



The Walkerton disaster and family physicians

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From the perspective of a family physician and Medical Officer of Health involved in the Walkerton, Ont, water-borne disaster, I know there are lessons to be learned and issues to be understood that will aid physicians in their daily practice of family medicine. I also hope that this editorial will help readers get a better understanding of public health and our changing environment (both political and biological).

Sources of drinking water can no longer be trusted to be uncontaminated. Contamination of municipal drinking water systems can be disastrous. We are changing our environment (and not for the better). New and dangerous water-borne pathogens are emerging. Worldwide, public health safeguards and surveillance are in decline, and governments seem less interested in the health and safety of their citizens. Family physicians need to be aware of community health issues (yes, yet another responsibility) and continue to work closely with public health authorities.

Drinking water

Human, industrial, and agricultural biological and chemical wastes are getting into our ground and surface water and contaminating our drinking water. There are now some 6.2 billion people on this planet that experts tell us can sustain a population of only 4 billion. Lakes, streams, and ground water that once were pristine are either contaminated now or will be in the near future.

In Ontario and elsewhere in Canada, 40% of results of tests on private wells routinely show levels of contaminants exceeding standards for potability (personal communication with public health units across Canada, 1990 to 2002).

The study of biofilms is a new science. A biofilm is the cells immobilized at a substratum and frequently embedded in an organic polymer matrix of microbial origin. In other words, in water distribution systems, a biofilm is the layer that lines the inside of the pipes and consists of corrosion products from the pipes and colonies of bacteria, viruses, and algae. Bacteria in biofilms get organized and can exhibit unique properties. Biofilms are a potential cause of disease because their bacteria exhibit increased resistance to antibiotics and disinfectants. *Escherichia coli* 0157:H7, for instance, is 2000 times more resistant to chlorine in biofilms than when floating free in water.¹ Biofilms not only protect bacteria but also adhere very firmly

to objects to which they are attached. In operating rooms, biofilms are now posing a concern on surgical instruments, where they are proving very difficult (if not impossible) to remove and hence, to disinfect.

Drinking water sources need to be secured, and drinking water systems need to have the appropriate treatment, contamination alarms, and trained and updated operators in place. Water is a common resource and should be regulated as such; both public and private water use should be included in the overall management of our water. We should not be putting waste into our water at all. We should start with this premise and look for solutions to make it possible. The Walkerton experience has shown that, under the right conditions, a contaminated drinking water system can cause thousands of illnesses and many deaths.²

Prevention is the key to safe drinking water. By the time results of water tests are reported as contaminated, it is far too late. The public has already consumed the water and is at risk.

New pathogens

Escherichia coli 0157:H7 (the bacteria that caused the illness and deaths in Walkerton) was first discovered in 1982 by Dr Mohammed Karmali, a Canadian working at the Hospital for Sick Children in Toronto, Ont. He made the connection between illness with this bacteria and hemolytic uremic syndrome. *Cryptosporidium* and other pathogens are emerging as an increasing threat to drinking water. *Escherichia coli* 0157:H7 will not be the last new pathogen to emerge; we have to anticipate new threats to our drinking water.³ That is why it is so important to have training programs for water operators and ongoing programs to update that training with new developments in technology and emerging health threats.

A new book⁴ by Marq De Villiers called simply *Water* details the fate of drinking water around the world. There is too little drinking water for too many people. Conflicts will arise over ownership and access to drinking water.

Role of public health

In Canada, the public has long taken clean drinking water for granted. They assume that safe drinking water is the natural order of things and, perhaps understandably, know little about the people and

agencies that struggle daily to make sure drinking water remains uncontaminated. Safe drinking water is the cornerstone of good public health.

In Canada, public health units were established in the late 1800s in response to people's concerns about disease spread by contaminated drinking water. An event like the one in Walkerton has not happened in Canada since the early 1900s before chlorination of water began.

Worldwide, the number of people involved in public health, disease surveillance, and public health regulations and enforcement are in decline. A book⁵ by Laurie Garrett called *The Betrayal of Trust* documents the declining resources being put into public health worldwide. Garrett discusses the resulting disease outbreaks and risks to the public caused by government's lack of support for basic public health surveillance and interventions.

Role of government

Democratic governments are expected to protect the health and safety of their citizens. But in the last few years, there has been a shift in government thinking. Governments now seem to put more emphasis on supporting businesses so they can compete in the global marketplace and much less emphasis on regulating those businesses to ensure their activities do not threaten the safety of food, water, and other basic elements of public health.

I realize governments need to be fiscally responsible, but they need to better balance their role in supporting business with their role in protecting the population. People have stated that, since the September 11 attacks, and the threat of bioterrorism, the public demands more emphasis be put on adequate funding of government agencies concerned with public protection. I hope so. It would be ironic if Canada were able to compete well in the global marketplace but, in order to compete, had reduced public safety measures to the point where the health of its workforce was put at risk.

Role of family physicians

All public health units in Canada have a list of diseases that, by law, must be reported to them by physicians. This system worked in the Walkerton disaster. A local pediatrician reported to our health unit when Walkerton doctors sent the first two children with bloody diarrhea to her. We began our investigation on that basis.

Family physicians play a valuable role in reporting unusual cases or levels of disease in their communities. This means that family physicians need to be aware of patients' sources of drinking water

when they are dealing with diarrheal disease. Take nothing for granted when it comes to water.

Family physicians report to our health unit when they see unusual infectious diseases, often diseases they are not mandated to report. This response is important because we can often put the reports from several physicians together to discover a new trend or outbreak.

Disease reporting by family physicians will be even more crucial in this new age of bioterrorism. The reverse is also true. Public health units need to ensure that family physicians are well informed about community health issues, trends in diseases in their area, new pathogens, and the need to report diseases early.

In the Walkerton disaster, the public health unit and local family physicians worked in close coordination. We met early on in the outbreak to discuss prevention methods, a testing protocol, and the latest information on *E coli O157:H7* disease and management. The public health unit's website was a means of updating that information, and the Walkerton branch office of our health unit worked closely with physicians and the hospital to ensure that patients had fact sheets and updated information as the disaster unfolded.

Recommendations

The Commissioner of the inquiry into the Walkerton disaster developed an excellent understanding of public health issues and water safety. His first report, recommends having full-time Medical Officers of Health for each public health unit in Ontario. His second report will outline his recommendations for ensuring safe drinking water and preventing another disaster.

Our environment is changing and putting our drinking water at risk. Governments need to re-examine their role in protecting the health and safety of their citizens. Most importantly, family physicians and public health units play a vital role in disease surveillance and in a coordinated response to a disaster, such as the Walkerton water-borne disease outbreak. ♣

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