

Much Ado about (Almost) Nothing Greenpeace and the Allegedly Toxic Teethers and Toys

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1 Introduction

The issue of allegedly toxic teethers and toys made headlines in Canada, the United States, Europe, and a few other countries in 1997 and 1998. The extensive coverage in the news media was the result of Greenpeace's "Play Safe" campaign.¹ The campaign was apparently triggered by a study conducted by Greenpeace that found high levels of toxic chemicals in children's toys. Specifically, the concern revolved around the phthalate softeners found in polyvinylchloride (PVC), a common plastic used to make teethers and toys for children. Greenpeace was also concerned with the hazardous levels of lead and cadmium found in PVC.²

The chapter is organized as follows. Section 2 briefly describes the product in question, polyvinylchloride (PVC), and notes its extensive

Notes will be found on pages 129–31.

use in the toy industry for over a decade. Section 3 provides some background to Greenpeace's campaign against allegedly toxic teething toys, focusing on Greenpeace's research, said to be the primary motivation for the "Play Safe" campaign.

Section 4 describes Greenpeace's "Play Safe" campaign in Canada in 1997 and 1998. It was part of a multi-nation effort in North America and Europe coordinated by Greenpeace International. Section 5 describes the responses of Health Canada, which has primary regulatory responsibility for hazardous products relating to children.

Our analysis of Greenpeace's "toxic toys" campaign in Canada is found in section 6. Finally, in section 7 we set out our conclusions.

2 The product in question: PVC

Polyvinylchloride (PVC) is the second most common type of plastic and is used in a wide variety of products: packaging, credit cards, car interiors, flooring and blinds.

PVC alone is a brittle plastic. When used to produce items such as toys, which require a softer plastic, softeners or plasticizers are added to achieve the needed flexibility. Although a variety of chemicals are used as softeners, phthalates are the most common. The most commonly used phthalates are diethylhexyl-phthalate (DEHP), di-isodecyl phthalate (DIDP), and di-isononyl phthalate (DINP). DINP, the current most commonly used phthalate, has been found to cause damage to the liver and kidneys of laboratory animals, although it does not follow that the same result would appear in humans. When used by humans in laboratories, bottles of DINP are required to carry warning labels (website, Phthalates). The main concern with PVC is that phthalates are not chemically bound to it; instead, they sit side by side with the polymer. PVC also contains lead and cadmium. Together, phthalates, lead, and cadmium can leach out of the PVC and be ingested by children using teething toys or sucking on small toys.

Greenpeace's position is this: "The entire life-cycle of PVC plastic is a polluting process. Its production involves highly toxic additives and generates hazardous chlorinated emissions and wastes. When burned in accidental fires or incinerators, PVC products are a significant source of dioxins" (Greenpeace, press release, September 17, 1997).

PVC is extensively used in the toy industry by all the major toy makers such as Mattel, Inc. (makers of Barbie, Fisher-Price, and Disney products), Hasbro, Inc. (which includes Playskool and Tonka), and Galoob Toys, Inc. (makers of Power Rangers) (Christensen 1998: 38). Studies have shown that about 93 percent of soft vinyl toys sold in Canada contain between 4 percent to 44 percent of product weight of DINP (Everson 1998a: A1).

Many things we use in everyday life contain toxic chemicals.³ The real issue is whether their use results in exposure to those chemicals and then whether the amount of exposure could cause illness or death. Then, we need to know how many people are harmed in various ways. While Greenpeace in a host of countries made repeated claims of harm, no evidence was presented of actual harm. Yet DINP had been used in PVC toys for well over a decade.

3 Background to Greenpeace's campaign

(a) Toxic Teethers: Part of a larger Greenpeace campaign against PVC

Greenpeace Canada (and Greenpeace in other nations) was attempting to stop the usage of PVC plastics long before the "Play Safe" campaign began in September 1997. PVC plastics are believed by Greenpeace to be harmful to the environment because of the release of dioxins in both the production and disposal process. Greenpeace claims that the "entire life-cycle of PVC plastic is a polluting process" (Greenpeace, press release, September 17, 1997; Rice 1995)

It is important to understand that the "Play Safe" campaign is really only another skirmish in Greenpeace's war on dioxins, which began in the mid-1980s. In fact, Greenpeace has been able to stigmatize dioxin as the most toxic chemical on the earth, largely because of the ineffectiveness of governments' risk communication efforts (see Powell and Leiss 1997: chap. 3). Greenpeace's sustained and often misleading attack on dioxin has followed a complex course from a critique of the release of chlorine by pulp mills (ca. 1987) to criticisms of the release of phthalates by PVCs (1993 to 1998). Its series of publications beginning in 1987 "take up the following set of relationships, for example: (1) pulp and paper—chlorine, (2) pulp and paper—dioxin, (3) dioxin—chlorine, (4) chlorine—incineration, (5) dioxin—incineration, (6) PVC—incineration, (7) PVC—dioxin, (8) PVC—chlorine, (9) chlorine—hormone disruptors, (10) PVC—hormone disruptors" (Powell and Leiss 1997: 62).

A precursor to the "Play Safe" campaign occurred 18 months earlier (March 25, 1996) when Greenpeace Canada appeared before a joint meeting of the health board and city's services committee at Toronto city hall and requested that the City ban the use of water and sewage pipes made of PVC (see Corcoran 1996; Powell and Leiss 1997: chap. 3). Greenpeace claimed that "toxic piping" produces "dangerous toxins" that imperil humans and wildlife by, among other things, reducing sperm counts and increasing cancer rates. The Vinyl Council of Canada, a division of the Society of the Plastics Industry of Canada, told the City that the assessment of experts and governmental agencies is that PVC

pipng does not endanger human or animal health and does not produce dangerous quantities of dioxin (Corcoran 1996).

Greenpeace claimed that PVC piping contains cancer-causing “plasticizers.” However, Environment Canada’s review of PVC concluded that it is not a health hazard and is not bioaccumulative or toxic. Other studies have concluded that incineration of vinyl does produce unsafe amounts of dioxin. While Greenpeace did not persuade Toronto to stop using PVC piping, it was able to persuade the City to adopt a policy of not incinerating any of its PVC waste.

(b) *Greenpeace’s original research*

Greenpeace’s “Play Safe” campaign in 1997 and 1998 was said to be based on research conducted on PVC toys for Greenpeace at Exeter University in the United Kingdom.⁴ For the test, 71 toys were purchased from 17 countries worldwide, of which 63 were made of, or contained, PVC. The tests revealed that 10 percent to 40 percent of most of the PVC toys was toxic material, namely phthalate (website, Some Quick Facts). The phthalate most commonly found in the toys was di-isononylphthalate (DINP). The study for Greenpeace, performed on laboratory animals, found that di-isononylphthalate caused liver and kidney damage and hindered reproductive development. Since phthalates are released by excessive sucking or chewing, this study caused Greenpeace to be concerned over the possible damage to children.

The possibility that PVC toys are toxic is not new to the toy industry. Di-ethylhexylphthalate (DEHP) was used before it was replaced in 1985 with DINP after Greenpeace had found that liver damage occurred in rats that ingested this chemical.

(c) *Other Greenpeace research*

Additional research commissioned by Greenpeace Germany, and carried out by two separate German laboratories, supported the findings of the study done at Exeter University. Their tests concluded that “PVC toys leach hazardous additives” (Lisa Finaldi, Greenpeace International, quoted in a Greenpeace press release, December 12, 1997). Twelve out of 23 toys made of PVC that were tested were found to be “leaching chemical additives at levels five to six times the recommended limits set by German official authorities” (Greenpeace website, Chemical Leaching).

Three points should be noted here. First, the size of the sample used for testing by Greenpeace Germany was very small. Second, there were several studies of the leaching of phthalates (cited in Health Canada 1998a) that did not get the results claimed by Greenpeace Germany or Greenpeace International. Third, weak science—or even “junk science”

(see Huber 1991)—can be effective in causing fear in a risk controversy and in helping to set the agenda for both industry and government.

4 The campaign in Canada, 1997–1998

The “Play Safe” campaign in Canada⁵ began on September 17, 1997 with a press release based on its research on soft PVC toys and teethingers for children. Press conferences were held in New York and London. The press release was reported in newspaper stories and on television news. It appears that the opening of the campaign was timed to coincide with the peak toy-buying period before Christmas.

On September 23, 1997, Greenpeace Canada sent letters to leading Canadian retailers of toys (Toys ‘R’ Us, Wal-Mart and Zellers) demanding they withdraw all soft PVC infant toys from sale (press release, September 23, 1997). On October 9, 1997, Greenpeace submitted a copy of its study of PVC toys and teethingers to Health Canada. Almost immediately Health Canada began a reassessment of the safety of soft PVC toys and phthalates (see section 5).

Receiving no response from the toy retailers, Greenpeace activists took direct action and hung a banner at a Toronto Toys ‘R’ Us store on November 27, 1997, urging the company to “Stop Selling Toxic Toys.” They also removed PVC toys from the Toys ‘R’ Us shelves. The action highlighted the fact that all Toys ‘R’ Us stores in Denmark, Holland, and Belgium had withdrawn soft PVC plastic toys for children under age three from sale. The Greenpeace activists loaded shopping carts with PVC toys and hung signs reading “Play Safe: Buy PVC-Free” on the shelves. They also confronted the Toys ‘R’ Us manager, calling on the retailer to follow the example of European chains.⁶

On June 1, 1998, Greenpeace activists interrupted the annual meeting of the International Council of Toy Industries in Toronto to demand the withdrawal of PVC toys from store shelves.

About a year after the campaign began, Greenpeace formed alliances with five of Canada’s leading organizations concerned with the health of children and with the environment: Canadian Institute of Child Health, Learning Disabilities Association of Canada, Canadian Association of Physicians for the Environment, Canadian Childcare Federation, and Canadian Association of Family Resource Programs (McIlroy 1998a). Together, the group called on Health Minister Allan Rock on November 16, 1998 to force stores to remove PVC children’s products. Health Canada reacted the same day with an “advisory” (see section 5).

On October 21, 1998, Dr. Paul Johnston, a British toxicologist retained by Greenpeace, gave a public lecture on the issue of toxic chemicals at the Vancouver Public Library sponsored by the BC Environmental Network. He was one of the authors of the report on toys and teethingers

made out of PVC commissioned by Greenpeace in 1997. Johnston said adoption of the precautionary principle made sense because no one seems to know the effect on humans who handle, chew, bite, and suck on toys containing phthalates (Fayerman 1998).

On November 13, 1998, the *National Post* (A10) quoted the federal health minister Allan Rock who wrote, in a letter to Greenpeace: "It would be premature, at this time, for Health Canada to formulate a position" on phthalates in children's toys. In the same article, the *National Post* quoted American expert Richard Mass (retained by Greenpeace) saying that chemicals are transferred to children's mouths when they suck or chew on teething or rubber toys. This conclusion was reached after 131 PVC toys were tested for levels of lead and cadmium. The results showed that 18 percent of the toys not only contained high levels of lead but phthalates as well. These levels were said to be high enough to cause substantial brain damage to children and hormone developmental problems.

The same article reported the results of Health Canada's tests (reported on November 16, 1998, see section 5), which found that 17 out of 24 products contained 200 parts per million of lead compared to the Canadian standard of 15 parts per million. Yet Health Canada did not conclude that the products were risky to children because the products they tested were mainly intended for older children (Everson 1998a).

On November 14, 1998, Health Canada (1998a) published its updated risk assessment on di-isobutylphthalate in vinyl children's products. The study had taken 11 months. (It is discussed in section 5.) Also on November 14, the *Globe and Mail* (A13) reported the challenge by biochemist Joe DiGangi of Greenpeace USA of the method used by the US Consumer Product Safety Commission to set the maximum allowable level for humans (take the largest dosage level that does not appear to cause problems in rats and divide by 100). He said "this one-hundredth is a made up number; it's a standard they've invented." DiGangi argued that substances that cause cancer in laboratory animals should not be allowed in items that children could chew.

On November 16, Greenpeace Canada demanded in a press release (1) that products that contain PVC should be removed from sale and from use by small children, (2) that the government ensure that the manufacturers are labeling the content of the product in order to inform the parents, and (3) that government set a limit on the amount of lead, cadmium, and phthalates used in products (press release, November 16, 1998). Greenpeace Canada also challenged the federal Minister of Health, Allan Rock, to take action against PVC toys.

On the same day, Health Canada issued an advisory bulletin on children's toys made of PVC (see section 5). The Vinyl Council of

Canada (1998b) also issued a press release on November 16, 1998 stating that the “preponderance of scientific evidence supports the safe use of DINP” Not surprisingly, on November 16, 1998, the lead story on CBC-TV’s national news (*The National*) was toxic toys. The same issue was a front-page story in the *Toronto Star*, though only page three in the *Globe and Mail*.

The next day, the *Globe and Mail* (A1, A3) quoted Greenpeace toxics expert, Matthew Bramley as saying that “Health Canada has done nothing about the various serious dangers from astonishingly high levels of lead and cadmium.” It also quotes him to the effect that toys containing PVC are hazardous to children (McIlroy 1998b).

On November 18, 1998, columnist Marcus Gee sought to put the toxic toy issue into perspective by describing the much greater risks faced by children in poor countries: for example, two million die each year for lack of immunization against simple diseases like measles. Gee wrote:

If it wasn’t clear before, the vinyl toy scare has made it so: Canada has become a nation of hypochondriacs. Enclosed in a bubble of wealth and privilege, we have become neurotic about our health and the health of our cosseted, overprotected children. While millions of children around the world waste away from measles or pneumonia or diarrhea, we fret that our little darlings will succumb to a deadly rubber ducky or a toxic Barbie House (Gee 1998: A31).

During the same week, in a speech in Toronto to a meeting of the Canadian Institute of Law and Medicine, Dr. Cornelia Baines, professor of public health sciences at the University of Toronto, said that “unfettered junk science” is distorting health care, interfering with industry, and causing life-saving products to be removed from the market (cited in Corcoran 1998).

On November 21, 1998, *Financial Post* columnist Terence Corcoran (D8) indicated that, based on the view of a Health Canada official, children would have to suck on the same soother for at least three hours a day for several years before any significant risk would be involved. Even then, the likelihood of sufficient exposure to DINP to cause illness (not death) would be one in a million. As well, tests on mammals such as hamsters and monkeys, which are closely related to humans, did not show any negative effects from exposure to phthalates.

The issue of toxic teethingers and toys became nearly invisible in the news media after Health Canada issued its advisory bulletin in mid-November 1998. Greenpeace Canada, however, soon came up with another product said to be leaching phthalates.

On February 22, 1999, Greenpeace Canada issued a press release saying that lab tests it had commissioned showed “extraordinarily high levels of DEHP (diethylhexyl) phthalate” in PVC bags used to deliver medicines intravenously and for transfusions (see also Le Gault 1999). It claimed: “over 160 North American health organizations including the American Public Health Association and the American Nurses Association, are calling today on hospitals to switch from PVC products to safer approved alternatives” (McIlroy 1999). Again, Greenpeace used Dr. Matthew Bramley as a spokesman.

5 Health Canada’s responses

Determined efforts by an interest group to create a risk controversy put pressure on the government agency responsible for regulating or otherwise dealing with such risks. In Canada, the agency on the “hot seat” was the Health Protection Branch of Health Canada (Aubuchon 1999). The federal government does not have a good record in dealing with risk controversies, particularly with respect to the important activity of risk communication (Powel and Leiss 1997; Lundgren 1994; Covello, von Winterfeldt and Slovic 1987; Gutteling and Wiegman 1996).

(a) The risk assessment

Less than a month after Greenpeace Canada launched the “Play Safe” campaign on September 17, 1997, Health Canada initiated its own tests on PVC toys in Canada to verify the levels of phthalates leached into the mouths of children.⁷ “Whenever there is a lead in products we’re always concerned,” said Francois Dignard of the Health Department.⁸ Health Canada said that it wanted to propose a “Strategy for Reducing Lead in Children’s and other Consumer Products,” which would be completely voluntary, rely principally on industry, and not come into full effect until 2001. Health Canada has called for phasing-out the use of lead where it poses unacceptable health hazards and where alternatives to lead are available but they refuse to regulate. After this announcement, Health Canada became all but invisible for eleven months when its research was completed.

On November 14, 1998, Health Canada published an eight-page risk assessment on DINP in vinyl children’s products (1998a). Specifically, this investigation was conducted to determine the health risk of DINP from soft PVC children’s products as a result of mouthing by a child. The risk assessment included an analysis of the total DINP content in PVC children’s products, human exposure to DINP, a hazard assessment of DINP, the cancer risk of DINP, an evaluation of the risks, and a probabilistic analysis of risk. The study found that there is no sig-

nificant correlation between the total DINP content in a given PVC children's product and its release rate. In other words, it does not matter that Greenpeace found 40 percent of the content of some toys to be phthalates; this does not determine how much exposure children actually receive because that depends on the amount that leaches out of the toy or teether and is ingested.

Health Canada also concluded that a reasonable extrapolation from the cancer risk found in the animal model to humans cannot be made given currently available information (1998a). The investigation did find, however, that the quantity of DINP released from soft PVC products designed specifically to be mouthed by young children may pose a risk to the health and safety of children between the ages of three months and one year (Health Canada 1998a). As a result, Health Canada issued an advisory bulletin two days later.

(b) The advisory bulletin

On November 16, 1998, Health Canada issued an advisory bulletin (1998b) saying that children under eight kilograms could be at risk if they sucked on a rattle or teether containing DINP for more than three hours a day. It stated that testing on animals showed that intense exposure to DINP could lead to kidney and liver damage. Also, parents were advised to remove soft vinyl items that were not designed for sucking and chewing from playpens and cribs from the reach of small children because children could easily have oral contact with them. However, at the time when the advisory was released,⁹ the risk from sucking and chewing was not reported.

Health Canada sent out faxes to 75,000 Canadian retail outlets to "urge" them to "withdraw the teethers and rattles from their stores (Kennedy 1998).¹⁰ It also sent out an advisory warning to parents and caregivers. Health Canada also requested physicians to post the notice, "Health Canada Notice to Parents and Caregivers with Very Young Children," in their offices and in daycare facilities. The warning informed parents and caregivers to dispose of "products designed for sucking or teething," as Health Canada had concluded that "intense DINP exposure can cause potential damage to the kidneys and liver" (Health Canada 1998b).

PVC products containing the phthalate DINP cannot be distinguished from others since contents are not marked on the products. For this reason, Health Canada recommended that all soft vinyl toys be removed from younger children's cribs. Health Canada gave manufacturers six months to find a replacement for the phthalate DINP in the manufacturing of soft PVC toys (Health Canada 1998b). It also put on its website the names of soft PVC toys and teethers that do not contain phthalates.¹¹

Health Canada said that it issued the advisory only as a precautionary measure because it found no scientific proof of DINP posing a health risk to small children (Everson 1998a: A1). The department wanted to inform the parents and caregivers that some risk (not quantified) was associated with vinyl toys.

(c) Information bulletin

Also on November 16, 1998, Health Canada released an information bulletin¹² on lead and cadmium (1998c). It noted that the international standard (European Standard EN-71) for the allowable amount of releasable lead in children's toys is 90 ppm (parts per million) and for cadmium, 75 ppm. The bulletin pointed out that the presence of lead or cadmium in the toy does not necessarily mean that children who mouth or suck such toys are at risk since the amounts leaching out may be below the standard.

Health Canada stated that its testing of numerous soft vinyl (PVC) products, including children's toys and garments, found that:

While some of these tested products were found to contain lead, the vast majority of the tested products were found not to have extractable lead that exceeded the international standard of 90 ppm. (Heath Canada 1998a: 2)

Health Canada indicated that in May 1997 it had initiated its "Strategy for Reducing Lead" as a preventative measure to reduce the exposure of children to lead in toys and other consumer products.

6 Analysis of Greenpeace's campaign

(a) How big a risk?

The claims of Greenpeace suggest that a serious risk is being posed to children by the leaching of phthalates from toys made of PVC in which DINP has been used as a softening agent. But rationality requires both citizens and governments to ask how big is the risk. In particular, (a) what harm(s) can occur (e.g., slight illness versus certain death), (b) what is the likelihood (or probability) of such harm(s), (c) how many people are exposed to such harm(s), and (d) how many people are likely to be harmed?¹³

The quantity of phthalate to which children are exposed from toys and teethingers is minute. A Health Canada official said (in November 1998) that if a person had a PVC toy in his mouth continuously for 18 years, that individual would have about one chance in one million of developing an illness as a result (Corcoran 1998). Children usually stop

putting toys in their mouths after their first three years. Further, plastic toys are not constantly in their mouths. Thus, the chance of a child developing an illness as a result of toys and teething is near zero. Even Greenpeace, on its website, admitted as much: “The Dutch Government released the results of the study on a standardized and validated test . . . the study concludes that there is presently no reliable laboratory test available for measuring phthalate release” (website, Government Action . . .).

When assessing the dangers of PVC toys, one should also observe past generations who had PVC toys. The fact is that PVC toys have been softened with DINP for some 13 years and there has not been any reported cases of illnesses due to contact with PVC toys in children.

As important as the estimate of very tiny risk involved in this case is the timing and origins of the estimate. The estimate was not made public until November 1998, over a year after Greenpeace launched its “Play Safe” campaign. Further, the estimate was offered by a Health Canada official in response to questions at a press conference. In other words, Health Canada made no effort early in Greenpeace’s campaign to try to help parents understand the possible harm (illness, not death) and the low probability of that harm (one chance in a million). This is hardly a model of risk communication. Nor did Health Canada offer any figures on other risks to children that might have helped parents put the alleged risk from “toxic toys” into perspective.

(b) Comparing risks

The comparison of different types of risks is difficult because the perception of risks is necessarily subjective and there are large differences in the way people characterize risks (number of dimensions and the utility for combinations of dimensions).¹⁴ But without some effort to make comparisons we lose all sense of perspective. It simply cannot be true that each of the millions of different risks in the world is unique for each person. If such were the case, rational public policy (risk management) is impossible.

What can we say about the attributes of the alleged risks relating to phthalates in PVC toys and teething? These appear to be the key characteristics:

- (1) This is a risk to the health of children under age three—this is a category of risk very likely to seem a threat or an outrage (see Sandman 1986).
- (2) The risk comes from a man-made chemical, which are always seen by the public as much more threatening than the many more poisonous chemicals in nature (see Ames and Gold 1996).

- (3) The risk is invisible—the toxic chemical leaches out of the plastic and is ingested when children “mouth” the toys or teethingers. Invisible threats are perceived as more serious.
- (4) The risk is largely voluntary: parents and other adults give soft PVC toys to children. Other toys deemed to be safer can be substituted. Involuntary risks are almost always perceived as vastly more serious than objectively comparable risks that are voluntarily assumed (see Fischer et al., 1991).

The “good news” is that millions of children have been “mouthing” soft PVC toys or teethingers containing phthalates for at least a decade. Neither Greenpeace nor any national health authority have published any data showing illnesses reasonably related to phthalates leaching from toys or teethingers. Not one death has been attributed to such leaching. Nor has any research—even that by Greenpeace—suggested that the leaching of phthalates has a long latency period, i.e., that the harm shows up years after the exposure.

So what do we have? Is this is another example of Greenpeace-induced fear overwhelming both logic and the absence of hard evidence of any harm, let alone serious harm? Several nations in Europe have legislated against either a phantom or a truly minute risk. In December 1999, the EU Health and Consumer Protection Commissioner imposed an emergency ban on soft plastic toys made with phthalates, ignoring the unanimous advice of the European Commission’s scientific committee that had earlier found no evidence of danger to children (Milloy 2000: C7).

It has been argued that one of the criteria for good risk management is for government to ignore very tiny risks (i.e., those of less than one chance in a million of harm). Why? Because, by expending regulatory time and citizens’ money on unimportant risks, much more important ones will not be addressed. No wonder that Professor John Graham (1996) has described the American government’s approach to selecting risks for regulatory action as “a syndrome of paranoia and neglect.” Canada’s approach is very similar (Stanbury 2000).

While all the controversy over phthalates was occurring in 1998, Health Canada was conducting a study of the injuries to children from dog bites and attacks. In April 1998, the Health Protection Branch searched the database of the Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP) for 1996 to identify the number of persons injured from dog bites or attacks (Health Protection Branch 1998). They accounted for 1.0 percent of all injuries in the CHIRPP database. The number of injuries by age group is shown in table 1. The data indicate that some 350 young children (under age 4) are injured each year by dogs (a risk voluntarily accepted by parents). By compari-

Table 1 Number of injuries from dog bite per age group (1996)

≤ 1 year	80	10–14 years	292
2–4 years	273	15–19 years	65
5–9 years	353	≥ 20 years	174

Source Health Protection Branch, Health Canada

son, there are no reports of illness or injury due to phthalates from PVC toys or teethingers. Yet Health Canada has never issued an advisory on the risks of dog bites and attacks to young children.

The data also indicated that 30.1 percent of the injuries (all ages) were inflicted by the victim’s dog or family dog and 35.1 percent came from the dog of a friend, neighbour, or relative. Some 73.1 percent of injuries consisted of a bite (mainly to the head, face, neck) while 18.0 percent consisted of a laceration (again primarily to the face).

Of the 1,237 persons injured by a dog, 56 (or 5.8 percent) had to be admitted to hospital. Note that one-half of these were children under age four (the same group said to be at risk from toxic toys and teethingers). The good news is that no fatalities resulted from dog bites.

To see how small the risk relating to certain teethingers and plastic toys was, consider the following: on average the odds of a child dying from all causes under the age of one is 1 in 140 for boys and 1 in 180 for girls (Thomas and Hruddy 1997: 3). The annual odds of a child dying between the ages of 5 to 9 years are 1 in 5,500 for boys and 1 in 7,300 for girls (again, these figures are for all risks). For additional perspective, consider two more risks: in the United States, the risk that a baby will be born with Down’s syndrome is 1 in 600; the risk that a newborn will have a serious birth defect is one in six (Laudan 1997: 153–56).

Analysts find it hard to explain the underlying rationale for the process by which society (through government) decides to focus regulatory efforts on certain risks while ignoring risks that have a higher probability of harm, where the harms are more serious, and where more people are harmed (injuries, illness, death). They are becoming increasingly critical (particularly in the United States) of the process that generates such idiosyncratic results.

(c) Criticisms of Health Canada’s responses to Greenpeace Canada’s campaign

One criticism of the Health Canada risk assessment is that it covered only DINP. It did not address Greenpeace’s concerns about lead and cadmium in toys. Activists claim that this is too significant a problem to be

overlooked; these chemicals are identical to those found in vinyl mini-blinds that caused dozens of cases of lead poisoning in children in the United States (Ross 1996) and eventually brought a call for a public health warning in 1996 (Everson 1998a: A10). Health Canada's response to this criticism is that it had found that "there was no danger posed by lead in toys, in part because unlike DINP, the lead is not easily extracted from a product, even if children chew on it" (McIlroy 1998a: A1, A3).

In terms of the method of research used, Health Canada's findings have more validity compared to those of Greenpeace. Health Canada conducted its investigation using conventional research methods, with extensive testing and without any suspect assumptions. However, Health Canada did overlook an important aspect of this issue. Its study failed to consider how long young children actually suck or chew on toys. This flaw is revealed in the Human Exposure section of the study, where "the average levels of DINP released into saliva were obtained from 20 adult volunteers" in order to determine human exposure. The fact that adults were used in the study was addressed by Health Canada, saying that the "difference between adults and children in the manner of chewing or sucking on a toy were not considered to introduce a significant error in the estimate of exposure" (Health Canada 1998a: 2). Perhaps, but this does not address the likely greater duration of time children under age three have a teether or soother in their mouth.

Some critics claimed that Health Canada overreacted to Greenpeace's claims. Some even go as far as to say that Health Canada ran a junk science campaign¹⁵ that is "distorting health care, and interfering with industry" (Corcoran 1998: D8). These critics highlight the fact that there is no report of any child becoming sick from exposure to PVC toys. Despite a Greenpeace news release claiming that babies who sucked on a soother for three or more hours daily might receive too much DINP, Corcoran (1998) states that Health Canada failed to mention the critical point that a baby would have to suck on the same soother for years to achieve anything that could even remotely be considered risky.

So why did Health Canada react the way it did, notably issuing the advisory bulletin. Francois Dignard, of Health Canada's consumer products division, stated: "It's an unnecessary risk, so [they're] taking a precautionary measure. [They're] not about to sit back and do nothing" (Kennedy 1998: A9c). For those who have young children, or are fond of them, this is likely to be a strong enough defence (even though it ignores the costs of over-reaction).

Note also that several European countries had already taken stronger action in the face of similar campaigns by Greenpeace. For example, in July 1998, Austria imposed a ban on the use of phthalates in

PVC toys and teethingers; Denmark did the same in June 1998. The EU proposed such legislation in June 1998.

Two weeks after Health Canada put out its advisory bulletin, the United States Consumer Product Safety Commission (1998a, 1998b) released its study of the DINP phthalate used in the production of children's products. The study concluded that few if any children are at risk from the chemical because the amount that they ingest does not reach a level that would be harmful.

To put the advisory bulletin on PVC toys containing DINP into perspective, it is useful to note that in 1997 and 1998 Health Canada issued a total of eight warnings or advisories with respect to children and 25 with respect to adults (data compiled from Health Canada's website). Almost all were warnings rather than advisories. In other words, advisories are rare compared to the stronger action of warnings (which also include product withdrawals).

Business columnist Terence Corcoran (1998: D8) expressed concern that the government, by listing the brands of teethingers and rattles that it deems to be safe, implies that all products not on the list are unsafe. This may create a very undesirable situation where the government will find itself approving all toys and maybe even all products (Corcoran 1998: D8).

Health Canada's advisory was another case where risk management was based on the need to deal with false perceptions created by an activist group (which is not accountable for its actions). This action begs the question: why didn't Health Canada go on the offensive with its own media campaign aimed at countering the misinformation and faulty inferences promulgated by Greenpeace? The federal government has never been loath to use taxpayers' dollars to trumpet its "successes," or to "market" a wide variety of policies. Why the reluctance to communicate good science, to explain how tiny was the risk and to help people to think more clearly about this and other risks promoted by activist groups?

(d) The problem of "junk science"

The "Play Safe" campaigns by Greenpeace in Canada, the United States, and Europe were said to be based on scientific research conducted for Greenpeace International (and later for Greenpeace Germany). Certainly, Greenpeace made heavy use of its research in its press releases and its press conferences often featured scientists (usually those closely associated with Greenpeace) making statements said to be based on scientific research. But a closer analysis indicates that Greenpeace's science is probably better described as "junk science" (see Le Gault 1999).

The best evidence for this conclusion is the inconsistency between the conclusions drawn by Greenpeace from its research and those drawn by scientists working for various official bodies notably Health Canada, the United States Consumer Product Safety Commission, the European Union's Scientific Committee on Toxicity, Ecotoxicity and the Environment,¹⁶ and the study for the Dutch Technical Consensus Committee appointed by The Netherlands Minister of the Environment.

Junk science is the mirror maze of real science, with much of the same form but none of the same substance . . . It is a hodgepodge of biased data, spurious inference, and logical legerdemain, patched together by researchers whose enthusiasm for discovery and diagnosis far outstrips their skill. It is a catalog of every conceivable kind of error: data dredging, wishful thinking, truculent dogmatism, and, now and again, outright fraud. (Huber 1991: 2–3)

“Junk science's one very real power is to stir up fear” (Huber 1991: 212). Much junk science focuses on the fear of harm—often rather far-fetched—rather than harm itself. In the age of risk consciousness, the number of things to become fearful of is almost without limit: chemical toxins, electromagnetic fields, microwaves, trace contaminants, possible carcinogens, birth defects, solar radiation, and suppression of the immune system from various causes.

People want—often desperately want—explanations for phenomena that affect them or may affect them adversely. Uncertainty creates much anxiety. Even a non-scientific explanation of cause and effect is preferred to a scientific “we just don't know what causes that problem.”

(e) Postscript: Science and rationality triumph?

On June 22, 1999, the 17-member panel convened in November 1998 by the American Council on Science and Health issued its report in two plastic softeners, DINP and DEHP. In summary, the chair of the panel stated: “Consumers can be confident that vinyl toys and medical devices [e.g., intravenous plastic bags] are safe” (Upham 1999: A1). The report stated that the scientific evidence that showed that DINP can cause cancer in rats—a point strongly emphasized by Greenpeace—“has little relevance for humans.” Vinyl toys that contain the softener DINP “are not harmful to children under normal use” (Upham 1999: A1).

7 Conclusions

We focus on three main issues here: (a) the tactics Greenpeace uses in its campaigns relating to risk controversies, (b) a summary of some of the federal government's problems in dealing with risk controversies

pushed by groups like Greenpeace, and (c) an assessment of whether Greenpeace's "Play Safe" campaign was a success from Greenpeace's perspective.

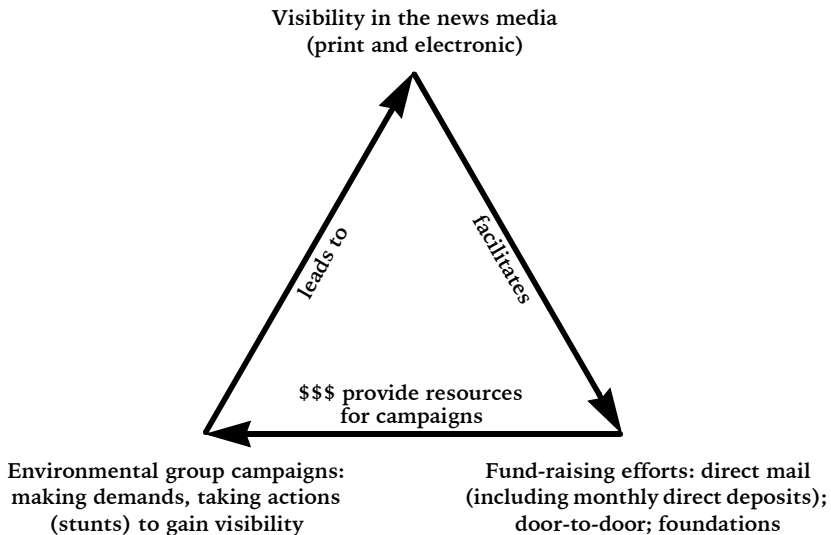
(a) Greenpeace's tactics

This study illustrates the way Greenpeace has been able to initiate and dominate risk controversies in a number of areas since the mid-1980s. Here we try to summarize how Greenpeace has conducted these campaigns and note any differences in the "Play Safe" campaign.

In general, Greenpeace positions itself, first, as an alarm raiser on the cutting edge of new problems, second, as an "outsider" group that is never contaminated with pragmatic compromise, and, third, as most willing to use confrontation and direct action. At the same time, Greenpeace is in competition for "share of mind" and share of donations with a considerable number of environmental groups and with activist groups generally (see Jordan and Maloney 1997).

(1) Greenpeace makes use of a wide range of tactics with the apparent objective of obtaining extensive coverage in the news media. Publicity is the life blood of Greenpeace (see figure 1). Greenpeace is famous for its "stunts" aimed at gaining visibility, primarily pictures, in the news media. In the "Play Safe" campaign, the following "stunts" were used: (a) "invasion" of toy stores; use of banners and signs; removal of toys (sometimes by a staff-member dressed as Santa Claus), (b) large banner

Figure 1: The Iron Triangle of Staff-Type Environmental Groups



draped over the Ministry of Health's building in Rome, (c) having a group of activists disrupt the annual meeting of the toy manufacturers' association, and (d) creating a display to counter those of toy-makers at toy fairs. The other influence techniques used in the "Play Safe" campaign included:

- a large number of press releases; some press conferences;
- studies (said to be independent, scientific investigations);
- letters, visits to retailers, manufacturers;
- forming alliances or coalitions;
- having staff or consultant toxicologists give speeches and interviews; and
- advocacy advertisements.

(2) Greenpeace International often coordinates the efforts of a number of national Greenpeace organizations. The anti-PVC toys campaign involved Greenpeace organizations in many countries besides Canada: United States, Belgium, Austria, The Netherlands, Germany, Italy, United Kingdom, and the Philippines as well as the European community. The multinational approach gives the appearance of international or even worldwide concern. It also increases the odds that one government will "crack" under pressure and take action along the lines proposed by Greenpeace. Greenpeace then treats this as a "precedent" or example for other countries. This tactic was used in the "Play Safe" campaign.

(3) Greenpeace gives the appearance of relying on science or scientific research. Science provides a rational underpinning for Greenpeace's calls for immediate action often based on stunts aimed at gaining visibility in the news media. However, Greenpeace's "science" is biased (to support its pre-determined conclusion) and based on selective quotations, selective references. It also ignores contrary evidence. All of this is done in a sophisticated way.¹⁷

(4) Greenpeace makes a major effort to make its science-based claims understandable by the general public and the news media. Governments are generally poor at this important element of risk communication.¹⁸ Greenpeace's studies are heavy on implications and conclusions for policy. However, the studies do not stray very far from the outer boundary of prevailing scientific consensus, according to Powell and Leiss, (1997: 63). Thus, Greenpeace provides a "partisan, yet plausible construction of science with sharply drawn conclusions [all of which is] cleverly communicated."

One key to Greenpeace's impact is that there is nothing comparable produced and communicated by any other actor (including government and industry). Where neither government nor industry assumes responsibility for effective risk communication with the public, Greenpeace's successes are close to victories by default. In the "Play Safe" campaign, industry challenged Greenpeace's claims but the Canadian government did not.

(5) Greenpeace relentlessly exploits the asymmetries between its position in society and the position of governments and industry. These asymmetries relate to at least the following:

- the tactics that may be employed to win the support of the public;
- the nature of the appeals (often to emotion—trying to induce fear) made to influence the public;
- the attitude of the public toward interest groups like Greenpeace, i.e., much more tolerant of aggressive, direct-action tactics, strong language, and looseness with respect to the truth; and
- the much greater accountability of government organizations for their behaviour—being Greenpeace means never having to say you are sorry, no matter the extent of the group's misbehaviour.

More radical groups like Greenpeace are not necessarily expected by the public to be rational and to provide factual support or logical arguments. In the "Play Safe" campaign, however, Greenpeace emphasized the scientific research it had done and on which it said it based its demands for government action. Greenpeace can use hit and run or guerilla tactics not available to others such as business firms or associations. Greenpeace can try almost any appeal to see what resonates with the public. If it fails to get the desired response, Greenpeace will try something else next week or next month. In the "Play Safe" campaign, there is no doubt that an effort was made to make parents fearful for the safety of their children.

Greenpeace can create pressure on established organizations to prove something is "safe" even though this is conceptually impossible. It can emphasize the existence of risk without quantifying it or putting it into perspective. In the "Play Safe" campaign, Greenpeace emphasizes the most remote possibilities as if they are clear and present dangers. Greenpeace's power is based largely on its ability to create fear in the minds of ordinary citizens. In general, it plays on ignorance and distrust of government. Greenpeace targets issues likely to be most vulnerable, e.g., children, medical supplies that give life.

(6) Critics confuse the substance of Greenpeace's claims or demands and the factors that greatly influence campaigns, namely extensive media coverage that is vital to fundraising. Money is the life blood of this staff-type interest group whose leaders and employees are entirely self-selected. No members participate in governance, only the senior staff. This is a marketing organization operating in a competitive market—for "causes" (see Jordan and Maloney 1997).

For Greenpeace, lack of visibility in the news media equals lack of effect and lack of effect means donors cannot see their money at work. Figure 1 describes the "iron triangle," which links visibility in the news media to efficacy in raising funds. Such money pays for the various campaigns. Central to all campaigns is the need to gain visibility in the news media. Coverage is easier where the media operate on the principle that the news is a branch of entertainment. Sensationalism and graphic images sell—"if it bleeds, it leads."

The news media's reportage of risk controversies is important for several reasons. First, the public is heavily dependent upon the mass media for information and opinions on these controversies; it is the primary filter between the various participants and citizens. Second, the reportage also provides some clues as to how the public understands these controversies. Third, governments' efforts at risk communication must rely heavily on this channel that, by its nature, must be selective and so introduces biases into the messages conveyed to the public.

(b) *The government's problems*

Greenpeace's skill in initiating and advancing risk controversies is able to create enormous pressures on governments and other established organizations. They must respond in some fashion, no matter how ridiculous the claim by an interest group, particularly if that group can claim some scientific support for its position. Moreover, they must operate in a rational fashion as responsible, professional organizations. The need to respond immediately puts the established organization on the defensive. It is easier to plant doubt or create fear than it is to offer rational explanations, particularly when they involve tiny probabilities, imperfect knowledge, and the need to make trade-offs. Creating uncertainty or the awareness of uncertainty is a primary means of creating fear.

When fear dominates an issue, rationality is cold comfort to the concerned, anxious, and distraught individuals since it operates in a different part of the brain. Fear leads to the bypass of reason, engendering the atavistic fight-or-flight response, a holdover from our primitive past (see Hall 1999).

The Canadian federal government has a poor record in terms of effective communications in recent risk controversies (Powell and Leiss

1997). It did not acquit itself well in the “Play Safe” campaign: it communicated too little, too slowly, and its communications were not well designed to help a fearful public understand and cope with the issue. It must be appreciated that it is hard for government to deal with interest groups¹⁹ and others engaging in “down and dirty” tactics (Leiss 1995).

Major players in risk controversies, in communicating with other parties, have exploited the inherent uncertainties in the estimates of risks, and the lack of even reasonably complete databases to advance their interests as they see them. Sometimes they conceal what they do know or suspect (Leiss 1995: 688).

The federal government should devote some resources to an effort to predict which issues are likely to become important in the future—particularly those likely to be “crisis” issues.²⁰ Issues do not arise spontaneously. They always have a “pusher” (or a coalition of pushers). Greenpeace has been a notable pusher of a number of risk issues (e.g. dioxins, chlorine, and various types of PVC). Moreover, it has been argued that “the hottest risk issue of the coming decade [will be] endocrine disruptors”—and Greenpeace published a report on this issue (“Our Stolen Future . . .”) in 1996 (Powell and Leiss 1997: 61). Part of the federal government’s forecasting efforts should be a “Greenpeace Watch” because of (a) its malign record on dioxins and PVC including toxic teethers, medical products (bags, tubes for injections); (b) Greenpeace’s scale of operations and the international scope of many of its campaigns, and (c) ability to move governments to regulatory action even when it is unjustified.

(c) Effectiveness of Greenpeace’s efforts

The success or effectiveness of any interest group’s efforts to influence public policy are usually difficult to determine, often because of time lags and the presence of other variables that influence changes in public policy. More generally—and particularly when assessing a Greenpeace campaign—it is important to ask what criteria the group might use to measure its performance. For Greenpeace, the following criteria could be relevant:

- fund-raising (which requires extensive media coverage);
- provoking over-reaction by businesses (many Greenpeacers are really watermelons—green on the outside but red on the inside);
- changes in public policy;
- increased credibility and legitimacy; and
- capturing or setting the agenda in a policy issue.

A campaign could move government to modify its policies in the direction desired by Greenpeace or it could alter the activities of major corporations. Yet, the same campaign could fail to persuade people to give money to Greenpeace and, without funds, Greenpeace would soon not be able to carry on. The reverse could be true: a campaign may be useful in raising money even if no substantive results are achieved.

An important objective for Greenpeace is to set or change the agenda in some area of public policy;²¹ i.e. get everyone responding to their issue or question. Since this, too, is a competitive process, Greenpeace's reputation in the competitive market for "causes" is enhanced and its "share of mind" is increased. Even when Greenpeace does not succeed in changing public policy in the short-run, it often succeeds in defining the terms of the debate in the future. This occurs at least in part because of the failure of government (and industry) in risk communication.

It is clear that the "Play Safe" campaign in 1997 and 1998 produced substantive results in terms of (a) the behaviour of certain toymakers and retailers, particularly in Europe, and (b) certain governments. For example, Austria, Denmark, and Sweden imposed a ban on the use of DINP in toys and teethingers for children under age three. Spain banned five types of teethingers.

Note that all the countries that took the strongest actions with respect to "toxic toys" were in Europe. By comparison, Canada did a re-assessment and issued an advisory bulletin. The United States did not go beyond a study of the toxicity of phthalates in PVC toys and concluded that no official action was warranted. It is possible that Health Canada may not have issued the advisory and published a list of toys not containing DINP if the Health Protection Branch was not in "disarray" when it had to deal with Greenpeace's "Play Safe" campaign (see McIlroy 1998b).

The "Play Safe" campaign raised public awareness in Canada of Greenpeace's position on PVC. However, Greenpeace studies have been the subject of strong criticism since researchers found significant flaws in the methods used. It is not clear that these flaws caused Greenpeace to lose credibility with the general public and the news media, both of which are more important than government. The media provide the publicity and the public provides the money to finance the organization.

For Greenpeace, the "Play Safe" campaign appears to have been a success in the following ways. First, because of its mass media penetration, many parents have discarded or stopped purchasing PVC toys for their children. Despite the evidence against Greenpeace's findings, parents are understandably unwilling to take the risk of endangering their children. Second, Greenpeace has also convinced many toy retailers worldwide to "voluntarily" (under serious pressure) stop selling PVC

toys. Third, Greenpeace's poorly conducted studies appear to have triggered many more credible studies that may soon settle this controversial toxic-toys issue. We do not know if "Play Safe" was successful in terms of raising money for Greenpeace because Greenpeace's financial statements do not provide sufficient detail.

With the November 16, 1998 advisory bulletin and implicit recall, Greenpeace Canada can reasonably claim to have cowed Health Canada, which took the actions knowing that "the probability of anything happening is very small" (Gee 1998: A31). Health Canada could not ignore the issue. But, it did very little to challenge Greenpeace's grossly exaggerated claims.

After reviewing all the evidence and putting the risks into perspective, it is hard to avoid the conclusion that governments in a number of nations, by banning phthalates in toys and teething rings, over-reacted to a minute risk of a modest harm. This was another example of weak risk management in the face of a skilled and determined interest group. Fear of harm to children created sufficient fear of political repercussions in a number of countries to result in over-regulation. Thus, rationality in policy-making took another beating.

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Notes

- 1 Greenpeace consists of Greenpeace International, which holds the copyright in the name and has its offices in Amsterdam, and the separate Greenpeace operations in over 30 nations. These entities are referred to as Greenpeace Canada, Greenpeace USA, Greenpeace Germany, Greenpeace UK and so on. All of the Greenpeace entities are "staff" groups, i.e., they are controlled entirely by the employees. While donors are often called "members," they have no say in the governance of any Greenpeace entity, except indirectly by no longer making donations. It is these donations that finance the Greenpeace entities. Note, however, that Greenpeace International is financed by a "tax" of variable percentage on the gross revenues of each Greenpeace operation in industrialized nations. Part of Greenpeace

- International's revenues (about \$30 million in 1997) are used to help finance Greenpeace operations in developing countries or those where environmentalism is less well developed (about \$7 million). From 1993 to 1998, Greenpeace Canada did not pay any "tax" to Greenpeace International; rather, it was receiving contributions from Greenpeace International (\$4.7 million from 1993 to 1997) to augment the revenues raised within Canada as these had fallen sharply in the early 1990s (Gao 1998).
- 2 Greenpeace Canada's website says that it wants "to ensure the ability of the Earth to nurture life in all its diversity." In 1997 and 1998 Greenpeace Canada had three main campaigns: Climate and Energy, Biodiversity, Fish, and Forests, and Toxics and Health. The "Play Safe" initiative was part of the Toxics and Health campaign.
 - 3 Bruce Ames, a leading toxicologist, points out that the risks posed by natural carcinogens are far greater than those related to man-made substances. See Ames and Gold 1996.
 - 4 Greenpeace, press release, September 17, 1997. The study was received by Greenpeace International in April 1997 but not made public until September. See McAndrew 1997 and Greenpeace Research Laboratories 1997.
 - 5 Greenpeace Canada states (on its website, www.greenpeace.org) that it has 130,000 members. It described its method of fundraising as follows: Greenpeace "signs on new members through direct mail, door and phone canvass, workplace giving and monthly giving. We also raise money through bequests and gifts of life insurance." Greenpeace noted that it accepts no government or corporate funding.
 - 6 "Toys 'R' Us has strong guidelines to protect the health of European children, but weak ones for Canadian children," said Greenpeace campaigner Beverly Thorpe, who monitors international action on the PVC issue. (Greenpeace, press release *Company Withdraws Products in Europe—but Not Canada*, November 27, 1998.
 - 7 On risk assessments, generally, see Health Canada 1993; Kunreuther and Slovic 1996; Presidential/ Congressional Commission on Risk Assessment and Risk Management 1997).
 - 8 "Vinyl Toys to Be Tested for Lead, Cadmium," *Globe and Mail*, (October 10, 1997): A8.
 - 9 According to its website, Health Canada issued only three advisory bulletins in 1997 and 1998.
 - 10 The Canadian Toy Association (1998) on the same day recommended that member companies begin to use alternative plasticizers temporarily in soft teethers and rattles designed for children under eight kilograms. It also recommended that the Minister of Health establish an international panel of scientific experts to develop worldwide standards for plasticizers used in soft teethers and rattles.
 - 11 By January 9, 1999, some 174 toys and teethers from over a score of manufacturers were listed on Health Canada's website as containing no DINP (phthalates).
 - 12 This is another form of communication with the public. Information bulletins do not result in actions by Health Canada beyond monitoring.

- 13 These are standard questions in any reasonable risk assessment. See Presidential/Congressional Commission on Risk Assessment and Risk Management 1997.
- 14 Generally, see Fischhoff et al. 1981, Slovic 1987, Slovic 1993, Slovic, Kraus and Covello 1990.
- 15 See the discussion of junk science in (d) below.
- 16 The issue with this study, which raised concerns about the leaching of phthalates, lies in the standard to which the results were compared.
- 17 Le Gault (1999) states that the key features of junk science are fear, suspicious logic, and misleading information.
- 18 While appearing to use science, Greenpeace benefits from the very limited knowledge of science or even scientific thinking in the vast majority of citizens. This also applies to reporters.
- 19 The advantages of interest groups over even respected individual scientists in communicating with the public will inevitably give the interest groups an opportunity to dominate the presentation of science. The groups also claim both the public and science.
- 20 Generally, see Stanbury 2000.
- 21 See Powell and Leiss 1997: chap. 3.

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