



CURRENT ISSUES – ISCAID Task Force

SARS-CoV-2 Infections in Domestic Cats

The International Society for Companion Animal Infectious Diseases (ISCAID) provides opinions on topics regarding SARS-CoV-2 infections of companion animals in an online section called “CURRENT ISSUES.” The information discussed is reviewed frequently and updated as new information is received. In this **CURRENT ISSUE**, our panel of reviewers evaluate available information and update readers on what is currently known about SARS-CoV-2 infection in domestic cats.

The current COVID-19 pandemic in people is caused by a new coronavirus, SARS-CoV-2.¹ Data from a paper from China was recently reported and showed that SARS-CoV-2 can infect cats.² This paper also showed evidence for transmission of the virus amongst some of the in-contact cats. **The ISCAID committee noted that it is unknown whether the SARS-CoV-2 doses used to initiate these experiments are commonly achieved when an infected owner has contact with their personal cats. Since only a small number of cats were studied, caution should be exercised when interpreting these results.**

The first naturally exposed cat positive for SARS-CoV-2 RNA (samples obtained from the cat’s feces and vomitus) lived in Belgium with a person with COVID-19.³ The clinical signs of disease (anorexia, vomiting, diarrhea, dyspnea), which may have been related to the viral infection, resolved after 9 days.

In Hong Kong, some cats owned by people with COVID-19 have been quarantined and tested for the presence of SARS-CoV-2 over time.⁴ One of 18 cats tested was positive by qRT-PCR on 3 occasions in nasal and oral samples collected every two days but showed no signs of illness during the period it tested qRT-PCR positive. This cat ultimately was negative for live SARS-CoV-2 on virus isolation but did develop a serum antibody response.

On April 22, 2020, the first two domestic cats in the United States to test positive for SARS-CoV-2 RNA by qRT-PCR assay were reported and the Centers for Disease Control & Prevention (CDC) and the United States Department of Agriculture (USDA)’s National Veterinary Services Laboratories (NVSL) subsequently posted their findings and recommendations.^{5,6} Both cats had mild respiratory clinical signs but recovered.

On May 1, one cat from a household of owners suspected of being infected with SAR-CoV-2 in France was found to be qRT-PCR positive on fecal swabs but nasopharyngeal swabs were negative.⁷ It was the only cat that tested positive but the number of cats tested was not specified. The positive cat showed mild respiratory and digestive signs but details were not provided.

On May 8, a cat which lived with a family of SAR-CoV-2 infected people in Spain was found to be RT-PCR positive on tissues (nasal and mesenteric lymph node) collected at necropsy.⁸ SAR-



CoV-2 was not believed to be the cause of disease as the cat had been euthanized due to heart failure and had hypertrophic cardiomyopathy on necropsy.

During the time that these 6 cats have been documented with SARS-CoV-2 infection, the World Health Organization (WHO) estimated that COVID-19 associated illness occurred in 3,925,815 people.⁹ If a cat is infected, it is most likely to be from exposure to an infected person, early in the course of their disease, when the viral levels are the highest.¹⁰ Guidelines for minimizing risk of cats becoming infected with SARS-CoV-2 focus on avoiding prolonged exposure to infected people.

SARS-CoV-2 infection was confirmed on qRT-PCR testing of respiratory swabs or feces in 3 lions and 4 tigers with mild respiratory signs in the Bronx Zoo in New York City. The source of infection was believed to be an asymptomatic infected staff worker and transmission among the animals is suspected.¹¹ Further studies will be required to determine whether exotic cats are more susceptible to the SARS-CoV-2 virus than domestic cats which has been documented with the feline infectious peritonitis virus coronavirus.

A pre-review version of a manuscript is available that reported SARS-CoV-2 antibody test results from 102 cats collected during the COVID-19 outbreak in Wuhan (January to March 2020) and those from 39 cats collected prior to the outbreak in 2019.¹² Antibodies against the virus were detected by both ELISA and virus neutralization in 11 of 102 cat samples from the outbreak period, but none of the samples from cats tested positive prior to the outbreak. SARS-CoV-2 RNA was not amplified from any of the tested cats. Of the confirmed positive cats, 3 with the highest antibody titres belonged to known COVID-19 infected people and the others were collected from animal shelters or veterinary hospitals. In a separate recent report from Wuhan City, all of the 66 pet cats and 21 street cats tested were negative for antibodies against SARS-CoV-2.¹³

The data from the Hong Kong monitoring program suggest that even if owned by a person with symptoms of COVID-19, infection of cats with the virus is uncommon (1 of 18 cats).⁴ In another recent report, 9 cats living with 2 veterinary students positive for SARS-CoV-2 and 11 other students with suggestive symptoms of COVID-19 were tested by qRT-PCR and serology and all cats were negative.¹⁴

On a porous surface like cardboard, the virus did not live past 24 hours in one study.¹⁵ This suggests that cats are unlikely to serve as important fomites, passing SARS-CoV-2 to humans. However, further data will need to be collected before definitive statements can be made as there have been no investigation of haircoat contamination or the potential human impacts. SARS-CoV-2 is easy to kill with detergents and so if cat hair was proven to be a fomite, bathing or cleaning could likely be beneficial if the procedure could be applied safely, both for the cat and the person doing the procedure. However, it should be emphasized to cat owners that application of cleaning agents to cats can be very toxic.¹⁶ In the absence of data proving or denying a positive effect and since SARS-CoV-2 infection of people from contact with a cat has not been documented, some groups have stated that cats exposed to people with COVID-19 do not need to be bathed.¹⁷



The ISCAID committee concluded that the data collected to date from cats document that SARS-CoV-2 can be a reverse zoonosis, with a small proportion of cats being infected by contact with an infected human. However, to date, there are no data that document SARS-CoV-2 infection of a human from contact with an infected cat.

Combining risk factors identified in individual cats with those identified in the household of the owner currently are used to determine case management, including personal protective equipment (PPE) choices some public health groups like the CDC and the Ontario Veterinary Medical Association.^{18,19} While the clinical spectrum of SARS-COV-2 infection in naturally exposed cats is basically unknown, it seems reasonable to assume that if illness was to occur, the signs would be those of acute respiratory tract disease and/or gastrointestinal tract disease. Thus, cats with acute (within 14 days of the beginning of signs) vomiting, diarrhea, coughing, sneezing, or ocular or nasal discharge from households with suspected or confirmed COVID-19 human infection would be expected to be the greatest risk. If possible, these cases should be managed within the home. If veterinary care is required, the cases should be admitted, housed, and managed by personnel with the least risk for developing COVID-19 wearing appropriate PPE.^{18,19} **The ISCAID committee believes that cats with clinical signs of respiratory tract disease and/or gastrointestinal tract disease that have been present for 14 days or longer are not likely to have illness from infection by SARS-CoV-2.**

There are multiple common non-SARS-CoV-2 causes of acute vomiting, diarrhea, coughing, sneezing, or ocular or nasal discharge in cats. The failure to detect more SARS-CoV-2 positive cases in cats likely relates in part to lack of widespread testing in this species and well-designed epidemiologic studies are needed to further define the role of cats in this pandemic. However, whether there is benefit to testing individual cats by qRT-PCR alone at this time is unclear. Most cats known to be living with families with COVID-19 have tested negative to date. Also, a single positive qRT-PCR result for a viral infection does not prove the presence of live virus nor correlate to the presence of clinical disease, and finally there is currently no specific treatment for cats. **The ISCAID committee concluded that this combination of facts suggests that testing of individual cats is unlikely to be of clinical benefit.** Readers will also want to check for local recommendations for testing cats as recently published for the USA and Canada.^{20,21}

The recommendation to house cats indoors to lessen odds of exposure to SARS-CoV-2 caused considerable controversy recently in the United Kingdom.²²⁻²⁴ **The ISCAID committee concluded that both the welfare of the cat and the risk for SARS-CoV-2 exposure be considered when making housing decisions for individual cats.** However, since cats allowed outdoors are generally solitary and unlikely to have prolonged contact with a SARS-CoV-2 infected person, the risk of acquiring the infection outside the home seems low. Thus, feral cats are unlikely to be infected by SARS-CoV-2.

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