

Do animals contaminated with SARS-CoV-2 represent a risk for humans?

Press release from the French National Academy of Medicine

and the French Veterinary Academy

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Knowledge of the risks of human contamination by SARS-CoV-2 from animals [1] has been enriched by new data on susceptibility or resistance to the virus among different animal species, under natural or experimental conditions.

Although the zoonotic origin of Covid-19 is well established (bats of the genus *Rhinolophus*, possible intermediate hosts, including the Asian Pangolin), only one case of animal contamination in humans by SARS-CoV-2 having been documented with farmed minks in the Netherlands, there is currently no evidence that animals are involved in the spread of the pandemic in the human population. On the other hand, human-animal contamination by SARS-CoV-2 has been described on several occasions: since the first case of February 26 of the dog contaminated by its owner in Hong Kong, other cases have been reported in the same city (2 dogs and one cat), as well as in Belgium (one cat), the United States (5 tigers, 3 lions, 7 dogs, 5 cats), France (2 cats), Spain (2 cats, one farm mink), Germany (one cat), Russia (one cat), the Netherlands (25 mink farms) and Denmark (3 mink farms) at the time of this press release. A serological survey carried out in Wuhan after the Covid-19 epidemic revealed that out of 102 cats tested, 11 had been infected [2]. In France, 9 cats and 12 dogs in close contact with 20 veterinary students with Covid-19 (suspected or confirmed) remained seronegative. In addition, cats have been found seropositive near Dutch mink farms (3 out of 11 cats on one farm and 7 out of 24 stray cats near two infected farms; these 24 stray cats do not enter the houses [3]). With the exception of the specific case of mink in the Netherlands, where the spread of the virus by aerosols, favored by a high animal density inside livestock buildings, quickly infected the vast majority of minks as well as two employees, none of these observations currently allow us SARS-CoV-2 contagiousness from animals to humans or animals to animals to be concluded [4]. Furthermore, there are no data in favor of the transmission of the virus to wild animals under natural conditions. Experimental SARS-CoV-2 infection tests carried out in China, Korea, Germany and France have shown a high sensitivity in ferrets, cynomolgus and rhesus macaques, cats and golden Syrian hamsters, a much lower susceptibility in dogs, and a resistance in pigs, chickens, ducks, rats and mice. This work also showed that infected ferrets exhibited respiratory symptoms and could infect through contact with other ferrets. This has also been observed with cats, where symptoms are not always observed.

Although these animal infections do not play a role in the evolution of the Covid-19 pandemic, the National Academy of Medicine and the Veterinary Academy of France recommend, as part of a global strategy "one health":

- to implement the most stringent biosecurity measures in the mink farms that are not yet affected, in order to avoid human contamination and any risk of subsequent propagation, or even the creation of an animal reservoir;
- to avoid any contact between people infected with SARS-CoV-2, or suspected of being so, with their pets, especially if they are ferrets or cats, and to observe the same

barrier measures than to prevent contamination of those around them (hand washing, masks, etc.);

- not to apply to animals infected with SARS-CoV-2 measures contrary to their welfare;

- to continue the research to specify the conditions of contamination of various pets and to identify the risks of contagiousness for humans.

[1] Pets and Covid-19. Press release from the National Academy of Medicine of March 24, 2020

[2] Zhang Q et al. SARS-CoV-2 neutralizing serum antibodies in cats: a serological investigation. <https://doi.org/10.1101/2020.04.01.021196>

[3] Oreshkova N et al. SARS-CoV-2 infection in farmed minks, the Netherlands, April and May 2020. EuroSurveill. 2020; 25 (23). <https://doi.org/10.2807/1560-7917.ES.2020.25.23.2001005>

[4] Leroy E et al. Transmission of Covid-19 to pets: a risk that should not be overlooked. Bull Acad Vét France 2020; <http://www.academie-veterinaire-defrance.org/>