

The frustrations of fighting foodborne disease

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‡ See related article page 1409

Are we doing the best we can in Canada to identify and manage, or even better, to prevent outbreaks of foodborne disease? Clearly, not yet. A food-poisoning outbreak after a church supper is usually easy to recognize. Unfortunately, the patterns of foodborne illness are changing, making recognition more complex; we are faced with new and uncommon pathogens like *Cyclospora* spp. and *Listeria* spp. and unexpected food vehicles like frozen strawberries for hepatitis A and sprouts and salami for *Escherichia coli*. Most importantly, with the globalization of our food supply a contaminated product can produce widely dispersed outbreaks. For example, infections associated with eating sprouts from the same seed lots turned up on both sides of the Atlantic,¹ and *Shigella sonnei* infections in 4 states, Ontario and Alberta were traced to parsley imported from a farm in Mexico.²

Foodborne illness is seriously underreported. Recent surveys conducted in the United States³ found that only 8% of people with acute diarrhea sought medical care and physicians asked for stool specimens from fewer than half of the patients presenting with acute diarrhea.³ Not all stools yield a pathogen and not all pathogens are reported to public health officials.

Successful surveillance starts when the family physician or emergency department physician sees a patient with diarrhea or a related illness. The physician should think of the possibility of foodborne illness and inquire about others who might be ill. Stool specimens from persons with bloody diarrhea or diarrhea accompanied by fever or whose bouts last more than 48 hours (the usual limit for viral gastroenteritis) should be tested; both suspicions of foodborne disease and positive results should be reported to the local public health department.

Also key to the successful detection of food-related illness is the public health system. Public health laboratories are often the first to notice increased reports of pathogens, as was the case in the 1998 nationwide *Salmonella* Enteritidis outbreak of more than 800 cases of foodborne disease associated with packaged lunch products. The detection of the outbreak reported by Williams and colleagues⁴ in this issue (page 1409) began with 2 adjacent health departments recognizing an increased number of reports of *E. coli* O157:H7 positive cases. For appropriate action to be taken, however, information about a suspected outbreak must make its way speedily through the system, and as was noted by the Auditor General of Canada in the analysis of the management of the *Salmonella* outbreak, this doesn't always happen.⁵

Genetic fingerprinting is a new "wonder tool" for link-

ing isolates from humans and suspect foods. Pulsed-field gel electrophoresis is now widely used in outbreak investigations, but it could also play a much wider role in surveillance. In the United States, networked public health laboratories use this DNA fingerprinting on disease-causing bacteria isolated from humans and suspected foods and transfer the pulsed-field gel electrophoresis patterns electronically to a central computer at the US Centers for Disease Control and Prevention.⁶ Pattern matches help authorities recognize when cases of foodborne illness from different geographic locations may be related to exposure to a common widely dispersed food product. In Canada not all provincial laboratories provide pulsed-field gel electrophoresis, few use standardized techniques and the electronic transmission of patterns to the national lab is not yet possible. Cost constraints are delaying the use of this valuable surveillance tool across Canada.

Few local health departments have the capacity to handle a complex foodborne disease investigation. Fortunately, they can draw on a network of help from provincial and federal health and agricultural agencies. Unfortunately, however, the resulting investigation may be hampered by poor communication, lack of cooperation and withheld information. A *Food-borne Illness Outbreak Response Protocol*⁷ has been developed to help overcome these interjurisdictional difficulties and facilitate a more coordinated and rapid response to foodborne outbreaks. Key provisions of this new agreement between provincial and territorial governments, Health Canada and the Canadian Food Inspection Agency include:

- a primary focus on protecting the health of Canadians (Critics have charged that at times the Canadian Food Inspection Agency focused more on protecting industry.)
- establishing an Outbreak Investigation Coordinating Committee
- free and full communication of all pertinent information
- accepting epidemiological evidence in addition to laboratory evidence (Previously, the Canadian Food Inspection Agency only accepted lab evidence.)

Other measures that would greatly enhance our ability to conduct timely and effective investigations include providing adequate resources for strapped health departments, formal protocols and training for public health staff and an integrated data communication system. An outbreak surveillance Web site, which is being developed by Health Canada for public health professionals across the country, will allow for early alerts and post-outbreak summaries to

be posted. Another area where improvement is clearly needed is in our ability to conduct trace backs (i.e., to track food items back to their source) of implicated foods. The process needs streamlining through the development of protocols, more training in trace-back techniques and the timely feedback of results to investigators.

Finally, can we do more to prevent foodborne outbreaks? Here, the answer is a resounding "Yes!" There have been many instances where Canada's actions seemed to be too little too late. Take unpasteurized juice or cider, for example. Several outbreaks of *E. coli* O157:H7 and cryptosporidiosis in 1996 resulted in new US regulations that require that juice products be processed under a Hazard Analysis and Critical Control Point Program and mandatory warning statements appear on fruit and vegetable juice products that have not been processed to destroy pathogenic microorganisms. Canada, however, issued only a voluntary Code of Practice in July 1998. Additional outbreaks, including one in my own health unit,⁸ have prompted more attention, but regulatory measures as basic as labelling unpasteurized cider have still not been adopted. Public health officials also question the outbreaks of cyclosporiasis that occur each spring in Canada and have been attributed to raspberries imported from Guatemala.⁹ Why can't Canadian regulators manage to stop this recurring "rite of spring," as the Americans have done?

Dry fermented sausages have been recognized as a risk for *E. coli* O157:H7 since 1994.¹⁰ The US Department of Agriculture required that significant manufacturing changes be made in 1996; unfortunately, no Canadian regulatory action was taken, even after the 1998 outbreak reported in this issue. It took a large second outbreak in British Columbia and Alberta in late 1999, also traced to dry fermented sausage,¹¹ before meaningful food-safety changes were initiated in Canada. In addition, although the Canadian Food Inspection Agency has now taken action in federally inspected food plants, Health Canada's regulatory changes for other plants will take as long as a year.

Responsibility for food safety in Canada is complex and involves many jurisdictions. Health Canada, through its Food Directorate, has the key responsibilities of conducting health-risk assessments, setting standards related to food safety and developing appropriate regulations. Unfortunately, it takes far too long to translate the policy gaps that are identified in outbreaks into policies that will protect the food supply. We need to identify health risks quickly and learn from outbreaks that occur elsewhere. Let's be proactive in adopting measures to ensure the safety of our food supply. Our progress to date has not been completely reassuring.

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References

1. Taormina PJ, Beuchat LR, Slutsker L. Infection associated with eating seed sprouts: an international concern. *Emerg Infect Dis* 1999;5:626-34.
2. Crowe L, Lau W, McLeod L, Anand CM, Ciebin B, LeBer C, et al. Outbreaks of *Shigella sonnei* infection associated with eating fresh parsley — United States and Canada, July–August 1998. *MMWR* 1999;48:285-9.
3. Yang S. FoodNet and enter-net: Emerging surveillance programs for foodborne diseases. *Emerg Infect Dis* 1998;4:457-8.
4. Williams RC, Isaacs S, Decou ML, Richardson EA, Buffett MC, Slinger RW, et al. Illness outbreak associated with *Escherichia coli* O157:H7 in Genoa salami. *CMAJ* 2000;162(10):1409-13. Available: www.cma.ca/cmaj/vol-162/issue-10/1409.htm
5. *Management of a food-borne disease outbreak. Report of the Auditor General of Canada to the House of Commons.* Ottawa: Minister of Public Works and Government Services Canada; 1999. Available: <http://www.oag-bvg.gc.ca/domino/reports.nsf/html/9915ce.html> (accessed 2000 April 10).
6. PulseNet. *The National Molecular Subtyping Network for Foodborne Disease Surveillance.* Available: www.cdc.gov/ncidod/dbmd/pulsenet/pulsenet.htm (accessed 2000 Feb 3).
7. *Foodborne Illness Outbreak Response Protocol.* Partnership among provincial/territorial governments and Health Canada and the Canadian Food Inspection Agency. 1999 Aug.
8. An outbreak of *Escherichia coli* O157:H7 infection associated with unpasteurized non-commercial custom-pressed apple cider — Ontario, 1998. *Can Commun Dis Rep* 1999;25:113-20.
9. Outbreak of cyclosporiasis — Ontario, May 1998. *Can Commun Dis Report* 1998;24:153-6.
10. *Escherichia coli* O157:H7 outbreak linked to commercially distributed dry-cured salami — Washington and California, 1994. *MMWR* 1995;44:157-60.
11. Health Advisory. *E. coli* alert issued for Hungarian salami. Vancouver: BC Centre for Disease Control Society. 1999 Nov 10. Available: www.bccdc.org/media.html (accessed 2000 Feb 3).

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