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Subject: PRO/AH/EDR> COVID-19 update (37): USA, SARS-CoV-2 in wildlife

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CORONAVIRUS DISEASE 2019 UPDATE (37): USA, SARS-COV-2 IN WILDLIFE

A ProMED-mail post

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https://www.standardsspeaker.com/lifestyles/health/covid-19-virus-is-widespread-in-u-s-wildlife/article_a3a2ab95-44cd-51e9-9f1d-981e426293cd.html

The virus responsible for COVID-19 is widespread among wildlife, a new study finds.

SARS-CoV-2 was detected in 6 common backyard species, including deer mice, opossums, raccoons, groundhogs, cottontail rabbits and red bats, researchers reported 29 Jul 2024 in the journal Nature Communications.

Further, antibodies indicating prior exposure to the coronavirus were found in 5 animal species, with rates of exposure ranging from 40% to 60% between species.

The highest exposure to the COVID virus was found in animals near hiking trails and high-traffic public areas, suggesting that the virus passed from humans to wildlife, researchers said.

There was no evidence of COVID passing from animals to humans, so people don't need to worry about getting the illness from any critters they come across while on a hike, researchers added.

"The virus can jump from humans to wildlife when we are in contact with them, like a hitchhiker switching rides to a new, more suitable host," said researcher Carla Finkelstein, a professor of biological sciences with Virginia Tech's Fralin Biomedical Research Institute at VTC.

"The goal of the virus is to spread in order to survive. The virus aims to infect more humans, but vaccinations protect many humans," Finkelstein added in a Virginia Tech news release. "So, the virus turns to animals, adapting and mutating to thrive in the new hosts."

SARS-CoV-2 infections have previously been found in wildlife, primarily in white-tailed deer and feral mink, researchers noted.

The new study significantly expands the number of species in which the COVID virus has been found, and suggests that areas with high human activity can serve as points of contact for transmission between humans and animals.

For the study, researchers collected nearly 800 nasal and oral swabs in Virginia from animals either live-trapped in the field and released or receiving treatment in a wildlife rehabilitation center.

The team also obtained 126 blood samples from 6 different species.

On one day, researchers identified 2 mice at the same site with the exact same COVID variant, indicating that they either both got it from the same human or one infected the other.

In addition, COVID isolated from one opossum showed viral mutations that had not been seen before, which could potentially make the virus more dangerous to humans.

"I think the big take-home message is the virus is pretty ubiquitous," said lead researcher Amanda Goldberg, a former postdoctoral associate with the Virginia Tech College of Science. "We found positives in a large suite of common backyard animals."

Many of the species that tested positive in Virginia are common throughout North America, and it's likely they're being exposed in other areas as well, Finkelstein said.

"The virus is indifferent to whether its host walks on 2 legs or 4. Its primary objective is survival," Finkelstein said. "Mutations that do not confer a survival or replication advantage to the virus will not persist and will eventually disappear."

Surveillance for COVID transmission in animals needs to continue, and new mutations taken seriously as a potential threat to human health, researchers said.

"This study highlights the potentially large host range SARS-CoV-2 can have in nature and really how widespread it might be," said researcher Joseph Hoyt, an assistant professor of biological sciences at Virginia Tech. "There is a lot of work to be done to understand which species of wildlife, if any, will be important in the long-term maintenance of SARS-CoV-2 in humans."

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[Citation: Goldberg, A.R., Langwig, K.E., Brown, K.L. et al. Widespread exposure to SARS-CoV-2 in wildlife communities. Nat Commun 15, 6210 (2024). <https://doi.org/10.1038/s41467-024-49891->

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The abstract reads:

"Pervasive SARS-CoV-2 infections in humans have led to multiple transmission events to animals. While SARS-CoV-2 has a potential broad wildlife host range, most documented infections have been in captive animals and a single wildlife species, the white-tailed deer. The full extent of SARS-CoV-2 exposure among wildlife communities and the factors that influence wildlife transmission risk remain unknown. We sampled 23 species of wildlife for SARS-CoV-2 and examined the effects of urbanization and human use on seropositivity. Here, we document positive detections of SARS-CoV-2 RNA in 6 species, including the deer mouse, Virginia opossum, raccoon, groundhog, Eastern cottontail, and Eastern red bat between May 2022-September 2023 across Virginia and Washington, D.C., USA. In addition, we found that sites with high human activity had 3 times higher seroprevalence than low human-use areas. We obtained SARS-CoV-2 genomic sequences from 9 individuals of 6 species which were assigned to 7 Pango lineages of the omicron variant. The close match to variants circulating in humans at the time suggests at least 7 recent human-to-animal transmission events. Our data support that exposure to SARS-CoV-2 has been widespread in wildlife communities and suggests that areas with high human activity may serve as points of contact for cross-species transmission."

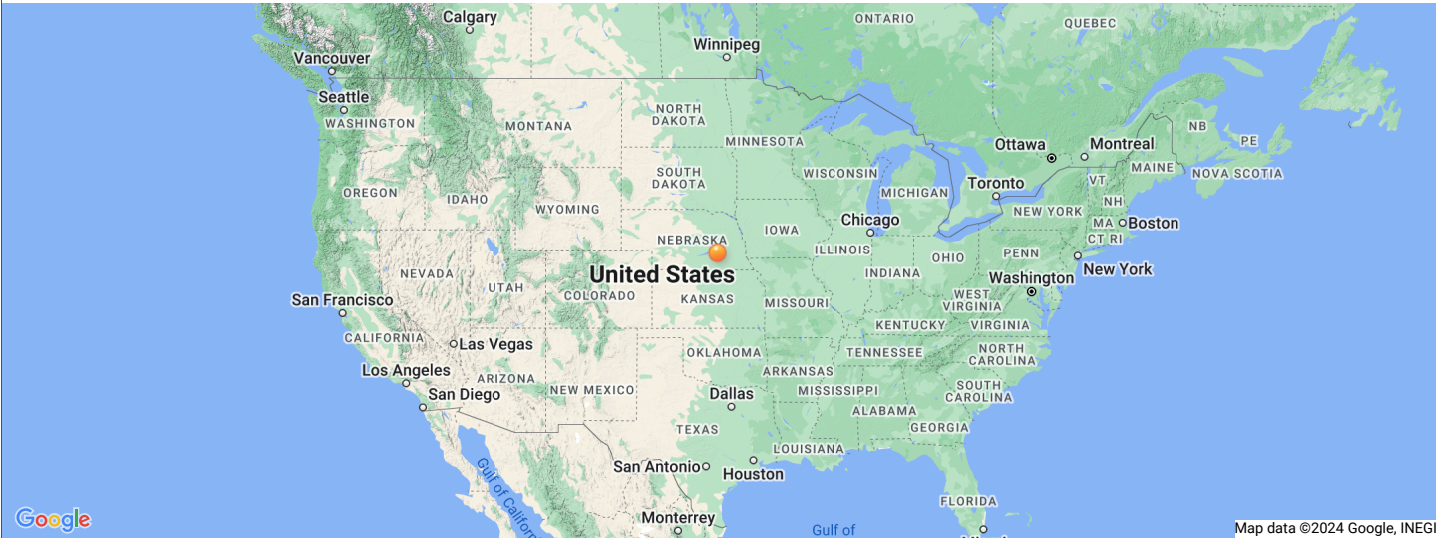
This is another compelling example of the relevance of the 'One Health' approach. This approach recognizes the inextricable links between people and nature, and visualizes the health and disease phenomenon from an integrative angle. The COVID-19 pandemic and the global spread of Avian Influenza H5N1 urge us to acknowledge the interconnection between people and the remaining forms of life, and with the environments they share, and demonstrates that the improvement of global health needs a collaborative, multisectoral, and transdisciplinary approach, acting at the local, regional and global levels. This concept becomes paramount when taking into account that most diseases -- not only COVID-19 -- affecting humans in the last decades have been caused by pathogens originated in animals. The human-livestock-wildlife interface must be the focus of surveillance efforts. - Mod.PMB

ProMED map:
United States: <https://promedmail.org/promed-post?place=8717868,106>]

See Also

- COVID-19 update (26): animal, North America, wild deer as reservoirs 20230713.8711124
2022
- COVID-19 update (92): animal, Canada, wild deer 20220408.8702494
COVID-19 update (83): animal, USA, mule deer 20220329.8702286
COVID-19 update (80): animal, USA, deer, transmission 20220325.8702212
COVID-19 update (63): animal, Canada, wild deer 20220303.8701773
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COVID-19 update (413): animal, Canada, wild deer 20211202.8700020
COVID-19 update (373): animal, USA, wild deer, transmission 20211102.8699412
COVID-19 update (260): animal, USA, wild deer, exposure, RFI 20210729.8554149
16 Jan 2021 COVID-19 update (20): animal, deer, experimental infection
2020
- COVID-19 update (536): animal, USA (UT) wild mink, 1st case 20201213.8015608
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