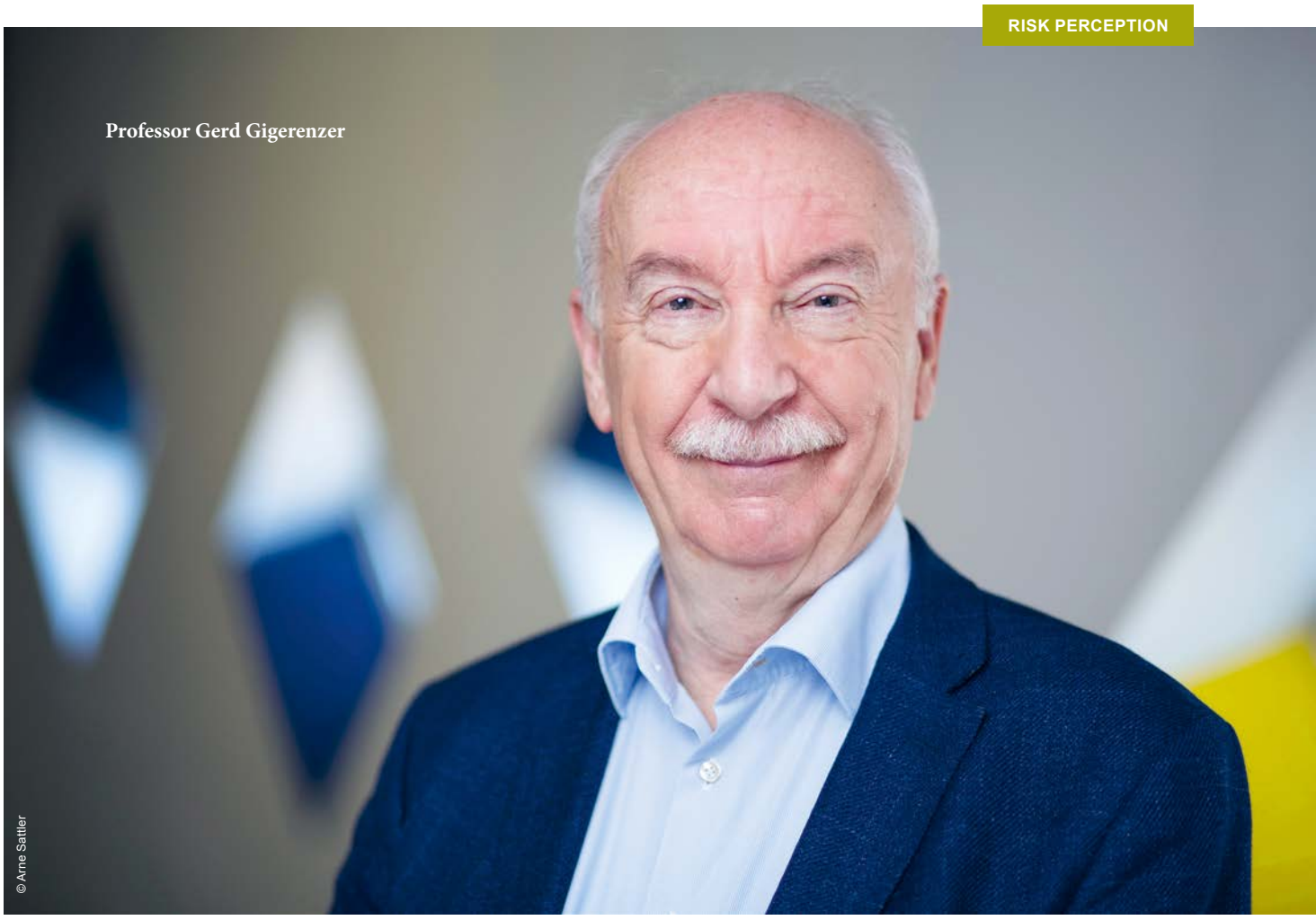

Professor Gerd Gigerenzer

"Fear is a poor basis for decision-making"

"The coronavirus pandemic should teach us to deal rationally with uncertainty," says psychologist Professor Gerd Gigerenzer. He is the director of the Harding Center for Risk Literacy at the University of Potsdam, director emeritus at the Max Planck Institute for Human Development in Berlin and was a member of the BfR's Scientific Advisory Board.

At the beginning of the pandemic, it was estimated that hundreds of thousands could die in Germany. This is far from the actual figures. Mr. Gigerenzer, why did the predictions miss the mark?

When it comes to statistical predictions, a distinction must be made between situations where the risks can be calculated and those in which this is not possible because there is too much uncertainty. This uncertainty has played a major role during the coronavirus pandemic, as it did during the last financial crisis. It is not possible to reliably predict the upcoming months in such cases. However, the models in which the number of coronavirus victims were too high, such as those compiled by Imperial College London in March, have ignored this and have not clearly communicated the uncertainty.

Was publishing such alarming predictions a mistake then?

They were based on assumptions, not on facts. But the public was riveted by the immense number of victims. The number of intensive care beds needed in Germany and the USA was also greatly overestimated. At the end of May, Andrew Cuomo, Governor of New York, frustratedly said about the predictions: "They were all wrong." Yet we could have learned from the past: using similar models, the British health authorities predicted up to 65,000 deaths from swine flu in 2009. Ultimately, there were fewer than 500. So much for the models. They are interesting intellectual games, but they should not be confused with reality.

> **The coronavirus predictions were based on assumptions, not on facts.**

Is there a kind of faith in numbers because numbers appear to be something specific, tangible?
Number blindness also comes into play. If we look at the work of scientists, we see that they usually also specify confidence intervals, meaning a range of fluctuation for an estimate. In the case of swine flu, these were between 3,000 and 510,000 presumed deaths, a huge uncertainty. But this was not reported. The actual victims, fewer than 500, were then still outside of the entire estimated range. There is an illusion of certainty in which numbers are believed without considering that they are based on assumptions. The distinction between calculable risks and situations in which risks cannot be calculated is crucial. For example, viruses can mutate and human behaviour is difficult to calculate – these kinds of uncertainties must be taken seriously. This is why it is sensible for governments to make short-term plans and revise decisions.

Can the public endure this kind of uncertainty?
It is important to raise awareness here. In this world nothing can be said to be certain, except death and taxes, as United States' founder Benjamin Franklin already knew. We must learn to live with uncertainty and deal with it rationally.

There is no absolute certainty. But exactly this is what is being demanded in the case of the coronavirus. Many people want the virus to be eradicated so that we are once again completely protected.
We have been in contact with coronaviruses for many years already, albeit with different variations than SARS-CoV-2. But this has never concerned anyone. These kinds of virus are part of a normal flu season.

There have always been epidemics. What is different now?
First and foremost, the greater number of fatalities compared with many other epidemics. Covid-19 is a serious threat. But there is also a psychological principle at work here: the fear of shock risks. These are situations in which many people die or could die in a relatively short time. Fear of these kinds of events can be triggered relatively easily.

An example?
Many people are afraid of flying. In a plane crash, the worst-case scenario is that several hundred people die at the same time. What many people forget: there are significantly more fatalities in cars – but spread out over the year. Yet not many people are afraid to get into a car. Our reaction to normal waves of flu is similar to that of car accidents. Who remembers that three years ago, an estimated 25,000 people died of flu in Germany?

After the terrorist attacks of 11 September 2001, many Americans switched to cars. This risk avoidance claimed many victims, namely in fatal road accidents, as you determined in a study at that time.
This was precisely the fear of shock risks that had hit people. In the year after the attacks, around 1,600 Americans lost their lives attempting to avoid the risk of flying.

Would this kind of analysis also be appropriate for the coronavirus? Does avoiding risks also lead to significant victims here?
This is a legitimate question. There are reports that patients are avoiding hospitals despite acute symptoms because they are afraid of the coronavirus – just as Americans avoided airports back then. Initial analyses show that the number of stroke patients in German hospitals has declined by a quarter and the number of heart attack patients by a third. That has not yet been systematically investigated, but this is my intention. Then it can be estimated how many lives the fear of danger – Covid-19 in this case – has cost. Fear is a poor basis for decision-making; thinking can save lives.

What can we learn from the coronavirus?
The coronavirus crisis has a special characteristic. It is not so much the pictures that frighten us, but the bare figures, more than with bird flu, swine flu or mad cow

“ It is the bare figures that scare us. But do we understand what they mean?

disease. Changes in the number of new infections or the reproduction number R scare us or give us hope. But do we understand what these figures mean? The crisis would be our big opportunity to do something about widespread number blindness. Statistical thinking should already be taught in school. But not as a dry mathematical discipline but rather using the example of Covid-19 and other realistic uncertain situations.

In other words?

What do the new infection rates that are reported every day mean? These figures are not the actual rates of newly infected people. They are people who have tested positive for Covid-19. Therefore, the reported numbers are uncertain on two counts. For one thing, not all people are tested, which leads to the real number of newly infected people being underestimated. On the other hand, positive does not necessarily mean infected, but rather people can either test as true positive or false positive. False positive test results lead to the real rate of new infections being overestimated. Only the interaction of these factors makes it possible to understand what lies behind the seemingly clear figures.

Coronavirus tests are considered to be an important weapon against the virus.

They are, but the possibilities and limitations of the tests still have to be understood. Let’s assume that you are having an antibody test with the hope of a positive result and, therefore, of being immune. And the test really is positive. Can you now go to parties without any fear of getting infected and infecting others? No, and not just because repeated infections are possible.

Are you hinting at the possibility that the tests have an uncertain success rate?

Let’s assume that two percent of people have antibodies. The test correctly identifies 99 percent of people with antibodies and 98 percent of those who do not have antibodies. You can, therefore, expect that for every 100 people who are tested, two people will test true positive, but two people will also test false positive. This means that your chance that the test is correct and that you actually have antibodies after a positive result would only be about 50:50. Therefore, if you get a positive antibody test result, especially if you have no symptoms, the test should be repeated immediately. However, the figures in the example are only approximate since we still know little about the reliability of the tests.

The crux is that when there are few antibody positives – in this case two percent – the false positives, meaning people without antibodies but with a positive test result, become a problem?

Exactly. The high number of false positive results also speaks against nationwide antibody tests in Germany, because then tracking hundreds of thousands of false positives and their contacts would overstrain the health care system and tie up capacities that are urgently needed elsewhere.

What do you think is the BfR’s role in this situation?

The BfR can be a voice of sanity in the hubbub from conspiracy theorists, those blinded by figures and Covid-19 deniers. With its voice, it could definitely enter the public discussion in an even more audible way. Of course, the BfR will then – and it would not be the first time – be attacked by these groups. That is to be expected – but those without critics have never shown any backbone. That is the price of truth. ◘

More information:
www.hardingcenter.de/en