

Principles and challenges of risk communication/crisis communication, specifically addressing issues relating to pandemics

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“the ignorant smiles of PR types are a good tool for digging oneself into a hole” (Baruch Fischhoff 1994)

Sweden’s Corona commission asked the author of this report to conduct an independent overview of key principles of risk and crisis communication, specifically addressing issues relating to pandemics. The report offers a concise summary of key lessons/challenges and key recommendations from theory and empirical research.

1 General overview of key principles of risk and crisis communication

Risk communication is a relatively new field of studies that emerged in the 1980s as a “follow-up of risk perception studies” with an extension to “the flow of information between subsystems of society” (Renn 2008: 190). Decision-making is clouded by perceptions (Starr 1969; Slovic 1987), bias and mental shortcuts (‘heuristics’) (Kahneman and Tversky 1979; Tversky and Kahneman 1981; Kahneman 2011), as well as emotions and affect (Finucane et al. 2000; Lerner et al. 2000; Slovic et al. 2004). Psychometric perception studies convey evidence on how people perceive various hazards (from nuclear to disease) and how they rank them. Key drivers of perception include, for example, albeit not exclusively, the degree of control, catastrophic potential, and familiarity of a hazard (Fischhoff et al. 1978; Slovic 1987). Finally, the study of the complex and fragile relationships of trust that bind people and institutions together offers precious insights into people’s attitudes, likely acceptance and expected behaviour when confronted to risk (Renn and Levine 1991; Löfstedt 2005; Earle 2010; Siegrist 2019).

The fundamental principles that apply to risk communication also apply to crisis communication. Despite the sense of urgency that a crisis situation may trigger, two-way, proactive and non-persuasive communication is more likely to bear fruits than top-down one-way communication (Fischhoff 1995, 2005; Johansson and Bäck 2017; Eriksson 2018). In both crisis and “routine” situations, it is also important to pre-test one’s communications (Fischhoff 2005; Seeger 2006). Neutral third parties, such as scientific experts, also play a key role in maintaining trust in the response (Löfstedt 2005; Reynolds and Seeger 2005). Risk and crisis management needs to be conducted honestly, candidly, and receptively while avoiding to mis-represent or stretch the truth (Fischhoff 1995; Seeger 2006; Wardman 2020).

A sense of crisis, however, triggers specific challenges. In emergency situations preparedness (Seeger 2006) and timely response

action – and communication – are paramount. This calls for improved institutional co-ordination as well as transformations which, in turn, require leadership (for an in-depth discussion see Wardman 2020). Effective leadership derives from a commitment to playing a leading role in enacting and integrating knowledge as well as bridging gaps between key knowledge communities (Hyvärinen and Vos 2015; Reynolds and Seeger 2005). Leaders also play a central role in sounding the alarm as well as offering direction and contextualising information (Seeger 2006). They also need to maintain open dialogue channels in the context of the vivid discussions that may take place on social media (Austin and Jin 2017). Effective leadership contrasts with attempts that focus on tightening control mechanisms and neglecting reciprocal dialogue (Jaques 2012).

A number of reviews (McComas 2006; Balog-Way et al. 2020) have systematically explored the depth and breadth of the emerging risk communication field. Modern risk communication, in crisis as well as non-crisis situation, can no longer be viewed as a simple “sender-received” model (Laswell 1948) between two parties. Institutions who may initiate critical communication about risks, such as regulatory agencies, industries, NGOS or the media resort to multiple channels of information – from traditional press release to conferences (e.g. stakeholder consultations) and social networks. The dominant view within the risk research community is that risk communication should be conceptualised as a multi-way exchange among those concerned to support independent risk/benefit decisions (Balog-Way et al. 2020). This approach has been remarkably stable over time. Back in 1993 Clarke and Freudenburg already described the ideal risk communication format as an honest exchange of information, a co-operative relationship, between experts and non-experts, producers and consumers, government, and citizens (Clarke and Freudenburg 1993). Risk communication, therefore, is a process that differs fundamentally from public relation messaging (Fischhoff 1994). It is not designed to ‘convince’ but rather to ‘support’ and ‘empower’. In crisis situations this approach may prove precious to prevent destructive infighting and support a more constructive way of fostering better quality disagreements (Fischhoff 2009). Effective risk communication is playing a crucial role as a way to meet the challenge of effectively supporting better individual choices. To achieve this goal risk communications need to: (i) be

able to produce and convey probabilistic and other evidence to lay audiences that ‘explains’ the risk; (ii) make convincing use of various techniques (e.g. valid benefit-risk comparisons, risk-risk comparisons) that convincingly show the merits of a particular course of action, and (iii) support fair procedures to engage scientists, risk managers and various stakeholders in a shared learning process (Fischhoff 1995; Leiss 1996).

Since the mid-1990s repeated efforts have been made to define which communications ‘work’, which ones are ‘state of the art’ (HSE 2010) and ‘effective’ (Arvai and Rivers III 2013). The appetite for an actionable toolkit of sound principles has been heightened by the devastating impacts of past failures and ‘crises’ on public trust (Löfstedt 2005). National governments and International organisations have developed numerous communication ‘checklists’, some informed by science (Fischhoff and Scheufele 2019), some developed by consultants. Examples that directly concern pandemics include the Pan-American Health Organisation- WHO Risk Communication Checklist for Ebola and the CDC Crisis Emergency Risk Communication Checklists. These documents provide extremely detailed and prescriptive guidance, containing many “dos” and “don’ts”. In practice, however, detailed prescriptive guidance is difficult to implement, and our direct policy experience suggests that public administrators are often struggling to adapt this advice to real-life situations. For example, one such checklist raised the issue of “What are the templates for developing accurate, consistent, and credible messages?” Another one suggested to “consider the top 2 unintended consequences of a situation”. Although these considerations may be valid, they provide little direct value to those in charge of crisis-response. To use a culinary metaphor, providing help about how to cook will be more effective than producing a universal recipe book based on a list of ingredients or trying to figure out what ingredients are missing.

In 2009, the author worked with the UK Risk and Regulation Advisory Council, the UK Government Office for Science and the UK Department for Business, Innovation and Skills (BIS) to elaborate a more concise ‘survivor’s guide’ that could be used to address the needs of policy makers. Five procedural principles – the so-called ‘five As’ of public risk communication – were developed drawing on decades of research on risk communication combined with direct

input from leading researchers and senior practitioners from the UK, the US and Europe (Bouder 2009). The five principles were subsequently adapted to specific field requirements, including vaccine risk communication in the context of hesitancy and scares (Bouder 2015). It should be specified that in the author's view, the line between 'routine' and 'crisis' communication is somewhat blurred by the fact that the concept of crisis is rather subjective and that many risk communication studies have focused on controversial and heated situations (from nuclear incidents and food scares). The principles, which are detailed in box 1, would apply to routine situations as well as situations that may be described as crises.

Box 1: Principles of Public Risk Communication

1. Assembling the evidence

Concretely, this means that risk communicators need to demonstrate that they understand the risk and therefore have a credible basis for their decisions. Questions that may guide communicators include:

- What is the risk?
- Have you used the best available information to define the problem at stake?
- Are you aware of the chance that the hazard may occur?
- Are you aware of the size of the hazard?
- Who will benefit and who will suffer if the hazard occurs? Will everyone be equally affected?
- Have you considered complexity, ambiguity and uncertainty?

2. Acknowledgement of public perspectives

Acknowledging public perspectives should include a commitment to generate and draw on robust studies as to better understand the nature of public perception as well as showing an ongoing commitment to 'test for trust'. Questions to bear in mind:

- Do you understand how members of the public perceive the risk?

- Do you understand how influential risk actors view the risk?
- Have you identified the risk entrepreneurs that are likely to fear the risk the most?
- Have you identified those groups that are likely to want to amplify or diminish the risk, or others' perceptions of the risk, for their own benefit?
- Have you considered those groups that are negatively affected by the risk, especially where those groups are seen as particularly vulnerable?

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Analysis of options

The quality of risk communications will benefit from openly discussing the broad range of options and the associated trade-offs that drive a specific policy or response. Crucially, this implies for institutional actors to devise a clear communication of the expected impacts, costs and benefits of action as well as inaction. Questions include:

- Can you demonstrate that you have weighed the costs and benefits of the risk and the options for managing it?
- Do you have good arguments for assigning the necessary trade-offs between conflicting objectives and goals?
- Are you clear about the impact of doing too much, too little or nothing?
- When time permits, do you look for a range of options and select the one that promises the best balance of ‘upsides’ and ‘downsides’?
- When you have the opportunity, do you reduce those risks that are easy and inexpensive to reduce?

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4. Authority in charge

Risk communicators need to define the nature of their involvement with the risk. It is important to face up to one’s responsibilities, yet it is equally important to avoid overstepping one’s competences as well as leaving space to other stakeholders, and trusted parties viewed as independent and neutral. Questions to consider include:

- What are the reasons for your organization to step in?
- Have you identified conflicting views within your organization?
- Have you made sufficient efforts to ensure that your organization speaks with one voice?
- Do you periodically check how well-trusted you are?
- Should any other public body be speaking out on this issue?
- Have you identified independent third parties that are more trusted than you and may facilitate the public debate?

5. Interacting with the audience

Effective communication requires interacting with the right audience using a factual approach that refrains from triggering emotions, as well as the right methods depending on the context (e.g. face-to-face vs. internet). Supportive questions include:

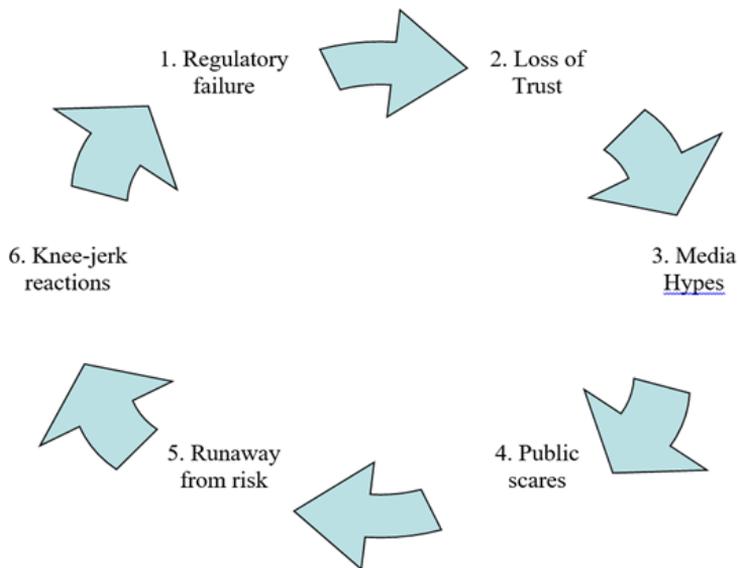
- Have you clarified who the audience of your message is likely to be?
- Have you clarified how you will interact with other groups (through information, consultation, and deliberation)?
- Are you clear whether messages are intended to inform your organization, organized groups or the general public?
- Have you used communication methods that have worked in similar circumstances?
- Do you select and train effective communicators and learn from examples of similar situations where messages have proven successful?

2 Key challenges of risk- and crisis communication

Multi-layered and complex webs of interactions characterise the environment in which most modern risk communications take place. The active role of the media adds to this challenge: risks may be amplified or attenuated (Kasperson et al. 1988; Pidgeon et al. 2003). Complexity and ambiguity combined with the digitalisation process and the role played by the social media (Facebook, Twitter etc.) creates an environment that is full of opportunities for distortions, dis/mis-information or simply misunderstandings (Jin et al. 2014; Comrie et al. 2019; Roozenbeek and Van Der Linden 2019). H5N1 and H1N1 were, arguably, examples of risk amplifications, where people were scared by sensationalistic news and a focus on worse case scenarios. Crisis situations create a challenging environment in this respect, not least because emotions run high and politicisation is tempting.

Trust is fragile (Slovic 1993; Löfstedt 2005) and relatively minor mistakes may jeopardise the social acceptability of specific risks and create a vicious circle of risk aversion. “Media hypes often amplify regulatory failures, and the likely result is a ‘runaway’ from potential injury. In this context ‘knee-jerk reactions’ may tempt the regulator, with unfair, incompetent or inefficient policies as a likely result. Knee-jerk reactions often take the form of bans and restrictions placed on a technology or activity despite a lack of solid evidence. In October 1998, the French Ministry of Health decided to abruptly stop its ambitious hepatitis B vaccination programme following scares that the vaccine might trigger Multiple Sclerosis. Despite a lack of scientific evidence, the decision, which was presented as ‘precautionary’, came after very intense and hostile media reporting (Bouder 2006). This destructive path may only be countered by a “dynamic approach that aims to rebuild trust through proactive risk communication” (Bouder 2008:46). Figure 1 offers a visual representation of the post-trust society’s vicious circle.

Figure 1 Post-trust vicious cycle of risk aversion



Source: Bouder 2008.

In this environment simple and authoritative top-down messaging becomes particularly challenging. Top-down communication from experts to lay audiences is unlikely to achieve behavioural compliance unless experts enjoy high levels of trust and credibility (Löfstedt 2005; Van der Linden and Löfstedt 2019) and are ready to engage in complex, time-consuming and expensive processes (Downs 2014). This reality, however, contrasts with the expectation of many institutional and industrial risk communicators who would like to see risk communication as a tool to get their message across and change people's behaviour especially when a crisis situation calls for immediate results. Institutional actors often follow a 'public deficit' model (Wynne 1991, 1992; Rickard 2019; Wardman 2008) that sees the audience as the source of the problem – to be convinced with even more top-down persuasion. One definite challenge is that, while risk communicators may feel that they act responsibly, and that, as a consequence, risk and crisis communication is practiced effectively, the results are disappointing. In the context of the current Covid-19 pandemic, common errors include the 'decide-announce-defend' (DAD) approach that is making little impact (Wardman 2020)

Extensive research on risk perception and communication has the potential to transform risk communication from an 'art' to a science-informed practice. Unfortunately, communications that take the scientific approach to risk communication on board tend to be the exception rather than the rule (Kasperson 2014; Wardman 2014). Some of the key challenges are therefore internal and have to do with institutional risk communicators who apply poor standards of risk and crisis communication. Of particular importance is the need to move away from the "Deficit Model" of risk communication (Gregory & Lock 2008; Renn 2014) that seeks to

align 'lay' perspectives with those of 'the experts' with the expectation that this would change lay behaviour (Balog-Way et al. 2020).

Key features of this deficit include:

- Neglecting perceptions (Fischhoff et al. 1978; Slovic 1987), biases (Kahneman & Tversky 1979) and feelings (Slovic et al. 2004),

- Overlooking the features (Renn and Levine 1991), fragility (Slovic 1993) and importance of trust dynamics, in particular the need to demonstrate fairness, competence and efficiency (Löfstedt 2005),
- Overestimating the potential for behavioural change (Way et al. 2017),
- Clouding people’s choices about acceptable and tolerable risks (Fischhoff and Fischhoff 2001; Boudier et al. 2007) with damaging consequences, including to their health.

Risk communication in the context of pandemic crises

The World Health Organisation (WHO) defines a pandemic as a “worldwide spread of a new disease” (WHO 2010). This of course says little about the intensity or morbidity of the disease. Yet, public announcements that a disease may become a pandemic, or that it has now been classified as one is subject to intense discussion in the media and society. The result is often a crisis-prone context. Such cases may require a “systematic approach that requires ongoing and escalating communication processes throughout the stages of precrisis, initial event, maintenance, resolution and evaluation” (Veil et al. 2008: 27). A systemic approach may be more challenging to follow in a context where uncertainty remains high throughout the crisis and the response needs to be re-formulated and re-calibrated on a regular basis. It is therefore important that the plan be sufficiently flexible to allow room for change as a too narrow design may curtail adaptation (Crouse Quinn 2008). During a pandemic, the key role of strong partnership with key players (Boin and Hart 2003) and leadership and maintaining trust has proven to be of paramount importance (Nyenswah and Peters 2016). Leaders need to be candid about changes of direction, as long as they are justified and explained. When mistakes are made it is also important to accept them rather than trying to cover up (Heath 2006).

Early phases of the pandemic provide a precious window of opportunity to organise one’s risk communication:

in addressing a risk that has not yet evolved into a crisis, communicators have the luxury of time to fully develop and test messages to maximise effectiveness (Veil et al. 2008: 28)

Yet, key messages may prove challenging to formulate when science progresses slower than the spread of the disease itself. Communication may have to take place in a context of high uncertainty where experts only have few answers (Aven and Boudier 2020). Significant differences of appreciation may even exist between epistemic communities of experts. During the H5N1 ('bird flu') pandemic, for instance, non-medical experts saw much higher chances of both human-to-human transmission and of effective vaccine and anti-vaccine responses being available than medical experts (Bruine de Bruin et al. 2006). In addition, expert judgement and public views are unlikely to be aligned. Specific attention should be paid to connecting the views and actions of risk experts with those of the general public (Bourrier et al. 2019). This has been achieved in other settings by using structured methods such as for example the mental model approach that is specifically designed to identify, map and bridge perception gaps between experts and lay people (Morgan et al. 2002; Bruine de Bruin and Bostrom, 2013).

Therefore, exchanging critical knowledge to support decision-making should be at the centre of the pandemic risk communication at all times. In a large US survey into the public understanding of Ebola, Fischhoff et al. (2018) found that despite variations in public perceptions based on gender, age, education, income and political ideology, many respondents expressed support for honest, accurate information, even if that information worried people. These results suggest that the positive value of proactive communication that is found in other studies is clearly applicable to the pandemic context. Renn (2020) echoes this in relation to Covid-19 by stressing the need for an 'inclusive' approach that involves stakeholders within discussion of policy strategies. An inclusive approach would involve scientific institutions, business communities, and non-governmental organizations (NGOs). Of particular importance in the current context would also be the inclusion of groups that represent categories of people who suffer the most (Rajan et al. 2020). Communicators should also maintain transparency for the justification of making painful decisions and a convincing rationale for justifying trade-offs. Despite pressures to act swiftly some countries, noticeably Germany, have been able to maintain such an inclusive approach with positive effects on public trust (WEF 2020).

Distinctive features of the 2020 Covid-19 pandemic include high levels of uncertainty and complexity (Aven and Bouder 2020) that suggest specific actions from risk communicators, such as:

- Generating, using and communicating evidence that adheres to the highest scientific standards (Rugeri et al. 2020). This implies to keep a critical eye regarding studies that do not meet those standards and are likely to be invalidated or even retracted (e.g. Hydroxychloroquine study published in the Lancet in May 2020).
- Remaining broad enough when considering relevant evidence (Mercuri 2020). This means for instance that pandemic risk communication should go beyond crucial statistics such as contamination rates and deaths. Risk communication should extend to the larger spectrum of health, economic and social risks, as well as discussing risk/benefit and risk/risk trade-offs.
- Adapting communication to new evidence. New scientific studies have led to revise institutional advice on key aspects of the pandemic response, for example on face covering (Shapiro & Bouder 2021). Institutional communicators need to make extra efforts to clarify their positions. They need to give clear evidence about why their advice is evolving. A lack of justification is likely to make them appear inconsistent or incompetent.
- Avoiding overcommunication, sensationalism and appealing to intuitions (Balog-Way and McComas 2020). Covid-19 creates a context of dramatic real-life experiments (e.g. lockdowns) and media amplification (e.g. alarming stories and death counts). It is therefore important to lower rather than increase the level of anxiety in order to maintain a reasoned high quality public debate.
- Ensuring the right balance between disease-specific risk communication and communication of the downside of the risk minimisation measures. Pandemic crises are likely to spread over several months and as such several impacts will need to be discussed, such as negative physical and mental health impacts (Saladino et al. 2020)?

Recent studies focusing on the Covid-19 pandemic are drawing attention to key findings, including:

- The importance of social norms as key variable likely to affect compliance with government advice (Goldberg et al. 2020). This is for example the case of political philosophy and ethical or religious standpoints. These variations must be addressed and confronted, not dismissed.
- People’s disagreements about the risks, variations in perceptions of the need for protective behaviours (Bruine de Bruin & Bennett 2020). As different sub-groups are not exposed to the same level of risk, risk communicators should demonstrate that they are able to modulate their approach.
- The importance of age groups in terms of risk perception variations (Bruine de Bruin 2020) also calls for risk communications that are age sensitive.
- The role of mis- and disinformation. A recent survey found that while public belief in misinformation about COVID-19 is not particularly common, a substantial number of respondents view this type of misinformation as highly reliable (Roozenbeek et al. 2020). A Laissez-faire approach or, on the contrary, heavy-handed measures to promote “truth” and shut down alternative voices will undermine trust. Evidence-based models of risk communication based on two-way participatory practices are more than ever needed.
- The key role of leadership – or lack of – as a key indicator of risk communication performance is becoming apparent. This suggests to invest some specific efforts into practicing effective leadership (see Wardman 2020).

As progress is made towards the availability of Covid-19 vaccines the relationship between risk communication and vaccination is also becoming crucial. Roozenbeek et al. (2020) suggest a clear link between susceptibility to misinformation and vaccine hesitancy, which draws attention to the role that effective risk communication will play for compliance with health guidance. The authors suggest that interventions that aim to improve critical thinking and trust in science should be prioritised.

3 Key recommendations for an effective risk- and crisis communication

The last two sections establish a distinction between general recommendations that are applicable to most crises and targeted recommendations that have been formulated in the context of Pandemics. The distinction is didactic, yet the two sets of advice are mutually reinforcing.

a) General recommendations to conduct effective risk communication in a time of crisis

The ‘five As’ of public risk communication, may still play a key role in most situations as a guide to develop a comprehensive approach. Communicators will need to give due consideration to evidence, public perspectives, the weighing of different options, ensuring that the right authorities are in charge and interacting with their audience in a positive way. In time of crisis, however, leadership qualities and trust will also need to be prioritised. Demonstrating leadership includes being clear-sighted, proactive, inclusive, and responding decisively (Wardman 2020). Harm and damages can be minimised, and trust can be gained (Fischhoff 2005; Löfstedt 2005; Löfstedt et al. 2011; Nyenswah et al. 2016). Research also shows that maintaining trust through risk communication can be greatly facilitated by paying attention to relatively simple steps (Löfstedt 2005; HSE 2010). These are summarised in box 2:

Box 2: Trust-building risk communication: simple steps

1. Maintain frequent communication with key stakeholders (government, Industry, Journalists etc.)

It is not because you don't like what they stand for that you should ignore them. In the context of the pandemic this also implies to engage with those who are sceptics and hesitant about specific measures or therapeutics.

2. Avoid unnecessary confrontation

It is not because you don't agree with them that you should get into a fight. In a pandemic situation it is particularly important to maintain a positive and constructive debate. For instance, it is essential to show empathy when discussing the pros and cons of specific measures or therapeutics.

3. Rely on neutral third parties

You may think you are best placed to speak but that it is not necessarily the case. Someone with no vested interest or stake is likely to be more trusted than you. In a pandemic situation, scientists with high credentials and who do not have major conflicts of interest can play a key role for building trust in the science.

4. Avoid the lawyers as long as possible

Think twice before you bring your lawyers in, as their role is to protect your legal interest, which often involves advice to shut communication channels. In a pandemic situation, legal actions (e.g. between two vaccine producers fighting for property rights or between a company and government about vaccine or drug supply) can be very destructive

5. Local decision-makers matter

Bypassing local decision-makers may seem like a shortcut, but remember that they are likely to be trusted and non-involving them can be counter-productive as you need them on your side. This is particularly important in the Covid-19 context as local authorities often play a critical role in the pandemic response.

6. NGOs are increasingly shaping policies

Don't ignore pressure groups like NGOs as they may not ignore you. Patients and especially at-risk groups should be part of the discussion.

7. Always take responsibility

It may be tempting to blame others for one's mistake or not do your bit. The problem is you can't fool people. It will backfire eventually. In a pandemic context it has become apparent that strong leadership and not evading one's responsibilities is a key factor of success.

Source: Adapted from Boudier and Löfstedt for EPO 2016.

b) Recommendations to conduct risk communication in the context of pandemics

In addition to the simple steps of trust-building risk communication, additional actions may be needed to ensure effective risk communication during pandemic crises. Back in 2005 Fischhoff summarised how research should be mobilised to deal with pandemic flu. He highlighted 7 points of particular importance (Fischhoff 2005):

1. People want the truth even if it is worrisome. Candor is therefore critical in risk communication.
2. People can absorb only a limited amount of information. Communicators must therefore identify the most critical facts and organise them according to their audiences' way of thinking.
3. People have difficulties understanding some kinds of information – for instance how small risks mount up through repeated exposure – adapting communications to the audience's thought process is crucial.
4. Emotions cloud people's judgement, in predictable ways. When angry people are likely to blame other people for their problems. As a result, it is important that communicators treat their audience respectfully.
5. Especially when a topic is new (e.g. a new disease) communicators cannot accurately predict how their messages will be interpreted. It is therefore important to systematically evaluate messages before they are disseminated. With dynamic events where prototype messages can be pretested.
6. People – including experts and decision makers – exaggerate their ability to predict other people's behaviour. Social scientists need to be part of the planning team so that plans are based on evidence not intuition.
7. People often make sensible decisions provided they receive the right information to form their judgment. Communicators must assume responsibility for providing relevant information in a timely fashion.

This advice appears to contradict the current reductionist view that official announcements and prescriptions will work as long as they stem from an official source or the holder of a political mandate, then to be passed down to others, and defended if questioned (Jetten et al. 2020). A compliance-based approach may only work partially over a short period of time, especially so in the current context where very high demands are made on individuals and societies (Renn 2020). It is unlikely to be a sustainable alternative to effective science-informed risk communication. In his recent article that focuses on the UK experience Wardman (2020) looks into the critical factors that have hampered the UK pandemic response. A central pitfall of the UK response has been the difficulty to maintain consistency and leadership and build enduring adaptive capacities as the crisis continues. The article offers “thirteen crisis ready strategies for COVID-19 pandemic” to strengthen leadership as a way to critically improve risk communication. Table 1 combines these strategies with the five risk communication principles to offer an integrated and thorough approach to crisis risk communication.

Tabell 1 Leadership-based risk communication for the Covid-19 pandemic

Risk Communication principles	Strategies for Covid-19 pandemic
1. Assembling the evidence	3. Describe the risk, explain and contextualise its significance at opportune moments of public connection. 8. Accept uncertainty. Enable critical input, allow hard truths to be aired. Admit mistakes, apologise when you get it wrong. Be receptive to and listen to external concerns.
2. Acknowledgement of public perspectives	5. Obtain, understand and address the varying information and support needs, preferences and concerns of different individuals, groups and cultures. 10. Show situational awareness. Acknowledge and respect others and show that you feel as they do. Do not be aloof and dismissive.

Risk Communication principles	Strategies for Covid-19 pandemic
3. Analysis of options	12. Act quickly and decisively. Continuously evaluate and update plans and impacts and react promptly to change. Conduct dynamic risk assessments to identify wider interdependencies, needs and practical constraints. Involve stakeholders at all stages.
4. Authority in charge	<p>1. Integrate risk communication into planning, make it part of training and preparedness exercises and embed it as part of harm mitigation strategies.</p> <p>2. Narrate the strategy for how the threat is to be addressed and the role people can play. Set the tone from the top, lead by example. Don't give mixed messages.</p> <p>9. Establish networks integrating internal and external members and agencies at all levels. Identify the needs of stakeholders, partner up and provide support where it is needed. Work together with communities, coordinate and pool respective strengths and resources.</p> <p>11. Express solidarity. Emphasise and enact a sense of 'weness', identify that everyone is 'in it together' including leaders 'at the top'. Share the burden of risk and responsibility for dealing with it.</p>
5. Interacting with the audience	<p>4. Give clear, coherent, concise and comprehensible decision-relevant information and instructions.</p> <p>6. Align with credible sources and use experts well. Communicate in ways that build trust. Do not over-protect or over promise, do not stretch the truth.</p> <p>7. Make information ascertainable, comprehensible, verifiable in a timely way.</p> <p>13. Meet the needs of the media. Monitor sentiment, interact with and proactively engage across traditional.</p>

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Several decades of Risk Communication research offer precious insights into how the complex and multiple risks induced by the Covid-19 pandemic, from disease to response, may be tackled and communicated. One of the key findings of science-informed risk communication is that a proactive, adaptable, non-persuasive two-way model of communication will support better individual choices as well as building trust among the key actors. While a top-down, command and control approach sounds appealing in the face of emergency it is unlikely to produce the expected outcomes – i.e. behavioural change and public support.

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