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WILDLIFE DISEASES AND HUMAN HEALTH

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Introduction

Zoonoses (singular, zoonosis) are diseases transmissible from animals to man. There are over 200 such diseases; many are harbored by wildlife reservoirs. A reservoir may be defined as a source which maintains the presence of a disease in an ecosystem. Wildlife-associated zoonoses found in Texas include rabies, plague, tularemia, Rocky Mountain spotted fever, Lyme disease, leptospirosis, relapsing fever, typhus, and leprosy. The mission of the Zoonosis Control Division of the Texas Department of Health is to protect the health of Texas citizens against zoonoses. Surveillance programs for various diseases are an integral part of the overall control programs, which include epidemiological (case) investigations, surveillance, health education, and direct control efforts. The cooperation of other agencies is essential to a successful operation. The Animal Damage Control (ADC) branch of the U.S. Fish and Wildlife (USFWS) and the Texas Rodent and Predatory Animal Control Service have been especially helpful with surveillance activities, especially those involving sylvatic plague. They also assist, as needed, in other control efforts. For example, in 1976, during a major canine rabies outbreak in Laredo, (US-Mexico border), there were questions about the role of feral dogs living along the Rio Grande River in maintaining the epizootic. ADC personnel assisted when called upon by trapping several of the animals for rabies examination. (They were not infected). ADC personnel have also assisted in a study to elucidate the relationships between raccoons, bats, and rabies.

Rabies

The classical concept of rabies involves "mad dogs", foaming at the mouth, savagely attacking people and other animals. Actually, the disease in the United States involves wild animal hosts, which maintain the disease and occasionally transmit it to domestic animals and, rarely, to humans. Rabies is a disease of wild skunks, foxes, raccoons, and bats. It is cyclic because it is associated with overpopulation of the involved species. In Texas, 80% of all rabies cases can be directly or indirectly attributed to skunks, and another 10 to 15% involves bats. A new laboratory technique, monoclonal antibody analysis, has demonstrated that there are different ecotypes or "strains" of rabies virus which are somewhat host specific. While a strain from a particular species may be transmitted to another species, transmission cycles are not established. For example, cats are frequently infected by rabid skunks, but transmission from cat to cat has not been recorded. Human rabies may be acquired from wild species, but exposure to rabies from wild species is not as common nor as dangerous as exposure from rabid domestic dogs (transmission from dog to man is principally a problem in underdeveloped countries). In certain parts of the U.S., foxes are also important reservoirs of rabies. Bats rabies is widespread, but bats do not appear to be important in transmitting rabies to terrestrial mammals.

Plague

Plague is a disease which is maintained in nature by wild rodents and is transmitted by infected fleas. Some rodents are resistant, harboring the infection for relatively long periods of time (reservoirs) while others are highly susceptible and the infection rapidly spreads

through the population (amplifying hosts). Prairie dogs are the major amplifying hosts in Texas and the Southwestern United States. Plague surveillance based on rodent collections is costly and unproductive. However, since wild carnivores subsist on a diet of wild rodents, they are very effective "concentrators" of rodents. Therefore, sampling one carnivore, in effect, is a sampling of many rodents over a prolonged period of time. Carnivores which eat infected rodents, or are bitten by infected fleas become infected with plague. Infected canines almost always recover, therefore, evidence of past infection is available through serologic studies. Infected cats usually sicken and die. Other carnivores are useful in plague surveillance, but the wild canines are by far the most important. Since animal damage control personnel routinely collect many coyotes, they are an excellent source of specimens. The Texas Department of Health has had excellent cooperation from them. We know, based principally on carnivore serology, the general limits of plague in the State, and can usually detect localized exacerbations.

Other Activities

ADC personnel have also been very helpful in obtaining other specimens, such as ticks, for surveillance of other diseases. One was a little unusual: armadillo leprosy. Leprosy occurs naturally in wild armadillos in Louisiana and Texas and has been associated with several human cases of leprosy. The next question obviously is, "How widespread is leprosy in wild armadillo populations?" We attempted to assess the status of leprosy in Central Texas armadillos, and with monumental assistance from several trappers, approximately 200 armadillos were sampled. Our results show that Central Texas armadillos have a lower incidence of leprosy than those along the Texas Gulf Coast.

Conclusion

In summary, Animal Damage Control personnel contribute greatly to surveillance activities and zoonosis control activities, which are very important in protecting the health of the citizens of the State of Texas.