

Communicating science responsibly

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Key messages

- Responsible science communication is crucial for bridging the gap between science and society, fostering public trust in science, and promoting evidence-based policymaking. Science in this context encompasses all disciplines ranging from science, technology, engineering, and math (STEM) to the social sciences.
- Ensuring effective public communication of science is not a new challenge, but the COVID-19 pandemic and widespread use of social media have created a new context for communication that is more dynamic, interactive, and complex.
- With the spread of mis- and disinformation, some of which is either inadvertently or deliberately propagated by scientists, ensuring the rigour of publicly communicated scientific evidence is of paramount importance.
- As the context and mechanisms for science communication evolve, a major and persistent challenge for scientific institutions is how to communicate responsibly, respecting academic freedom whilst promoting rigour and transparency.

What's the issue?

The digital transformation has radically altered the science communication landscape. Due to a shift from traditional intermediaries – scientific journals and mainstream media – to social media and the internet, anyone can now create and share ‘scientific’ content. In this new era, science communicators include not only scientists, scientific institutions, journalists, and governments, but also social media influencers, digital platforms and algorithms, and multiple publics with different levels of expertise. The digital transformation has provided a welcome opportunity to move beyond one-way communication, enabling different audiences with different needs and expectations to participate in two-way dialogue around scientific issues (and beyond that to engage in scientific knowledge production). However, this democratisation is a double-edged sword. While online tools can facilitate easier access and engagement with science, social media content is largely unregulated, enabling the rapid spread of mis- and disinformation. The lack of systematic quality controls means that users, including scientists, can intentionally or inadvertently spread misleading or false scientific messages. In this context, it can be difficult to make clear and reliable scientific information readily accessible and understandable to the public.

During complex crises, like the COVID-19 pandemic, communicating science effectively is both more important and more challenging (OECD, 2023^[1]). In such situations, much of the relevant scientific evidence is associated with a considerable level of uncertainty, and this evidence can evolve rapidly. When there are scientific uncertainties, it can be difficult to explain these to the public and have an informed and constructive dialogue. Insights from social and behavioural sciences can play an important role in designing effective communication strategies, but the knowledge from these domains is often overlooked. A persistent communication challenge that is accentuated during crises is how to accommodate legitimate, yet dissenting, scientific views. During the COVID-19 pandemic, debates that traditionally would have taken place within scientific institutions spilled over into the public domain, and in the absence of a unified, expert voice this often led to confusion. Even when a clear scientific consensus exists, if this is contrary to the values, beliefs, or vested interests of certain sectors of society, the scientists who communicate this consensus can easily become the target for defamatory attacks.

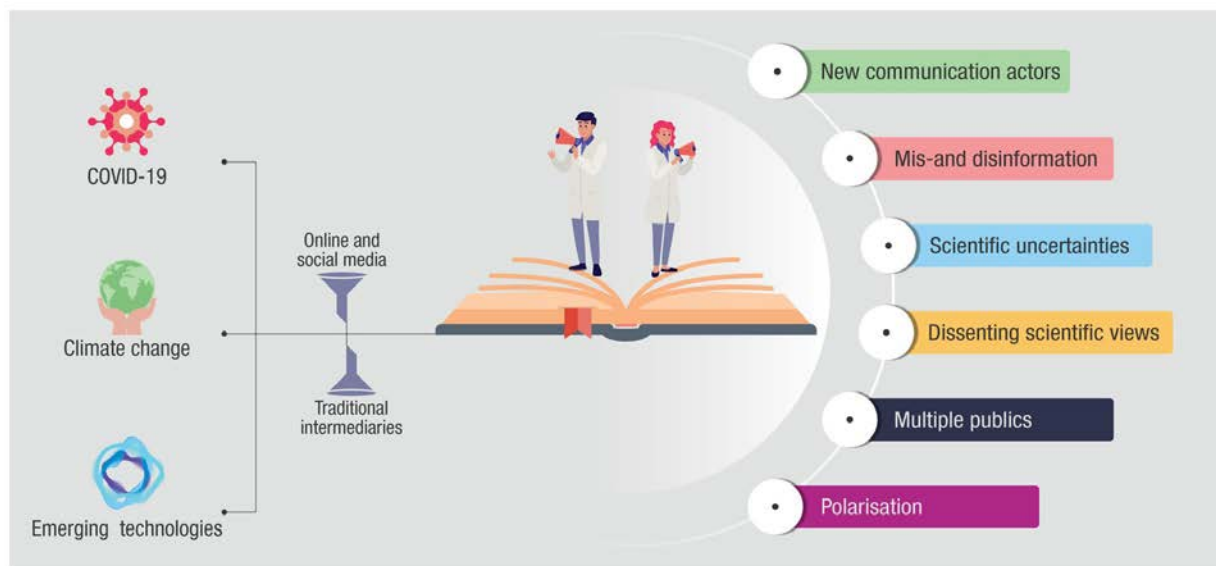
Why is this important?

Many citizens are interested in science, particularly in so far as it affects their daily lives, and they expect to be informed about scientific developments in a timely manner. However, inaccurate information can confuse the public and have negative impacts on individuals and society. The amplification of mis- and disinformation and reinforcement of polarised views in echo chambers on social media can bias perceptions of science and give rise to heated, even abusive, debates. These may be ostensibly about scientific evidence but are often more about ideology and political beliefs. A pertinent example is the growing political polarisation around climate change on social media, in which scientific information is being used, and often distorted, to influence people’s attitudes and behaviours – including who they vote for (Falkenberg et al., 2022^[2]). In the public health domain, inaccurate or poorly communicated scientific information can put individuals and communities at risk. For example, during COVID-19, ineffective communication, including conflicting messages from scientists, sometimes led to poor compliance with public health advice that could have saved lives.

Ineffective science communication undermines the credibility of scientific experts, scientific institutions, and policymakers. During the COVID-19 pandemic, public trust in science and scientists rose globally although it varied significantly between different countries and population groups (Wellcome Global Monitor, 2020^[3]). Trust in science is influenced both by individuals’ perceived knowledge of science and confidence in government and public authorities (ibid.). Access to clear and reliable scientific information

is fundamental to maintaining public support for evidence-based policymaking and empowering citizens to make informed decisions. In turn, a well-informed public that recognises the relevance of science in their daily lives is important for resilient and well-functioning democracies.

Figure 1. The evolving science communication landscape



Note: the figure is a conceptual representation of the relationship between critical issues of societal concern and the challenges for science communication. These are not necessarily wholly new challenges, but they can manifest differently and are often magnified by social media. The figure is a simplified representation of multiple complex processes.

Source: Author's design

Key principles for responsible science communication

For science communication to be clear, understandable, and trustworthy for the public, it is fundamental for scientists, scientific institutions, and governments to agree and adhere to a minimum set of universal principles. Many governments and institutions have developed their own guidelines for conducting scientific research with integrity and communicating it responsibly and, following the COVID-19 pandemic, some of this guidance is now being revisited. Drawing on existing materials (OECD, 2023^[4]) (National Science and Technology Council, 2023^[5]), six common principles can be identified as being important for communicating science responsibly and effectively:

1. **Transparency**
 - providing access to data on which scientific conclusions depend
 - describing clearly the methods and data used to reach a conclusion
 - communicating uncertainties
2. **Inclusivity**
 - reaching out to diverse groups in society
 - making science communications accessible (e.g. taking into account digital infrastructure and language barriers)
3. **Integrity**
 - adhering to ethical and professional standards in scientific research and communication

- being intellectually honest (e.g. not hyping scientific results) and ensuring the rigour of the research that is being communicated
4. **Accountability**
 - making clear who is responsible for a scientific communication and in what capacity they are communicating (e.g. personal or institutional; subject expert or scientific commentator)
 - being clear on the sources that underpin a scientific communication
 - openly declaring any potential conflicts of interest or commitment for those communicating or providing the content of scientific communications
 5. **Freedom and autonomy.** This includes:
 - communicating scientific research without being constrained by external interference (e.g. political, legal, religious)
 - respecting the self-governance of academic research and right of scientists to freely communicate (in accordance with principles 1-4)
 6. **Timeliness.** This is particularly relevant in emergency situations and includes:
 - delivering relevant and up-to-date information to citizens in a timely manner, with appropriate caveats where necessary
 - not withholding or delaying the communication of relevant scientific information, while ensuring that essential quality controls have been performed prior to its release

What can policymakers do?

- **Promote responsible science communication based on these six common principles.** Governments can develop guidance for their own scientists and support scientific institutions and universities to do likewise. The guidance can take the form of guidelines, good practices, and frameworks. It is crucial that the guidance states clearly the relationship between individual and institutional roles and responsibilities (including legal liabilities) and what each of these entails.
- **Build capacity and invest in science communication.** Trustworthy scientific institutions can be leveraged to convey scientific information to citizens effectively, either by reinforcing the communication structures that already exist within these institutions and/or by establishing new collective organisations or platforms. As part of this investment, research in communication and behavioural sciences should be supported and integrated into science communication structures, strategies, and approaches.
- **Establish structures and processes to communicate scientific evidence during crises effectively.** Governments are encouraged to work closely with scientists to develop effective evidence-based crisis communication strategies that respect the six common principles (see above). Crisis communications should be tailored to address the needs, questions, and concerns of all citizens. Creating spaces where citizens can engage with the science underpinning policy decisions can facilitate two-way communication and foster public trust in science and evidence-based policies.
- **Train and reward scientists for public communication.** Training programmes, such as media training, should be readily available in research institutions and universities. Communication activities should be recognised in scientific evaluation and assessment processes for individuals and institutions. Governments, institutions, and funding bodies can reward communication work through financial and other incentives (e.g. science communication prizes).
- **Promote scientific and digital literacy.** Effective participation in dialogue around science requires a minimal level of scientific literacy and appreciation of the value (and limitations) of scientific evidence. At the same time, digital literacy is required to equip individuals with the skills and tools to discern between reliable and misleading online sources of information. These skills need to be nurtured from an early age via both formal and informal education.

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Explore further

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