

Coronavirus Disease (COVID-19) and Bats in Human Care: Considerations from the AZA Bat TAG Veterinary Advisors

Prepared: 13 Apr 2020

Updated: 7 Jul 2020

Chiropterans are well known to host many viruses, including various coronaviruses. These include some very specific coronaviruses that are found in one species or only one genus of bats (Wacharapluesadeem et al, 2015).

SARS-CoV-2 is showing 96.3% genomic identity with Bat-CoV-RaTG13 that was previously detected in the Intermediate horseshoe bat (*Rhinolophus affinis*) from southwest China's Yunnan Province (Zhou et al, 2020).

There is no documented proof that Horseshoe bats (genus *Rhinolophidae*) have ever been kept in captivity in the U.S. or international zoos. Most bats in North American zoos are Old World fruit bats, with small populations of nectarivorous, piscivorous, and insectivorous species.

Nonetheless, a number of pathogens have been described to circulate between humans and bats. Due to their rapid spread and difficult containment, airborne pathogens raise the greatest concerns. It is important to remember that there have been limited studies looking at the transmission potential or pathogenicity of SARS-CoV-2 between humans and bats.

A [press release](#) of a recent study conducted by the Friedrich-Loeffler-Institut in Germany showed that intranasal inoculation of nine Egyptian fruit bats (*Rousettus aegyptiacus*) resulted in a transient infection in the respiratory tract, with virus replication detectable in the nasal epithelium, trachea, lung and lung-associated lymphatic tissue. These animals did not show any symptoms of disease or infect in-contact animals.

Considering the escalating disease (COVID-19) outbreak in the United States, there is concern that the coronavirus may pose a significant health risk to bats in human care. The AZA Bat TAG veterinary advisors have reviewed current literature and would like to make the following recommendations:

- Enhance PPE and disinfection protocols for staff that come within 6' of bats, maintain bat facilities and habitats, and/or prepare and deliver food, enrichment, etc.
- Wear masks, face shields/goggles, and gloves when working around bats and their habitats.
- Individuals preparing diets should wear masks and gloves.
- If possible, maintain a minimum of 6' distancing from the bats.
- Reduce all human/bat interactions to the minimum needed to maintain safety and animal welfare.
- Only allow trained staff to work within 6' of bats.

- Stop or minimize training/handfeeding unless required to administer medications.
- Separate all items that come in contact with bats from other species and disinfect accordingly.
- Use separate boots when working with bats or consider footbaths using institution approved disinfectants.
- Regularly disinfect all surfaces that commonly come into human contact.
- Practice proper hygiene.
- Follow all local/state/CDC ([human](#), [animal](#)) health and distancing guidelines when outside of work which is essential to the safety of the collection.
- Regularly wash hands and use hand sanitizer.
- Consider regularly testing staff for COVID-19 based on local and institutional health and safety guidelines.
- If you are sick and feel that your [symptoms](#) may be indicative of Covid-19, STAY HOME and consult your PCP or local health department.
- If a bat species presents with clinical signs such as fever, lethargy, or respiratory signs, report the animal immediately to your supervisor.

Exposure to transmissible respiratory pathogens can often be reduced or possibly avoided through engineering and administrative controls, and PPE. The optimal way to prevent airborne transmission is to use a combination of interventions from across the hierarchy of controls, not just PPE alone. Applying a combination of controls can provide an additional degree of protection, even if one intervention fails or is not available.

What To Do If A Bat Seems Ill

If a bat species presents with clinical signs listed above, samples can be submitted out of an abundance of caution, especially in light of each institution's risk assessment and finances.

Clinical evaluation and sample submission should take into consideration the following:

- Consider isolating the animal(s) and/or managing that animal's environment/holding area as a quarantine space that is serviced at the end of the shift.
- Per regulatory authorities, **zoos must first contact their State Animal Health Official to obtain permission to send samples**, and these officials may suggest a certain lab.
 - Oral/nasal swabs, tracheal wash, other respiratory samples, or feces can be sent to approved veterinary diagnostic laboratories.
 - SARS-CoV-2 is an OIE reportable disease and reporting is mandatory.
 - Any positive sample will be automatically sent to National Veterinary Services Laboratory (NVSL), and if positive, reported to federal and state officials.
 - The decision to test should be made with the understanding the above implications.
- If animals die with clinical signs consistent with SARS-CoV, consider performing necropsies under a hood, or if hood is unavailable, use appropriate PPE and ventilation.

For further information, please visit the ZAHP Fusion Center's [Considerations for the Management of Non-Domestic Species in Human Care During COVID-19](#).

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