

HEALTHY ENVIRONMENT

HEALTHY CANADIANS

northern exposure

ACUTE PESTICIDE
POISONINGS IN CANADA



David
Suzuki
Foundation

SOLUTIONS ARE IN OUR NATURE

JUNE 2007

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A REPORT PREPARED FOR THE DAVID SUZUKI FOUNDATION
HEALTHY ENVIRONMENT, HEALTHY CANADIANS SERIES

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Northern Exposure: Acute Pesticide Poisonings in Canada

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ISBN 1-897375-06-9

Canadian Cataloguing in Publication Data for this book
is available through the National Library of Canada

ACKNOWLEDGEMENTS

Many people provided valuable assistance in preparing this report. Among them are Dr. David Suzuki, David Hocking, Dr. Meg Sears, Kathleen Cooper, Dr. Cathy Vakil, Mike Christie, and all of the dedicated professionals working at poison control centres across Canada. The author would also like to thank the David Suzuki Foundation, most particularly Ann Rowan, Lisa Gue, Lindsay Coulter, Dominic Ali, and Jason Curran.

This report was made possible through the generous support of The Lefebvre Charitable Foundation.

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DESIGN AND PRODUCTION: Arifin Graham, Alaris Design

PHOTOGRAPHS: David Suzuki by Rich Frishman/Frish Photo; all others by iStockphoto.com

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DANGER

“Along with the possibility of the extinction of mankind by nuclear war, the central problem of our age has become the contamination of man’s total environment with substances of incredible potential harm...”

– RACHEL CARSON, *SILENT SPRING*



In Canada, human health and the environment have become two of the most interconnected and salient issues we all face today. While we fight to maintain and improve one of the world's best health-care systems, we have ignored new, important preventative actions that can save us from illness and death. We should pay attention to keeping healthy people healthy, instead of focusing on treating illness after it sets in.

In many Canadian homes toxic pesticides pose an unnecessary risk to our most vulnerable population – children. These poisons can be found in our cupboards, under the sink, and in the garage. Acute toxicity refers to the immediate effects of a particular dose of a pesticide on humans. Whether it's via inhalation, eating, drinking, or direct contact with eyes or skin, acute pesticide poisonings are an all too common occurrence among children, farm workers and homeowners.

In the fourth in a series of reports on environmental health in Canada, the David Suzuki Foundation looks at acute pesticide poisonings in this country. This report concludes that Canada operates an ineffective system for tracking and monitoring acute poisonings, and most importantly, fails to sufficiently protect its citizens from the adverse health effects of pesticides.

We possess the capacity to improve our health and our children's health; it's as simple as breathing clean air, drinking clean water and eating food that's free from harmful pollutants. To guarantee a clean natural environment and healthy citizens, we require adequate systems, laws, policies and commitments by government.

Individuals can also play a role by taking the steps outlined in our Nature Challenge.

Our Foundation is committed to achieving sustainability within a generation in Canada. Living within the earth's limits is not easy, but it's essential. A healthy environment – free from harmful and unnecessary pesticides – is a vital cornerstone of a sustainable, prosperous future.

A handwritten signature in black ink, reading "David Suzuki". The signature is fluid and cursive, with a long horizontal stroke extending from the end of the name.

David Suzuki
FOUNDER, DAVID SUZUKI FOUNDATION



Introduction

The pesticide industry, elected politicians, and the government agencies responsible for regulating pesticides claim that the pesticides approved for use in Canada do not pose an unacceptable risk to human health or the environment, as long as they are used according to the instructions on the label. They also claim that Canada has one of the best systems in the world for regulating pesticides. For example, Steven Fletcher, the Parliamentary Secretary to the Minister of Health, told the House of Commons that, “The approach that we have in Canada to the regulation of pesticides is known and respected around the world.”¹

Are these industry and government claims accurate? The short answer is no. Pesticides, as Rachel Carson observed in *Silent Spring*, are by their very nature designed to kill. For purposes of this report, ‘pesticides’ includes insecticides, herbicides, fungicides, rodenticides, algacides, and slimicides. Experts generally agree that reducing exposure to pesticides reduces health risks.² There are approximately 1,000 commercial pesticide products for sale in Canada that cannot be sold in other nations because of health and environmental concerns.³

Although medical evidence of the connections between pesticide exposure and long-term illnesses is accumulating, there are still unresolved questions. It is difficult to link specific cases of chronic health outcomes such as cancer to pesticides because of multiple factors, including: the long period between exposures and illnesses; the fact that an individual is exposed to thousands of chemicals over the course of a lifetime; the different genetic susceptibility of some individuals; and the presence of other confounding factors including occupation, geographic location, socioeconomic status, behaviour, and lifestyle.

However, the focus of this report is on acute pesticide poisonings, where there is a clear and compelling connection between exposure and the onset of illness. Acute pesticide poisoning occurs when an individual develops adverse health effects immediately after

being exposed to a pesticide or pesticides. Exposure can be via inhalation, eating, drinking, or direct contact with the eyes or skin. Acute pesticide poisoning can harm the eyes, the skin, the gastrointestinal tract, the nervous system, the respiratory system, the cardiovascular system, the liver, the kidneys, and the blood. In extreme cases death may occur (a very rare occurrence in Canada, although not in developing countries).

This report highlights gaps in our knowledge about the prevalence of acute pesticide poisoning in Canada; estimates the number of poisoning cases annually (based on data from provincial authorities); and recommends actions for Canadians and governments to reduce the risks posed by pesticides.



Information Gaps

Information on the number of Canadians poisoned by exposure to pesticides is extremely difficult to uncover. The federal government doesn't keep track of such data. Poisonings are not considered a 'reportable event' so provincial health care systems do not consistently report or systematically monitor them. Data on hospitalizations caused by poisonings are available but represent the tip of the proverbial iceberg. As a recent article on poisonings in British Columbia observed, "data are unavailable on poisonings that present to physicians, medical clinics, or emergency rooms and are discharged without hospital admission or BCPCC [B.C. Poison Control Centre] contact."⁴ The Canadian Association of Poison Control Centres, unlike its U.S. counterpart (the American Association of Poison Control Centers), does not have the ability or the resources to compile and publish national data on pesticide poisonings.

This information gap includes all poisonings and is highly problematic, as the federal government admits. A report published by Health Canada in 1999 concluded, "At present, the very limited and heterogeneous data sets collected by Canadian poison control centres do not allow for surveillance of acute poisonings in Canada. This severely impairs the development and implementation of effective prevention, regulatory, and information/education programs."⁵

Health Canada, in collaboration with provincial partners, did attempt to fill the gap with a surveillance and response system called Prod Tox, developed by the Centre for Surveillance Coordination. Prod Tox involved a web-based network, drawing data from provincial poison control centres to monitor, prevent and reduce poisonings in Canada. Data from existing poison control centres were integrated and shared via the web-based network. Unexpected budget cuts at Health Canada in 2002 terminated the Prod Tox project, just as it was getting started. However, a working group established by the Pest Management Advisory Council (a group of stakeholders that oversees the activities of the Pest Management Regulatory Agency) recently recommended that Health Canada revive and fund Prod Tox. The

working group also “strongly recommended” that Canada build a national poisonings database similar to the one in the United States.⁶ British Columbia’s Provincial Health Services Authority also advocates the revival and implementation of Prod Tox.⁷

Recent regulatory developments should help to partially close the information gap. Under Canada’s significantly revamped federal pesticide law, the *Pest Control Products Act*, new *Pest Control Products Incident Reporting Regulations* came into force on April 26, 2007.⁸ These regulations require pesticide manufacturers in Canada to report all poisoning incidents (adverse effects on humans, domestic animals, or the environment) that come to their attention. However, this is likely to be a small fraction of total pesticide poisonings. As a result, the Pest Management Regulatory Agency also initiated the development of a voluntary system for reporting pesticide poisonings. The voluntary system will encourage health professionals, public health organizations, and the general public to report pesticide poisonings to manufacturers or the Pest Management Regulatory Agency. The voluntary system may become operational by the end of 2007. The implementation of these complementary initiatives should improve the state of knowledge about the magnitude of the pesticide-poisoning problem in Canada. However, the voluntary portion of the reporting system for pesticide poisonings is unlikely to capture all incidents, meaning that the information gap will continue.



The Health Effects of Pesticides

All Canadians are exposed to pesticides. Bio-monitoring studies published by Environmental Defence in 2005 and 2006 revealed that the bodies of Canadians, including children, in all parts of the country, from all walks of life, are contaminated by a toxic cocktail of industrial chemicals, including organochlorine pesticides and organophosphate pesticide metabolites.⁸ The results of these Canadian studies are consistent with the results of bio-monitoring studies with a much larger sample size conducted biannually in the United States.¹⁰ A recent American study found pesticides in the cord blood of newborn infants.¹¹ Even residues from pesticides banned years ago continue to be detected in the meconium of newborn babies.¹²

Pesticide exposures can produce two distinct types of adverse health effects – acute or short-term effects and chronic long-term effects. Exposure to pesticides does not necessarily cause health problems. The active ingredients in pesticides have varying levels of toxicity. Other chemical ingredients in pesticide products may also be toxic. A number of factors are involved in determining the likelihood and severity of adverse health effects, including: the dose (magnitude and concentration of the exposure); the route of exposure (inhalation, ingestion, dermal contact, or in-utero exposure); an individual's genetic vulnerability, age at the time of exposure and general health; the length of exposure (e.g. one time versus ongoing); environmental factors; and potential interactions with other chemicals.

Chronic health effects linked to pesticide exposure

Scientific evidence (toxicological and epidemiological) links pesticide exposure to many chronic health effects, including:

- increased risk of cancer (e.g. non-Hodgkin's lymphoma, childhood leukemia, and breast cancer);
- neurological impairment (e.g. Parkinson's disease, Alzheimer's disease);

- developmental effects (e.g. autism);
- reproductive effects (e.g. sperm abnormalities, birth defects);
- organ damage; and
- interference with the human hormone system.¹³

In July 2006, a study published in the *Annals of Neurology* looked at the relationship between pesticide exposure and Parkinson's disease in over 140,000 people.¹⁴ Exposure to pesticides – even at low levels – increased the likelihood that an individual would suffer from Parkinson's disease by 70% compared to individuals not exposed to pesticides. Another recent study found that individuals exposed to substantial quantities of pesticides face triple the risk of non-Hodgkins lymphoma compared to unexposed individuals.¹⁵ An article published in the medical journal *Paediatrics and Child Health* in 2006 concluded, “cancer, neurological impairment and reproductive problems are persuasively linked to phenoxy herbicide exposure.”¹⁶ Congenital anomalies (i.e. birth defects) have been linked to pesticides.¹⁷

Acute pesticide poisonings

The focus in this study is on acute pesticide poisonings, which involve an immediate connection between exposure and the onset of symptoms of illness. Acute pesticide poisoning can cause the following kinds of injuries, illnesses and symptoms:¹⁸

- **Eyes:** tearing, irritation, conjunctivitis
- **Skin:** rash, blistering, burns, sweating, contact dermatitis, jaundice
- **Nervous system:** headache, dizziness, mood disturbances, depression, stupor, muscle twitching, lack of coordination, seizures, paralysis, loss of consciousness, coma
- **Respiratory system:** sore throat, runny nose, cough, pulmonary edema, difficulty breathing, respiratory failure
- **Cardiovascular system:** cardiac arrhythmias
- **Gastrointestinal tract:** nausea, vomiting, diarrhea, abdominal pain

Acute pesticide poisoning can occur by various means, including accidental ingestion of pesticides in the home or garden, consumption of food containing pesticide residues, and involuntary exposure to pesticides applied to homes, other buildings, lawns, gardens, forests, and farms. Children are especially vulnerable to pesticide poisoning, particularly very young children whose bodies may not have developed the ability to defend themselves against certain kinds of pesticides.¹⁹ The majority of pesticide poisonings involving children occur in the home or in the homes of friends and relatives.²⁰

In addition, there is a growing number of Canadians who suffer from heightened vulnerability to a wide range of chemicals, including pesticides. Statistics Canada recently reported that 2.4% of Canadians, more than 640,000 people, suffer from doctor diagnosed multiple chemical sensitivities.²¹ Even minor exposures to pesticides can trigger serious adverse health effects in this sub-population.



Canadian Data on Acute Pesticide Poisonings

The following data on pesticide poisonings in Canada were gathered from provincial and regional authorities covering nine of the ten provinces. Despite repeated inquiries, no data were available from authorities responsible for poison control information in Manitoba. No data were obtained from the Yukon, Northwest Territories, or Nunavut. Therefore, estimates for these regions were extrapolated based on the per capita average in the rest of the country.

There is a high degree of variability in the way that poisoning data are reported and recorded in Canada. Nevertheless, these figures are based on the best available information. It was obvious from conversations with doctors and staff at a number of provincial poison control centres that there is an urgent need for more resources (both financial and human), standardized reporting and recording, and a national approach. The foregoing observations apply to poisonings generally and not only to pesticide poisonings.

Deaths resulting from acute exposure to pesticides do occur in Canada but are extremely rare.²² Cases of illness caused by unintentional acute exposure to pesticides, on the other hand, are surprisingly common (see Table 1). More than 6,000 cases of pesticide poisonings are reported in Canada annually. It is a disturbing reality that 2,832 cases involved children under the age of six (46.5% of total cases). The proportion of cases involving children under six is consistent from province to province, generally ranging from 42% to 50% of total pesticide poisonings.

Children under the age of six comprise only 6.4% of the total Canadian population but experience 46.5% of the acute pesticide poisonings.²³ This disproportionate level of impact reflects a number of factors but primarily unsafe storage and the different behaviours of young children who tend to put everything in their mouths and cannot read labels and respond appropriately. Parents and other adults bear some of the responsibility for protecting children from exposure to pesticides, but there is also an important role for governments in publicizing, preventing, and/or minimizing risks.

It should be noted that although these estimates are based on the best available evidence, pesticide poisonings are often not diagnosed, are not a reportable event, and national data are not available.²⁴ It is widely believed that calls to poison control centres represent only a fraction of poisoning cases. Sometimes physicians, medical clinics, emergency rooms, and hospitals will contact poison control centres but the proportion of cases where this occurs is unknown. It is highly likely that the figures in this report under-estimate the actual magnitude of pesticide poisonings in Canada.

TABLE 1
Annual Acute Pesticide Poisonings in Canada

PROVINCE	PESTICIDE POISONINGS	PESTICIDE POISONINGS CHILD <6 YRS	PESTICIDE POISONINGS PER 100,000 RESIDENTS
BC	436	190 (43.6%)	10
AB	1,021	461 (45.2%)	30
SK	322	138 (42.9%)	33
MB	211*	98*	18*
ON	1,629 ^Δ	821 ^Δ (50.4%)	13 ^Δ
QC	2,096	966 ^ο (46.1%)	27
NB/NS/PEI	319	144 [†] (45.2%)	18
NL	37	5 (13.5%)	7
YT/NWT/NU	19*	9*	18*
TOTALS	6,090	2,832 (46.5%)	18

* Data unavailable; figures represent estimates based on national average.

^Δ Figure includes estimate for eastern Ontario based on historical trends.

^ο Data unavailable; figure represents estimate based on historical data.

[†] Data unavailable; figure represents estimate based on data for total poisonings.

British Columbia

Data for British Columbia were provided by the B.C. Drug and Poison Information Centre. From 2003 to 2005, an average of 23,646 total poisonings were reported annually (2003 – 23,631; 2004 – 24,427; 2005 – 22,879). Each year between 2003 and 2005, 47% of the poisonings in the province of B.C. involved children under the age of six. From 2003 to 2005, an average of 436 cases of pesticide poisonings were recorded in B.C., with an average of 190 cases per year involving children under the age of six.²⁵

Alberta

Data for Alberta were provided by the Calgary Health Region's Poison and Drug Information Service. For the year spanning April 2005 to April 2006, Alberta recorded a total of 26,614 poisonings. Similar to B.C., 49% of the total poisoning cases in Alberta involved children under the age of six. There were 1,021 cases of pesticide poisoning in Alberta in 2005-06, including 461 cases involving children under the age of six.

Saskatchewan

Data for Saskatchewan were provided by the Calgary Health Region's Poison and Drug Information Service. For the year spanning April 2005 to April 2006, Saskatchewan recorded 6,362 poisonings in total. There were 322 cases of pesticide poisoning in Saskatchewan in 2005-06, including 138 cases involving children under the age of six.

Manitoba

Data on pesticide poisonings in the province of Manitoba were unavailable despite repeated requests to provincial health authorities responsible for poison control information. Provincial officials did observe that no recent deaths were attributed to unintentional pesticide poisonings. Manitoba Health reported that of 1065 hospitalizations associated with poisoning in 2004/05, only three cases involved pesticide poisoning (all involving patients older than five years). In order to estimate data for Manitoba, we applied the per capita rate of pesticide poisonings for the rest of Canada to Manitoba's population.²⁶

Ontario

Data for Ontario were provided by the Ontario Poison Information Centre in Toronto. In 2005, the Ontario Poison Information Centre in Toronto recorded 1,140 cases of acute pesticide poisoning, including 577 cases involving children under the age of six. Data from the Ottawa poison control centre, which previously covered the eastern part of the province, were unavailable because the Ottawa centre closed in November 2005. Since the Toronto poison control centre received roughly 70% of calls prior to the closure of the Ottawa centre, figures have been extrapolated upwards by 30% to represent the missing data. This results in a total number of pesticide poisonings of 1,629 for the province of Ontario, including 821 poisonings of children under the age of six.

Quebec

Quebec's Poison Control Centre received 2,096 calls associated with pesticides in 2002. The number of cases in 2002 involving children under the age of six was not specified; however, in 1996 this age group accounted for 46.1% of pesticide poisonings.²⁷ Using this proportion, we estimate that children under the age of six were victims in 966 cases. It is important to note that these data predate Quebec's *Pesticide Management Code*, which was fully implemented in April 2006 and prohibits the sale of many pesticides. More recent data could not be obtained. Pesticide poisonings in the province might be expected to decline as a result of the new law.

Nova Scotia, New Brunswick, and Prince Edward Island

Data for Nova Scotia, New Brunswick, and Prince Edward Island are from the IWK Regional Poison Centre in Halifax. There were 7,996 human exposure calls to the IWK Regional Poison Centre in 2002, with 45.2% of cases involving children under the age of six.²⁸ Because data on pesticide poisonings are not reported by age group in the IWK report, we used the 45.2% figure for all poisonings to estimate the number of children under the age of six poisoned by pesticides in 2002. Therefore, we estimate that of the 319 cases of pesticide poisoning in 2002, 144 involved children under the age of six.

Newfoundland and Labrador

Data for poisonings in Newfoundland and Labrador in 2005-06 were provided by the Janeway Child Health Centre in St. John's. There were 37 cases of pesticide poisoning, including five cases involving children under the age of six. As well, the Newfoundland and Labrador Centre for Health Information indicated that for 2004-05, there were fewer than five cases of hospitalizations resulting from acute pesticide poisoning (out of a total of 605 acute care hospitalizations involving poisoning).

Yukon, Nunavut and Northwest Territories

In order to estimate data for the Territories, we applied the per capita rate of pesticide poisonings for the rest of Canada to the combined population of the Yukon, the Northwest Territories, and Nunavut.



International Comparison

It is worth reiterating that the number of acute pesticide poisonings identified in this report is almost certainly an underestimate of the true magnitude of the problem. In the United States, governments provide more resources to poison control centres and fund the management of a national poisonings database. The annual report from the American Association of Poison Control Centers recorded 102,754 pesticide poisonings in 2004.²⁹ More than half of these cases (52,174) involved children under the age of six. Earlier U.S. data indicated that pesticide poisonings resulted in an average of 56,000 poison centre consultations, 15,000 health care facility visits, 4,000 hospitalizations, and 57 deaths annually during the years between 1985 and 1990.³⁰ In Mexico, more than 60% of the victims of pesticide poisoning are children under the age of six, an even higher proportion than the U.S. or Canada.³¹

The incomplete and inconsistent Canadian system estimates 2,832 cases of children under the age of six being poisoned by pesticides. In comparison, the more comprehensive American system records more than 52,000 cases of children under six who are poisoned by pesticides annually. The American figure is 20 times higher than the corresponding Canadian figure. Given that the U.S. population is roughly ten times the size of Canada's population, this discrepancy provides further support for our assertion that Canadian cases of pesticide poisoning are under-reported, perhaps by as much as half. This situation merits urgent investigation.



The Economic Costs of Pesticide Poisonings

Injuries cost Canadians an estimated \$15 billion annually in direct and indirect costs, and poisoning is one of the leading causes of injuries.³² A study published in 1998 found that the annual effects of all types of poisonings in Canada (including pesticide poisonings) included 667 deaths, 4,996 hospitalizations, 58,897 cases requiring medical treatment, 1,096 cases resulting in partial permanent disability, and 34 cases resulting in total permanent disability.³³ The economic costs of poisoning were estimated to be \$400 million, including direct health care costs of \$116 million and indirect costs (including only productivity losses) of \$284 million.³⁴

In 1995, Health Canada estimated that 4% of reported poisonings of Canadian children each year are due to accidental pesticide exposure.³⁵ Using Health Canada's estimate, we can estimate that acute pesticide poisonings cause roughly \$16 million per year in economic costs, not including any valuation of the pain and suffering endured by thousands of Canadians and their families, or the potential costs incurred as a result of damage to the normal development of children.

Advice for Canadians: How to reduce the risks of pesticide poisonings

1. DON'T BUY PESTICIDES

Avoid using or storing pesticides in and around the home and garden. Non-toxic, less toxic, and yet equally effective alternatives are almost always available. The use of pesticides for cosmetic purposes, such as a green lawn, cannot be justified in light of the known risks to human health and the environment.

2. IF YOU DO USE PESTICIDES...

... carefully follow the instructions on the label. Wear proper protective clothing. Post a sign to warn others that the area has been treated. Avoid using pesticides when children are nearby.

3. ALWAYS STORE PESTICIDES AND OTHER HAZARDOUS SUBSTANCES IN LOCKED CABINETS

Items such as medication, cleaning products, and cosmetics should be kept in places that are inaccessible to children.

4. KEEP PESTICIDES IN THEIR ORIGINAL CONTAINERS TO PREVENT MIS-IDENTIFICATION.

5. DISPOSE OF PESTICIDES AND OTHER TOXIC HOUSEHOLD PRODUCTS CURRENTLY IN YOUR POSSESSION IN A SAFE MANNER.

Provincial poison control centres, health care facilities, and local recycling and waste management facilities often offer useful information about safe disposal. Do not simply put in the garbage, pour down the drain, or flush down the toilet.

6. KEEP A CLOSE EYE ON CHILDREN WHEN VISITING FRIENDS OR RELATIVES...

... as they may not take the same level of precautions that you take at home.

7. PURCHASE LOCAL ORGANIC FOOD WHENEVER POSSIBLE.

8. TALK TO FAMILIES, FRIENDS, NEIGHBOURS, AND COLLEAGUES ABOUT THIS REPORT...

... and the preventable health risks posed by pesticides. Find out about pesticide policies at your children's schools and day-care facilities.

9. VOTE FOR POLITICIANS (FEDERAL, PROVINCIAL, TERRITORIAL, AND MUNICIPAL) WHO SUPPORT TIGHTER RESTRICTIONS ON THE USE OF PESTICIDES IN CANADA...

... such as the recommendations advanced by the David Suzuki Foundation.

10. KEEP THE NUMBER FOR YOUR REGIONAL POISON INFORMATION CENTRE NEAR THE PHONE.





Laws Governing Pesticide Use in Canada

The production, import, sale, and use of pesticides in Canada are governed by a complex but not necessarily effective array of international, federal, provincial, territorial, and municipal rules.³⁶ All levels of government in Canada share the responsibility for protecting Canadians and the environment from the risks posed by pesticides. The federal government, pursuant to the *Pest Control Products Act*, decides which pesticides are approved for use in Canada. Under the *Food and Drug Act*, the federal government sets limits on the amount of pesticide residues that can remain on food sold in Canada, and conducts monitoring in an effort to ensure that these limits are not exceeded.

Canada passed a new and improved *Pest Control Products Act (PCPA)* in 2002.³⁷ However, the new law did not come into force until June 2006. It is widely acknowledged that the previous Canadian legislation governing pesticides was badly out of date and incapable of adequately protecting human health and the environment.³⁸ Recent criticisms have focused on inadequate implementation of provisions intended to protect public health from the adverse effects of pesticides.³⁹ The new legislation, *if satisfactorily implemented and enforced*, has the potential to address many of the concerns raised about the old law. The new *PCPA* provides, at least on paper, significant improvements in a number of areas, including recognition of the precautionary principle, mandatory re-evaluation of registered pesticides on a regular basis, improved access to information (including poisonings), and increased opportunities for public participation.

The new *PCPA* offers an important opportunity to enter a new era in Canadian pesticide regulation, enabling the federal government to regain the trust and confidence of Canadians. The primary purpose of the new Act is clear – to provide a stronger level of protection for the health of Canadians and the environment from the harmful effects of pesticides. As section 4 of the new *PCPA* states:

In the administration of this Act, the Minister's primary objective is to prevent unacceptable risks to people and the environment from the use of pest control products.

Despite the new *PCPA* there are still more than fifty active ingredients approved for use in approximately 1,000 commercial pesticide products in Canada, which have been effectively banned by other nations for health and environmental reasons. The standards governing allowable levels of pesticide residues on food in Canada, set under the *Food and Drug Act*, are still weaker than the standards in other industrialized nations, in some cases hundreds of times weaker.⁴⁰ To make matters worse, negotiations are underway that could further weaken pesticide residue limits in order to harmonize Canadian standards with American standards.

Provincial and territorial governments establish rules governing the sale, use, transportation, storage, and disposal of pesticides, as well as emergencies such as spills. These rules apply to agriculture, forestry, commercial, and domestic applications. For the most part, provincial pesticide laws are weak and riddled with loopholes, such as broad exemptions for farmers, the major users of pesticides. Quebec is the only province with legislation that restricts the sale of pesticides approved by the federal government. Quebec's *Pesticide Management Code* prohibits the use and sale of numerous pesticides, including lawn and garden applications. At the present time, only 20 active ingredients are subject to this provincial ban.

Municipal governments are playing an increasingly important part in regulating pesticide use. The role of municipalities was given a large boost in 2001 when the Supreme Court of Canada ruled in favour of a by-law passed by the Town of Hudson in Quebec that prohibited the cosmetic or non-essential use of pesticides.⁴¹ Spurred on by concerned citizens, the medical community, and environmental groups, 125 Canadian municipalities have passed pesticide by-laws. Courts have repeatedly endorsed these by-laws in response to challenges by lawn care and chemical companies. As of 2006, more than 12 million Canadians, or 38% of Canada's population, enjoy improved protection from pesticide exposures. These figures include the province-wide protection provided by Quebec's *Pesticide Management Code*.⁴² See Appendix 1: Municipalities with Pesticide Bylaws.



Conclusion and Recommendations

The David Suzuki Foundation's guiding principle is that all Canadians, especially children, should enjoy a level of protection from environmental hazards that is equal to or better than the highest standard enjoyed by citizens of other industrialized nations. Canada is failing to meet this test. Unlike the U.S. and many other industrialized nations, Canada has no national database to track and monitor poisonings. Canada also appears to offer less effective protection from the adverse health effects of pesticides than many other nations, including the U.S., Australia, and the 25 nations that belong to the European Union.⁴³

More than 6,000 Canadians are acutely poisoned by pesticides every year, resulting in calls to poison control centres, visits to emergency wards, and hospitalizations. Even more disturbing is that more than 2,800 children under the age of six suffer acute pesticide poisoning in Canada annually. That is the equivalent of more than 100 kindergarten classes or 50 school buses filled with toddlers and young children who are poisoned by pesticides in Canada every year. If the problem continues unabated, the number of children under six who will be acutely poisoned by pesticides over the next decade is enough to fill a hockey arena as large as the Air Canada Centre in Toronto, G.M. Place in Vancouver, or the Bell Centre in Montreal.

The mere presence of pesticides in a home, garage, or garden creates a risk to children, as does the application of pesticides, particularly when not used properly. Young children cannot read the labels on pesticide products. They cannot read signs – if there are any – indicating where and when pesticides have been sprayed. The number of cases involving children under the age of six proves that it is insufficient to rely on labels and signs to prevent pesticide poisoning.

Stronger laws to protect human health from the risks posed by pesticides have been endorsed by many highly regarded institutions and organizations in Canada including the Canadian Cancer Society, the Canadian Medical Association, the Ontario College of Family Physicians, the Canadian Association of Physicians for the Environment, and the Learning Disabilities Association of Canada. The new *Pest Control Products Act* is a step in the right direction, but there is clearly still room for improvement. The Canadian Cancer

Society recommends prohibiting the use of pesticides for cosmetic purposes, to prevent cancer.⁴⁴ The Learning Disabilities Association of Canada supports the elimination of “non-essential” uses of pesticides (on lawns, gardens, playgrounds, etc.) because of concerns about the adverse effects of pesticides on the neurological development of children.⁴⁵ The Canadian Medical Association called on the federal government to rescind the registration of combined fertilizer/pesticide lawn care products.⁴⁶

It is time for Canadian politicians and bureaucrats – at all levels of government – to heed the warnings from experts, stop putting the pesticide industry ahead of human health, and take the actions needed to protect the well-being of all Canadians, especially our children, from the harms caused by pesticides.

Reducing the use of hazardous pesticides will reduce the risks to human health and the environment, as well as reducing health care expenses and other societal costs. Swedish cancer experts believe that early regulatory action by the government of Sweden on pesticides and other toxic substances contributed to declining rates of some cancers, particularly non-Hodgkins lymphoma.⁴⁷ A study published in 2006 demonstrated that when a group of children in Seattle had their diet switched from conventional food (grown with pesticides) to organic food, pesticide residues in their urine quickly dropped to non-detectable levels. The authors of the study concluded that switching to an organic diet provides children with “immediate and dramatic” protection against the adverse health effects of exposure to pesticides.⁴⁸

Although this report focuses on poisonings caused by exposure to pesticides, it is important to note that pesticide cases make up a small percentage of total poisonings in Canada. The two leading causes of poisoning among the entire population are cleaning products and cosmetics, common household items that often contain toxic substances.⁴⁹ The leading cause of poisoning among children is medication, and small amounts of some adult medication can be fatal to a child.⁵⁰ Again, the key issues are education, prevention, and, where hazardous substances are genuinely necessary, precautions to ensure safe storage, inaccessible to children. Canada needs to do a much better job in reporting and monitoring all cases of poisoning, educating Canadians about ways to reduce risks, and regulating substances that pose an unnecessary threat to health. Prevention is far more effective, efficient, and equitable than the current approach of burying our heads in the sand.

In order to reduce the risks of pesticide poisoning in Canada, the David Suzuki Foundation offers the following recommendations:*

Recommendation 1

REQUIRE ALL PESTICIDE PRODUCTS SOLD IN CANADA TO BE IN CHILD-RESISTANT CONTAINERS.

The federal government should enact a regulation requiring that all pesticide products sold or imported into Canada can only be sold in child-resistant containers, to minimize the risk of accidental exposures (as is done with medication). Declining rates of death and hospitalization among Canadian children caused by poisoning in recent years are attributed, in part, to child-resistant containers for medication.⁵¹

*Some of these recommendations have been made previously in an earlier David Suzuki Foundation report, *The Food We Eat: An International Comparison of Pesticide Regulations* (2006).

Recommendation 2

INCREASE FUNDING TO CANADIAN POISON CONTROL CENTRES.

Provincial and territorial governments should increase funding to poison control centres. Poison control centres in Canada suffer from a severe shortage of financial and human resources and urgently require additional funding for collecting, managing, responding to, and using poisoning data.

The federal government should provide, in partnership with the provinces, adequate long-term funding for the Canadian Association of Poison Control Centres (CAPCC). The CAPCC lacks adequate funding to function properly, as indicated by the lack of national poisoning data and numerous information gaps on its website.⁵²

Revenue to implement this recommendation should be raised, in part, through a special surcharge on all pesticides.

Recommendation 3

IMPLEMENT A NATIONAL POISONING PREVENTION PROGRAM.

The federal government should implement, in partnership with the provinces, a national poisoning prevention program with the following elements: improved surveillance, a national database, and education programs. Key steps include:

- designating all poisonings, including pesticide poisonings, as reportable events;
- funding and implementing the Prod Tox poisoning surveillance and response system that was shelved in 2002; and
- creating a national poisonings database.

These actions would facilitate proper surveillance and monitoring of poisoning incidents, which would in turn enable effective prevention, regulatory, and education programs. The national database would gather data from provincial poison control centres, physicians, hospitals, and emergency medical facilities. The creation of a national poisonings database was recently recommended by the North American Commission for Environmental Cooperation and endorsed by the federal government.⁵³ In the U.S., the National Institute for Occupational Safety and Health recently published a how-to guide for state governments seeking to establish consistent surveillance and monitoring systems of pesticide-related injuries and illnesses. This could provide a useful resource.⁵⁴

Recommendation 4

BAN THE USE AND SALE OF PESTICIDES FOR COSMETIC PURPOSES.

The surest way to reduce the risk of pesticide poisoning is to eliminate the possibility of exposure. Municipal governments should enact and enforce by-laws that prohibit cosmetic uses of pesticides on public and private property. In Canada, 125 municipalities have passed anti-pesticide by-laws (see Appendix 1). The Federation of Canadian Municipalities

operates a useful website with extensive information available to municipal governments, including existing pesticide by-laws.⁵⁵

Provincial and territorial governments should enact and enforce laws or regulations to prohibit the sale of pesticides for cosmetic purposes. Quebec's *Pesticide Management Code* paves the way for provincial action to restrict the sale of pesticides for residential use.⁵⁶ Other provinces should follow this lead. To improve the effectiveness of Quebec's law, its scope should be expanded (currently only 20 active ingredients are prohibited) and adequate resources should be made available for its implementation.

The federal government should amend the *Pest Control Products Act* to ban the sale and use of cosmetic pesticides nation-wide. Federal action would ensure the same level of protection for all Canadians, particularly children, who are most at risk of unintentional pesticide poisoning.

Recommendation 5

TERMINATE THE REGISTRATION OF ALL PESTICIDE PRODUCTS WHERE THE ACTIVE INGREDIENT HAS BEEN BANNED IN ANOTHER OECD COUNTRY BECAUSE OF HEALTH OR ENVIRONMENTAL CONCERNS.

The David Suzuki Foundation has reminded the federal Minister of Health of his statutory obligation to conduct a special review of the active ingredients used in approximately 1,000 pesticide products registered in Canada but prohibited in other OECD countries. The special review required pursuant to the new *Pest Control Products Act (PCPA)* places the burden of proof on the corporation seeking continued registration of a product to provide evidence that there are no health or environmental concerns. Upon conclusion of the special review, the Minister of Health must make a decision based on the precautionary principle. Given the evidence of negative health and environmental effects that resulted in bans in other OECD countries, the David Suzuki Foundation believes that these pesticide products should be banned in Canada.

Recommendation 6

ESTABLISH A NATIONAL ENVIRONMENTAL HEALTH TRACKING SYSTEM THAT INCLUDES PESTICIDE POISONINGS.

The federal government, in partnership with the provinces, should establish a national environmental health tracking system to monitor environmental hazards, environmental exposures, and health impacts (e.g. poisonings, waterborne illnesses, hospital admissions caused by cardiovascular and respiratory illness related to air quality, learning and behavioural disabilities, childhood cancers, and negative reproductive health outcomes).⁵⁷ The national poisonings database, recommended above, should be linked to the broader environmental health tracking system.

Recommendation 7

RECOGNIZE CITIZENS' RIGHT TO A HEALTHY ENVIRONMENT.

The federal government should recognize that all Canadians enjoy a basic human right to breathe clean air, drink clean water, and live in a healthy environment. The Supreme Court of Canada has endorsed recognition of the right to live in a healthy environment.⁵⁸ In recent years more than 70 nations, including more than 20 in Europe, have explicitly acknowledged in their constitutions that all citizens have the right to a healthy environment.

Appendix 1 Municipalities with pesticide bylaws

PROVINCE	POPULATION	BY-LAW STATUS
BRITISH COLUMBIA		
1. Vancouver	545,671	Pesticide By-law Adopted
2. North Vancouver (District)	82,310	Pesticide By-law Drafted
3. Maple Ridge (District)	63,169	Pesticide By-law Adopted
4. New Westminster	54,656	Pesticide By-law Drafted
5. North Vancouver (City)	44,303	Pesticide By-law Adopted
6. West Vancouver	41,421	Pesticide By-law Adopted
7. Port Moody	23,816	Pesticide By-law Adopted
8. Comox	11,172	Pesticide By-law Adopted
9. Nelson	9,296	Pesticide By-law Drafted
10. Gibsons	3,904	Pesticide By-law Adopted
11. Cumberland	2,616	Pesticide By-law Adopted
MANITOBA		
1. Brandon	39,716	Pesticide By-law Adopted
ONTARIO		
1. Toronto	2,481,494	Pesticide By-law Adopted
2. Hamilton	490,268	Pesticide By-law Drafted
3. Waterloo (Region)	307,443	Pesticide By-law Adopted
4. London	271,003	Pesticide By-law Adopted
5. Markham	208,615	Pesticide By-law Drafted
6. Windsor	208,402	Pesticide By-law Adopted
7. Oakville	144,738	Pesticide By-law Drafted
8. Guelph	106,170	Pesticide By-law Drafted
9. Peterborough	71,446	Pesticide By-law Adopted
10. Newmarket	65,788	Pesticide By-law Adopted
11. North Bay	52,771	Pesticide By-law Adopted
12. Caledon	50,595	Pesticide By-law Adopted
13. Georgina	39,263	Pesticide By-law Adopted
14. Orangeville	25,248	Pesticide By-law Adopted
15. Thorold	18,048	Pesticide By-law Adopted
16. Cobourg	17,172	Pesticide By-law Adopted
17. Perth	6,003	Pesticide By-law Adopted
18. Gananoque	5,167	Pesticide By-law Adopted
19. Deep River	4,135	Pesticide By-law Adopted
20. Georgian Bay	2,228	Pesticide By-law Adopted
21. Cobalt	1,228	Pesticide By-law Adopted
22. The Archipelago (Parry Sound)	504	Pesticide By-law Adopted

APPENDIX 1 CONTINUED

PROVINCE	POPULATION	BY-LAW STATUS
QUEBEC		
1. Montréal	842,926	Pesticide By-law Adopted
2. Brossard	65,026	Pesticide By-law Adopted
3. Longueuil	62,480	Pesticide By-law Adopted
4. Verdun*	60,564	Pesticide By-law Adopted
5. Pierrefonds*	54,963	Pesticide By-law Adopted
6. Repentigny	54,550	Pesticide By-law Adopted
7. Dollard-des-Ormeaux	48,206	Pesticide By-law Adopted
8. Saint-Eustache	40,378	Pesticide By-law Adopted
9. Anjou*	38,015	Pesticide By-law Adopted
10. Boucherville	36,253	Pesticide By-law Adopted
11. Blainville	36,029	Pesticide By-law Adopted
12. Rimouski	31,304	Pesticide By-law Adopted
13. Cote-Saint-Luc	30,244	Pesticide By-law Adopted
14. Pointe-Claire	29,284	Pesticide By-law Adopted
15. Boisbriand	26,728	Pesticide By-law Adopted
16. Sainte-Thérèse	24,268	Pesticide By-law Adopted
17. Saint-Bruno-de-Montarville	23,843	Pesticide By-law Adopted
18. Val-Bélair	21,332	Pesticide By-law Adopted
19. Saint-Lambert	21,048	Pesticide By-law Adopted
20. Kirkland	20,434	Pesticide By-law Adopted
21. Chambly	20,340	Pesticide By-law Adopted
22. Vaudreuil-Dorion	19,920	Pesticide By-law Adopted
23. Westmount	19,727	Pesticide By-law Adopted
24. Varennes	19,653	Pesticide By-law Adopted
25. Beaconsfield	19,310	Pesticide By-law Adopted
26. Beloeil	19,053	Pesticide By-law Adopted
27. Mont-Royal	18,682	Pesticide By-law Adopted
28. Dorval	17,706	Pesticide By-law Adopted
29. Shawinigan	17,535	Pesticide By-law Adopted
30. Deux-Montagnes	17,080	Pesticide By-law Adopted
31. Greenfield Park	16,978	Pesticide By-law Adopted
32. Mont-Saint-Hilaire	14,270	Pesticide By-law Adopted
33. L'Île-Bizard*	13,861	Pesticide By-law Adopted
34. Rosmère	13,391	Pesticide By-law Adopted
35. Sainte-Anne-des-Plaines	12,908	Pesticide By-law Adopted
36. Saint-Lazare	12,895	Pesticide By-law Adopted
37. Sherbrooke	10,380	Pesticide By-law Adopted
38. Pincourt	10,107	Pesticide By-law Adopted
39. Lorraine	9,476	Pesticide By-law Adopted

APPENDIX 1 CONTINUED

PROVINCE	POPULATION	BY-LAW STATUS
40. Saint-Raymond	8,836	Pesticide By-law Adopted
41. Notre-Dame-de-l'Île Perrot	8,546	Pesticide By-law Adopted
42. Mont-Tremblant	8,352	Pesticide By-law Adopted
43. Prévost	8,280	Pesticide By-law Adopted
44. Nicolet	7,928	Pesticide By-law Adopted
45. Otterburn Park	7,866	Pesticide By-law Adopted
46. Val-des-Monts	7,842	Pesticide By-law Adopted
47. Bois-des-Filion	7,712	Pesticide By-law Adopted
48. Hampstead	6,974	Pesticide By-law Adopted
49. Plessisville	6,756	Pesticide By-law Adopted
50. Saint-Hippolyte	6,039	Pesticide By-law Adopted
51. Chelsea	6,036	Pesticide By-law Adopted
52. Lac-Mégantic	5,897	Pesticide By-law Adopted
53. Roxboro*	5,642	Pesticide By-law Adopted
54. Lac-Beauport	5,519	Pesticide By-law Adopted
55. Lac-Brome	5,444	Pesticide By-law Adopted
56. Montréal-Ouest	5,172	Pesticide By-law Adopted
57. Les Cèdres	5,128	Pesticide By-law Adopted
58. Sainte-Anne-de-Bellevue	5,062	Pesticide By-law Adopted
59. Saint-Sauveur	4,806	Pesticide By-law Adopted
60. Hudson	4,796	Pesticide By-law Adopted
61. Sainte-Martine	3,740	Pesticide By-law Adopted
62. East Angus	3,570	Pesticide By-law Adopted
63. Montréal-Est	3,547	Pesticide By-law Adopted
64. Saint-Donat	3,444	Pesticide By-law Adopted
65. Sainte-Genève	3,278	Pesticide By-law Adopted
66. Baie-d'Urfé	3,183	Pesticide By-law Adopted
67. Napierville	3,073	Pesticide By-law Adopted
68. Saint-Liboire	2,829	Pesticide By-law Adopted
69. Sainte-Faustin-Lac-Carré	2,790	Pesticide By-law Adopted
70. Saint-Alphonse-Rodriguez	2,691	Pesticide By-law Adopted
71. Saint-Adolphe-d'Howard	2,684	Pesticide By-law Adopted
72. Huntingdon	2,666	Pesticide By-law Adopted
73. Disraeli	2,635	Pesticide By-law Adopted
74. Morin-Heights	2,575	Pesticide By-law Adopted
75. Sainte-Anne-des-Lacs	2,511	Pesticide By-law Adopted
76. Saint-Denis-de-Brompton	2,498	Pesticide By-law Adopted
77. Adstock	2,368	Pesticide By-law Adopted
78. Piedmont	2,122	Pesticide By-law Adopted
79. Sainte-Marguerite-Estérel	2,093	Pesticide By-law Adopted
80. Nominigüe	2,064	Pesticide By-law Adopted

APPENDIX 1 CONTINUED

PROVINCE	POPULATION	BY-LAW STATUS	
81. Saint-Marc-sur-Richelieu	1,975	Pesticide By-law Adopted	
82. Lacolle	1,503	Pesticide By-law Adopted	
83. Sainte-Marcelline-de-Kildare	1,279	Pesticide By-law Adopted	
84. Austin	1,201	Pesticide By-law Adopted	
85. Notre-Dame-du-Portage	1,172	Pesticide By-law Adopted	
86. Wentworth-Nord	1,121	Pesticide By-law Adopted	
87. Ayer's Cliff	1,102	Pesticide By-law Adopted	
88. La Minerve	1,080	Pesticide By-law Adopted	
89. Senneville	970	Pesticide By-law Adopted	
90. Vaudreuil-sur-le-Lac	893	Pesticide By-law Adopted	
91. Entrelacs	798	Pesticide By-law Adopted	
92. Eastman	790	Pesticide By-law Adopted	
93. North Hatley	746	Pesticide By-law Adopted	
94. Lac-Delage	447	Pesticide By-law Adopted	
95. Wentworth	434	Pesticide By-law Adopted	
96. Sainte-Paule	199	Pesticide By-law Adopted	
97. Lac-Saint-Joseph	184	Pesticide By-law Adopted	
98. L'Île Dorval	2	Pesticide By-law Adopted	
Adopted, Sub-Total:	1,908,992		
*Municipalities with by-laws are 93 because these five municipalities were subsequently merged with Montréal. To avoid double counting, the listed populations of these former municipalities are not included in the provincial total. However the provincial Pesticides Management Code covers the entire population of Quebec (7,676,097.)			
NEW BRUNSWICK			
1. Saint John	69,661	Pesticide By-law Drafted	
2. Moncton	61,046	Pesticide By-law Drafted	
3. Sackville	5,360	Pesticide By-law Adopted	
4. Shediac	4,892	Pesticide By-law Adopted	
5. Caraquet	4,440	Pesticide By-law Adopted	
6. St. Andrews	1,869	Pesticide By-law Adopted	
NOVA SCOTIA			
1. Halifax	293,575	Pesticide By-law Adopted	
BYLAWS ADOPTED	JURISDICTION	POPULATION PROTECTED	% POPULATION
93	Quebec	7,676,097	100%
19	Ontario	3,772,676	29.64%
8	British Columbia	736,072	16.97%
4	New Brunswick	16,561	2.21%
1	Nova Scotia	293,575	31.44%
1	Manitoba	39,716	3.37%
125	Canada	12,534,697	38.24%

Source: Christie, M. 2007. Private Property Pesticide Bylaws in Canada: Population Statistics by Municipality. Current as of December 24, 2006. www.flora.org/healthyottawa/BylawList.pdf.

NOTES

- 1 Office of the Auditor General of Canada. 2003. 2003 Report of the Commissioner of the Environment and Sustainable Development to the House of Commons: Commissioner's Perspective - 2003. Ottawa: OAG. <http://www.oag-bvg.gc.ca/domino/reports.nsf/html/c20031001ce.html>
- 2 National Research Council. 1993. Pesticides in the Diets of Infants and Children. Washington, D.C.: National Academies Press., C. Lu et al. 2006. "Organic Diets Significantly Lower Children's Dietary Exposure to Organophosphorous Pesticides". *Environmental Health Perspectives*. 114: 260-263.
- 3 Boyd, D. R. 2006. *The Food We Eat: An International Comparison of Pesticide Regulations*. Vancouver: David Suzuki Foundation.
- 4 Daws, D. and D.A. Kent. 2006. "Poisoning in British Columbia". *British Columbia Medical Journal*. 48(1): 35.
- 5 Health Canada. 1999. Proposal to Develop a Network for Health Surveillance in Canada. p.48.
- 6 Pest Management Advisory Council Working Group on Voluntary Adverse Effects Reporting. 2005. Presentation to Pest Management Advisory Council. November 8, 2005.
- 7 Provincial Health Services Authority. 2006. *Leveraging Strengths, Transforming Health Care: The PHSA Strategic Plan*. www.phsa.ca
- 8 Pest Control Products Incident Reporting Regulations. SOR/2006-260.
- 9 Environmental Defence Canada. 2005. *Toxic Nation: A Report on Pollution in Canadians*. Toronto: EDC., Environmental Defence Canada.
- 10 Environmental Defence Canada. 2006. *Polluted Children, Toxic Nation: A Report on Pollution in Canadian Families*. Toronto: EDC. www.environmentaldefence.ca
- 11 Centers for Disease Control. 2005. *National Report on Human Exposure to Environmental Chemicals*. Atlanta: CDC.
- 12 Environmental Working Group. 2005. *Body Burden 2: The Pollution in Newborns*. www.ewg.org
- 13 Enrique, M. O., V. Morales, E. Ngoumgna, et al. 2002. "Prevalence of Fetal Exposure to Environmental Toxins as Determined by Meconium Analysis". *Neurotoxicology*. 23(3): 329-39.
- 14 Evans, N. ed. 2006. *State of the Evidence: What is the Connection Between the Environment and Breast Cancer?*. 4th ed. San Francisco: Breast Cancer Fund and Breast Cancer Action., Buckley, J.T., A.T. Meadows, M.E. Kadin, et al. 2000. "Pesticide Exposures in Children with Non-Hodgkin Lymphoma". *Cancer* 89:11., Gilliland, F. D., M.T. Salam, Y. Li and B.M. Langholz. 2003. "Early Life Risk Factors for Asthma: Findings from the Children's Health Study". International Conference of the American Thoracic Society., Ziaomei, M., P. Buffler, R. Gunier, et al. 2002. "Critical Windows of Exposure to Household Pesticides and Risk of Childhood Leukemia". *Environmental Health Perspectives*. 110: 9., Sanborn, M., D. Cole, K. Kerr et al. Ontario College of Family Physicians: Pesticides Literature Review. www.ocfp.on.ca, Infante-Rivard, C., D. Labuda, M. Krajinovic, et al. 1999. "Risk of Childhood Leukemia Associated with exposure to pesticides and gene polymorphisms" *Epidemiology* 10: 481-87.
- 15 Ascherio, A. H. Chen, M. Weisskopf, et al. 2006. "Pesticide Exposure and Risk of Parkinson's Disease". *Annals of Neurology*. July 2006.
- 16 Fritschi, L., G. Benke, A.M. Hughes, et al. 2005. "Occupational exposure to pesticides and risk of non-Hodgkin's lymphoma," *American Journal of Epidemiology*. 162(9): 849-57.
- 17 Sears, M., C.R. Walker, R. van der Jagt, and P. Claman. 2006. "Pesticide assessment: Protecting public health on the home turf". *Paediatrics and Child Health* 11(4): 229-235.
- 18 Bull, R.P., B. Ritz, and G.M. Shaw. 2006. "Neural tube defects and maternal residential proximity to agricultural pesticide applications". *American Journal of Epidemiology*. 163(8): 743-53., Bell, E.M., I. Hertz-Picciotto, and J.J. Beaumont. 2001. "A case-control study of pesticides and fetal death due to congenital anomalies". *Epidemiology*. 12(2): 148-56.
- 19 Reigart, R. and J. Roberts (eds.) 1999. *Recognition and Management of Pesticide Poisoning*. 5th ed. Washington: Environmental Protection Agency.
- 20 Furlong, C. E., T.B. Cole, G.P. Jarvik et al. 2005. "Role of paraoxonase (PON1) status in pesticide sensitivity: genetic and temporal determinants". *Neurotoxicology*. 26: 651-659.
- 21 Health Canada. 1997. "Poisonings" in *For the Safety of Canadian Children and Youth: From Injury Data to Preventive Measures*. Ottawa: Health Canada.
- 22 Park, J. and S. Knudson. 2007. "Medically unexplained physical symptoms". *Health Reports*. 18(1): 43-47.
- 23 Statistics Canada. 2006. *Deaths by cause, External Causes of Morbidity and Mortality*. Table 102-0540.
- 24 Statistics Canada indicates that children aged 0-4 made up 1,712,800 Canadians. We added one-fifth of the 5-9 age category (0.2 x 1,844,300) to be consistent with our use of the category of children under the age of six. Statistics Canada. 2006. *Population by sex and age group*. www40.statcan.ca/l01/cst01/demo10a.htm
- 25 Sanborn, M.D., D. Cole, A. Abelsohn and E. Weir. 2002. "Identifying and managing adverse environmental health effects for Pesticides". *Canadian Medical Association Journal*. 166: 1431-1436.

- 25 B.C. Drug and Poisoning Information Centre. 2006. Poisoning Incidence Statistics.
- 26 The population of Canada is 32,777,304; Manitoba: 1,178,491; Yukon/NWT/Nunavut: 103,756. (Statistics Canada. March 29, 2007: <http://www.statcan.ca/Daily/English/070329/do70329b.htm>.) Pesticide poisonings in Canada excluding Manitoba and the Territories is 5,346. The national average of cases involving children under six is 46.5%.
- 27 Centre Anti-Poison du Quebec, Rapport annuel 1996: statistiques sur les intoxications par les pesticides, April 1997.
- 28 IWK Regional Poison Centre. 2002. Annual Statistical Report. www.capcc.com
- 29 Watson, W. A., T.L. Litovitz, G.C. Rodgers, Jr. et al. 2005. 2004 Annual Report of the American Association of Poison Control Centers Toxic Exposure Surveillance System. www.aapcc.org
- 30 Klein-Schwartz, W. and G.S. Smith. 1997. "Agricultural and Horticultural Chemical Poisonings: Mortality and Morbidity in the United States". *Annals of Emergency Medicine*. 29(2): 232-238.
- 31 Commission for Environmental Cooperation. 2003. Feasibility Study for the Development of Indicators of Children's Health and the Environment in North America. www.cec.org
- 32 Daws and Kent. "Poisoning in British Columbia"
- 33 Angus, D.E., E. Cloutier, T. Albert et al. 1998. *The Economic Burden of Unintentional Injury in Canada*. Toronto: Smartrisk. Note: The disability figures refer only to labour market participation.
- 34 Ibid.
- 35 Health Canada. 1995. Pesticide-related Poisoning and Injuries to Children Less than 20 Years of Age. Canadian Hospital Injury Reporting and Prevention Program.
- 36 Boyd. D. R. 2003. "Pesticide Regulation" in *Unnatural Law: Rethinking Canadian Environmental Law and Policy*. Vancouver: UBC Press.
- 37 Pest Control Products Act, S.C. 2002, c. 28.
- 38 Comprehensive critiques of the old Pest Control Products Act were published by the Law Reform Commission of Canada, the Standing Committee on Environment and Sustainable Development, the federal Commissioner for the Environment and Sustainable Development, environmental organizations, and academics. See Office of the Auditor General of Canada. 2003. *Managing the Safety and Accessibility of Pesticides in Report of the Commissioner of the Environment and Sustainable Development*. <http://www.oag-bvg.gc.ca/domino/reports.nsf/html/c20031001ce.html>, Boyd. *Unnatural Law*.
- 39 Sears, Walker, van der Jagt, and Claman. "Pesticide assessment: Protecting public health on the home turf"
- 40 Boyd. *The Food We Eat: An International Comparison of Pesticide Regulations*.
- 41 114957 Canada Ltee (Spraytech) v. Town of Hudson (2001) 40 C.E.L.R. 1 (S.C.C.)
- 42 Christie, M. 2007. Private Property Pesticide Bylaws in Canada: Population Statistics by Municipality. Current as of December 24, 2006. www.flora.org/healthyottawa/BylawList.pdf. There are 1141 municipalities (cities, villages and townships) in Quebec
- 43 Boyd., *The Food We Eat: An International Comparison of Pesticide Regulations*.
- 44 The Canadian Cancer Society's position is posted on its website at www.cancer.ca
- 45 The Learning Disabilities Association of Canada posts its Policy Statement on Pesticide Use on its website at http://www.ldac-taac.ca/Environment/position_pesticides-e.asp
- 46 Canadian Medical Association. 2004. Resolution GC04-50 – Combined fertilizer/pesticides. Approved Aug. 18, 2004.
- 47 Hardell, L. and M. Eriksson. 2003. "Is the Decline of the Increasing Incidence of Non-Hodgkin Lymphoma in Sweden and Other Countries a Result of Cancer Preventive Measures?". *Environmental Health Perspectives*. 111(14): 1704-06.
- 48 Lu, C., K. Toepel, R. Irish, et al. 2006. "Organic Diets Significantly Lower Children's Dietary Exposure to Organophosphate Pesticides". *Environmental Health Perspectives*. 114(2): 260-63.
- 49 IWK Regional Poison Centre. 2002. Annual Statistical Report. See also Watson, W. A., T.L. Litovitz, G.C. Rodgers, Jr. et al. 2005. 2004 Annual Report of the American Association of Poison Control Centers Toxic Exposure Surveillance System.
- 50 Safe Kids Canada. 2006. Child and Youth Unintentional Injury 1994-2003: Ten Years in Review.
- 51 Ibid.
- 52 See www.capcc.ca
- 53 Commission for Environmental Cooperation. 2006. *Children's Health and the Environment in North America: A First Report on Available Indicators and Measures*. Montreal: CEC. p. 69. See also Government of Canada. 2005. *Children's Health and the Environment in North America: A First Report on Available Indicators and Measures*. Country report: Canada. Ottawa: Environment Canada, p. 56.
- 54 National Institute for Occupational Safety and Health. 2006. Pesticide-related Injury and Illness Surveillance: A How-To Guide for State-Based Programs. NIOSH publication 2006-102. <http://www.cdc.gov/niosh/docs/2006-102/2006-102a.html>
- 55 See www.pestinfo.ca
- 56 Pesticides Management Code, RSQ 2003, c. P-9.3, r.0.01.
- 57 Commission for Environmental Cooperation. *Children's Health and the Environment in North America: A First Report on Available Indicators and Measures*.
- 58 Ontario v. Canadian Pacific [1995] 2 S.C.R. 1031 at 1076.

More than 6,000 Canadians are acutely poisoned by pesticides each year, resulting in calls to poison control centres, visits to emergency wards, and hospitalizations. These acute poisonings occur after exposure to a single dose of pesticide – through inhalation, eating, drinking, or direct contact with eyes or skin. Nearly half of the victims are children under the age of six. The mere presence of pesticides in a home, garage, or garden creates a risk to homeowners and children, as does the application of pesticides, particularly when not used properly.

Northern Exposure: Acute Pesticide Poisonings in Canada is the fourth in a series of reports on how our environment affects human health in Canada.

In an effort to propose real, workable solutions, this report offers a series of recommendations to reduce the risks of pesticide poisoning in Canada.

The David Suzuki Foundation is committed to achieving sustainability within a generation. A healthy environment is a vital cornerstone of a sustainable, prosperous future.



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