

Investigative report: 1766 boil-water advisories now in place across Canada

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More than 1760 provincial boil-water advisories are currently in effect in communities and neighbourhoods across Canada, prompting calls from national and municipal advocacy groups for a federal and provincial strategy to ensure safe drinking water for all Canadians.

Poor quality drinking water in Canada is often perceived as an issue primarily of concern to First Nations communities; as of Feb. 29, 2008, there were boil-water advisories in place in 93 First Nations (*CMAJ* 2008;178:985). These are not included, however, in the 1766 advisories now in place elsewhere in Canada (Box 1). *CMAJ* compiled provincial lists of small towns, cities and townships, as well as neighbourhoods, trailer parks and business establishments within larger communities where local health officials have instructed residents not to drink water without first boiling it — or, in a few



An estimated 90 Canadians die annually from drinking contaminated water.

cases, not to drink or bathe in it at all.

Advisories are intended to be a precautionary measure in the public health tool kit, but given that some have been in place for at least 5 years, they are apparently being used as a band-aid substitute for treatment.

Ontario and British Columbia have the most boil-water advisories. A spokesman for the Ontario Ministry of Health and Long-Term Care says that 679 boil-water advisories have been issued since 2006 that, as far as the Ministry knows, remained in effect as of Mar. 19, 2008. Spokesman Dave Jensen cautioned, however, that public health units in Ontario do not always report all their advisories to the Ministry, nor do they always report when an advisory has been lifted.

In British Columbia, the Ministry of Health documented 530 boil-water advisories as of Mar. 31, 2008, although the Interior Health Region's 352 boil-water advisories were only current as of Jan. 3, 2008, whereas the remaining 178 advisories were updated as of Mar. 27 or 31, 2008, depending on the region.

Newfoundland and Labrador lists

228 orders as of Apr. 1, 2008, with some communities having more than 10 boil-water advisory in effect.

Saskatchewan had 126 advisories as of Mar. 31, 2008. Of these, 53 were emergency boil-water orders, meaning a threat to human health has been identified. The province had another 73 precautionary drinking water advisories in place, meaning residents were advised to boil water because of the possibility problems exist with their water.

In Nova Scotia, 67 communities had boil-water advisories in effect as of Mar. 19, 2008, according to the Department of Environment and Labour.

Quebec reported 61 boil-water advisories as of Mar. 31, 2008, according to its Ministry website, which is regularly updated.

In Manitoba, there were 59 boil-water advisories or boil orders in place as of Mar. 14, 2008. Those advisories covered both public water systems, and private wells and septic field systems, according to Manitoba Water Stewardship's Office of Drinking Water.

New Brunswick reported only 2 boil-water advisories as of Feb. 22, 2008.

Box 1: Boil-water advisories in Canada, by province

A *CMAJ* survey indicates that, as of Mar. 31, 2008, there were 1766 boil-water advisories across Canada in small towns, cities and townships, or in neighbourhoods, trailer parks and business sites. The totals by province and territory:

British Columbia	530
Alberta	13
Saskatchewan	126
Manitoba	59
Ontario	679
Quebec	61
New Brunswick	2
Nova Scotia	67
Prince Edward Island	0
Newfoundland/Labrador	228
Yukon	0
Northwest Territories	1
Nunavut	0



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The Public Health Agency of Canada reported some 571 cases of cryptosporidiosis and 4046 cases of giardiasis in 2005.

In Alberta, there were 13 boil-water advisories in effect as of Mar. 31, 2008, according to 5 of the province's 9 regional health units that provided figures to *CMAJ*.

There were no boil-water advisories reported in Prince Edward Island, Nunavut or the Yukon as of print deadline, Apr. 7, 2008. One community in the Northwest Territories, Colville Lake, had a boil-water advisory in place because its new solar-powered treatment centre was not operating.

The 1766 boil-water advisories currently in place mean affected residents cannot rely on the safety of their drinking water. Affected communities range from portions of Bay Roberts, Newfoundland and Labrador, and Wallaceburg, Ontario, to the entire communities of Sullivan Bay, British Columbia, Victoria Beach, Manitoba, and Tilley, Alberta.

"That's stunning," says Maude Barlow, chair of the Council of Canadians, and author of *Blue Covenant: The Global Water Crisis and the Coming Battle for the Right to Water* (McClelland & Stewart, 2007). "It's stunning in a country with what we have [that the] the state of our water is perilous."

The boil-water advisories are issued for reasons ranging from adverse taste to high coliform count to a breakdown in chlorination equipment.

The Council of Canadians and the

Federation of Canadian Municipalities, whose members have direct responsibility for the water treatment plants and other municipal infrastructure that ensures clean water, are calling on the federal government to work with provinces and territories to develop a strategy framework that will make clean, safe water a priority across the country.

"We're in favour of upping the quality of water and ensuring that it meets a certain standard right across the country," says Gord Steeves, president of the Federation of Canadian Municipalities. "We're very concerned about the amounts of negative effluents going into water systems and finding their way into potable water systems as well."

Although the various levels of government share jurisdiction over water, there are currently no national drinking water quality standards. Each province has its own standards and regulations.

"We haven't updated our national Water Act since the 1970s," says Barlow, who would like to see a federal-provincial water framework that not only implements national standards, but also protects watersheds and outlaw bulk water exports.

"We do not take care of our water. We need legislative and regulatory protection. We want really strict legislation — some of it provincial — around treatment of water," Barlow adds.

The problem for British Columbia is that there are more than 3500 water systems in the province, most of which deliver surface water and are untreated, so are vulnerable to potential contamination, says Dr. Perry Kendall, British Columbia's provincial health officer. "Our boil-water advisories have gone up over the past 3 or 4 years because of greater attention to monitoring and greater attention to risk and probably an application of the turbidity guidelines," he says.

Turbidity refers to cloudiness in water, which can be caused by suspended solids that can interfere with disinfection, so may be an indication of potential problems.

The problem with smaller systems, which exist in many provinces, is that they may not be managed by qualified people, says Kendall. The issue also comes down to cost. If a system is not part of a municipal infrastructure, many people are loath to pay to improve treatment.

British Columbia sees water as a provincial jurisdiction and so does not support federal standards, Kendall says, but would "love more federal infrastructure cost-sharing" without the application of national standards. The latter often fall towards the lowest common denominator and would not be flexible enough to handle one-time issues, such as the heavy rainfall that had everyone in Metro Vancouver boiling their water in the fall of 2007, he says. Although Vancouver water had high turbidity for weeks, health officials knew that was caused by fine clay particles, so it was safe to drink but wouldn't have met a standard, Kendall adds.

Still, he acknowledges the large number of boil-water advisories indicates a significant public health issue. "People should definitely be concerned. If people really want to have water that poses negligible risk, that a reasonably informed person would be happy to drink, they need to be prepared to pay more through their tax system. They need to be conserving water in many areas, and they need to be investing hundreds of millions of dollars in infrastructure, in filtration plants, in ultraviolet monitoring systems."

Josee Milville-Dechene, editor of *The Water Chronicles* (www.water.ca), an in-

dependent online media organization that monitors water quality, says “everybody in Canada seems to think we don’t have issues with water, and we do, and they’re growing.” The site maps boil-water advisories and “Do Not Consume” orders from across Canada daily. (CMAJ collected its figures independently.) “What we’re trying to do is get people aware of the issues,” Milville-Dechene says.

The provinces and territories vary on how up-to-date their figures on water quality are, and on how readily they make them available to the public, she adds. Alberta does not publish its figures online, while British Columbia, Saskatchewan, and Newfoundland and Labrador do, but provide different levels of detail about the causes for the boil-water advisories or Do Not Consume orders.

In 2005, the most recent year for which statistics are available, the Public Health Agency of Canada reported 571 cases of cryptosporidiosis and 4046 cases of giardiasis. The Canadian Public Health Association declined comment.

For municipalities, which are on the front lines of any water crisis, the repercussions of the health issues that poor quality or contaminated water can cause can be overwhelming, says Steeves. He cites the *Escherichia coli* O157:H7 contamination in Walkerton, Ontario, that killed 7 people and made an estimated 2000 ill in May 2000, and the *Cryptosporidium parvum* crisis that made between 6000 and 7000 people ill after the parasite contaminated the drinking water in North Battleford, Saskatchewan, in April 2001.

“It is absolutely apocalyptic for a community to go through what a place like Walkerton, Ontario, went through,” says Steeves. In addition to the health consequences, “the economic ramifications are so great, proportionately, that they are almost impossible to measure.”

While municipalities support and recognize that much of the responsibility for correcting the infrastructure deficiencies that jeopardize the provision of clean water in communities, they cannot pay the approximately \$31 billion it will collectively cost to upgrade water and waste water treatment infrastructure across the country, Steeves says. “We require federal and provincial funding to

support any new standards or any augmentation of the infrastructure.”

The issue of water quality is high on the municipal agenda, says Steeves, and bleeds into many areas of provincial and federal jurisdiction. Vancouver, British Columbia, for example, attributes approximately 30 000 hospital visits a year to gastrointestinal illness, including those from water-borne causes, while Montréal, Quebec, cites water-borne contaminants as being responsible for about a third of all gastrointestinal complaints in their hospitals. Clean water “is pretty fundamental,” adds Steeves. — Laura Eggertson, Ottawa, Ont.

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Research chairs program under review

The formulas for divvying up Canada Research Chairs among the biomedical, natural and social sciences, and among the nation’s universities, will be put under an international microscope in a forthcoming review of the program.

No aspect of the roughly \$300 million per year program will be exempt from scrutiny, says Canada Research Chairs Steering Committee Chairman and Social Sciences and Humanities Research Council President Chad Gaffield.

“There’s absolutely no doubt about it. The world has changed, what’s happening on our campuses has evolved, the development of graduate programs and so on. There’s lots of changes on our campuses and my expectation would be that we’d start and go from A to Z in terms of all features of the program.”

Under the program, which was created in 1999, the available 2000 chairs were divvied up among 61 universities, using a distribution formula based on each institution’s track record in obtaining grants from the nation’s 3 granting councils. Chairs were awarded on 2 levels: Tier I, worth \$200 000 per year for 7 years, and Tier II, worth \$100 000 per year for 5 years. All chairs were renewable.

The program is officially slated to expire in 2010, although administrators

hope its demonstrated worth will persuade the federal government to extend, or even expand, funding for at least another decade.

Gaffield says the chairs program is such a success that a number of countries, including Spain, South Africa, Australia, France and Finland have already moved with imitations. “My expectation will be the key question will be, not whether to just renew it, but how can we really use this foundation to really keep going in the years after 2010.”

Earlier, Gaffield argued that the program had positioned Canada as a global leader in many disciplines. It has also “revitalized university-based research in Canada,” he told a Mar. 27, 2008, gathering which brought together roughly 100 chair recipients in Gatineau, Quebec, for round table discussions on scientific developments that will revolutionize society and medicine over the coming decade.

The review of the chairs program will include evaluation by an independent, international peer panel, as well as a measure of consultation with the universities to ascertain whether they believe aspects of the program, including institutional allocations, should be changed.



Gordon King Photography

Each of Canada’s 2000 Tier I and Tier II research chairs will receive a sterling silver lapel pin, valued at \$11.50 apiece. Program managers say the expense was justified because it will make chairholders “easily recognizable” by Canadians.