16TH CALL WOAH *AD HOC* GROUP ON COVID-19 AT THE ANIMAL-HUMAN INTERFACE

14th June 2022

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Agenda

1. WAHIAD's activities to gather information on surveillance activities in animals and its gaps (Paolo Tizzani, WOAH)
2. Serological SARS-CoV-2 screening in cattle in Germany (Martin Beer, FLI)
3. Discussion on recent findings in animals and research activities

Meeting notes

1. WAHIAD's activities to gather information on surveillance activities in animals and its gaps

The group was updated on the activities of the World Animal Health Information and Analysis Department concerning the monitoring of official and unofficial data sources to better understand global surveillance activities and their gaps regarding the infection of animals with SARS-CoV-2. Since the beginning of 2020, WAHIAD had analysed more than 50.000 information "signals" using EIOS technology and WOAH has received over 300 reports of SARS-CoV-2 infection in animals. There is a gap of animal surveillance information in the African continent and the central Asian region. The WAHIAD is planning to do a survey of WOAH notification focal points to better understand national/regional animal health surveillance activities for SARS-CoV-2.

2. Serological SARS-CoV-2 screening in cattle in Germany

The group learned about research activities on SARS-CoV-2 and animals recently done by FLI. The first work that was described dated back to 2020 and involved the experimental infection of 6 calves with the first SARS-CoV-2 strain detected in Germany. Viral replication and specific seroreactivity were detected in 2 inoculated animals. The in-contact animals did not become infected (Ulrich *et al*., 2020).

Later, the research group decided to use samples of cattle sera (n=1000) from 83 farms located in four German federal states that had been collected for existing disease control programmes and analyse them using the same RBD-based multi-species ELISA. An indirect immunofluorescence assay and a surrogate virus neutralization test were used as confirmatory tests. The study detected occasional infected of cattle by keepers infected with SARS-CoV-2, but no evidence of onwards spread. This work has not been published yet.

The same assay was used to test deer populations (roe deer, red deer, and fallow deer), taking the opportunity of existing control programmes for Schmallenberg and Bluetongue and in collaboration with local hunters. Among the 700-800 samples tested, although there was some seroreactivity, there were no positive results using the RBD-based multi-species ELISA and the confirmatory tests mentioned above. The reactivity presented by roe deer suggest the presence of an unknown deer *Sarbecovirus* in this population.

German cervids seem to be less susceptible to infection with SARS-CoV-2 than North American white-tailed deer. Hence the stark difference in seroprevalence.

Finally, the group has recently done experimental infection of goats with SARS-CoV-2 using two different variants: Delta and Omicron (B.A.1) (yet unpublished). The cT values show that although some animals could possibly have been infected with Delta, no animals were infected with the Omicron (B.A.1) strain. These results are consistent with a similar experiment recently done with ferrets, which has shown that the Omicron (B.A. 1) variant that was used could no longer infect ferrets possibly due to its high adaptation to human hosts.

3. Discussion on recent findings in animals and research activities

White-tailed deer: Continued surveillance activities show that SARS-CoV-2 circulation has been established in white-tailed deer (WTD) populations. These animals roam freely between Canada and the USA. Genetic sequencing of SARS-CoV-2 from deer samples shows adaptive mutations, meaning that the circulation has been happening for a significant length of time. Researchers in Canada and in the USA are collaborating in prospective experimental infection studies of WTD with different SARS-CoV-2 variants. However, to ensure WTD have not been previously exposed to SARS-CoV-2, sourcing animals will take additional time. It was noted that there is not any information regarding the health/infection status of WTD predators.

Other surveillance studies: the group showed concern regarding the results reported in series of pre-print articles which have shown a high seroprevalence of SARS-CoV-2 antibodies in camels, cats and dogs (Heshborne *et al.*, 2022), including a study that claims seropositivity in birds and small ruminants (Nakavuma et al., 2022). The group noted that no confirmatory tests were used. The preprint from Patel *et al.*, 2022, was also mentioned – the group will discuss these findings after peer-review and publication.

Cat to human transmission: the group was not surprised by the recent report of cat-to-human transmission after a veterinarian in Thailand was diagnosed with COVID-19 after being sneezed on by an infected cat owned by an infected patient (Sila *et al.*, 2022). Personal protective equipment and infection prevention measures should be applied when dealing with animals suspected of being infected with SARS-CoV-2.

Recommendations:

- WOAH should work with its partners (FAO and WHO) to set up a mechanism to help groups of scientists working on the animal surveillance/susceptibility field to exchange information and samples and coordinate research activities.
- More screening studies should be done in populations of susceptible livestock that have close contact with humans, especially in areas with high incidence of COVID-19.

The next call of this *ad hoc* Group shall be scheduled on a need-basis.