

# Researcher explores role of human behavior in infectious disease emergence

April 29 2010

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Virginia Tech wildlife scientist Kathleen Alexander examined how human behavior influences disease transmission between domestic and wild dogs in Africa. Credit: Courtesy of the Virginia Tech College of Natural Resources

Wildlife scientists Kathleen Alexander examined how different human behaviors influence disease transmission between domestic dogs and the African wild dog, an endangered species.

After studying the interactions of human and animal populations in Africa, Kathleen Alexander, associate professor of wildlife science in Virginia Tech's College of Natural Resources, found powerful evidence of how [human behavior](#) can influence the emergence of infectious disease in humans and animals.

Although human behavior is frequently cited as a factor that influences

disease emergence events, most behavioral research has focused on the pathogen, the reservoir hosts (animals populations that maintain the pathogen in the environment), or the vectors (agents that transmit pathogens from host to host) of infectious disease. To demonstrate the relationship between human behavior and pathogen emergence, Alexander examined how different human behaviors influence disease transmission between domestic dogs and the African wild dog, an endangered species, in Kenya and Botswana. In Africa, the domestic dog is thought to be the primary source of canine diseases leading to the decline of African wild dog populations.

In the journal article, "Human behavior influences infectious disease emergence at the human-animal interface," published in the Ecological Society of America's *Frontiers in Ecology and the Environment*, Alexander explains the significant differences in ranging behavior that she found in domestic dogs in Kenya and Botswana, which parallel the differences in disease-related mortality in African wild dog populations. The majority of domestic dogs in Kenya spend the day with grazing cattle, accompanied by herders, whereas in Botswana, most domestic dogs remain in the village, since cattle are normally left to graze unattended. As a result, African wild dogs have much higher disease mortality rates in Kenya, where they have more contact with domestic dogs.

These range differences in domestic dogs are associated with animal husbandry practices that vary between cultures. Using this investigation and similar cases in which human culture has influenced disease emergence, Alexander illustrates the implications of human behavior on infectious disease research and control, and explains how some animal illnesses can be spread to humans. "By promoting infectious disease emergence, human behavior may be the key that unlocks the proverbial Pandora's Box, allowing [infectious diseases](#) to emerge," Alexander remarked.

"We are increasingly seeing the threat that zoonotic disease emergence [animal diseases that can be passed to humans] poses to human health. One of the key drivers of emerging infectious disease is human behavior. What people do and how they do it in their environment will strongly shape the risk of pathogen exposure," Alexander said. "We need to better understand human culture and behavior in this context so we are better able to predict where the next pandemic might begin. At present, we can only wait for the next outbreak."

Provided by Virginia Tech

Citation: Researcher explores role of human behavior in infectious disease emergence (2010, April 29) retrieved 5 May 2024 from <https://phys.org/news/2010-04-explores-role-human-behavior-infectious.html>

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