

Corona virus disease (COVID-19): considerations for Great Apes in human care

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Considering the escalating Corona virus disease (COVID-19) outbreak in the United States, the great ape veterinary advisors have reviewed current literature and would like to make the following statement.

Background:

A number of pathogens have been described to circulate between humans and non-human primates. The close relatedness between these hosts is thought to support pathogen transmission. Due to their rapid spread and difficult containment, airborne pathogens raise the greatest concerns. Common human respiratory viruses such as the human respiratory syncytial virus (HRSV), the human metapneumovirus (HMPV) and the human rhinovirus C, have caused lethal outbreaks in wild habituated great apes. Before the discovery of the coronavirus that causes SARS, the most commonly identified coronaviruses known to infect humans, causing self-limiting upper respiratory tract infections were HCoV-229E and HCoV-OC43.

The corona viruses responsible for SARS, MERS and now SARS-CoV-2 (the corona virus that causes COVID-19) have dramatically altered the pathogenicity and threat to human populations of this family of coronaviruses. Currently- there is no data supporting host-specific CoVs in great apes and other primates, but there is a published report on anthroponotic transmission of HCoV-OC43 (the corona virus that causes the “common cold” in humans) resulting in respiratory disease in chimpanzees. **It is important to remember that there have been no studies looking at the transmission potential or pathogenicity of SARS-CoV-2 between humans and great apes. Despite this, it is the feeling of the great ape veterinary advisors that the emergence of this novel corona virus may pose a significant health risk to great apes in human care.**

Risk Assessments:

Because so much is unknown right now about the potential pathogenicity of the SARS-CoV-2 virus to great apes, the great ape SSP Veterinary Advisor group is advising that prevention of any potential pathogen spread between humans and great apes is critical. We are urging that all zoos housing great apes do a comprehensive risk assessment in your facilities that may include the following:

1. What are the current PPE and disinfection practices in ape areas, and do they need to be enhanced?
2. Who has access to great apes and for what reason?
 - a. Paid vs unpaid staff / volunteers, animal care staff vs other staff- e.g. grounds maintenance, researchers, educators etc., tours / encounters.
3. What is your risk of airborne pathogen transmission from humans to great apes? (CDC is recommending a minimum of 6 feet distancing)

- a. How close do keepers get to the apes for training? Shifting? Feeding?
- b. How close can the visiting public get to great apes without solid barriers (glass)?
- c. Can the visiting public throw objects into great ape habitats and how frequently does this occur?
4. Where are your “common touchpoints” where infection could be transmitted via non-aerosol contact? For example- who prepares the diet for the apes, how are diets delivered and by whom, etc.
5. Are staff that have close contact with apes being screened/evaluated for symptoms of COVID 19?
6. What are the potential staffing bottlenecks, and can they be proactively mitigated?

Potential actions:

Exposures 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.

Some potential mitigation strategies are:

1. Enhance PPE and disinfection protocols for staff that come within 6’ of apes and/or maintain ape facilities and habitats.
 - a. See PPE guidelines on AAZV website https://cdn.ymaws.com/www.aazv.org/resource/resmgr/Docs/primate_safety_guidelines_8_.pdf and/or PPE COVID-19 guidelines at www.CDC.gov
 - b. Examine PPE and disinfection protocols for staff that prepare and deliver food, enrichment etc.
2. Reduce all human / ape interactions to the minimum needed to maintain safety and animal welfare.
 - a. Only allow trained great ape staff to work within 6’ of apes
 - b. Consider temporarily stopping practices that allow close contact with apes and/or limit the number of people that may have close contact with apes.
 - c. Stop or minimize training / handfeeding
 - d. Stop tours / experience with apes etc.
3. If you cannot keep visitors more than 6’ away from apes and/or behind impenetrable barriers- consider closing those habitats or putting up barriers to keep safe distances between humans and the great apes.
4. Put in place protocols / questionnaires to screen the keeper staff and/or any staff that contacts great apes for symptoms of COVID-19.

- a. Note: for asymptomatic people without a history of exposure to COVID-19 who are being evaluated for a non-infectious complaint like hypertension, hyperglycemia etc.- and if they are afebrile (<100.0 F) and otherwise without even mild symptoms that might be consistent with COVID-19 (e.g., cough, sore throat, shortness of breath), the likelihood of infection is low.
 - b. Typical symptoms of COVID-19 that appear 2-14 days post-exposure include fever, cough and shortness of breath. In addition to cough and shortness of breath, nonspecific symptoms such as sore throat, myalgia, fatigue, nausea, and diarrhea have been noted as initial symptoms in some cases of COVID-19. These symptoms can have several alternative explanations; however, failure to identify and implement proper precautions for persons infected with COVID-19 can contribute to widespread transmission. For this reason, a lower temperature of 100.0°F and the inclusion of mild and non-specific symptoms should be considered suspicious and appropriate precautions and follow-up taken.
5. Generate crisis response pay protocols and quarantine pay protocols that compensate staff who have symptoms to stay home, thereby encouraging them to self-report any signs of illness.
 6. Analyze areas where you may have a bottleneck in staffing levels and how to mitigate the effects of any quarantines due to exposure in these staff.
 - a. For example- consider splitting critical / essential staff into two shifts that work on alternating schedules so that if one shift is exposed, there is a back-up shift that can take over the critical functions while the other shift is quarantined or tested negative.

What to do if you suspect COVID-19 in a great ape:

At this time, COVID-19 is considered a public health emergency so coordination with your state veterinarian, your local / county and/or state department of public health, and your occupational health services would be prudent before initiating any screening or treatment of a suspect corona virus case in a great ape.

The University of Illinois Veterinary Diagnostic Laboratory has an assay for COVID-19 and is willing to accept non-human primate samples for testing. They are currently working through logistic details in this rapidly evolving situation. An important point to remember is that we do not know how this would be handled from a regulatory standpoint so that is why working with your local public health authorities will be critical when making these decisions.

Resources:

Please refer to your state or local department of public health for additional information about plans and guidance for your area.

<https://zahp.aza.org/>

[World Health Organization \(WHO\)](#)

[CDC Situation Summary](#)

CDC

- Non-pharmaceutical Interventions (NPIs) Planning Guidance and Checklists: <https://www.cdc.gov/nonpharmaceutical-interventions/tools-resources/planning-guidance-checklists.html>
- CDC Get Your Workplace Ready for Pandemic Flu: <https://www.cdc.gov/nonpharmaceutical-interventions/pdf/gr-pan-flu-work-set.pdf>
 - Pandemic Flu Checklist for: Workplace Administrators: <https://www.cdc.gov/nonpharmaceutical-interventions/pdf/pan-flu-checklist-workplace-administrators-item1.pdf>
- Preparing communities for potential spread of COVID-19: <https://www.cdc.gov/coronavirus/2019-ncov/php/preparing-communities.html>
- Interim Guidance for Businesses and Employers to Plan and Respond to Coronavirus Disease 2019 (COVID-19): https://www.cdc.gov/coronavirus/2019-ncov/specific-groups/guidance-business-response.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fguidance-business-response.html
- WHO:
 - Getting your workplace ready for COVID-19: <https://www.who.int/docs/default-source/coronaviruse/getting-workplace-ready-for-covid-19.pdf>
 - Checklist for influenza pandemic preparedness planning: <https://www.who.int/influenza/resources/documents/FluCheck6web.pdf>
- ZAHF Resources for disease preparedness:
 - Secure Zoo Strategy: <https://securezoostrategy.org/build-facility-plan/>
 - Concept of Operations Plan for the Management of an Avian Influenza Outbreak at a Zoological Institution: https://www.aphis.usda.gov/animal_health/downloads/animal_diseases/ai/hpai-zoo-conops.pdf
 - HPAI Zoological Preparedness web exercise: https://zahf.aza.org/FADresponseexercise/story_html5.html
- National Association of State Public Health Veterinarians (NASPHV):
 - Current contacts: <http://www.nasphv.org/Documents/StatePublicHealthVeterinariansByState.pdf>
 - Compendium of Measures to Prevent Disease Associated with Animals in Public Settings: <http://www.nasphv.org/documentsCompendiumAnimals.html>
 - Compendium of Veterinary Standard Precautions for Zoonotic Disease Prevention in Veterinary Personnel: <http://www.nasphv.org/documentsCompendiaVet.html>

- American Association of Zoo Veterinarians (AAZV) Infectious Disease Manual: https://cdn.ymaws.com/www.aazv.org/resource/resmgr/idm/idm_updated_september_2019.pdf
 - *Please note the Coronavirus fact sheet on page 160 does not include considerations for the current strain*

References:

CDC website

Livia V. Patrono, Liran Samuni, Victor M. Corman, Leila Nourifar, Caroline Röthemeier, Roman M. Wittig, Christian Drosten, Sébastien Calvignac-Spencer, Fabian H. Leendertz. (2018) [Human coronavirus OC43 outbreak in wild chimpanzees, Côte d'Ivoire, 2016](#). *Emerging Microbes & Infections* 7:1, pages 1-4.

Jacob D. Negrey, Rachna B. Reddy, Erik J. Scully, Sarah Phillips-Garcia, Leah A. Owens, Kevin E. Langergraber, John C. Mitani, Melissa Emery Thompson, Richard W. Wrangham, Martin N. Muller, Emily Otali, Zarin Machanda, David Hyeroba, Kristine A. Grindle, Tressa E. Pappas, Ann C. Palmenberg, James E. Gern, Tony L. Goldberg. (2019) [Simultaneous outbreaks of respiratory disease in wild chimpanzees caused by distinct viruses of human origin](#). *Emerging Microbes & Infections* 8:1, pages 139-149.

Epidemiology and Clinical Presentations of the Four Human Coronaviruses 229E, HKU1, NL63, and OC43 Detected over 3 Years Using a Novel Multiplex Real-Time PCR Method
E. R. Gaunt, A. Hardie, E. C. J. Claas, P. Simmonds, K. E. Templeton
Journal of Clinical Microbiology Jul 2010, 48 (8) 2940-2947; **DOI:** 10.1128/JCM.00636-10