

# Coronavirus Probably Spread Widely in Deer and Perhaps Back to People, U.S.D.A. Says

By Emily Anthes

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## The News

Humans transmitted the coronavirus to white-tailed deer more than 100 times in late 2021 and early 2022, according to new research led by the U.S. Department of Agriculture's Animal and Plant Health Inspection Service. The research also suggests that the virus probably spread widely among deer, that it mutated in the animals and that they may have passed these altered versions of the virus back to people at least three times.

The findings, some of which were also published in the journal *Nature Communications*, add to concerns that deer, which are ubiquitous in the United States, might become a long-term animal reservoir for the virus and a potential source of new variants.

"Deer regularly interact with humans and are commonly found in human environments — near our homes, pets, wastewater and trash," Xiu-Feng Wan, an expert on zoonotic disease at the University of Missouri and an author of the new paper, said in a statement. "The potential for SARS-CoV-2, or any zoonotic disease, to persist and evolve in wildlife populations can pose unique public health risks."



Scientists collected more than 11,000 samples from deer in 26 states and Washington, D.C. They found that one-third had antibodies to the coronavirus and 12 percent were actively infected. Genna Martin/San Francisco Chronicle, via Associated Press

## Why It Matters: Deer could be a source of new variants.

There is no evidence that deer play a major role in spreading the virus to humans, but the transmission of the virus from people to animals raises several public health concerns.

First, animal reservoir could allow viral variants that have disappeared from human populations to persist. Indeed, the new study confirms prior reports that some coronavirus variants, including Alpha and Gamma, continued to circulate in deer even after they became rare in people.

New animal hosts also give the virus new opportunities to mutate and evolve, potentially giving rise to new variants that could infect people. If these variants are different enough from those that have previously circulated in humans, they could evade some of the immune system's defenses.

## Background: Scientists have found signs of widespread infection in deer.

Researchers at the Animal and Plant Health Inspection Service, in collaboration with other government and academic scientists, began looking for the coronavirus in free-ranging white-tailed deer in 2021, after studies suggested that the animals were susceptible to the virus.

In that first year of surveillance work, the scientists ultimately collected more than 11,000 samples from deer in 26 states and Washington, D.C. Nearly a third of the animals had antibodies to the coronavirus, suggesting that they had previously been exposed, and 12 percent were actively infected, APHIS said on Tuesday.

For the new Nature Communications paper, scientists from APHIS, the Centers for Disease Control and Prevention and the University of Missouri sequenced nearly 400 of the samples collected between November 2021 and April 2022. They found multiple versions of the virus in deer, including the Alpha, Gamma, Delta and Omicron variants.

Then, the scientists compared the viral samples isolated from deer with those from human patients and mapped the evolutionary relationships between them. They concluded that the virus moved from humans to deer at least 109 times and that deer-to-deer transmission often followed.

The virus also showed signs of adapting to deer, and the researchers identified several cases in North Carolina and Massachusetts in which humans were infected with these “deer-adapted” versions of the virus.

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**What's Next: Surveillance will continue.**

APHIS has expanded its surveillance to additional states and species.

Many questions remain, including precisely how people are passing the virus to deer, and the role that the animals might play in sustaining the virus in the wild.

**Emily Anthes** is a reporter for The Times, where she focuses on science and health and covers topics like the coronavirus pandemic, vaccinations, virus testing and Covid in children. More about Emily Anthes