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REVIEW OF H1N1 RESPONSE

The Community and Health Services Committee recommends the adoption of the recommendation contained in the following report dated April 30, 2010, from the Commissioner of Community and Health Services.

1. RECOMMENDATION

It is recommended that:

1. The Regional Clerk circulate this report to the Chief Public Health Officer for Canada, the Chief Medical Officer of Health for Ontario, the President of the Ontario Agency for Health Protection and Promotion, the Central Local Health Integration Network, the Region's local municipalities and local hospitals and school boards.

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 provides a review of the York Region response to pandemic H1N1 influenza and identifies lessons learned to improve response to future emerging infectious disease epidemics and other emergencies.

3. BACKGROUND

Provincial pandemic plan outlines the key responsibilities of the local health unit

The Ontario Health Plan for an Influenza Pandemic assigns municipal governments and public health units responsibility for coordinating the local response to an influenza pandemic. This entails maintaining a local surveillance system to monitor levels of influenza activity, coordinating vaccine and antiviral distribution through the existing health care system, and enhancing this system through the operation of mass immunization clinics and alternate flu assessment centres. Other local responsibilities include keeping the public and health care providers informed about the impact of the pandemic and about public health measures to reduce infection risk, and liaising with community partners such as health care facilities and school boards.

Local H1N1 influenza activity peaked in the second week of November at levels well above seasonal flu activity levels, but with much less severity than predicted

During the first wave of H1N1 (April 2009 to August 2009) there were 532 confirmed Influenza A cases reported in York Region. Forty residents required hospitalization, but there were no associated deaths. Public health activities focussed on understanding the behaviour of the novel virus, educating the community on public health measures and personal infection control behaviours, developing a vaccine strategy in anticipation of the arrival of vaccines, and conducting influenza case management and contact follow up. Planning for the operation of flu assessment centres intensified in anticipation of a possible second wave. Disease activity peaked mid-June and waned by August.

During the second wave (September 2009 to December 2009) there were 361 confirmed cases of H1N1 in York Region. Of these cases, 134 required hospitalization and three residents, all in their fifties with underlying medical conditions, died. This compares with 23 hospitalizations and two deaths reported to York Region Public Health in the 2007-2008 influenza season. Rates of confirmed cases of H1N1 and influenza-like-illness peaked the week of November 7- 15, 2009 at two to three times the level observed at the peak of a typical flu season.

The number of confirmed cases underestimates the true extent of illness in the community since testing for H1N1 was restricted to severe cases.

York Region operated five mass immunization clinics during the second wave of H1N1

York Region operated a number of mass immunization clinics during the second wave of H1N1 in order to vaccinate as many residents in as short a timeframe as possible. The general locations of five immunization clinics were identified using Geographic Information Systems (GIS) tools, based on age distribution, birth rate, and hospital utilization patterns. On October 28, 2009, the immunization clinics at Vellore Village (Vaughan) and Ray Twinney (Newmarket) opened. The three remaining immunization clinics at the former Markham hydro building (Markham), Rouge Woods (Richmond Hill), and Sutton Kinsman Hall (Georgina) opened on Monday, November 2, 2009. All five community immunization clinics closed December 13, 2009. During initial days of operation, up to 9% of individuals receiving vaccine at local clinics were not residents of York Region. This percentage rapidly dropped as additional immunization clinics in surrounding health units opened.

In a typical flu season, York Region administers 13,400 doses of vaccine through public health seasonal influenza clinics. During the second wave of H1N1, the Public Health Branch administered 106,161 doses of the H1N1 influenza vaccine (Table 1). This is nine times the volume normally administered by the Branch over an influenza season, since most residents access the seasonal flu vaccine through their family doctor or employer.

Table 1
Number of H1N1 Vaccine Doses Administered By York Region Public Health Immunization Clinics Between October 28, 2009 And December 13, 2009

Clinic	Doses given
Former Markham Hydro Building	29,429
Ray Twinney Community Centre	27,252
Rouge Woods Community Centre	25,710
Vellore Village Community Centre	20,499
Sutton Kinsman Hall	3,271
Total	106,161

Data Source: York Region Analysis and Reporting Team, Clinical Events Management System, (Version 2.07 - The Regional Municipality of Niagara – IT Solutions Division): February 11, 2010.

Table 2 compares the number of H1N1 vaccine doses administered at York Region immunization clinics with the number of doses administered through other local health units during the operation of their clinics. Further analysis on a per capita basis is not reliable owing to movement between health units.

Table 2
Number of H1N1 Vaccine Doses Administered Through Neighbouring Public Health Unit Mass Immunization Clinics

Health unit	No. of H1N1 doses administered
Durham Region	84,556
Halton Region	90,510
Peel Region	101,880
Simcoe Muskoka	59,594
City of Toronto	231,600
York Region	106,161

The Region operated two community flu assessment centres for a short duration

York Region operated two community flu assessment centres to provide surge capacity for an overwhelmed acute health care system. The purpose of the community flu assessment centres was to assess residents with mild to moderate influenza and provide prompt access to antiviral treatment. Three of the other five health units in the Greater Toronto Area also opened flu assessment centres. In accordance with York Region's

coordinated plan, the three hospitals in the Region also opened dedicated onsite flu assessment centres. Table 3 summarizes Regional and hospital flu assessment centre activity.

Table 3
Number of Clients Seen at Flu Assessment Centres

Assessment centre	No. of patients seen	Days open
York Region Community Flu Assessment Centre: Vaughan	472	20
York Region Community Flu Assessment Centre: Markham	113	12
Southlake Regional Health Centre	316	11
York Central Hospital	659	15
Markham Stouffville Hospital	1,021	19

77% of Public Health Branch staff were redeployed during the second wave to support H1N1 response

In order to staff the immunization clinics and flu assessment centres and to coordinate communications and decision-making, 335 Public Health Branch staff were redeployed from their usual positions, leaving a skeletal staff to continue with the delivery of critically essential public health services. The length of redeployment varied from a number of weeks to several months, depending on the role of the staff member. It required staff to assume roles and responsibilities outside their usual competencies, work hours and location. An additional 56 regional employees and 118 individuals from temporary agencies, mostly nurses and clerks, also staffed these response activities.

4. ANALYSIS AND OPTIONS

Fluctuating levels of vaccine supply and demand posed challenges

In the fall of 2009, the Ministry of Health and Long-Term Care indicated health units should expect to receive the H1N1 vaccine in early November. By mid October, however, the Ministry announced it would receive an unknown amount of vaccine imminently and instructed health units to be prepared to start administering the vaccine in the last week of October, bringing forward the planned opening date of mass immunization clinics by two weeks.

Just prior to opening the mass immunization clinics, consumer surveys indicated that demand for the vaccine was low because most cases of H1N1 illness were mild. The province identified the need for intensive social marketing to promote uptake. However, on the eve of opening the first York Region mass immunization clinics, circumstances changed virtually overnight with the unfortunate death of a local young hockey player on

October 26. Levels of anxiety heightened across the province but were particularly pronounced in York Region, where the youth attended school. The resultant surge in demand for vaccine contributed to some of the challenges encountered at immunization clinics in the first three days of operation.

Vaccine shortage resulted in restricting eligibility to provincial priority groups

As a result of a vaccine shortage announced by the manufacturer, the Ministry of Health and Long-Term Care instructed health units to restrict eligibility to the six priority groups that would most benefit from protection based on the disease patterns of H1N1. These were:

- People under 65 with chronic conditions.
- Pregnant women.
- Healthy children 6 months to under five years of age.
- People living in remote or isolated communities.
- Health care workers.
- Household contacts and care providers of persons at high risk who cannot be immunized or may not respond to vaccines.

Enforcing these criteria helped with initial line management at clinics, but as demand for the vaccine in the priority groups dropped, inefficiencies resulted because the clinics were staffed at levels prepared to serve much higher volumes. Efficiency improved significantly once the Region lifted priority group restrictions.

Vaccine packaging and reporting requirements discouraged local vaccine delivery agents

Whereas 331 physicians normally participate in the Region's universal seasonal influenza vaccine program, H1N1 vaccine was delivered to only 63 physicians during the first week of November 2009. Feedback from physicians indicates that the extent of documentation required by the Ministry discouraged their participation. The packaging of vaccines in large (500 dose) quantities also limited participation to vaccine delivery agents with practices of sufficient volume to administer 500 doses. To address this, York Region retained a pharmacist to repackage the vaccine. Over time the Ministry required less documentation and provided vaccine in smaller quantities. By the end of February, the Public Health Branch had distributed 549,071 H1N1 vaccine doses to vaccine delivery agents in the Region.

High H1N1 activity in late October 2009 required early opening of public health community flu assessment centres

The H1N1 second wave arrived and peaked earlier than anticipated. Originally, York Region planned to open the first of three community flu assessment centres on November

17, 2009. However, on October 30, both Markham Stouffville Hospital and Southlake Regional Health Centre reported that their emergency rooms were overwhelmed with influenza cases and they opened their onsite flu assessment centres. York Central Hospital opened theirs on November 2. Consequently the Region rapidly expedited plans to open the first community flu assessment centre on November 3 and the second on November 11. A third centre was ready to open on November 15 but did not because by that time the volume of cases at the operating community flu assessment centres was low and pressures on the hospitals had eased.

The Region mobilized additional resources to assist in the response and to meet the public demand for information

Through meetings of the Regional Emergency Control Group, all Regional departments contributed to the logistics of the H1N1 response. The opening of the Public Health Emergency Operations Centre assisted in coordinating communication.

Between October 26 and December 4, the Health Connection public health telephone information service received a total of 10,072 calls of which 58% related to H1N1. Call activity peaked on October 28, when over 1,400 calls were received. Historically the average number of calls to Health Connection on a regular business day is 100.

During the second wave of H1N1 the Public Health Branch responded to approximately 150 media inquiries. Of these, 107 (70%) were received between October 28 and November 9. During a typical week, the York Region Community and Health Services Department responds to 10-15 media requests. Over the second wave of H1N1 the Region issued 24 media releases to provide residents with information about immunization clinics, priority groups and flu assessment centres. Between October 1 and December 31 there were approximately 250,000 visits to the main York Region H1N1 web site.

Translating the evolving science to inform the public and health care providers about the vaccine was challenging

The evolving science about H1N1 and implications for vaccine eligibility posed communication challenges. Examples include the justification for the sequencing of seasonal and H1N1 vaccines, the reasons for the adjuvant in the vaccine, the change in the number of doses required for children, and the evolving eligibility criteria for priority groups. The responsibility for providing the science and instructing on vaccine eligibility resided with the Ontario Agency for Health Protection and Promotion and the Ministry of Health and Long-Term Care respectively. Public health units shared in the challenge of interpreting this information for the general public and local health care providers. To facilitate knowledge translation, the Community and Health Services Department liaised with the communications representatives from local school boards and held weekly teleconferences with local health care agencies and primary care physicians.

Survey of York Region residents indicates a high level of satisfaction with the mass immunization clinic experience

The H1N1 Residents Telephone Survey for York Region was administered to 2,000 randomly selected households during the period of March 8 to March 17, 2010. A response rate of 31% was achieved with 500 completed surveys. Statistical results are accurate to within 4.4% 19 times out of 20.

Results indicate that respondent awareness that York Region opened H1N1 immunization clinics was high (92%). Similarly, the large majority (90%) reported it was clear which groups were priority for vaccination, and 73% indicated they had heard or read messages from the Region relating to H1N1.

A total of 338 individuals from the 500 households surveyed attended a York Region H1N1 immunization clinic. More than 90% of respondents who attended an immunization clinic reported they were satisfied with the staff working in the clinic (95%), notices and signage about the clinic (94%), and efficiency of the clinic (93%).

Awareness among respondents about the community flu assessment centres was lower (59%). Only 47 individuals among the 500 responding households reported they attended a community flu assessment centre.

Staff and local partners offer lessons learned and recommendations

The Region conducted debriefings with primary care physicians and local health care partners, Municipal Community Emergency Management Coordinators, Regional staff and members of the Community and Health Services Committee. The objectives were to understand the H1N1 experience, identify successes and lessons learned and receive recommendations to improve planning and response to future emerging infectious disease epidemics. Overall, Regional staff were congratulated on the professional and collegial manner in which they responded to the H1N1 pandemic. Key recommendations include the following:

Vaccine strategy

- Improve the efficiency and responsiveness of the vaccine ordering process.
- Involve primary care physicians in the planning of pandemic vaccine administration.
- The province should use existing seasonal influenza vaccine delivery agents and processes to deliver pandemic vaccine.
- The province should reduce the amount of documentation required from vaccine delivery agents.
- The province should package the vaccine in smaller quantities.

Mass immunization clinics

- Involve municipal staff, facilities staff and Regional staff in advance planning of site selection and consider such sites under the Region's Strategic Accommodation Plan.
- Involve municipal staff, facilities staff and Regional staff in planning related to human resources, security, parking, custodial needs, supplies, disabled access and program disruption.
- Establish clear lines of communication, reporting and decision-making between clinic staff, facility staff, municipal and Regional staff, and, if facilitation is required, municipal and Regional politicians, prior to opening the clinics.
- Select facilities with more space and ensure better space planning to improve crowd control, line management, shelter from inclement weather and wheelchair accessibility.
- Improve strategy to manage the line and handle individuals requiring assistance, and investigate an automated line management system.
- Ensure clarity of messaging regarding local access to vaccine for all Regional residents.
- Routinely rotate all nursing staff through community immunization clinics to refresh clinical skills.

Communication

- The federal, provincial and local public health agencies need to synchronize their messaging, the timing of release of information and how the message is framed.
- Revise local communication strategy to strengthen local media relationships, explain information changes and counter misinformation.
- Develop a policy for the Regional use of social marketing and social media.
- Provide healthcare providers with web-based daily updates including "nothing new."
- Update staff more frequently to explain the rationale for certain decisions and to forecast what to expect next.

Other

- Invest in software and training to facilitate staff scheduling.
- Develop a staff inventory and review human resource policies to facilitate redeployment.
- Update and test emergency response operational manuals based on lessons learned.

5. FINANCIAL IMPLICATIONS

York Region was able to absorb all the H1N1 response costs within its approved cost shared 2009 budget except for an additional $1.3 million contributed by the province.

Regional H1N1 expenditures can be categorized into three areas summarized in Table 5:

- Mass immunization clinics
- Community flu assessment centres
- Other costs

Mass immunization clinic costs include direct costs for Regional staff salaries, overtime, premiums, mileage, program equipment and supplies, contracted services for nursing and clerks, security, and municipal reimbursements for clinic sites.

Community flu assessment centre costs relate to the two sites that were operated by the Public Health Branch and include incremental staffing related costs, contracted nursing and other services, mileage, supplies, equipment, facility rental, utility and renovation costs.

Other costs include:

- Costs associated with one additional community flu assessment centre location that did not become operational.
- Regular salary costs for staff assigned to two operational community flu assessment centres.
- Indirect costs, including departmental and corporate support staffing costs.
- Costs of increased staff hours related to Wave 1 (Spring 2009).
- Costs for increased services required from the Health Connection telephone information line, including extended hours and increased capacity.
- Increased staff costs for the Health Emergency Operations Centre, Communications and Business Support functions.

The Ministry of Health and Long Term Care provided special funding of $10 per immunization dose administered and 100% funding to acquire laptops and printers to support the ministry’s data collection and reporting requirements, totalling $1,337,440.

Table 5
Expenditure and funding for York Region's response to H1N1

	Immunization Clinics	Community Flu Assessment Centres (CFAC)	Other costs incurred	Total
Salary and Benefits	$1,947,320	$ 47,109	$1,752,540	$3,746,969
Services, supplies, equipment	836,712	275,633	164,254	1,276,599
Facilities and Security	571,902	189,984	126,296	888,182
Total expenditures	**$3,355,934**	**$512,726**	**$2,043,090**	**$5,911,750**
Less: Special Funding	($1,337,440)			($1,337,440)
Net Expenditures	**$2,018,494**	**$512,726**	**$2,043,090**	**$4,574,310**
Less: 75 % Provincial cost share	($1,507,339)	($384,425)	($1,532,317)	($3,424,081)
Tax Levy funded	**$511,155**	**$128,301**	**$510,773**	**$1,150,229**

The Public Health Branch managed the net H1N1 expenditures within its 2009 Council approved operating budget, through in-year under expenditures that had developed out of a number of circumstances:

- $2.3 million of regular services were re-directed to manage H1N1.
- The regional hiring freeze in the spring created financial flexibility to absorb costs.
- Programs were managed throughout the first three quarters of 2009 in line with ongoing messages of constraint from the Ministry. The Ministry did not advise the Public Health Branch of their approved funding allocation (exceeding what was requested) until mid September 2009.

The Ministry advised that if public health units were not able to manage the pandemic response activities within their approved funding allocation, additional 100% funding would be available.

6. LOCAL MUNICIPAL IMPACT

Strategic location of immunization clinics at five sites distributed throughout York Region permitted residents to have access to the vaccine. The municipalities that hosted the clinics experienced some cancellation of services and programs with consequential loss of revenue. The host municipalities were reimbursed for costs and/or lost revenues totalling $248,111 plus applicable taxes. Early pre-selection of sites and establishing

agreements with the hosting municipality will facilitate future planning and response to local and regional infectious disease emergencies.

7. CONCLUSION

The 2009 influenza season was exceptional and unusual. Responding to the H1N1 influenza pandemic in accordance with the Ontario and local pandemic plans necessitated sustained coordination with Regional and municipal partners as well as significant mobilization of staff and resources. York Region redeployed three quarters of the Public Health Branch staff complement and 56 other Regional employees, and retained 118 individuals from temporary agencies in order to coordinate local response measures. During the second wave of H1N1, York Region Public Health administered 106,161 doses of the H1N1 influenza vaccine through mass immunization clinics and distributed an additional 549,071 doses of the vaccine to local vaccine delivery agents. The Region also operated two community flu assessment centres, where a combined total of 585 individuals with influenza were assessed. Total gross Regional H1N1 response expenditures were $5,911,750, of which $4,761,521 was provincially funded and $1,150,229 was tax levy funded.

In the end, everyone who wanted and needed the vaccine in York Region had access to it, and results of a survey indicate that most York Region residents were satisfied with their immunization clinic experience. Overall the pandemic was milder than predicted, although three of our residents lost their lives. However, had the pandemic been more severe, the ability of the public health care system to cope may have been greatly challenged.

In order to improve response to future emergencies, York Region conducted debriefings with staff, local partners, and members of the Community and Health Services Committee. Many of the factors that contributed to uncertainty, such as the evolving science, changing provincial directives on vaccine eligibility and fluctuations between vaccine demand and supply are beyond the influence of local health units. The Public Health Branch will continue to work with staff and partners on those aspects of emergency preparedness and response that can be improved locally.

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.