Cock-a-Doodle-Doo: Pandemic Avian Influenza and the Legal Preparation and Consequences of an H5N1 Influenza Outbreak

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INTRODUCTION

Epidemic disease has long played a role in the evolution of mankind. As mankind evolved, disease impacted his laws. With disease outbreak came chaos, death, and change. As we learned to recognize the causes of disease, laws attempted to prevent and combat the threat. The combat continues today in our global challenge to halt the spread of devastating diseases like HIV/AIDS.

The greatest pending threat modern man faces from infectious disease, however, is not a slow moving disease like HIV/AIDS, but a fast moving and virulent influenza outbreak on par with the 1918 pandemic. Such an outbreak would threaten the political, social, and legal fabric holding modern society together. Imagine closed schools, churches, malls, theatres, and grocery stores, as well as prohibitions on public gatherings of any kind, forced quarantine of civilian populations, mandatory masking, and harsh restrictions on travel. Further, imagine the mass slaughter of tens of millions of farm birds under

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government orders, as happened in Asia.\(^4\) Consider the international relations between highly infected developing nations as they demand care and assistance from the developed nations. Further, consider the role of the World Health Organization (WHO) and domestic agencies like the Centers for Disease Control and Prevention (CDC) in the United States. What policy or law-making power would these bodies have at the height of a pandemic responsible for the death of over 250,000 people a day for a year?\(^5\)

Based on global influenza surveillance, avian influenza or “bird flu” represents the most likely cause of the next global influenza pandemic.\(^6\) In 1997, epidemiologists from around the world observed the unexplained infection of poultry in Hong Kong and the eventual spread of avian influenza in Asia.\(^7\) Concern grew as human cases were identified in the late 1990s.\(^8\) Very recently, the realization that “we


\(^5\) Helen Branswell, Flu Pandemic Near, Experts Fear, GLOBE & MAIL, Nov. 17, 2004, at A1, available at http://www.rense.com/general59/flu.htm (predicting the grave effect of the avian influenza if preparations for the pandemic are not hastened because a pandemic is viewed as unlikely). In fact, some estimates are that if a pandemic with mortality rates similar to the 1918 pandemic hit, between 36 million and 177 million people would die. Until March 2005, the mortality rate for avian influenza was approximately 72 percent. James Hookway, Bad Diagnosis: In Rural Cambodia, Avian Influenza Finds A Weak Spot; Human Cases Escape Notice Amid Ignorance, Poverty as a Pandemic Threatens; Advice: Don’t Eat Sick Birds, WALL ST. J., Mar. 4, 2005, at A1 (discussing an avian influenza mortality rate). Currently, however, the mortality rate has dropped to approximately 35 percent, suggesting the virus is adapting to human hosts yet increasing the probability of spreading among the human population. Alan Sipress, In Vietnam, A Dark Side to Good News on Bird Flu, WASH. POST, Apr. 23, 2005, at A1 (providing the avian flu mortality rate in Vietnam).


\(^7\) Klaus St6hr, Avian Influenza and Pandemics—Research Needs and Opportunities, 352 NEW ENG. J. MED. 405, 405 (2005) (suggesting approaches to study, and methods to combat, the avian influenza to prevent a pandemic in humans).

This article sets out to chronicle the legal preparations nations and international bodies are making to prevent and prepare for a future global outbreak of avian influenza as well as combat such a pandemic outbreak. In order to best understand the potential danger, one must have an understanding not only of avian influenza, but also a general understanding of the history of disease and the basic science underlying influenza. Only by recognizing how science and history interplay with the current concern about avian influenza can one truly appreciate the threat facing humanity. This article sets out to introduce the reader to the threat of avian influenza and briefly summarize some of the issues likely to arise during a pandemic. In order to understand the issue, Part I of this article highlights the scientific aspect of the problem and sets out to explain where the viral threat originates, how it spreads, and why it is so unpredictable. Part II provides historical lessons for combating viral outbreaks. For example, the events of the 1918 pandemic provide a glimpse of the nightmare scenario modern scientists and lawmakers fear. Additionally, the SARS outbreak, originating in China, spreading through the developing nations of Asia, and reaching developed countries like Canada, highlights the rapid spread of disease in a world of easy airline travel. Together, these two examples highlight the necessity of preparing for what in-

cussing human cases of bird flu eight years ago in Hong Kong).


10 This study will focus on the avian influenza A strain (H5N1). Currently, the avian influenza viruses that have caused illness in people include the H5N1, H7N7, H7N3 and H9N2 subtypes. See generally Pub. Health Agency of Can., Avian Influenza, http://www.phac-aspc.gc.ca/influenza/avian_e.html#2 (last visited Feb. 5, 2006) (list of online sources concerning avian influenza). H5N1, however, appears to cause the most serious illness in humans. In 2003, H5N1 avian influenza was discovered in pigs in southern China, marking the first time pigs were found to be infected with the H5 subtype of the virus. See Stöhrl, supra note 7, at 405-06.

creasingly worries epidemiologists specializing in influenza: a swift-moving global killer cutting down those between twenty and forty years of age. Part III highlights the legal issues such as quarantine, isolation, and vaccination of infected individuals and the Model State Emergency Health Powers Acts. Part IV focuses on the preparations, both international and domestic, currently being undertaken to monitor and prevent an uncontrollable human-to-human outbreak. It further enumerates several recommendations designed to facilitate the successful monitoring of regional viral outbreaks and to combat an outbreak once it has occurred by striking a balance between legal measures designed to reduce further spread and a public willingness to comply.

I. SCIENCE: WHAT IS AN INFLUENZA VIRUS?

In order to answer the legal questions related to influenza in general and avian influenza specifically, one must have a cursory understanding of what scientists, public health officials, lawyers, and humanity is up against. Without knowing the details of the influenza virus, one cannot adequately prepare or combat the virus.

A. The Importance of Understanding the Influenza Virus

The influenza virus belongs to the family of viruses known as the Orthomyxoviridae. The virus is extremely small, measuring 80–100 nanometers in diameter or approximately one billionth of a centimeter.

The virus particle is a spherical or filament-shaped particle covered in protein spikes. The interior contains the genetic make-up of

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13 Bray, supra note 12, at 193. This fact, unknown during the 1918 pandemic, reveals the uselessness of the various mandatory masking orders implemented throughout the world because the fabric, either cloth or gauze, used to make the masks is unable to filter out the viral particles. See generally ALFRED W. CROSBY, AMERICA'S FORGOTTEN PANDEMIC: THE INFLuenza OF 1918 103 (2nd ed. 2003); and ANDREW NIKIFORUK, THE FOURTH HORSEMAN: A SHORT HISTORY OF EPIDEMICS, PLAGUES, FAMINE AND OTHER SCOURGES 154 (1991) (discussing useless masking orders).

14 The Big Picture Book of Viruses, supra note 12 (discussing the morphology of the Orthomyxoviridae family of viruses).
the virus, the Ribonucleic Acid (RNA). The surface proteins, hemagglutinin (H) and neuraminidase (N), are the proteins on the A type influenza virus. There are three types of influenza virus: type A, type B, and type C. Influenza types A and B cause epidemics of disease almost every winter. Each year, types A and B are responsible for infecting 10–20 percent of the population, causing an average of 36,000 deaths and 114,000 hospitalizations. Type A, however, has been the cause of the great pandemics, while type B causes more local epidemics. While both type A and B viruses undergo continual change, leading to other slightly different forms of the virus and allowing the viruses to evade the human immune system and thereby cause infection, only type A has several subtypes of the virus that result from rapid and sometimes drastic changes. The influenza A virus subtypes are classified based on the virus’s two surface proteins, hemagglutinin and neuraminidase, and lead to such subtypes as H3N2 or H1N1. Hemagglutinin allows the virus particle to bind to other “target” cells in the body once they come into contact. While the virus particle and the target cell are bound together, the virus particle penetrates the target cell, making a host cell. Meanwhile, the second protein on the surface of the viral particle, neuraminidase, prepares for the release of the new viral particles. Soon, the host cell is producing copies of the virus rather than its own genes. Neuraminidase breaks down the surface of the dying host cell and destroys it. Ultimately, the host cell bursts, releasing between

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18 Id.

19 BRAY, supra note 12, at 193.


22 Id.

23 BARRY, supra note 3, at 103.

24 Id. at 103-04.

25 Id. at 104.

26 Id.
one hundred thousand and one million new virus particles to infect other cells. This process continues over and over, ultimately leading to symptoms of respiratory infection. Fever and sweating are followed by muscle aches, exhaustion, and violent sneezing and dry coughing.

During viral reproduction in the host cell, however, mutations in the replication of the viral RNA occur. These mutations can lead to catastrophic problems. The virus reproduces so fast and in such great numbers that there are usually several slightly different strains in each viral release. Most of the copies are too defective to infect other cells, but approximately one thousand to ten thousand of the newly copies viruses can carry out further infection. Customarily, however, there are only slight changes in the virus RNA and protein structure. This slight change is called an antigenic drift. The result of the antigenic drift is that individuals may have immunity to much of the virus, thereby resulting in only a minor infection. Further, a great many people may have immunity, meaning few people are even made ill. A danger comes, however, with an antigenic shift, a major change in the RNA and protein structure of the virus. Few people have immunity because it is so radically different from past viruses and the antibodies of the immune system would not be able to recognize the invading virus. Accordingly, the virus spreads rapidly, resulting in severe symptoms and increased infection and death rates.

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27 Id.
28 Bray, supra note 12, at 194. Influenza virus particles are spread in the respiratory droplets of a person who coughs or sneezes. After their release, they move through the air and land on the mouth or nose of people nearby. Viruses can also spread when a person touches respiratory droplets on another person or an object and then touches their own mouth or nose before washing their hands. See generally Ctrs. for Disease Control & Prevention, Dep’t of Health & Human Servs., Influenza: The Disease, http://www.cdc.gov/flu/about/disease.htm (last visited Dec. 17, 2005) (providing a description of influenza); and Lynette Iezzoni, Influenza 1918: The Worst Epidemic in American History 111 (1999) (historical account of how influenza overtook the body).
30 Barry, supra note 3, at 105.
31 Id. at 105-06.
32 Id. at 105.
33 Garrett, supra note 29, at 156.
34 Id.
35 Id.
37 Barry, supra note 3, at 111.
38 Id.
B. Avian Influenza

Avian influenza is an infectious disease found in birds caused by a type A strain of the influenza virus.\(^{39}\) It was first identified one hundred years ago in Italy and today is found in all regions of the world.\(^{40}\) The first known cases of human infection with the H5N1 virus strain were documented in Hong Kong in 1997.\(^{41}\) Based on these first cases, and fearing a pandemic outbreak, the Hong Kong government ordered the slaughter of 1.5 million birds.\(^{42}\) Many in the epidemiological circles argue the cull staved off a global pandemic.\(^{43}\)

As of October 20, 2005, there have been a total of 118 human cases of laboratory confirmed avian influenza and sixty-one deaths since January 2004.\(^{44}\) There were six deaths and eighteen confirmed cases of avian influenza in Hong Kong in 1997.\(^{45}\) Epidemiologists have noted, however, that the 1997 H5N1 strain differs genetically from the 2003 H5N1 strain.\(^{46}\) The differences are the result of constant mutations and adaptations to human hosts as well as the possible mixing of human and avian influenza strains in infected pigs.\(^{47}\) To date, several Asian countries have reported human cases of avian influenza at some time since 1997.\(^{48}\)

Avian influenza is entrenched in bird populations, both wild and domesticated, in Asia.\(^{49}\) Recently, there have been several suggested

\(^{39}\) WHO, supra note 36.

\(^{40}\) Id.


\(^{42}\) Id.

\(^{43}\) Id.


\(^{46}\) Ctrs. for Disease Control & Prevention, Dep’t of Health & Human Servs., *Outbreaks of Avian Influenza A (H5N1) in Asia and Interim Recommendations for Evaluation and Reporting of Suspected Cases—United States*, 2004, 291 JAMA 1191, 1191 (2004).


\(^{49}\) Animal & Plant Health Inspection Serv., U.S. Dep’t of Agric., *Avian Influ-
modes of direct bird-to-human infection. For example, in January 2005, two Vietnamese brothers contracted avian influenza (H5N1) presumably when they ate congealed raw duck blood and herbs given at a “welcome home” celebration.\(^5\) One brother died, but the other recovered.\(^5\) In September 2004, another young man in Thailand became ill and died after his contact with a fighting rooster used in cock-fighting.\(^5\) According to the Thailand Department of Disease Control, the young man handled many birds and even helped to clear mucus secretions from the throat of one bird during a fight by using his mouth to suck the spit and mucus out of the bird’s airway.\(^5\) As a result, he swallowed some of the spit and mucus and contracted avian influenza soon after.\(^5\)

In early 2005, epidemiologists noted H5N1 acquired the ability to spread from person-to-person rather than simply from bird-to-human.\(^5\) This direct human-to-human transmission enables H5N1 to spread rapidly among humans and is the final step before a pandemic can result.

### II. CONTAGIOUS DISEASE AND THE LESSONS OF HISTORY

Disease has impacted the course of human history in dramatic ways. During the Peloponnesian War in 429–430 B.C., Thucydides chronicled the demise of Athens and its leader, Pericles.\(^56\) The Athe-
nian city-state was forced into an unfavorable peace settlement with Sparta resulting in the end of the Athenian golden-age. In another example, when Spanish conquistadors invaded the New World they brought with them the diseases of the Old World which killed millions. There were an estimated twenty-five to thirty million Amerindian people living in Mexico at the time of conquest, but within sixty years the population of Mexico had shrunk to only three million, leaving the land and riches of the new world ripe for the taking. Many argue the influenza pandemic of 1918 was a major reason World War I ended in November 1918. The combatants were simply running out of healthy men to fight. More recently, SARS revealed the speed with which today's viruses can travel around the world.

A. The 1918 Influenza Pandemic

The 1918 influenza outbreak was unlike anything the world had seen before for several reasons. First, it was far more virulent than any other recorded influenza outbreak in history. Second, it specifically struck down those between the ages of twenty and forty. Third, the pandemic spread faster than any other in history.

Influenza generally kills one-tenth of 1 percent of those it infects. The 1918 virus, however, killed 2.5 percent of those it infected. In the United States this deceptively low percentage resulted in more American deaths from influenza than from combat with

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57 See WILLIAM H. MCNEILL, PLAGUES AND PEOPLES 105-06 (1976).
58 Id. at 201-02.
59 Id. at 203-04.
60 NIKIFORUK, supra note 13, at 154.
61 There is growing realization that the 1918 virus and the current avian influenza virus are similar in several ways. See Charles Piller, Killer 1918 Flu Gives Clues to New Virus, Scientists Reconstruct the Source of the 20th Century Scourge and Find it Shares Mutations with the Bird Influenza in Asia, L.A. TIMES, Oct. 6, 2005, at A1.
63 BARRY, supra note 3, at 4.
64 Id. at 5.
65 KOLATA, supra note 16, at 7.
66 The 1918 influenza A virus strain is believed to be H1N1. See Klempner & Shapiro, supra note 62, at 1172.
68 CROSBY, supra note 13, at 11. The number of American military deaths during World War I was approximately 58,000. See Military Casualties of World War One, http://www.yusrsa.com/history/West%20Civ/Textbook/WWI-casualties.htm (last viewed Mar. 9, 2006).
over 670,000 Americans in total dying from influenza. Estimates of
global infection and death rates vary due to the overwhelming nature
of the outbreak and inadequate record keeping. However, overall
infection rates have been estimated at over one billion people between
1918 and 1919 or approximately 40–50 percent of the population.
Death rates also vary considerably, but estimates commonly range
between twenty and forty million deaths due to influenza during the
pandemic. Still, some estimates suggest fifty to one hundred million
deaths.

The second reason the 1918 pandemic was so devastating was be-
cause it struck down those typically most resistant to influenza—
young adults—like nothing before it. The 1918 outbreak targeted
those in ideal health. Death from influenza came rapidly. At first, pa-
tients would report to the hospital with flu-like symptoms. Rapidly,
they would develop severe pneumonia-like symptoms and, in some
cases, dark mahogany spots over their cheekbones. Within hours,
cyanosis could be seen extending from their ears to their face. Death
came only hours later. Doctors were unable to cope with the magni-
tude of the outbreak and were forced to watch helplessly as their pa-
tients died swift, excruciating deaths.

Finally, the rapid spread of the contagion far surpassed anything
in recorded history. More people died of influenza in one year than
Black Death killed in one century. Influenza killed more people in
twenty-four weeks than AIDS killed in twenty-four years.

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69 Iezzoni, supra note 28, at 17.
70 Barry, supra note 3, at 396.
71 Garrett, supra note 29, at 158.
72 Bray, supra note 12, at 197-200.
73 Garrett, supra note 29, at 158.
74 Branswell, supra note 5, at A1; Reynolds, supra note 21, at 39; Kolata,
    supra note 16, at 7; Barry, supra note 3, at 4.
75 Garrett, supra note 29, at 154.
76 Barry, supra note 3, at 232.
77 Nikiforuk, supra note 13, at 151.
78 Cyanosis, as Barry writes, “occurs when a victim turns blue because the
    lungs cannot transfer oxygen into the blood. In 1918 cyanosis was so extreme, turning
    some victims so dark—the entire body could take on color resembling that of the
79 Id. at 188. For audio oral interviews from survivors of the 1918 influenza
    pandemic see History Matters: The U.S. Survey Course on the Web, http://
    historymatters.gmu.edu/search.php?function=find&keyword=Spanish+Or+1918+And
    +Influenza&x=8&y=8 (search “Spanish or 1918 and influenza”) (last visited Mar. 9,
    2006).
80 Abraham, supra note 15, at 133-34.
81 Barry, supra note 3, at 5.
82 Id.
By modern standards, the 1918 influenza virus moved slowly. It crossed the globe in the infected bodies of young soldiers sailing aboard transatlantic steam ships to and from the war front in Europe.\(^8^3\) Port cities and military bases were usually the first to be infected.\(^8^4\) In the United States, the virus moved from the port cities of the east coast to the west coast by car and train.\(^8^5\) Today, with international air travel, viruses move from one continent to another overnight. They can move from one coast to another in hours.\(^8^6\) Such was the case with SARS in 2003.

**B. SARS\(^{8^7}\)**

SARS, many believe, represents the future of viral outbreaks. With the ease and speed of international travel, SARS symbolized the swift spread of disease from developing countries to developed countries. It has become the model of concern for international public health and international public health law.\(^8^8\)

First emerging from Foshan City, Guangdong Province, China in November 2002,\(^8^9\) there were eventually a total of 8,098 reported SARS cases worldwide.\(^9^0\) Of these, 774 died.\(^9^1\) China suffered 5,327 cases as of July 31, 2003.\(^9^2\) SARS, however, spread from China to the hardest hit western city, Toronto, Canada, in early 2003.\(^9^3\) In Canada, there were 251 reported cases and forty-four deaths due to SARS ac-

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\(^8^3\) CROSBY, *supra* note 13, at 38-39.
\(^8^4\) *Id.* at 48.
\(^8^5\) *Id.* at 63-64.
\(^8^6\) Approximately 1.5 billion people travel by air each year. ABRAHAM, *supra* note 15, at 11.


\(^8^8\) *Id.* at 202.

\(^8^9\) Ctrs. for Disease Control & Prevention, *supra* note 87.

\(^9^0\) There is some conflict on this point. Some argue over nine hundred deaths were reported worldwide due to SARS. See generally *Id.*; and Colleen M. Flood & Anthea Williams, *A Tale of Toronto: National and International Lessons in Public Health Governance from the SARS Crisis,* 12 MICH. ST. J. INT’L. L. 229, 229 (2004).

\(^9^1\) Ctrs. for Disease Control & Prevention, *supra* note 87.


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According to the WHO,94 in the United States, only eight people had laboratory evidence of infection.95 It only took four months for the illness to spread to Hong Kong, Thailand, Vietnam, Taiwan, and Canada.96 It eventually spread to twenty-six separate countries.97 Overall, the mortality rate for SARS was about 3 percent in young adults and approximately 50 percent in the elderly, while the overall average mortality rate was about 9 percent of those infected.98 Canada had approximately a 17 percent mortality rate, the same as China.99

There were many “firsts” associated with the SARS outbreak,100 but from a public health law perspective, it represents the first truly global infectious disease threat of the twenty-first century.101 SARS impacted international airline travel,102 tourism,103 and national interests of various countries.104 Further, the outbreak stressed the importance of global cooperation105 and raised questions of how to balance public health concerns with respect for individual rights.106 Most importantly, however, the SARS outbreak revealed the importance of the WHO in coordinating a global response to combating infectious disease.107

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94 There is also conflict on the number of deaths in Canada. See generally WHO, supra note 92; and Flood & Williams, supra note 91, at 229.
95 Ctrs. for Disease Control & Prevention, supra note 87.
96 Arshagouni, supra note 88, at 202.
97 WHO, supra note 92.
98 Arshagouni, supra note 88, at 201; WHO, supra note 92.
99 WHO, supra note 92.
100 For example, SARS was the first time this type of coronavirus was identified in human beings. See Fidler, supra note 2, at 5.
101 Id. at 6-7.
102 See generally Ruwantissa Abeyratne, International Responsibility in Preventing the Spread of Communicable Diseases through Air Carriage—The SARS Crisis, 30 TRANSP. L. J. 53 (2002).
103 C. David Naylor et al., Learning From SARS in Hong Kong and Toronto, 291 JAMA 2483, 2485 (2004).
104 China, hoping to join the World Trade Organization, hid the first cases of SARS from the world. As the crisis worsened, China believed it was in its best interest to deny or downplay the outbreak. Abraham, supra note 15, at 102-03.
107 See generally Abraham, supra note 15, at 81-106. “SARS strengthened the lesson that we live in a global village [and] the importance of surveillance [ ] in that [Asian] region.” Telephone Interview and Follow-up Email with Christine Pearson & Dave Daigle, Spokespersons, Centers for Disease Control and Prevention (Apr. 22, 2005) [hereinafter Pearson & Daigle Interview] (on file with author). According to CDC officials, the CDC “linked labs” with the WHO during the SARS outbreak, “which proved very useful and a model for the future.” Id.
When SARS broke out in late 2002, scientists took it as the initial stages of another global pandemic akin to the 1918 pandemic.\textsuperscript{108} SARS, however, was the "dress rehearsal" for a threat like avian influenza poses.\textsuperscript{109} SARS exposed gaps in communication as well as response.\textsuperscript{110} Further, such a relatively minor outbreak revealed large gaps in health services, even in developed countries like Canada.\textsuperscript{111} These lessons will guide the WHO, national governments, local medical care providers, and the world through the next global pandemic. If an avian influenza pandemic were to occur, national governments would be overwhelmed. Health care facilities, health care workers, and other essential services would be unable to cope.\textsuperscript{112} Accordingly, the individual national governments must begin to plan for an outbreak of avian flu. While the WHO monitors the progress of the virus, it is the responsibility of national governments to ensure their countries are prepared and their citizens informed. National governments must, however, work to balance protective health measures with a respect for the law and civil liberties.

III. THE LAW AND AVIAN INFLUENZA

Effectively combating infectious disease outbreaks requires balancing legal controls and civil liberties. Without a balance, individuals and nations alike disregard the law in pursuit of their own interests. Accordingly, the efforts of governments and international organizations to inform and regulate the conduct of citizens may be ignored if legal controls are too stringent. Stringent legal controls may lead to public disregard, and consequently, the continued, unabated spread of the contagion. Clearly, there are numerous legal issues related to an infectious disease such as avian influenza: measures designed to prepare for a possible outbreak, issues of quarantining or isolating suspected cases once an outbreak has occurred, and international surveillance and reporting of infection outbreaks. Further, the legal aspects


\textsuperscript{109} Id. at 140.

\textsuperscript{110} Id. at 140.

\textsuperscript{111} ABRAHAM, supra note 15, at 140. To many experts, SARS was a relatively minor outbreak. To highlight this sentiment, Abraham writes that Klaus Stöhr, coordinator of the WHO’s Global Influenza Surveillance Program, declared that "[c]ompared to a flu pandemic, SARS will be something to smile about." Id. at 135.

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of a large-scale viral outbreak have numerous domestic and international ramifications.

A. The World Health Organization

The WHO is the primary international body for addressing the potential threat to global health posed by avian influenza. The WHO is a United Nations (UN) organization and was created in 1948. Although other UN organizations play a role in monitoring and attending to international health, it is the WHO that provides leadership in international health law. Under Article 55 of the UN Charter, one of the goals of the UN is to promote solutions to international health problems. Thus, the WHO has the responsibility of implementing the goals of the Charter in respect to matters of health. According to the preamble of the WHO Constitution, every human being has a fundamental right to the "highest attainable standard of health . . . without distinction [to] race, religion, political belief, economic or social condition." In order to accomplish this goal, WHO member states, under Article 21 and 22 of the WHO Constitution, can agree to adopt binding regulations, such as the International Health Regulations (IHR). The IHR embodies the organization's efforts to control infectious diseases. Revised on May 23, 2005, the purpose of the IHR is to "prevent, protect against, control and provide a public health response to the international spread of disease . . . and

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114 Stem & Markel, supra note 1, at 1477.
116 Id. at 504.
117 Id.
118 Id.
120 For a complete list of the 192 member states, see WHO, Countries, http://www.who.int/countries/en/ (last visited Jan. 27, 2006).
121 Forrest, supra note 113, at 161-62.
avoid unnecessary interference with international traffic and trade.”

The revisions to the IHR stem from the experiences of the last thirty years and strive to implement a more “coordinated international response to the spread of disease” in light of the 2003 SARS outbreak and the current avian influenza crisis in Asia. The first IHR, called the International Sanitary Regulations when first adopted by the WHO in 1951, were renamed the IHR in 1969 and later modified in 1973 and 1981. The initial intent was to monitor six infectious diseases, but has now come to be the primary weapon against the global spread of all infectious disease.

To accomplish its task, the IHR requires member states to report outbreaks of infectious diseases and maintain public health capabilities at all points of entry. Article 6 of the revised IHR, for example, mandates a state notify the WHO within twenty-four hours after a disease is identified as originating within its borders. Each member state is required to notify the WHO “by the most efficient means of communication” of all disease “events” which may “constitute a public health emergency of international concern.” States are required to “continue to communicate” with the WHO and provide detailed information related to the number of cases and deaths, laboratory results, sources of infection and risks, as well as conditions affecting the spread of the disease and all health measures deployed to halt its spread.

In the area of surveillance, each member state is required to “develop, strengthen, and maintain, as soon as possible but no later than five years from entry into force . . . the capacity to detect, assess, notify and report events.” Moreover, each member state is required

126 Id. See also FIDLER, supra note 2, at 33 (criticizing the IHR for its limited scope of disease coverage prior to the May 2005 revision).
127 IHR (2005), supra note 123, at 11-15.
128 Id. at 19-29.
129 Id. at 11.
130 Id.
131 Id.
132 Id.
to designate or establish a “National IHR Focal Point” within its borders. The National IHR Focal Point is the national contact point for all WHO communications. It serves to “disseminate [e] information [ ] and consolidate input” from national sources responsible for surveillance, public health, ports of entry, and other governmental departments.

Taking into account other non-governmental sources of information, the revised IHR states that the WHO “may take into account reports from sources . . . and then communicate [the] information” to the member state where a disease outbreak is occurring. The “other reports” the IHR speaks of refer to information available over the Internet or from other organizations monitoring and reporting on health issues in a given country. The WHO verifies with the member state that a disease outbreak is occurring, and “only where it is duly justified may [the] WHO maintain the confidentiality of the source.”

In respect to monitoring various ports of entry, member states may require a traveler to furnish information of destination, itinerary, or review relevant health documents. Further, travelers may be subject to “non-invasive medical examination” and have their baggage, cargo, or other goods inspected for public health purposes. Travelers, however, are to be permitted to continue an international voyage if there is no imminent public health risk and the member state informs the authorities of the traveler’s presence to the port of entry at the traveler’s destination.

In determining when a public health risk of international concern threatens to spread, the WHO Director-General shall consult with the government of the member state to determine the risk and recommend a course of action. If the Director-General and the government officials disagree as to the determination an international public health risk is present in its territory, the Director-General may convene a meeting of the Emergency Committee to consider the threat and make recommendations. The Director-General of the WHO, however, has

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133 Id. at 10.
134 Id. at 8.
135 Id. at 10.
136 Id. at 12.
137 Id.
138 Id. at 20.
139 Id. at 21.
140 Id. at 24.
141 Id. at 14.
the final determination to communicate the risk and recommendations to the general public.\textsuperscript{142}

Ideally, the revised IHR will provide the power to address the growing threat from infectious disease, but will be tested on current avian influenza threat. The revised IHR also affords new strength to address situations like issuing unilateral travel advisories while encouraging the goals of greater communication, surveillance, and cooperation.

These international measures, however, were not in existence during the 1918 influenza pandemic and the previous IHR were initially ignored during the first weeks of the SARS outbreak in 2002–2003. In fact, China, where the SARS virus originated, refused to cooperate with the WHO during the early, most crucial stages of the SARS outbreak.\textsuperscript{143} Chinese governmental officials wrongly believed they could control the disease and feared economic reprisals for declaring an outbreak of a previously unknown virus.\textsuperscript{144} Consequently, when the disease first appeared in November 2002, Chinese officials said nothing.\textsuperscript{145}

Fortunately, unlike SARS, this failure to cooperate and the fear of economic hardships is minimal during the early stages of the current avian influenza outbreak occurring in Asia. Officials from affected Asian countries have identified the infection and made reports of avian influenza cases and deaths in their countries and reported them to the WHO.\textsuperscript{146} While the IHR provides the legal framework for dealing with global infectious disease control, the WHO’s Global Outbreak Alert and Response Network is responsible for investigating potential global outbreaks of infectious disease.\textsuperscript{147}

\begin{tabular}{l}
\textsuperscript{\texttt{142}} Id. at 33. \\
\textsuperscript{\texttt{143}} Gabriel M. Leung et al., \textit{The Public Health Viewpoint, in AT THE EPICENTRE: HONG KONG AND THE SARS OUTBREAK} 55, 63 (Christine Loh ed., 2004). \\
\textsuperscript{\texttt{144}} ABRAHAM, \textit{supra} note 15, at 102-03. \\
\textsuperscript{\texttt{145}} Naylor et al., \textit{supra} note 103, at 2484. \\
\textsuperscript{\texttt{146}} WHO, \textit{supra} note 44. \\
\end{tabular}
The Global Outbreak Alert and Response Network (GOARN) actively monitors the evolving avian influenza situation in Asia for the WHO.\footnote{148} Created in 1998,\footnote{149} GOARN is designed to collect and analyze information from a variety of sources including government, nongovernmental organizations, and the Internet.\footnote{150} GOARN uses the technical and operational resources from scientific institutions in Member States, “networks of laboratories, United Nations organizations (e.g., UNICEF, UNHCR), the Red Cross (International Committee of the Red Cross, International Federation of Red Cross and Red Crescent Societies and national societies) and international humanitarian nongovernmental organizations (e.g., Médecins sans Frontières [ ])” in an effort to collect data and control the international spread of outbreaks.\footnote{151} GOARN operates according to the Guiding Principles for International Outbreak Alert and Response.\footnote{152} News of avian influenza outbreaks reaches the WHO through its web of labs and institutions operating around the world. Further, GOARN has played a vital role in learning the real story of SARS even when the Chinese government was refusing to cooperate.\footnote{153} While originally operating “without formal legal authority or express policy approval from WHO member states,” that changed in 2001 when the member states granted GOARN the power to conduct global surveillance.\footnote{154}

\begin{flushright}
\footnote{148} WHO, WHO/SEARO Meetings, Ninth Meeting of Health Secretaries of Countries of SEAR: Establishment of Regional Cooperation on Avian Influenza Prevention and Control, http://w3.whosea.org/en/Section1430/Section1439/Section1590/Section1591/Section1594/Section1596_6511.htm (last visited Jan. 5, 2006). The CDC is one of the WHO’s “collaborating centers and supports the WHO with team members for outbreaks and lab surveillance.” Pearson & Daigle Interview, supra note 107. For example, CDC officials are working with the WHO and the Vietnamese Ministry of Health “to investigate influenza H5N1 in Vietnam and provide help in laboratory diagnostics and training to local authorities.” Id.

\footnote{149} FIDLER, supra note 2, at 66.

\footnote{150} Id. at 67.

\footnote{151} WHO, Epidemic and Pandemic Alert and Response (EPR), Global Outbreak Alert & Response Network, http://www.who.int/csr/outbreaknetwork/en/ (last visited Jan. 27, 2006). The guiding principals are designed “to prepare for field activity, to activate international support, to coordinate response in the field, [and] to evaluate and follow up outbreaks of international importance.” Id.

\footnote{152} WHO, Guiding Principles for International Outbreak Alert and Response, http://www.who.int/csr/outbreaknetwork/guidingprinciples/en/ (last visited Jan. 27, 2006). The guiding principals are designed “to prepare for field activity, to activate international support, to coordinate response in the field, [and] to evaluate and follow up outbreaks of international importance.” Id.

\footnote{153} Alexandra A. Seno & Alejandro Reyes, Unmasking SARS: Voices From the Epicentre, in AT THE EPICENTRE: HONG KONG AND THE SARS OUTBREAK 1, 11 (Christine Loh ed., 2004) (stating the “war on SARS was . . . the first time the WHO has coordinated such a large number of laboratories”).

\footnote{154} FIDLER, supra note 2, at 67.
\end{flushright}
GOARN is aware, however, its surveillance is not 100 percent and concerns about various countries have arisen. For example, some question Cambodia’s surveillance of the problem.\textsuperscript{155} Cambodia lies between Thailand and Vietnam and there are fears of gaps in the surveillance net and official responses to confirmed outbreaks have been very hesitant.\textsuperscript{156} WHO officials report villagers are fearful of telling officials about sick poultry or flu-like symptoms in their neighbors for fear of the government ordering the mass slaughter of their animals.\textsuperscript{157} Laos, also between Thailand and Vietnam, has yet to report a single case of avian influenza in either birds or humans in 2005.\textsuperscript{158} Further, in Vietnam, human cases of avian influenza are being missed.\textsuperscript{159} Recently, seven new cases were identified from samples of thirty Vietnamese patients who had previously not shown symptoms.\textsuperscript{160} This data suggests that while there is little evidence of actively hiding of cases or downplaying the severity of the situation, questions are beginning to arise regarding gaps in the defenses. Consequently, Canada has sent additional health officials to Southeast Asia in an effort to encourage governments throughout the region to be more forthcoming in reporting cases of avian influenza.\textsuperscript{161}

The WHO, however, is the international monitoring device that will alert the world when avian influenza threatens a global pandemic.\textsuperscript{162} When avian influenza causes several outbreaks in at least one country, has spread to other countries, and has caused serious morbidity and mortality, the WHO will declare an international pandemic.\textsuperscript{163}

\begin{itemize}
\item \textsuperscript{155} Hookway, supra note 5, at A1 (discussing the problem of identifying, containing, and treating the bird flu in Cambodia).
\item \textsuperscript{156} Id. There are reports that many people in rural Cambodia have not even heard of bird flu, thus raising fears the virus is still spreading and is almost impossible to monitor. Sitting Ducks: Bird Flu Is Now Endemic in Asia. This Is Frightening for Everyone, ECONOMIST, Apr. 16, 2005, at 35, 35 (discussing the bird flu in Asia and public health efforts to contain it).
\item \textsuperscript{157} Bird Flu Kills 2 More in Southeast Asia, SAN DIEGO UNION-TRIB., Mar. 26, 2005, at A21.
\item \textsuperscript{158} Piller, supra note 49, at A11. See generally WHO, supra note 44.
\item \textsuperscript{159} Piller, supra note 49, at A11.
\item \textsuperscript{160} Gautam Naik, Flawed Bird-Flu Data in Vietnam Fuels Concerns, WALL ST. J., Mar. 10, 2005, at A2.
\item \textsuperscript{161} Fear of Global Plague Sparks Research Trip, TORONTO SUN, Mar. 24, 2005, at 27.
\item \textsuperscript{162} Brian Vastag, Agencies Prepare Worst-Case Flu Vaccine, 291 JAMA 1429, 1430 (2004).
\item \textsuperscript{163} Id.
\end{itemize}
B. International Ramifications of an H5N1 Avian Influenza Outbreak

A global outbreak of avian influenza would have a profound impact on international air travel and trade. Considering the international impact HIV/AIDS has had, a fast moving virulent outbreak of avian influenza would require swift, far-reaching action by the WHO and individual nations. For example, airline travel may be restricted and travel advisories implemented by the WHO in order to restrict the spread of the virus. Nations could also restrict entry of individuals arriving from infected regions of the world out of fear of spreading the disease. Further, international trade may suffer and individual nations may ignore their obligations under international treaties.

1. Impact on Airline Travel

Contagious disease continues to spread along military and trade routes with human beings. Contagious disease, however, now travels these routes at supersonic speeds. Contagious disease respects no borders and carries no passport. International air travel has rendered the idea of national quarantine measures obsolete.

Airline travel, like transoceanic ships in 1918, present an ideal environment for the spread of influenza. Passengers are cramped together for long periods of time and breathe recycled, dry air. Airlines use high-efficiency particulate air filters to filter cabin air aboard aircraft while in flight. While these are the same kind of filters used in hospital emergency rooms, planes built after the mid-1980s recycle only up to 50 percent of their air in order to save on fuel costs. When one passenger is ill, the cabin environment is an ideal atmosphere to spread a virus. One episode from the SARS outbreak illustrates the speed with which a virus can spread. On March 15, 2003, a

164 FIDLER, supra note 122, at 70 (discussing how globalization has led to greater spread of infectious disease).
165 See id. at 70-71. As an example of a successful national quarantine strategy, Australia successfully prevented the 1918 influenza pandemic from breaching its borders until very late in the outbreak. BARRY, supra note 3, at 375-76.
166 GARRETT, supra note 29, at 569-70.
169 ABRAHAM, supra note 15, at 92.
170 Smith, supra note 168, at 726.
171 GARRETT, supra note 29, at 569.
seventy-two-year old man boarded a flight in Hong Kong destined for Beijing. He had recently visited his sick niece in a hospital in Hong Kong and was ill when he boarded the flight. From his seat, he infected twenty-one other people on the flight, including those sitting seven rows away. He infected two stewardesses from Mongolia who in turn spread the virus to nearly three hundred people in that country. Several other people of different nationalities destined for various parts of the world caught and spread the virus as well.

During the SARS outbreak, the International Civil Aviation Organization issued guidelines on issuing informative leaflets to arriving passengers on SARS, screening of arriving passengers for symptoms, radioing ahead if a passenger appeared to be infected with SARS, instructing crew members on how to deal with suspected SARS cases while in flight, and disinfecting an aircraft which had a SARS infected passenger aboard. Other organizations such as the International Air Transport Association worked closely with the WHO to coordinate a response to the SARS outbreak, recognizing the threat a large-scale outbreak would have on the airline industry.

The primary body of law governing infectious disease and air travel is the Convention on International Civil Aviation. Article 14 of the Convention mandates contracting states take the lead and enact measures to prevent the spread of communicable disease during air travel. During the SARS outbreak, for example, the Canadian government issued Health Alert notices to all arriving and departing passengers. The notices outlined how to identify symptoms associated with SARS. Further, each passenger was required to provide contact information in order for government health officials to identify

172 ABRAHAM, supra note 15, at 91.
173 Id.
174 Id.
175 Id.
176 Id. Four Taiwanese workers, a Chinese government employee en route to Thailand, and a Finnish labor organization official were all infected on board and contributed to the spread of SARS. Id.
178 Abeyratne, supra note 102, at 58-59.
180 Abeyratne, Tuberculosis, supra note 167, at 45.
182 Id.
him in the event one of his fellow passengers developed symptoms.183 Later, the notices were amended to include questions about travel and personal health.184 Anyone answering “yes” to any one of the questions was sent for an interview with a government health nurse.185 Additionally, major airports were outfitted with thermal screening devices that would monitor passengers walking passed in an effort to identify individuals with high temperatures and, therefore, possibly a SARS case.186 Individual airlines, however, also could potentially face liability for their actions of allowing an obviously sick individual to board a plane.187

Airlines owe passengers a duty of care to protect that person from harm. If one passenger contracts a contagious disease in flight from another passenger, the airline may be liable if it is found to have knowingly allowed an infected person to travel on the plane or willfully blinded itself by not investigating the infected passenger’s symptoms.188 Moreover, under the Montreal Convention of 1999,189 an airline may be liable for injury suffered during flight.190 Further, under the Warsaw Convention of 1929,191 passengers who are wounded or injured during flight may have a cause of action against an airline. However, the issue is whether contracting an infectious disease like avian influenza while aboard an aircraft constitutes injury or wounding.192 No such cases have arisen, however, and this remains an issue for future litigation. During a large-scale avian influenza outbreak, however, national governments would closely monitor arriving passengers for signs of infection and, consequently, airlines would have an interest in vigilantly monitoring the health of their boarding passengers.

183 Flood & Williams, supra note 91, at 242.
184 Id.
185 Id.
187 See generally Abeyratne, supra note 102.
188 Id. at 61.
190 Abeyratne, supra note 102, at 61. See also Convention for the Unification of Certain Rules for International Carriage by Air art. 17.
192 Abeyratne, supra note 102, at 64.
2. Travel Advisories

During an avian influenza outbreak, national governments and the WHO would issue travel warnings against nonessential travel to infected areas. Such was the case with the SARS outbreak. The WHO issued travel advisories for Hong Kong and the Guangdong Province of China. Later, a travel advisory for Toronto, Canada was issued. Canadian officials, angered by what they perceived as an unnecessary warning, strongly petitioned the WHO to lift its warning. Citing severe damage to local business and the tourism industry, the travel advisory was lifted in only days.

During the SARS outbreak, however, some argue the WHO went beyond its authority in the IHR by implementing the travel advisories. These were in fact the first travel advisories ever issued by the WHO. The advisories were warnings directed at individual travelers, not at WHO member states. Further, there appears to have been no consensus among the member states for the issuing of the travel advisories. Rather, Harlem Brundtland, the Director-General of the WHO, seeking to avoid controversy, issued the initial alert without consulting member states. Brundtland was praised by her colleagues because they understood she did not want the WHO blamed later for failing to warn the world of a new infectious disease.

193 ABRAHAM, supra note 15, at 92.
194 FIDLER, supra note 2, at 90.
198 Fidler, supra note 106, at 495. These were the IHR in place during the 2003 SARS outbreak, not the recently revised IHR of May 2005.
199 Flood & Williams, supra note 91, at 243.
200 Fidler, supra note 106, at 495.
201 Id.
203 ABRAHAM, supra note 15, at 86-87.
204 Id. at 87.
The controversy regarding the issuing of alerts and travel advisories is unlikely to erupt again if avian influenza begins to spread the same way SARS did. While acting beyond its authority, the WHO acted under its mandate to monitor disease and prevent its spread. To have done otherwise would have allowed the illness to further establish itself and left many uninformed. Brundtland's decision, although controversial, was correct and, ideally, such decisions would be made in the event of a large-scale avian influenza outbreak.

3. Impact on Trade

Avian influenza is likely to have a drastic impact on trade should the outbreak become widespread. Trade routes and goods exchanged in trade are often another mode of transportation for infectious disease. Government officials may act to restrict or ban the entry of goods or vessels from infected areas, fearing introduction or spread of a disease. Rejecting trade agreements or operating through the agreements’ adjudication procedures, nations may disregard their commitments during an outbreak. Moreover, fearing a negative impact on trade, government officials could delay the announcement of the presence of an outbreak in their country. For example, China covered up initial SARS cases fearing trade implications and its application to the WTO.\(^\text{205}\)

Under the World Trade Organization and the General Agreement on Trade and Tariffs (GATT), as well as other multilateral and bilateral trade agreements, a balance has been struck between a nation’s right to restrict the entry of contaminated goods and disciplinary actions designed to punish a nation for misusing the protectionist health measures.\(^\text{206}\) Such protections were implemented in Europe in 2003 when the European Commission, fearing a fresh outbreak of another strain on avian influenza, banned the export of poultry and hatching eggs from the Netherlands.\(^\text{207}\)

Moreover, during the avian influenza outbreak among poultry in British Columbia in 2004, several nations around the world suspended imports of Canadian poultry products.\(^\text{208}\) Japan, South Africa, the

\(^{205}\) Id. at 102.

\(^{206}\) FIDLER, supra note 122, at 219-21. Under article XX(b) of the GATT, as Fidler notes, a nation has the right to restrict trade to protect public health. See id at 221-23. See also General Agreement on Tariffs and Trade, Oct. 30, 1947, Art. XX(b), GATT Secretariat, Geneva, July 1986, available at http://www.wto.org/english/docs_e/legal_e/.


\(^{208}\) See generally COMPREHENSIVE REPORT ON THE 2004 OUTBREAK OF HIGH
European Union, and the United States all limited their import of Canadian poultry products in some way due to the outbreak. During an avian influenza outbreak, nations would presumably restrict the import and export of poultry and poultry products in the same way some nations restricted imports of beef from countries where "Mad Cow" disease is present.

In conclusion, an avian influenza pandemic would have widespread impact on international affairs and the law. The outbreak will affect all aspects of travel, trade, and civil liberties. Just like several nations restrict the movement and entry of HIV/AIDS infected people or require proof of vaccinations for certain disease prior to being admitted entry, such policies would likely appear during an avian influenza outbreak. Further, developing nations, such as the Asian countries currently experiencing avian influenza outbreaks, would demand medical care and financial assistance from the developed nations. This has already occurred in Vietnam. When faced with their own massive outbreaks and response, developed nations would not likely have the resources to assist developing nations with their plight. Consequently, they would be left to suffer.

Domestically, however, there are numerous ways for a nation to address a large-scale outbreak of avian influenza. Preparation is the

Pathogenicity Avian Influenza (H7N3) in the Fraser Valley of British Columbia, Canada (Wayne Lees ed., 2004), http://www.inspection.gc.ca/english/anima/heasan/disemala/avflu/2004rep/introe.shtml (providing an executive summary of the 2004 outbreak of avian influenza in Canada). The strain of avian influenza that hit British Columbia in 2004 was not the H5N1 strain discussed in this paper, however. The strain was the H7N3 and symptoms in humans were restricted to eye infections. See Ctrs. for Disease Control & Prevention, Dep't of Health & Human Servs., What You Should Know about Avian Flu, http://www.cdc.gov/flu/avian/gen-info/avian-flu-humans.htm (last visited Jan. 15, 2006).


See FIDLER, supra note 122, at 296-97.

Bryn Nelson, Global Threat: Experts Say Deadly Virus Presents Grave Risk if We Don't 'Get Our Act Together', NEWSDAY, Mar. 6, 2005, at A03.

initial concern, but once an outbreak has been recorded, other measures are likely to be implemented.

C. Domestic Ramifications of an H5N1 Outbreak

Ultimately, each nation would be left to provide for the health and safety of its citizens, whether through vaccinations, quarantines, isolation, \(^{214}\) or mandatory masking. However a nation chooses to battle the outbreak, there will be charges that civil liberties were trampled upon. What government officials must consider, therefore, is a balance between public health measures to halt the spread of the virus and maintaining public support for government policy.

In the United States, states are primarily responsible for public health unless there is an effect on interstate commerce, when it then becomes a matter of federal concern. \(^{215}\) Most states, however, have passed some type of Model State Emergency Health Powers Act (MSEHPA), which, among other things, calls on health care providers to report all persons infected with a contagious disease that may cause a public health emergency, enables governors to declare a state of emergency, and even authorizes the confiscation and rationing of personal property. \(^{216}\) In Canada, public health care is largely a matter of provincial concern; however, there is overlap with federal and municipal governments. \(^{217}\) Usually, the more local forms of government take the lead in issuing laws related to infectious disease control.

1. Mandatory Masking

During the 1918 pandemic, several American cities, including San Francisco, implemented mandatory masking ordinances. Believing voluntary masking by citizens reduced the number of influenza cases and deaths during late September 1918, the San Francisco Board of Health recommended to the Board of Supervisors \(^{218}\) that all San Fran-

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\(^{217}\) Flood & Williams, supra note 91, at 234-35.

\(^{218}\) San Francisco's Board of Directors is the equivalent of another city's city
ciscans be ordered to wear a mask. The zealous Chief of the Board of Health declared if compulsory masking were implemented, influenza "[would] be under control in a week." The San Francisco ordinance read, in part:

Every person appearing on the public streets, in any public place, or in any assemblage of persons or in any place where two or more persons are congregated, except in homes where only two members of the family are present, and every person engaged in the sale, handling or distribution of foodstuffs or wearing apparel shall wear a mask or covering except when partaking in meals, over the nose and mouth, consisting of four-ply materials known as butter-cloth or fine mesh gauze.

Influenza lingered in San Francisco longer than one week. It did not dissipate until early 1919. Numerous people, however, were charged for violating the San Francisco masking law. To some, masks were a nuisance and inconvenience. Others thought it humiliating and unconstitutional to be compelled to wear a mask. Resistance grew. The Anti-Masking League was formed by civil libertarians and smokers who were caught by the thousands and arrested. Police raided hotel lobbies in one mass sweep and arrested four hundred people who had slipped their mask down around their chins in order to smoke a cigarette.

During the SARS outbreak, numerous individuals wore masks in public and to work. There were, however, no masking laws enacted during the SARS outbreak. If a large-scale outbreak of avian influenza occurred, it is difficult to imagine modern day masking ordinances. While many individuals would voluntarily mask themselves, being ordered to purchase and wear a mask is likely to raise constitutional challenges.

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219 CROSBY, supra note 13, at 102.
220 Id. at 102.
221 Id. (citing S.F. CHRON., Oct. 15, 18-20, & 24, 1918 and Board of Supervisors of the City and County of San Francisco, 13 J. of Proceedings 900-01 (1918)).
222 Id. at 114.
223 Id. at 105.
224 NIKIFORUK, supra note 13, at 154.
225 CROSBY, supra note 13, at 105.
226 The ideal mask was (and remains) the N95 respirator which is approved by the National Institute for Occupational Safety and Health (NIOSH). See WHO, WHO Interim Recommendations for the Protection of Persons Involved in the Mass Slaughter of Animals Potentially Infected with Highly Pathogenic Avian Influenza Viruses (Jan. 26, 2004), http://www.wpro.who.int/sites/csr/documents/.
227 Upon arriving at Toronto's Pearson International Airport on May 1, 2003, the author was greeted by Canadian Customs officials wearing masks.
Quarantine, like isolation, represents the ultimate restrictions on an individual’s civil liberty: the restriction of movement. Quarantine and isolation are two different measures, however. Quarantine is a large-scale restriction of a population’s movement. Historically, quarantine was the detention of people suspected of carrying a disease, primarily travelers. Today, quarantine measures restrict the movements of healthy individuals believed exposed to an infectious disease during its period of communicability in order to prevent future transmission. There are various levels of quarantine, including travel advisories warning people about travel to certain regions, travel restrictions preventing travel to infected areas, canceling public events, and curfews. One provision in the MSEHPA, however, empowers health officials to use “every available means to prevent the transmission of infectious disease and to ensure that all cases of contagious disease are subject to proper control and treatment.” Accordingly, health officials can quarantine individuals for up to fifteen days (ten more days if a petition is filed by the health authority) before that person has a right to be heard by a court.

One of the most flagrant abuses of a quarantine measure implemented in the United States comes from the case Jew Ho v. Williamson. In Jew Ho, the court struck down a quarantine measure restricting the movement of people living within a twelve-block area of San Francisco after nine cases of bubonic plague were diagnosed. The quarantine measure in question, however, applied only to people of Chinese ancestry. In Jew Ho, the court declared it would uphold any “reasonable regulation” imposed for protecting people from the disease. It further declared it would “give the widest discretion” in construing the regulations adopted by the Board.
3. Isolation

Isolation applies to individuals who are personally restricted from contact with others. Isolation pertains to infected persons, whose movements and contacts are restricted in order to prevent further transmission of the outbreak.

During the SARS outbreak in Toronto, judges were called on to deal with issues of quarantine, isolation, and forced treatment. As SARS developed in Toronto, medical officers wanted to invoke special powers under the provincial Health Protection and Promotion Act. The statute, as one judge described it, allows medical officers to bring applications, supported by evidence, before judges stating that the officer has ordered a person into treatment or quarantine and the person refused to comply. The police can be ordered to apprehend the person if necessary. One case resulted in a person suspected of being infected with SARS being detained by police and transported to a hospital quarantine facility, where a hearing involving lawyers and the judge was conducted by telephone. Generally, however, people complied with quarantine orders during SARS. In cases dealing with quarantine measures set up in prisons and further restricting the movements of prisoners, Ontario courts credited

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237 Id.
238 Id. at 26.
239 Thomason, supra note 105, at 318.
240 GOSTIN, supra note 215, at 210. For example, Toronto's first case of SARS died at home with her family members present. Her SARS was unrecognized so early in the outbreak. Days later her son became ill and was admitted to the hospital where he also died. Four other family members soon began to exhibit symptoms and were immediately put into isolation wards in four separate Toronto area hospitals. Tomislav Svoboda et al., Public Health Measures to Control the Spread of the Severe Acute Respiratory Syndrome During the Outbreak in Toronto, 350 NEW ENG. J. MED. 2352, 2358 (2004).
242 Cowan, supra note 93, at 4.
243 Id.
244 Id. The case in question, however, was moot in that the medical officer withdrew his quarantine order after determining the individual had not been exposed to SARS. The individual, however, had been subject to forcible confinement for three days. Id.
245 Id. at 6.
246 During the height of the SARS outbreak in Toronto, prisoners had their family visits cancelled, contact with lawyers was severely limited (allowed by tele-
prisoners three days of time served for each day they endured the hardships of heightened lockdown during the SARS outbreak in Toronto.

During the 1918 pandemic, the public challenged other measures implemented to restrict the spread of the disease. For example, in *Globe School Dist. No. 1 of Globe County, Arizona v. Board of Health of the City of Globe*, the local school board sought to enjoin its local board of health and city officers from enforcing a local closing order compelling schools to close. The closing ordinance declared it unlawful for two or more people to congregate at theatres, movie houses, banks, businesses, pool halls, dances, schools, and churches during the 1918 influenza outbreak. The school board argued it was beyond the authority of the local Board of Health to pass such a drastic closing order. The local board of health, however, based its closing order on the advice of doctors at a conference of members of state and local boards of health, which was convened to address the large number of cases and deaths due to influenza. The Arizona Supreme Court held that while an emergency clearly existed, “to concede that any board of health has been delegated the legislative power to declare what is or is not a nuisance is to concede that boards of health may be delegated legislative power, and this cannot be done.” No law gave the local board of health this authority. The court struck down the portion of the regulation giving the local board of health the authority to declare what constituted a nuisance, but found the local board of health had the power to issue a closing order. The closing order was an “emergency measure, to be effective only during the emergency requiring it.” The court declared Arizona’s Board of Health was empowered to make and enforce all rules to prevent, cure, and halt the spread of any contagious disease. Its powers, however, were administrative, but “[t]he emergency calls forth the occasion to exercise the power to protect the public health.”

Another example of a challenge to a local closing order came in *C. J. Alden v. State* where the appellant was arrested for violating a phone through a glass partition), all volunteer programs were cancelled in an effort to prevent prisoners from being exposed. See generally The Queen v. Blake, 2003 W.C.B.J. 7686; and The Queen v. Bhangal, 2004 O.N.C.J. 266.

247 *Id.*
248 *Id.* at 210.
249 *Id.*
250 *Id.* at 211.
251 *Id.* at 211.
252 *Id.*
253 *Id.* at 214.
254 *Id.* at 218.
local board of health regulation mandating all movie houses be closed in order to prevent the spread of influenza.\(^{255}\) Appellant Alden challenged the constitutional authority of the local board of health to enact rules compelling him to close his place of business.\(^{256}\) The court declared the regulations were reasonable to prevent the spread of the virus and that the board acted well within its powers during the 1918 epidemic.\(^{257}\)

During an avian influenza outbreak, similar objections to various quarantine, isolation, or closing orders can be expected.\(^{258}\) Currently, public resistance to government measures to prevent the spread of the virus among birds have already taken shape. In Vietnam, for example, when WHO officials expressed grave concerns about the spread of avian influenza among the domestic bird population, local farmers objected to recently enacted bans on keeping birds.\(^{259}\) In Vietnam, "backyard farmers" raise about 90 percent of the country's poultry.\(^{260}\) The WHO recommends these farmers keep all birds out of their homes and segregate different species of birds.\(^{261}\) Some have already voiced concern, however, that jobs are being lost and local business is suffering because, in a country where 50 percent of all households keep and raise birds for food and for sale, curbing sales and requiring separate pens for the animals is too much to ask of a subsistence farmer.\(^{262}\)

Further, in Thailand, there is growing discontent among farmers as they watch their flocks killed off to prevent an outbreak.\(^{263}\) Some

\(^{256}\) Id.
\(^{257}\) Id. at 236.
\(^{258}\) During the SARS outbreak, for example, China implemented many of the same measures related to the closing bans discussed above. Closing orders are universal measures designed to prevent the spread of a viral contagion like SARS or avian influenza. See John Gittings, \textit{Beijing Theatres and Bars Closed In Crackdown}, \textit{GUARDIAN UNLIMITED}, Apr. 28, 2003, http://www.guardian.co.uk/sars/story/0,13036,944819,00.html. For a critique of MSEHPA see generally Nat'l Vaccine Info. Ctr., \textit{supra} note 233, \textit{supra} note 259, at A4.
\(^{260}\) Id.
\(^{262}\) Piller & Maugh II, \textit{supra} note 259, at A4.
find the new regulations difficult to comply with. 264 Others are upset at the loss of their livelihoods. 265

Closing businesses represent loss of jobs, income, and consumer spending power. Closed schools means parents are responsible for the daylong care of their children. Restricting what farmers can sell or how to keep their livestock cause resentment. All play to undermine government efforts to prevent, contain, or reduce the impact of avian influenza. Furthermore, the sweeping powers enumerated in the MSEHPA frighten individuals who recognize the potential for government action during an emergency without a legal check from the courts, thereby impinging upon their civil rights. 266 To maintain balance, the public must be informed. They must be made aware of how their personal actions impact the spread of the virus. Swiftly implemented government regulations, however, threaten to undermine age-old cultural and societal traditions, especially in Asia.

4. Vaccinations

Currently, there is no one vaccine for the avian influenza virus infecting Asia because the virus is continually mutating. 267 Some countries are stockpiling doses of general avian influenza vaccines, but at the moment there is no vaccine specifically for the H5N1 outbreak in Asia. 268 In the event of pandemic outbreak of avian influenza, it would take over six months to develop and test a vaccine. 269

264 Id. (discussing farmers being forced out of business and their grumblings about aspects of the new regulations such as having to change clothes each time they enter a chicken house).

265 Id.

266 GOSTIN, supra note 215, at 472.

267 Ctrs. for Disease Control & Prevention, Dep’t of Health & Human Servs., Key Facts: Information About Avian Influenza (Bird Flu) and Avian Influenza A (H5N1) Virus (Jan. 10, 2006), http://www.cdc.gov/flu/avian/gen-info/facts.htm; Telephone Interview with Christine Pearson, Spokesperson, Centers for Disease Control and Prevention (Mar. 30, 2005).


The Swine Flu threat of 1976, however, is the precedent for large-scale, swift vaccination of a civilian population against influenza.\textsuperscript{270} Over forty million Americans, one third of the population, were vaccinated during the fall of 1976.\textsuperscript{271} This was the largest vaccination program in American history.\textsuperscript{272} However, there were several problems associated with the Swine Flu vaccination program which must be avoided by any vaccination program implemented to deal with an avian influenza outbreak. Liability issues, however, were the primary problem with the vaccination program.\textsuperscript{273} Insurance company officials feared liability of possible side effects from the vaccinations and informed pharmaceutical companies they could not provide liability insurance.\textsuperscript{274} Congress acted quickly, fearing an outbreak.\textsuperscript{275} It hastily passed the Swine Flu Act of 1976\textsuperscript{276} and implemented President Ford’s plan to vaccinate every American.\textsuperscript{277} The Act was passed so quickly that there were no hearings or committee reports and the majority of legislators did not read the Act.\textsuperscript{278} The Act, however, provided that the federal government would bear the liability for any complications arising from vaccinations.\textsuperscript{279} When people started to die or become ill after being vaccinated, however, media attention worked to undermine the public support.\textsuperscript{280} The program ended in December 1976 when increased incidence of side effects was noted.\textsuperscript{281} The media, many argue, exaggerated the health effects of swine flu and the risk of illness or death due to vaccination.\textsuperscript{282}

The federal government must not fear overreacting to avian influenza like it did to the swine flu outbreak in 1976. The media must

\textsuperscript{271} GOSTIN, \textit{supra} note 215, at 185-86. Swine Flu originated as an outbreak of influenza among arm recruits in 1976. The CDC identified the virus and feared another outbreak of influenza along the lines of the 1918 influenza pandemic. Officials at the CDC advised President Gerald Ford to implement a mass vaccination program. \textit{Id.} See generally \textsc{Garrett, supra} note 29, at 153-91.
\textsuperscript{272} \textit{Unthank v. United States}, 732 F.2d 1517, 1519 (10th Cir. 1984).
\textsuperscript{273} \textit{Id.}
\textsuperscript{274} GOSTIN, \textit{supra} note 215, at 186.
\textsuperscript{275} \textit{Unthank}, 732 F.2d at 1519-20.
\textsuperscript{277} \textit{Wallace v. United States}, 669 F.2d 947, 950 (4th Cir. 1982).
\textsuperscript{278} KOLATA, \textit{supra} note 16, at 164. See also \textit{Unthank}, 732 F.2d at 1519-20.
\textsuperscript{279} GOSTIN, \textit{supra} note 215, at 186.
\textsuperscript{280} KOLATA, \textit{supra} note 16, at 165-66.
\textsuperscript{281} GOSTIN, \textit{supra} note 215, at 186 (discussing Guillain-Barré syndrome resulting from vaccinations).
\textsuperscript{282} \textit{Id.} at 187.
collaborate with government in the face of a real or likely threat. To overreact is far more excusable than to delay. Waiting until avian influenza is present and spreading is too late to implement a nationwide vaccination program. Further, just as the American federal government accepted liability for complications arising from vaccinations, so should other governments who choose to implement a nationwide avian influenza vaccination program. To do otherwise hinders efforts to prevent the spread of the virus. Accordingly, nations should develop avian influenza vaccination programs and have them ready to implement once avian influenza begins to spread.

Another issue to consider is forced vaccinations of individuals. Section 603 of the MSEHPA empowers public health officials “to vaccinate persons as protection against infectious disease and to prevent the spread of contagious disease or possibly contagious disease.” Should avian influenza develop into a serious threat to the nation’s security, forced vaccination could be conducted and would likely be upheld by the Supreme Court. In Jacobson v. Massachusetts, the Court held that a compulsory smallpox vaccination had a substantial relation to the protection of the public health and safety of the state of Massachusetts. The defendant argued his liberty was invaded by forced vaccination, but the Court reasoned that for the benefit of all, certain restrictions and restraints on liberty were needed for the common good. To hold otherwise, the Court declared, would “strip the legislative department of its function to care for the public health and the public safety when endangered by epidemics of disease.”

In conclusion, on the domestic front, a nation must maintain a balance between legal controls and public willingness to comply. Implemented laws should remain feasible for daily living, but strictly enforced. Forced vaccinations, mass quarantine, or long-term isolation without access to legal counsel should be avoided for fear of an erosion of public support and trust. Further, nations should develop plans to implement if avian influenza begins to spread uncontrollably. Local, provincial, and federal levels of government must establish protocols delineating responsibilities. Lines of communication must

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285 Id. at 26.
286 Id. at 37.
287 WHO, supra note 269, at 5.
be established. No nation will be able to fend off the virus alone. Preparation is the key.

IV. RECOMMENDATIONS

The emergence of human cases of H5N1 avian influenza and direct human-to-human transmission of the virus is a warning.\(^{288}\) The governments of the world as well as health organizations must prepare for the possibility of a global pandemic outbreak. National governments, health care providers, medical researchers, and the public must cooperate to stem the threat.\(^{289}\)

Internationally, the WHO should continue to lead the global monitoring and response to the outbreak.\(^{290}\) It is the only public international health organization with broad international support, legal authority, and public health expertise to address the emerging threat posed by an avian influenza pandemic. Moreover, WHO officials and researchers have the unique ability to monitor avian influenza activity in closed countries such as North Korea.\(^{291}\)

Domestically, however, there is much individual nations can do to prepare and deal with an outbreak. Adopting a national plan to combat an outbreak of pandemic influenza, stockpiling of vaccines and antiviral drugs,\(^{292}\) and establishing priority rankings of who would receive these drugs are important. Moreover, increasing surge capacity in hospitals is essential to handling the number of sick people who will require medical assistance and strain medical services.\(^{293}\) Physicians must be trained to identify potential avian influenza patients, and nursing staff must be trained to inquire into a patient’s travel history.\(^{294}\) Finally, clear and established lines of communication must be in place in order to direct the response to the outbreak.\(^{295}\) Without

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\(^{288}\) See Stöhr, supra note 7, at 407.

\(^{289}\) Stern & Markel, supra note 1, at 1478.

\(^{290}\) Telephone Interview with Christine Pearson, supra note 267. Ms. Pearson stated that the WHO is the “primary lead” in the global effort to monitor and combat the threat posed by avian influenza. Id.

\(^{291}\) Barbara Demick, Bird Flu Hits N. Korea In Sore Spot: The Destructive Nation Has Made A Rare Success of Poultry Production, Which Now Faces Disaster, L.A. TIMES, Mar. 31, 2005, at A1. News reports have confirmed the presence of H5N1 avian influenza in North Korea. Sitting Ducks, supra note 156, at 35.

\(^{292}\) The Bush administration plans to purchase twenty million doses of Tamiflu, but as of October 2005, the United States had only stockpiled enough to treat 4.3 million people. Wysocki Jr., supra note 269, at A1.


\(^{294}\) Ctrs. for Disease Control & Prevention, supra note 46, at 1191.

\(^{295}\) Weinstein, supra note 293, at 2334.
these measures, nations will be unprepared, citizens uninformed, and hospitals overburdened. This will result in an increased reliance on quarantine, isolation, and closing orders, which increase the likelihood of public resentment and general disobedience.  

A. Preparations for an Eventual Outbreak

After the SARS outbreak, there were renewed calls for more comprehensive preparations, both internationally and domestically, for a global outbreak of disease. However, even before the 2003 SARS outbreak, in April 1999 the WHO’s Department of Communicable Disease Surveillance and Response convened a meeting in Geneva, Switzerland to discuss the role of the WHO and national and regional planning for an influenza pandemic. The purpose was to assist medical and public health leaders in responding to future threats and to recommend all countries establish national pandemic planning committees in order to develop national strategies in dealing with a future pandemic. Noting air travel would accelerate the spread of the new virus and health care systems would be “overburdened, economies strained, and social order disrupted,” it was determined that a preparation plan could not feasibly halt the spread of the virus, but could minimize the consequences of an outbreak.

In the United States, the General Accounting Office (GAO) produced a report in October 2000 highlighting issues such as stockpiling vaccinations and antiviral drugs as well as developing plans to identify priority groups who would receive these drugs should a pandemic erupt. Today, many nations either have or are currently developing

296 See Stöhr, supra note 7, at 406-07.
297 Naylor et al., supra note 103, at 2485.
299 Id. at 5.
300 Id.
plans to combat an influenza pandemic. All nations, however, should develop a plan to address pandemic outbreaks of disease and should be encouraged to comply with the IHR.

B. Educating the Public

As noted in hearings before the Committee on International Relations on June 29, 2000, it is difficult to galvanize the public to the issue of infectious disease when the disease is a slow-moving killer in a far-off part of the world. Although media reports carry news of the avian influenza outbreak, both local inhabitants and foreign travelers are often left uninformed. For international travelers traveling to and from infected regions in Asia, announcements should be made aboard conveyances. Announcements made aboard commercial airlines, for example, should warn passengers who experience flu-like symptoms to seek immediate medical attention. Travelers should be expressly warned about coming into contact with both domesticated and wild birds as well as eating local delicacies comprised of uncooked poultry. Further, physicians, nurses, and other medical staff should be trained to inquire about a patient’s recent travel history when interviewing a patient complaining of flu-like symptoms.

In Asia, the dangers of avian influenza must be emphasized. Local doctors and health care providers must be taught how to recog

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303 For a detailed assessment of risk perception related to avian influenza in Hong Kong, see Richard Fielding et al., Avian Influenza Risk Perception, Hong Kong, 11 EMERGING INFECTIOUS DISEASES 677 (2005).

304 Infectious Diseases, supra note 301, at 3.

305 Ctrs. for Disease Control & Prevention, supra note 46, at 1191.

306 For example, when an ill Vietnamese woman who had cared for her recently deceased brother was brought to a local clinic suffering from an unknown illness, the medical staff, not aware of avian influenza, sent the woman home with instructions to perform a ceremony to appease angry spirits. James Hookway, supra note 5, at A1.
nize the symptoms and contact government authorities when a suspected case is identified. Further, farming practices must be altered to reduce the risks of spreading the virus not only among domesticated birds, but also from domesticated to wild migratory birds or to other mammals, such as pigs. Altering animal husbandry practices in Asia, however, while a major step in restricting the spread of the contagion, is unlikely to be implemented soon enough to stem the current outbreak.

However, people who are unaware of or do not "worry[y] about infectious diseases do not support prevention programs and do not appreciate the need for changes in their way of life." Such awareness, however, only comes from properly funded education.

C. Economic Support

Funding measures aimed at promoting awareness and control of avian influenza must be increased and implemented. The UN's Food and Agricultural Organization (FAO) and the World Organization for Animal Health (OIE) met in Vietnam in February 2005 to discuss avian influenza. They assessed the avian influenza threat and advised on new control measures. Together, the two organizations called for a three-year, $100 million international investment at the national level in Asia. Further, in May 2005, the WHO held an inter-country meeting to assess the avian influenza crisis. While not specifying amounts, the WHO called for international organizations to coordinate their resources and declared "support should be given to capacity building as well as urgent or emergency solutions."

Ideally, the WHO should create a global avian influenza fund by coordinating donations and funding. As the world leader in addressing

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307 See id.
311 Id. at 9.
313 Id. at 6.
the issue, the WHO has the resources and knowledge to properly di-
rect the monies and monitor their use.

D. Local Public Health Care in Asia

Medical and scientific facilities in Asia as well as local infrastruc-
ture must be improved to facilitate communication, access to patients,
and transportation of medical supplies. Facility and infrastructure im-
provements, however, rely on an increase in awareness and funding.
For example, local medical care providers must have access to more
sophisticated training and testing equipment.\textsuperscript{314} Current levels of train-
ing and the use of outdated equipment in Vietnam recently led to the
discovery of previously "overlooked cases" of avian influenza, which
were diagnosed after retesting. The current situation highlights the
need to improve local health facilities.\textsuperscript{315}

E. Prevention

Several measures can be implemented to prevent to the spread of
avian influenza, but prevention measures rely on an educated public
and properly funded initiatives.

1. Surveillance

While the WHO, through GOARN, is responsible for much of the
global surveillance of the outbreak and spread of infectious diseases
like avian influenza, national governments must play a greater role in
detecting and monitoring outbreaks in their initial stages. Focusing on
avian influenza, governments in affected countries must be encour-
aged to establish laboratories and monitoring stations throughout their
countries. All information gathered must be consolidated and commu-
nicated to the WHO in compliance with the IHR.

Local government officials must be encouraged to monitor the
health of birds for sale in markets as well as the health of migratory
wild birds within their territory. Bird smuggling must be vigilantly
monitored and game fighting banned.

2. Culling

Recognized as having helped to avoid a large scale pandemic
among birds in 1997, the mass culling of infected birds must be im-

\textsuperscript{314} See Piller, \textit{supra} note 49, at A11.
\textsuperscript{315} Naik, \textit{supra} note 160, at A2; VIETNAM REPORT, \textit{supra} note 310, at 7.
Many consider culling the first line of defense against an encroaching threat. Accordingly, to foster compliance, local farmers should be adequately compensated for their property and encouraged to comply.

3. Hygiene

Proper hygiene in all countries should be stressed. In Asia, contact with wild and domestic birds should be reduced, open-air markets disinfected or even closed, and all contact with the mucous and other bird secretions halted. Finally, proper hand-washing should be emphasized in all regions.

CONCLUSION

Although the world is currently facing "the gravest possible danger" of a global pandemic, the WHO and individual nations have reacted appropriately. The magnitude of the 1918 influenza outbreak and swift spread of the SARS virus in 2003 have guided epidemiologists in their reactions to the present outbreak. Together, these past two outbreaks indicate that if left to spread, avian influenza has the potential to be an unprecedented, fast moving, global killer.
Nations must prevent the erosion of trust among citizens and work to ensure people are informed about the various responses that may be taken should the outbreak spread. If the public loses trust in the government during a large-scale epidemic, mass dissent and disregard for public health measures and law may result. In such a lawless environment, the avian influenza virus would spread rapidly, further undermining all law.
