

canadian partnership for



children's
health & environment

A Father's Day Report — Men, Boys and Environmental Health Threats

Summary Report

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Boys at Risk

The health of all children living in Canada is at risk from exposure to environmental hazards. Hundreds of toxic substances, such as air pollutants and pesticides are known, or suspected of contributing to adverse child health outcomes. Much remains to be understood about environmental links to adverse health impacts. In the meantime, it is better to be safe than sorry. Much can be done to reduce or prevent exposures.

For a number of these health outcomes, boys seem to be particularly at risk. Whether we look at cancer, asthma, birth defects, or learning and behavioural disorders, the boys are often faring worse than the girls.

The reasons that boys appear to be at greater risk for these conditions are largely unknown, but several reasons have been suggested, including increased exposure and genetic, hormonal and physiological differences between the sexes.

Male vulnerability to environmental hazards is an emerging area of scientific research and public education. This Father's Day report summarizes the information currently available on the rates of diseases and disabilities of boys compared to girls and what is known about the environmental links to these health impacts. We need to know more about the reasons why boys appear to be more vulnerable. In the meantime, both parents, and all members of society, can take action to prevent exposure to toxic chemicals.



Photo credit: Loren Vanderlinden

Cancer

Although cancer is rare among all children, more boys get cancer than girls. Among young adults (age 20–44) several cancers are on the rise, including testicular cancer. Concern arises over parents' exposures before conception or during pregnancy. Childhood cancers are associated with exposures to pesticides, solvents, petroleum products, motor vehicle exhaust, benzene and other pollutants. Much remains unknown. Since cancer involves problems with cell division, it is logical that exposures during times of rapid cell division (especially in the womb) likely pose the greatest risk.

Asthma

In the past 20 years there has been a dramatic rise in asthma in children. Less well known is that boys are worse off. More boys have asthma than girls and more are hospitalized for it. Boys are born with smaller airways, relative to their lung size, than girls. They also tend to have more allergies which can contribute to their developing asthma. Asthma is a complex disease. Evidence shows that it results from interactions between genetics and environmental triggers. Such triggers include indoor and outdoor air pollution and may also include some pesticides and chemicals in household cleaning products.

Learning and Developmental Disorders and Disabilities

Very large numbers of children in Canada have learning and behavioural disorders or disabilities. The apparent increase in autism in recent years is of concern. For unknown reasons, boys are at greater risk. More boys than girls have autism, Attention Deficit Hyperactivity Disorder (ADHD), learning disabilities, Tourette's syndrome, cerebral palsy, and dyslexia. For autism and ADHD, boys outnumber the girls by up to four to one.

We know that children's brains can be damaged by lead, mercury, arsenic, radiation, dioxins, PCBs, solvents and some pesticides. Many more chemicals may be toxic to the brain but much is unknown. Of special concern are chemicals that

are similar to dioxin and PCBs including the fire proofing chemicals or flame retardants known as PBDEs. Boys' brains may be more vulnerable for several reasons. There are genetic differences, slower rates of maturity and greater vulnerability to physical injury. Brain development and the pattern of hormone production in the womb are different for boys than girls. Recent studies of adults reveal gender differences in brain structure, function and chemistry. These differences may make boys more vulnerable to chemical exposures. As well, there are a larger number of cell divisions in males during fetal development which increases the chances of genetic errors occurring.

Birth Defects

Birth defects occur in about two to three per cent of births in Canada with boys affected more often than girls. About half of birth defects affecting boys include cryptorchidism (undescended testicles) and hypospadias (a defect of the male urinary tract). Stillbirths and miscarriages — which often can be due to birth defects — also seem to be more common in male babies.

Many factors can contribute to birth defects including genetics, infection during pregnancy, and environmental factors. Much remains completely unknown. Interaction of multiple factors is likely. We know that certain chemicals can impact development, including lead, mercury, radiation, and PCBs contaminated by dioxins and furans. Scientists suspect many more including some pesticides, organic solvents, and some air pollutants.

Development of the male reproductive system has more steps and is more complex than for the female system. As a result there are more chances for error. Rapid cell growth creates a higher risk of incorporating errors during development than cells growing more slowly. Where defects originate in an X chromosome, females have a chance to “neutralize” this defect with another X chromosome, while males have only one X chromosome.

Testicular Dysgenesis Syndrome

Scientists describe a group of impacts on the male reproductive system under the term Testicular Dysgenesis Syndrome (TDS). TDS includes the birth defects cryptorchidism and hypospadias, as well as poor semen quality (i.e. reduced sperm count, more abnormal sperm), lower fertility and perhaps also testicular cancer. Scientists suspect chemical exposures during pregnancy, specifically during the time when the male reproductive system is developing may be causing these related impacts.



Photo credit: Mark Surman

Hormones of the endocrine system play an important role in development of the fetus. Scientists suspect that TDS results from chemicals that can disrupt these hormones. Called “endocrine disruptors,” scientists have shown these effects (mostly through animal studies but also in some human studies) for a few chemicals including PCBs, dioxins and some organochlorine pesticides

such as DDT. Evidence is growing about other chemicals found in everyday consumer products such as: phthalates (found in many personal care products, food packaging and other products), Bisphenol A (also in food packaging and many other plastic products), brominated flame retardants or PBDEs (used in many different products containing foam or fabric as well as numerous electronic products) and surfactants such as nonylphenols (used in detergents, degreasers, paints, etc.).

Endocrine disruptors may also have played a role in the declining male to female sex ratio in many industrialized nations — that is, fewer male children are born every year. Between 1970 and 1990, there was a decline of 2.2 males per 1,000 live births in Canada.

Fathers' Exposures and their Children's Health

Many studies show links between fathers' exposures to chemicals and health problems in their children. These include low birth weight, spontaneous abortion, birth defects, cancer and developmental delays. Chemical exposures for men may directly affect sperm quality. Chemicals can also be carried in seminal fluid. Workplace chemicals may be brought home by the father exposing mother, fetus or child. Occupations of particular concern include those that involve the use of pesticides, solvents, petroleum products, paints, anesthetics, metals or radiation.

Playing It Safe: Childproofing Tips for Fathers

As a father, you can take steps to minimize the toxic substances that you, your partner and your children may be exposed to. You can do this at work, at home and in your community. Remember that these tips are just as important for mothers.

At work, become aware of possible environmental and occupational hazards. If you work with chemicals, or in construction or renovation, make sure you take all necessary precautions to protect yourself and your family:

- Wear protective clothing and equipment (e.g., masks, gloves, or other protections)
- Wash your hands when possible, especially before eating
- Change your clothes and shower when you get home if facilities are not available at your workplace
- Wash work clothes separately from other clothes
- Keep work equipment outside if possible (in the tool shed or garage for example)

For more information on the chemicals you may be exposed to on the job, and what you can do about them, contact the Canadian Centre for Occupational Health and Safety at 1-800-668-4284 or visit www.ccohs.ca.

At home, it is important to:

- Remove shoes at the door
- Wet dust, vacuum and ventilate your home regularly
- Minimize your use of toxic chemicals: buy personal care products and cleaning products that are less toxic. See www.lesstoxicguide.ca for a list of safe alternatives
- If your hobbies involve the use of hazardous substances make sure these are not practiced in the living areas of the house, that your workspace is kept well ventilated, and that you wear protective clothing

For many more useful tips, see *Child Health and the Environment — A Primer* and the *Playing It Safe* brochure available at www.healthyenvironmentforkids.ca.

And in the community, as fathers you can:

- Become aware of the chemicals your children may be exposed to in childcare facilities, schools, playgrounds, parks, libraries, sports fields and arenas. Ask what products are being used — particularly cleaning products and pesticides — and whether they have been evaluated for health impacts. Find out if alternative products or approaches have been considered.
- Start or support campaigns to reduce pesticide use, promote energy efficiency, and reduce greenhouse gas emissions, etc.
- Voice your concerns to your elected officials — many issues require policy change at the municipal, provincial or federal level.

For more information on ways you can get involved and steps that you can take to ensure a healthy future for you and your children visit the Canadian Partnership for Children's Health and Environment at www.healthyenvironmentforkids.ca.

For the full Father's Day report summarized here, please visit the CPCHE website at www.healthyenvironmentforkids.ca.