

Monitoring Animal Diseases & Their Impact on Public Health in Wyoming

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Dr. Tim Graham drove his pickup loaded with trash down the dusty dirt road and through the entrance gate to the Big Horn County Landfill. He looked forward to seeing and talking to Connie Stolk, the landfill manager, as they had known each other for most of Tim's 57 years. Tim had been Connie's veterinarian for many of those years.

As Tim pulled up to the tiny shack where Connie collected the landfill fees, he immediately noticed the troubled look on Connie's face.

"Hey Tim, what is causing all the sheep deaths?" Connie asked. "We have buried probably ten sheep brought in by ranchers over the past week."

This incident illustrates one of the unexpected sources of animal disease information that has been discovered during the beginning years of a pioneering surveillance program at the Wyoming Department of Health (WDH). The program, initiated in 2004, collects information on zoonotic diseases and adverse

anthrax. The other, less well known, zoonotic disease considered was Orf, or contagious ecthyma. Orf is caused by a *parapoxvirus* and causes lesions on the lips and mouth of sheep and goats. Most of the sheep at the landfill had oral lesions.

The outbreak, which occurred in the summer of 2007, was determined to be caused by Bluetongue disease. Also known as Catarrhal fever, Bluetongue is not a zoonotic disease and did not represent a danger to public health. It is caused by a virus transmitted through the bite of an infected fly, primarily to livestock such as sheep, cattle, goats, and to some wildlife including buffalo, deer, and antelope. When Dr. Graham alerted authorities to the outbreak, fewer than 25 sheep had died. However, those sheep came from several separate ranches, and even though a quarantine preventing movement of sheep in the area was instituted, the disease eventually spread to more than 900 sheep and caused the deaths of about 300. Dr. Graham's early discovery was instrumental in controlling what could have been a much larger outbreak.

Wyoming started designating veterinarians to monitor and report animal disease activity in their regions after the September 11, 2001, terrorist attacks. Because most of the biological agents that could be used as weapons against human populations are zoonotic, illness or death in animals could be early indicators of the release of a biological agent during a bioterrorism event. The state wanted to avert potential acts of agroterrorism that could negatively affect the Wyoming livestock industry. The directors of the Wyoming Office of Homeland Security, Wyoming Livestock Board, and the Wyoming Department of Health collaborated to initiate the program, which is supported through funds from the Wyoming Public Health and Emergency Preparedness Program. In the early stages of the program, the seven veterinarians, originally referred to as regional veterinary coordinators (RVCs), focused on preparedness activities related to a potential bioterrorism and agroterrorism incident. Disease monitoring was passive—the RVCs periodically informed area veterinarians, ranchers and others that they were available to respond to suspected or confirmed outbreaks.

The Bluetongue outbreak pointed out an unfortunate side effect of the passive approach. Inves-

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health events in animals that may potentially affect humans. A zoonotic disease is one that can be transmitted from vertebrate animal to humans.

The surveillance activity is accomplished through the use of seven regional veterinary public health coordinators (RVPHCs), who collect information from veterinary clinics and other sources each week. Dr. Tim Graham is one of the RVPHCs. The information is then forwarded to the State Public Health Veterinarian, who compiles a summary report that is distributed widely throughout both the public health and animal health communities.

In the landfill incident described above, the cause of the sheep deaths was not known for several days, though two zoonotic diseases were suspected. Anthrax was considered because many of the sheep were found dead without any previous illness observed by the rancher. Sudden deaths are often seen with

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tigators learned that a veterinarian suspected the disease on one ranch but withheld the information out of concern that the flock would be quarantined, economically harming the rancher. Because of an apparent reluctance of veterinarians, ranchers and others to report diseases to their RVCs during the first two years, a confidential, active surveillance system was implemented in September 2007. The RVCs were encouraged to build good working relationships with source veterinarians and the general public by ensuring their confidentiality and discussing the importance of such a system for the safety of their livestock and public health.

Under the new surveillance system, RVCs are now referred to as regional veterinary public health coordinators (RVPHCs) to better reflect their public health role, and are required to spend at least two hours a week actively contacting their reporting sources. Each week, they report their findings to the State Public Health Veterinarian.

The type of contact between source and RVPHC varies. Some use e-mail while others contact their sources by phone and request reports by fax. A few RVPHCs meet in person each week with critical sources, such as the owner of the busiest veterinary clinic in their region. It is hoped that this active surveillance system will identify problems early, as reporting sources are now directly asked about animal diseases seen over the previous week.

A preliminary data analysis shows that, from September 2007 to October 2008, the system received 589 reports, 488 of which were confirmed or suspected zoonotic diseases. It showed 228 reports of animal bites or rabies-related incidents, including 20 confirmed cases of animal rabies, 63 cases of animals being confined and observed after biting a human, 7 cases of animals being quarantined after exposure to wild animals potentially infected with rabies, and 16 animals euthanized and tested for rabies.

Among the confirmed or suspected zoonotic diseases, campylobacteriosis and salmonellosis were most common, with 35 and 15 reports respectively.

The information flows both ways. Some were initially reported by the health department as human cases where laboratory or epidemiological evidence pointed to an animal source of the illness. These included, in addition to the salmonellosis and campylobacteriosis cases, 12 poisonings, 9 wild animal die-offs, 15 undiagnosed illness syndromes, and a surprisingly high number of rattlesnake bites (14).

This surveillance system has numerous strengths. First, it has the ability to collect animal disease information that was missed by previous reporting mechanisms, including diseases diagnosed through private laboratories or those seen by nontraditional reporting sources such as landfill operators. Second, although Wyoming has an animal reportable disease list that includes major zoonotic diseases, it omitted



Photo: Tim Graham

many zoonotic pathogens such as *Campylobacter* and *Salmonella* species. Third, the program is inexpensive. The annual operating budget is \$83,000, which includes the RVPHC contracts (\$800 per month).

There are limitations to this surveillance system. In order to promote timely investigations and communication, veterinarians are encouraged to report suspected zoonotic diseases. However, further diagnostics may never be performed to determine if the veterinarian's suspicions are correct, and it can be difficult to determine the true incidence. Since the program is funded through a cooperative agreement from a federal agency, the long-term sustainability is susceptible to federal budget pressures. Furthermore, the voluntary nature of the program, as opposed to legally mandated reporting, makes it dependent on the willingness of individual veterinarians to participate. Currently, about half of the 70–80 veterinary clinics in Wyoming report information to the RVPHCs. The applicability of this program to other geographical areas where there are many more veterinary clinics may be limited; as the RVPHCs had met most, if not all, of the limited number of veterinarians in their regions before the program began. Nevertheless, the system provides a model of how an active surveillance system can be implemented at a modest cost. Efforts are underway to increase the number of reporting veterinary clinics as well as to recruit reporting from other sources such as animal control organizations. ■

Sheep ranchers Kay Neves and Randall Jones discuss the Bluetongue outbreak.

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Resources

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