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Introduction

This chapter is designed to test your knowledge of the legal concepts that we have examined so far. Engaging with the exercise will give you a sense of your strengths and weaknesses in understanding the material and will be good preparation for a final examination.

The facts in the briefings and the scenario are grounded in science, but they are not intended to substitute for the most authoritative research. Obviously, the narrative and many of the details are invented. The exercise encompasses only a small number of the many issues that would arise should a real outbreak occur. As you read the scenario, note what some of the most important additional issues would be if the event actually occurred.

Background Briefing: Pandemic Influenza

A Potential Influenza Pandemic
Congressional Budget Office 2006

Although a pandemic could be caused by any of several influenza strains, scientists are particularly worried about H5N1, a strain that has caused repeated epidemics with high mortality among poultry in Asia, has spread from Southeast Asia to flocks in Central Asia and Europe, and has made the jump from birds to humans, causing the deaths of over 60 people. Moreover, viruses of the H5 subtype are not known to have ever circulated among the human population, which means that there would be little immunity to it. To date, close contact with infected poultry is thought to be required for human infection, but the danger exists that the virus will evolve in a way that allows for efficient human-to-human transmission.
If the virus does acquire that capability, a worldwide epidemic, or pandemic, could occur. Depending on the virulence of the particular strain of flu, such an outbreak could have substantial consequences for people and economic activity around the world. …

Avian influenza (or “bird flu”) is a contagious animal disease that infects birds and some mammals. Scientists believe that all bird species are susceptible to infection but that some are more resistant than others. Wild waterfowl, especially ducks, are a so-called natural reservoir of influenza viruses, including the bird flu. The birds carry the virus without displaying any symptoms of the disease and can spread the virus over great distances while remaining healthy.

Poultry are quite susceptible to avian influenza, which can cause a wide range of symptoms, from mild (reduced egg production) to severe (rapid death). The severe form of the disease, which is known as “highly pathogenic avian influenza,” is extremely contagious and has been the source of numerous epidemics among domesticated birds. It is also characterized by very high and rapid mortality, with rates approaching 100 percent and death sometimes occurring on the first day that symptoms appear.

Although frequently deadly for poultry, avian influenza viruses in the past have rarely caused severe disease in humans. However, in 1997, a highly pathogenic strain of bird flu known as H5N1 jumped from birds to humans during an outbreak among poultry in Hong Kong. The 1997 event was notable for two reasons. First, molecular studies indicated that the genetic makeup of the human and avian viruses were virtually identical, indicating direct transmission from birds to humans. Second, the H5N1 virus caused severe illness with extreme mortality among humans: of the 18 persons known to have been infected, six died. The outbreak ended after authorities slaughtered Hong Kong’s entire stock of poultry (about 1.5 million birds).

The Hong Kong episode put world health officials on alert because the H5N1 strain had fulfilled two of the three prerequisites for a pandemic. First, the strain was a new virus
subtype to which the population would have little or no immunity, and second, the virus had the ability to replicate in humans and cause serious illness. However, the virus still has not developed the ability to be transmitted efficiently from human to human. ...

Since the 1997 episode in Hong Kong, there have been several outbreaks of the H5N1 influenza around the world, leading to tens of millions of infections among poultry and dozens of cases among humans. The first human infection occurred in Hong Kong in February 2003, when a nine-year-old boy and his father became sick after a trip to southern China. The man, who was 33, died, but his son recovered.

Then, in 2004, the H5N1 virus spread among poultry populations in Southeast Asia, with outbreaks of influenza reported in two separate waves. The first wave, in January and February, affected Vietnam, Japan, Korea, Thailand, Laos, Cambodia, Indonesia, and China. The second wave, which began in July and continued into 2005, included outbreaks in the same countries and in Malaysia as well. More recently, the virus has shown up in Russia, Kazakhstan, Turkey, and Romania. The scope of the outbreaks is historically unprecedented: a highly pathogenic strain of avian influenza has not been known before to spread so widely and so rapidly.

The number of human cases of the H5N1 virus has also grown. Between January 2004 and August 2005, there were 112 human cases of H5N1 avian flu (in Vietnam, Thailand, Cambodia, and Indonesia) that resulted in 57 deaths. The vast majority of those cases (and deaths) involved children and young adults. However, accurately computing the case fatality rate (the percentage of infected persons who eventually die from the disease or from its complications) is impossible because authorities do not know how many people had milder cases but did not seek medical care or how many received care that was not reported. Nearly all of the human cases resulted from close contact with infected birds. There is evidence, though, of at least one case of probable human-to-human transmission, and some experts suspect that a few other cases of human-to-human spread of the H5N1 virus have occurred.
Events since the beginning of 2004 have heightened concerns among public health officials. Not only has the H5N1 virus spread widely – expanding beyond Southeast Asia and China into Central Asia and Europe – but laboratory results indicate that the virus has evolved in ways that may make a pandemic more likely:

- It has found a permanent ecological niche, becoming entrenched among domestic ducks in rural areas of Asia.
- It has become more robust than the 1997 strain and is able to survive longer under a broad range of environmental conditions.
- It has become increasingly pathogenic in poultry and has increased the range of species it can infect, now including domestic cats (in laboratory experiments) and captive tigers (after being fed infected chicken carcasses in a zoo in Thailand).
- It has become resistant to one of the two classes of antiflu drugs.

Experts do not know if an avian influenza pandemic is likely to occur, largely because they cannot predict when, or even if, the H5N1 virus might acquire the ability to pass readily from human to human. But the wider presence of the avian strain raises the probability of a pandemic because it increases the likelihood that an individual will become infected with the human strain and the avian strain at the same time, thus opening up the possibility of a genetic reassortment that could improve transmissibility of the disease. Wider prevalence of the virus also increases the likelihood that a series of mutations will produce a pandemic strain, even without the virus’s undergoing reassortment. ...

Although the dimensions of a future flu pandemic are unknowable, past outbreaks suggest the following pattern of events:

1. The virus would spread widely in a very short time. On the basis of experience with severe acute respiratory syndrome (SARS) in 2003, a pandemic influenza virus would be expected to cross national borders very rapidly.

2. A rapid surge in the number of cases in each affected area would occur very quickly, within weeks. The number of cases would vary with the severity of the outbreak, but there would be a sharp increase in demand for medical services.
3. The pandemic would probably spread across geographic areas and vulnerable populations in waves. In any given geographic region, each wave could last for three to five months, and a second wave could appear anywhere from one to three months after the first disappears. ...

### WHO Global Pandemic Phases

The World Health Organization has developed the system shown in Table 16.1 for coding phases of a pandemic, in the same way that codes indicate the severity of a storm or hurricane:

| Phase                              | Public Health Goals                                                                 |
|------------------------------------|--------------------------------------------------------------------------------------|
| **Interpandemic Period**           |                                                                                      |
| Phase 1 – No new influenza subtypes have been detected in humans. If present in animals risk of human infection or disease is considered low. | Strengthen preparedness                                                              |
| Phase 2 – No new influenza subtypes have been detected in humans, but a circulating animal influenza virus subtype poses a substantial risk of human disease. | Minimize risk of transmission to humans; detect and report such transmission rapidly if it occurs. |
| **Pandemic Alert Period**          |                                                                                      |
| Phase 3 – Human infections with a new subtype, but no human-to-human spread or, at most, rare instances and only to a close contact. | Ensure rapid characterization of the new virus subtype and early detection, notification and response. |
| Phase 4 – Small clusters with limited human-to-human transmission, but spread is highly localized. | Contain the new virus within limited foci or delay spread to gain time to implement preparedness measures, including vaccine development. |
| Phase 5 – Larger clusters but human-to-human spread still localized | Maximize efforts to contain or delay spread to possibly avert a pandemic and to gain time to implement pandemic response measures. |
| **Pandemic Period**                |                                                                                      |
| Phase 6 – Pandemic – increased and sustained transmission in general population | Minimize the impact of the pandemic                                                  |

Source: World Health Organization, Department of Communicable Disease
The Scenario Unfolds

Frank Wheeler’s wife, Martha, picked him up at Newark International Airport, and they returned home to Montclair, NJ. Frank was exhausted. He had spent two weeks in Istanbul representing his client, a computer maker, in negotiations over business transactions throughout Eastern Europe and Western Asia. He had been sneezing throughout the long flight back to the United States and wanted nothing more than to sleep. He took one day to recover from jet lag but found that the sneezing had progressed to a cough, scratchy throat, runny nose, and muscle aches. On his second day back, believing that he had the flu but worried about the work that had accumulated during his absence at his law office in New York, he took the commuter train into the city.

By the time he got home from work that day, he felt much worse. Most alarmingly, he was starting to have difficulty breathing. At about 3 a.m., when he began gasping for breath, Martha drove him to Montclair Memorial Hospital. He was intubated (a plastic tube was inserted into the trachea to assist in breathing) and later put on a ventilator. The chief resident, who had been following news reports of increased incidence of avian influenza in humans elsewhere in the world, could hardly believe that a case might have come to her suburban New Jersey hospital. But it had. After extensive testing, Frank was diagnosed with a virus that had formed from the mixture of genetic material from two viruses: influenza A and H5N1 influenza. Because this was a new pathogen, Frank had no immunity to it.

Neither did Martha, who was an assistant district attorney for the county. By the time she took Frank to the hospital, she had already begun to display symptoms, and she too entered the hospital and was diagnosed with avian flu. One of their two children was also admitted and placed under observation. Their other child, Frances, had left on a Girl Scout weekend camping trip the same morning that Frank had gone to his office. When public health officials arrived at the camp, they found that Frances had begun sneezing and felt tired. The parents of the other children began to receive phone calls telling them that the camp was suddenly closing, that county physicians were examining the children, and that the parents’ consent would be necessary for their children to receive antiviral drugs. It did not take long for the story to hit first the local, then the national, then the international news media: there was a bird flu outbreak in New Jersey. The next day, WHO raised the risk level from Phase 3 to Phase 4 in its coding system for pandemics.
In Atlanta, the CDC receives reports of Frank’s diagnosis, then of Martha’s diagnosis, and of suspicious symptoms that have appeared among the children at Frances’ camp and among some court staff in the county where Martha works. Reports of similar cases, although with no confirmed diagnosis yet, have come from New York and Los Angeles. State and local health departments reassure CDC that they are on top of the issue. Assume that the 2005 proposed regulations discussed in Chapter 5 are now in effect. What actions can federal officials legally take at this point?

The New Jersey Health Department begins a massive public education effort. Their central message is that avian flu is generally transmitted only when an individual comes into fairly close contact with an infected person – the ballpark estimate is three to six feet. People are encouraged to stay three to six feet away from other persons at all times, to the maximum extent possible.

Health departments in the three locations where the first cases have appeared also begin the process of tracking the contacts of each of those persons. Anyone who is found to be exhibiting the symptoms of avian flu is immediately placed in hospital isolation; those without symptoms are given antiviral medications (which may have some preventive effect) and asked to stay home for 72 hours to see if symptoms develop. Their household contacts are also given antiviral drugs and face masks.

Additional cases are confirmed as avian flu, including several among health care workers at Montclair Memorial, court staff, and children at Frances’ camp. The number of cases is also growing in other areas in the United States, including a few outside New York and Los Angeles. All schools and day care centers in New Jersey are closed for two weeks. There is an immediate spike in absenteeism at work, as thousands of parents suddenly have to stay home. Servers crash as more people attempt to work from home. There is growing public debate over whether large-scale quarantine should be imposed. The WHO has announced that the disease is in the Phase 6 – pandemic – stage.
THE GOVERNOR’S POWERS

New Jersey officials are trying to steer a path between effectively responding to the growing crisis and not making it worse by overreacting. The debate centers on whether the Governor should declare a public health emergency under the New Jersey law described in Chapter 6. What actions would such a declaration enable? What would be the advantages and disadvantages of declaring an emergency?

Meanwhile, a strange set of circumstances has arisen. Many normally busy streets are empty, and restaurants and shopping malls are virtually deserted. On the other hand, grocery and drug stores have been overrun and are finding it difficult to restock, in part, because absenteeism is becoming widespread. Many small businesses do not want to close but have no choice because there are no customers. The unemployment rate is ratcheting up.

Hospitals are struggling to deal with an increasing number of avian flu patients with a decreasing number of staff. Fewer sick patients are discharged and all elective procedures are delayed. Even greater numbers of the “worried well” are coming to emergency rooms when they develop sneezes or coughing. There is a wait of several hours, during which the healthy and the sick alike sit in the same waiting rooms.

MEDICAL CARE

Because this is a new strain of influenza, there is no vaccine for it. Scientists began working to develop one, starting with some of the virus first found in Frank Wheeler. They estimate that it will be another five months before such a vaccine can be produced. In the meantime, the only medical intervention consists of antiviral drugs that can be helpful in warding off viral infections if administered within 48 hours of exposure. Supplies of those are now running out.

How should the remaining stock of antivirals be allocated? When the vaccine does arrive, in what order should people have access
to it? What modifications if any would you suggest to the CDC proposal outlined in Chapter 7? Explain your reasoning.

Are there legal interventions that could mitigate the crisis situation at the hospitals? What are the advantages and disadvantages of various options?

Social and economic life continues to deteriorate. School closures have continued past the initial two-week period, and it now appears that eight weeks may be a more realistic estimate. Social service agencies and charities have run food distribution programs for those in voluntary home quarantine, but they are running out of volunteers. One charitable organization working with a county agency inadvertently distributed tainted food, probably because there was insufficient oversight by an overworked staff.

As public discontent has risen, automobile travel has increased sharply (air travel is heavily restricted). There are reports of many people from New Jersey renting temporary residences in Pennsylvania, where more restaurants and stores remain open.

The Governor asks the President to declare an emergency under the Stafford Act so that unemployment benefits and other emergency financial aid can flow into the state. Are there any legal barriers to this declaration? Are there other federal powers that can be used?

One critical area is community policing, which is stretched to the breaking point. Can the Governor deploy National Guard troops to assist local law enforcement agencies?

The Governor declared a public health emergency almost 30 days ago, and now it must be renewed (see Chapter 6). Confidently, she asks your advice on whether to announce that the renewal will remain in effect indefinitely. A member of the legislature from the opposition party has threatened to challenge the constitutionality of an indefinite declaration. What do you advise?
Historical Perspectives

In recent years, a number of books have been written about the worldwide influenza epidemic of 1918. Although medical care is much better now, mobility is also much greater, and thus there is the potential for infectious disease to spread much faster. Consider those factors as you read about the 1918 experience, in such books as *The Great Influenza*, *Flu: The Story of the Great Influenza Pandemic*, and *America’s Forgotten Pandemic*. Do you think a 21st century avian flu pandemic would have greater or lesser social impact than the 1918 flu?

### Pandemic Definitions

**Antibiotic (also antimicrobial):** A drug produced by bacteria or fungi that destroys or prevents the growth of other bacteria and fungi.

**Antiviral:** A drug that is used to prevent or cure a disease caused by a virus by interfering with the ability of the virus to multiply or spread from cell to cell.

**Asymptomatic:** Presenting no symptoms of disease.

**Avian flu (also AI or bird flu):** A highly contagious viral disease with up to 100% mortality in domestic fowl caused by influenza A virus subtypes H5 and H7. Low pathogenic AI causes few problems and is carried by many birds with no resulting problems. Highly pathogenic AI kills birds and can also be fatal if transmitted to humans. There is little or no human immunity, but humans are rarely affected.

**Containment measures that apply to use of specific sites or buildings** include cancellation of public events (e.g., concerts, sports events, and movies), closure of office buildings, apartment complexes, or schools, and closure of public transit systems. These measures may also involve restricting entrance to buildings or other sites (e.g., requiring fever screening or use of face masks before entry).

**Community-based measures to increase social distance** include measures applied to whole neighborhoods, towns, or cities (e.g., snow days, establishment of fever clinics, and community-wide quarantine).

**Drift:** The process in which influenza virus undergoes normal mutations. The amount of change can be subtle or dramatic, but eventually as drift occurs, a new variant strain becomes dominant.
This process allows influenza viruses to change and reinfect people repeatedly through their lifetime and is the reason influenza virus strains in vaccine must be updated each year. See also “Shift.”

**Epidemic:** A disease occurring suddenly in humans in a community, region, or country in numbers clearly in excess of those that may be typical.

**H5N1:** A variant of avian influenza, which is a type of influenza virulent in birds. It was first identified in Italy in the early 1900s and is now known to exist worldwide. There are both low and highly pathogenic variants in different regions of the world.

**HPAI:** Highly pathogenic form of avian influenza. Avian flu viruses are classified based upon the severity of the illness, and HPAI is extremely infectious among humans. The rapid spread of HPAI, with outbreaks occurring at the same time, is of growing concern for human health as well as for animal health. See also “LPAI.”

**Hemagglutinin:** An important surface structure protein of the influenza virus that is an essential gene for the spread of the virus throughout the respiratory tract. This enables the virus to attach itself to a cell in the respiratory system and penetrate it. It is referred to as the “H” in influenza viruses. See also “neuraminidase.”

**Influenza:** A serious disease caused by viruses that infect the respiratory tract.

**Isolation:** A state of separation and restriction of movement between persons or groups to prevent the spread of disease. Isolation measures can be undertaken in hospitals or homes, as well as in alternative facilities.

**LPAI:** Low pathogenic form of avian influenza. Most avian flu strains are classified as LPAI and typically cause little or no clinical signs in infected birds. However, some LPAI virus strains are capable of mutating under field conditions into HPAI viruses. See “HPAI.”

**Mutation:** Any alteration in a gene from its natural state. This change may be disease-causing or a benign, normal variant.

**Neuraminidase:** An important surface structure protein of the influenza virus that is an essential enzyme for the spread of the virus throughout the respiratory tract. It enables the virus to escape the host cell and infect new cells. It is referred to as the “N” in influenza viruses. See also “hemagglutinin.”
**Pandemic**: The worldwide outbreak of a disease in humans in numbers clearly in excess of normal.

**Pathogenic**: Causing disease or capable of doing so.

**Prepandemic vaccine**: A vaccine created to protect against currently circulating H5N1 avian influenza virus strains with the expectation that it would provide at least some protection against new virus strains that might evolve.

**Prophylactic**: A pharmaceutical or a procedure that prevents or protects against a disease or condition (e.g., vaccines, antibiotics).

**Quarantine**: A time period of separation or restriction of movement decreed to control the spread of disease. Before the era of antibiotics, quarantine was one of the few available means of halting the spread of infectious disease. It is still employed today as needed. Individuals may be quarantined at home or in designated facilities.

**Seasonal flu**: A respiratory illness that can be transmitted person to person. Most people have some immunity, and a vaccine is available. This is also known as the common flu or winter flu.

**Shift**: The process in which the existing H (hemagglutinin) and N (neuraminidase) are replaced by significantly different Hs and Ns. These new H or H/N combinations are perceived by human immune systems as new, so most people do not have preexisting antibody protection to these novel viruses. This is one of the reasons that pandemic viruses can have such a severe impact on the health of populations. See also “Drift.”

**Snow days**: Days on which offices, schools, and transportation systems are closed or cancelled, as if there were a major snowstorm. This approach may be recommended to reduce disease transmission.

**Virus**: Any of various simple submicroscopic parasites of plants, animals, and bacteria that often cause disease and that consist essentially of a core of RNA or DNA surrounded by a protein coat. Unable to replicate without a host cell, viruses are typically not considered living organisms.

**Widespread or community-wide quarantine** refers to the closing of community borders or the erection of a real or virtual barrier around a geographic area (a *cordon sanitaire*) with prohibition of travel into or out of the area.