



The Winton Centre

A vital time for nuanced risk communication

The Winton Centre for Risk and Evidence Communication, based at the University of Cambridge, UK, was established with a simple belief: that everyone deserves to hear accurate evidence concerning matters which are important to their lives. Never has this core tenet been so vital, or so widely scrutinised, as during the COVID-19 pandemic. We spoke with the Centre's Executive Director, Dr Alexandra Freeman, to discuss the joys and subtleties of evidence communication, and to learn more about the Winton Centre's crucial work.

Over the past year, pandemic-related risk communication has become ubiquitous. It has been a struggle to feel confident in discerning truth from fiction, impartiality from persuasion, errors from lies. Dr Freeman has a wealth of expertise in scientific communication, with a recent interest in questions of persuasion and uncertainty.

Could you tell us about your professional background, and about how this led to your involvement with the Winton Centre?

Well, from as early as I can remember I had two passions: the natural world and writing. Over time my natural history interest sharpened into a scientific interest about the world around me, and my love of writing broadened into other forms of communication. After studying biological sciences at university to doctoral level I fulfilled my long-standing ambition to work in the media, as a director of natural history and science films. But my broader communication interests meant that as

well as directing 'linear TV narrative' as it's known, I was equally interested in building other forms of communication around it. For every programme I made, I tried to build a comprehensive website, and – where I could – games, books, educational materials and even experimental interactive TV models. For me, much though I loved the visual elements of directing, what really drove me was the challenge of communicating information, and the public service element of working for the BBC.

In 2016, although I had no particular thoughts of leaving my job in television, the BBC science unit was about to be made a commercial rather than public service entity and also separated from the online and other media departments, meaning my '360 degree' approach to scientific content was going to be difficult to continue. At the same time, I saw a tweet from statistician Prof Sir David Spiegelhalter (whom I had directed in the series

'Climate Change by Numbers' the year before) saying he was looking for an Executive Director for a new centre at the University of Cambridge. Philanthropically funded, the centre could focus on communicating evidence and risks to a range of audiences, in any suitable media, with the only aim of serving the public benefit. I immediately retweeted it saying 'best job in the world'... before realising that I was possibly eligible to apply. And did.

You have a successful history of communicating complex science across a range of media. Which platforms have you found most enjoyable and effective in promoting scientific engagement?

Every medium and every style has a different audience, and is good for sharing different material. I've enjoyed experimenting with every one of them: using children's love of Walking with Dinosaurs to show the point of maths in their school curriculum – turning



Dr Alexandra Freeman has a wealth of expertise in scientific communication.

it from a meaningless and abstract language into a tool for getting answers to questions that they have; recruiting people to take part in big national experiments that will help answer questions that academia has not had the funding or incentive to ask, such as whether omega-3 supplements or fish oils actually make any measurable difference in healthy people; using detectors attached to LED strips to allow people to literally see wireless network ranges.

But I don't think it's all about 'promoting public engagement with science'. I think it's exciting what scientific research can reveal about the world, and I think that understanding more about and seeing the natural world is important if we want people to care about what happens to it (and I do want that), but I also think it's important to help people critique what they hear, whatever the source of it. *Nullius in verba*, as the Royal Society motto goes: 'Take Nobody's Word for It'. Maybe that is engagement – but it's a critical engagement.

Could you tell us about some of the projects the Winton Centre is currently undertaking?

At the Winton Centre we are working in several areas: to help the communication of medical evidence, to help the communication of forensic evidence in court, the communication of evidence to policy-makers, and to support journalistic communication of numbers.

We also have a project working on the communication of earthquake forecasts (which are particularly tricky because they involve low probabilities and high uncertainties).

These broad areas cover a lot of projects, such as working on the design of 'risk matrices', particularly those used in the UK's national risk register; working on how institutions can increase the trustworthiness of their communications through being balanced in their presentations of harms and benefits; working on how to communicate the quality of evidence underlying numbers and claims; designing templates to help communicate genetic and genomic test results to patients in a clear way etc.

All our work is done hand-in-hand with professional practitioners as much as possible – journalists, doctors, forensic

countries trusted when it came to COVID-19. We were also able to run experiments on different messages very quickly. With such an international team we could translate our survey into different languages and had it running in 10 or more countries within a week or so. Those early data points have proved crucial – people's perception of the risk, their trust in different people, and their feelings about the situation changed very quickly and we were one of the few places that were able to capture that data, which we made publicly available immediately.

Those surveys have provided us a great base for experimentally exploring issues such as the effects of communicating uncertainty in numbers, the effects of telling people about the quality of evidence behind public health messages, giving people scientific explanations for advice, and being

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experts, civil servants – to make sure that we put our resources into work that will directly make a difference. Our aim is always to help ensure that people with important decisions to make get the information that they need, in a clear and balanced way. Everything we do has to have that aim at its heart, and be able to make that practical difference within the lifetime of the Centre.

What roles has the Winton Centre played through the COVID-19 pandemic?

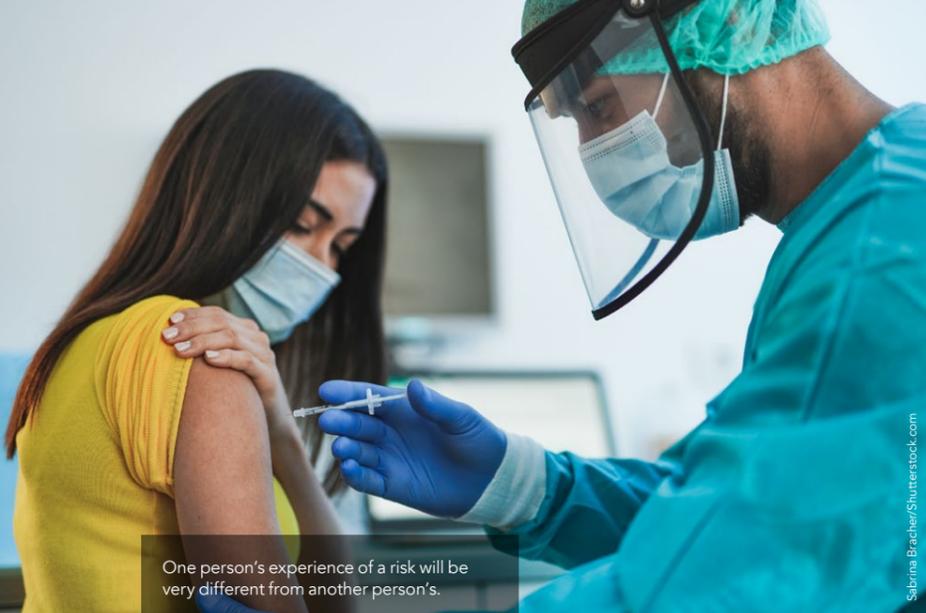
The unusual way in which the Winton Centre is funded – by a single capital donation from a philanthropist – means that we can be very fleet of foot, and do whatever we think best without having to waste resources on putting together funding applications. As soon as we saw the pandemic sweeping across the globe we were able to start running online surveys – assessing risk perceptions, media messages and who/what/why people in different

transparent about the potential side-effects of vaccines.

On top of that work, though, we have also been doing some quite specific risk communication work such as taking part in briefings for journalists to help them report numbers accurately, producing graphics for national briefings on vaccination and risks, and on how to communicate people's personalised risk from COVID-19. Much of the time, seeing our work is the first time that journalists or institutions have realized that 'risk communication' is a science and that there are empirically-tested ways to do it well ... and to do it badly.

Could you speak about the relationship between numbers and risk communication in the pandemic context?

Here in the UK, many people have joked that Saturday night television has changed dramatically from February 2020, when millions would settle down



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The Winton Centre sets out 'to inform and not persuade'.



Thought Leader

How might we change what is rewarded and incentivised within scientific publishing?

to watch *Strictly Come Dancing*, to April 2020 when at least the same number would switch on every Saturday night to watch a government scientific advisor present slides showing endless graphs and statistics. I don't think there has ever been a point in history when the world has been so bombarded by numbers – and tried so hard to make sense of them.

But a 'risk' isn't a number – it's a subjective feeling. The point of good risk communication is not to 'tell someone the numbers' but to try to convey a much more nebulous concept: to communicate a sense of the likelihood of the event happening in an appropriate context, along with the uncertainties around that likelihood – and also ensure that the potential impacts of that event are clear. But one person's experience of a risk will be very different from another person's, for a whole range of reasons. Firstly, everyone has their own context for a likelihood: a 1 in 100 chance of death for a 90-year old will be very different to a 1 in 100 chance of death for a 30-year-old, for example. Then there's what the event will mean for us: the impact of having to self-isolate for 10 days for someone who is retired and lives with a healthy partner will be very different from the impact of the same event on someone who has caring responsibilities or relies on income from a job.

These issues are what makes 'risk communication' very different from data visualisation, for example. It's a more conceptual kind of communication. Whilst there

have been some excellent data visualisations during the pandemic, there are far fewer people who have really worked on communicating the 'risks' in this kind of sense – in helping people develop their own conception of likelihood and impact, based on statistical evidence, but framed within their own personal context.

What are the differences between 'informing' and 'persuading' when it comes to scientific communication?

The spectrum between setting out to persuade someone to believe something or do something – the province of marketing and advertising – and setting out to provide someone with neutral and balanced information on a subject, as a doctor should when going through informed consent with a patient or a forensic expert explaining evidence in court, is something I'd never really thought about before I started at the Winton Centre. It now forms the core of our ethos: 'to inform and not persuade'.

When I worked at the BBC I thought I was setting out to inform – after all, 'inform, educate and entertain' is the motto of that institution. I soon came to realise, though, that whenever I made a programme, I was holding the audience's hand all through the journey I took them on. Using language, images, and music I was steering their emotions – persuading them to believe what I wanted them to, to feel the way I wanted them to about the information I was giving them. And in the end I sometimes wanted them to act in a certain way as a result of that information – in fact a 'take

home message' was very popular with audiences and sometimes part of the requirements of a successful script.

Purely informative communication is an interestingly different proposition. You have to give the audience much more freedom in their interpretation: you are there to assist and provide trustworthy information, but it is not up to you to influence how they feel about that information. It asks more of the audience – they are no longer being led by the hand, they are being treated like an adult. The audience, then, need to be prepared to take on the greater role in the relationship. If someone is expecting a 'sit back' experience and to be engaged, entertained or given a nicely packaged emotional experience then they won't be impressed with being given information where the emotional experience is more ambiguous and they are being asked to make their own decisions based on it. If, though, they are already acutely engaged, and want to make a decision (such as a patient making a critical choice over their healthcare, a judge in a legal case, or perhaps someone being given information about an important topic such as COVID, where they want to be able to make up their own mind), then this is exactly the kind of communication they appreciate. And it's a whole new skill to master!

If you are a communicator, have a think about where on the inform-persuade spectrum your communications lie, and where they should, ethically. I've already named some communicators who should probably always lie at the far opposite ends of the spectrum,

but where do others lie? What about public health professionals? Scientific advisors to the government? How about scientific researchers in their academic publications?

What does Open Research mean to you, and how could it lead to advancements in scientific publishing?

When you think of how important scientific research is to our lives – to every choice we make about our health, or about conservation and the environment – it's clear that we need it to be robust and trustworthy. We need everyone to be working together to ensure that every part of the research

entirely judged on a researcher's ability to write a persuasive narrative about their work. Scientific communication, I feel, has become infused with the aims and techniques of the 'wrong end' of the spectrum. Just as in more overt entertainment media, within scientific journals the power of a strong story can leave readers persuaded that the author was 'right' and led along a neat path from hypothesis to conclusions without having their critical antennae sent a-shiver. And the need for this narrative backbone drives people to attempt to avoid sharing their ideas or any stages of their research until they have got completely to the end of

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process is done to the highest level it possibly can be. This means openly making suggestions for improvements, sharing expertise, allowing specialists to tackle each part, and catching each others' mistakes. I don't want to hear that the analysis of the clinical trial I am staking my life on was done by a doctor who had taken an undergraduate course in biostatistics 20 years ago and no one else had seen the trial data to check she was right.

To make this come about, we need to change the way scientific work is assessed. At the moment, it is almost

their work, so that they can then reveal their 'story'. They try to complete every part of the work necessary within a closed circle of collaborators in order to protect their ideas, meaning that they don't allow more experienced or specialised people outside of their network to contribute. Then they prune all the work that they've done to make a neat, straight story – in the most extreme cases, selectively reporting some hypotheses, data or analyses and ignoring inconvenient others. Even researchers trying to be as open as possible, as honest as possible and as innovative as possible are hamstrung

by the fact that all scientific publications must be in a linear, story-based form. Even if they use every possible resource to make their data, code and prior hypotheses openly available to other readers, these are really only recognised and discovered by others if they are linked to a traditional 'paper' and its unavoidable narrative form.

I think it's high time that the scientific research community shifted the aims of its primary research communication towards the 'inform' end of the spectrum. It will take a conscious change of the scientific publishing system in order to change what is rewarded, what is incentivised, what the aims of scientific work are, in the eyes of those who carry it out. But my experience of coming into the academic community from the outside, thinking about these issues from a communicator's perspective, and having the freedom to speak out – without a career dependent on the established system – means I feel in a uniquely privileged position. I have developed a new concept for the dissemination of scientific research, which is relatively easy to build and designed to present an improvement in useability and functionality for everyone within the system – something important for driving change. This system is called *Octopus*, and I hope to launch it later this year.

If I can make *Octopus* work – and I think it will – then I think it could change science for ever. And I can't imagine anything more important to dedicate my time to.