Turbulent times for science

Science is taking a lot of criticism, be it because of falsified research, "predatory journals" or due to controversial or unpopular results. It is also a target of fake news. How can science assert itself in times of fake news?

No matter whether they relate to climate research or the health assessment of plant protection products, scientifically substantiated arguments come across as mere opinions which you can share or not. Hard facts are being replaced by perceived knowledge. The crisis of trust in science was reason enough for the BfR to discuss these latest developments at a conference with renowned experts.

In theory at least, the problem of fake news is easy to solve. "Truth is the conformity of a statement with whatever it is made about," quotes Bernhard Kühnle, head of the Food Safety and Animal Health department at the Federal Ministry of Food and Agriculture, from the Duden dictionary at the beginning of the conference. Science is indispensible on the way to finding this truth, in areas such as consumer protection. Its assessments form a solid basis for reliable decisions from consumer protection institutions and food companies in Kühnle's view, and they should also help the general public to decide in favour of a healthy diet. "Science must be strengthened and protected as a reliable source," says Kühnle. It helps to defend against fake news.

Many people live in a social media bubble and believe everything they read there, says Alois Gerig (CDU/CSU), chair of the parliamentary (Bundestag) Committee for Nutrition and Agriculture. "They allow themselves to be manipulated." An example of this, according to Gerig, is the unobjective and occasionally hysterical discussion of plant protection products with the active substance glyphosate. There were suddenly 80 million experts in Germany who were all driven in one direction by the media. Among them, says Gerig, is a tendency towards "emotionalisation, moralisation and polarisation". The boundary between facts and opinions gets blurred and there is less reporting on issues with a complex scientific background. "To distinguish between fact and fake has become much more difficult in the age of the internet," says Gerig.

A forger at Stalin's court

Are there fakes in science too? Professor Dr. Dr. Andreas Hensel, President of the BfR, knows several facets of a multifarious and essentially not really new topic. In Stalin's Soviet Union in the 1930s and 40s, Russian biologist Trofim Lyssenko faked experiments which were intended to prove the transformation of species. Fraud is not always as obvious as it is with the manipulation of data and test results. The random utilisation of methods and results until they fit in with the concept (cherry picking) is a popular method, as is the one-sided – often ideologically motivated – interpretation of results.

There are various motives for deception, from career advancement, the struggle for funding, publication pressure ("publish or perish") or maintaining a good reputation. The consequences of fake science should not be underestimated. The credibility of science among the general public is damaged. Falsified study results also lead into dead ends when assessing health risks, for example, or when attempting to reproduce results.

Risk assessment: Is science failing?

Risk assessment is lagging behind its opportunities, criticises Professor Wilfried Kühling from the University of Halle-Wittenberg and scientific advisory board of the NGO Friends of the Earth Germany (BUND), using the example of the prevention of leukaemia in children near high-voltage cables. According to Kühling, it has been scientifically proven that the risk of leukaemia in children increases significantly from a field strength of roughly 0.2 microtesla. Protection against magnetic fields in the vicinity of power lines must therefore be increased significantly. "Is science failing here," asks Kühling. Where standards and limit values are concerned, the verdict of science alone is not sufficient. In addition to the scientific experts, social groups have to be included. "The solution lies in a joint assessment process," says Kühling.

Uncertainty is strength

Although life is full of uncertainty, we manage to get along with it quite well. We only expect complete certainty from science. Those who don't spread absolute certainty here are quickly regarded as dubious. Some areas of climate research are criticised as being fake because science is still forced to juggle with possibilities. This, however, is the strength of science, in the opinion of philosopher and physicist Rafaela Hillerbrand. "Scientific statements are reliable not despite but because of their uncertainty," says the professor at the Karlsruhe Institute of Technology. "I can't make the same demands on accuracy when predicting climate change as I can with Newton's laws of gravity." Those who discredit research for this reason are disempowering the scientific method as such, says Hillerbrand – a dangerous move.

The discussion about fake news is "less about false facts but above all about a lack of trust in expertise", ascertains science journalist Volker Stollorz (see interview Page 18) of the "Science Media Center". The lack of trust in experts plays into the hands of powerful people with other interests. These people "have recognised how you can spread the most absurd things on communication platforms if you know how to manipulate others". This tends to be specific disinformation rather than fake news: "Deliberately distorted information secretly fed into the communication process with the goal of deceiving and manipulating".

Fake journals don't mean fake science

A certain scepticism towards science doesn't only exist in the general public but also within the scientific community itself, as neuroscientist Professor Ulrich Dirnagl (Charité – Universitätsmedizin Berlin) documents using the example of a survey conducted by "Nature" magazine. According to this survey, 90 percent of researchers hold the view that scientific results can only be believed to a certain extent, perhaps because some results cannot be repeated in other studies. The devastating criticism of influential media concerning "rip-off journals" in line with the motto "Fake science – the lie makers" misses the point, however, says Dirnagl. Just because science is published in a "predatory journal" doesn't mean that it has been faked.

A real problem in Dirnagl's view is the non-publication of data, often because it simply "doesn't fit in with what we're doing". Depending on the area of specialisation, this applies to 40 to more than 50 percent of studies, the physician estimates. The compulsion for success distorts results too. Using statistical tricks, results are manipulated until the story "fits", which is where the expression "story telling" comes from.

Science: reliable but uncertain

For Dirnagl, the "elephant in the room" is the term "uncertainty". In science – as similarly stated by the philosopher Rafaela Hillerbrand – it is central to everything, not as a weakness but as a strength, as knowledge of the possibilities and limits of cognition. Dirnagl proposes that this strength be made a topic of public discussion. A differentiated assessment is not possible in a "seven second statement" or a single tweet, however.

Media scientist Professor Thomas Hestermann of Macromedia University (Berlin and Hamburg) argues that people expect reliability and not uncertainty from science. Journalist Volker Stollorz also sees science as a "mental sewage plant" which provides knowledge as the basis for political decision-making. Affirmation of uncertainty, on the other hand, would be instrumentalised by politics. The motto "Everything is uncertain" would be used to justify doing nothing in issues such as climate change.

If you research the internet, you will find many "truths". "A whole world exists there which has absolutely no interest in facts," says BfR President Andreas Hensel. Everyone has to ask themselves how trustworthy the information on their own smartphone is. Will knowledge ultimately become a question of belief again? ◘

This text is an abridged version of the report on the 7th BfR stakeholder conference, which took place on 15 November 2018 in the auditorium of the Kaiserin Friedrich Foundation in Berlin-Mitte.

More information:
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