The second the series of Science & Innovation dialogues **'How to Communicate Data in a Pandemic',** proved how the Covid-19 pandemic has highlighted what is needed in order for science and data communication to be effective and transparent. The introduction was provided by **Prof Carole Mundell**, followed by keynote speaker **Prof David Spiegelhalter** of the University of Cambridge and then other panelists.

The word "data" has taken on new meaning in the UK. The Government has said that the latest easing out of lockdown will proceed by "data, not dates" and the phrase has become something of a mantra. Yet data hardly got a look in on the public discourse before the pandemic. Now, a daily look at "the numbers" is a habit. Everyone is hungry for a barometer by which to gauge the impact of measures to control infection.

Exactly how such data are collated, digested and presented to the public gets less attention. Yet grappling with pandemic data is a problem for all nations. And this became clear from the lively discussion at the Dialogue event '**How to Communicate Data in a Pandemic'** last month [Wednesday 24 February]. This was the second in a three-part series of **Science and Innovation Dialogues**, convened by the British Council and the UK Science and Innovation Network. Its overriding message was just how much can be gained if countries take time to listen to each other, no matter how distinct their cultures.

Gathering data

Maja Pohar Perme, professor of biostatistics at the **University of Ljubljana** in Slovenia, described a project set up by volunteers, called Covid-19 Tracker, to which she is lending her expertise. "This is now the best, largest, basically only source of information - a web portal with all the information….So they are now getting the data from official sources, and trying to present the data in a way that is interesting for the public and also for decision makers."

There's a resemblance here to the Zoe Covid Symptom tracker App, devised by King's College London, and used by approaching five million people in the UK to track their Covid symptoms, vaccination and testing status. This has become a source of data trusted by the UK Government, and one that makes public its collated statistics. It's an approach supported by **Prof David Spiegelhalter**, Chair of the Winton Centre for Risk and Evidence Communication at the University of Cambridge. "The ability to harness that community expertise, that volunteer nature, is extraordinarily powerful and it's one of the signs of modern communications and the Internet, so I welcome that," he told the online audience.

Openness and Transparency

Decisions about how much data, and which data, to make public, can be influenced by factors ranging from legal limits, to limits on people and resources. Roundtable speaker **Andrzej Fal**, head of the **Department of Allergy, Lung Diseases and Internal Diseases at the Central Clinical Hospital** in Warsaw, Poland, and President of the Polish Society of Public Health, asked if all data should be communicated. He wondered if some should be held back, especially given the risk that some data may be misinterpreted, or misrepresented. A key role for Professor Spiegelhalter, and his institute, is to improve the way that statistical evidence is used by health professionals, patients, lawyers and judges, media and policy makers. His view is clear: "Individuals are making such sacrifices. I feel they have a right to see this [data], and regardless of anything else, just absolutely a right to see the data that affects them."

Carole Mundell, International Science Envoy at the FCDO and Professor of Extragalactic Astronomy and Head of Astrophysics at the University of Bath, has been part of the UK Government's science advisory process during the pandemic. She described the collective responsibility of holders of data - from scientists, to governments to journalists - in communicating and interpreting data. Governments across the world recognise this challenge, she said, in terms of putting data-based evidence at the heart of their policy making, "Of course it's a really complex thing to do, and in the pandemic, getting this right is absolutely vital. We work at the frontiers of uncertainty, we're doing this at pace, and it affects not only people's livelihoods but actually people's lives."

But **Ondřej Májek**, head of the international department at the **Institute of Health Information and Statistics of the Czech Republic**, reminded participants that for some it may be hard to be as open with data as they might want. "Sometimes the official institutes operate under quite a strict legal environment, and sometimes it's not so easy. So this is often the reason why some processes might be difficult, and the ownership of the data may be more difficult than it looks."

Handling Misinformation

Professor Mundell stressed the importance for the UK Government in making sure that communication with the public is as clear and transparent as possible. Giving journalists direct access to scientific experts is vital, she said, because deliberate misrepresentation of the situation is a growing problem and one which undermines public health efforts.

''We've created a new counter disinformation unit, bringing together expert teams to help to provide a comprehensive picture on the potential extent, scope and impact of the disinformation on coronavirus in the UK. That's something that we're very happy to share with countries around the world. This is a new form of data and new way of analysing the impact of such misinformation… a challenge for countries around the globe."

Professor Fal described how he and colleagues had tackled vaccine hesitancy, and a lack of clear, factual information. “Only around 30% of people here in my country were willing to take the vaccines... so at that point we said OK, why is that? We decided to start giving the information publicly. A group of 13 or 14 scientists decided to write a handbook in a plain language understandable to junior school graduates.” Thanks to initiatives such as this, he said, around 70% of people are now willing to be vaccinated.

Gkikas Magiorkinis, Professor of Hygiene and Epidemiology and scientific coordinator at the National Reference Centre for Retroviruses at the **University of Athens in Greece**, agreed that tackling misunderstanding is a key difficulty for academics like him. “A major challenge that we faced was that we were trying to convince people that things are not the same as the flu epidemic, that this is a different epidemic.”

Data Demand

Florina Bojin, **Associate Professor at the “Victor Babes” University of Medicine and Pharmacy** in Romania, described just how hard it can be for scientists to fulfil a role as both researchers and communicators, even though she understood the impact this dual role can have. At the start of the pandemic “…even the medical students were scared about this disease,” she said, “and everybody around them was scared. So imagine that just informing 1000 students, then they informed their parents, their relatives and so on.” She reflected that even though this was a good outcome, it was demanding. She asked if it is really necessary to explain everything to the general public.

This burden on researchers was a point echoed by **Ivan Ivanov**, from **Bulgaria’s National Center of Infectious and Parasitic Diseases**. Ordinarily he collects and analyses data on microbial resistance, but now he and his colleagues are working on Covid - supporting sequencing teams working on Covid genomes. It’s a huge task, he said, “to associate this data with the patient information in a way that is really manageable to [serve] all the systems and users of this data.”

Practical Top-Tips

Professor Spiegelhalter is a non-executive director of the UK statistics Authority, a role in which he helps to oversee the entire statistical system for the UK. From this vantage point he had some practical advice for scientists trying to avoid distortion as they try to get their point across. His first tip was to present graphs with titles that explain what the data are saying, with the interpretation made clear.

He also made a plea not to become overly focussed on the search for perfect data. Making data available, along with any necessary caveats, is his overriding concern. “Data is not perfect…it gives you an image. It doesn't tell you what to do. It is just gives you some information. We need some care and thought to interpret it.”

Professor Pohar Perme cited public expectations of “experts” as a key difficulty for her. She said the perception is that experts are people who know things with certainty. “It is problematic communicating uncertainty because when we are approached by the media we are approached as experts. So experts should know, right?”

For this type of situation, **Professor Spiegelhalter** recommended the “Krebs List”. This is a set of guidelines from Professor Sir John Krebs, zoologist and former chair of the UK’s Food Standards Agency. The gist is that first you tell the public what you do know. Then you set out what you don't know; what you're going to do to find out more; what people can do to help and finally you make clear that things will change, as you learn more.

Communications Ecosystems

The Krebs list reflects an environment in the UK that values public engagement with science. And this has evolved over decades. This “ecosystem” prioritises engagement with public life as a vital part of a scientist’s career, and one that is rewarded, alongside publications, Professor Spiegelhalter said. It also includes organisations such as the Science Media Centre, which helps reporters with direct access to scientists, and the science museums with their strong pedigree in wide science communication. These contributions, as well as the network of chief scientific advice that is embedded in government, provide an important bridge between politics and science which existed long before the pandemic.

He pities journalists who have to grapple with so many differing sets of statistics around Covid deaths. He’s particularly bothered by daily statistics that cite deaths from Covid-19 as reported in the past 24 hours, chiefly because these are skewed by reporting lags and contain multiple spikes and troughs. Yet these are the numbers relayed every day by the media - because it’s a new number, and therefore “news”. “This is one of the worst bits of data communication that I know. It's always high on Tuesdays and Wednesdays and it's always low on Sundays and Mondays... so you can’t believe any of those things. It's vaguely reliable on Thursdays, Fridays and Saturdays…and people still have not grasped this.” Other data, such as what is actually written on death certificates, is closer to a gold standard, Professor Spiegelhalter said.

And he’s not shy of calling out his own Government if he thinks something’s missing. He recently asked for more granular data on the UK’s vaccine rollout programme, and is confident this will be forthcoming. Lessons must be learned, he said, including structural changes in the way data are collected, curated, used in policy and made available to the public. “Open data should be there unless there's a good reason not to, and it shouldn't be held back because people might not understand it, or people might not use it properly, that is just an excuse for trying to keep the public ignorant of what's going on.”

He quotes one of his favourite philosophers, Onora O’Neill, Emeritus Professor of Philosophy at the University of Cambridge. She has said that it’s less important to persuade the public that you are to be trusted, than to show that you are trustworthy. “We have a duty to demonstrate trustworthiness,” Professor Spiegelhater said. “The responsibility is ours. Then, if people want to trust us, that's good.”

By Susan Watts - Moderator, Covid-19 Dialogues, 2021.