH PROFESSIONAL RELATIVELY NEW TO THE ISSUES. THOUGH THIS HANDBOOK IS NOT INTENDED AS A PHYSICIANS GUIDE OR A TECHNICAL REFERENCE, THERE IS ENOUGH DETAILED INFORMATION PRESENTED HERE TO INTEREST THE MORE EXPERIENCED USER AS WELL.

physicians guide or a technical reference, there is enough detailed information presented here to interest the more experienced user as well. In the interests of readability and brevity, the handbook does not provide continuous referencing throughout the text. However, all sources of information used in the writing of the handbook are listed in the "Bibliography." This handbook can serve as a quick reference and will assist the health professional to effectively communicate complex and important information to the community.

Much of the research discussed or referred to in this handbook relies on occupational settings because, in general, workers tend to be the most highly exposed group. While worker exposure can be a serious concern, this handbook focusses on contaminants and health effects that may affect the general population or specific groups outside of the workplace. In Ontario, the *Occupational Health and Safety Act* is designed to protect workers' health and there are several mechanisms in place, such as joint worker-management committees and the Workplace Hazardous Materials Information System (WHMIS) to reduce workplace exposure to contaminants. (See *Resource Guide*.)

Background and Objectives

In July 1992, the Great Lakes Health Effects Program of Health Canada, in consultation with the Public Health Branch of the Ontario Ministry of Health, conducted a survey of public health staff from 37 health units in the Great Lakes Basin. The survey was used to determine what information was required by public health unit personnel to answer the increasing numbers of inquiries from the public regarding environmental health issues.

The first draft of this handbook was developed in response to the diverse needs and priorities expressed in that survey. It provided current basic environmental health information in anticipation of the questions and public issues that health professionals are being asked to address. The draft handbook was then presented to the health community through workshops, conferences, by mail and by direct request in order to receive feedback both on the content and on the presentation of the material. After a lengthy review period and an enthusiastic response, many comments have been integrated into this text, new sections and chapters have been added, and the design of the handbook has been slightly modified to suit the needs of those who expressed their interest.

New public concerns are emerging even as this handbook is being written. Much of the information provided here can be applied to emerging concerns, be they food safety, the use of pesticides, the causes of breast cancer, "healthy environment" policies, etc. This information is intended to complement the small but growing body of Canadian resource material available for health professionals.

The handbook has been prepared primarily as a resource for health professionals working in Ontario communities. Examples of health related research are frequently taken from studies on the health effects of contaminants found in the Great Lakes basin. However, the concepts are general and can be applied in any community concerned about human exposure to pollution.

The handbook is structured around the following questions:

1. What are the basic concepts of environmental health: i.e., risk; contaminants; exposure; dose and response, etc.?
2. What are common causes of concern and key issues to be informed about: i.e., water quality, food safety, air pollution, etc.?
3. Where can I find more information?

Format

Understanding environmental health and the impacts of persistent toxic chemicals and other contaminants on long term human health are areas of ongoing study. Consequently, this binder format has been chosen so that the *Contaminant Profiles* and the *Resource Guide* can be periodically updated and appended.

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Contaminant Profiles

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Acetone
Aldrin and Dieldrin
Aluminum
Ammonium Phosphates
Arsenic
Asbestos and Fibrous Materials
BTEX: Benzene, Toluene, Ethyl benzene and Xylene/Gasoline
Cadmium
Campylobacter spp.
Carbon Monoxide (CO)
Chlorofluorocarbons (CFCs)
Chlorophenols/PCP
Clostridium botulinum
Clostridium perfringens
Cryptosporidium parvum and *Giardia lamblia*
DDT and related compounds: DDE, TDE, DDA, methoxychlor
Dieldrin: see Aldrin and Dieldrin
Dioxins (polychlorinated dibenzodioxins) and
Furans (polychlorinated dibenzofurans)
Escherichia coli (*E. coli*)
Fluoride
Furans: see Dioxins
Hexachlorobenzene (HCB)
Lead
Mercury
Mirex
Moulds
Nitrites, Nitrates and Nitrosamines
Nitrogen Oxides (NO_x)
Ozone: see Smog and Ground-Level Ozone
Particulate Matter
Perchloroethylene (Perc)/PCE/Tetrachloroethylene
Phthalates
Polychlorinated Biphenyls (PCBs)
Polycyclic Aromatic Hydrocarbons (PAHs): Benzo[a]pyrene
and related compounds
Radon
Salmonella spp.
Smog and Ground-Level Ozone
Sodium Chloride — Road Salt
Staphylococcus aureus
Sulphur Dioxide (SO₂)
Toxaphene
Trihalomethanes (THMs)
Tritium
Vibrio vulnificus
Vinyl Chloride and Polyvinyl Chloride
2,4-Dichlorophenoxyacetic acid (2,4-D)