

THE SARS EPIDEMIC IN CANADA

Excerpted from: *No Need to Panic: Public Resilience in CBRN Events*

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"Let me be clear: It's safe to live in Toronto and it's safe to visit."

—Mayor Mel Lastman

Salient Points

- The absence of a coherent pandemic plan limited Ontario's ability to manage the SARS outbreak.
- Preparation by the healthcare community in British Columbia minimized the impact of the outbreak not only on the victims but also on the community at large.
- Lack of effective communication severely hampered Toronto's ability to control infection.

In November 2002, Guangdong Province in China experienced a fast moving and highly contagious respiratory disease outbreak. By February 2003, this respiratory disease that had first emerged in China was given the name Severe Acute Respiratory Syndrome (SARS) by a World Health Organization (WHO) epidemiologist in Vietnam.¹ SARS "is a viral respiratory illness caused by a corona virus, called SARS-associated corona virus (SARS-CoV)."² It is similar to pneumonia with symptoms, such as a high fever, dry cough, and shortness of breath or breathing problems,³ with a mortality rate of around 15 percent. In individuals over the age of 65, those with chronic illnesses or individuals who seek treatment late in the course of the illness the mortality rate is 50 percent or higher. Transmission can occur through contact with infected persons "droplets of respiratory secretions created while coughing or sneezing as well as in their

¹ Judith A. Johnson, "Severe Acute Respiratory Syndrome (SARS): Public Health Situation and U.S. Response," *Congressional Research Service Report for Congress* (RL31937), (May 23, 2003, available from http://opencrs.cdt.org/rpts/RL31937_20030523.Pdf, (Nov. 18, 2003).

² Centers for Disease Control and Prevention, *Basic Information about SARS*, <http://www.cdc.gov/ncidod/sars/factsheet.htm>, (Nov. 19, 2003).

³ The University of Toronto Joint Centre for Bioethics, *Ethics and SARS: Learning Lessons from the Toronto Experience*, www.yorku.ca/igreene/sars.html, (Oct. 10, 2007).

stool and urine."⁴ By May 2003, there were an estimated 7,183 cases of SARS worldwide and 514 reported deaths.⁵

The Start of an Epidemic

The initial outbreak of SARS started in rural areas of Guangdong province in November 2002, but was not officially recognized by the Chinese government until February 2003. On Feb. 1, 2003, an ambulance driver in Guangzhou transported a desperately ill patient from the Second Affiliated Hospital to the Third Affiliated Hospital. He was alerted the patient was ill with an extremely contagious respiratory illness. While in contact with the patient, he used all necessary precaution, including triple layer surgical mask and gloves. After transporting the patient, he cleaned and disinfected the ambulance. Three days later, the ambulance driver fell ill. He was hospitalized for observation, but no extraordinary precautions were taken. While in the hospital his wife cared for his daily needs without any protective equipment. His condition continued to decline and on February 21 he died. As he became ill, a similar respiratory disease infected other healthcare workers. This ambulance driver is thought to be the first of more than 1,700 healthcare workers to die of SARS. By June 2003, 32 countries reported cases of SARS with more than 8,000 people infected.⁶

The SARS outbreak in Canada offers a rare opportunity to examine the reaction of a country to a potential pandemic from two different perspectives. The SARS epidemic was located mainly in two provinces: British Columbia and Ontario. The differences in how these cases were handled within these provinces help to explain why Toronto came to be seen as the focal point of SARS, while cases in British Columbia were largely unnoticed by the rest of world.

⁴ Judith Johnson, (2003).

⁵ The World Health Organization, *Cumulative Number of Reported Probable Cases of Severe Acute Respiratory Syndrome (SARS)*, (May 9, 2003), http://www.who.int/csr/sars/country/2003_05_09/en/print.html, (Nov. 19, 2003).

⁶ T. Abraham, *Twenty-First Century Plague: The Story of SARS*, Baltimore, Md.: The John's Hopkins University Press, (2005).

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British Columbia

On March 7, 2003, a man and his wife returned home to Vancouver from a trip to Asia. While in Hong Kong they stayed on the ninth floor of the Metropole hotel along with a woman from Toronto and a doctor from Guangdong province. During the third week of February, a number of people on the ninth floor of the Metropole would become ill with SARS through contact with the doctor from Guangdong. Soon after the Vancouver couple's return home, the man was taken to Vancouver General by ambulance following a visit to his physician. Prior to his arrival, the emergency room was alerted to his condition and his wife was isolated upon arrival at the hospital. While at Vancouver General, there was no transmission of SARS to any hospital employee or patient.

Vancouver General in Vancouver, British Columbia is the largest hospital in the province and is a major research and teaching institution. They practice vigorous infection control and have a strong culture of worker safety by taking a precautionary approach. This included the use of N95 respirators. At the time of the SARS outbreak, this was a novel approach in hospital management, but has gained credibility since 2003. When patients presented with an undiagnosed respiratory illness the healthcare staff at Vancouver General started with the highest level of protection and then scaled back as more information became available. Shortly before SARS was gaining strength in Asia, the emergency department of the hospital had undergone an infection control audit. This audit reinforced many of the practices that were standard procedure and made the department attuned to the precautionary approach of the hospital. This type of audit had been happening at Vancouver General for eight years prior to SARS. Vancouver General was only a small piece of a larger system. British Columbia had just released their pandemic plan in response to fears of Avian Influenza. Health officials also had a system of distributing health alerts to healthcare facilities throughout the province. In February 2003, health officials thoroughly monitored the situation in China. Alerts were sent to healthcare facilities in late February. Emergency room doctors at Vancouver General actively looked for unexplained fevers and respiratory infections in patients who had traveled to Asia during this time. When the patient who had been in China presented to the emergency room, the staff was aware of his travel history and was able to take precautions. "Two and a half hours after arriving at Vancouver General the patient was isolated, examined by specialists, treated by health

workers wearing full respiratory protections and moved into a negative-pressure isolation room."⁷ By April 2, 2003, the Workers Compensation Board, the labor department for British Columbia, performed systematic inspections of healthcare facilities.

Through all the precautions exercised by the medical staff in Vancouver, coupled with the coherent pandemic plan and clear communication between government officials and hospital staff only 46 people were infected, and no SARS deaths were reported in British Columbia. The results of this preparation highlighted how effective planning for communicable disease outbreaks can not only minimize the loss of life as a result of the disease, but also dramatically reduce the impact of the outbreak on the larger community.

Ontario

In contrast to the example of British Columbia, Ontario struggled through the outbreak with a number of fatalities, of which, several were in the healthcare community. In late February 2003, a 78-year-old resident of Ontario returned from a trip to Hong Kong. She had unknowingly been exposed to SARS by the doctor from Guangdong Province who was on the ninth floor of the Metropole hotel. Shortly after her return home she died of what at the time was reported as heart failure. On March 7, 2003, two days after her death, her son went to Scarborough-Grace Hospital emergency room complaining of a respiratory infection, only hours after the patient had been admitted to the hospital in Vancouver. The Ontario patient had been his mother's primary caregiver during her illness and had prolonged contact with her as well as his family during that time. He first went to his primary care physician who prescribed antibiotics and sent him home. When the medication failed to help he presented at the emergency room. He waited for more than 16 hours during which he is believed to have infected two other patients at the hospital. This is thought to be the start of the transmission chain in Toronto. From the time his mother landed in Ontario and his death there were a number of contacts with the community. Her physician, her son's physician and his medical practice, their large extended family,

⁷ Commission to Investigate the Introduction and Spread of SARS in Ontario, *Volume Two: Spring of Fear*, (2003), p. 257, On-line, Internet, 18 November 2007, available from <http://www.sarscommission.ca/index.html>.

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and the numerous people he encountered in the hospital were contacts he had days before he was quarantined. In the end, 44 died and 330 were infected with SARS.⁸ More than half of those infected were healthcare workers, three of which succumbed to their infections.⁹

Unlike British Columbia, Ontario had no comprehensive pandemic plan. Further, no system of communication existed between government health officials and the healthcare community. If health alerts had been generated by the provincial government it is unlikely the alerts would have been effectively communicated. Another problem the province faced was a lack of education or misunderstanding regarding laws and regulations. For example, provincial law in British Columbia specifically states all respirators used by hospitals must first be tested and approved by government labs before use. Hospital workers therefore knew exactly what equipment should be used when confronted with suspect respiratory illnesses. In contrast, Ontario uses less specific wording regarding the use of regulators. The lack of specificity left both the healthcare facilities and workers confused regarding the appropriate equipment. When the Vancouver patient was intubated the dangers of this procedure were understood by the doctors and staff at Vancouver General. Even though this practice was extremely hazardous to the staff due to the risk of infection, no one at Vancouver General suffered ill effects. It was a different story at Scarborough Grace. Four workers were infected on March 17 after an intubation and later on March 24, an anesthetist, a medical resident and a nurse were infected by a patient they intubated in Toronto. One of the main reasons SARS spread quickly through the province was the lack of clear government control over hospital inspections to ensure compliance with safety standards.

While the provincial government in British Columbia was well-organized for a pandemic with a thoroughly practiced plan, a communication system, and inspections of healthcare facilities, Toronto had no coherent plan or system. The Ontario Ministry of Labour was officially in charge of public health, but throughout the 1990s had lost much of its resources to cost cutting measures. This left the office unprepared for a public health crisis like SARS. In 1992, the Ministry had 19 physicians on staff, but by 1996 only three remained. Further, there were no lab

or air sampling technicians and all of the occupational health and safety nurses had been laid off. Most importantly, inspectors had no real training for issues surrounding infectious disease and had never participated in an inspection of a healthcare institution specifically regarding an infectious disease before the SARS outbreak.

It is not surprising therefore that while provincial government inspectors in British Columbia made systematic inspections in early April, Ontario officials did not start the practice until June. It was in May the Ministry of Labour realized healthcare workers inadequately protected. One reason for the delay in inspections was fear for the safety of the inspectors. The Worker's Compensation Board in British Columbia had developed internal systems for protecting inspectors. In Ontario, the Ministry of Labour took a backseat to the Ministry of Health. "The Ministry of Labour was largely sidelined during the outbreak. It was not given a primary role at the Provincial Operations Centre, and it was not seen as having a central responsibility in protecting healthcare workers."¹⁰

Ontario lacked any comprehensive method for recognizing and dealing with a potential pandemic. There was also little communication from provincial health officials. Isolation was delayed by many days as Scarborough Grace stayed open to new patients. Patients with compromised immune systems who had been exposed to Mr. Kwan were transferred to other hospitals throughout the province. In addition to procedural problems, the health workers suffered great losses during this time.

Many of the nurses and doctors had never learned how to properly use N95 respirators or other protective equipment. Due to the lack of precaution and not properly isolating workers from potentially contagious patients a number of nurses and doctors became ill, and three died. This was both a physical and psychological drain to the medical community. Nurses complained to superiors, but much of what they said was disregarded or not acted upon. Those who became ill were eventually quarantined, but not until the disease was able to move through several hospitals. Those who remained on the job faced enormous pressure at home and at work. Fewer health workers meant longer hours for those still on the job, which took a physical and mental toll. In addition, those workers with family felt enormous

⁸ Ibid.

⁹ Ibid.

¹⁰ Commission to Investigate the Introduction and Spread of SARS in Ontario, vol. 2, (2003).

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pressure to either not return to work or quit for fear they might bring the infection home. Even in the workplace, those individuals who dealt with SARS patients were often shunned by co-workers. Some doctors even refused to treat people who were or may have been infected with SARS. Doctors from the United States were asked by Canadian colleagues to come and help relieve some of the burden.¹¹

Public Response

SARS had a significant psychological and economic impact on the people of Toronto. For the limited spread and lethality of the disease there was considerable anxiety among the population. To a lesser extent it had an impact on people in other provinces and in the United States. One finding suggests the attempts to educate the public through the media were mixed. Positive results of the media campaign included more frequent hand washing, especially among Ontario residents, and being fairly knowledgeable about the disease. This knowledge included the contagious nature of the illness, generally how it spreads and that there is no vaccination. One negative aspect included people in areas unaffected by the outbreak taking unnecessary precautions. A survey conducted in April of 2003 demonstrated 35 percent of adults in the United States were concerned they or their family members may have been exposed to SARS.¹² This is close to the number concerned about terrorist attacks, which was around 42 percent of surveyed adults in the United States. The United States had a handful of isolated infections as a result of the individual returning from a country highly affected by the disease but no deaths were reported as a result of SARS. The level of fear was not proportionate to the actual danger of contracting the illness. Ideally, in future incidents fewer people in unaffected areas would demonstrate fear responses to such an outbreak. The authors of the study suggest this problem may be rectified by the clinicians and public health officials who provide the public with information. In the future, public health officials and

¹¹ L.K. Altman, "The Doctor's World: Behind the Mask, The Fear of SARS," *New York Times*, (June 24, 2003).

¹² R.J. Blendon, J.M. Benson, C.M. DesRoches, E. Raleigh, K. Taylor-Clark, "The Public's Response to Severe Acute Respiratory Syndrome in Toronto and the United States," *Clinical Infectious Diseases*, (2004), p. 38; pp. 925-931.

clinicians would work closely to communicate more effectively. A final finding suggests that media coverage is both positive and negative because it informs individuals in the area of concern, but it also can create fear in people far removed from the incident.¹³

Healthcare Worker's Reaction

During a health crisis the healthcare workers are a vital resource. In Ontario during the SARS outbreak, the healthcare community was hit hard by the disease with health workers the main victims. Nearly 130 nurses, physicians, respiratory therapists and other health workers became sick. As previously discussed, this left a large burden, both physical and psychological, on those who remained at work. "Nurses lived daily with the fear that they would die or infect their families with a fatal disease."¹⁴ One nurse was asked by her 9-year-old daughter if she was going to die. Almost two thirds of those workers surveyed felt their health and safety had been compromised during the outbreak. Some felt torn between continuing to work and quitting because of their families fear of infection. Some workers quit or refused to care for SARS patients; one radiologist locked himself in his office and would only review x-rays if they were slipped under the door. Physicians who worked with SARS patients were stigmatized by other doctors in the hospital. They would move to the other side of the room from a colleague who cared for SARS patients.¹⁵ Dr. Perl, a doctor from the United States, told of her experience helping at Scarborough Grace during the epidemic. After her departure, her children's babysitter in the states quit. Later Dr. Perl was told by the teen's father that they were endangering his daughter by exposing her to SARS. While in Toronto, Dr. Perl did not tell anyone at her hotel why she was in Canada for fear of being ostracized.¹⁶

The Registered Nurses Association of Ontario surveyed healthcare workers after SARS to determine the psychological impact of the disease outbreak. A key finding in this report was that two-thirds of

¹³ Ibid.

¹⁴ Commission to Investigate the Introduction and Spread of SARS in Ontario, *Volume One: Spring of Fear*, (2003), p. 1, <http://www.sarscommission.ca/index.html>, (Nov. 18, 2007).

¹⁵ L.K. Altman, *New York Times*.

¹⁶ Ibid.

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respondents had a change of attitude toward the nursing profession because of SARS. Those at SARS infected hospitals felt the effect more than those at non-SARS affected hospitals. Eighteen percent of respondents from North York General Hospital and 24 percent from Scarborough Grace Hospital reported feeling SARS symptoms during or after the SARS crisis.¹⁷ In contrast, 7.6 percent of total respondents reported the same experience. Nurses reported their family lives were impacted by anxiety, isolation, stress, depression and loved ones fearing for the caregiver's health. Those nurses surveyed from North York and Scarborough Grace reported suffering from post traumatic stress at a rate of 57 percent and 47 percent respectively. This finding is not surprising when nurses recount being shunned by neighbors and separated from colleagues while at work. One nurse described her experience of her neighbors refusing to leave their house if she was in her backyard. At work, "nurses were directed to sit two seats apart in the cafeteria in an area separated from non-clinical staff, and security staff was present to monitor compliance with this directive."¹⁸ Of those nurses surveyed, 15 percent declined to work because of the SARS crisis, five percent refused to work and 34 percent considered refusing to work. As discussed earlier, there was much confusion on how to properly wear protective equipment and exactly which gear was required. This fact is supported by the results of the nurses' survey. Fifty-three percent of respondents felt confusion regarding which mask would provide adequate protection and only five percent were trained in the proper use and fit tested for respirators. Nurses reported problems trying to control infection because of the shortage of personnel. The lack of training with safety equipment and too few nurses created stress and frustration. The situation was exacerbated as personnel were put into quarantine or became sick.¹⁹ Twenty-nine percent of respondents were quarantined either at home or on the job. Of those who were quarantined during the outbreak, 57 percent were quarantined for 10 days or more.

Another critical issue does not directly deal with the healthcare worker, but their patients. During the SARS outbreak, many facilities were closed and procedures unrelated to SARS were postponed for

¹⁷ Registered Nurses Association of Ontario (Sept. 29, 2003). *SARS unmasked*, http://www.sarscommission.ca/hearings/01Mon.pdf/Mon_10_45_RNAO.pdf, p. 17.

¹⁸ Ibid.

¹⁹ Ibid., 19.

fear of spreading the infection to people with already compromised immune systems. Both necessary and elective surgeries were cancelled due to a fear of contamination. Treatments for many illnesses, such as cancer, were postponed or cancelled. Those who died because they could not receive treatment on time or have a surgery vital to survival are not calculated in the deaths related to SARS. Those critically ill patients admitted to the hospital oftentimes were not allowed visitors, causing undue stress on them and their families. Often nurses were the only people patients saw for weeks at a time. In addition, the nurses wore full protective equipment at these meetings which hampered communication, especially with the elderly. It also increased the patient's sense of isolation. They were not touched without gloved hands and would spend hours alone in between checks by hospital staff.²⁰

The Travel Advisory

The World Health Organization issued a travel advisory for the Toronto area on April 23, 2003, advising travelers to avoid this area. This announcement angered Toronto which felt unduly punished for an illness thought, at the time, to be on the run. The SARS Commission estimates the travel advisory led to an estimated \$950 million loss, and \$570 million of that total was in tourism and travel dollars. In Canada, only 44 people succumbed to the disease and most deaths occurred in the elderly or chronically ill individuals. These facts did little to assuage the public's fear of SARS, especially when faced with headlines such as, "SARS death toll rises; health officials quarantined."²¹ The article describes how some public health officials working to contain the disease had gone into quarantine. Overall economic impact of the SARS outbreak was estimated to be \$1.5 billion, with two thirds of that impact in the Toronto area, and the remainder spread throughout the country. The study noted no other single area experienced a significant enough economic impact to be measured in the study.²²

²⁰ Ibid.

²¹ C. Abraham, "SARS Death Toll Rises; Health Officials Quarantined," *The Globe and Mail*, (April 2, 2003).

²² Paul M. Darby, "The Economic Impact of SARS," The Conference Board of Canada, (2003), <http://www.dfait-maeci.gc.ca/mexico-city/economic/may/sarsbrief/May03.pdf>.

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Implications for Resilience

Lessons Learned

It is clear the Vancouver area hospitals weathered SARS more effectively than Toronto. There are three main differences between the reactions of the healthcare facilities in both regions.

1. Disease surveillance. Province health officials in British Columbia were aware of the mysterious illness moving through China early in February and monitored the situation for new developments. In Ontario few people seemed to be aware of what happened in China and were not on alert for any suspect illnesses.
2. Communication. British Columbia was both aware of what was happening in Asia, and that information was also effectively communicated throughout the healthcare system. Physicians throughout the province were actively looking for individuals with suspect respiratory illnesses. This allowed Mr. C's physician to act quickly to get his patient isolated in a facility equipped to deal with infectious diseases. Likewise, Vancouver General had specialists available to assist in handling him safely. In addition, Vancouver General also had effective organizational communication. Information flowed both up and down the chain of command. The duties of the staff were well known and left little room for confusion. This was not the case at Scarborough Grace where many of the nurses were confused on which protective equipment was appropriate and in which circumstances it was warranted. Further, Ontario did not have the benefit of an established system of electronic bulletins to facilitate communication between government health officials and healthcare facilities.
3. Preparedness. Just prior to the outbreak of SARS, British Columbia had developed a pandemic plan that represented a clear plan of action in the case of an infectious disease outbreak. Coupled with this was the overall focus on worker safety and infection control at Vancouver General. Worker safety was well ingrained in the hospital staff and was practiced regularly. In Toronto, worker safety and infection control were not as rigorously practiced.

The primary difference between the government's response in British Columbia and Ontario was preparedness. Just prior to the outbreak of SARS, British Columbia had developed a pandemic plan that had been transmitted, operationalized and practiced throughout the provincial healthcare system. The preparedness of the healthcare sector in British Columbia minimized the impact of the outbreak not only on the victims but also on the community at large. The differences in management and overall impact of disease outbreaks in Ontario and British Columbia highlight the critical role planning and preparedness within healthcare systems can have not only on preventing loss of life but also on the social and economic health of the greater community. Despite the poor management of the crisis in Toronto there was no evidence of panic, but many citizens in Toronto and other areas of Canada reacted reasonably and calmly in an attempt to prevent infection. Fortunately, there appears to have been little stigma attached to the city as a result of the outbreak as the Toronto tourism board reported by 2004 tourism has returned to pre-outbreak levels and visits continued to increase in 2005. This shows the willingness of tourists to accept announcements that locations impacted by such events are again safe, and over time resume their normal behavior.