

4

ENHANCING YORK REGION PUBLIC HEALTH SURVEILLANCE CAPACITY

The Community and Health Services Committee recommends the adoption of the recommendations contained in the following report dated September 3, 2009, from the Commissioner of Community and Health Services.

1. RECOMMENDATIONS

It is recommended that:

1. Council approve the Community and Health Services Department's participation in the Advanced Syndromic Surveillance and Emergency Triage project, in order to increase its Public Health Branch disease surveillance capacity.
2. The Commissioner of Community and Health Services be authorized to enter into the necessary agreements, subject to review by Legal Services, related to the Community and Health Services Department's participation in the Advanced Syndromic Surveillance and Emergency Triage project.

2. PURPOSE

This report is prepared for Regional Council in order for it to carry out its legislative duties and responsibilities as the Board of Health under the *Health Protection and Promotion Act*. It seeks authorization to enter into the necessary agreements to enhance local public health surveillance capacity for early detection of chemical, biological, radiological or nuclear events in York Region and surrounding areas.

3. BACKGROUND

The ability to detect public health threats prior to mass impact is a key factor in mitigating the scope and burden of those threats

The past decade has seen the emergence of several public health threats in North America, such as SARS, *E.coli*, anthrax bioterrorism, listeriosis food poisoning, avian influenza, tuberculosis resurgence, antibiotic-resistant organisms and, more recently, pandemic H1N1 influenza. These threats all share one common element—early detection of these threats in York Region and surrounding areas would enhance the Region's ability to identify the scope and cause of the events, and minimize exposure or harm.

Traditional public health surveillance relies on clinical diagnoses or laboratory confirmation for the detection of public health threats

Surveillance is the systematic and ongoing collection, collation and analysis of health-related information that is communicated in a timely manner to all who need to know, so that action can be taken. Traditional surveillance systems in York Region and Ontario rely on the establishment of clinical diagnoses or laboratory results for the detection of new and/or emerging public health threats. Waiting for conclusive evidence of disease presence can delay public health response. Individual cases have often been infectious for several days prior to clinical diagnosis or laboratory confirmation, and the potential for community transmission prior to detection and intervention is significant.

York Region has already made significant strides in public health surveillance capacity

Through pharmacy-based surveillance of the sales of prescription and over-the counter medications, York Region Public Health has the ability to detect increases in the treatment of illnesses prior to laboratory confirmation of their presence in the community. York Region has also created the largest school absenteeism monitoring system in Canada. The school population is one of the largest at-risk populations for the introduction and transmission of disease. As a result of close monitoring of increases in illness-associated absenteeism, York Region is able to detect school-based disease events prior to notification from traditional surveillance systems.

Syndromic surveillance enhances early response to public health threats

According to the Centers for Disease Control and Prevention, syndromic surveillance is a type of surveillance in which health-related data is gathered on the basis of symptoms or illness complaint prior to clinical diagnosis or laboratory confirmation. It signals a sufficient probability of a case or an outbreak to warrant further public health response. Whether chemical, biological, radiological or nuclear events, early warning systems support the advanced mobilization of both public health and emergency management resources, for efficient and timely response.

York Region will form a syndromic surveillance program in partnership with hospitals and primary care physicians

York Region will enhance its capacity for surveillance of chemical, biological, radiological and nuclear events by forming a syndromic surveillance program that will track visits and illness complaints to the hospital and primary care sector. Hospitals and physicians comprise the largest source of early warning indicators for the existence of public health threats in a community as they are often the first place ill people go for assistance.

Upon entry into a York Region emergency room or physician's office, patients are evaluated by medical personnel and symptoms are recorded to form a clinical diagnosis. Medical personnel record these symptoms into electronic systems as an integral component of the medical record. Each event associated with a chemical, biological, radiological or nuclear threat is associated with a typical clinical picture, or syndrome.

Through access gained to the hospital's electronic clinical patient management systems, public health can automatically detect increases in the numbers of patients meeting syndromic definitions of disease. This information can be used to mount public health investigations potentially days prior to notification through routine surveillance such as laboratory and/or physician reporting.

Other provincial health units have begun using hospital-based syndromic surveillance systems for the early detection of public health threats

Over the past several years, other health units in Ontario have begun introducing syndromic surveillance systems in local hospitals, including food borne and influenza outbreak detection systems, to significantly enhance their public health detection capacity. Originally piloted in the Grey-Bruce health unit and Kingston, Frontenac and Lennox & Addington health unit, comprehensive evaluations have determined that hospital syndromic surveillance systems are able to detect the presence of certain outbreaks in the communities up to 2-3 days prior to detection with traditional surveillance systems. These syndromic surveillance systems require minimal human and capital resource commitments.

AMITA Corporation is a public safety and emergency management solutions company that offers IT consulting, commercialized software solutions and expertise in chemical, biological, radiological-nuclear and explosives-based research & development programs. To address and improve preparedness and response to a pandemic/chemical, biological, radiological-nuclear and explosive event, AMITA is focused on partnering with public health organizations to find new solutions to these emerging threats.

Beginning in 2007, the AMITA Corporation, based in Ottawa, Ontario, has spearheaded the introduction of hospital-based syndromic surveillance systems in Canada by applying information technology to routinely monitor existing data (e.g. hospital health records) in order to identify disease threats. Until recently, significant barriers existed to the implementation of surveillance systems into the hospital sector, including the expense and effort required. The AMITA Corporation addresses these barriers by establishing ready-to-use systems for Canada that can be uniformly applied across hospitals and across existing systems. Additionally, by linking hospitals together to share syndromic surveillance information, the accuracy and precision of the systems is continually improved as information is gathered.

The AMITA Corporation's Advanced Syndromic Surveillance and Emergency Triage (ASSET) project has been successful in receiving multi-year funding from the Chemical,

Biological, Radiological-Nuclear and Explosives Research and Technology Initiative of the Defence Research and Development Canada agency. This funding has been applied to the integration of a portion of the Kingston, Frontenac and Lennox & Addington health unit system into the ASSET project, the introduction of the ASSET project into all 11 Ottawa-area hospitals in conjunction with Ottawa Public Health and the pending introduction of similar systems in Peel Region and Simcoe-Muskoka health units in preparation for the G8 summit in Spring 2010.

4. ANALYSIS AND OPTIONS

Phase 1: York Region will join the ASSET project and introduce influenza-related syndromic surveillance into all three regional hospitals

The emergence of the pandemic flu threat in North America, most recently with the initial introduction of pandemic H1N1 flu into Canada, United States and Mexico and consequently worldwide, has highlighted the urgent need to establish more robust early warning surveillance systems into the existing public health infrastructure.

The Public Health Branch of the Community and Health Services Department, in collaboration with York Region hospitals, proposes to join the ASSET project funded by the Chemical, Biological, Radiological-Nuclear and Explosives Research and Technology Initiative of Defence Research and Development Canada. Along with Kingston, Frontenac and Lennox & Addington, Ottawa, Grey-Bruce, Peel Region and Simcoe-Muskoka health units, York Region will introduce an electronic influenza syndromic surveillance system into Southlake Regional Health Centre, in the Town of Newmarket, York Central Hospital, in the Town of Richmond Hill, and Markham Stouffville Hospital, in the Town of Markham, in advance of the anticipated arrival of the next phase of pandemic influenza. The introduction of this system will permit York Region Public Health to detect early increases in emergency room visits for any symptoms consistent with pandemic and/or seasonal influenza. Early detection will allow for early mobilization of resources dedicated to mitigating the impact of pandemic influenza in York Region residents.

Phase 2: Expand the scope of York Region's participation in the ASSET project to monitor all respiratory, enteric, and bioterrorism-related syndromes in both hospitals and sentinel physician offices

Following full integration of syndromic surveillance information technology systems into three York Region hospitals, the Public Health Branch plans to expand the range of syndromes that can be evaluated and integrated into the early warning system. Through a comprehensive review of symptom profiles associated with infectious diseases and chemical/radiological-nuclear events, the same systems used for pandemic influenza early warning can be applied to other public health threats.

It is also important for a comprehensive early warning system to capture individuals who may choose to visit physician offices and/or walk-in clinics as an alternative to emergency rooms when ill. Many large medical practices in York Region have introduced fully electronic information management systems to track the care of their patients in a manner similar to that seen in hospitals. In Phase 2 of this project, the Public Health Branch will work with medical practices and walk-in clinics throughout York Region to expand the ASSET project into these settings.

Phase 3: Merge York Region's school absenteeism monitoring program into the ASSET project

The York Region school absenteeism monitoring program monitors both all-cause and illness-caused absenteeism in all elementary schools and all public high schools on a daily basis. Currently, through collaborations established with both the York Region District School Board and the York Catholic District School Board, data is fed to York Region Public Health and manually analyzed for "unusual" levels of activity. This manual integration and analysis of data is both time consuming and complicated.

In collaboration with the school boards, the Public Health Branch proposes to integrate its school absenteeism monitoring program into the ASSET project such that the same automated information technology systems in hospitals can be applied to the daily data from the school boards. As such, York Region Public Health and the York Region District School Board and York Catholic District School Board will gain the ability to automate the daily analysis of school absenteeism data and produce similar automated early warning signals for public health response.

Following the completion of Phase 3, York Region will have one of the most comprehensive syndromic surveillance systems in Canada, encompassing school, pharmacy, hospital and physician-based systems for the early detection and response to emerging public health threats.

5. FINANCIAL IMPLICATIONS

All funding will be provided by Defence Research and Development Canada's Chemical, Biological, Radiological-Nuclear and Explosives Research and Technology Initiative

Consistent with the process utilized in the Kingston, Frontenac and Lennox & Addington, Grey Bruce, Ottawa, Peel Region and Simcoe-Muskoka health units, the AMITA Corporation, on behalf of York Region, will approach the Chemical, Biological, Radiological-Nuclear and Explosives Research and Technology Initiative for additional funding to add York Region as an early adopter of the ASSET project. The AMITA Corporation will handle and manage all funds, including the provision of funds for the

introduction of information technology systems to York Region hospitals and sentinel physician offices.

York Region will not be required to provide any funds towards the completion of all three phases of the ASSET project, but is expected to provide minimal in-kind contributions in the form of epidemiological and health analyst support for the introduction, analysis and evaluation of the ASSET project. Staff will monitor costs associated with this and will report back if there are any changes in the magnitude of support required.

All planned surveillance initiatives will be conducted within the approved operating budget for the Public Health Branch.

6. LOCAL MUNICIPAL IMPACT

Participation in this fully-funded project will benefit local municipalities by significantly expanding York Region's capacity for the early detection of chemical, biological, radiological and/or nuclear events. Through early detection, responses to these events can be mounted prior to full impact, prevention and control measures can be introduced and ultimately the impact on York Region residents can be more efficiently mitigated.

7. CONCLUSION

A well-developed, comprehensive surveillance strategy is the cornerstone of effective identification and control of disease in the community. Early identification of chemical, biological, radiological and nuclear events permits rapid response and subsequent reductions in community impact. As established by York Region's peer health units, syndromic surveillance is emerging as the new standard by which surveillance capacity will be evaluated. York Region's involvement as an early adopter of the ASSET project will positively position Public Health for timely, effective responses to these threats to best protect the health of our residents.

For more information on this report, please contact Dr. Karim Kurji, Medical Officer of Health at Ext. 4012.

The Senior Management Group has reviewed this report.