Public Health Update

Thursday, April 27, 2006

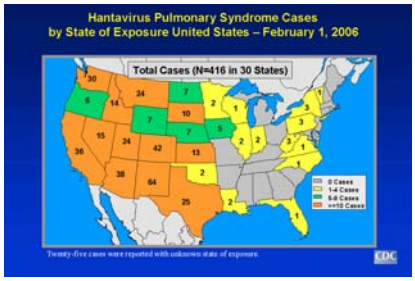
Hantavirus Pulmonary Syndrome

As parks gear up for the new summer season and especially for those who might be opening up buildings that were closed for the winter, it's worth while to remind ourselves of the potential for exposure to the pathogens that can cause Hantavirus Pulmonary Syndrome (HPS).

Note: The following material is from materials provided by CDC.

Hantavirus pulmonary syndrome (HPS) is a deadly disease transmitted by infected rodents through urine, droppings, or saliva. Humans can contract the disease when they breathe in aerosolized virus.

Anyone who comes into contact with rodents that carry hantavirus is at risk of HPS. Rodent infestation in and around the home remains the primary risk for hantavirus exposure. Even healthy individuals are at risk for HPS infection if exposed to the virus.



In the United States, deer mice, cotton and rice rats (in the Southeast), and the white-footed mouse (in the Northeast), are the only known rodent carriers of hantaviruses causing HPS.

Hantavirus is transmitted by infected rodents through urine, droppings, or saliva. Individuals become infected with HPS after breathing fresh aerosolized urine, droppings, saliva, or nesting materials. Transmission can also occur when these materials are directly introduced into broken skin, the nose or the mouth. If a rodent with the virus bites someone, the virus may be spread to that person, but this type of transmission is rare.

HPS in the United States cannot be transmitted from one person to another. You cannot get the virus from touching or kissing a person who has HPS or from a health care worker who has treated someone with the disease. In addition, you cannot contract the virus from a blood transfusion in which you receive blood from a person who survived HPS.

Hantaviruses that cause HPS in the United States are only known to be transmitted by certain species of rodents. HPS in the United States is not known to be transmitted by farm animals, dogs, or cats or from rodents purchased from a pet store.

The length of time hantaviruses can remain infectious in the environment is variable and depends on environmental conditions, such as temperature and humidity, whether the virus is indoors or outdoors or exposed to the sun, and even on the rodent's diet (which would affect the chemistry of its urine). Viability for 2 or 3 days has been shown at normal room temperature. Exposure to sunlight will decrease the time of viability, and freezing temperatures will actually increase the time that the virus remains viable. Since the survival of infectious virus is measured in terms of hours or days, only active infestations of infected rodents result in conditions that are likely to lead to human hantavirus infection.

Seal up rodent entry holes or gaps with steel wool, lath metal, or caulk. Trap rats and mice by using an appropriate snap trap. **as allowed by NPS policy* Clean up rodent food sources and nesting sites and take precautions when cleaning rodent- infested areas.

What are the recommendations for cleaning a rodent- infested area?

- Put on rubber, latex, vinyl or nitrile gloves.
- Do not stir up dust by vacuuming, sweeping, or any other means.
- Thoroughly wet contaminated areas with a bleach solution or household disinfectant.

  Hypochlorite (bleach) solution: Mix 1 and ½ cups of household bleach in 1 gallon of water.
- Once everything is wet, take up contaminated materials with damp towel and then mop or sponge the area with bleach solution or household disinfectant.
- Spray dead rodents with disinfectant and then double- bag along with all cleaning materials. Bury, burn, or throw out rodent in appropriate waste disposal system. (Contact your local or state health department concerning other appropriate disposal methods.)
- Disinfect gloves with disinfectant or soap and water before taking them off.
- After taking off the clean gloves, thoroughly wash hands with soap and water (or use a waterless alcohol-based hand rub when soap is not available).

Books, papers, and other items that cannot be cleaned with a liquid disinfectant or thrown away should be left outdoors in the sunlight for several hours or in an indoor area free of rodents for approximately 1 week before final cleaning. After that time, the virus should no longer be infectious. Wear rubber, latex, or vinyl gloves and wipe the items with a cloth moistened with disinfectant.

Wash clothing or stuffed animals in the washing machine using hot water and regular detergent. Laundry detergent can break down the virus's lipid envelope, rendering it harmless. Machine dry laundry on a high setting or hang it to air dry in the sun.

Disinfect carpets and upholstered furniture with a disinfectant or with a commercial-grade steam cleaner or shampoo.

If you have been exposed to rodents or rodent infestations and have symptoms of fever, deep muscle aches, and severe shortness of breath, see your doctor immediately. Inform your doctor of possible rodent exposure so that he/she is

alerted to the possibility of rodent- borne diseases, such as HPS.

Deer Mouse

For additional information:
http://www.nps.gov/public_health/zed/hanta/hanta.htm

http://inside.nps.gov/waso/custommenu.cfm?lv=3&prg=648&id=2483

Avian Influenza

Over the course of the next few weeks, NPS will be distributing instructions to WASO, regions and parks about how to plan for the potential impact of a virus called Highly Pathogenic Avian Influenza, H5N1.

This article is intended as an introduction to this subject and additional information can be found at:

http://www.nps.gov/public_health/zed/ai/ai.htm

http://www.pandemicflu.gov/

Note: The following information is excerpted and edited from material provided by the World Health Organization

Avian influenza is an infectious disease of birds caused by type A strains of the influenza virus. The disease occurs worldwide. While all birds are thought to be susceptible to infection with avian influenza viruses, many wild bird species carry these viruses with no apparent signs of harm.

Other bird species, including domestic poultry, develop disease when infected with avian influenza viruses. In poultry, the viruses cause two distinctly different forms of disease – one common and mild, the other rare and highly lethal. In the mild form, signs of illness may be expressed only as ruffled feathers, reduced egg production, or mild effects on the respiratory system. Outbreaks can be so mild they escape detection unless regular testing for viruses is in place.

In contrast, the second and far less common highly pathogenic form is difficult to miss. First identified in Italy in 1878, highly pathogenic avian influenza is characterized by sudden onset of severe disease, rapid contagion, and a mortality rate that can approach 100% within 48 hours. In this form of the disease, the virus not only affects the respiratory tract, as in the mild form, but also invades multiple organs and tissues. The resulting massive internal haemorrhaging has earned it the lay name of "chicken Ebola".

All 16 HA (haemagluttinin) and 9 NA (neuraminidase) subtypes of influenza viruses are known to infect wild waterfowl, thus providing an extensive reservoir of influenza viruses perpetually circulating in bird populations. In wild birds, routine testing will nearly always find some influenza viruses. The vast majority of these viruses cause no harm.

To date, all outbreaks of the highly pathogenic form of avian influenza have been caused by viruses of the H5 and H7 subtypes. Highly pathogenic viruses possess a tell- tale genetic "trade mark" or signature – a distinctive set of basic amino acids in the cleavage site of the HA – that distinguishes them from all other avian influenza viruses and is associated with their exceptional virulence.

During 2005, an additional and significant source of international spread of the virus in birds became apparent for the first time, but remains poorly understood. Scientists are increasingly convinced that at least some migratory waterfowl are now carrying the H5N1 virus in its highly pathogenic form, sometimes over long distances, and introducing the virus to poultry flocks in areas that lie along their migratory routes. Should this new role of migratory birds be scientifically confirmed, it will mark a change in a long- standing stable relationship between the H5N1 virus and its natural wild- bird reservoir.

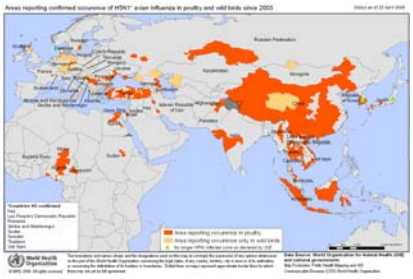
The outbreaks of highly pathogenic H5N1 avian influenza that began in south- east Asia in mid- 2003 and have now spread to Europe and Africa, are the largest and most severe on record.

In late July 2005, the virus spread geographically beyond its original focus in Asia to affect poultry and wild birds in the Russian Federation and adjacent parts of Kazakhstan. Almost simultaneously, Mongolia reported detection of the highly pathogenic virus in wild birds. In October 2005, the virus was reported in Turkey, Romania, and Croatia. In early December 2005, Ukraine reported its first outbreak in domestic birds. Subsequent rapid spread as occurred, bringing the virus into most of Europe and parts of Africa. Most of these newer outbreaks were detected and reported quickly. Further spread of the virus along the migratory routes of wild waterfowl is, however, anticipated. Moreover, bird migration is a recurring event. Countries that lie along the flight pathways of birds migrating from central Asia may face a persistent risk of introduction or re- introduction of the virus to domestic poultry flocks.

Influenza viruses are normally highly species- specific, meaning that viruses that infect an individual species (humans, certain species of birds, pigs, horses, and seals) stay "true" to that species, and only rarely spill over to cause infection in other species. Since 1959, instances of human infection with an avian influenza virus have been documented on only 10 occasions. Of the hundreds of strains of avian influenza A viruses, only four are known to have caused human infections: H5N1, H7N3, H7N7, and H9N2.

Of all influenza viruses that circulate in birds, the H5N1 virus is of greatest present concern for human health for two main reasons. First, the H5N1 virus has caused by far the greatest number of human cases of very severe disease and the greatest number of deaths. It has crossed the species barrier to infect humans on at least three occasions in recent years: in Hong Kong in 1997 (18 cases with six deaths), in Hong Kong in 2003 (two cases with one death) and in the current outbreaks that began in December 2003 and were first recognized in January 2004.

A second implication for human health, of far greater concern, is the risk that the H5N1 virus – if given enough opportunities – will develop the characteristics it needs to start another influenza pandemic. The virus has met all prerequisites for the start of a pandemic save one: an ability to spread efficiently and sustainably among humans. While H5N1 is presently the virus of greatest concern, the possibility that other avian influenza viruses, known to infect humans, might cause a pandemic cannot be ruled out.



The virus can improve its transmissibility among humans via two principal mechanisms. The first is a "reassortment" event, in which genetic material is exchanged between human and avian viruses during co- infection of a human or pig. Reassortment could result in a fully transmissible pandemic virus, announced by a sudden surge of cases with explosive spread.

The second mechanism is a more gradual process of adaptive mutation, whereby the capability of the virus to bind to human cells increases during subsequent infections of humans. Adaptive mutation, expressed initially as small clusters of human cases with some evidence of human- to- human transmission, would probably give the world some time to take defensive action, if detected sufficiently early.

Public Health Program Highlights from FY05

The core mission of the Public Health Program (PHP) is to assist NPS in identifying public health issues and taking actions that strengthen protection of visitors. In FY05, nine Regional Public Health Consultants provided on- site evaluation and consultation to park managers and staff in the four priority areas of drinking water safety, waste water disposal, food safety and zoonotic/vector borne diseases.

- ✓ Conducted 292 on- site visits
- ✓ Completed 495 food safety evaluations
- ✓ 383 inspections / consultations for events at National Mall
- ✓ Evaluated 544 drinking water systems
- ✓ Reviewed the operation of 564 waste water systems
- ✓ Provided consultation on vector borne disease at all 292 sites

Another important role of the PHP is to provide public health expertise for response to outbreaks of communicable disease, natural disasters and other emergencies within the national park system. This fiscal year, program staff identified and investigated several large outbreaks and 70% of program staff participated in the hurricane response.

An outbreak of gastrointestinal illness at GRCA was associated with river rafting and affected approximately 140 visitors and river guides. The investigation revealed that lunchmeat obtained from a USDA meat processor in Utah had been contaminated by an ill food handler with norovirus.

The PHP is assisting DOI and leading the NPS effort to prepare for and respond to the emergence of a new highly pathogenic form of Avian Influenza and the possible world- wide pandemic that it could create.

In addition to all of the routine work, several strategic initiatives designed to support the core mission and build a more sustainable program, were continued in fiscal year 2005.

- ✓ Completed a system- wide workload analysis
- ✓ Implemented a participatory management model for the program
- ✓ Continued exploring ways to measure outputs and outcomes
- ✓ Submitted budget proposals that reflect strategic changes
- ✓ Worked with the Centers for Disease Control and Prevention, GRCA and YELL, continuing work toward the establishment of an NPS disease surveillance system

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Program Websites:

Internal:

http://www.nps.gov/public_health/intra/index.htm

External:

http://www.nps.gov/public_health/

In Partnership for nearly 100 years, the National Park Service and the United States Public Health Service have worked together to protect the health of visitors in Americas Parks!