



Great apes, COVID-19 and the SARS CoV-2

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The purpose of this document is to update great ape site managers, researchers, tourism operators and others about the known risks posed to great apes by the SARS CoV-2 virus, and to recommend measures for minimizing the risk of SARS CoV-2 transmission to great apes. This document updates a statement issued in March 2020. Summary information on COVID-19 (the disease caused by this virus) in humans has been moved to an Annex at the end of this communiqué.

SARS-CoV-2 AND GREAT APES

There is abundant evidence that great apes are susceptible to infection with human respiratory pathogens. *It can now be clearly stated that great apes are susceptible to SARS CoV-2 infection.* In January 2021, a captive troop of eight western lowland gorillas (*Gorilla gorilla gorilla*) at the San Diego Zoo Wildlife Alliance (SDZWA) was diagnosed with COVID-19, confirmed positive based on PCR tests. Infection occurred through exposure to a gorilla keeper who was infected with SARS CoV-2 but not yet clinically symptomatic at the time of exposure. All eight gorillas exhibited intermittent clinical signs of respiratory illness, which were mild to moderate in all gorillas but one. Clinical signs in a geriatric male gorilla (48 years old) were more severe, and it was the judgement of SDZWA veterinarians that his illness warranted examination under anaesthesia to enable comprehensive diagnostic assessment and supportive care. He responded well to treatment, and the other seven gorillas recovered on their own.

In response to detection of the virus in several domestic and non-domestic species living in captive situations (e.g., farmed mink, captive large cats), vaccines for use in animals are in development: a vaccine for use in animals has just been registered for use in Russia (as of March 31, 2021). SDZWA, under special dispensation from a US-based manufacturer and government regulators, administered an experimental animal COVID-19 vaccine to 13 great apes (orangutans, bonobos and gorillas) in their collection after the January outbreak. Vaccination appears to have been well tolerated by the animals; there is not yet evidence to prove its efficacy in preventing disease in these vaccinated individuals.

RECOMMENDATIONS FOR MINIMIZING THE RISK OF SARS CoV-2 TRANSMISSION TO WILD GREAT APES FROM HUMANS

The most effective measures for preventing the introduction of SARS CoV-2 to wild great apes from humans are to limit all contact, and limit the potential for aerosol spread among great apes and infected or potentially-infected people. *It is strongly recommended that site managers*

minimize great ape visitation (time spent near great apes, numbers of people) to those individuals who facilitate or participate in essential activities only. For ALL individuals coming within close proximity of great apes, [great ape visitation rules](#) need to be strictly enforced at all sites.

MINIMUM REQUIREMENTS

- ❖ Strict maintenance of a distance of at least 7 meters from great apes at all times; however, a minimum distance of 10 meters between humans and great apes at all times is strongly advised in the current situation.
- ❖ Requirement that a medical (surgical or N95 without valve) mask/respirator, or an alternate facial covering comprised of at least two layers, fitting tightly across the face (nose and mouth), be worn by anyone coming within 10 meters of great apes (see <https://www.leendertz-lab.org/blog/the-leendertz-lab-in-times-of-sars-cov-2>).
- ❖ Assurance that no person (park staff, researcher, tourist, etc.) exhibiting or reporting any signs of illness is allowed to visit great apes.
- ❖ Assurance that no person (park staff, researcher, tourist, etc.) who has been in contact with anybody diagnosed with COVID-19 in the preceding 14 days is allowed to visit great apes.
- ❖ Require a 10-day quarantine for all people arriving from outside the country who will come into frequent (daily) or longer-term (>1 hour) close proximity with wild great apes (e.g., protected area personnel, veterinarians, researchers, journalists), together with at least one negative COVID-19 test administered on Day 8 or 9. Clinical signs of COVID-19 and/or a positive COVID-19 test during quarantine should trigger mandatory isolation and medical attention.

ADDITIONAL BEST PRACTICES listed in [IUCN Best Practice Guidelines for Health Monitoring and Disease Control in Great Ape Populations](#)¹ identify the following further considerations:

- ❖ Respiratory hygiene – reinforce instructions that people who need to sneeze or cough should cover their mouths and noses with the crook of their elbows rather than their hands; if they need to sneeze or cough they should immediately leave the area and not return.
- ❖ Hand hygiene – provide and use hand-washing facilities and supplies for all individuals entering protected areas or other great ape sites; regular use of hand sanitizer (at least hourly when in ape habitats) for hands free of debris may be equivalent.
- ❖ Field clothes hygiene – ensure that all individuals coming into proximity of great apes are wearing clean, dedicated clothing and disinfected footwear prior to park entry.
- ❖ Waste hygiene – ensure that defecation and urination by individuals occurs at least 100 meters away from great apes: urine and faeces should either be carried out of great ape habitat, or be buried in a minimum 30 cm-deep hole to minimize the potential for direct contact by great apes.

¹ IUCN best practice guidelines for disease control in great ape populations are available in English, French & Bahasa Indonesia at: <https://portals.iucn.org/library/node/45793>

IUCN best practice guidelines for tourism with great apes are also available in English, French & Bahasa Indonesia at: <https://portals.iucn.org/library/node/9636>

ADDITIONAL PROGRAMMATIC CONSIDERATIONS for preventing transmission of SARS CoV-2 to wild great apes, where governments permit and resources allow, include:

- ❖ Routine COVID-19 surveillance and testing of personnel (e.g., protected area, research, veterinary, tourism/hospitality):
 - Daily self-checking and reporting for clinical signs and potential exposure by all personnel working at great ape sites.
 - A negative PCR test at least every 7 days for all personnel working at great ape work sites; an antigen test is acceptable if PCR testing is accessible for confirming an antigen test result if necessary.
 - Anyone testing positive should isolate at a location away from colleagues and the protected area and seek immediate medical attention.
- ❖ Anyone with exposure to a test-positive individual in the last 48 hours should quarantine at a location away from colleagues and the protected area for at least 10 days; individuals should seek COVID-19 testing at least once during quarantine period.
- ❖ Great ape tourists should be required to show either proof of COVID-19 vaccination or a negative COVID-19 PCR test conducted within 48 hours of visiting the great ape site, and at least 72 hours after disembarking an international flight.
- ❖ NOTE that COVID-19 vaccination will provide additional protection against COVID-19, while the protection measures described above remain critical for preventing transmission of other infectious diseases and should not be relaxed.

Further guidance is available from the Non Human Primate COVID-19 Information Hub <https://umnadvet.instructure.com/courses/324> and the Leendertz Lab <https://www.leendertz-lab.org/blog/the-leendertz-lab-in-times-of-sars-cov-2>.

In closing, strict adherence to best practices for great ape disease prevention and great ape tourism is a critical and effective barrier to transmission of SARS CoV-2 to wild great apes. As additional prevention measures (vaccines) become increasingly available, sites should advocate for vaccination requirements for all individuals coming into close proximity of great apes, including tourists.

Finally, given that the health of humans, other animals and the environment are inextricably linked, and recognizing that it may not be possible to implement all guidelines at all sites, we urge practitioners to adopt a One Health approach (<https://www.cdc.gov/onehealth/basics/index.html>).

ANNEX: Current information on COVID-19

Much is now known about human COVID-19 case and fatality numbers, treatment options, and vaccine effectiveness and safety, and this information is being updated regularly through research studies and the human experience globally. Current information on the pandemic can be found at the following two websites:

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>

<https://coronavirus.jhu.edu>

In Summary:

The World Health Organization China office was first alerted to several cases of pneumonia in people in Wuhan, China on December 31, 2019. On January 7, 2020 it was confirmed that pneumonia was a complication of a viral infection with a novel coronavirus, now named SARS CoV-2. The World Health Organization declared a global public health emergency on January 30, 2020, and a pandemic on March 11, 2020 – both urgent calls to action internationally. COVID-19, the disease caused by SARS CoV-2, has now affected nearly 133 million people worldwide, causing more than 2.886 million fatalities (as of April 6, 2021).

Only some infected people develop COVID-19 disease; if infected, COVID-19 presents clinically primarily as a respiratory illness, mild to severe (e.g., dry cough, nasal discharge, fever, malaise, loss of sense of taste and smell). Some infected patients develop other or additional clinical signs, some of which may persist as a 'long COVID' syndrome, an active area of clinical investigation. Deaths due to COVID-19 are primarily due to severe pneumonia. Case-fatality, or the proportion of confirmed COVID-19 patients who die due to having been infected, is currently approximately 2.2%. Treatment is in the form of supportive care, ranging from antivirals to medications to relieve symptoms and support one's own natural defences; evidence clarifying the usefulness of treatment options is continually being updated.

SARS CoV-2 is spread via contact with respiratory droplets emitted by an infected person. In all infected individuals, regardless of the severity of their illness, viral loads and viral shedding peak within days of infection and before infected people show clinical signs. While not considered an important source of infection, the virus can survive on surfaces and in the environment for hours to several days, depending on surface material and temperature; simple disinfectants (e.g., 60-80% ethanol or isopropyl alcohol or 10% household bleach solution) will inactivate the virus. While coronaviruses can also be spread through exposure to faeces and bodily fluids from infected individuals, this is not considered to be a significant route of transmission for SARS CoV-2.

While the first confirmed human case was in China (in Hubei Province), it remains unknown when and how this virus emerged. Bats are a wildlife reservoir of SARS-like coronaviruses and are widely believed to be the source, but this has not been confirmed. Hypotheses that this virus emerged as a deliberate act of bioterrorism or as a result of a laboratory accident have been deemed extremely unlikely. One year into the pandemic, virus variants of concern have emerged with increased transmissibility and more altered clinical outcomes, and their introduction and rapid spread in some locations is well documented.

Human vaccines for SARS CoV-2 have been developed, validated and approved or authorized in record time, and several are now being manufactured and administered globally. Unfortunately, availability and distribution limitations constrain immunization in many parts of the world.