

Study Reveals 1 in 5 Zoo Animals Infected with COVID-19

Description

A recent study serves as a poignant reminder that the virus responsible for COVID-19 continues to propagate, with 9 out of 47 animals testing positive for SARS-CoV-2 at a zoo in Brazil.

It is probable that these animals contracted the virus through interactions with humans.

"Zoos present a distinctive context concerning the epidemiology of human-animal interactions," the research team, led by scholars from the Federal University of Minas Gerais in Brazil, elucidates in [their publication](#).

"These establishments house diverse species of wildlife from varied taxonomic categories in close quarters, leading to frequent interactions between animals and humans, especially among caregivers."

The testing for SARS-CoV-2 was conducted at the Belo Horizonte Zoo from November 2021 to March 2023, during which researchers successfully sequenced three viral genomes from the nine infected animals.

A maned wolf ([Chrysocyon brachyurus](#)) and a fallow deer ([Dama dama](#)) were identified as carriers of the notorious Alpha variant, while a western lowland gorilla ([Gorilla gorilla gorilla](#)) harbored the Omicron strain.

The SARS-CoV-2 RNA detected in these animals exhibited close genetic similarity to samples obtained from humans in the same geographic locale.

"The close proximity between zoo animals and their caretakers likely constitutes a significant pathway for infection," the authors [observe](#).

This was particularly relevant for infections documented between November 2021 and January 2022; however, a resurgence of infections occurred following the zoo's reopening in February 2022, likely due to increased interactions between the public and animal keepers, ultimately affecting the animals.

Notably, a map of the zoo indicates that the species that tested positive were relatively close to one another



within the overall layout.

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map shows infected species were in the same 'neighbourhood' of the zoo

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The black dots represent the locations of cages at the Belo Horizonte Zoo, with each dot denoting the mo
genomes were successfully sequenced. (Pérez Castillo et al., [Virology Journal](#), 2024)

Among the infected animals at the zoo were three western lowland gorillas, two maned wolves, a pampas cat ([Leopardus braccatus](#)), a brown brocket deer ([Subulo gouazoubira](#)), a red deer ([Cervus elaphus](#)), and one fallow deer.

Since the initial identification of SARS-CoV-2 in December 2019, researchers have expressed significant concern regarding its capacity to traverse species barriers, particularly from humans to previously unexposed animal species.

This phenomenon not only poses threats to newly infected species but also presents opportunities for the virus to establish natural reservoirs, potentially resulting in future outbreaks.

Effective disease management within zoo populations is crucial, given their interactions with humans and the close confines with other animals, as well as their roles in vital conservation initiatives aimed at preserving their species.

For instance, western lowland gorillas are critically endangered, and records from the World Organization for Animal Health indicate their heightened susceptibility to SARS-CoV-2 infections.

Timely identification of infections in zoo animals could furnish researchers with insights to mitigate the spread and evolution of the virus, thereby averting potential decimation of wild populations.

"The discovery of various variants highlights ongoing viral evolution and adaptation in new hosts," the authors [write](#).

"These findings emphasize the necessity for integrated public health strategies that encompass wildlife monitoring to alleviate the risks associated with emerging infectious diseases."

This research was published in [Virology Journal](#).

Vocabulary List:

1. **Epidemiology** /,ep.ɪ.diː.miˈɒl.ə.dʒi/ (noun): The branch of medicine that deals with the incidence distribution and



control of diseases.

2. **Propagation** /,prɒp.ə'geɪ.jən/ (noun): The act of spreading or promoting an idea or a disease.
3. **Reservoirs** /'rez.ər.vwɑ:r/ (noun): Natural or artificial lakes where water is stored or in a biological context hosts that can harbor pathogens.
4. **Susceptibility** /sə,sep.tə'bɪl.ɪ.ti/ (noun): The state of being likely to be influenced or harmed by a particular thing.
5. **Identification** /aɪ,dentɪfɪ'keɪʃən/ (noun): The action or process of identifying someone or something.
6. **Resurgence** /rɪ'sɜ:.dʒəns/ (noun): An increase or revival after a period of little activity or occurrence.

Comprehension Questions

Multiple Choice

1. Where was the recent study conducted on animals testing positive for SARS-CoV-2?

Option: Brazil
Option: India
Option: China
Option: USA

2. Which animals were carriers of the Alpha variant in the study?

Option: Maned wolf and fallow deer
Option: Western lowland gorilla and maned wolf
Option: Red deer and brown brocket deer
Option: Pampas cat and fallow deer

3. What did researchers successfully sequence from the infected animals?

Option: Three DNA genomes
Option: Three viral genomes
Option: Nine genomes
Option: Fifty genomes

4. What is emphasized as a significant pathway for infection by the authors?

Option: Proper ventilation
Option: Close proximity between zoo animals and caretakers
Option: Outdoor activities
Option: Vaccination



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5. Which of the following is a possible reason for a resurgence of infections post-zoo reopening?
- Option: Decreased interactions between public and animal keepers
 - Option: Enhanced safety measures
 - Option: Increased interactions between public and animal keepers
 - Option: Animal relocation
6. Which organization indicates the heightened susceptibility of western lowland gorillas to SARS-CoV-2 infections?
- Option: World Health Organization
 - Option: World Organization for Animal Health
 - Option: CDC
 - Option: FDA

True-False

7. Zoos are mentioned to have limited interactions between animals and humans.
8. The researchers identified the Delta variant in the infected animals.
9. Timely identification of infections in zoo animals could help mitigate the spread of the virus.
10. The study was conducted at the Singapore Zoo.
11. The Alpha variant was harbored by a maned wolf and a red deer.
12. The SARS-CoV-2 RNA detected in animals had no genetic similarity to samples from humans.

Gap-Fill

13. The testing for SARS-CoV-2 was conducted at the Belo Horizonte Zoo from November 2021 to March _____.
14. Effective disease management within zoo populations is crucial given their interactions with _____.



15. The discovery of various variants highlights ongoing viral evolution and adaptation in new _____ .
16. The animals that tested positive were relatively close to one another within the zoo's overall _____ .
17. Zoos house diverse species of wildlife from varied taxonomic categories in _____ quarters.
18. The zoo animals' caretakers likely constitute a significant pathway for _____ .

Answer

Multiple Choice: 1. Brazil 2. Maned wolf and fallow deer 3. Three viral genomes 4. Close proximity between zoo animals and caretakers 5. Increased interactions between public and animal keepers 6. World Organization for Animal Health

True-False: 7. False 8. False 9. True 10. False 11. False 12. False

Gap-Fill: 13. 2023 14. humans 15. hosts 16. layout 17. close 18. infection

Vocabulary quizzes

Multiple Choice (Select the Correct answer for each question.)

1. What is a term used to describe something mysterious or puzzling?
- Option: Secret code
 - Option: Electrophysiological
 - Option: Resilience
 - Option: Indulgences
2. Which plant is known for its medicinal and recreational uses?
- Option: Fungi
 - Option: Cannabis
 - Option: Correlations
 - Option: Resilience
3. What is the term for taking action to reduce the severity or risk of something?



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- Option: Inclusive
Option: Mitigate
Option: Proliferation
Option: Susceptibility
4. Which term refers to the ability of an individual or entity to govern itself independently?
Option: Potent
Option: Autonomy
Option: Chronic
Option: Epidemiology
5. What is the collection of chemical compounds that guide the functioning of our genes?
Option: Causation
Option: Enhancing
Option: Epigenome
Option: Propensity
6. Which term describes the rising again or renewal of an activity after a period of dormancy?
Option: Transiently
Option: Impairments
Option: Resurgence
Option: Propagation
7. What does the term "propensity" refer to?
Option: Identification
Option: Enhancing
Option: Resilience
Option: Propensity
8. What are acts of satisfying desires without restraint called?
Option: Phenomena
Option: Correlations
Option: Indulgences
Option: Mitigate
9. Which term refers to a group of organisms that includes mushrooms yeasts and molds?
Option: Enigma
Option: Transients
Option: Fungi
Option: Telophase
10. Which term means to improve or increase the quality value or extent of something?
Option: Enhancing



- Option: Propagation
Option: Susceptibility
Option: Identification

Gap-Fill (Fill in the blanks with the correct word from the vocabulary list.)

11. The _____ of the novel won numerous awards for their captivating storytelling.
12. The study focused on the _____ responses of the brain to different stimuli.
13. Prolonged stress can lead to various _____ health conditions.
14. The team analyzed the genetic factors influencing _____ to certain diseases.
15. The scientist studied natural _____ to understand underlying principles.
16. Effective _____ measures can reduce the impact of environmental disasters.
17. Water _____ in the region serve as crucial sources for agriculture.
18. The report outlined strategies for the rapid _____ of renewable energy sources.
19. The forensic team used DNA _____ to determine the victim of the crime.
20. The study established strong _____ between diet and overall health.

Matching Sentences (Match each definition to the correct word from the vocabulary list.)

21. The research project aims to develop a new generation of medical implants using living cells and organic materials.
22. The community showed great in rebuilding after the natural disaster.
23. The policy was designed to be of all members of society regardless of background or status.
24. The new drug demonstrated a effect in treating the rare disease.
25. Long-term smoking can lead to respiratory diseases.
26. The migratory birds were considered in the region only staying for a short period each year.



27. Public health officials relied on data to track the spread of the contagious disease.
28. The rapid of rumors led to widespread misinformation within the community.
29. Individuals with weakened immune systems have increased to infections.
30. In times of stress people often seek as a form of comfort and escape.

Answer

Multiple Choice: 1. Secret code 2. Cannabis 3. Mitigate 4. Autonomy 5. Epigenome 6. Resurgence 7. Propensity 8. Indulgences 9. Fungi 10. Enhancing

Gap-Fill: 11. Author 12. Electrophysiological 13. Chronic 14. Susceptibility 15. Phenomena 16. Mitigation 17. Reservoirs 18. Propagation 19. Identification 20. Correlations

Matching sentence: 1. Biohybrid 2. Resilience 3. Inclusive 4. Potent 5. Chronic 6. Transients 7. Epidemiology 8. Propagation 9. Susceptibility 10. Indulgences

CATEGORY

- 1. Sci/Tech - LEVEL5

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