

“The truth is only rarely properly conveyed”

The emeritus Dortmund-based statistics professor Dr Walter Krämer, co-creator of the “bad statistic of the month”, on the perception of risks and the role of science.



Mr Krämer, at least since the COVID-19 pandemic, crises have been a constant topic of discussion. Viruses, war, terrorism, climate change: is this down to a distorted perception of risk?

Yes, precisely. Give me one year since the Second World War in which there weren't myriad catastrophes. The difference is that our readiness to be hysterical has increased substantially, particularly when it comes to social media.

What can help keep us relaxed?

Whenever there's talk of the end of Western Civilisation, all I have to do is watch a couple of videos about life in Caesar's Ancient Rome. It calms me down to know how orderly and civilised things are for us now. So far, humanity has survived every predicted demise.

You caution against perceiving small risks as big and big risks as small. Why?

If you wish to efficiently combat hazards to your health and safety, it makes most sense to start with the major risks, does it not? To do this, though, you have to know what really poses a risk to your money, your life or your health. And you have to know what are just trivialities. However, it might be difficult for a lot of people to differentiate between real risks and trivialities. We should be clear about which factors distort our risk perception: voluntarily willing versus involuntarily willing versus involuntary (voluntarily accepted risks are massively underestimated), known or unknown mechanics (mysterious risks such as death by cancer are overestimated in comparison to easily

understandable risks such as death by cardiovascular illnesses), manipulable or not (fear of flying versus fear of driving), and top of the list of course: natural versus artificial. Artificial risks are vastly overestimated around the world.

What are artificial risks?

Many examples are chemical, for example dihydrogen monoxide. Chemistry students frequently amuse themselves by collecting signatures outside of primary schools to call for a ban on the chemical. And they're successful. After all, this heinous stuff is the main component of acid rain, it contributes to soil erosion, and accelerates the corrosion of metal parts. Prolonged contact with it in its solid state harms tissue, and in its gas state it causes burns. Worldwide, thousands die every year due to dihydrogen monoxide. In actuality, dihydrogen monoxide, chemically denoted as H_2O , is just water. But as soon as something has a chemical name, a whole lot of people get scared.

How can science properly communicate risks?

With difficulty. Of course, lying is completely off limits. But unfortunately, the truth is only rarely properly conveyed. As long as many people don't understand the message – see above – the best risk communication is useless.

With your “bad statistic of the month”, you take a critical look at scientific studies and the way they are presented in the media. “Science” is not infrequently somewhat inaccurate...

That's the unfortunate truth and is often a consequence of a poor grasp of certain basic statistical concepts. For example, the fact that correlation does not equal causation, meaning that a connection between two things does not necessarily mean that there is cause and effect. Or the fact that projections can be wildly inaccurate if they are based on studies with distorted sampling. —

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statistics professor (emeritus)