



TAFS – Information on COVID-19

In December 2019, a new coronavirus, later named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), emerged in Wuhan, China (Wuhan Municipal Health Commission, 2019). The virus was found to infect the respiratory epithelium of affected patients causing, sometimes fatal, pneumonia (Xu et al., 2020). Since then, SARS-CoV-2, the causative agent of corona virus disease 2019 (COVID-19), is spreading globally, and was declared a pandemic by the World Health Organization on the 11th of March.

As of the 23rd of March, SARS-CoV-2 is present in 190 countries with 334,981 confirmed cases and 14,652 reported deaths (WHO COVID-19 outbreak situation, 24 March 2020). At this time, the numbers are increasing dramatically every day.

Limit the spread of SARS-CoV-2

It is crucial to limit the spread of SARS-CoV-2 to prevent too many people from becoming infected at the same time, which would consequently overload the healthcare systems. Control of the pandemic needs all of us, both young and old to help.

Follow the recommendations of the WHO and your local government. Social distancing, strict hygiene measures, and voluntary isolation in case of symptoms are key to slow down the spread of SARS-CoV-2 and with it, to saving lives.

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>

<https://foph-coronavirus.ch/>

Limit the spread of SARS-CoV-2

Mankind had never seen SARS-CoV-2 before and therefore does not have any immunity towards the virus. That allows the virus to spread without any big hurdle within the global population.

It is assumed that about 80% of people infected with SARS-CoV-2 are showing mild symptoms or are asymptomatic and likely not officially reported (Anderson 2020, Li 2020). The estimated incubation time for COVID-19 is about 5-6 days, but infected people start shedding the virus approximately 1-2 days before onset of the clinical symptoms (Anderson 2020). The current reproduction number (R_0), which indicates the number of people to which an infected person will transmit the virus on average, is estimated to be about 2.5 (Anderson 2020). Considering that SARS-CoV-2 seems to have a high affinity to the human ACE2 receptor, a receptor present in the epithelial cells of the pulmonary alveolus as well as other cell types, the transmission efficiency is likely favoured. The high transmission efficiency combined with a human population that has no pre-existing immunity towards this new virus, together with a dense, connected and interlinked world favour the spread of SARS-CoV-2 rapidly and globally.

In absence of pre-existing immunity or a vaccine, the only option to limit the spread of SARS-CoV-2 is to limit the possibility of the virus to infect new people. This is where social distancing and strict hygiene measures come into play. In order to flatten the epidemiological curve and reduce the R_0 , a combination of measures is needed, including case isolation, social distancing, hygiene measures,

voluntary isolation in case of symptoms and closure of schools, universities, and other points of interaction, where many people come together are important measures. Slowing down the spread of the virus is crucial to lowering the influx of COVID-19 patients into the health care system. Based on reports on the cause of COVID-19 from China, Italy and other countries, 21–31% of all COVID-19 patients require hospitalization, and approximately 16–55% of this group require admission to intensive medical care units, depending on the age group (“Severe Outcomes Among Patients”, 2020). The high number of people requiring intensive care is overburdening the healthcare system, which can exacerbate the number of deaths (Ferguson, 2020).

Governments need to implement measures to lower the infection rate and to keep the mortality rate as low as possible, at the expense of individual freedom and economic losses if necessary. The imposed measures, such as closing of schools and bars and bans of sport events and leisure activities need to be carefully timed. A baseline level of immunity is needed to prevent the immediate return of the virus once intervention measures are lifted. Keeping the measures in place for a long time also has disadvantages not only due to the effect on the economy, but also due to the effect on individuals. Social distancing does not mean a cap on all social interaction but a limitation on physical contact. The balanced timing of introduction of intervention measures with the scale of disruption and the period over which time the measures can be maintained are crucial (Ferguson, 2020).

Rules alone will not be enough to control the pandemic. All of us, every single one, need to help slow down the spread of the virus and to flatten the epidemiological curve.

The role of animals

SARS-CoV-2 most likely originated in bats and jumped to humans either directly or through an intermediate host. Several animals, like snakes, turtles, and pangolins, are suggested as potential intermediate host for SARS-CoV-2 (Liu et al. 2020). Coronaviruses have in the past jumped from animals to humans. SARS 2003 originated from horseshoe bats and initially jumped to palm civets and from there to humans (Xu et al. 2020). MERS was first identified in a human in 2012 in the Kingdom of Saudi Arabia (Zaki et al. 2012) and jumped from its natural host, horseshoe bats, via dromedary camels to humans (WHO 2018, Killerby et al. 2020).

Recent reports of dogs infected with SARS-CoV-2 raised the concern of an involvement of dogs and cats in disease transmission (Post 2020). The repeated positive test results call for an acknowledgment of virus replication in dogs (OIE, Follow-up report No. 3 16/03/2020). It was shown that SARS-CoV, the infective agent of SARS, can infect a range of pets and production animals including cats, chickens and pigs (Tu et al. 2004, World Health Organization 2003). SARS-CoV-2 as well as SARS-CoV use the same receptor (i.e. ACE2 receptor) to infect the host cell. SARS-CoV-2 shows a high binding affinity to the human ACE2 receptor which is also present in a broad range of animal species.

Although only limited data is available, it must be expected that SARS-CoV-2 can infect a broad range of animals, including both pets and livestock. The different animal species which might play a role in the epidemic of SARS-CoV-2, currently and in future, need to be further observed and examined. During the current COVID-19 pandemic, a spill over from humans to animals due to the high infection rate of humans and to environmental contamination is possible or even that the virus establish itself in animals. A focus on animals with a genetic similarity of the ACE2 gene and its receptor binding domain, combined with a high population density is needed. In such an environment, SARS-CoV-2 might be able to successfully adapt to potential hosts and intermediate hosts through genetic recombination (Forni, Cagliani, Clerici, & Sironi, 2017). The role of pets and livestock that could be

infected by humans and the possibility that the virus can jump back from those animals to humans need to be evaluated.

It is important to remember that the expansion of the human population, often into new so far untouched territories, and contact with wildlife where there exists a large family of coronavirus strains will maintain the likelihood of further spill over events. It is estimated that there are more than 3,200 coronaviruses in bats alone (Anthony 2017). For this reason, it is important to prepare globally for future spill overs.

Consequences for business

The current pandemic is definitively a challenge for business continuation. On one hand there is a risk of sustaining the supply chain and the production of goods due to limitation of intermediate products and raw materials as a result of production interruptions in other locations. On the other hand, there is the challenge to safeguard the health of employees. Finding the balance requires radical changes in the way a company is run and how employees work together. Businesses must develop new ways of doing business, such as new sales approaches where direct contact is not possible. For employees, staggered lunch times, switching to home office, and keeping a distance on the work floor are only a few aspects that need not only be organized but also explained. Supervisors must act as a role model and strictly monitor the measures imposed. Companies must be flexible and understanding of sudden changes in the situation of their employees e.g. due to closed schools and sick family members. They also must take the fears of their employees seriously. The constant flow of news reports on COVID-19, the heavy restrictions on moving and gathering, and the uncertainty about the future can take a heavy toll on people. Clear and open communication to explain why certain measures are implemented is key to maintaining business continuity. Providing information materials and regularly informing and reminding employees of the key measures to limit the spread of SARS-CoV-2 at the workplace are essential. People must understand why measures are imposed, otherwise they will not follow them.

Outlook

“It will get worse before it will get better” is a sentence we unfortunately are hearing often. But it is at the current stage brutally true. The global number of infections will further increase over the next weeks, maybe months. Based on current data we can divide the world in different groups based on their status within the current epidemic: at the beginning of the current epidemic is the North and South American region, in the middle of the current epidemic is Europe and Asian countries, and past the first wave of the epidemic is China. The status of Africa is less understood as testing is just beginning to ramp up in the continent (“Coronavirus (COVID-19),” 2020). Since there is little know about the duration of immunity in infected persons, there is the risk of a second wave of infections within the naïve population. The duration of immunity following an infection will have an impact on the frequency of waves of infection. The pattern could be similar to the seasonal flu, where the virus mutates seasonally, but this is not yet known.

There is an urgent need to understand how many people have been exposed to the virus and have achieved a minimum of temporary immune protection. This information is crucial to guide politicians on the implementation or reduction of measures imposed to limit the spread of the virus.

Whatever the future course of the epidemic will look like, one point is clear: We need to keep the level of people infected at the same time low to avoid an overload of the healthcare system and to gain time to learn more about this new coronavirus and developing drugs and vaccines.

TAFS is constantly monitoring the situation regarding COVID-19 and is discussing ways to help our members with validated information on the subject. TAFS aims to provide members with trusted and up-to-date information on the actual situation to use for themselves and their businesses. Further information will become available on the role of pets and livestock in the epidemiology of COVID-19, the impact of COVID-19 on pets and livestock, and how TAFS will continue to update its members.

“There have been as many plagues as wars in history; yet always plagues and wars take people equally by surprise.”

- Albert Camus in *The Plague* (1947)

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