Severe acute respiratory syndrome and Toronto

M Regan

Early detection and isolation of suspected cases is the key

“I hold my breath in elevators even empty ones”. This was the view of one Toronto resident I read in a local newspaper in late April this year. I had just joined, as an observer, the Federal Emergency Operations Centre that had been activated by Health Canada to coordinate efforts to contain and control the spread of SARS. However, my perception was that Canadians in general appear to have responded calmly and positively to the appearance of severe acute respiratory syndrome (SARS) and to the open and frank communication from territorial, provincial, and federal authorities about the infection and the measures they could take to protect themselves. Some political accusations and recriminations have followed over the handling of the SARS outbreak, but the overall impression that I was left with was of a calm and well informed public who had confidence in the measures being taken by health officials and politicians under extreme pressure to manage a new infection that is yet to be fully understood.

The emergence of SARS and its health, social, and economic impacts has been the subject of intense international discussion and collaboration. The facts concerning the origin of SARS associated coronavirus are becoming clearer and the clinical and epidemiological features are being pieced together to give an increasingly coherent perspective on this new infection. Optimal public health management has yet to be determined. This ultimately may have as much to do with was of a calm and well informed public who had confidence in the measures being taken by health officials and politicians under extreme pressure to manage a new infection that is yet to be fully understood.

SARS is not the first and is unlikely to be the last emerging zoonotic infection of modern times. Much of the wider impact of SARS has been seen in the Far East, but in the West it has been Canada and in particular Ontario and the City of Toronto that has taken the brunt of the impact of this infection so far.

The circumstances leading to the initial case cluster are well reported and the reasons underlying the most recent and ongoing case cluster are also known.

It is important to see the current Canadian SARS outbreak in a wider context to appreciate the lessons it offers to others. Canada covers an extensive geographical area with a comparatively small but heavily urbanised population distribution. Of the present 33 million Canadians about 13 million live in Ontario, 9 million in the Greater Toronto area, and 3 million live in the City of Toronto itself. Within Toronto about 100 000 people are Chinese or of Chinese descent. An understanding and appreciation of the demographics of populations can give the first clues as to the probable impacts of newly emerging infections and other urbanised areas with similar ethnic and social profiles to Toronto could be similarly affected in time. Opportunities can therefore be taken to target public information campaigns to population groups who are at increased risk. These include travellers to affected areas where transmission has been demonstrated and to local communities that have links with affected areas.

Sick or worried people will often present themselves to their local accident and emergency units and the key issue of whether or not local hospitals can promptly detect and isolate suspected cases is perhaps worthy of particular scrutiny.

Awareness among healthcare professionals is also important and although specific guidance needs to be given, as important is to provide support and reassurance for front line workers who are not immune to the same understandable concerns surrounding the emergence of an new infections as members of the public. Perhaps healthcare professionals need to be communicated as people first and professionals second?

We also need to be mindful of the lessons learned from communicating about other serious infections such as HIV. The assimilation of this information does not happen overnight and can be very difficult to come to terms with in the midst of an outbreak. Communication strategies should aim to pave the way to now to minimise possible problems in the future by establishing links and communicating key messages early so that people have the time and opportunity to digest and accept them.

Control of infection in hospital and surveillance for infection will never be quite the same again. Focused infection control measures and public health intentions will need to be put in place using a risk assessment approach. The hazard analysis critical control point (HACCP) approach is one well known risk assessment model widely used in industry and in food hygiene and now increasingly being used and applied to infectious diseases and public health issues. This approach has the potential to provide a useful checklist for action to guide decision makers and public health professionals, as they become “task saturated” with a multitude of diverse problems in the heat of a major communicable disease incident. Pressure points in the health and social care system can be anticipated using a HACCP approach and some early measures put in place in advance. HACCP principles are currently being applied to the development of national contingency plans for SARS by the Health Protection Agency and critical control points defined for each phase of an evolving outbreak.

Prompt detection and appropriate isolation of hospitalised cases is one critical control point and suggests that in the future that there should be more investment in syndromic surveillance. Perhaps travel associated pneumonias and nosocomial pneumonias should be early candidates for such surveillance in the post-SARS period. Most importantly we should look to constructively learn from the practical experience that others have gained from engaging to control SARS. Capturing, remembering, and learning from these experiences will enable the wider international community to be better prepared for not only SARS, but also for the next emerging infection that we will undoubtedly have to face in the future.

J Epidemiol Community Health 2003;57:642–643

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I n this issue of the journal, Lee and
Abdullah focus on the adoption of
hygienic and health promotion mea-
ures in Hong Kong for controlling the
spread of severe acute respiratory syn-
drome (SARS).1 One of the interesting
aspects of this work is that it provides an
insider’s point of view, yet these hygiene
measures need to be discussed in the
overall context of the outbreak, includ-
ing the other public health interventions
that have been performed in both Hong
Kong and other heavily affected cities.

It should first be mentioned that one
of the distinguishing characteristics
of SARS is that for the first time in many
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dies and people living in poor resource
countries.

The global level concern surrounding
SARS began to take form when reports
from Hong Kong and China's Guangdong
province incited the WHO to launch a
global alert, unprecedented in its history,
that recommended the postponement of
all but essential travel to the affected
areas and the screening of airline pas-
sengers; around the same time, the pub-
lic health measures for reducing the risk
of transmission in the affected areas
became extremely strict. None the less, it
is fair to say that we were not prepared to
cope with the SARS emergency, for
several reasons. Specifically, SARS,
which is caused by a new human
 coronavirus (referred to as “SARS-
CoV”), is mainly transmitted through
respiratory secretions, and these types of
infections are not as easily controlled as
those transmitted through, for example,
sexual intercourse or blood. Secondly,
that the infection is viral makes treat-
ment difficult, given the scarcity of effec-
tive antiviral drugs in general. Thirdly,
there is not much experience with vac-
cines against other known human
 coronaviruses (229E and OC43-like), as
they have only been associated with mild
pathogens, which cause about 30% of
seasonal common colds.

However, despite these hurdles, the
epidemic curves of SARS in Guangdong,
Hong Kong, Singapore, Beijing, Toronto,
and Taiwan all showed a rather rapid
decline after the implementation of
stringent public health measures,1 and in
Hanoi, where WHO officer Carlo Urbani
recommended that stringent measures
be adopted immediately after he identi-
fied the disease, the outbreak was
contained within a few weeks. The group
of Roy Anderson of Imperial College in
London has emphasised that the spread
of infection has been successfully limited
because mixing and travel were re-
stricted through measures that the au-
tors defined as “draconian”, including:
the isolation of cases, contact tracing and
mandatory home quarantine, suspen-
sion of school sessions, health declara-
tions for visitors, isolation of residents of
a building and their subsequent move to
rural isolation camps, and body tempera-
ture checks for air passengers.4 Although
the application and enforcement of these
measures varied across the different
affected areas, it can be safely be said
that they were effective.

Severe acute respiratory syndrome

A challenge for public health

G Rezza

Insight into the reasons for this
success has been provided by the dy-
namic mathematical models designed to
determine how and why the disease had
spread among populations in Asia and
elsewhere. According to preliminary
analyses of the outbreak in Hong Kong,
SARS-CoV is more likely to be transmit-
ted by direct contact or by larger virus
laden droplets, which travel only one or
two metres, as compared with lighter
airborne particles or aerosols, as is the
case for influenza and measles.1,2 This
theory is supported by the comparatively
low basic case reproduction number (R0)
(that is, the average number of persons
infected by each case at the beginning of
the epidemic), which seems to range
from 2 to 4, with the exception of two
super-spread events; the theory is also
supported by the occurrence of clusters
of cases linked to symptomatic people in
a particular spatial setting (for example,
healthcare facilities or households).

This success, which to some extent
was unexpected, has played down the
criticism concerning the supposed non-
effectiveness of the cordon sanitaire in
the era of globalisation. However, whether
or not imposing these measures
represents an unacceptable infringe-
ment of individual rights continues to be
a matter of debate.

J Epidemiol Community Health 2003;57:643

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Severe acute respiratory syndrome

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*J Epidemiol Community Health* 2003 57: 643
doi: 10.1136/jech.57.9.643

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