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Feature

Communicating science in a crisis

The global COVID-19 pandemic is a challenge not only for health systems but also for science communication. To protect public health, science had to obtain knowledge about the new disease at record speed and efficiently communicate it to political leaders, health professionals and the general public. Communication failures and the rise of misinformation have cost lives. Michael Gross reports.

The global spread of the COVID-19 pandemic was swiftly followed by a tsunami of information related to the disease, much of it essential, some unhelpful, and some downright dangerous. The president of the USA used his press briefings variously to advertise unproven treatment options, attack journalists, or suggest injecting disinfectants. Brazil’s president undermined state and regional pandemic responses with his pronouncements spreading doubt regarding the seriousness of the disease.

Meanwhile, the UK government switched its red and yellow warning sign saying “Stay home” to a green and yellow design saying “Stay alert”. At that time, daily death tolls were still above 450 in the rolling average, and staying home whenever possible was still very much the best advice, but with its green colour implying “go ahead” the sign managed to spread confusion among the general public who were left wondering how to stay alert against an invisibly small enemy.

Graphic designers questioned whether the remarkably unprofessional visuals used by the government were part of a clever strategy designed to connect with ordinary people and create distance from the perceived metropolitan elite and its emphasis on cool design, or whether they were simply part of a wider culture of carelessness.

Incidentally, these three countries that have provided examples for future textbooks of public health studies regarding how not to do communications in a pandemic are also the ones that have had the worst death tolls. In overall terms, the USA leads the field, but on a per capita basis the UK is in front. In pandemics, as in wars, carelessness kills.

Know your enemy

When a new infectious kind of respiratory disease emerged in the Wuhan district of China in late 2019, science was remarkably swift in identifying the causal agent and highlighting the likely risks and necessary containment measures. The knowledge base from previous zoonotic coronavirus outbreaks including SARS and MERS (Curr. Biol. (2020) 30, R191–R194) provided a suitable starting point, although the new disease turned out to be different in important ways.

In January, the medical journal The Lancet published a series of five reports describing the new viral disease and suggesting measures that would be required to contain its spread. The importance of mass testing, avoiding mass gatherings, personal protective equipment for health professionals, school closures and lockdowns were all
discussed in some of these papers, as The Lancet editor Richard Horton, a vocal critic of the UK government’s inadequate pandemic response, has pointed out repeatedly. Some governments were paying attention and initiated measures in time. Some didn’t.

From February, as the disease spread around the world and case numbers grew exponentially, so did the scientific studies. Containment and eradication of the disease, which had succeeded with the original SARS coronavirus in 2004, looked increasingly unlikely, so the focus shifted towards treatment options and possible vaccines.

As the brute force measures like lockdowns and travel bans were beginning to inflict unprecedented damage on the global and national economies, the need of a cure or a vaccine became more urgent. Without the luxury of the time usually required for drug development, pharmaceutical databases were scrutinised for any existing drugs that might in any way help the fight. For any possible candidates, procedures for clinical trials and data sharing had to be accelerated accordingly.

Inevitably, this haste led to wrong or insufficiently checked information being published. Even The Lancet, along with the New England Journal of Medicine, suffered an embarrassment when journalists uncovered that the data used in studies of the use of the malaria drug hydroxychloroquine came from a data company that didn’t appear to be operating to professional standards.

Hydroxychloroquine was championed by the French researcher Didier Raoult after a small non-randomised trial in which he claims to have observed benefits. Whether or not the drug may be of any help at all, is at the time of writing still an issue of debate. Even more than in normal research, all insights are only true until they are proven wrong. One of the major challenges is communicating these necessary uncertainties of a fast-moving field to the wider public, while maintaining the trust in science as the only mechanism that will ultimately lead us to the truth of the matter.

**Informing policy**

The cooperation and communication between scientists and political leaders is essential in public health crises such as a pandemic. In this respect, the three countries leading the death charts have been providing ample material for criticism. In the UK, in particular, the composition and operation of the Scientific Advisory Group for Emergencies (SAGE) has come under intense scrutiny.

The committee attended by a wide range of scientific experts from academia and practice is meant to provide objective advice to inform government policy. However, doubts emerged after the events surrounding the beginning of the epidemic in March. Although the infections were running out of control and death counts rising exponentially since the beginning of March, the government still allowed major events like the Cheltenham Festival to go ahead, which happened on March 10–13 with 250,000 people attending. A Champions League game at Liverpool on March 11 saw 3,000 supporters travelling in from Madrid, even though Spain was at that point entering lockdown.
Speaking at the government’s press briefing on coronavirus on March 13, the government’s chief scientific advisor, Patrick Vallance, mentioned herd immunity as a method for how the virus could eventually be brought under control. Minutes of SAGE meetings later revealed that the committee, which Vallance chairs, had heard evidence on February 27 that such an approach, letting everybody get infected, would come at a cost of 500,000 lives. It took the UK government another 10 days after this to turn around and take more drastic measures to fight the spread. During these 10 days, infections went up by an order of magnitude, suggesting that an earlier response could have saved the majority of those who have since died of the disease.

Scientists outside the SAGE circle like The Lancet’s Richard Horton and the public health expert Devi Sridhar from the University of Edinburgh have pointed out the deadly errors as the events unfolded, but the question remained where things had gone wrong. The government repeatedly claimed to be “following the science” — but was it cherry-picking bits of science that turned out to be the wrong ones? Was it perhaps leaning on SAGE to give the advice to fit its political leanings, namely not to restrict economic freedoms?

Intense scrutiny from parts of the media and from concerned experts led to the revelation that two government employees, Dominic Cummings and Ben Warner, attended SAGE meetings and may have influenced the conclusions. Following this revelation, the government was forced to publish a membership list and minutes of SAGE meetings.

The membership list revealed certain blind spots in public health and patient care. Still, the minutes show that at least some of the problems were recognised in time but not acted upon by the government. Having a political advisor acting as the messenger who probably explained to the prime minister what the scientists allegedly said may be a big part of the problem.

The dramatic events casting doubt on the independence of SAGE advice led the former government chief scientific advisor, the Cambridge chemist David King, to set up an alternative board, the Independent SAGE, at the beginning of May. Like opposition in parliament, this offers the hope of some checks and balances to the work of SAGE which has become a bone of contention.

Once the dust has settled on the COVID-19 crisis, analyses of SAGE proceedings will surely provide valuable lessons on how the communication between scientific experts and governments in crisis situations can be improved.

**Informing the public**

Transferring the scientific information from the research front to the policy makers is already a challenge, but getting the general public on board is where it becomes complicated. The measures required to keep health systems functional were in many cases severe restrictions of liberties. Thus, in democracies, political leaders had to justify and explain these deprivations to their electorate, while relying on the help of scientists and medical experts to explain the scientific reasoning underlying the measures. Again, this effort has been more successful with some governments, and
less so with those of a populist inclination that have been known to have conflicted relations with experts even before the pandemic.

The urgent necessity of clear communications has created new stars of the COVID age, however. In Germany, for instance, the virologist Christian Drosten from the Charité hospital in Berlin, who had been part of the team that discovered the original SARS virus in 2003, became the public face of the pandemic response and was applauded for his clear messaging. However, he has also faced attacks from those who considered the response unnecessary. The chemist and YouTuber Mai Thi Nguyen-Kim also won praise for clear communications to the public.

Science writer Laura Spinney was much in demand as a commentator, as she had written a book about the 1918 flu pandemic published on its centenary, and thus knew better than most people what it is like when a new infectious agent sweeps around the world. Writing about the current pandemic, Spinney also highlighted success stories, such as the Indian state of Kerala, where health minister K.K. Shailaja presided over a remarkable response that limited the number of casualties to double digits (20 by June 15th) in a state of 35 million inhabitants.

The sheer amount of information accumulating, which also has to be made accessible to the world population, has been a major challenge. To address this, biologists Virginie Courtier-Orgozo and Claire Wyart, both based at research institutes in Paris, France, have set up a multi-authored, multi-lingual web resource, en.adios-corona.org. “We deeply believe that it is the role of scientists to inform society and to provide the public with cues and methodology for them to be able to make better choices and to navigate safely in our new environment that we share with the SARS-CoV-2 coronavirus,” Wyart explains. “We hope to inspire our colleagues around the world to join and help in this fight against both the virus’ spread and misinformation for the public good.”

Communicators are confronted with a rising tide of misinformation. False information, some of it seeded maliciously with the aim to destabilise democracies has become a growing problem and contributed to the shift to a ‘post-truth world’ where even populist leaders take part in the spreading of conspiracy theories and other untruths (Curr. Biol. (2017) 27, R1–R4).

While these toxic falsehoods can be destabilising at the best of times, undermining the trust in scientific evidence in the event of a pandemic contributes to making things worse. Following swiftly after the wave of infections, the world has witnessed a wave of misinformation, including a rich diversity of implausible conspiracy theories either denying the reality of the disease or attributing it to various non-viral causes from the 5G communications infrastructure to bioweapons research.

The World Health Organisation (WHO) has highlighted the information overload and described it as an infodemic, meaning “an over-abundance of information — some accurate and some not — rendering it difficult to find trustworthy sources of information and reliable guidance.”

Researchers are already investigating the infodemic phenomenon, but results published on preprint servers so far are yet to be peer-reviewed. Observers of
misinformation problems have already remarked that various interested parties have spotted an opportunity in the crisis and swiftly hitched their hobbyhorses to it.

The most important battle in the fight against misinformation is still to come, however. If and when a vaccine for COVID-19 becomes available, the established networks of hardened vaccine critics may rise to the challenge of undermining its use. In the wealthier countries, where the cost of the vaccination is less of an issue, public trust in it may be the factor deciding its success. In such cases, good science communication can save many lives.

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Images:

Figure 1 legend:  
**Stay alert:** When to wear face protection has been one of the many issues on which conflicting and changeable information has been given to the general public. (Photo: Engin_Akyurt/Pixabay.)

Figure 2 legend:  
**News flash:** Large parts of the mainstream media were dedicated to reporting the spread of the disease and the measures taken to contain it. This has been particularly challenging in the presence of misinformation being spread via social media. (Photo: Michael Gross.)

In brief:  
The global COVID-19 pandemic is a challenge for health systems and for science communication. To protect public health, science had to obtain knowledge about the new disease at record speed and efficiently communicate it to political leaders, health professionals and the public. Communication failures and the rise of misinformation have cost lives.
New rules allow ‘support bubbles’ for those living alone and single parent