

Great Ape TAG SARS CoV-2 Vaccination Statement – Update March 2023

To all AZA institutions with great ape species:

This document has been compiled to provide an update on SARS-CoV-2 infection rates in great apes under human care, vaccination considerations, and serology results from institutions that have tested animals. Thus far, only gorillas have been documented to have SARS-CoV-2 infection according to USDA APHIS and Species Survival Plan (SSP) reporting, and no bonobos, chimpanzees, or orangutans have tested positive. Since most testing has been on symptomatic animals, we do not know the prevalence of infection in asymptomatic/unaffected apes. The most prevalent variant has been the Delta variant, and clinical cases reported to USDA have declined dramatically since October 2021.

Vaccination rates utilizing the previous Zoetis Conditionally licensed veterinary experimental vaccine against SARS-CoV-2 have been variable across AZA institutions. The vaccine is now commercially available as a mink coronavirus subunit vaccine, but Zoetis is continuing their vaccine donation program for zoos, conservatories and other qualifying animal organizations. The AZA Ape TAG did not release a specific study design for the monitoring of vaccination response, however a request for serology data was submitted to all ape holding institutions via the ape TAG listserv. Numerous facilities have run antibody titers to evaluate post-vaccination responses, with variable results. While most individuals do mount some degree of an immune response to this vaccination, not all of them have. No ape species appears to react more favorably to vaccination than others, and it is unknown what antibody level is considered protective against severe clinical disease from SARS-CoV-2 infection. Based on this information and correlating this with the dearth of concise information from the human medical field, we have no standard recommendation on the frequency of booster vaccinations after the initial vaccination course of two vaccines given three weeks apart. The frequency of booster vaccinations should be performed based on the critical evaluation of an individual's serological response to vaccination, continued desire for protection against disease, and bearing in mind that no adverse effects secondary to Zoetis vaccination have been reported in great apes thus far. Dr. Diego G. Diel, DVM, MS, PhD (Cornell University) is still running SARS-CoV serology (virus neutralization), and welcomes samples. Please provide vaccination status with dates of vaccinations to assist with the interpretation of the data.

Vaccination use data for great apes: Provided by Dr. Hardham (Zoetis) -

Animal	# Institutions that utilized the vaccination/ total number of holding institutions	# Vaccine Uses Reported (NOT the number of animals vaccinated)
Gorilla	40 / 48	538
Orangutan	38 / 49	303
Chimpanzee	28 / 35	796
Bonobo	7 / 8	144

As always, we recommend that each institution do a risk analysis of their ape populations for exposure to the SARS-CoV-2 virus, and continue to utilize appropriate PPE and evaluate the need for social distancing based on the risk of the species, contact with humans, and vaccination rates among animal management staff.

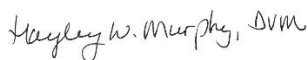
A non-invasive fecal screening panel is available from the Zoological Pathology Program Molecular Diagnostic Laboratory (University of Illinois, College of Veterinary Medicine). A Pan Coronavirus test is available, and if positive, confirmatory testing would be carried out at the same lab.

There is still much to learn regarding the impact of SARS-CoV-2 on great ape populations. The retrospective data learned and shared will provide prospective data for non-human primates in human care, as well as for apes in native ranges. Facilities that vaccinate apes are highly encouraged to share their data / information with the Ape TAG, and also share any serological data collected. This information will help the veterinary advisors for the great apes in human care make informed, evidence based recommendations regarding best practices to protect animals under human care. Any information shared will be collated and anonymously shared with stakeholders at the next update.

Please share the following information information with Dr. Priya Bapodra (priya.bapodra@columbuszoo.org) -

- Of the apes that received an initial Zoetis vaccination series, how many received a booster vaccination and at what interval?
- If any serology testing has been performed, please provide test results, dates of Zoetis SARS-CoV-2 vaccination, lab used
- Of apes that tested positive to SARS-CoV-2 (PCR/ antigen positive), what variant were they affected by?
- How many of the apes that have tested positive (PCR/ antigen positive), had received a primary Zoetis vaccination course?
- Did any apes with clinical signs of SARS-CoV-2 prior to vaccination have serology performed, and how do those titers compare with titers from vaccinated animals?
- Were any side-effects thought to be associated with the use of the Zoetis vaccination for SARS-CoV2 vaccination in apes?
- If any other formulation of SARS-CoV2 vaccine was used, please provide that information and any relevant data associated with the vaccination series (frequency, side effects, serology).

Thank you for everything that you do to keep the animals in your care healthy. Please see appendices for additional information



Dr. Hayley Murphy



Dr. Priya Bapodra

APPENDIX ONE:

List of Ape Vet Advisors -

Dr. Hayley Murphy (Ape TAG, Gorilla SSP, hmurphy@dsz.org)

Dr. Priya Bapodra (Bonobo SSP, priya.bapodra@columbuszoo.org)

Dr. Kathryn Gamble (Chimpanzee SSP, kgamble@lpzoo.org)

Dr. Ann Duncan (Chimpanzee SSP, aduncan@dzs.org)

Dr. Anne Meyer (Chimpanzee SSP, ameyer@savethechimps.org)

Dr. JB Minter (Chimpanzee SSP, Jb.Minter@nczoo.org)

Dr. George Prevolos (Chimpanzee SSP, gprevolos@lvzoo.org)

Dr. Karen Terio (Chimpanzee SSP, Bonobo SSP, and Great Ape Heart Project Pathology Advisor, kterio@illinois.edu)

Dr. Pam Dennis (Gorilla SSP, pmd@clevelandmetroparks.com)

Dr. Tom Meehan (Gorilla SSP, Thomas.Meehan@CZS.org)

Dr. Sam Rivera (Gorilla SSP, srivera@zooatlanta.org)

Dr. Nancy Lung (Orangutan SSP, nancylung2@gmail.com)

Dr. Joe Smith (Orangutan SSP, jsmith@thewilds.org)

APPENDIX TWO:

Contact information -

Diego G. Diel, DVM, MS, PhD, Associate Professor, Director, Virology Laboratory, Department of Population Medicine and Diagnostic Sciences, Animal Health Diagnostic Center, College of Veterinary Medicine, Cornell University, 240 Farrier Rd, Ithaca, NY 14853m, dgdziel@cornell.edu

John M. Hardham, Ph.D., Research Director, Global Biologics, Zoetis Center for Transboundary and Emerging Diseases, 333 Portage Street, Kalamazoo, MI 49007, john.m.hardham@zoetis.com

Zoological Pathology Program Molecular Diagnostic Laboratory (University of Illinois, College of Veterinary Medicine), zpplaboratory@vetmed.illinois.edu Submission form - https://vdl.vetmed.illinois.edu/assets/files/Submission%20Forms/F_ZPP-20_MDL.pdf

APPENDIX THREE: USDA Charts- March 2023



Confirmed Cases of SARS-CoV-2 in Animals in the United States

Last updated March 7, 2023

Filter data by footnote number
(See definitions on cases list tab)
All records

Companion Animals and Other Animals in Human Care	Method of Initial Diagnosis			
	Companion Animals and Other Animals in Human Care	PCR	Ab	Grand Total
399	Cat	61	57	118
	Dog	42	71	113
	Tiger	53	2	55
	Lion	52	2	54
	Gorilla	28		28
	Snow Leopard	13		13
	Otter	8		8
	Spotted Hyena	2		2
	Confirmed diagnosis of a single animal for species: Binturong, Coati, Cougar, Ferret, Fishing Cat, Lynx, Mandrill, Squirrel Monkey,			
	Mink Farms	Premises*		
Mink		16	2	18
States with Cases in Wildlife	Wildlife Detections**			
	Mink			
	Mule Deer White-tailed Deer			

*Location of some farms is withheld to avoid disclosing data about individual operations.
**Wildlife data only indicate detection in that species and not the number of animals confirmed.

SARS-CoV-2 and Variants Detected in Animals

Animal Type	WHO Variant Name																		
	D614G (pre-variant)	Alpha	Delta	Epsilon	Gamma	Iota	Mu	Omicron											
Companion Animals	Cat ✓	Dog ✓	Ferret ✓	Binturong ✓	Coati ✓	Cougar ✓	Fishing Cat ✓	Gorilla ✓	Lion ✓	Lynx ✓	Otter ✓	Snow Leopard ✓	Spotted Hyena ✓	Squirrel Monkey ✓	Tiger ✓	Mink ✓	Mink ✓	Mule Deer ✓	White-tailed Deer ✓

SARS-CoV-2 and Variants By Sample Collection Date Excluding Farmed Animals and Wildlife

