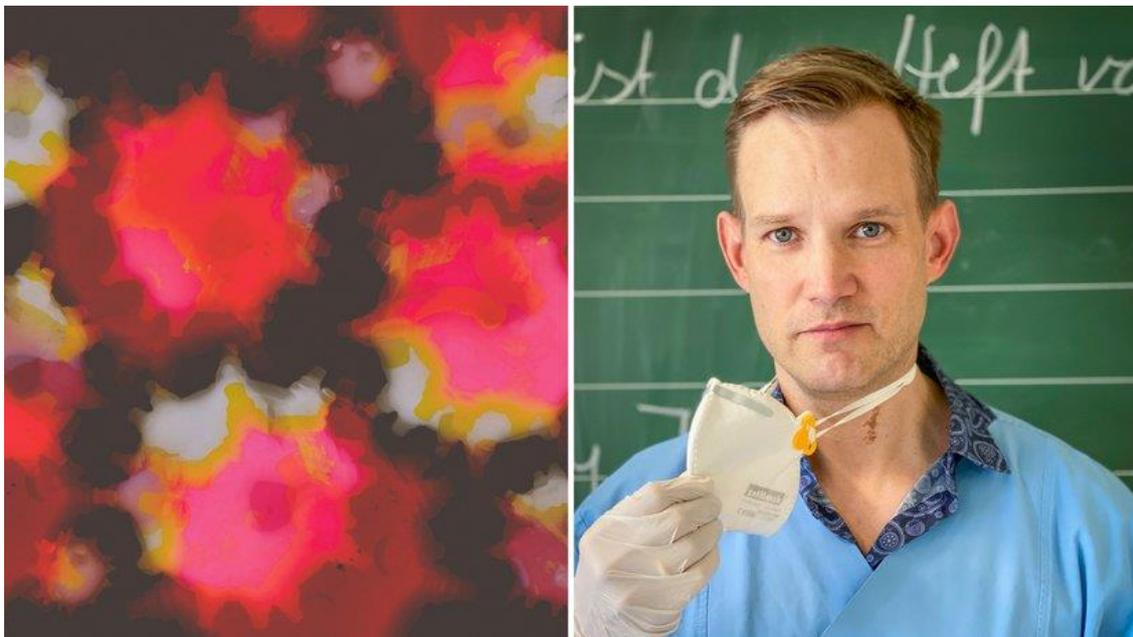


Hendrik Streeck: Isolated cases of transmission of the virus in the supermarket isn't a problem

Virologist Hendrik Streeck is looking for a coronavirus on remote controls and door handles in Heinsberg. His research may prove crucial for the completion of the quarantine regime.

Interview: **Jakob Simmank** and **Florian Schumann**

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Bonn-based virologist Hendrik Streeck collects data at the epicenter of a coronavirus outbreak in Germany. © Federico Gambarini/dpa

Isolated cases of virus transmission in a supermarket aren't the problem.

Hendrik Streeck is sitting in a school class in the Gangelt municipality of Heinsberg County (North Rhine-Westphalia): a center of the coronavirus epidemic outbreak in Germany. A board with a world map and planets of the solar system are behind him. He's wearing a blue robe, and a breathing mask dangles around his neck. A virologist at the University of Bonn, together with his team, is conducting an examination of people as part of Germany's largest study of coronavirus distribution. The school, which is currently empty due to the epidemic, is its headquarters. He gets an SMS from Armin Lachet--the prime minister of North Rhine-Westphalia--during a videoconference, and the school supply and maintenance manager drops by to ask if he wants to eat.

ZEIT ONLINE: Mr. Professor, how is your mood?

Hendrik Streeck: Thanks, alright. The medical students who support us in the study are unbelievably motivated, and the people of Gangelt are wonderful. School teachers bake pies for us. Wireless LAN was arranged within several days, and a computer station was installed in the basement.

ZEIT ONLINE: You're an HIV specialist, and you've become a sought-after virologist with the advent of the SARS-CoV-2 coronavirus. What has this virus become for you personally?

HENDRIK STREECK

Since 2019 a professor of Virology at the University of Bonn, he succeeded Christian Drosten in this post. He is also director of the Institute for HIV Research.

Streack: SARS-CoV-2 defines every day of my life. These days, I can't even remember having done something else. It can't be otherwise. COVID-19 is getting closer and closer to all of us. Almost every one of us already knows someone who is infected.

ZEIT ONLINE: Many people look at the number of detected cases every day and ask themselves, "Is the curve finally smoothed out?" What are your thoughts in this regard?

Streack: It's good that the clinical patient capacity limit is still not exceeded, despite the increase in numbers. This is a sign that our healthcare system can overcome a lot. Fortunately, we haven't yet had a situation where we would have to decide how many patients can be admitted for treatment. The number of free beds for intensive treatment is the most important thing for me. It indicates if we have the ability to treat severe cases of COVID-19.

ZEIT ONLINE: What can you say about the death toll, which has thus far been relatively low in Germany?

Streack: It's too early to talk about whether monthly mortality due to COVID-19 is increasing and how much it's increasing. I carefully studied the 31 deaths of 40 people from Heinsberg County, so I wasn't too surprised that those people died. One of the deceased was more than 100 years old, and in such a case a common cold could lead to death. However, as I said, research is ongoing.

ZEIT ONLINE: Should you more carefully examine the reasons that those people died?

Streack: I think we should. It's often very important to understand whether people have died because of viral pneumonia, that is, COVID-19, or because of something else. SARS-CoV-2 was found in the throat of a patient in Heinsberg. However, he didn't have pneumonia, and cardiac arrest was the cause of death.

ZEIT ONLINE: There are discussions in society now about whether politicians are listening too much to individual experts. What's your position on this issue?

Streack: Currently, too many people rely on model calculations. However, these models are full of assumptions that no one has tested. Very often, just one erroneous assumption or one ignored detail leads to the collapse of the entire model.

ZEIT ONLINE: Can you give an example?

Streack: For example, authors of experimental epidemic research studies from Imperial College believe that 50 percent of families with infections didn't adhere to voluntary quarantine. Where does this assumption come from? I think we should collect more facts.

ZEIT ONLINE: That is what you decided to do in Gangelt. You've just begun the largest to this date COVID-19 study in Germany. What's your goal?

Streack: First, we test a representative sample of Germany for the presence of coronavirus infection now or in the past. To do this, we do a smear test and a test for antibodies in the blood. We can estimate the number of unregistered infections in this way. We examine 1,000 people from 500 families in all. They just come here to school: 12 families per hour. First, we interviewed them: Did they attend the carnival, from which, according to rumors, the outbreak began in this region. Had they experienced a previous illness, and were they taking certain medications that could make the infection worse? Then we took blood samples and throat smears. We invited all the carnival

participants on Tuesday. It's hard to believe, but not all of them had been tested. Currently, my doctoral candidate is reconstructing the course of this holiday. He finds out from people where they sat during the holiday feast and with whom they talked.

ZEIT ONLINE: Is it possible to identify the chain of infection this way?

Streeck: I hope so. We began to analyze who could infect whom. It was repeatedly assumed that the water used to wash the beer glasses didn't disinfect them properly, and this led to the spread of the virus. However, this does not look like the truth - most visitors drank bottled beer. And other things also don't converge.

ZEIT ONLINE: Which ones?

Streeck: We were surprised to find that many fell ill immediately after the carnival or a day later. This isn't consistent with the attributed COVID-19 incubation period of several days. There are other traces: they say that the lessons at one of the schools practically stopped at the end of January. Almost all of the children and parents were ill. We're now checking whether these people have antibodies. The results will affect our findings accordingly.

We haven't managed to grow viruses taken from the doorknob until now.



Hendrik Streeck works in the classroom of the Gangelt School, which serves as the headquarters for virologists from the University of Bonn. © Photographer Property

ZEIT ONLINE: Will you re-examine people after time?

Streeck: We're discussing this. We see that the number of infected in the Gangelt is no longer growing. The peak has already been reached here. This is the best time to study samples. We would still continue our project, even if the first thing they did in the Gangelt were to mitigate [protective] measures.

ZEIT ONLINE: You once examined the homes of infected people immediately after the February outbreak in Heinsberg. Are you doing it again now?

Streeck: Yes, hygienists go to the homes of people who have recently been tested positive since Tuesday. They take air samples there and take smears from the remote controls and doorknobs. We took samples in 70 houses, but we need a larger sample, although I can already imagine what the result of the research will be.

ZEIT ONLINE: What?

Streeck: We've found the virus on various objects and doorknobs as well as in the water from the toilet, if the patient had diarrhea. However, we haven't been able to grow intact viruses of them. This indicates, at a minimum, that most people don't become infected through contact with surfaces. However, we have now improved the methodology. I think we'll get even more accurate data thanks to this.

ZEIT ONLINE: Let's talk about the symptoms that you have found at infected people. You were one of the first to talk about an almost complete loss of smell and taste. Are there any other new symptoms?

Streeck: To date, we have evidence that about a third of patients suffer from diarrhea, and within a few days. This is more than previously thought. In addition - we ourselves haven't yet established this, but have heard about it many times - deafness and dizziness may occur. At first, they didn't pay attention to all of those things, because they didn't correspond to a respiratory disease.

ZEIT ONLINE: Nevertheless, they correspond to reports by some scientists that SARS-CoV-2 infection can cause symptoms associated with the nervous system, including headaches. In some cases, severe brain damage was found in deceased patients [Radiology: [Poyiadji et al., 2020](#)]. Is the SARS virus actually capable of that?

Streeck: Be that as it may, this isn't in the textbooks. SARS-CoV-2 is a pretty amazing virus. It can cause symptoms in several systems, and sometimes it has a two-phase course. In other words, it affects the throat first and then the lungs. No other pathogen is known to function that way.

ZEIT ONLINE: Here's another big mystery: Why are some people seriously ill and others almost asymptomatic?

Streeck: It depends on various factors. Previous diseases play a role as well as the reaction of the immune system. However, scientists still don't understand many of the nuances. Recently, we were surprised by the results of a study whose authors discovered a virus in the blood [[Jama: Young et al., 2020](#)]. We conducted such a study with each of our first 70 patients and have never found any viruses in their blood. We reported this to the Paul Ehrlich Institute, as it's important for blood donation. And now we ask ourselves: is it possible that the virus enters the blood only with a severe course of the disease but not with a mild one? We want to continue research on such topics.

ZEIT ONLINE: In severe cases, is it possible that part of the population is protected because it has cross-immunity to another coronavirus infection?

Streeck: This is a very exciting question: Is it possible to have an existing immunity, that is, a kind of cross-immunity? Ultimately, in addition to SARS-CoV-2 there are four more types of coronavirus that have spread around the world for many years, but generally they cause a very mild course of the disease. It's severe only in rare cases. We noted something similar in some of our institute's employees this winter. Currently, we're checking whether their immune system can partially recognize SARS-2.

"I tend to think that isolating people from risk groups is wrong"

ZEIT ONLINE: Questions about the immune response are fascinating, but they are unlikely to help politicians. Soon the time will come to decide what to do with the rather tough [protective] measures in force after April 19th. People are hoping for quick results from your research.

Strecek: Of course, because--I hope--our data will help us to understand which measures work and which measures do not. However, we still have to wait for the results. The biggest mistake we can make right now is to rush to conclusions and give early advice only to revise it later. We hope that on the eve of Easter or afterward we'll be able to give concrete recommendations. I keep in touch with the State Chancellery of the North Rhine-Westphalia and with Prime Minister Armin Lachet. North Rhine-Westphalia is funding our research, for which we're very grateful.

ZEIT ONLINE: In this regard, a very important question: how is the virus transmitted at all? Shops are closed, people should stay at home. And you recently spoke on the Marcus Lanz talk show and said that you didn't find any infections when you went to hairdressing salons, traveling by public transport or shopping in stores. Are the current measures too tough?

Strecek: If there are still isolated cases of transmission of the virus in the supermarket or at the hairdresser's, this isn't good, but this can't be called a big problem. It has always been said that our goal isn't to completely destroy the virus, but to keep it below the hospital patient capacity limit. We would have to sit at home for two or three years in order to completely destroy the virus. Additionally, we really need to rely on data.

ZEIT ONLINE: What do you mean?

Strecek: Our preliminary data contain, at least, signs that the virus isn't transmitted through the surface, but through close contact. This is also indicated by the case near Munich, which was the first case of infection in Germany. An employee of an auto-parts supplier from China infected only those colleagues with whom she had worked closely during her visit. There was no virus transmission in the restaurant, the taxi driver wasn't infected, and no one was infected in the public transport although this woman apparently had acute infection.

ZEIT ONLINE: Do you see this in the Gangelt? Is it really possible to trace the chains of infection and reveal that the newly infected people know those who infected them?

Strecek: Almost everyone knows each other in Gangelt. However, yes, we can usually understand how this has happened.

ZEIT ONLINE: In addition to all of that, the current restrictions have certain side effects. They have consequences in terms of the economy: Unemployment is rising, and domestic violence and suicide are possible. Are we serious enough about all of this?

Strecek: As a virologist, I can't say what the economic and psychological consequences will be.

ZEIT ONLINE: However, you opposed the strict restriction of movement, albeit for other reasons. What are those reasons?

Strecek: One reason is that we're doing everything we can to harm our immune systems. We stay at home, and we go out in the sun. It's forbidden even for four people to sit together on a blanket in the park. In doing so, we turn a blind eye to the facts. SARS-CoV-2 is an infection that's transmitted through the droplets but not through the

air. If it were measles and we didn't have immune defenses, I'd also advise the avoidance of public transportation. I would also behave differently with respect to smallpox.

ZEIT ONLINE: When we talk about how to act, the key issue is working with risk groups. What would that look like?

Streeck: First, we're talking about the elderly and people with concomitant diseases. Ideally, the staff at hospitals and nursing homes could be tested every week. In front of the entrance would be a device for relatives and visitors, which would allow the rapid testing. They could enter if the test is negative. We might think about other options if express testing fails. However, the worst thing would be to just keep some people locked up.

ZEIT ONLINE: Crowded events, such as a concert at the Trompete Club in Berlin or the après-ski party in Ischgl, have often served as starting points for outbreaks. Should they remain banned for the time being?

Streeck: We strive to gather facts but not to speculate.