

The future of SARS-CoV-2 in animals: what will be the role of animals in COVID-19 epidemiology?

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Abstract

Animals are common hosts for many *coronaviruses* where bats and rodents are commonly regarded as primary reservoirs. The unquestionable emergence of *severe acute respiratory syndrome coronavirus 2* (SARS-CoV-2) in a yet unknown animal host - in addition with reports of further anthropogenic spread and sustained transmission in mustelids, captive felids, and domestic dogs and cats owned by people previously tested as SARS-CoV-2-positive, rise some concerns about possible continuous maintenance of the virus in nature and domestic species. In this review, we discussed the current data about *coronaviruses* in domestic and farming animals, recombination events, animal species susceptibility, virus-cell receptor interactions, and clinical signs of most relevant *Coronaviridae* members of each genera. Also, we present what is known about SARS-CoV-2 in animals and what will be the potential role of those species in COVID-19 epidemiology. Apparently, the virus can infect pets on some occasions, where cats look to be more susceptible than dogs. Thus, pet infection by sick owners is not only likely but expected given the numerous opportunities for spill-over during a massive outbreak. Regarded to farm animals, attention should be focused on breeding species of the *Mustelidae* family since they are those that have been shown to be more susceptible in experimental infections and have also effectively exhibited animal-to-human transmission. Other intensively bred species such as poultry, swine, horses and ruminants seem to present little or no epidemiological risk so far. The continuous monitoring of SARS-CoV-2 in animals in close contact with people with COVID-19 may be a key in the understanding of this emergent disease and the animal's role in epidemiology in the future. It is possible that some species will serve as important reservoirs and source of infection of COVID-19 for humans making it re-emergent in the future, as is theoretically proposed for the origin of SARS-CoV-2.

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