Isolation and Quarantine: Surviving A Lethal Outbreak

An outbreak or global epidemic may be only one plane ride, one infected patient, one cruise ship, or one flock of infected birds away.

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In February 2004, a child in King County was diagnosed with pneumonia after returning from Asia where he stayed on a chicken farm in a region affected by Avian Influenza H5N1. Local health officials rightly anticipated that something other than avian flu was the culprit of the boy's illness, but the incident was a jarring reminder that we are living on the razor's edge of tragedy. Public health officials no longer ask *if* we will see a pandemic but *when*.

The SARS crisis of 2003 tested modern large-scale isolation and quarantine methods, tools with an infamous history characterized by abuse of power and discrimination against groups and individuals, as well as success in containing serious infections from leprosy to tuberculosis. In the absence of rapid and definitive diagnostic tests, vaccines, or cures, isolation and quarantine remain our best countermeasures against the spread of mass illness—illness that could overwhelm hospitals, overcrowd morgues, cripple essential services, and wreak social and economic disorder. Yet, isolation and quarantine require an enormous, complex, and above all, *prepared* community response network to help individuals survive and recover and to guide a community through a period of unpredictability, uncertainty, and loss.

To prepare for a local outbreak, health officials in Seattle and King County are applying the lessons learned from containing SARS in Toronto, Canada, where there were 438 SARS cases and 43 deaths. During the outbreak in Toronto, 13,000 individuals were isolated or quarantined, requiring 23,000 follow-up contacts to monitor their symptoms. Yet, Dr. William Bowie, a Canadian infectious disease expert, said recently that, compared to a flu pandemic, "SARS is going to look like a joke."

Isolation refers to the separation from those who are healthy and possible hospitalization for treatment of *ill* persons with a confirmed or suspected communicable disease. *Quarantine* is the separation or restriction of activities of *well* persons who are believed to have been exposed to a communicable disease and are therefore at highest risk of becoming infected. Quarantined individuals are confined for the longest usual incubation period of the infectious agent. An individual's home is the preferred setting for both isolation and quarantine.

Isolation and quarantine measures are generally applied on an individual basis. Broader community containment measures, however, may be applied to groups of persons or to communities during outbreaks with extensive transmission of disease. These interventions would be used to increase social distance among community members (for example, cancellation of public gatherings, use of masks, or implementation of community-wide "snow days").

Both isolation and quarantine are usually voluntary but may also be mandatory. Depending on the risk of epidemic propagation and the scale of an outbreak, designated facilities could be used to quarantine large numbers of people.

The local health officer has the authority and responsibility to direct a person or group to isolate or quarantine themselves, or to issue emergency detention orders to ensure compliance. To protect civil liberties and ensure fair treatment of individuals ordered into isolation or quarantine, a judicial system of due process is in place. The Toronto SARS outbreak gave a hopeful indication that the public understands that the ethics of isolation and quarantine require balancing individual freedoms and protecting the public from a potentially lethal disease. Almost all of the 13,000 Toronto citizens in isolation or quarantined complied voluntarily; of the 27 detention orders issued, only one was appealed. It was later withdrawn.

Anticipating an epidemic

Public Health - Seattle & King County (Public Health) is the lead agency preparing the county for a contagion potentially requiring isolation and quarantine. Public Health's plan for dealing with an infectious disease outbreak involves dozens of agencies, including local health care providers, health facilities, emergency management personnel, law enforcement agencies, and community-based organizations. These agencies must build strong partnerships now and be ready to combine forces to halt the spread of communicable disease. Public Health is also preparing a sweeping county-wide plan to secure and distribute drugs or vaccines from the Strategic National Stockpile across the county quickly.

Public Health's plan must meet the needs of King County's 1.8 million people—a population equal to or greater than 14 of the 50 United States,

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which swells each weekday with an additional 400,000 workers. Thirty-nine suburban cities, as well as rural communities in the eastern portion, have vulnerable populations of significant scale, including people with disabilities, homeless individuals, people with serious mental illnesses, minority groups, non-English speakers, children, and frail elderly. Many do not have a regular health care provider and are beyond the reach of traditional public health and other emergency response systems. As many as 50 to 60 languages are spoken in the schools, and at least 10 language groups require regular translation and interpreter services in public health clinics alone.

Public Health's plan connects King County's 19 hospitals, more than 7,000 medical professionals, 27 community health centers, several specialty care facilities, and numerous primary care organizations into a dynamic response network. First response organizations are included in this network of preparedness planning—30 fire departments that provide basic or advanced life support response throughout the county, 8 HAZMAT teams, and 29 local law enforcement agencies.

Seattle is also an international port of entry with a high level of threat not only for acts of terrorism but also for infectious diseases such as SARS and Norwalk virus. Each year nearly 26 million passengers travel through SeaTac Airport with more than 2.2 million of these going to or coming from international destinations. During the five-month summer season, more than 100 cruise ships carrying nearly 200,000 passengers disembark.

Planning to handle thousands

Clinically and logistically, isolation and quarantine require complex management strategies to deal with sick or exposed people. The range of strategies is designed to facilitate early recognition of symptoms and reduce the risk of transmission.

Isolation and quarantine can place great stress on individuals or households, requiring people to stay home from work, and in some cases forego earnings, and temporarily dividing families where it may be necessary to separate an ill family member from children or other vulnerable family members.

Public Health's plan includes coordinating with regional partners to deliver essential goods and services, such as food and medicines, to persons in quarantine and isolation and to meet their social, psychological, and financial needs.

Public Health is preparing to respond head-on to the challenges, but deep concerns remain about the ability to meet the enormous strain on all the agencies involved in carrying out the functions of an isolation and quarantine plan. The possibility of skyrocketing staffing demands and costs and draining resources from other important programs and services are of most concern.

Local public health plan for dealing with an infectious disease outbreak

- Identify, evaluate, and monitor contacts of patients and people in isolation
- Assess the safety and suitability of the home environment for isolation or quarantine
- Identify facilities for persons who do not have access to an appropriate home setting, such as travelers and homeless populations
- Develop educational materials in appropriate languages and literacy levels, and provide interpreter services
- Monitor and evaluate isolated or quarantined individuals and coordinate necessary medical care and follow-up
- Monitor the course and extent of the outbreak and evaluate the need for community containment measures
- Coordinate with the prosecuting attorney's office and superior court to issue legally binding isolation and quarantine orders, as well as ensure that isolated and quarantined patients have access to legal representation
- Train law enforcement and other first responders in the use of personal protective equipment
- Prepare law enforcement to enforce isolation and quarantine orders issued in their jurisdiction

Public Health has discovered that just a few isolated individuals or quarantined households can stretch the agency's resources to its limits. It conducted approximately 150 SARS investigations in 2003. During the peak of the local SARS activity Public Health received one phone call from the public or a health provider every 10 minutes. The 2003 SARS response required 16 full-time Public Health staff to be reassigned for several months from their existing duties to manage the workload.

An outbreak involving hundreds or thousands of households would require an unprecedented surge in response capacity, especially if public health, hospital workers, and other staff became ill. Health care workers and first responders would be at higher risk than the general population, further impeding the care of victims. This was the case in Hong Kong and Toronto, where hospital personnel became infected with SARS, and some died. Widespread illness could also increase the shortage of personnel in other sectors that provide critical community services, such as utility and transportation workers.

Providing information to the public is an essential service during a public health emergency, creating additional pressure on public health and other agencies. Over the five-month outbreak in Toronto, the city established a public hotline number that received more than 300,000 calls, with a peak of 47,567 calls in one day.

The public health system is the frontline of defense against emerging and re-emerging infectious diseases and is continually being asked to expand its emergency role to protect communities against bioterrorism and threats that emerge from nature. At the same time, the system is providing, without adequate resources, a spectrum of services to create the conditions in which people can be healthy. Attempting to do more and more with less already takes superhuman effort, but public health's thinning resources perhaps poses the greatest threat to the successful containment of an outbreak.

The King County child has recovered, but a 12-year-old boy in Vietnam has died from Avian Influenza H5N1. As of March his death was the country's fifteenth fatality. Eight other people have died in Thailand. Scientists continue to monitor for possible human-to-human transmission of lethal flu strains or other diseases. Sooner or later, we could be fighting one on our own shores and, with preparedness and luck, stop it in its tracks.

Resources

Allan S. Quarantine, isolation and other legal issues from the SARS experience: Concerns for local health officials. http://bt.naccho.org/E-newsletter/Quarantine-and-Isolation.htm.