

Salvagene SARS-CoV-2 Task Force: Flu in the time of SARS-CoV-2 - or maybe it's just a cold?

KEYNOTE

Dear Premium Customers,

With the onset of the flu season, it is vital to correctly diagnose symptoms to establish what kind of infection they indicate. We explain below why this is so important.

During the flu season, we are exposed to a whole range of different viruses, of which SARS-CoV-2 is currently the greatest cause for concern. The four most important virus types in this flu season also include the coronaviruses responsible for triggering the common cold, the influenza viruses which cause flu and the noroviruses responsible for gastrointestinal infections.

It is very important to distinguish and diagnose which disease you may be suffering from. As we have already reported, in the event of multiple infections, the order in which they have been caught will determine the severity of the course of the disease. You can read more about this in our [Keynote 37](#).

Our interferon system activates itself particularly well in response to influenza and noroviruses, which is why we can usually deal with these types of viruses without any fear of complications. Neither type of virus is really able to inhibit our interferon system. Quite the opposite applies in the case of SARS-CoV-2, which is able to downregulate weak or compromised interferon systems very easily and can thus proliferate readily in our body. This is also the main reason why it is proving to be so "successful".

It is therefore important to know what kind of infection you have fallen victim to. For example, if a SARS-CoV-2 infection occurs first, the interferon system will already be downregulated by the time a further infection based on influenza, norovirus or the common cold is added to the mix. This would lead to a much more severe course of the disease than without the prior SARS-CoV-2 infection. Conversely, if the individual is first infected with interferon-stimulating viruses, these will have already activated the interferon system and a SARS-CoV-2 infection shortly afterwards should therefore take a less severe course. The situation is different if we catch a cold based on coronaviruses, as these are very similar to the antibodies of SARS-CoV-2 and can provide additional immune protection. So it really does depend on the order in which the infections occur.

Confusingly, though, the symptoms are very similar, at least for influenza and SARS CoV 2. The most common symptoms of SARS-CoV-2 are a cough (45%), a high temperature (38%) and a runny nose (20%), with around 15% of patients also reporting a loss of sense of smell and taste. Sudden coughing and fever as well as general lethargy are typical of both. Pain in the throat, head and limbs, as well as a runny nose, is much more common in influenza patients. Loss of smell and taste is more common in Covid-19 patients. It is certainly easier to distinguish colds caused by coronaviruses. The typical symptoms are a sore throat, a runny nose, headaches and fatigue, and they tend to come on gradually over several days. In addition to the above-mentioned symptoms, noroviruses typically give rise to gastrointestinal

complaints. Naturally, the course of the disease differs greatly between SARS-CoV-2 and influenza virus patients. The symptoms manifested with SARS-CoV-2 are much more severe, and the experience of clinicians in the EU is that hospitalization lasts up to 4.5 times longer and is required more frequently; the number of patients on respirators is also twice as high for SARS-CoV-2 as for influenza. The mortality rate for SARS CoV 2 is significantly higher than for influenza, as has so often been reported during the past year. Mortality is generally on the rise again during the winter months, which is due to the fact that those who get infected in summer tend to be younger people who have a lower mortality rate. Now, we are once again beginning to see an increase in the number of older people getting infected and filling the hospitals, especially intensive care units. However, we continue to maintain that younger people – even very healthy ones – are also at risk. For example, last week in Slovakia, a fit and otherwise healthy personal trainer died within a few days of becoming infected with SARS-CoV-2.

Another co-factor contributing to a complicated and severe course of SARS-CoV-2 infection is air pollution; indeed, this is emerging as one of the most important co-factors. Based on the latest research done at the Max Planck Institute for Chemistry in Mainz, which has analyzed a wealth of data from the USA and China, we believe that 27% of all Covid-19 deaths in Asia can be traced back to poor air quality. In Europe, the rate is 19%, and in America, 17%. There are of course big differences. In Europe, for example, the Czech Republic has a percentage of 29% whereas Spain shows only 9%. On a wider global scale, only 3% of all Covid-19 deaths in Australia are due to poor air quality (i.e. particulate matter). In New Zealand, the figure drops even further to 1%. This is because both particulate matter and SARS-CoV-2 attack the endothelium – the lining of the blood vessels – causing inflammation. Extrapolated, this means that 40,000 Covid-19 deaths in the USA can be attributed to the co-factor of air pollution.

It is important that all known measures for avoiding infection are very strictly adhered to. In particular, because in our view, the prospects for a sustainable, permanent and widely available vaccine or medication solution becoming available are currently uncertain. More specifically, we expect that the first generation of Covid-19 vaccines will not be 100% perfect and will not be suitable for all. It is also likely that they will not prevent the infection, but only alleviate the symptoms. We also do not know how long these vaccines will retain their effectiveness.

Kate Bingham, a colleague at the UK Vaccine Working Group, has published an article on this in *The Lancet*. It is already clear that approval of a vaccine will not end the pandemic immediately. We are working on the very cautious assumption that the effectiveness of a vaccine will be around 50%, which is the threshold set by the FDA. The EU has not yet expressed an opinion in this regard. We expect that it will be well below the figures achieved by the measles vaccine (95%) and the influenza vaccine, which is 55-65% effective depending on the season. However, we believe that there will be a very clear effect in terms of clinical symptoms. Even severe courses will be mitigated due to a lower viral load and thus reduced infectivity, which would already represent a major success. Furthermore, we assume that multiple inoculations will be necessary, so that it may be years before complete immunity can be established – if this is even achievable. We can indicate the most likely scenario with the current number one project, the vector-based corona vaccine being developed by AstraZeneca. Here, the first deliveries to clinics within the Phase 3 approval process are expected to take place as early as next week. We expect the potential launch to take place in the first months of next year. As previously reported, there is also the number two contender, an RNA-based vaccine from Biontech, and then there are also the vaccines from Janssen in Belgium, from Moderna in the USA and from Novavax. Also of interest for the first generation of vaccines in the first months of 2021 are the three vaccines from Sinofarm, Sinovac and CanSino from China, on which we have already reported on several occasions.

We will continue to update you on the current status of the respective projects. The temporary halts to testing at AstraZeneca are especially noteworthy. In our opinion, the two vaccines from Russia will not play a major role, at least not for the time being, as relatively little work is being done with these vaccines in Russia itself. A much greater role will be played by antibody therapies, and here too we have already reported several times on Regeneron, which has now submitted an application for emergency approval. Regeneron works with two antibodies which, in our view, show an increased risk of cross-reaction, but overall have shown a certain efficacy in early studies. These include 25 worldwide projects by companies such as Eli Lilly and medical institutes such as the Charité in Berlin, but here too there is no short-term solution in sight before spring at the earliest. The Eli Lilly project was also halted by the regulatory authorities last week. The herd immunity strategy outlined in the Great Barrington Declaration from the USA and the UK plays a rather minor role in the management of the pandemic. We have commented on this issue on several occasions and are more or less in sync with all our colleagues that, for a variety of reasons, this is not a viable solution at present.

The Salvagene SARS-CoV-2 Vaccine and Medication Advisory Board is currently working flat out to provide ongoing personalized recommendations for our Premium clients regarding vaccine and medication compatibility over the coming weeks and months.

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