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THE SEVERE ACUTE RESPIRATORY SYNDROME (SARS) OUTBREAK IN YORK REGION

The Health and Emergency Medical Services Committee recommends the adoption of the recommendation contained in the following report, May 13, 2004, from the Commissioner of Health Services:

1. RECOMMENDATION

It is recommended that:
1. This report be received for information purposes.

2. PURPOSE

The purpose of this report is to provide a final update on the 2003 SARS outbreak as it occurred in York Region including a description of the activities undertaken by the Health Services Department, during and subsequent to the outbreak.

3. BACKGROUND

SARS is characterized by fever, malaise, cough, shortness of breath and abnormal chest X-rays and is believed to be caused by a new coronavirus. Prior to 2003, the disease was unknown to health care experts, no tests were available to confirm the presence of the disease, no vaccine existed and health care agencies globally struggled for the perfect case definition and the most effective treatment and containment methods.

According to the most recent data from the World Health Organization (WHO), 8,096 cases of SARS occurred in 29 countries during the 2003 outbreak. These cases resulted in 774 deaths. All but 8 of these deaths were in the most severely affected countries of China (including Hong Kong and Taiwan), Canada, Singapore and Viet Nam.

3.1 York Region Outbreak

SARS was first identified in York Region in mid-March 2003. The transfer of a patient from the Scarborough Hospital – Grace Division to York Central Hospital on March 16 resulted in one of The Region's most significant events during the outbreak—the closure of York Central Hospital (YCH). That patient, whose symptoms were only linked to SARS following transfer to YCH, started the spread of the virus within that hospital. YCH was closed to new patients on March 28 and remained closed for approximately three weeks.

By the end of the outbreak in York Region, two SARS outbreaks (SARS 1, March 15-May 14 and SARS 2, May 23-July 5), and 17 different exposure sites had been identified.

A retirement home, a school, two workplaces, and a retail outlet were either closed and/or had full screening activities conducted on site. Numerous faith-related ceremonies were suspended and others required full investigation. Attachment 1 lists the chronology of events that occurred in York Region during the course of the outbreak.

The outbreak resulted in a total of 88 SARS cases within York Region residents. Characteristics of these cases are discussed in detail in Section 4.1.

3.2 York Region Response to the 2003 Outbreak

York Region was the second largest epicentre in North America during the 2003 SARS outbreak. In collaboration with other Regional Departments, York Region hospitals, police, fire, long term care facilities and many community, health and government agencies, the Health Services Department took the lead in mounting a comprehensive response to the outbreak.

The entire Health Services Department were greatly involved in the outbreak. Activities included, but were not limited to, the following:

- daily conference calls with Region hospitals, the Ministry of Health and Long-Term Care (MOHLTC), long term care facilities, the Community Care Access Centre (CCAC) and emergency responders (fire, police and EMS)
- daily communication and media briefings
- the operation of the Health Services Emergency Operations Centre (EOC)
- expansion of the Health Connection Line
- case management, identification and surveillance of contacts, and epidemiologic reporting
- enforcement of quarantine
- the establishment of the only SARS Assessment Clinic in Ontario managed and operated by a Health Department

The following table illustrates the re-deployment of Health Services Department staff to SARS outbreak activities.

Table 1
Health Services Department Staff Allocated to SARS

Operational Branch	Approved FTE	Total Max FTE Allocated to SARS	
		SARS 1	SARS 2
Public Health	370.2	270.7	128.5
EMS	239.0	30.0	1.0
Long Term Care	244.4	40.4	0
Total	**853.6**	**341.1**	**129.5**

During SARS 1, 270 of the 370 approved FTE for Public Health worked solely in outbreak-related activities. The remaining staff worked on programs deemed to be essential. It should be noted that even these programs were often curtailed in terms of scope during this time period. During SARS 2, approximately 129 FTE from the Public

Health Branch remained dedicated to the SARS outbreak, some up to and including the first week of July. The number of EMS and Long Term Care staff dedicated to the outbreak is also found in Table 1.

A snapshot of the breadth of activities performed by York Region staff is as follows:

- 26,419 calls received by Health Connection; up to 48 dedicated phone lines operating at one point during the outbreak
- over 21,000 contacts (those potentially exposed to SARS) investigated and followed-up
- more than 5,000 individuals quarantined at the height of the outbreak
- 1,153 patients screened and assessed at the SARS Assessment Clinic in a 44 day period (39 SARS cases identified, 27 individuals referred to hospital for more detailed assessment and 195 quarantined)
- 170 epidemiologic reports created and distributed to internal and external audiences over approximately 90 days
- 42 calls made to the Physician's Call Line (April 25 – May 15)
- 23 orders issued under the *Health Promotion and Protection Act*, 20 of which were Section 22 Orders issued to individuals; 2 were Section 13 Orders and 1 was a Section 35 Order
- 30 media releases and 72 communication updates sent
- 4,795 quarantine kits (masks and thermometers) delivered in conjunction with the Canadian Red Cross

Other activities that were conducted and were equally important include: the development of various assessment and screening tools used by Health Connection, the Infectious Diseases Control and Surveillance Groups, the SARS Assessment Clinic and on home visits; the planning, operations and strict infection control practices instituted at the SARS Assessment Clinic; a system for follow-up of quarantined individuals in the community through enforcement utilizing public health inspectors and York Regional Police; a mechanism for all Departments, York Region hospitals and long term care facilities to report up to 3 times daily during the course of the outbreak regarding their quarantined staff and clients; and the development and construction of databases for entry of York Region cases, contact and quarantined individuals. The York Region database was reviewed and subsequently utilized by the MOHLTC in the early stages of the outbreak as a basis for its SARS case forms and database.

One of the most positive outcomes of the outbreak was the establishment of many new partnerships and interdisciplinary, functional teams within the Health Services Department, across Regional Departments and with emergency responders, hospitals and other health, government and community agencies. The collaborative York Regional response included support and efforts of many departments including Human Resources, Finance, Corporate Communications, Community Services and Housing, and individual volunteers. In addition, eight health units assigned staff to assist York Region, and five medical doctors/public health physicians provided onsite medical direction for varying lengths of time. Without these, none of the Department's countless activities would have been realized.

4. ANALYSIS AND OPTIONS

4.1 Characteristics of York Region SARS Cases

In the months following the SARS outbreak, a dedicated team of Epidemiologists, Managers and data entry staff worked together to review and consolidate all data received by the Department to finalize York Region's experience during SARS. This team worked very closely with representatives of the MOHLTC and the other health units that reported SARS cases—primarily Toronto, Durham and Peel Regions—to create what would be known as a finalized provincial SARS database. The purpose of this working group became the accurate reporting of the characteristics of all SARS cases without duplication of cases across jurisdictions. This review is in its final stages and a report on Ontario's SARS cases is expected in late summer 2004.

The review of cases over the past eight months, according to case definition and defined jurisdictional reporting in order to avoid duplication of cases, has resulted in changes to the number of cases previously reported by York Region. It is important to note that, as in any review process following an outbreak, as more information is received and analyzed, changes in the number of cases occur as well as shifts between type of case, category of exposure, etc.

The mean age of those who experienced SARS was 44.1 years with 9 cases age 65 and over. No children age 0-6 had SARS in York Region. The gender mix of those who experienced SARS (for both phases of the outbreak) was 36.4% male and 63.6% female. Of the 60 cases diagnosed during SARS 1, 10 were hospitalized in an Intensive Care Unit (ICU) setting and 5 were intubated at one time during their hospitalization. Of the 28 cases in SARS 2, 6 cases were both hospitalized in an ICU at one point during their stay in hospital and intubated.

Attachment 2 is an epidemiologic curve that demonstrates the date of onset of SARS symptoms in York Region. The onset of symptoms of the first case of SARS in York Region occurred on March 15, 2003. This individual was not confirmed to have SARS symptoms until approximately one week later at which time the case was reported to York Region. The date of onset of the last case of SARS in York Region was June 12, 2003. This was also the latest onset date in Ontario and Canada.

The curve also demonstrates that the largest number of cases (7) had an onset of symptoms on March 30, 2003. Six of these cases were classified as probable cases and one as a suspect case. In York Region, SARS 1 cases had onset of symptom dates spanning from March 15 – April 8, 2003. Although SARS 2 cases were identified after May 23, 2003, the date of onset of symptoms spanned from May 11, 2003 through to June 12.

Attachment 3 shows the number of probable and suspect cases and their type of exposure setting. The greatest number of cases, 41 or 46.4%, were health care employees;

however, none were Regional staff. Twenty–two cases, or 25%, were exposed to SARS within their household setting. This was followed by cases who were exposed in a hospital setting either as a visitor (16 cases) or as a hospital patient (9 cases). There were no cases of SARS in York Region that originated due to a travel exposure.

Sadly, eight York Region residents died from SARS. Four of these individuals were male and four were female. Of these eight residents, five died during SARS 1, while the remaining three died in SARS 2.

4.2 Quarantined Individuals

At the height of the outbreak more than 5,000 York Region residents were quarantined due to their apparent exposure to SARS. Department staff are now focusing their attention on the over 20,000 files related to the outbreak which detail individuals' potential exposure to SARS in an effort to better quantify the number of people who were actually in contact with a SARS case.

Understanding the pattern of spread of the disease can provide significant information to aid in preventive public health measures in the case of a future outbreak. The early identification of index cases in households, the immediate isolation of infected persons, and the quarantine of exposed individuals appear to be essential to disease prevention and control.

4.3 Impact of the SARS Outbreak on the Health Services Department

The SARS outbreak of 2003 will forever change how the Health Services Department, and the entire health care sector, conduct operations.

Examples of some of the "new normal" ways of working include:

- The use of personal protective equipment by Emergency Medical Services (EMS) personnel
- New infectious diseases and infection control protocols
- Testing of a new Integrated Public Health Information System (iPHIS)
- Renewed emergency planning/protocols/systems

In general, many of the goals and objectives outlined in the Health Services Department or Branch Business Plans for 2003 were only partially completed or simply not addressed. It should be noted, however, that this result is more than offset by the significant accomplishments made by management and staff during the response to the outbreak.

4.3.1 Impact on the Emergency Medical Services Branch

The SARS outbreak has had a lasting impact on how EMS paramedics respond to calls and deal with patients and their family members. Not knowing whether the next patient, or family member, could have been exposed to SARS, paramedics were galvanized into protecting themselves, their colleagues and whomever they were in contact with. With other drug resistant infectious diseases emerging, that same type of response is still in place – the approach and assessment of patients is forever changed.

A total of 98 York Region EMS paramedics were quarantined in SARS 1. Twenty-three were quarantined during SARS 2. Many paramedics across the GTA became ill, a number required hospitalization, and a few even required admission to an ICU during the SARS outbreak.

EMS call volumes and response times were significantly affected during the outbreak due to the implementation of directives related to the use of Personal Protective Equipment, delays in transferring patients into hospital emergency rooms due to SARS screening of staff, paramedics and patients, and an amplification of the already present health system issues.

Call volumes are approximately the same for the 1st Quarter 2003 as for the 2nd Quarter. However, the calls received in the 2nd Quarter show a different pattern in the types of calls with a decrease in the number of scheduled transfers and deferrable, non-urgent calls and an increase in emergency coverage redeployment calls. This pattern reverted back substantially after the outbreak.

York Region EMS vehicle 90th Percentile Response Times increased by 27 seconds from the 1st to 2nd Quarter of 2003. Of note is that the 90th Percentile Response times for all vehicles answering calls from neighbouring jurisdictions within York Region also increased by a similar amount during the same time frame.

4.3.2 Impact on the Long Term Care and Seniors Branch

During the SARS outbreak, the Long Term Care and Seniors Branch took on a significant role as the coordinator of information dissemination to the 19 long term facilities in York Region, in conjunction with the Regional Offices of the MOHLTC and other Branches of the Health Services Department. The Branch organized teleconferences following the distribution of new directives from the MOHLTC to ensure that all facilities had not only received the documents and but had a similar understanding of the required changes to operations. In addition, these teleconferences were instrumental in transmitting Public Health related messages to these long term care facilities and the ongoing need for submission of quarantine and case data to the Health Services Department.

The Long Term Care and Seniors Branch experienced a reduction in many of its programs, due to the restrictions placed on movement in and out of long term facilities and in the community during the outbreak. The Branch was required to implement stringent screening protocols for staff members, to restrict patient transfers in and out of its two facilities, suspend out-patient programming and curtail visitor and volunteer entry into the facility.

All Respite programs showed significant decreases in the 2nd Quarter 2003 which then resulted in decreases for the entire year (of 6–21%) when compared to the 2002 values.

Other programs experienced decreases from 2002, including the Community Outreach Programs (Lunch-out Program -40%), and the Day Centre Outreach Programs (Cognitive Disorders Program -2% and the Acquired Brain Injury Programs -12%).

However, due to the diligent efforts by staff, most programs and the delivery of care services continued as per the previous year. A few areas showed increases in activity.

It is interesting to note that although volunteers were severely restricted during the 2nd Quarter, and the number of hours provided to assist residents was almost halved, by Year End 2003, total volunteer activity showed a 15% increase over 2002.

4.3.3 Impact on the Public Health Branch

The SARS Outbreak had a profound impact on the operations of the Public Health Branch. As mentioned earlier, approximately 270 FTE of 370 FTE associated with the Branch were re-deployed to SARS-related activities during the outbreak. Only the most essential of services, such as follow-up screening for high risk newborns and their families were carried out by the remaining staff.

Programs that were deemed to be non-essential during the time of the emergency were suspended during the outbreak. These programs subsequently show a decrease in volume of activity from 2002.

The suspension of activities had a significant effect on pre-natal programs, all clinic programs (including dental and sexual health clinics) and on any type of educational or screening program, including those delivered through schools and workplaces. Inspection programs such as pool safety, playgrounds and restaurant inspections were conducted for all call-ins or complaints. However, regularly scheduled inspections were affected.

Despite increased activity and major efforts by staff in these areas in the 3rd and 4th Quarters, specifically in the Health Inspection areas, the 2002 activity levels could not be reached. For example, despite the performance of 3,408 high risk food safety inspections in the 3rd and 4th Quarters of 2003, a 14% decrease in activity was realized from the previous year. The same scenario holds true for other inspection programs and dental screening programs.

There were also certain programs that saw a significant increase in activity over 2002 as they were areas that ran continuously during the outbreak. Health Connection ran extended hours seven days per week during the outbreak. Staff were redeployed from other programs to assist with this function and received 43% of its annual call volume during the outbreak.

The Infectious Diseases and Epidemiology activities, such as contact tracing and follow-up, case follow-up, data analysis and reporting, are other areas which required an influx of staff during the outbreak. These activities are mentioned in Section 3.2 of this report. Case management, contact surveillance, the analysis of assessment and screening

forms, and daily reporting had a profound effect on the Infectious Diseases Control and Epidemiology staff at York Region. Not staffed sufficiently to manage the volume of the surveillance and data to be dealt with, aggressive recruitment occurred from health units, District Health Councils and agencies. Over 15 Epidemiologists from across Ontario, as well as countless temporary data entry staff and surveillance staff were recruited in a large-scale Human Resources Department drive.

4.4 Activities Undertaken Subsequent to the SARS Outbreak

4.4.1 York Region Activities

Over the eight months following the SARS outbreak (July 2003 to February 2004), members of the Health Services Department have been involved in a variety of activities to finalize the impact of the outbreak on York Region; assist in provincial and federal activities related to the outbreak; participate in panel discussions, working groups, presentations, conferences and emergency planning.

Lessons learned and recommendations articulated to these panels and working groups include, but are not limited to: recommendations regarding infection control resources required in order to effectively implement Infection Control Resource Groups/Networks within each health unit; the requirement for improved communication systems from the province to health care agencies; the need for integrated provincial data systems; concerns regarding data quality and ownership; the successes and shortcomings of technology; the need for new directives to be disseminated with changes to previous versions highlighted; the overwhelming need for increased and experienced health human resources; and the requirement for a new, sustainable funding model for public health.

Internally, staff have been involved in a number of de-briefing experiences. Feedback compiled from staff and management de-briefing sessions and results from a questionnaire issued to staff following the SARS outbreak have provided invaluable information regarding the status of resources, level of preparedness, need for system changes, and requirements for the next emergency or outbreak event.

Staff have also been involved in a number of emergency planning activities with Regional hospitals, as part of MOHLTC sponsored committees, and within The Regional Municipality of York and the various Branches and Divisions of the Health Services Department.

The Health Services Department has also initiated a Municipal Communications Group. Invitations were extended to communications representatives from the nine area municipalities as well as representatives from the York Region hospitals, York Regional Police, and both Region school boards. The goal of the group is to formulate processes that will provide essential health information to all community partners in a cohesive and timely manner. A representative from York Region Corporate Communications Services also attends these meetings and acts as a liaison between the group and Corporate Communications Services.

4.4.2 Associated SARS Research Studies

In addition to the activities mentioned above, three research studies have been explored and are in various stages of completion. They include a Health Canada funded SARS Household Transmission Study, a Health Canada funded Quarantine Study and an international study proposed by the Centres for Disease Control (CDC) in Atlanta in conjunction with Harvard University.

4.5 Relationship to Vision 2026

The comprehensive response to the SARS outbreak by York Region Health Services staff supports The Region's Vision 2026 goal of Responding to the Needs of York Region Residents. In addition, the translation and wide distribution of SARS-related materials in other languages contributes to the goal of Sustaining Quality Communities for a Diverse Population.

5. FINANCIAL IMPLICATIONS

In spring 2003, the MOHLTC committed to 100% funding for all eligible expenses incurred in responding to the SARS outbreak. Eligible expenses included the hiring/contracting of additional staff; staff overtime; additional materials, supplies and equipment; as well as expenses related to the operation of the York Region SARS Assessment Clinic. Table 2 outlines the costs incurred by the Health Services Department as a result of the SARS outbreak.

Table 2
2003 SARS Expenditures

Branch	Claims Submitted to MOHLTC	Claims Approved by MOHLTC	Shortfall
Public Health	$2,905,674	$2,886,054	$19,620
Long Term Care	317,817	316,712	1,105
EMS	790,510	790,510	0
Totals	$4,014,001	$3,993,276	$20,725

It should be noted that the Public Health expenses that were identified as ineligible by the MOHLTC will be cost shared through the 50/50 program areas.

6. LOCAL MUNICIPAL IMPACT

Many York Region residents were impacted by the 2003 SARS outbreak in York Region. Through ongoing investigation and activities, it is anticipated that a better understanding of the transmission of SARS and the management of this type of emerging infectious disease outbreak will help officials understand the public health measures that protect individuals from becoming ill if exposed to SARS. Emergency planning activities, the

results of the various studies, and recommendations from federal and provincial SARS-related inquires will impact what type of measures will be used during future outbreaks to protect and safeguard York Region residents.

7. CONCLUSION

In conclusion, the SARS outbreak had a significant impact on York Region. The result has been that many lessons have been learned, not only by the Health Services Department, but by the entire health care and public safety sectors.

As discussed during the report, the efforts mounted to respond to the outbreak dramatically affected the delivery of mandated Health Services programs and services. Volumes and types of activities performed in 2003 were both affected. This was inevitable given the widespread reach of the outbreak.

All Regional staff involved in the response to the SARS outbreak and all York Region partners are to be commended for their extensive, comprehensive efforts and activities.

While it is clear that we need to be vigilant in our planning and response at the local level, it is clearer that we require sufficient resources, surge capacity and integrated systems in order to mount this type of response within The Region in the future.

A number of activities have been undertaken by all levels of government and the health and public safety sectors since the containment of the outbreak in Canada. Several reports calling for widespread change have been released and follow-up announcements are still pending.

The Senior Management Group has reviewed this report.

(A copy of the attachments referred to in the foregoing were forwarded to each Member of Council with the June 3, 2004 Health and Emergency Medical Services Committee agenda and a copy thereof is on file in the Regional Clerk's Office)