

AN EPIDEMIC CRISIS

Part four of a four-part series on health and the environment

by Zoe Cormier

Fourteen-year-old Sarah Mediouni of Orangeville, Ontario, started campaigning three years ago against garden pesticides. Concerned about the risk of cancer to children, she wanted a ban placed on the herbicides and pesticides that residents spray on their lawns and gardens every summer.

Last year, Mediouni herself became sick. She was diagnosed with acute lymphoblastic leukemia—one of the most aggressive kinds.

Today, she is still campaigning against pesticides. “I don’t want other kids to go through what I am going through, just because somebody wants a perfect lawn,” she says. Even in the cold of March, Mediouni is distributing flyers to neighbours, talking about the evidence linking pesticides to cancer and suggesting organic alternatives.

Mediouni’s friend, Scott Rafferty, died in April 2006 from soft tissue sarcoma, which has been linked to the herbicide 2,4-Dichlorophenoxyacetic acid (also known as 2,4-D), a widely-used herbicide. You can buy it off-the-shelf in Canada in weed killers like Killex.

Frustration at the wide availability of such dangerous chemicals bothers Mediouni’s co-campaigner and friend Miranda Brar. “I don’t think it’s fair that people are allowed to spray their lawns, ruin the air and the water, and people like Sarah get sick, who’ve never sprayed a weed in their life,” she says.

There is controversy about whether or not 2,4-D causes cancer in humans. The International Agency for Research on Cancer (IARC), a branch of the World Health Organization, categorizes 2,4-D “possibly carcinogenic to humans.” The Pest Management Regulatory Agency (PMRA), part of Health Canada, announced in February 2005 that the herbicide is safe. But a study by Canadian scientists published this May in the scientific journal *Paediatrics and Child Health* directly contradicts the PMRA, stating that “2,4-D can be persuasively linked to can-

cers,” and concludes that “Canada needs a stronger regulator for pesticides.”

The Ontario College of Family Physicians released a comprehensive literature review in 2004 highlighting the link between pesticide exposure and serious illnesses and disease, including cancer. Both the OCFP and the Canadian Cancer Society oppose the cosmetic (versus agricultural) use of pesticides.

According to the Canadian Cancer Society, 38 per cent of women and 44 per cent of men will develop cancer at some point in their lives. It estimates that 153,100 new cases of cancer will be diagnosed this year, and 70,400 Canadians will die from the disease.

Statistics show that cancer is more common than it used to be. According to Winnipeg researcher Lissa Donner, who uses data from Canadian Cancer Statistics, the age-adjusted incidence of cancer increased by 27.7 per cent in males and 17.8 per cent in females between 1976 and 2001—meaning that if you account for the aging population, the incidence of cancer as whole has increased by more than 20 per cent overall.

Some experts have argued that the apparent increase in cancer is simply due to better science—we’re detecting more cancers than we used to. But cancer has clearly increased in children. “Childhood cancers, according to historical records, were much less common hundreds of years ago,” says Dr. Warren Bell, past president of the Canadian Association of Physicians for the Environment. “We just don’t see large numbers of skeletons with traces of cancer in the bones.”

According to Donner, the incidence of cancer among girls 19 and younger increased 29 per cent between 1976 and 2001 and was up 13.5 per cent among boys.

SEARCHING FOR THE SMOKING GUN

Cancer is a maddeningly complex disease—hundreds of different factors can

interact to spawn a tumour. Sun exposure, poor diet, lack of exercise, alcohol and smoking are all well-known risk factors. And genetics don’t account for the increasing numbers. This has left many people pointing to an invisible, ubiquitous suspect: chemical carcinogens.

Carcinogens are all around us. We breathe in polyaromatic hydrocarbons (PAHs), benzene and cadmium in vehicle exhaust. Cosmetics, household cleaners and food additives contain a slew of carcinogens, from methylene chloride in stain removers to dioxins (carcinogenic industrial waste products) that end up in many products such as soap, tampons and plastic bottles.

And let’s not forget about industrial smokestacks. According to PollutionWatch, more than 8.7 million kg of suspected and known carcinogens were released into the air in Canada in 2003. Most of the big emitters of carcinogens are waste incinerators, petrochemical factories and mining operations.

We know that many synthetic chemicals can cause cancer because people who are exposed to them on the job get certain types of cancers more often. People who work with asbestos, solvents, inks and dyes, and petrochemicals—such as printers, auto workers, welders and miners—are all known to be at increased risk.

PIECES OF THE PUZZLE

Far more controversial is whether or not chemical carcinogens in the environment are responsible for the prevalence of cancer in people who do not work in risky jobs. But increasingly, evidence implies that this is indeed the case.

A study published in the *Journal of the American Medical Association* in March 2002, which looked at 500,000 Americans between 1982 and 1998, found that rates of lung cancers increase with air pollution. Based on this study, most health profession-

als, including Dr James Brophy, epidemiologist and executive director for the Occupational Health Clinics for Ontario Workers, conclude that “about ten per cent of lung cancers in the US are attributable to air pollution.”

Consumer products are also coming under fire. A 2004 study in the *Journal of Applied Toxicology* linked parabens in deodorant and skin creams to breast cancer after finding high concentrations of the chemicals in 18 of the 20 breast tumours they examined.

A huge number of studies have linked pesticides to cancer—not just in farmers, but also in people exposed to pesticides and herbicides in their gardens and in their homes, including insecticides used on pets.

The best evidence, Dr Bell says, comes from Sweden, where chlorophenoxy herbicides and phenoxyacetic acids (a group that includes 2,4-D) were banned in 1977 and 1978. A study in the journal *Environmental Health Perspectives* in November 2003 demonstrated that rates of non-Hodgkin’s lymphoma increased steadily between 1971 and 1990, and then fell between 1991 and 2000—which is exactly what you would expect, given the many years it takes for a tumour to develop after exposure to a carcinogen. “This study showed something that could not be misinterpreted. It really is quite clear cut.”

SUFFER THE LITTLE CHILDREN

Skeptics point out that most people are simply not exposed to a high enough concentration of any potential carcinogen to be at risk. They argue, “It’s not the poison, it’s the dose.” This has always been the paradigm when it comes to cancer research—but now it’s being turned on its head by new evidence.

We now know that it’s not just the dose—it’s the timing. According to a 2005 EPA assessment, a carcinogen is ten times more potent in a baby than in an adult.

Studies have shown links between a parent’s job and their child’s risk of getting cancer, and most experts think the damage begins in the womb, or even in sperm and eggs. Children of farmers and other people who work with dangerous chemicals have been shown time and time again to have higher rates of cancer.

Exposure to chemicals from everyday products may also spawn tumours before birth. A June 2003 study in *EHP* found that the mothers of men with testicular cancer had much higher concentrations of PCBs and other pollutants in their blood than

mothers of sons without testicular cancer, pointing to exposure in the womb.

Children are also vulnerable while growing up, especially during certain “windows” when they are especially sensitive to the effects of carcinogens, such as at the onset of puberty. “The whole system is on fire,” Dr Brophy says. “If young women are exposed to pesticides during key moments, it could have a huge impact on their risk for breast cancer later in life.”

DON'T MIX YOUR DRINKS

There is one more aspect of the “it’s not the poison, it’s the dose” paradigm that public health officials have failed to take into account. People are exposed to dozens, perhaps hundreds, of carcinogens every day. Could it be that tiny amounts of a multitude of chemicals can cause cancer? “There has been some remarkable research showing that combinations of things are much more dangerous than individual items,” Dr Bell says.

For example, studies have found that certain mixtures of individually innocuous pesticides can kill tadpoles, reduce the size of mouse litters, impair immune systems, and cause all kinds of damage to lab animals.

Unfortunately, Health Canada assesses chemicals for safety individually—not in combination. To study the impact of all the permutations of the thousands of chemicals with which we come into contact every day would take tens of thousands of years.

WORKING AT THE GAP

There are 23,000 chemicals currently in use in Canada, many of which were approved for use decades ago under more relaxed guidelines. Fortunately, the federal government is taking a second look at them. Under section 73 of the Canadian Environmental Protection Act (CEPA), Health Canada and Environment Canada are re-evaluating all of them. The government categorized a list of those 23,000 chemicals on September 14, 2006. The list will be made public in October.

In some respects CEPA falls short of its EU counterpart REACH (Registration, Evaluation and Authorization of CHemicals). REACH requires industry to provide scientific data on their chemicals before they are approved for use. “Europe is putting the onus on industry ... that’s a real difference,” Fe de Leon, researcher with the Canadian Environmental Law Association, says.

Moreover, the EU has already taken measures to phase out certain controversial chemicals that the Canadian government has said nothing about restricting, such as

phthalates, the pesticide atrazine and PBDEs, just to name a few.

Critics say there are other gaps in Canadian cancer policy. Labelling of consumer products is a thorn in the side of cancer activists. Until now, cosmetics and personal-care products were not required to list all their ingredients. This will change in November 2006, when new labelling laws take effect under the amended Canadian Cosmetic Regulations. But ingredients will be listed by their proper chemical names, which most people will not be able to understand (ever heard of sodium dichloroisocyanurate dihydrate? It’s sodium salt, a corrosive irritant that causes dermatitis in allergy sufferers). Moreover, the new regulations will only apply to personal-care products, so ingredients in items like household cleaners, detergents and insecticides will not be disclosed.

“We should have hazard-based labelling—which means that if something has a carcinogen in it, it should have a label,” Mae Burrows, a founder of the Labour Environmental Alliance Society (LEAS) says. “It should be clear and easy for people to understand.”

She says people shouldn’t feel helpless about their exposure to carcinogens and hazardous chemicals around them. One can take matters into their own hands.

'THERE ARE ALWAYS ALTERNATIVES'

Frustrated with the lack of information about hazardous chemicals in schools, LEAS worked with custodians and staff at schools in the Burnaby, Langley and Nelson school districts in British Columbia to identify carcinogens. They looked for trichloroethylene in spot cleaners and degreasers in the cafeteria, perchloroethylene in upholstery cleaners and floor polish, and methylene chloride in stain and graffiti remover, among others. They then replaced these chemicals with non-toxic alternatives. “There are always alternatives,” Burrows says.

The \$10 CancerSmart Consumer Guide from LEAS (www.leas.ca) has more information on toxic chemicals and their alternatives. Since Burrows started producing the guide, she says she has seen a big trend in companies offering non-toxic ways to keep homes clean.

Canadian company Sensible Life Products became the first in North America to produce a botanical disinfectant in 1999 when it introduced Benefect. The company has grown by leaps and bounds since then, with total revenues jumping from \$114,000 in 2000 to almost \$1.5 million in 2005.

“That’s really positive,” says Burrows. “It

shows us that the world doesn't have to stop. Commerce can still go on. People can still make a buck on the product and still get the toxins and carcinogens out of there." The increasing popularity of organic farming, organic lawn-care companies, and botanical cosmetics all testify to this.

Husky Injection Molding, one of the world's largest suppliers of injection molding equipment, eliminated the release of 250,000 litres annually of the suspected carcinogen trichloroethane by converting to water-based washers.

Valle Foam Industries, which makes polyurethane foam for mattresses and furniture, managed to reduce its releases of carcinogens by almost 184,000 kilos—a decrease of more than 90 per cent—between 1998 and 2002 at its location in Brampton, Ontario. It eliminated the known human carcinogen methylene chloride from its production process and replaced it with liquid carbon dioxide. The federal government has mandated that methylene chloride be eliminated by 2007, but Valle Foam was able to remove it five years ahead of schedule.

Other companies are proving that taking action to reduce harmful chemicals can be profitable. Toronto pharmaceutical manu-

facturer Novopharm was one of the largest air emitters of methylene chloride in Canada in 1998, releasing more than 440,000 kilos of the chemical annually from two facilities. In 2001, the company cut that number to 46,000 kilos after switching to water-based coating processes—and netted a total savings of about \$1 million per year.

Carpeting and flooring giant Interface, Inc. also saved money by eliminating releases of all carcinogenic substances from its production, such as the heavy metals involved in dye production. As a result of all its sustainability measures, which also include absolutely zero water emissions, the company saved about \$12.8 million all told in Canada (and \$299 million worldwide).

FROM THE GROUND UP

Even if the federal government is slow to deal with some cancer risks, we can try to protect our health at the local level. Over 100 Canadian municipalities have prohibited the use of pesticides, typically only allowing people to spray in the event of severe infestation. The City of Toronto will fine lawn companies as much as \$5,000 if they fail to comply. This May, Quebec became the first province to ban the pesticide 2,4-D (com-

mercial enterprises such as golf courses and farms exempted).

Of course, pesticide manufacturers are not happy with the wave of bylaws spreading across the country. Debra Conlon, executive director of Urban Pest Management for CropLife, a pesticide industry group says, "Any bylaw that I have seen has been a huge waste of time and taxpayers' money because pesticides are already regulated by the federal and provincial government." CropLife Canada took its case to the Supreme Court of Canada when Toronto implemented a pesticide bylaw—and lost. Now any city in Ontario has the prerogative to prohibit pesticide use.

Which is just what Mediouni and Brar are hoping for their home town. Orangeville passed a ban this spring, but they call it weak and inadequate because it only restricts residents from spraying in July and August. Their resolve unabated, Brar says they are planning to take their case to the province: "We are inheriting the earth that they are polluting, so we have a right to make a stand." **CK**

Zoe Cormier is a science writer.

YOU'VE HEARD OF CARBON OFFSETS, BUT WE GO FURTHER.



ZeroFootprint takes a holistic approach to offsetting your ecological impact:

We neutralize greenhouse gas emissions resulting from production and distribution processes and travel. Plus, our programs offset through natural resource restoration and conservation, accounting for the trees and water used in products and services.

Our programs are coupled with the three R's—reduce, reuse, recycle—and are often self-financing.

www.zerofootprintoffsets.com