

CHIEF MEDICAL OFFICER OF HEALTH'S REPORT ON THE MANAGEMENT OF THE 2008 LISTERIOSIS OUTBREAK IN ONTARIO Summary of Findings and Recommendations

April 17, 2009

1. Detecting the Outbreak

In 2005, Ontario implemented the integrated Public Health Information System (iPHIS), a web-based system, which all public health units use for reportable infectious disease surveillance and case and contact management. Each health unit is required to enter case information on all reportable diseases in its jurisdiction into iPHIS. Staff at the Ministry of Health and Long-Term Care analyze data from iPHIS daily supported by a program called Early Aberration Reporting System (EARS), which detects statistical increases in the number of cases above the norm.

The iPHIS and EARS systems aided in the detection of the province-wide listeriosis outbreak. The EARS flags alerted staff to a higher number of cases than usual. As a result, staff was quick to consider the possibility of a wider outbreak. Without iPHIS, the small number of initial cases across the province might never have been linked together and the outbreak might not have been detected until many more people had fallen ill.

The ministry has refined its process for investigating and responding to EARS flags, but more can still be done to assess the sensitivity and specificity of EARS in detecting outbreaks.

Although the iPHIS system works well, there is sometimes a lag between the time a public health unit is aware of a case and the time that data on the case are entered into iPHIS. In some cases, health units do not initially enter enough information for ministry staff to be able to identify possible links.

During the investigation, the ministry reminded health units to enter listeriosis cases within one business day of receiving the initial notification from a health care facility or laboratory, and to provide more information about each case. As a result, the ministry was able to identify that a larger number of cases than originally suspected. The information on these cases helped identify the outbreak and guide the investigation.

Timely and complete reporting is crucial in detecting outbreaks. The system would be more efficient if all health units routinely entered cases quickly and provided complete surveillance data.

Recommendations

To continue to build the province's capacity to detect future province-wide outbreaks:

1.1 Local public health units should:

- enter cases of high risk disease, such as listeriosis, into iPHIS in a timely way (i.e., within 1 business day)
- provide adequate case information to support provincial analysis and investigation.

1.2 The ministry should ensure that Public Health Division and local health units have the skilled staff and other resources to provide timely data, and investigate and respond to any aberrations identified in surveillance data in iPHIS and other electronic systems.

1.3 The MOHLTC should review the sensitivity and specificity of EARS flags and develop an algorithm that defines the steps to assess the follow-up action to be taken in response to EARS flags.

2. Confirming the Outbreak

Given the non-specific symptoms of listeriosis and the relatively small number of people who fall ill from listeriosis, laboratory testing is essential to help identify and confirm an outbreak.

Molecular typing was critical to investigating the 2008 listeriosis outbreak. It allowed investigators to compare human and food samples, and identify the probable source of the outbreak.

Listeria testing expertise has been centralized at two federal laboratories: the National Microbiology Laboratory in Winnipeg and the National Listeria Reference Laboratory in Ottawa. During the 2008 listeriosis outbreak investigation, all molecular typing was conducted by the two federal laboratories, which were responsible for responding to requests from across the country.

The molecular typing provided by the National Microbiology Laboratory for human samples and by the Listeria Reference Laboratory for food samples helped confirm that the cases across the country were linked, and that the source of the contamination was the luncheon meats from the Maple Leaf Foods plant.

This reliance on a single laboratory for all molecular typing may no longer be sufficient as typing becomes more integrated into the testing menu.

At the beginning of the 2008 outbreak, molecular typing of *Listeria monocytogenes* was not available at the Ontario Central Public Health Laboratory, but it was subsequently introduced. If the Ontario Central Public Health Laboratory had conducted the molecular typing in its own laboratory, the time required to transport the samples and request the tests could have been eliminated, and the time it took to obtain test results might have been reduced by, at most two to three days. Testing process and protocols will still take time (i.e., about 12 days) and the Central Public Health Laboratory will still have had to send its molecular typing results to the National Microbiology Laboratory for cross referencing with molecular typing results from other provinces. Consideration should be given by the federal government to the need for greater regional capacity as molecular typing moves from a research tool into more standardized usage. Further, reliance on a single laboratory for advanced testing may compromise time frames for testing in some areas of the country.

At the time of the outbreak, Ontario's public health laboratories did not have a fully integrated laboratory information system. Ontario would be able to respond more quickly to outbreaks if it had an information system that could integrate public health surveillance data and laboratory testing data.

Recommendations

In December 2008, the newly created Ontario Agency for Health Protection and Promotion (OAHPP) assumed responsibility for the operation of the province's public health laboratories. To address gaps identified during the 2008 listeriosis outbreak and enhance Ontario's capacity to investigate and confirm outbreaks:

2.1 The OAHPP should ensure that partners are aware of the requirements for specimen collection and submission, which will lead to more timely processing of tests and communication of laboratory data to all outbreak partners.

2.2 OAHPP should ensure that Ontario has 24/7 capacity within its own laboratory system to conduct the tests required to detect and respond to foodborne outbreaks, thereby reducing its reliance on federal agencies. Predetermined testing protocols should be established for outbreaks that require federal agency lab support.

2.3 OAHPP should develop a coordinated system to monitor strains of bacteria and other organisms identified as public health priorities in human, food and environmental samples, including maintaining a database of strain patterns that can assist in investigating future outbreaks.

2.4 OAHPP should establish a working group (including representatives from federal partners) to:

- identify any potential to improve testing timelines in the province
- develop a plan to enhance Ontario's laboratory capacity and reduce its dependence on federal agencies
- define laboratory roles and responsibilities for sample testing during foodborne outbreak
- report back to the Chief Medical Officer of Health with recommendations.

2.5 The federal government should:

- review the existing strategic approach to advanced molecular testing, addressing such items as the acceptable turnaround time for lab results (including transportation), the ability to address anticipated higher demand for molecular testing, and the importance of having appropriate alternatives should the NML not be available.

3. Managing the Outbreak

Information is the most important asset during an outbreak investigation. During the investigation the Canadian Food Inspection Agency (CFIA) – the lead federal agency for food recalls – was the sole intermediary between Maple Leaf Foods and the public health officials responsible for investigating the outbreak. Toronto public health inspectors were not able to enter the plant until almost three weeks after CFIA first identified Maple Leaf Foods as the manufacturer of the food that tested positive for *Listeria*.

Although the Ministry of Health and Long-Term Care asked the CFIA for comprehensive information on the distribution of the products implicated in the outbreak, this information was never received. As a result, it was not until August 14th that public health officials were informed that contaminated products might have been distributed to restaurants and August 17th that they were informed that contaminated products might have been distributed to some retail stores and deli counters. During the investigation, they were not able to obtain complete information on the number or location of establishments in Ontario that had received products implicated in the outbreak. If public health authorities had had timely access to this information, they might have been able to take additional targeted steps to reduce possible exposure among the general public. The lack of information about the national distribution of affected products also hampered the national investigation of the outbreak.

No mandatory food recall was issued by CFIA; however, Maple Leaf Foods issued a voluntary recall that started with two products and expanded to over 220 products made in the same plant.

Over a period of about two weeks after the outbreak was declared, the CFIA health hazard alerts expanded in scope (number of products) and extent (number of retail sites). Each day, new products

were announced as posing a risk.

The ever-expanding list of products and stores affected created the impression that the response was not well organized, and contributed to the public's sense of unease and confusion. It also made it more difficult for public health units to plan and organize their efforts to monitor the effectiveness of product recalls.

The handling of food recalls highlighted the management and coordination challenges of an outbreak that involves federal, provincial and local partners, particularly when roles and responsibilities are not clear.

Given large-scale manufacturing and processing of food and complex food distribution networks, Ontario and Canada are likely to see more non-localized outbreaks of foodborne illnesses. The current processes and structures for investigating and managing outbreaks are not adequate to support a coordinated response among different jurisdictions and levels of government. Roles and responsibilities at the federal, provincial and local levels are not clear.

It was not clear to the partners which responsibilities rested with the Public Health Agency of Canada (PHAC) and the federal Chief Public Health Officer, and which ones with the Chief Medical Officer of Health in Ontario. It was also not clear whether the lead federal agency was PHAC or the CFIA, or to what extent local medical officers of health or the Chief Medical Officer of Health in Ontario could act alone to protect public health.

Recommendations

To enhance the capacity of all provinces and territories to manage provincial/territorial foodborne outbreaks:

3.1 In the event of a suspected or declared provincial/territorial outbreak, the provincial/territorial Chief Medical Officer of Health should establish and chair a provincial/territorial Outbreak Coordinating Committee (OCC) to provide him/her information and advice in managing the outbreak. The terms of reference of the OCC should explicitly require:

- a mandate to protect public health as the overarching priority
- the participation of all lead provincial and federal food inspection, regulation and public health agencies, including laboratories
- all agencies within the province/territory to fall under the leadership of OCC
- open disclosure of all data and information from all participating agencies
- the provincial/territorial Chief Medical Officer of Health to be the spokesperson for the OCC
- the operation of the OCC to be consistent and, when required, integrated with existing provincial/territorial emergency response plans, the revised FIORP and other provincial/territorial outbreak response plans.

To enhance the capacity to manage a national or international foodborne outbreak:

3.2 In the event of a suspected or declared national/international outbreak, the federal Chief Public Health Officer should establish and chair a National Outbreak Coordinating Committee (NOCC). The terms of reference of the NOCC should explicitly require:

- a mandate to protect public health as the overarching priority
- the participation of the Chairs of the provincial OCCs and the leads of federal food regulation, inspection and public health agencies, including laboratories
- the Chief Federal Public Health Officer to be the spokesperson of the NOCC
- the existence of the NOCC to not compromise the mandate, role and primacy of the

provincial/territorial OCCs in outbreak management.

To enhance Ontario's capacity to manage provincial outbreaks:

3.3 Both the Canada Foodborne Illness Outbreak Response Protocol (FIORP) and the Ontario Foodborne Health Hazard and Illness Outbreak Investigations Memorandum of Understanding (Ontario MOU) should be reviewed at the provincial and federal levels to make certain the documents take into account large-scale manufacturing practices and that the protocols and processes set out clear roles and responsibilities, and will ensure a timely, effective and coordinated response to a foodborne outbreak; they should then be put into operation.

3.4 The Chief Medical Officer of Health for Ontario should develop Ontario-specific guidelines for the management of foodborne outbreaks and provincially initiated food recalls, food seizures, and other activities that may be required under the HPPA. The guidance document should:

- reinforce Ontario's statutory authority to manage a provincial outbreak and protect public health even if that means acting independently from other provincial and federal partners (i.e., when the evidence that public health requires to act may not meet the CFIA criteria to issue a food recall)
- use the protocols within existing Ministry of Health and Long-Term Care and Public Health Division emergency response plans as the basis for outbreak management guidelines
- set out the criteria to change a local outbreak to a provincially managed outbreak
- establish a framework and structure for managing a provincial outbreak that is consistent with existing provincial protocols and agreements with local health units
- identify the criteria/triggers that will be used to:
 - issue orders to address health hazards related to foodborne outbreaks
 - declare a possible or probable provincial outbreak
 - encourage a federal or industry-led food recall
 - implement a public communications plan.
- provide guidelines for investigating listeriosis and other reportable foodborne illnesses, including sampling protocols and methodologies to be used during provincial outbreaks
- include guidelines on issuing and enforcing orders for holding, disposing of or returning suspect food items to a plant; and processes to monitor the effectiveness of a food recall
- establish requirements for regularly reviewing and updating the guidance documents.

3.5 The Chief Medical Officer of Health for Ontario should encourage training and tabletop exercises for all partners to test the protocols and processes for managing a cross-jurisdictional outbreak.

3.6 All public health units in Ontario should maintain 24/7 capacity to monitor outbreak communications, including food recall notices, and develop on-call systems that ensure any notices received after hours are read within two hours of being issued.

4. Communications

During the outbreak, each organization and each level of government handled public communications within their respective jurisdictions. Public health units provided information to their local media. The Ministry of Health and Long-Term Care managed communications to the media and the general public in Ontario. The PHAC and the CFIA were responsible for communications at the national level. Communications were not well coordinated among these different levels of government.

The lack of coordination contributed to public confusion and created the impression that the outbreak was not being well managed, which affected public trust and confidence in the public health system.

The lack of coordination was due in part to the different levels of evidence required by different partners to trigger action, but it was also due to the fact that the Office of the Chief Public Health Officer at the PHAC did not appear to have a clear mandate for leadership in a cross-jurisdictional foodborne outbreak.

Recommendations

To enhance the capacity to communicate during an outbreak:

4.1 All organizations involved in managing a foodborne outbreak should adopt the 24-hour information cycle that is an integral part of all Ontario emergency response plans.

4.2 Communications to health care practitioners should be timely and efficient to ensure that people are diagnosed and treated quickly and effectively.

4.3 The Chief Medical Officer of Health or designate should be the official media spokesperson for a provincial outbreak, and adhere to the 24-hour information cycle when speaking to the media.

4.4 The Federal Chief Public Health Officer or designate should be the official media spokesperson for a national outbreak.

4.5 To improve the accuracy of reporting, the MOHTLC and OAHPP should educate the media about epidemiological and laboratory testing methods used during a foodborne outbreak and how data are interpreted.

4.6 The MOHLTC should develop standard fact sheets that can be adapted and distributed quickly in the event of a foodborne outbreak. Communication staff should be involved early in the outbreak response so any communications issues can be resolved quickly and the MOHTLC should establish a streamlined approval process for communications during an outbreak.