

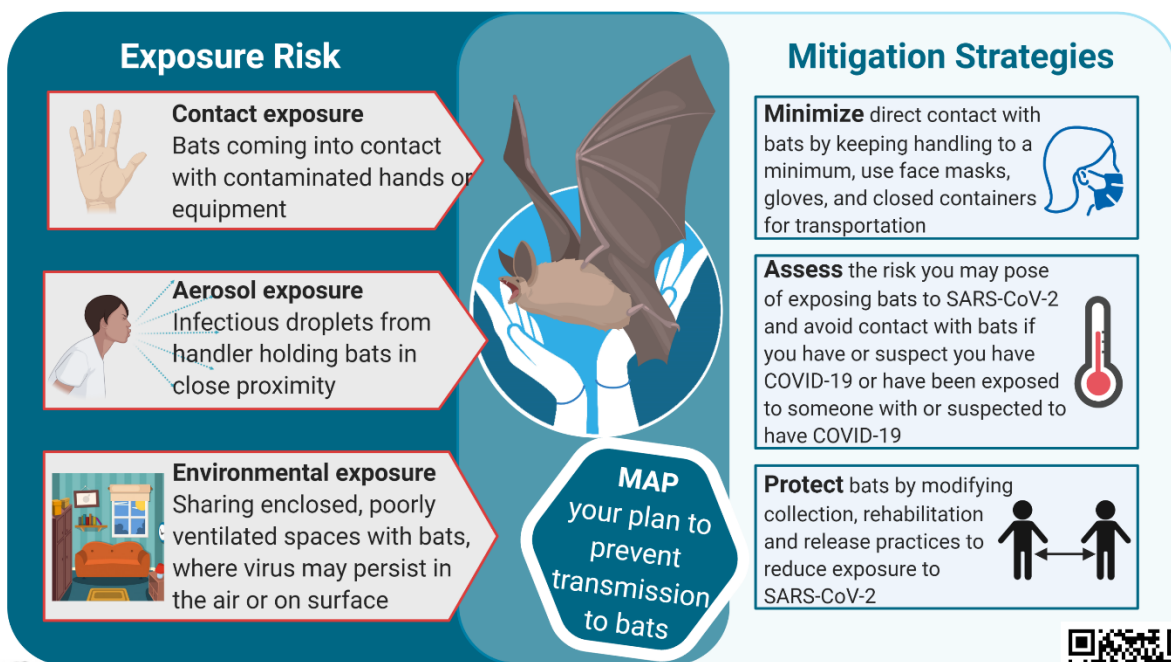
IUCN SSC Bat Specialist Group (BSG) recommendations to reduce the risk of transmission of SARS-CoV-2 from humans to bats in bat rescue and rehabilitation centers

MAP: Minimize, Assess, Protect

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Preventing human-to-bat transmission of SARS-CoV-2 *for bat rehabilitation*



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SARS-CoV-2 (the virus that causes COVID-19) has not been found in any species of bat and there is currently no credible risk of transmission of the virus from bats to humans. However, the IUCN BSG considers that there is a potential risk of human to bat transmission, which could create a viral reservoir in bats. This may have serious negative consequences for public health

and human attitudes toward bats. Fortunately, this risk can be significantly reduced using appropriate mitigation strategies.

Overview

The recommendations given below relate to minimizing the risk of human to bat transmission of SARS-CoV-2. All activities involving close contact with wild animals, including bats, retain some risk of accidental transmission of pathogens between species, this includes from humans to animals. Such transmission may have serious negative consequences should SARS-CoV-2 become established in wild animals, not only in the risks to public health but the unknown consequences for animal health and the human attitudes towards bats in particular. Fortunately, the transmission risk can be significantly reduced using appropriate mitigation strategies.

It is now known that humans can transmit SARS-CoV-2 to other animals and the consequences can be devastating. In a number of countries SARS-CoV-2 has been transmitted to mink on farms [1], spread through these populations, and may have even been transmitted back to farm workers [2,3]. This led to massive culls of thousands, and in some cases millions, of mink [3,4]. Humans have also transmitted SARS-CoV-2 to domestic dogs, cats and ferrets [5], and to zoo animals including captive tigers, lions, snow leopard and puma [5].

Since the last version of this document in July 2020, laboratory studies have shown that Egyptian fruit bats (*Rousettus aegyptiacus*) can be infected by SARS-CoV-2 [6] while big brown bats (*Eptesicus fuscus*) cannot [7]. We do not currently know how susceptible any of the other 1400+ bat species are to SARS-CoV-2, although modelling-based analyses suggest that the virus could potentially infect the cells in at least three genera (types) of bats [8]. Given the potential consequences, it is essential to minimize the risks so that SARS-CoV-2 is not accidentally transmitted from people to bats, including during rescue or rehabilitation. Recently, more information and country specific-scenarios have been made available by some authors [e.g. 9, 10, 11, 12]. It is important to remember that the BSG recommendations consider the world-wide risk of transmission and that the risk may be higher or lower in certain regions at any given moment.

We must also note that bats, like other animals, can host pathogens that can be transmitted to humans, some of which can cause serious illness or death. Those working with bats should always follow the advice of their government's health departments regarding minimization of the risk of pathogen transmission from bats to humans.

On 13 April 2020 the IUCN Species Survival Commission Bat Specialist Group (IUCN BSG) recommended the suspension of all field work that involves interactions with bats while it considered the risk of human to bat transmission of SARS-CoV-2, the virus that causes the illness COVID-19. Subsequently, the IUCN BSG convened a global panel of experts to assess the risk of human to bat transmission and to develop appropriate mitigation strategies to protect bats. It remains the opinion of the panel that there is a **credible risk of human-to-bat transmission of SARS-CoV-2**, but this risk can be reduced using appropriate mitigation

strategies, such as always using masks and gloves when handling bats, regularly disinfecting equipment that comes in contact with bats, and not handling bats if you have shown any symptoms of COVID-19 in the past 10 days or have been in contact with anyone else who has.

The panel further recognises that our understanding of SARS-CoV-2 is changing rapidly and advises bat rescuers and rehabilitators that this is a **living document** with further updates anticipated.

Background

The IUCN BSG considers it important to provide recommendations to professionals and members of the public who may come into contact with bats to minimize the risk of disease transmission. It is particularly important to share this message to reach anyone who comes into frequent and prolonged contact with bats and may not have access to necessary advice, training, or equipment.

The following recommendations have been developed to encourage and assist bat experts and enthusiasts involved in bat rescue and rehabilitation around the world to prepare and implement these mitigation strategies. Special guidelines concerning SARS-CoV-2 should be included in the general framework of health and safety at facilities involved in bat rescue and rehabilitation, and consider all regional risks, capabilities and regulations.

Current research suggests that the ancestor of SARS-CoV-2 arose in bats between 40 and 70 years ago. However, the current form of SARS-CoV-2 is genetically different and is circulating in humans, not bats. Consequently, there does not appear to be a risk that humans can catch SARS-CoV-2 from bats. However, the IUCN BSG considers that there is a credible risk of humans transmitting the virus to bats. This could have consequences for public attitudes towards bats, bat health, and if the virus were to establish in bat populations, for human health. Fortunately, this risk can be significantly reduced using appropriate mitigation strategies.

Bats could potentially be exposed to SARS-CoV-2 through infectious **aerosols** (droplets), **contact**, or **environmental contamination**. The likelihood of human-to-bat transmission of SARS-CoV-2 is increased in countries or areas with high rates of human viral infection. Sharing enclosed areas with bats, especially if poorly ventilated, may pose a risk to bats because the aerosols that people breathe out and could contain SARS-CoV-2 can linger in the air or on surfaces [13].

The rescue, treatment, rehabilitation, or quarantine of bats is an important aspect of their conservation. These activities raise public awareness and help maintain the health of both bats and humans. This is a high priority because despite the current pandemic, members of the public still find bats that are injured, weakened or otherwise in need of help. Given the extended contact that bat rehabilitators have with some individuals, the risk is greater for this type of ongoing interaction than for other bat-related activities where contact with bats is more limited, the recommendations are designed as a way to continue with this important task while minimizing the risk of pathogen transmission.

Take Action to Protect Bats – MAP your bat rehabilitation activities

Minimize direct contact with bats by keeping handling to a minimum, wear face masks, gloves, and use closed cardboard boxes for transportation, keeping individual bats isolated, until more is known about exposure, infectivity and transmissibility of SARS-CoV-2 from humans-to-bats;

Assess the risk you may pose of exposing bats to SARS-CoV-2 and avoid contact with bats if you have, or suspect you have, COVID-19 or have been exposed to someone with or suspected to have COVID-19;

Protect bats by modifying collection, rehabilitation and release practices to reduce opportunities for exposure to SARS-CoV-2.

Recommendations

The following recommendations aim to minimize the risk of accidental adverse impacts of bat rescue activities on both bats and bat workers due to SARS-CoV-2 at every stage of the rehabilitation process.

1. Capturing, securing and transport

- 1.a. Ask anyone finding a bat if, to their knowledge, the bat(s) may have had close contact with a person infected, or suspected of being infected, with SARS-CoV-2.
 - i) Anyone who has had symptoms of COVID-19 or contact with someone who has had COVID-19 in the past 14 days should not handle or transport any bats;
 - ii) If the bat may have had close contact with a person infected, or suspected of being infected, with SARS-CoV-2, additional precautions, such as testing or potentially not releasing the bat, will be necessary. See Section 3: Release for further guidance.
- 1.b. Advise anyone finding a bat that they should avoid holding them in the hand. We recommend that bats are contained, preferably using cardboard boxes. Use fresh disposable or disinfected gloves whenever handling bats is unavoidable. Do not hold bats for longer than necessary.
- 1.c. People finding bats, and rehabilitators, should use disposable cardboard boxes or special containers (disinfected and cleaned after each use) when transporting bats. Avoid containers with netting or rods that poorly isolate bats from humans.

2. Holding – treatment, rehabilitation, quarantine

- 2.a. Where vaccinations are available, bat rehabilitators should be vaccinated against COVID-19.
- 2.b. Individuals who have symptoms of COVID-19, who know that they have had contact with such a person (both quarantined and non-quarantined), or have been in contact with a person at risk of exposure, should immediately cease all direct contact with bats until they can demonstrate that they are not infected.
- 2.c. The following protective measures and equipment shall be applied when carrying out any activities involving close contact or manipulation of animals:
- i) Always wear a mask that covers the nose and mouth when handling bats or when in rooms or enclosures with bats;
 - ii) Individuals who have received full vaccination against COVID-19 should continue to use masks and gloves when handling bats or sharing an enclosed space with them;
 - iii) Wash and disinfect hands with soap and water or disinfectants before starting work, including the touching of equipment that will come into contact with bats. Rewash and disinfect hands following any activity that might lead to contamination with the virus;
 - iv) Wear gloves of material and thickness suited to the species of bat being handled and the work being conducted. Change or disinfect gloves regularly;
 - v) Only one bat should be placed in each bag or container during transportation or when being held temporarily, except for mother bats with babies or bats known to be from the same roost. Bags and containers should be disinfected and cleaned between bats;
 - vi) Carefully wash and disinfect all equipment in contact with bats (e.g. cages, bowls, tweezers, pipettes, syringes) before use;
 - vii) Do not blow with your mouth on bats (for example, to examine it or to break bites). Use alternatives such as blunt-ended dissecting scissors to part fur, bulb syringes or empty wash bottles with a fine nozzle to blow air onto the bat, etc.;
 - viii) For longer term housing, avoid keeping more than one individual bat in the same cage or container, with the exception of groups of baby bats (pups) being hand-raised for eventual release, mother bats with babies, bats brought into care known to be from the same roost, or those that suffer high levels of stress when held alone;
 - ix) Please note: direct contact with disinfectant products can be harmful to bats so do not spray disinfectants near any bats in your care, and ensure you dry any disinfected equipment or surfaces before coming into contact with bats.

- 2.d. During the COVID-19 pandemic, practice social distancing as much as possible. Work with bats individually or in small teams and avoid frequent exchanges of persons between teams. Minimize the number of different people coming into contact with each bat.
- 2.e. We encourage the use of contact-tracing apps where available to further reduce the risk of exposing bats to SARS-CoV-2.

3. Release

Following the guidelines and recommendations above can reduce the risk of transmitting SARS-CoV-2 to bats. Always use masks and gloves when handling bats or sharing an enclosed space with bats.

Prevention should always be prioritized because testing bats for SARS-CoV-2 after exposure may be costly or difficult to access. This may prevent the release of bats.

- 3.a. If a bat has had contact with a person infected, or suspected to be infected, with SARS-CoV-2, the bat should be kept isolated from all other bats and should not be released until the related risks have been clarified and infection excluded. Consider consulting your local veterinarian, bat conservation group, or wildlife rehabilitation center for further guidance.
- 3.b. Bats that may have been exposed to SARS-CoV-2 should be tested if possible. The IUCN BSG recognizes this will not be financially or logistically feasible in all locations or circumstances.
- i) Testing may be available through a local university or other research institution (your local veterinarian, bat conservation group, wildlife rehabilitation center or relevant government agency may be able to help, for a list of country agencies please see <https://docs.google.com/spreadsheets/d/1JbdKGrkekE9VtEEY6r3N-l7NX1tWt2xpNK8CtHUbP-w/edit?usp=sharing>). The laboratory that will carry out the testing should be able to provide sampling kits and instructions (please note samples must be fresh and placed in the appropriate storage media, e.g. RNAlater, Lysis Buffer or equivalent) as soon as possible.
 - ii) A World Health Organisation recommended protocol should be used (see: <https://www.who.int/docs/default-source/coronaviruse/whoinhouseassays.pdf> preferably one that uses 2 genetic markers as confirmation). [14]
 - iii) Two SARS-CoV-2 tests should be carried out. The first test should be 2-3 days after initial exposure and the second test should be 10-14 days later. We do not know how SARS-CoV-2 may replicate in bats so this is an estimate based on other animals.
 - iv) Only if both tests are negative should the bat be released.
 - v) If a bat in rehabilitation tests positive to SARS-CoV-2 it **must not** be released. The relevant public health agency or animal reference laboratory must be informed.

3.c. Do not release the bat if it has been exposed to SARS-CoV-2 and testing is not available.

4. Permanent residents

Following the guidelines and recommendations above can reduce the risk of transmitting SARS-CoV-2 to bats. Even when working with permanent resident bats, always use masks and gloves when handling or sharing an enclosed space with bats.

- 4.a. Bats unable to be released back into the wild due to injury or other incapacity should be permanently and effectively isolated from bats which may return to the wild after rehabilitation. This applies to the cages or rooms in which they are held, but also to any equipment and food associated with those animals.
- 4.b. Only permanent residents should be used for education activities and, to protect the bats, there should be no direct contact with the public. Careful thought should be given to the risks of taking bats to events during the pandemic.
- 4.c. Should the decision be made to take bats to events, they should be in enclosed plastic boxes with the ventilation appropriately protected, e.g. with a facemask held in place with elastic bands. The bats must not be taken out of their plastic box and handled at events, even by the bat rehabilitator, until the risk of transmission of SARS-CoV-2 to bats is further clarified. Containers made from net or mesh should not be used for bats for events as they do not offer any protection against aerosol transmission of SARS-CoV-2.

Further Reading & References

For more detailed recommendations for bat workers, including:

- disinfectant recommendations,
- recommendations on face coverings,
- general and basic best practices for field hygiene for standard bat survey work involving capture and handling of bats,

see: [IUCN SSC Bat Specialist Group \(BSG\) Recommended Strategy for Researchers to Reduce the Risk of Transmission of SARS-CoV-2 from Humans to Bats.](#)

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