



Rehabilitating North American Bats during the SARS-CoV2/COVID-19 Pandemic

The newly emerging SARS-CoV2, which causes COVID-19 in humans, is currently a worldwide pandemic and has been diagnosed in people from every state and province in the United States¹ and Canada. A summary of the non-human animal SARS-CoV2 positive individuals as of 4/10/2020 is provided as an appendix at the end of this statement. Zoonotic transmission from these animals back to humans has not been reported.

Currently, it is thought that the newly emerging SARS-CoV2 virus originated from wildlife and possibly from East Asian pangolins, and/or East Asian bats³. Details about these theories are summarized at the end of this statement. **SARS-CoV2 has not been found naturally in any wild bat.** One preliminary study did show the ability to infect Egyptian fruit bats with SARS-CoV2 in a research setting, however, they did not shed enough virus to infect conspecifics⁴. There are over 1400 different species of bats⁵, and it is unknown if this virus acts similarly in other species of bats. Many other coronaviruses use bats as a reservoir^{6,7} and **there is currently no evidence that introduction of SARS-CoV2 to North American bats would or would not cause population declines.**

A certain percentage of humans can be asymptomatic shedders of SARS-CoV2¹. Current expert understanding is that SARS-CoV2 is primarily transmitted person-to-person, and not a current zoonotic concern in any species⁸.

Many species of North American bats are incredibly adaptable and live in and around human dwellings (houses, attics, flashing, backyard foliage and trees, etc.), even in dense human populations. Bats come into close proximity of many people every day.

Wildlife rehabilitators across the continent who are trained to work with bats are a valuable public health resource. Members of the public come into contact with bats regularly, and often are directly exposed to bats before contacting professionals. Wildlife rehabilitators direct these individuals to local public health departments, help walk individuals through learning about rabies risk factors and following all public health recommendations, and ultimately act as an advocate for the health of the finder and the bat.

The NWRA Veterinary Committee supports the continued admittance of bats for rehabilitation to wildlife rehabilitation professionals not only to ensure proper bat care, welfare, and conservation, but foremost as part of the solution to public health concerns surrounding bats. Without wildlife rehabilitators, it is highly likely the public will have more human-bat interactions that lack the involvement of a professional to guide zoonotic concerns and take necessary

biosecurity precautions. Wildlife rehabilitators also represent a valuable resource for sample collection for researchers and are encouraged to collaborate whenever possible.

The NWRA Veterinary Committee supports one-health initiatives to improve human health, animal health and environmental health. Furthermore, the NWRA Veterinary Committee supports evidence-based medicine and subsequent actions.

Restrictions on bat rehabilitation and release have massive implications for the thousands of bats that are rehabilitated in the US and Canada each year, and for the adverse human-bat interactions that will inevitably occur as untrained people continue to find bats in need of care. If SARS-CoV2 is able to be transmitted from humans to bats, it has likely already occurred due to the high number of human cases in the United States and the frequency that people interact with bats at their homes.

Furthermore, due to the COVID-19 outbreak, fewer resources are available at municipalities to handle wildlife cases resulting in additional risk for the public who may take it upon themselves to handle a bat, without appropriate PPE, thus potentially having a negative impact on the health and welfare of the bat and the health of the person who handled it. Wildlife rehabilitators' expertise is needed even more during this crisis to protect human and animal health.

RECOMMENDATIONS

1. We recommend that authorized wildlife rehabilitators should be allowed to accept and rehabilitate bats, following appropriate biosecurity and safety measures to prevent human-bat respiratory virus exposures.
2. New bat admissions should be quarantined for 14 days.
3. There is no need to euthanize captive bats as a method of disease prevention.
4. Limit the number of people who have access to areas where bats are housed and cared for.
5. Rehabilitators showing any clinical signs of Covid-19 such as fever, coughing, or shortness of breath should immediately cease working with bats and consult their doctor for testing and quarantine recommendations. Backup caregivers should be pre-arranged for bats and any other animals undergoing rehabilitation.
6. Working with the local or regional veterinary laboratories and state/provincial public health officials, samples should be collected from rehabilitated bats if feasible, and if/when testing for bats is available, the bats should be tested for Covid-19 prior to release if available. However, bats should not be delayed from appropriate release simply because testing is not available.

Because this is an emerging pathogen, new research may sway directives and this statement will be updated accordingly.

Appendix

Since the outbreak of severe acute respiratory syndrome (SARS) 18 years ago, a large number of SARS-related coronaviruses (SARSr-CoVs) have been discovered in their natural reservoir host, bats, and previous studies have shown that some bat SARSr-CoVs have the potential to infect humans.⁶

The coronaviruses found in the Malayan pangolin (*Manis javanica*) and the *Rhinolophus affinis* bat remain the current closest to SARS-CoV2 across the genome (~96%⁶); some pangolin coronaviruses exhibit strong similarity to SARS-CoV2 in the virus receptor binding domain (RBD), including all six key RBD residues.³ However, bat coronaviruses are massively understudied³.

Currently, it is thought that SARS-CoV2 virus originated from wildlife naturally³, either via natural selection in the species in question before zoonotic transfer or natural selection in humans after zoonotic transfer from the species in question³. See the table below for current knowledge regarding positive test results suggestive of human to animal transmission of SARS-CoV2.

Summary below of current non-human animals that have tested positive for SARS-CoV2A⁸:

Species	Location	Antigen test results	Antibody test results	Symptoms	Possible source	Notes
Domestic dog	China	Weak positive	Positive	None	Owner had COVID-19	Elderly, died 3 d after release from unknown causes
Domestic dog ¹¹	Hong Kong	Positive		None	Owner had COVID-19	German Shepherd
Domestic cat	Belgium	Positive	--	Respiratory, vomiting	Owner had COVID-19	Unknowns around sampling
Domestic cat	China	Positive	--	None	Owner had COVID-19	
Tiger	NY, USA	Positive Confirmed by NVSL		Respiratory	Presumed asymptomatic keeper positive for COVID-19	Several big cats in zoo sick with respiratory signs
Domestic cats ¹²	China	Positive (15)	Positive (11)	None? Not clear in report	Owned and stray (community acquired)	Tested 102 cats in Wuhan
Domestic cat	Hong Kong	Positive		None	Owner had COVID-19	

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