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A PERSPECTIVE ON SOME RISK MANAGEMENT LESSONS FROM A SARS OUTBREAK

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Abstract
Toronto Canada suffered an outbreak of SARS that in spite of being controlled (restricted to the health care system) resulted in a number of deaths, thousands quarantined, court actions to secure quarantines, substantial dislocation of the health care system, economic loss and community concerns. During the SARS crisis some situations and practices were observed even by some risk specialists outside the public health system. At the request of the TIEMS 2003 conference program chairman, the author provides these personal observations.

Disclaimer
The author is not a public health professional nor is he involved with any aspects of the public health system. He does have experience in risk assessment, and as a planner is professionally interested in public participation and response. The observations reported here are based on observation of pubic briefings given by the SARS senior management team, media reports, and observations of public response and comments. Individuals interested in details regarding the Toronto SARS experience should consult the reports of appropriate public health professionals.

Introduction
An aged woman and her family had been visiting relatives in China. They returned to Toronto with several members of the family experiencing an acute respiratory infection with nausea and fever. *When they presented to a hospital, SARS was not yet known in the world community*. The World Health Organization (WHO) had not yet issued any alerts regarding SARS. The elderly woman was in acute distress and her daughter and other family members were very ill as well. Because of acute respiratory distress, the patients had to be ventilated. This is a process that often causes an individual to choke and spit – in this case contaminating the treatment room and health care workers. This elderly Chinese woman was the index case for what turned out to be a significant SARS cluster.

The patients were ventilated and one was transferred to an acute care hospital *before any warnings had come from the WHO*. This led to the infection of some other patients in the intensive care units and health care professionals. So *SARS was already established in 2 Toronto hospitals before the WHO alert was received*. It is a testimonial to the efficiency of dedicated staff that within only a few hours of having received the WHO SARS alert all effected areas were informed, two hospitals were secured to all patients and visitors and public health staff were contacting individuals about quarantine.

Because of the very infectious nature of SARS, it spread through the health care workers and some of the patients in the hospitals – but primarily the intensive care and SARS units. Due to rapid steps to quarantine hospitals and individuals who might have been in contact with the patients and/or health care workers, the Toronto SARS outbreak remained confined mainly to

the two hospitals. It turned out to be primarily a health care worker epidemic. Of course it took weeks for SARS to work its way through the expected series of infections of various individuals, and although it has largely been contained, it is anticipated that from time to time some SARS cases may yet develop – either from lingering problems related to original clusters in the effected hospitals or from a new case imported from abroad.

During the period of well over a month while the SARS outbreak was contained to the hospitals and eventually managed, two hospitals were unable to take new patients. As a wise precaution, all Ontario hospitals instituted very tight screening of all individuals coming and going. Visitors were restricted or prohibited. In other Toronto hospitals all elective procedures and in-hospital doctor office visits were curtailed; for example, not only were out patient services closed but cardiac clinics, and doctors who had their offices in hospitals were unable to see patients.

At this point I will leave it to other sources to provide information on detailed sequence of the SARS epidemic in Toronto. I now turn to identifying a few observations that occur to me regarding managing at least part of the SARS epidemic risk.

Dealing with Risks in Communications and Practices

Key objectives of managing risks in the outbreak of a major infectious disease are many; here I will deal briefly with the following three areas: 1. Steps to reduce the risk of the public becoming disease communication vector – i.e., keep it out of the community; 2. Steps to minimize the risk that valid health care workers might become a transmission vector; 3. Steps to reduce the risk of limiting general health care available to the community.

Managing the Risk to Contain an Existing Outbreak

Communication about the Quarantine must not introduce risk

To ensure that members of the public do not become a vector requires their 100% cooperation in honoring quarantine. The public health authorities decided to quarantine for 10 full days all individuals that might have been directly of even indirectly in contact with a probable or suspect SARS case. This included any individuals who had happened to visit any part of the effected hospitals. This made good sense – but now a lesson to learn about communication.

The authorities have the ability, in law, to obtain various levels of court order to force an individual into quarantine. The preference is not to have to obtain a court order against each of thousands of individuals. The chosen approach was simply to tell people to go into quarantine (in which they were check by public health staff twice a day). Unfortunately, this was referred to by public health workers and the media as "voluntary quarantine". (I.e., it was only voluntary in the sense that a court order had not been obtained. It was not intended to be voluntary for the individual because the public health authorities intended to get an order if required.) However, the media and some members of the senior SARS management team regularly used the term "voluntary quarantine" even weeks into the SARS crisis.

This was a very confusing term to citizens. It was possible for them to look at the "voluntary" part and think they could decide whether or not to comply. **Lesson:** *be very clear*. If it is a quarantine say it is a quarantine – leave the fine points to the lawyers. Here is an example of the importance of doing a risk analysis of the terms used and information given to the media to ensure that there are not any unwanted interpretations. (The quarantine by the way was well over 99% effective. This was seen as very important to block the transfer into the community.)

Ensure that health care professionals do not introduce risk
In one instance a physician who was in a group that possibly had been exposed to SARS and who had been asked to go into voluntary quarantine, went to the funeral home to pay his respects to a deceased SARS victim and family. This resulted in several hundred extra individuals being quarantined. Apparently, the physician was of the view that he could self assess his health. Anecdotal comments received by this author indicate that often health care workers have a lower estimation of their personal risk than does the general public. Sensible risk management would suggest that public health authorities should make extra effort to provide very good and clearly informative briefings to all health care professionals so that they do not take personal decisions that increase risk.

Ensure that the media information does not introduce risk
For much of the period of the SARS outbreak, there was discussion by some "consultant" epidemiologists contacted by the media that SARS morbidity was not necessarily as bad as influenza (SARS morbidity was initially reported at around 5% of cases.) This led some of the public to wonder what the big deal was all about. This could increase the risk that individuals would not comply with a quarantine order. What was not adequately discussed was the apparently virile transmission that made SARS very highly contagious. In other words, an exposure to SARS yielded a very high probability of infection – at a much higher rate than influenza. A statistician understands that the combination of a very high probability of infection when exposed times even a small morbidity proportion can still yield a large number of deaths. A risk communication **lesson learned** is to clearly communicate the *net* morbidity values so that people understand the seriousness of exposure.

Managing the Risks that Could Assist Transmission
Reduce risk in patient transfers
It is common practice to have a hierarchy of hospitals where some are designated acute care centres. Of course this leads to patient transfer of serious cases. It is clear in the index case, this led to transmission of SARS from one hospital to another. This indicates that in-depth risk assessment needs to be competed regarding this practice. Perhaps the assessment can identify improved protocols that will reduce transmission risks when patients are transferred.

Reduce the interchange of staff
Apparently there are many health care workers that regularly work in several hospitals – being part time in each one. Clearly this raises the possibility of one of these workers becoming a vector from one hospital to another. This suggests that there should be a risk analysis completed regarding the employment patterns of health care workers. Of course this would also apply to physicians and specialists. Perhaps better tracking and improved protocols might reduce some of these risks.

Managing Risks to General Health Care Services
The impact of closing two hospitals and severely restricting services at others had a profound effect on the general level of health care received by the public.

Examine the risk of having doctor's offices and clinics in hospitals
Patients were denied access and treatment for over a month. The risks of having doctors maintain offices in hospitals rather than outside in separate facilities should be examined. The same is true for clinics and labs that are now located in hospitals.

What is the risk of continuing partial hospital services in a crisis?
Can risks be well enough understood and managed to allow a reliable "fire wall" built that would allow out patient and other hospital services to be maintained even if there was an acute care area under quarantine? This is also worth a careful risk analysis.

Concluding Comments

These are observations I developed while observing an excellent public health response to a previously unknown and highly infectious disease. My comments are offered with the view of encouraging all health care facilities to undertake careful and formal risk analyses to review facilities, procedures and practices. I know that the US Centre for Disease Control consulting risk assessment team (invited during the crisis by Ontario) was able to contribute some valuable suggestions that were well appreciated and acted upon.

It is better for risk assessment be a normal part of health care facility audit than when the facility is in the middle of a crisis. In closing, I give my appreciation to the dedicated Toronto public health and other health care professionals who managed this SARS outbreak so well *that at no time did SARS jump into the community at large.*