

Rapid opinion 19-2020 of the Scientific Committee established at the Federal Agency for Safety of the Food Chain on the zoonotic potential of SARS-CoV-2 (etiological agent of Covid-19 in humans: risk of infection from man to animals and from animals to man

Terms of reference

On 24 April 2020, the Scientific Committee published an urgent opinion (urgent opinion 04-2020) on the zoonotic risk associated with pets for the transmission of SARS-CoV-2 (agent of Covid-19 in humans) infection from man to animals and from animals to man. Since then, new knowledge has been obtained and new cases of SARS-CoV-2 infection have been identified in animals. They make it necessary to update the risk assessment. The question addressed in this opinion is the following.

In the context of the pandemic spread of SARS-CoV-2 (Severe Acute Respiratory Syndrome-CoronaVirus-2 (etiological agent of Covid19 in man) and taken into account the developments in knowledge, what is the risk of infection from man to animals and from animals to man?

Method

This risk assessment is carried out on the basis of expert opinion and the data already available in the urgent opinion 04-2020 of the Scientific Committee. The risk assessment is qualitative and based on the Animal Health Risk Assessment Methodology of the Scientific Committee (SciCom, 2017). The risk of infection is the result of the combination of the assessment of the probability of infection (4 levels: very low, low, high, very high), with the level of clinical impact of this infection on animals and men (4 levels: negligible, minor, moderate, major). To express the risk of infection four levels of risk are used: very low, low, moderate and high. All the assessments carried address the risk of introduction, i.e. the first case of transmission of SARS-CoV-2 from man to animals and vice-versa from animals to man and its impact on human health. The estimated risk of introduction is the gross risk, i.e. in the absence of risk mitigation measures (such as wearing a mask, hand disinfection, etc.). The risk of further spread of the virus to animals was assessed for the purpose of this opinion.

Conclusion

As in its urgent opinion 04-2020, the Scientific Committee concludes that productive infections in certain animal species (in particular cats, mustelids, golden hamsters and certain species of bats) are possible but are currently quite rare. The Scientific Committee is of the opinion that infection of humans by SARS-CoV-2-infected animals is possible. The risk of infection of animals by man and of man by animals has been qualified on the basis of three animal groups and according to different scenarios.

1. Concerning pets

1.1. Risk of infection of pets by an infected human being

The likelihood of a pet being infected by a SARS-CoV2 infected human being is

- 'high' in the case of a susceptible pet (cat, ferret, golden hamster, dog);
- 'low' in the case of non-susceptible pets.

The clinical consequences of infection of a pet infection with SARS-CoV-2 are

- 'moderate' in ferrets, and are comparable to the dead of minks in the Netherlands;
- 'minor' in cats and golden hamsters;
- 'negligible' for the dog.

The **risk of infection of a pet by an infected human being** is assessed as

- **'low'** in cats, dogs and golden hamsters;
- **'moderate'** in ferrets

In the absence of data, this risk is estimated to be "very low" for all other pets.

1.2. Risk of infection of men by an infected pet animal

The likelihood of human infection by a susceptible SARS-CoV-2 infected pet becomes as follows:

- **'very low'**, in dogs (no excretion of infectious virus has so far been demonstrated) and other pets;
- **'low'** in cats, golden hamsters and ferrets;
- **'high'** when human interactions with a susceptible pet (cat, ferret, golden hamster) are close and prolonged.

The clinical consequences of human infection by a susceptible and SARS-CoV-2 infected pet are

- **'minor to moderate'** for people without risk factors (risk factors are *e.g.* age, gender, co-morbidities, etc.);
- **'major'** for vulnerable groups of the population with these risk factors.

The **risk of human infection by an infected animal** is **'very low'** for the majority of people but **'high'** for vulnerable groups with risk factors.

2. Concerning production animals

2.1. Risk of contamination of production animals by an infected human being

The probability of infection of a susceptible production animal (mink) by a human being infected with SARS-CoV-2 is **'high'**. For non-susceptible animals, it remains low.

The clinical consequences of a SARS-CoV-2 infection are estimated to be **'moderate'** for minks, since increased mortality has been observed in Dutch holdings and lung lesions (pneumonia) were observed in some dead animals, but in most cases asymptomatic infections were observed.

The **risk of infection of a production animal by an infected human being** is assessed as

- **'very low'** for all production animals except minks,
- **'moderate'** for minks.

2.2. Risk of infection of man by an infected production animal

The probability of infection of man by a production animal, even a sensitive animal (mink), is considered to be

- **'very low'** for the majority of people;
- **'high'** for a certain category of the human population (*e.g.* mink breeders, their families, farm personnel, veterinarians) because of their frequent and intense interactions with production animals that excrete the virus.

The clinical consequences of a SARS-CoV-2 infection are estimated as

- 'minor' to 'medium' for the majority of people;
- 'major' for vulnerable population groups with frequent and intense interactions with production animals that excrete the virus.

The **risk of infection of man by an infected production animal** is estimated as

- 'very low' for the majority of people;
- 'moderate' for people working in mink farms, with this risk estimated as 'high' for vulnerable population groups.

3. Concerning wild animals

3.1. Risk of infection of wild animals by an infected human being

The likelihood of infection of a susceptible wild animal by a human being infected with SARS-CoV 2 is estimated as

- 'high' for sensitive species during high-risk activities;
- 'very low' for non-sensitive wild animals.

The clinical consequences of SARS-CoV-2 infection are estimated as

- 'moderate' for mustelids by analogy with minks and ferrets and for non-human primates by analogy with humans and taking into account the experimental evidence;
- 'minor' in feral cats and rodents (by analogy with the gold hamster);
- 'negligible' in all other wild animals due to lack of data.

The **risk of infection of wild animals by an infected human being** is estimated as

- '**moderate**' in non-human primates and mustelids by analogy with that estimated in ferrets and mink;
- '**low**' in feral cats, captive felines, wild canids and rodents (by analogy with domestic cats, dogs and gold hamsters);
- '**very low**' for all other wild species.

3.2. Risk of infection of a wild animal by an infected pet or an infected production animal

The likelihood of infection of a sensitive wild animal by an infected pet or production animal is estimated to be very low, although little is known about the role of stray and feral cats.

The clinical consequences are similar to those specified in point 3.1.

The **risk of infection of a wild animal by an infected pet or production animal** is assessed to be **very low** (for the majority of wild animals) to **low** (for mustelids, feral cats and non-human primates).

3.3. Risk of infection of humans by an infected wild animal

The likelihood of infection of humans by a wild animal, even by a susceptible wild animal (mustelids), is assessed to be very low. For certain categories of the human population (e.g. professionals in animal care centers and zoos, people with professional activities requiring close contact with wild animals), the likelihood of infection is estimated to be high due to their frequent and close intense interactions with animals that excrete the virus.

The clinical consequences are similar to those specified in points 1.2 and 2.2.

The **risk of human infection by an infected wild animal** is assessed to be

- **'very low'** for the majority of the population;
- **'low to medium'** for people working in animal care centers, zoos or in professional environments requiring close contact with wild animals, with this risk estimated to be high for vulnerable population groups.

3.4. Risk of infection of a pet or production animal by an infected wild animal

The likelihood of contamination of a pet or production animal by a wild animal, even by a sensitive animal (*mustelidae*) is estimated to be very low but depends on the breeding and housing conditions.

The clinical consequences are similar to those specified in points 1.1. and 2.1.

The **risk of infection of a pet or production animals by an infected wild animal** is assessed to be **very low**.

The establishment of the virus in an animal population increases the risk of transmission to humans. Similarly, a high frequency of contact between humans and animals increases the risk of transmission from humans to a susceptible species.

Recommendations

On the basis of these risk assessments, the Scientific Committee recommends:

- to restrict the freedom of movement of pets that are infected or stay with one or more people who are infected or suspected of being infected;
- to identify susceptible animal species by experimental infection;
- to implement active and passive surveillance programs in the Belgian mink farms;
- to validate the tests to be used on animals with regard to their sensitivity and specificity;
- to introduce surveillance measures such as the establishment of a roadmap (guidelines) for the management of injured or dead animals and the raising of public awareness of the risk of SARS-CoV-2 contamination in wild animals.

The full text is available on this website in dutch and in french.