COVID-19: Animal Epidemiology and Zoonotic risk

Maurizio Ferri[1] and Shin Jie Yong[2]

[1]Affiliation not available
[2]Department of Biological Sciences, School of Science and Technology, Sunway University, Bandar Sunway, Malaysia

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Abstract

The COVID-19 pandemic represents one of the greatest public health crises in recent history that caused unprecedented and massive disruptions of social and economic life globally. It is widely acknowledged that bats are the animal reservoir of coronavirus 2 of the severe acute respiratory syndrome (SARS-CoV-2), the causative agent of the human coronavirus disease 2019 (COVID-19). It has also long been known that coronaviruses circulate among different animal species. However, much remain to be understood of the epidemiology, the presumed existence of intermediate animal species and current and potential animal routes of SARS-Cov-2 transmission to humans. The recent observational and experimental studies also highlight the role of domestic and farmed animals in the epidemiology of COVID-19. This raises concerns of the potential spread of infection among susceptible animal species, with the risk of evolving into panzootic, and the likely occurrence of anthropozoonoses or reverse zoonosis (from humans to animals). As for other wildlife emerging pathogens, the animal-human spillover of SARS-CoV-2 is linked to a closer interface with humans, with the resulting risk of a pandemic. This knowledge has meaningful implications for the design of effective wildlife animal surveillance (epidemic intelligence) targeting CoVs in animal reservoirs, and requires the mobilization of different lines of expertise, notably veterinary epidemiologists and virologists, within a multi-disciplinary approach according to the One-Health principles.

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Figure 1. Phylogenetic tree.pdf available at https://authorea.com/users/379029/articles/495400-covid-19-animal-epidemiology-and-zoonotic-risk

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Figure 2.pdf available at https://authorea.com/users/379029/articles/495400-covid-19-animal-epidemiology-and-zoonotic-risk

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Table 1 Experimental in vivo studies on susceptible and non susceptible animals to SARS CoV 2 and COVI available at https://authorea.com/users/379029/articles/495400-covid-19-animal-epidemiology-and-zoonotic-risk

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Table 2 Human health risk posed by SARS CoV 2 mink related variant.pdf available at https://authorea.com/users/379029/articles/495400-covid-19-animal-epidemiology-and-zoonotic-risk

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Table 3 Computational in silico studies on binding predictions of SARS CoV 2 to the ACE2 receptor of th
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Table 4 Functional in vitro studies on infection abilities of SARS CoV 2 to cells expressing animal ACE
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Table 5 Risk assessment of farmed animals of species susceptible to infection with SARS COV 2.pdf
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