

Communication of Safety Assessments/Cases

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Communicating uncertainty – a fictional interview

This is a fictional radio interview in which Professor Joe Bloggs is interviewed by Jim Hack, a journalist, about his research. The numbers and research are entirely made-up, but they are meant to be plausible, if not realistic. During this interview, Professor Bloggs will deal with (or ignore) major uncertainties relating to his research and its implications. Your job is to spot the major uncertainties and decide whether Professor Bloggs did a good job of communicating about them.

To help you, here is a list of some of the ‘uncertainty pot-holes’ into which Professor Bloggs may have stumbled during the interview:

1. Using numbers and statistics to imply a falsely precise quantification of uncertainty.
2. Not explaining conflicts between different research results.
3. Claiming that we know about, and can quantify, all of the sources of uncertainty that exist, particularly in future forecasts and predictions.
4. Highlighting a particular policy response to climate change as if it was the only option and as if it was automatically implied from the scientific evidence.

The Interview

Interviewer: Jim Hack

Interviewee: Professor Joe Bloggs

Version 1: How to get it wrong

HACK: Professor Bloggs, thank-you for speaking to us today. I wonder if we could begin with you telling us what the main finding of your research is?

BLOGGS: Certainly Jim. I have been looking at average day-time temperatures during June, July and August in south-east England between 1986 and 2006. I have found that the average number of hot summer days each year, during which peak temperatures exceeded 23 degrees centigrade, increased by 42.826 per cent from 10.232 to 14.614.

HACK: But summer temperatures seem to vary a lot from year to year. We had the extreme summer of 2003, but then last summer seemed to be a lot cooler than previous years. How can you be sure that there has been a rise?

BLOGGS: I performed a standard statistical test on my linear regression of the results and the null hypothesis was rejected at the prescribed significance level of 1%.

HACK: Researchers from the University of Brixton reported last month that the average number of hot summer days in south-east England has not increased. Doesn't that contradict your results?

BLOGGS: Well I've seen work their work and it doesn't seem very high quality. I've had my results published, so I think we can assume that they are right.

HACK: OK. Well looking ahead, what do you think this means in future? Do your findings shed any light on model predictions? I think some models predict a doubling of the number of hot days in south-east England.

BLOGGS: Yes, my results are consistent with the most extreme scenario from the regional model. That scenario shows that by 2050 the number of hot days will triple so that nearly every one in three summer days in south-east England will have an average temperature above 23 degrees centigrade.

HACK: How realistic are the models?

BLOGGS: The models are very realistic and show that we understand how the climate works. It may sound like an extreme prediction, but that's what the model scenario shows. People who disagree with the models are being unscientific.

HACK: OK, well if the model is correct, what would it mean for the people of south-east England?

BLOGGS: Well for one thing, it means that the Tube in London will become so hot in the future that lots of people will be literally cooked alive unless we shut it down completely over the summer months. Old people will be dropping like flies and the Mayor better start ordering in the body bags now.

HACK: So is there anything else we can do?

BLOGGS: Cars are the main cause of climate change, so the most important thing we can do to reduce carbon dioxide emissions is to make all engines run on biofuels instead of petrol and diesel. It's the best solution and if we don't do it the planet will burn.

HACK. Wow, it sounds like we have a real challenge on our hands. Thank-you for talking to us about your research, Professor Bloggs.

Here is a second version of the interview in which Professor Bloggs does a much better job of communicating about the uncertainties in his research and its implications, without stumbling into the ‘pot-holes’.

Version 2: A better way of communicating

HACK: Professor Bloggs, thank-you for speaking to us today. I wonder if we could begin with you telling us what the main finding of your research is?

BLOGGS: Certainly Jim. I have been looking at average day-time temperatures during June, July and August in south-east England between 1986 and 2006. I have found that the average number of hot summer days each year, during which average temperatures exceeded 23 degrees centigrade, has increased by around 43 per cent from 10.2 to 14.6.

HACK: But summer temperatures seem to vary a lot from year to year. We had the extreme summer of 2003, but then last summer seemed to be a lot cooler than previous years. How can you be sure that there has been a rise?

BLOGGS: You have given some good examples of the natural variability that we see from year to year. I have performed statistical tests that allow me to assess that there is only a one in a hundred chance that I have measured a trend that does not really exist in the measurements.

HACK: Researchers from the University of Brixton reported last month that the average number of hot summer days in south-east England has not increased. Doesn't that contradict your results?

BLOGGS: I think their temperature measurements were only made at one location, whereas I made measurements at a number of locations. My measurements at a couple of places did not show a change, but all the other places show an increase.

HACK: OK. Well looking ahead, what do you think this means in future? Do your findings shed any light on model predictions? I think some models predict a doubling of the number of hot days in south-east England.

BLOGGS: Well I have compared my results with climate models for south-east England. My measurements are consistent with a range of scenarios, including an extreme one in which the number of hot summer days will increase to about 30 by 2050, but that is less likely than the lower predictions.

HACK: How realistic are the models?

BLOGGS: It is true that making predictions about the future climate involves a lot of assumptions about uncertainties that are difficult to quantify. For instance, we don't know how emissions of greenhouse gases might change in the future. There are also uncertainties in our understanding of how the climate works. For example, it is difficult

to model how wind patterns, which affect the number of hot summer days, might change in south-east England. So the current model should be thought of as providing the best guide to what could happen, given what we know now, rather than giving an absolute prediction.

HACK: OK, well if the model is correct, what would it mean for the people of south-east England?

BLOGGS: Well clearly we will need to adapt to a rise in the number of hot summer days. In London, for instance, hot summer days can create health problems for people riding the Tube. In that case there are a number of options that have been suggested, ranging from providing better advance warnings and advice to passengers, to even the possibility of closing parts of the Tube system during very hot periods.

HACK: So is there anything else we can do?

BLOGGS: In addition to adapting to changes in climate that are now inevitable, we can mitigate worse impacts. There are many ways in which we can do this, for instance, by reducing the release of carbon dioxide that is produced by burning fossil fuels for transport. Biofuels could be part of the solution, because although they produce carbon dioxide they are also produced from plants that absorb the gas.

HACK. Wow, it sounds like we have a real challenge on our hands. Thank-you for talking to us about your research, Professor Bloggs.