

What is the coronavirus?

by Tania Louis

Translated and updated by Silvia De Monte and Florence Bansept

It has now been several weeks that we have heard about a new virus, which appeared in China at the end of 2019, and that is now circulating in Europe. New information reaches us every day – and that may be quite scary. We would like to review here what we know (and what we still do not) about this virus.

But before getting to this specific new virus : let's discuss the definition of a virus. We often hear that they can cause diseases, but you may not know why. The first characteristic of a virus is that it is tiny! If you take a ruler and look at the width of one single millimetre, you can imagine that it would be possible to fit in more than 8300 coronaviruses in this small area.

Since they are very small, viruses cannot carry many tools with them. This is why they need to use the ones of the organism they infect to multiply ; they are parasites. That is the reason why they can make us sick : they settle in our cells and transform them into small factories to make new viruses, which prevents them from working normally.

However, not all viruses infect humans, far from it! There are some that infect animals, plants, bacteria... and even other viruses !

What is this new virus ?

The newcomer belongs to a large family of what is called coronavirus, from the Latin *corona* which means *crown*. When you look at it under the microscope, indeed, the little spikes on their surface make them look like crowns (see figure 1). Today we know about forty coronaviruses, capable of infecting Mammals or Birds. Of these, only seven infect humans : four cause colds and three can cause more serious illnesses.

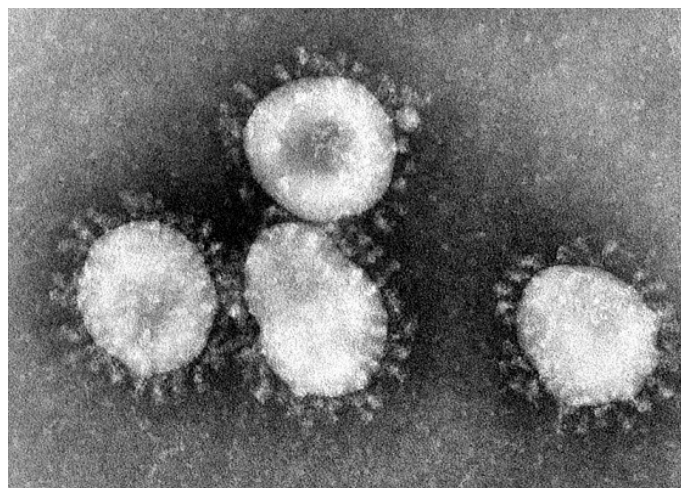


FIGURE 1 – *The coronavirus under the microscope !*

The virus that appeared at the end of 2019 in China was first called nCoV for "new coronavirus", but today specialists have agreed on a definitive name and this virus has been named "SARS-CoV-2". The World Health Organisation has also given a name to the disease caused by this virus : COVID-19, for "coronavirus disease 2019". Since this name is more convenient to remember and use than SARS-CoV-2, people sometimes also call the virus by the name of the disease.

The virus was first identified in December 2019 in the city of Wuhan, China. The scientists who studied it were able to show that it was an animal virus that managed to adapt to humans. A disease caused by a virus that passed from one species to another is called a zoonosis, and this kind of passage happens very often. In the case of SARS-CoV-2, we know that it was originally a bat virus that did not pass directly from bats to humans. There was an intermediate host, another Mammal that has not yet been identified, although you may have heard of the pangolin (see figure 2) – its involvement has not yet been proven !



FIGURE 2 – *A pangolin.*

Coronaviruses are respiratory viruses. They are transmitted mainly through the droplets produced when you cough or sneeze (see figure 3). These droplets contain viruses and can infect people directly if they reach their face, as coronaviruses enter the body through the mouth, nose and eyes. But these droplets can also be sprayed on surfaces. If this happens, the virus stays there until it is washed off and can infect people for hours or even days! One way to catch this virus is to touch a contaminated surface with our hands and then touch your face, which happens dozens of times every hour if you do not pay attention !



FIGURE 3 – *Droplets released when sneezing. Photo credit : Brian Judd.*

What precautions should you take ?

Now that you know this, you probably have a better understanding of why we advise you to wash your hands often : it helps to avoid bringing the virus to our mouth, nose or eyes after touching a contaminated object. Sick people should do their best not to spread viruses everywhere by coughing or sneezing. Ideally, people should cover their face with a tissue and then throw it away (and wash their hands) right away. Otherwise it is better to cough or sneeze into your elbow, which you do not use to catch things, than into your hand. It can also be useful to wear a mask, but be careful : it prevents viruses from going out of our body through our nose or mouth but not from entering into our eyes. Thus, it is useful to prevent sick people to spit out droplets, but may not be enough to avoid getting sick if you are sneezed at...

Today SARS-CoV-2 is found in most countries around the world. The number of sick people has become important in certain areas. In this situation it becomes difficult to prevent the virus from infecting more and more people, but it is still important to try to slow it down as much as possible by applying the advice we have just discussed. Some more precise and binding instructions, such as closing schools and asking people to stay at home, have been applied in many countries. Don't worry, this virus doesn't make children sick overall, but scientists believe that it can be spread fairly effectively in families when someone brings it home. Closing schools, in this case, is mainly to prevent children from making their parents sick.

By the way, should we be afraid of SARS-CoV-2 ? Is this virus dangerous ?

It's a difficult question because the answer is not the same for everyone, but yes, it is sufficiently dangerous to burden the hospitals of any country in the world. There have already been viruses more dangerous than this one, but it can still be fatal. And it is particularly good to spread from person to person. So, it is important to be careful and follow strictly the indications provided by the health officials. To better understand why, let's talk of the disease caused by this virus.

First of all, as with other viruses, not all humans infected with SARS-CoV-2 get sick. Some may get the virus and stay healthy, they are called asymptomatic. We don't yet know how often this happens because, since these people are healthy, they don't go to the doctor and we never check to see if they have the virus or not. In order to identify asymptomatic people, it is possible to test if they carry the virus or if they have developed an immune response to it. These tests are carried out more and more, and in a short time we will know more about how many people can spread the virus without being ill themselves.

For people who get sick, the first symptoms of COVID-19 (the illness caused by SARS-CoV-2) are unpleasant but not very serious : sore throat, fever, runny nose, sneezing, fatigue, headache... You or your loved ones may have had these kinds of things before : there are a lot of illnesses that cause them. For 80% of sick people, i.e. 4 out of 5 people, these symptoms last a week and... that's it. The illness stops.

Finally, and this is why this virus is still dangerous, in some patients, COVID-19 becomes more serious and they have to go to hospital because they have trouble breathing. This mainly concerns people over 60 years old or who already have health problems (for example, hypertension or diabetes), who can end up dying.

Even without being a doctor, there are things you can do to prevent this from happening ! By following the advice we talked about, you can avoid getting sick and protect the people around you. Coughing into your elbow, washing your hands, staying home or wearing a mask if you are sick, by the way,

are good habits that are not only useful against coronaviruses, they also help fight other diseases including the flu.

Research to find a cure

Scientists and doctors have been working restlessly on this new coronavirus since it emerged, both to try to understand it and to try to cure it! If we are lucky, we could have a first treatment against the virus in a few months or even weeks. There are also laboratories working on different vaccines. Their discovery and production take much longer than for drugs, but researchers think we could have an effective vaccine against SARS-CoV-2 in just under two years. A lot of research teams and health care providers are currently working to make this coronavirus less and less dangerous. Let's trust them, but let's not forget to be careful. For us and for our loved ones!

Translated and adapted from the French [Café des Sciences article](#)