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The Quarantine Conundrum: An Investigation into Public Health Measures to Control the Spread of Infectious Diseases

Alexandra Perri

With the recent outbreaks of infectious diseases such as SARS and TB, health authorities in Canada have had to rely on the practice of quarantine for the protection of public health. The use of quarantine, however, has spurred ethical debates about the suitability of the restrictive conditions of quarantine in a democratic society. This article discusses some of the questions surrounding the practice of quarantine and provides a framework for its use on the basis of a set of ethical considerations.

Brief History

Quarantine, the segregation of the diseased from the healthy, is a practice that has been in use for many years in an effort to control the spread of communicable diseases. Evidence of the first use of quarantine dates back as early as the writing of the Old Testament, when rules existed for the isolation of individuals infected with leprosy (Nova, 2004). Not until the outbreak of the Black Death in the 14th century, were the first forms of institutionalized quarantine established.

Innovations in systems of quarantine were first pioneered in Venice where ships were required to lay at anchor for 40 days before docking. The term quarantine itself is derived from the Venetian words *quaranta giorni*, meaning 40 day period (CDC, 2007). The Venetian system of quarantine was the common practice until the discovery that microbes are the cause of disease in the late 1800s. After this discovery, public health authorities began to tailor quarantine protocols to particular disease-causing microbes (Figure 1) (Nova, 2004).

The development of antibiotics and the routine administration of vaccinations in the 20th century rendered the Venetian method obsolete. Today, however, emerging infectious diseases such as tuberculosis, SARS, and HIV/AIDS currently threaten to cause the reinstitution of this practice (Mandavalli, 2003). Quarantine programs have been established by agencies such as the Centers for Disease

Figure 1 This photograph, taken in 1930, demonstrates how individuals placed under quarantine are often treated as criminals of the law. In this photo, a man is immediately segregated at the Immigration Station on New York's Ellis Island after demonstrating symptoms of a communicable disease. If diagnosis confirmed the suspicion, individuals were placed in quarantine until they were no longer contagious (Nova, 2004).

ASK THE EXPERT

Dr. Lisa Schwartz

To discuss the extent of public health measures that should be taken to control the spread of highly contagious diseases, Alexandra Perri of the McMaster Meducator has consulted an expert in the field, Dr. Lisa Schwartz, the Arnold L. Johnson Chair in Health Care Ethics at McMaster University.

Q: To what extent should public health agencies and officials go to contain individuals with highly infectious and communicable diseases?
A: It is hard to say how far we ought to permit public health measures to restrict the personal liberty of individuals. What is important is that we recognize that no matter how far we are prepared to go, movement toward limiting individual liberty for public good needs to be done with caution, and incrementally to prevent any one person being left with excessive burden or limitation. All limits need to be justifiable, and reciprocation and appeals are essential.

Q: In forcibly confining individuals with infectious diseases, are we doing the right thing?
A: Quarantine should only be employed in very extreme cases where the person will not co-operate and harm to others is clear and imminent. Here again, the notion of reciprocation is very important because there may be strong social reasons that would prevent a person from willingly being quarantined. I suspect that if we examined what it is that makes quarantine appear to be a threat to the person involved, we could go a long way to gaining cooperation and enforced restrictions would not be needed. We must also bear in mind that the broader effect of enforced quarantine may be to make others reluctant to self-report or seek treatment, thereby further endangering the wider public. It seems, then, that enforced quarantine can effectively undo its own efforts.

Q: Do public health authorities have the right to forcibly confine individuals infected with infectious diseases?
Public health authorities do have the right to forcibly confine individuals infected with infectious diseases. However, this right should only be employed in rare circumstances where the infected individual may pose harm to the public and only within Public Health guidelines.

Q: How important is the discussion of the issue of quarantine for the upcoming months and years? Where should future research on the issue of quarantine be directed?
A: Quarantine is an important area for discussion. Only if we are aware of the concerns and potential challenges it presents will we be properly prepared to avoid the worst case scenarios, such as a loss of trust in the system and unwillingness to cooperate with proactive measures to control disease. In the case of potential pandemics, quarantine will no longer be an issue and we will be faced with more difficult ethical problems. Future research on the issue of quarantine should perhaps look at public attitudes and should engage public upon their concerns or intuitions on justice in terms of restrictive measures for disease control. It is important that the public is better educated around this issue of quarantine.

Control and Prevention (CDC) in hopes of protecting the public from infected persons or those at risk of infection (CDC, 2008).

Threat Posed by Infectious Diseases

The 2003 SARS epidemic was the first time in several generations that health authorities in Canada were required to implement quarantine to prevent public contamination (Figure 2) (Mitka, 2003). In addition to the SARS epidemic, the emergence of highly infectious, incurable diseases is increasing at an alarming rate around the world. The CDC of the United States recently released a publication reporting that more than 90 000 Americans are infected with a potentially deadly methicillin-resistant strain of *Staphylococcus aureus*. This "superbug" is now the most frequent cause of skin and soft tissue infections reported in emergency departments across the United States (Klevens et al., 2007). Additionally, more than 25 000 to 30 000 people carry extensively drug-resistant tuberculosis (XDR-TB) worldwide (Figure 3) (WHO, 2006). Given the increasing threat and severity of newly emergent infectious diseases, it is clear that the control of communicable diseases must be addressed.

Defining Conditions of Quarantine and Isolation

Isolation and quarantine are both public health practices aimed at controlling the spread of infectious diseases, but a stark difference exists between the two. Isolation is used to separate infected persons who have a communicable disease from those who are healthy. Isolation restricts the movement of the ill in order to impede the spread of certain diseases (CDC, 2007). For example, patients with infectious tuberculosis are isolated in hospitals during remediation. Conversely, quarantine is used to separate and restrict the movement of asymptomatic persons who may have been exposed to a communicable disease. The separation of exposed individuals and the restriction of their movements slows the spread of disease, should symptoms develop (CDC, 2007).

When Should Public Safety Override Personal Freedom?

The decision to quarantine an individual is complicated by ethical debates about the extreme conditions of quarantine in a democratic society. In many

cases, patients are reluctant to be placed in quarantine and may be forced to assume these restrictions against their will (Svoboda et al., 2004). This begs the question: when should concerns over public safety supersede our individual rights to liberty? Due to growing rates of highly communicable diseasesahh, this question is often asked by public health officials.

The decision to place an individual in quarantine is based on a few considerations. Public health officials first need to consider whether medications are still effective in mitigating the proliferation of disease (Thompson et al., 2006). Contagious diseases are often treated with a first line of standard drugs, followed by Direct Observed Therapy (DOT) in which a trained nurse oversees all therapy given to the patient. If faced with a situation where no suitable course of treatment exists, quarantine may be considered an option to ensure protection of the health of the communities (Bensimon & Uphsur, 2007).

> "In addition to the SARS epidemic, the emergence of highly infectious, incurable diseases is increasing at an alarming rate around the world."

Upon placing an individual under quarantine, there are other ethical considerations. First, given the understanding that a mitigation of disease requires some degree of isolation, there is a need for a quarantine policy that enforces harsher limitations when lighter restrictions have been exhausted. Second, conditions of reciprocity must be put in place. This means that if public health has asked an individual to give up their mobility rights for the public and common good, then it is incumbent upon the public health authorities to make things as livable as possible for the person who relinquishes their liberties. Therefore, quarantined individuals should be provided with financial and social support to minimize the burden. Third, transparency is essential. The

Figure 2 A SARS patient receives treatment at a hospital in China during the 2003 SARS outbreak. Public health authorities ultimately credit quarantine, especially in Canada, with helping to mitigate the total number of individuals infected with SARS (Nova, 2004).

decision to quarantine and the extent of the loss of liberties must be available for public observation, while quarantined persons should have free access to legal counsel and appeal (Schwartz & Upshur, 2007).

Quarantine for the Future

Quarantine is a highly charged topic of health debate because of its direct and serious implications on the lives of those quarantined and on public health. Some see the practice of quarantine as a fundamental tool in infectious disease control, whereas others believe that the use of quarantine is an excessive measure that degrades one's rights in a democratic and liberal society. How we choose to treat individuals in these circumstances reflects the values of our society (Ruderman et al., 2006). Given the escalating incidence of communicable diseases, it is becoming increasingly important to understand effective decision-making and to discuss any ethical concerns and promote research regarding the practice of quarantine.

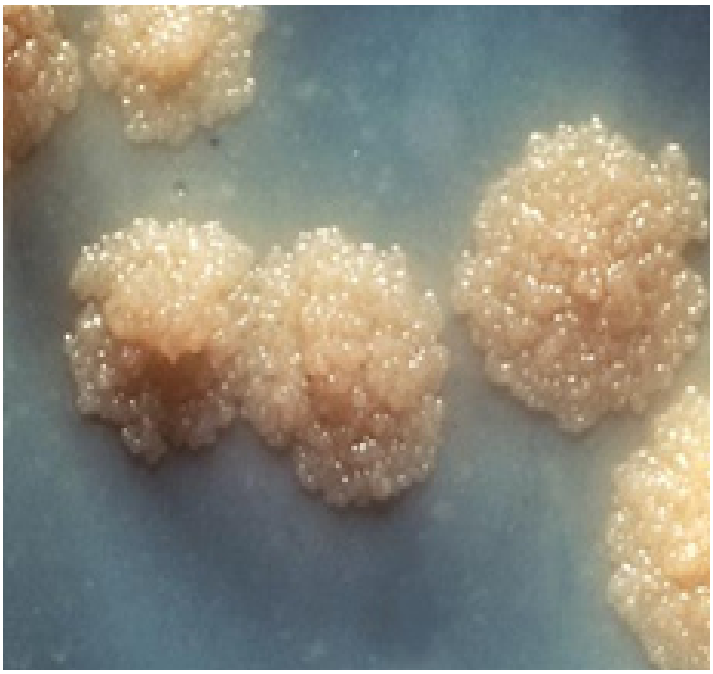

Figure 3 Electron micrograph of a highly pathogenic strain of bacteria, Myobacterium tuberculosis. An individual may be forcibly placed in quarantine according to the Centers for Disease Control and Prevention (Image provided by the Public Health Image Library of the Centers for Disease Control and Prevention, #4428).

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