Coronaviruses in human and animal health

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The Covid19 pandemic is still ongoing and you might wonder about how this virus is different from coronaviruses that infect livestock and other animals. Let’s try and answer some questions you might have with regards to this topic.

How widespread are coronaviruses?

Disease from coronaviruses is very common in humans and animals. Many species have their own version of coronavirus. In fact, one of the causes of the common cold in people is a coronavirus. What’s important to understand is that in general, these viruses stick with a species based on how their surface proteins fit receptors on the cells of their target species, in a lock and key fashion. The reasons the novel corononavirus has caused the world to enter gridlock is because it is new to our species, there is no immunity to it in the population, it spreads easily, and it can cause severe disease.

What is the source of the novel coronavirus?

SARS-CoV-2, the official name of the new coronavirus, is thought to have jumped from animals to humans. The most likely explanation is that it came from bats. You probably remember the SARS outbreak from 2003, which was caused by a similar coronavirus. Bats were found to be the likely source of the virus in the 2003 SARS outbreak, and probably passed it on to other animals that were sold in markets in China, such as the palm civet, a cat-like animal. Along the way the virus underwent mutations and finally was able to infect a new host – humans. Most importantly, it was able to spread from person to person. A similar mechanism was likely at play for this new coronavirus outbreak but we still do not have definitive proof. Rumors that the virus leaked from a lab in China have not been supported by facts.

How is the novel coronavirus different from coronavirus in cattle?

The good news is that the bovine coronavirus we have in the US belongs to a **different strain** of coronaviruses than the SARS-CoVs that have jumped to humans during the 2003 SARS and the current Covid19 outbreaks. Bovine coronavirus is a cause of calf diarrhea, winter dysentery in adult cattle and is thought to cause respiratory disease, for example as part of the shipping fever complex. There is no expectation that the novel coronavirus can infect cattle or that the bovine coronavirus that is endemic in the US causes disease in people. There is also **no evidence** that imported animals or animal products pose a risk for spreading Covid19, according to the CDC. Overall, there is no connection between coronavirus in cattle and SARS-CoV-2.

What about coronaviruses in other animals?

Epidemiologists are often worried about pigs as a mixing vessel for viruses that affect people and animals, e.g. for influenza viruses. Pigs have their own versions of coronaviruses that are the cause of Porcine Epidemic Diarrhea (PED) and Transmissible Gastroenteritis (TGE). However, just like in cattle, the coronaviruses in pigs are different and there is no evidence that pigs, chickens or ducks can get infected with SARS-CoV-2 or that they can transmit and spread it. The USDA webpage has a list of confirmed animal cases in the U.S: https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/sa\_one\_health/sars-cov-2-animals-us

Mink farms in the Netherlands have experienced cases of SARS-CoV-2 in animals and workers. Mink are closely related to ferrets, which researchers were able to experimentally infect with SARS-CoV-2 in the lab. Ferrets can catch the flu from people so the susceptibility of mink and ferrets to the novel coronavirus does not come as a huge surprise. Lions and tigers at a New York zoo also made the headlines after testing positive for the novel coronavirus and showing respiratory signs. The large cats likely became infected by a zoo employee. Could mink, ferrets, or cats spread the disease to people? At this time, there is only evidence that they can spread the virus to members of their own species, but not to people.

Should I worry about my pets?

There are a limited number of pets that have tested positive for Covid19, either by a direct test for the virus (PCR) or by antibody test, which shows prior exposure to the virus. However, healthcare professionals do not see pets as an important source of viral spread. The CDC offers answers to many questions related to pets and Covid19 on their webpage

https://www.cdc.gov/coronavirus/2019-ncov/faq.html#COVID-19-and-Animals

Would the coronavirus vaccine we have for cattle work in people?

Unfortunately, the corona virus vaccine for cattle would not work for people in the current pandemic because of the difference in strains. In fact, intentional or unintentional injections of animal vaccines in people can have adverse effects such as toxic inflammation or allergic reactions and must be avoided.

Additional resources

It is hard to escape information about Covid19 during this time. While there is a lot of information out there, not everything may be accurate. A reliable and up to date source is the CDC webpage including a page about animals:

<https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/animals.html>

As time goes by, we will continue to find out more about the role of animals in the pandemic, so check back occasionally for the latest information and recommendations.