

POLICY BRIEF ON

Excellent science communication for urgent societal challenges

Version 2.0



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1 Introduction

The challenges facing contemporary society are becoming increasingly complex. Pressing issues, such as the climate crisis and the socially disruptive effects of emerging technologies, transcend economic, social, cultural, ethical, scientific, and political boundaries, demanding integrated and collaborative responses. Such societal issues can be categorized as **‘wicked problems’** – complex societal problems that lack straightforward solutions, as they cannot be easily defined, and involve a wide range of stakeholders, each with their own perspectives, values, interests, and practices¹. These urgent societal issues are characterized by conflicts, controversies, ambiguities, and uncertainties. Attempts to resolve them often result in new challenges and conflicts.

Because wicked problems concern many different stakeholders, a socially robust response must account for the diversity of values, emotions, types of knowledge, expertise, and worldviews, which may clash or even contradict each other. Yet, fostering constructive exchange around science is particularly difficult when the related societal issues are complex and demand timely action.

This policy brief examines five characteristics of wicked problems that must be addressed simultaneously, ranging from the need to engage diverse stakeholders to the challenge of navigating the absence of straightforward solutions (see chapter 2). It is the second in a series of three documents. The [first policy](#)



[brief](#) in this series untangled the conflicts and controversies inherent in the context of wicked problems, by examining the perspectives of quadruple helix **(4H) stakeholders (policy, academia, industry, and civil society, including NGOs and advocacy groups)** involved in urgent societal issues across **four thematic areas: 1) Climate emergency, 2) Water oceans and soils, 3) Health & vaccines, and 4) Artificial intelligence & digital transformation**².

The five characteristics, as further detailed in chapter 3, illustrate how crises make it profoundly difficult to know what is true, whom to trust, and how to decide what information to act upon. Traditional science communication, focused on delivering clear and reliable information (scientific facts), often fails to support publics in these processes of deeper sensemaking. Research shows that people interpret science through the lens of their personal situations, values, and social contexts. This highlights the need for new roles and practices in science communication³.

¹ Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, 4(2), 155–169. <https://www.jstor.org/stable/4531523>

² DeLong, K., Roedema, T., Willems, W., Magalhães, J., Weitkamp, E., & Arias, R. (2024). Policy Brief on excellent science communication for urgent societal challenges. Zenodo. <https://doi.org/10.5281/zenodo.11082053>

³ Davies, S. R., Halpern, M., Horst, M., Kirby, D. & Lewenstein, B. (2019). Science stories as culture: experience, identity,

Science communication thus becomes both more complex and more indispensable during crises, as it can support public understanding and collective sense-making of science under conditions of uncertainty.

While fields such as crisis communication and risk communication are supported by well-established frameworks, roadmaps, and guidelines for effective communication in times of crisis, the field of science communication lacks such navigational tools. This gap became evident through several [COALESCE project](#) activities with science communication professionals across sectors (including policy, academia, NGOs, and media), who consistently reported the **absence of guidance on how to navigate their work for urgent societal issues**.

To address this gap, we developed ***the Crisis Navigator for Science Communication*** – a sensitizing tool to assist practitioners with science communication practices in times of crisis, allowing them to better imagine and anticipate challenges that emerge in the context of wicked problems⁴. Here, our focus was not to replace or extend existing frameworks from crisis or risk communication, nor to suggest a one-size-fits-all approach. Rather, we sought to strengthen the core qualities and working practices of science communication itself, and to explore its additional value alongside other fields that communicate science during crises.

This second policy brief provides recommendations to policymakers and interested parties in navigating wicked problems in the four thematic areas, through the Crisis Navigator.

narrative and emotion in public communication of science
JCOM 18(05), A01. <https://doi.org/10.22323/2.18050201>

⁴ Willems, W., Bruns, C., DeLong, K., Driessen, S., Van Oudheusden, M., Green, R., Roedema, T., Bohnke, L., & Pridmore, J. (2024). Crisis Navigator for rapid mobilisation of science communication. Zenodo. <https://doi.org/10.5281/zenodo.11446975>

2 Evidence and main findings

The structure of this section follows the five defining characteristics of wicked problems briefly introduced at the outset: 1) A diversity of stakeholders; 2) No central authority; 3) Constantly evolving knowledge and high uncertainty; 4) Time pressure; 5) No straightforward solutions. The material presented here is drawn from empirical findings.

1. Diversity of stakeholders

Facilitating collaboration between diverse stakeholders with varying values, perspectives, expertise, priorities, and power dynamics complicates science communication during crises like the COVID-19 pandemic. For instance, some stakeholders viewed COVID-19 primarily as a public health emergency, while others framed it as a socio-economic crisis. Even a seemingly single, homogeneous group may hold divergent crisis perspectives; for instance, industrial fishers versus small-scale fishers.

Although this diversity is widely acknowledged, **formal training in navigating stakeholder complexity is still seen as a competence gap**. Science communicators can facilitate collaboration by **identifying and addressing underlying conflicts**, with the aim of instilling more fruitful knowledge exchange and fostering trust among stakeholders.

This is why effective science communication during urgent societal challenges requires **adaptive, inclusive strategies**. It is not enough to simply acknowledge stakeholder differences. Instead, **institutional support and targeted training and capacity building are needed** to nurture and maintain a cohesive crisis response.

There is increasingly a critical need for **pre-crisis relationship-building**. This includes creating protocols that balance structured guidance with flexibility for unprecedented situations. Effective crisis communication requires acknowledging the distinct but interconnected roles of scientists as advisors and policymakers as decision-makers, while maintaining public trust through transparency about both evidence and its limitations.

2. No central authority

A second characteristic, which includes concerns such as limited accountability and trust, is that there is unclear responsibility among stakeholders during urgent societal challenges. This creates communication gaps, lack of accountability, and possibly implementation



paralysis. Policymakers and politicians frequently defer to scientists to avoid accountability, while scientists lack authority to steer policy decisions. Furthermore, no consensus exists on who (citizens, institutions, media) bears which share of responsibility during a crisis. For example, the COVID-19 pandemic showed responsibility gaps in reducing the spread of the coronavirus when emphasis was put on individual responsibility to wash hands and wear face masks, whilst clear and timely social distancing measurements and vaccine programs were slowly put in place. **A move toward shared accountability would be beneficial; however, institutions frequently resist assuming a “first mover” role when it comes to introducing new communication initiatives.**

The post-truth era presents an additional challenge for trust in science communicators⁵. **Trust is fragile, yet essential** for effective science communication during urgent societal challenges. **Transparency, relational trust, and accountability are critical factors**, while concomitant with current gaps in responsiveness and institutional practices.

Transparency about uncertainties (e.g., “known unknowns”) builds long-term trust but risks credibility short-term. Downplaying uncertainty is likely to backfire in the end, leading to communication outputs by scientists and establishment figures being described as “not tell[ing] the whole story.” Furthermore, opaque decision-making is often criticized (for example, undisclosed vaccine contract negotiations), which may fuel public distrust in scientific and democratic institutions.

Not all organizations respond to public concerns, suggesting that accountability is underprioritized and may damage public trust as a result. Trust problems can be systemic. During COVID-19, the political instrumentalization of science, such as selective use of data to support policy decisions, also damaged public confidence in scientific expertise. Thus, **trust cannot be fostered through better messaging alone**. Science communication is one tool in a broader trust ecosystem that includes institutional integrity and policymaker ethics. It requires **transparency, proactive relationship-building, and accountability**.

3. Constantly evolving knowledge and high uncertainty

Unpredictability and misinformation are two elements of this third characteristic of uncertainty presenting other key challenges⁶. Science communicators are expected to provide clarity amid situations that are continuously evolving. Scientists and policymakers may seem to grapple with pressure to deliver definitive answers, despite inherent uncertainties in evolving crises (e.g. “being accurate all the time” is unrealistic). Transparency about unknowns presents a credibility dilemma, as the **revision of early findings in light of new evidence can carry reputational consequences**. For example, early pandemic models and shifting data required candidness

⁵ Lewandowsky, S., Ecker, U. K., & Cook, J. (2017). Beyond misinformation: Understanding and coping with the “post-truth” era. *Journal of applied research in memory and cognition*, 6(4), 353–369

⁶ Moreno-Castro, C., Mendoza-Poudereux, I., van der Meij, M., Roedema, T., Taylor, A., Ridgway, A. et al. (2025). Strategies to address critical challenges to effective science–society relations, including misinformation and trust. Deliverable report (D2.2). Zenodo. <https://doi.org/10.5281/zenodo.14826013>

about limitations, yet transparency sometimes eroded trust. Where scientists embrace uncertainty as an inherent feature of their work, policymakers often rely on cross-national comparisons to offset uncertainty.

Navigating uncertainty requires **acknowledging its inevitability while fostering trust through consistent, transparent communication**. Institutions must support scientists, policymakers, journalists, and other science communicators who engage in science communication in balancing accuracy with transparency during crises.

The rapid spread of **misinformation** during urgent societal challenges complicates science communication, requiring **strategies that go beyond fact-checking to strengthen trust and engagement**. Scientists face frustration when misinformation spreads faster than evidence-based research, especially in contexts of uncertainty. The amount of (mis)information during urgent societal challenges easily leads to information overload. During COVID-19, this made reliable information harder to access, complicating decision-making processes for policymakers. Rapidly evolving science led to contradictory messaging (e.g., shifting vaccine recommendations), creating alternative narratives that exploit these contradictory messaging and gaps in public understanding. Arguably, these alternative narratives were more appealing to wider publics due to inconsistent communication from official sources.

Navigating misinformation requires a **shift from reactive fact-checking to proactive trust-building**. Science communicators must prioritize **clarity, consistency, and compassionate engagement** to navigate misinformation during crises.

4. Time pressure

The urgency of crises like COVID-19 and floods create intense time pressures that compromise ideal communication practices, forcing trade-offs between speed, accuracy, and inclusivity. During urgent societal challenges, being forced to act on partial information (e.g., 50% of needed data) may result in eroded public trust when early conclusions change. Furthermore, while stakeholder engagement builds trust, crisis urgency often sidelines it as "too time-consuming" (e.g., criticism of citizen involvement during peak COVID-19). This often results in dissemination being prioritized above marginalized communities' needs, exacerbating disparities. The **time scale of crises deserves to be given more consideration**. For example, COVID-19 unfolded over a much shorter time frame than long-term crises such as fisheries collapse. In fast-moving situations, the urgency of societal demands can create credibility gaps, as preliminary findings may need to be shared out of necessity rather than certainty.



Time pressure is inherent to urgent societal challenges, but its impacts can be mitigated through **preparedness, adaptive tools, and honest communication about the constraints themselves.**

5. No straightforward solutions

Wicked problems **involve conflicting interests (of different stakeholders), uncertainty, and social dimensions** that defy linear, one-size-fits-all responses. They need to be addressed from multiple angles, often simultaneously, because their causes and consequences cut across disciplinary, institutional, and societal boundaries⁷. Additionally, policies enacted during a crisis often neglect to reflect on future consequences⁸. In the context of science communication, this means moving beyond one-way information transfer toward more **integrative, dialogical, and reflexive approaches**. Communicators must engage with diverse forms of knowledge (scientific, experiential, and local) while navigating uncertainty, conflict, and competing values. Such **multidimensional engagement helps build shared understanding and trust, even when consensus on solutions remains elusive**. Science communication should therefore support collaboration between stakeholders, as wicked problems require holistic approaches.

Transparent messaging is especially important when dealing with wicked problems.

Solutions often cause other problems, and the same people or institutions contributing to the issue are also seeking solutions. Science communicators should transparently communicate these contradictions and uncertainties to foster trust with publics.

⁷ Hipolito, I., & Khanduja, A. (n.d.). Wicked Problems: Addressing the Crises of the 21st Century with Complex Systems Theory

⁸ Auld, G., Bernstein, S., Cashore, B. et al. (2021). Managing pandemics as super wicked problems: lessons from, and for, COVID-19 and the climate crisis. Policy Sci 54, 707–728. <https://doi.org/10.1007/s11077-021-09442-2>

3 Policy recommendations

The tensions presented in the previous section highlight the central challenge of navigating paradoxical demands, such as providing timely information while ensuring accuracy amid rapidly changing evidence. Here, we provide recommendations to help navigate them.



1. Improve stakeholder and public engagement

To navigate stakeholder complexity between diverse stakeholders and publics, it is necessary to move beyond one-way information transmission and implement genuine listening practices that identify fears, misinformation and values shaping public responses. This requires inclusive language and intercultural communication, ensuring that messages resonate across communities. Stakeholder engagement should also be strengthened by integrating multidisciplinary insights, as combining perspectives from social sciences and humanities (SSH) with those from natural and technical sciences helps to prevent scattered narratives, and ensures both technical solutions and sociocultural dimensions are considered. Lastly, genuine participation based on principles of inclusivity and equity depends on recognizing and addressing the power structures that shape the dialogue, such as the institutional authority of government agencies over citizens. When dialogue is called for, mechanisms should be in place to ensure accountability, transparency and inclusivity beyond mere formal consultation.

2. Address responsibility gaps and task devision

Upon implementing policies, decision-makers should be required to justify policy choices. Sharing reasons for policy decisions – without hiding behind ‘the science’ – and clarifying who is responsible for their implementation normalizes transparency, ensures accountability and increases trust. For the public, realistic roles and responsibilities should be defined before a crisis occurs. This will not only prepare the public for a crisis, but also prevent over-reliance on top-down solutions. To ensure clarity concerning responsibility, funding should go to dedicated communication teams, not individual researchers, to bridge gaps between science, policy, the public and relevant stakeholders. A uniform messaging system is likely to build trust and provide clarity on who is accountable for communication during a crisis.

3. Build relational trust

To build trust and foster connection in inter-stakeholder collaborations, language use should remain in sharp focus – this entails mirroring stakeholders' language and minimizing jargon (e.g., “model uncertainty”, “statistical significance,” “governance”). Trust in science can also be built through scientific literacy, which asks for messaging that is both credible and relatable, not solely relying on government spokespeople or scientists. While trust between the public and 4H stakeholders is essential for effective science communication, it requires a long-term process in which equity, empowerment, literacy and justice all play a role – all reflected throughout these various recommendations.

4. Accept and communicate uncertainty

Public messaging should frame uncertainty as a natural part of science, not a flaw. Science communication activities should also discuss limitations of scientific knowledge and trade-offs made. It also requires awareness of how appeals to uncertainty can be weaponized in certain contexts, and responsible framing of uncertainty. Science communicators must therefore receive training on conveying uncertainty, as this will improve their ability to engage with the public – all while balancing honesty about what is unknown with clarity about the robustness of existing evidence and the urgency of decision-making.

5. Anticipate and navigate misinformation

When a crisis is imminent, knowledge gaps quickly arise, making room for misinformation. Science communicators should anticipate these knowledge gaps and address potential gaps or contradictions in communication outputs. Debunking misinformation and communicating ‘the facts’ is often insufficient to convince publics. As spread of misinformation can be related to concerns and pre-existing beliefs, dialogical forms of communication that address values, (personal) context and trust in the communicator play a major role in the spread of misinformation. Additionally, crisis protocols to communicate key findings during crises should be developed, to limit information overload and increase access to reliable information for the public and policy makers. This can be done in collaboration with educators and journalists, who can translate difficult, jargon-rich information into everyday language materials.

6. Tailor approach to time pressure

As time pressure is inseparable from urgent societal challenges, it is essential to develop templated (crisis) communication frameworks that provide rapid but structured knowledge dissemination. This includes prioritizing “need-to-know” information in communication with relevant stakeholders to save time and prevent information overload, but also requires strengthening relational trust already before a crisis hits, as trust is vital when emergencies do not allow for it to build slowly. Additionally, time-sensitive responses should include rapid equity assessments for vulnerable groups, as they are often overlooked in policy and communication efforts. Lastly, when time pressure asks for compromises in decision making, this should be clearly communicated (e.g., “This is our best guidance today, and we will update as we learn more”).

7. Build collaborative platforms and networks

Collaboration between various stakeholders (and publics) is imperative to many of the policy recommendations described above. Therefore, it is important to prioritize building expert networks and platforms where such collaborations can take place and be upheld. Collaborative platforms with dedicated engagement coordinators could bridge gaps between research, policy and public communication. Such platforms should also include space for open dialogue with affected communities to foster trust and understanding.

8. Invest in tools and training

The implementation of our recommendations requires development of a wide range of tools and training for those responsible for science communication. Dialogue training will aid empathetic communication, allowing for emotional narratives, values and personal context to be included. Additionally, science communicators should be trained in communicating uncertainty (see recommendation 4). To aid science communicators in communication to a great variety of stakeholders and publics, tools should be in place that can help with adapting messaging to various cultural and/or linguistic contexts. To coordinate messages across various (digital) platforms, there should also be training on the construction of media narratives, which can help in public understanding and awareness.

4 Methodology

This policy brief is the second in a series of three. The series follows three phases of an action-oriented and transdisciplinary research approach: 1) *exploratory agenda-setting*; 2) *experimentation and reflection*; and 3) *iteration and validation*.

For this second policy brief we engaged science communication practitioners, as well as 4H stakeholders (policy makers, academic researchers, industry and civil society actors) working with or within the 4H stakeholder groups. Through a series of semi-structured interviews and participatory workshops (March–October 2025), we explored how effective science communication can be achieved in times of crisis. In total, ten interviews and six workshops were conducted, each focusing on one of the four topic areas central to the COALESCE project: 1) *health and vaccines*, 2) *climate emergency*, 3) *AI & digital transformation*, and 4) *water, oceans, and soil*. Participants used the Crisis Navigator's sensitizing concepts (e.g., trust, power, values)

to reflect on their experiences and work practices, identify what currently works or fails in crisis contexts; and to articulate what additional guidance the science communication field still needs to navigate wicked problems. Hence, building on insights from participatory research, the Crisis Navigator offers both a conceptual framework and practical guidance for communicating science collaboratively, responsibly, and reflexively in times of crisis. The main findings from these activities are summarized in this document. Accordingly, we mapped our findings on effective science communication in times of crisis onto the sensitizing concepts in the Crisis Navigator and the defining characteristics of wicked problems. In each category, when relevant, we highlight specificities for effective communication relating to the topical area and the 4H stakeholder group.

5 References

Auld, G., Bernstein, S., Cashore, B. et al. (2021). Managing pandemics as super wicked problems: lessons from, and for, COVID-19 and the climate crisis. *Policy Sci* 54, 707–728.
<https://doi.org/10.1007/s11077-021-09442-2>

Davies, S. R., Halpern, M., Horst, M., Kirby, D., & Lewenstein, B. (2019). Science stories as culture: experience, identity, narrative and emotion in public communication of science. *JCOM* 18(05), A01. <https://doi.org/10.22323/2.18050201>

DeLong, K., Roedema, T., Willems, W., Magalhães, J., Weitkamp, E., & Arias, R. (2024). Policy Brief on excellent science communication for urgent societal challenges. Zenodo.
<https://doi.org/10.5281/zenodo.11082053>

Hipolito, I., & Khanduja, A. (n.d.). Wicked Problems: Addressing the Crises of the 21st Century with Complex Systems Theory

Lewandowsky, S., Ecker, U. K., & Cook, J. (2017). Beyond misinformation: Understanding and coping with the “post-truth” era. *Journal of applied research in memory and cognition* 6(4), 353–369.

Moreno-Castro, C., Mendoza-Poudereux, I., van der Meij, M., Roedema, T., Taylor, A., Ridgway, A. et al. (2025). Strategies to address critical challenges to effective science–society relations, including misinformation and trust. Deliverable report (D2.2). Zenodo.
<https://doi.org/10.5281/zenodo.14826013>

Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, 4(2), 155– 169. <https://www.jstor.org/stable/4531523>

Willems, W., Bruns, C., DeLong, K., Driessen, S., Van Oudheusden, M., Green, R., Roedema, T., Bohnke, L., & Pridmore, J. (2024). Crisis Navigator for rapid mobilisation of science communication. Zenodo. <https://doi.org/10.5281/zenodo.11446975>

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7 Project details

The **Coordinated Opportunities for Advanced Leadership and Engagement in Science Communication in Europe (COALESCE)** project is funded by the European Commission (EC) to establish a European Competence Centre for Science Communication. The Competence Centre operates under a virtual platform, offering services, tools and resources, connected to a network of COALESCE hubs. The Competence Centre is being developed through consolidation of research and practice from past and ongoing research projects, including those funded under the 'Science with and for Society' (SwafS-19) programme as part of Horizon 2020, namely TRESKA, NEWSERA, PARCOS, GlobalScape, QUEST, ENJOI, CONCISE and RETHINK. The role of the Competence Centre is to further develop and mainstream science communication knowledge and to foster connections between science and society. The project has initial funding for four years (April 2023 – March 2027) but the Competence Centre is being developed to be sustainable beyond the project's duration.

PROJECT NAME Coordinated Opportunities for Advanced Leadership and Engagement in Science Communication in Europe (COALESCE)

PARTNERS



WEBSITE <https://coalesceproject.eu>

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