

Asbestos Cement Water Pipes and the Potential Risk of Ingested Asbestos

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The issue of the health impact of ingested (swallowed) asbestos has been debated for decades. The dangers of inhaling asbestos have long been known. The discussion over ingestion continues.

In 1983, Dr. Joseph Cotruvo, the former Director of the Drinking Water Standards Division with the United States Environmental Protection Agency (EPA), authored a commentary entitled *Asbestos in Drinking Water: A Status Report*.

The EPA had been grappling with the issue of asbestos in water since the early 1970s. In 1983, Cotruvo wrote: “What is EPA’s regulatory posture related to ingested asbestos from drinking water? Our response, at the time, was that we did not feel that there were sufficient data on which to make a judgment on the risk. The issue has ripened considerably since then.”

Almost four decades ago, a top expert on drinking water wrote that there was a growing concern about asbestos fibres in water. Since 1992, the EPA has regulated asbestos in water. It maintains that swallowing asbestos fibres can cause “lung disease; cancer.” Canada and several other countries around the world continue to insist that there is no consistent evidence that ingested asbestos is hazardous.

The issue may have ripened, but is still far from being ready to harvest.

But let’s back up a bit.

The issue of asbestos in water first came to light in the early 1970s, when the EPA launched a landmark legal action against the Reserve Mining Company.

For decades, the mining giant had been dumping iron ore tailings into Lake Superior, not far from Duluth, Minnesota. Environmentalists and fishers began to complain about the quality of the water.

In 1972, on behalf of the fledgling EPA, the Department of Justice took Reserve to court.

During the trial, which lasted over a year, Dr. Irving Selikoff testified on behalf of the government that the ingestion of asbestos was definitely a problem, “Secondly, although I stated yesterday that there are a number of routes, including hemotogeneous, whereby fibres could influence the gastrointestinal tract, in my opinion the best explanation is ingestion to explain the two, three times increase in the incidence of death of gastrointestinal cancer among occupationally exposed workers. So that in this sense, although there is no absolute proof, the kind that we would ordinarily want; there is, in my opinion, a very reasonable probability to state that this is the case.” Dr. Selikoff had, over the previous decades, been instrumental in highlighting the dangers of inhaled asbestos. Selikoff’s reasoning was simple; inhaled asbestos was also ingested.

During the investigation into the Reserve case, it was revealed that a litre of Duluth water had as many as 644 million amphibole fibres in it. At the conclusion of the trial, Reserve was ordered to stop dumping its waste into Lake Superior.

It did not take long for people to zero in on the court case. Aware that, decades earlier, the United States had installed hundreds of thousands of miles of asbestos cement water pipes, delivering water to millions of homes, schools, and businesses, the Centre for Science in the Public Interest called for the “prohibition of AC pipe in water supply systems.” In February 1973, the group made it very clear to the EPA that it believed “AC pipe contamination of drinking water from erosion and maintenance may present a major hazard to the general public.”

It would take a while longer for asbestos cement water pipes to be banned, but the publicity surrounding talk of mysterious fibres in Lake Superior spawned a flurry of studies into asbestos in drinking water, and asbestos cement water pipes.

One of the first studies conducted was by Health and Welfare Canada. Posted on the current Health Canada website under *Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Asbestos*, it reads: “Chrysolite was the predominant type of asbestos identified in a survey of drinking water supplies conducted at 71 locations

across Canada in 1977.” The web page goes on to state: “Based on the results of this survey, which encompassed the water supplies of about 55% of the Canadian population, it was estimated that 5% of the population receives water with chrysotile concentrations higher than 10 million fibres/L and that 0.6% receives water containing more than 100 million fibres/L.” The study, conducted when another Trudeau was prime minister, confirmed that there was a lot of asbestos in Canadian water almost 45 years ago.

This is a good time to tell you that the current allowable limit for asbestos in the United States is seven (7) million fibres per litre (MFL). Material readily available in the EPA archive states that beyond that level steps “such as providing alternative drinking water supplies may be required to prevent serious risks to public health.” The EPA maintains the level 7 MFL was established to “protect against cancer.” Even the warm and fuzzy version on the EPA website cautions: “Some people who drink water containing asbestos well in excess of the maximum contaminant level (MCL) for many years may have an increased risk of developing benign intestinal polyps.” I don’t know about you, but I do not believe drinking clean water is supposed to give people intestinal polyps, benign or otherwise.

While the Canadian government was busy looking into asbestos in water, the United States was also turning over stones south of the border, and what it discovered must have been shocking. In the 1979 report *Exposure to Asbestos from Drinking Water in the United States*, the EPA looked at asbestos concentrations in 365 cities in 43 States. “Of the 365 cities, 165 or 45.3% were reported to have significant concentrations of asbestos in the drinking water,” the study reads.

It’s estimated that as much as 18% of the water distribution pipes in North America are asbestos cement.

The pipes are also used extensively in the United Kingdom, South Africa, Australia, New Zealand, and Europe.

In 1980, the EPA conducted a detailed study entitled *Ambient Water Quality Criteria for Asbestos*. In part it reads; “Asbestos is a known carcinogen when inhaled. The demonstrated ability of asbestos to induce malignant tumours in different animal tissues, the passage of ingested fibers through the human gastrointestinal mucosa, and the extensive

human epidemiological evidence for excess peritoneal, gastrointestinal, and other extrapulmonary cancer as a result of asbestos exposure suggests that asbestos is likely to be a human carcinogen when ingested.”

In 1983, Dr. Cotruvo authored his commentary on the issue. It outlines, in excruciating detail, the steps required for a decision to regulate asbestos in drinking water. “The ultimate decision goes beyond science and calculations – it becomes a function of a social judgment in the context of the Safe Drinking Water Act in terms of the appropriate decision based on a weighing of all the available information” he wrote.

Dr. Cotruvo’s commentary was followed in 1987 by a Department of Health and Human Services study entitled *Report on Cancer risks Associated with the Ingestion of Asbestos*. The report concluded: “Sufficient direct evidence is not available for a credible quantitative cancer risk assessment of asbestos ingestion at this time.” However, a few paragraphs later can be found this glaringly contradictory statement: “Nonetheless, this should not be taken to mean that the potential hazard associated with ingested asbestos is an unimportant issue which does not warrant further research. Even if the increased rate of cancer is less than 10% of the background rate and cannot be demonstrated by available research tools, the ingestion of water, food, or drugs laden with asbestos by millions of people over their lifetimes could result in a substantial number of cancers.” The report goes on to say that several members of the working group felt it was “prudent public health policy to recommend eliminating possible sources of ingestion exposure to asbestos whenever and to whatever extent possible.” A few sentences later the report highlights “eliminating asbestos cement pipe in water supply systems.”

In 1974, the United States Congress passed the Safe Drinking Water Act. The enforceable regulation for asbestos became effective in 1992, with the maximum contaminant level (MCL) set at 7 MFL.

The National Research Council Canada (NRC) - a branch of the federal government - has conducted numerous studies into asbestos cement water pipes. All the NRC studies refer to asbestos fibres in water as a “health concern.” One NRC report goes even further; “Severely deteriorated AC pipes also released asbestos fibre into the drinking water, and could pose a hazard of tumours of the gastrointestinal tract, and other organs in consumers.” The 2010 study goes on to say “These AC pipes were laid

down before the potential environmental, social, and health impacts were recognized and evaluated. In recent years, problems with AC have gradually become significant including increases in the number of pipe breaks and failures.”

Yet another NRC report from 2010 points to the potential danger of using showers and humidifiers in homes where asbestos may be in the water.

The World Health Organization’s (WHO) 2017 fourth edition Guidelines for Drinking-Water Quality states: “Asbestos is a known human carcinogen by the inhalation route. Although it has been well studied, there is little convincing evidence of the carcinogenicity of ingested asbestos.”

Health Canada uses the same language, but has added the word “consistent” in front of the word “convincing”, concluding that “There is, therefore, no need to establish a maximum acceptable concentration (MAC) for asbestos in drinking water.”

Canada, and a number of other countries, cling to the WHO finding, seemingly ignoring the fact that the United States of America has said for two decades that drinking asbestos can cause cancer.

A few observations on the WHO finding: The organization has also produced a comprehensive study entitled *Chrysotile Asbestos*. “The scientific evidence is clear. The firm conclusion of the WHO and IARC (International Agency for Research on Cancer) assessments is that chrysotile causes cancer of the lung, larynx and ovary, mesothelioma and asbestosis,” reads the report. The next paragraph of the WHO report reads: “A major concern is that even where use is appropriately regulated, chrysotile-containing building products (e.g. roofing tile, **water pipes**) become damaged and release asbestos fibres into the environment during the course of building waste, and as a consequence of natural disasters. Such exposure may occur sometime later than the original (controlled) installation. This risk can be wholly averted by ceasing to use such products.” Nowhere in the 44-page report does it mention that it’s okay to drink asbestos fibres from crumbling water pipes.

In 2004, the WHO produced a report entitled *The precautionary principle: protecting public health, the environment and the future of our children*.

Simply put, the precautionary principle prescribes that in the case of serious or irreversible threats to the health of humans or the ecosystem, acknowledged scientific uncertainty should not be used as a reason to postpone preventative measures.

The WHO report actually uses asbestos as an example of when it is practical to employ the use of the principle. “Irreparable mistakes must be avoided, such as those related to tobacco or asbestos, when people waited for definitive evidence far too long before springing to action. Further irremediable chains of events leading to health damage must be prevented from being triggered,” reads a portion of the foreword to the 200-page report.

Isn't it interesting that the other example the WHO uses is tobacco – another insidious threat to human health, that we were assured for decades was harmless?

If ever there is a case that cries out for the application of the precautionary principle, the regulation of asbestos cement water pipes is it.

Take a peek at the American Cancer Society website. Under the heading: How are people exposed to asbestos? It lists Inhaling asbestos and swallowing asbestos. The organization aimed at preventing cancer goes on to say “Asbestos fibres can also be swallowed. This can happen when people consume contaminated food or liquids (such as water that flows through asbestos cement pipes). It can also occur when people cough up asbestos they have inhaled, and then swallow their saliva.”

I would argue that there is a great deal of convincing evidence pointing to the dangers of ingested asbestos. What I fail to understand is how swallowing asbestos can cause cancer in Americans and not Canadians, and millions of others around the world?

I recently reached out to the Canadian Water and Wastewater Association (CWWA), which bills itself as “the national voice for Canada’s municipal sector,” to find out what it knew about the state of asbestos cement water pipes across Canada, and whether it would be willing to lobby the federal government to regulate asbestos in water. Executive Director, Robert Haller, replied: “Many communities across Canada have asbestos cement pipes. As to how many, and what condition they are in, I’m afraid I am not

aware of any compiled data. As it has not been identified as a danger, it has not been well tracked or monitored.” Mr. Haller went on to say the issue “is outside the mandate and mission of the CWWA.”

Because asbestos cement water pipes are used extensively in Western Canada, I wrote to Western Canada Water which, on its Twitter feed, says it is “Influencing the future of water in Alberta, Manitoba, the Northwest Territories, Nunavut and Saskatchewan,” to ask what it knew about the issue in the region, and whether it would be willing to lobby the federal government to regulate asbestos in water. Executive Director Audrey Arisman told me to check with the City of Regina. I replied to confirm that I was asking about all of Western Canada. I have not heard back.

In Regina, Saskatchewan, there are 600 kilometres of old, deteriorating asbestos cement water pipes. Because of the soil type and the harsh climate, there are close to 200 AC water main breaks per year. The city has conducted one test at the same location each year since 2015. It maintains “no asbestos fibres were detected.” Since 2015, city officials have dropped the words “asbestos cement” when talking about the rash of water main breaks in the city, replacing them with “concrete.”

Years ago, when asked about the issue of asbestos water mains, the former executive director of the municipal branch at the Saskatchewan Ministry of Environment, assured people the water was safe to drink. However, Sam Ferris told the media “There has been some talk about a study coming out of the United States that has looked at a linkage between asbestos in drinking water and some benign forms of cancer of the stomach.” In 2012, Mr. Ferris went on to tell journalists that he hadn’t had the time to really look into the report. Given that the American study was very likely written well in advance of the regulation governing asbestos in water being promulgated in 1992, I wrote to Mr. Ferris to request a copy. I have not heard back.

Edmonton has 1,050 kilometres of the old water pipes and Winnipeg has 721 kilometres of them.

Most cities, towns and villages in Canada do not even test for asbestos in water, because Health Canada does not require it. Dr. Arthur Frank, a medical doctor and expert in environmental and occupational health, says that is a mistake. “Regulating asbestos in water means that the lives of

some Canadians would be saved by not ingesting asbestos in the water they drink, and use in showers,” said Frank, who is based out of Drexel University in Philadelphia, Pennsylvania. He also stated, “There is no question that the ingestion of asbestos, like breathing it, much of which when cleared from the lungs is then ingested, can lead to the development of a variety of cancers, including stomach, small and large intestine, and kidney cancer.”

As the asbestos cement water pipes continue to age, deteriorate, and break, releasing fibres into water, Dr. Frank’s concerns are being echoed by other experts around the globe.

“Furthermore, the exposure to asbestos by ingestion could explain the epidemiological finding of mesothelioma in subjects certainly unexposed by inhalation,” writes Agostino Di Ciaula, in the aptly named 2016 study *Possible health risks from asbestos in drinking water*. “In conclusion, several findings suggest that health risks from asbestos could not exclusively derive from inhalation of fibres.”

I know that for years Canada was one of the largest producers of asbestos in the world. I know this is a huge, scary, expensive issue to wrap your head around. (And you thought lead in water was bad?) That does not mean that we should turn our heads and pretend that it is not happening. All of the experts, and all of the studies, say that the older the asbestos cement pipes get, the worse the problem will get.

It is time for Canada, and other countries, to take a hard look at the “evidence”, and regulate asbestos in water.