

Canine Distemper – can a dog disease be a threat to wild tigers?

VIEW is working in Nepal to identify and help manage health threats to important endangered species such as the Bengal tiger. One health threat that we are concerned about may be coming from local domestic dogs. How can a dog disease affect a tiger? Last year we began a study to help answer that question.

Years ago the veterinary community was caught by surprise when a common dog virus, canine distemper, infected and killed a number of large carnivore species in a captive collection in California. Since then a number of outbreaks have been documented in endangered species in the wild, causing some populations to crash or even disappear and demonstrating the real power of this disease.

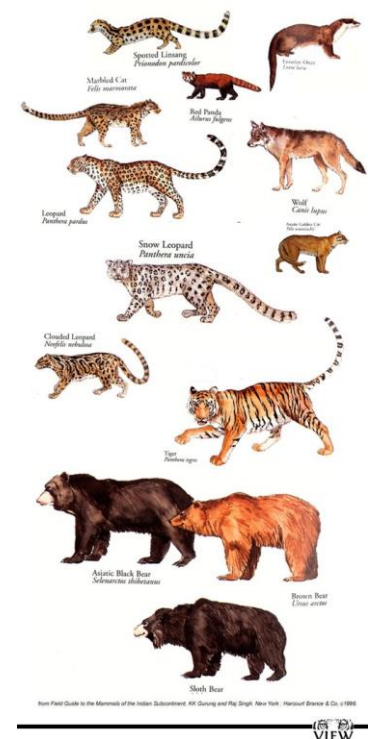
Canine distemper virus (CDV) is in a family of viruses that includes some of the world’s most deadly infectious diseases: a close cousin, measles virus, still kills about 122,000 people a year. In dogs, CDV is recognized as the second most deadly canine infectious disease behind rabies virus. For this reason, in most developed countries, dogs are routinely vaccinated for CDV along with rabies. Even so, this disease persists worldwide because the virus has adapted to wild carnivore species, like raccoons and skunks, which keeps it active as a persistent threat to unvaccinated dogs and others.

In fact, despite the name “canine” distemper, this virus has been known to infect every family in the Order Carnivora, making it a widespread health threat to many other animals and becoming a great concern for conservation: some of the species at risk include highly endangered animals such as black-footed ferrets, African wild dogs, and even some cat species such as lions and tigers.

Focus on Tigers: Globally, tigers are severely threatened overall with some estimates indicating that only 1000 breeding females are left in the wild. Well known threats to tiger populations from poaching and habitat loss due to human development have resulted in isolated populations that are at greater risk for disease than ever before. Recent work by scientists studying Amur tigers in Siberia has shown the potential for CDV to affect even very small populations of wild carnivores such as tigers. Their research, led by Gilbert et al., provides excellent evidence that this disease may be negatively impacting Amur tigers and raises the call for conservation efforts to focus on distemper as a threat to tigers worldwide.

Is distemper a threat to wildlife in Nepal? It is reasonable to assume that canine distemper is a potential threat to some of the 43 different carnivore species found in Nepal including specific threats to Bengal tigers. Thirteen of these carnivores are listed on CITES Appendix One (Endangered).

Endangered carnivores of Nepal



The current population of free-living tigers in Nepal is estimated to be 198 individuals, with a goal to reach 250 by 2022. Protected tiger habitat is concentrated in three main areas: Chitwan National Park, Shuklaphanta and Bardia. These protected wildlife areas are surrounded by human development, with communities that include

large numbers of domestic dogs. **No one really knows the true threat from CDV because there has been no testing or disease surveillance for canine distemper either in dogs or in wildlife in Nepal. VIEW has begun to study this** and would like to establish where the reservoirs exist both in domestic and wild animals. At the same time we need to be able to identify active cases of distemper in dogs and wildlife to see where transmission is occurring and to better design interventions that will reduce the risk to endangered species like the tiger.

Last year VIEW took the first step and proved that canine distemper virus was present in dogs living close to tiger habitat. We collected blood samples from dogs in communities in the bufferzone of Chitwan National Park and analyzed these samples for CDV antibodies as evidence of prior exposure to the disease. Samples had to be shipped to the US for the analysis because the serum virus neutralization technique is not available in Nepal. **Developing reliable CDV antibody and antigen testing is one of our primary goals to be able to continue this work in the field.**

CANINE DISTEMPER IN THE BUFFERZONE

VIEW organized teams of veterinarians and veterinary students to help collect samples and provide rabies vaccinations during animal health camps in four local communities in the Buffer Zone of Chitwan National Park. A total of 100 canine serum samples (25 from each community) were processed at our laboratory at the National Trust for Nature Conservation Biodiversity Conservation Center and transported to the US. These samples were analyzed for CDV antibody by serum virus neutralization assay at Washington Animal Disease Diagnostic Laboratory at Washington State University in Pullman, WA, USA.

Dr. Deborah McCauley, Executive Director of VIEW with colleagues and students at an Animal Health Camp for research and outreach in Chitwan NP buffer-zone.



We found that **27% of dogs sampled carried antibodies to canine distemper virus.** In one community 50% of the dogs were positive. None of these dogs were sick from the disease or had ever been vaccinated for CDV, but had survived exposure and infection. This shows that domestic dogs represent a domestic animal source (reservoir) of CDV that could spill over and threaten wild carnivores living in nearby protected areas.

We do not know if the domestic dog reservoir is a direct threat to Bengal tigers or whether a wild carnivore reservoir, such as the jackal, could bridge transmission between dogs and tigers. One of our next steps to help answer this question is to determine if any wild carnivores, including tigers, have been affected by this disease.