

# Why early detection of outbreaks is so important

## Case scenario

One evening you are working in the emergency department and you see a generally healthy middle-aged First Nations man with severe nausea and vomiting. Following a thorough workup you conclude he has gastroenteritis. You decide to keep him in the observation unit overnight to be treated for dehydration and electrolyte abnormalities. You treat gastroenteritis frequently, but this one was bad. The nurse mentions to you that a couple of other First Nations people had been in earlier in the day with similar symptoms. "Let's notify public health," you say to the nurse. "This could merit an investigation." Two weeks later you receive follow-up: Public health conducted interviews and laboratory testing of more than 2 dozen people and identified the likely cause of the outbreak as traditionally fermented game meat. Fortunately, the local public health unit had been developing an engagement strategy with respected people in the affected community and they will now work together to address this issue.

## Evidence


It has been estimated that there are 4 million cases of gastroenteritis in Canada each year.<sup>1</sup> Nationally, the most common microbial causes are *Salmonella* (40%), *Escherichia coli* (15%), and norovirus (12%), and the most common food source is meat,<sup>2</sup> although other sources like eggs and raw vegetables are also common. However, there are some unique aspects to enteric disease in Canadian indigenous populations. In a recent review on this topic, walrus, seal, caribou, and whale were the most common traditional foods tied to food-borne illness and were primarily associated with botulism and trichinosis. Raw food or food that had undergone fermentation were the most common traditional preparation methods linked to food-borne illness.<sup>3</sup>

This case exemplifies the synergy that can occur when primary care and public health work together and the affected community is an active partner in the response. If these patients were only stabilized medically, the outbreak might not be identified. Without a primary care physician notifying public health, the investigation might not be triggered. If the cause is not detected, then these types of infections can spread or recur. And unfortunately, this happens. However, when clinicians engage public health, and the source of the outbreak is identified, then the cause can be addressed and the health of the population improved.

The capacity to identify the cause of outbreaks is now greater than ever owing to new laboratory testing techniques. Using pulsed-field gel electrophoresis for DNA fingerprinting can identify the bacterium's specific genetic pattern. This is especially useful in detecting outbreaks that occur over large geographic areas. Recently, for example, a multiprovince outbreak was

identified in an Eastern Mediterranean community, and careful investigation and laboratory testing identified a rare form of *Salmonella*, likely due to contamination of a traditional food in this cultural group.<sup>4</sup>

## Bottom line

Infections affect individuals but also spread through communities. Early detection and mitigation efforts are possible when there is effective synergy among primary care, public health, laboratories, and engaged communities. Practising this on the "small stuff" like gastroenteritis can help, not only to decrease morbidity in a community, but also to have this synergy in place for when more serious outbreaks occur. 

## References

1. Thomas MK, Murray R, Flockhart L, Pintar K, Pollari F, Fazil A, et al. Estimates of the burden of foodborne illness in Canada for 30 specified pathogens and unspecified agents, circa 2006. *Foodborne Pathog Dis* 2013;10(7):639-48.
2. Bélanger P, Tanguay F, Hamel M, Phypers M. An overview of foodborne outbreaks in Canada reported through Outbreak Summaries: 2008-2014. *Can Comm Dis Rep* 2015;41(11):254-62.
3. Jung JKH, Skinner K. Foodborne and waterborne illness among Canadian Indigenous populations: a scoping review. *Can Comm Dis Rep* 2017;43(1):7-13.
4. Tanguay F, Vrbova L, Anderson M, Whitfield Y, Macdonald L, Tschetter L, et al. Outbreak of *Salmonella* Reading in persons of Eastern Mediterranean origin in Canada, 2014-2015. *Can Comm Dis Rep* 2017;43(1):14-20.



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La traduction en français de cet article se trouve à [www.cfp.ca](http://www.cfp.ca) dans la table des matières du numéro de février 2017 à la page e100.