

Public Health Law
Professor Smith - Fall 2009
Final Examination Instructions

1. You have three hours to complete the examination.
2. You may use your books, class materials and any outlines or notes you have prepared.
3. You may not use computers or any handheld devices.
4. You must write your answers in blue books provided. Put your name on the outside of each blue book you use and number them consecutively. Write your name on your copy of the exam.
5. There are four questions on the examination. Please use headers in writing your answer to separate questions and to provide structure to your answers.
6. Write legibly and with ink. If you make a mistake, cross out with one line your error. Do not use white out.
7. If you cite to a case or reading, please indicate in the name and page.
8. When you have completed the examination return your blue books, your examination, and any notes/scrap paper.
9. Because students are taking this exam at a later time, failure to return copies of the examination and any notes/scrap paper will result in a grade of F for the exam. You may keep copies of your outlines *so long as you have not made additional notes on them during the exam*. You may also not discuss this examination with your classmates before 12/21/09. Discussing the exam prior to 12/21 and/or failing to return the requested items will be considered academic misconduct and reported according to University of Connecticut's policy on Academic Integrity. Also, students are obligated to report any instance of academic misconduct that they are aware of.

Background

You are the Director of the Department of Public Health and report directly to the Governor in Western State. Western state is a relatively small state (1,000,000 people) but covers a large land area (550,000 sq miles). There are few population centers with the majority of the population living in Capital City near the center of Western. Western is crossed by two Interstates: West Interstate and North Interstate. These are part of the national interstate system and cut across the state East-West and North-South respectively, meeting in the center of this relatively square state where Capital City is located. The primary industry of Western State is livestock. In fact, the motto of Western State is the Livestock State. Much of the land of Western State is dedicated to raising livestock.

Western State has one large city, Capital City, with a population of approximately 300,000 people. There are three hospitals in Capital City with 40 available ICU beds with ventilator support. There are four regional hospitals in the state. These are little more than community health centers with approximately 50 in-patient beds each. Each regional hospital does have an ICU. The mean number of regional ICU beds 8.25 and the median is 3.

One company, Big Meat, owns 92% of the livestock operations in Western. These operations are CAFOs (Concentrated Animal Feeding Operations). They are all designated as large CAFOs with more than 1,000 cattle in each. Many reach as many as 3000 cattle. A CAFO concentrates cattle into very small areas bringing feed to them rather than allowing grazing. CAFOs have been associated with significant water and air pollution from the enormous amount of waste produced and run-off. CAFOs can also contaminate the air through dust and other dangerous gas emissions jeopardizing the health of nearby residents. In many of the rural areas, there have been high rates of COPD (Chronic Obstructive Pulmonary Disease) which has been associated with air pollution and smoking. Many of the workers and residents living near CAFOs smoke. You believe though that there is a relationship between the prevalence of COPD and the air pollution from CAFOs in your state. Western State has the following ethnic/racial

demographics: 60% White, 29% Hispanic, 11% Black. The majority of workers and residents in rural areas and who work at the CAFOs are Hispanic (90%), Black (5%), and White (5%)

CAFOs are regulated by the Environmental Protection Agency (EPA) and the United States Department of Agriculture (USDA). The EPA licenses CAFOs and their pollution controls. USDA regulates the treatment of the animals. The EPA requires CAFOs to obtain a license to operate and must put in place controls over waste water, air pollution, and other environmental impacts. The EPA regulation states: "As part of a national system of environmental control, all CAFOs must obtain a license from EPA to operate in the United States."

The USDA regulates CAFOs under the Improving Meat Act (IMA). The IMA states: "The USDA has express authority to regulate the treatment of animals in CAFOs"

Hanta viruses specifically SNV, New York Virus, Black Creek Canal Virus, and Bayou Virus are associated with Hantavirus Pulmonary Syndrome (HPS). Early symptoms include fatigue, fever and muscle aches, especially in the large muscle groups—thighs, hips, back, and sometimes shoulders. These symptoms are universal. There may also be headaches, dizziness, chills, and abdominal problems, such as nausea, vomiting, diarrhea, and abdominal pain. About half of all HPS patients experience these symptoms. The diagnosis is seldom made at this stage, as cough and rapid breathing generally do not develop until approximately day seven. Once this cardiopulmonary phase begins, however, the disease progresses rapidly, necessitating hospitalization and often ventilation within 24 hours. Four to 10 days after the initial phase of illness, the late symptoms of HPS appear. These include coughing and shortness of breath, with the sensation of, as one survivor put it, a "...tight band around my chest and a pillow over my face" as the lungs fill with fluid. There is no specific treatment or cure for hantavirus infection. Treatment of patients with HPS remains supportive in nature. Patients should receive appropriate, broad-spectrum antibiotic therapy while awaiting confirmation of a diagnosis of HPS. If there is a high degree of suspicion of HPS, patients should be immediately transferred to an emergency department or intensive care unit (ICU) for close monitoring and care. Patients presenting with fulminant illness due to HPS have a poor prognosis despite ICU care. HPS mortality with SNV

infection is 50% with ICU care. ICU management should include careful assessment, monitoring and adjustment of volume status and cardiac function. Equipment and materials for intubation and mechanical ventilation should be readily available since onset of respiratory failure may be precipitous.

Unfortunately, diagnosing HPS is difficult as it is very similar in presentation to Acute Respiratory Distress Syndrome (ARDS) which also requires ventilation support in ICU. ARDS is caused by a number of underlying conditions and infections but is treated differently from HPS. COPD as well as influenza can lead to ARDS. Patients in ICU with ARDS and HPS may be clinically indistinguishable without specific training and tests by the clinicians. There are particular blood tests that can help suggest HPS in the prodromic stage and particular techniques can be used to rule out ARDS once the patient is in ICU. HPS can only be confirmed by a specific test for HPS conducted at an off-site reference laboratory.

Hantavirus is spread by rodents. Rodents shed the virus in their urine, droppings, and saliva. The virus is mainly transmitted to people when they breathe in air contaminated with the virus. When fresh rodent urine, droppings or nesting materials are stirred up, tiny droplets containing the virus get into the air. This process is known as "aerosolization." There are several other ways rodents may spread hantavirus to people: If a rodent with the virus bites someone, the virus may be spread to that person-but this type of transmission is rare. Researchers believe that people may be able to get the virus if they touch something that has been contaminated with rodent urine, droppings, or saliva, and then touch their nose or mouth. Researchers also suspect people can become sick if they eat food contaminated by urine, droppings, or saliva from an infected rodent. Hantavirus is not spread by human-to-human contact. There has been very little research into the area but it isn't believed that hantavirus is transmitted through other animals. However, preliminary work has shown that hantavirus can be transmitted to cattle and has been found in exposed cattle. It is unknown if SNV and other hantavirus can be transmitted from the consumption of infected cattle.

Big Meat is owned by Big Food which also owns Big Grains. Big Grains provides feed to Big Meat's CAFOs shipping it from several other states into Western state on trucks. Big Grain has been fighting a rodent infestation in its facilities and has worked diligently to eliminate the infestation. Unfortunately, hantavirus infected rodents have contaminated some of the feed entering Western State and have also been caught on trucks carrying the feed to Big Meat's CAFOs. The contaminated rodents have found a home at the CAFOs and surrounding rural areas and the contaminated feed has been fed to the livestock at Big Meat's CAFO operations around Western state.

Your syndromic surveillance system and registry begin reporting a spike in cases of fever, headaches, nausea and vomiting and an increase in the number of deaths from ARDS. You should note that is also flu season. Your syndromic surveillance collects data and reports weekly. Your death registry compiles statistics quarterly. Your state is divided into five regions, NE, NW, SE, SW and Capital. You have the following syndromic and registry surveillance data:

Cumulative Incidence of Fever, Headaches, Vomiting, Diarrhea, Chills as reported per week per 10,000.

Region	Week 1	Week 2	Week 3	Week 4
Capital	16.84	16.84	21.05	25.26
NE	17.78	21.11	25.56	26.67
NW	20.00	30.00	37.50	100.00
SE	22.44	32.05	64.10	153.85
SW	23.08	23.08	76.92	100.00

Death Registry Data as Prevalence of Population with cause of death as ARDS per 10,000. 2 Quarters.
Current Quarter ends on Week 4 and includes Week 4 Data.

Region	Baseline	Current Quarter
Capital	2.11	3.16
NE	8.00	9.33
NW	10.00	54.00
SE	12.82	79.49
SW	34.15	72.31

Hantavirus, specifically SNV, was confirmed in Week 4 by a test at a reference laboratory. You have sent inspectors to the regions. They have identified a large infestation of rodents in many of the CAFOs and have assumed that excrement and urine from the rodents is being aerosolized in the very dusty CAFO conditions. You also have concerns that the CAFOs may create a reservoir of SNV in the bovine population and are concerned about the theoretical possibility of additional vectors of infection as was seen with Swine Flu and SARS. You are also concerned about the sanitary and health conditions of the workers.

The only public health statute in Western state says “There shall be a Department of Public Health to promote and protect the public health. It shall have a Director who reports to the Governor. In case of a public health emergency, the Director may declare a public health emergency and take whatever actions necessary to maintain the public health. A public health emergency shall expire sixty days after declaration unless the Director requests an extension from the Governor or Legislature.”

You do the following:

1. You declare a public health emergency and order the temporary suspension of CAFO activities. You also order the destruction of livestock in the CAFOs. You also order the Department of Public Health to decontaminate the CAFOs and mitigate the rodent infestation. You order CAFOs to remain closed for 60 days. As ventilators become available in Captial City, you begin airlifting individuals suffering from NW, SE, and SW to Captial City to be placed on ventilators there before patients from Capital or NE.

2. You and your colleagues write the following law and ask the Legislature to pass it, they do and the Governor signs it:

A. No livestock may kept in concentrated areas in Western State. CAFOs are prohibited. Operation of a CAFO is a criminal offense with a minimum penalty of \$250,000 fine and a maximum penalty of 5 years in prison.

B. All trucks traveling through Western from states with known Hanta Virus reservoirs and carrying livestock, grain, feed or agricultural equipment will be inspected at the state border. These trucks will be checked for rodent infestation. If rodent infestation is detected, the truck will not be allowed to pass through Western State.

3. You create and fund a public health intervention that targets tobacco control and smoking cessation programs to individuals living in rural areas of the state. The program provides counseling and screening for free as well as nicotine replacement therapy and other tools to reduce smoking. Residents of Capital are not eligible for the program.

QUESTIONS

Several lawsuits are filed. **Please discuss the likely causes of action, arguments and counter-arguments in each scenario. Provide a justification for the party that you believe would prevail.**

- A. Big Meat sues the Department of Public Health
- B. Big Grains sues the Department of Public Health
- C. CAFO operators/owners who are not part of Big Meat sue the Department of Public Health
- D. Residents of Capital City sue the Department of Public Health for denying them access to free smoking cessation program.