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Guiding Principles for Effective Communication during a Public Health Crisis

KWR

Bridging Science to Practice

Guiding Principles for Effective Communication during a Public Health Crisis

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Summary

Crisis communication is most often associated with public relations, and attempts to manage public perceptions of a crisis event so that harm is minimised for both the public, including the wider community, victims and their families, and the organisations' reputation and image. Science communication in turn is communicating science to an audience to help them make informed decisions. Combined, both crisis and science communications aim to support the target audience in question with information to minimise harm through informed decision-making. This report includes a literature review, a list of guiding principles, applications comparing to real world examples, and interviews with KWR colleagues, all delivering an overview of science and crisis communication in times of public health emergencies. The analysis is articulated into categories of how to approach a crisis communications strategy, as per the literature: *Strategy*, *Form* and *Content* (Coombs, 2019), with guiding principles of science and crisis communication identified and explained.

The aim of this report is to support an integrated and resilient crisis communications approach for KWR, partners and members, enabling the delivery of coordinated and cohesive messages to its target audiences. To this purpose, the report includes several operational and practical tools to apply effective science communication methods during times of crisis. The tools are:

1) A step-by-step guide on how to communicate *during* a crisis;
2) An analysis and summary of "do's and don'ts" in crisis communications from real world cases;
3) Application of the guiding principles in KWR research (COVID19 and toxicology); and
4) A presentation for colleagues on how to implement these guiding principles across teams, and sharing with partners and members of different groups (BTO network, for example).

Another output of this study is a blog shared on the Watershare and KWR websites and in the BTO newsletter, to reach interested parties.

Finally, it is important to note that this report is a starting point and can be improved upon with lessons learned from KWR staff and partners and future research.

The report is structured as follows. Section 1 describes science communication in general, followed by definitions of crisis and risk communications provided in Section 2. Section 3 dives into the guiding principles within each category to deliver effective communications during a public health crisis, followed by a special section on considerations about when communicating with the media (Section 4). Finally, Section 5 concludes and highlights a way forward with future research opportunities.

Contents

1 Introduction

What is science communication? In simple terms, it is communicating science to an audience to help them make informed decisions. In effect, science communication serves as the translator between science and the public and often has the purpose to help the public's decision making process (Avraamidou & Osborne, 2009). Since science is often outside the direct experience of most people, the public is dependent on others to inform and help interpret information about science (Dahlstrom, 2014). But how is that information communicated? To which audiences? In what formats, by whom, and when? The answers to these questions will define the success of science communication (Bruine de Bruin & Bostrom, 2013; Fischhoff & Scheufele 2013) and will be discussed in detail in this report.

There are many different aims of science communication: filling knowledge gaps, overcoming misconceptions, generating social acceptance, building public trust or political support, or collecting input from citizens and making use of local knowledge, all with the ultimate purpose of helping people's decision making processes (Fischhoff & Scheufele 2013; Kappel & Holmen, 2019). Effective science communication informs about the benefits and risks, thereby enabling sound decision-making; however even the most effective science communication cannot guarantee that people will agree on which decisions are to be made (Fischhoff, 2013). The reason is that the way in which science communication is interpreted depends on the beliefs, experiences, local context, and mental models of the target audience (Fischhoff & Scheufele 2013). As a result, effective communication relies on first listening and understanding the target audience to identify what information is needed and how it should be communicated (Fischhoff, 2013; Fischhoff & Scheufele 2013).

Crisis communication is most often associated with public relations (PR), and attempts to manage public perceptions of a crisis event so that harm is minimised for both the public, including the wider community, victims and their families, and the organisations' reputation and image (Coombs, 2019; Seeger et al., 1998 in Reynolds & Seeger, 2005).

In essence, "crisis communications aim to reduce uncertainty, respond to and resolve a situation, and to learn from it. Attentive targeting [of the audience] … [is] based on careful monitoring of the communication needs" (Palttala et al., 2012). In other words, the goal of crisis communications, whether related to PR or not, is to help the target audience to learn and manage levels of uncertainty that occur during a crisis.

Risk communication, in contrast, focuses on the identification of risks and efforts by stakeholders to understand those risks and consequences (Reynolds & Seeger, 2005; Van Leeuwen, 2007). Risk communication messages generally introduce a threat (such as public health threat), and then offers a modification such as a lifestyle behavior, which is then proposed as a way to overcome and lessen the threat (Reynolds & Seeger, 2005). Such a problem–solution communication structure is a basic form of persuasion (Witte et al., 2000 in Reynolds & Seeger, 2005). Therefore, risk communication is seeking to create a rational understanding of the specific risk with ways to overcome it; however, often the understanding and interpretation of that risk by the public is misaligned with scientific facts (Reynolds & Seeger, 2005). The public will interpret risks and information based on their mental models – i.e. psychological representations of real, hypothetical, or imaginary situations explaining how people reason deductively, how they infer probabilities, how they make decisions, and how they reason recursively about other people's reasoning, as well as intuition, cultural context, levels of uncertainty and resistance or avoidance of information based on their assessment of the situation (Brashers, 2001, 2006; Renn, 2018; Slovic, 1987). This differs to subject-matter experts, who have the ability to analytically assess and respond to the risk. Further, threats

may become politicised, increasing the challenge to communicate in accurate, credible, timely and reassuring ways (Reynolds & Seeger, 2005).

In sum, **science, crisis and risk communications involve the production of public messages designed to create specific responses for the public to make informed decisions**. Communicators must enter into a dialogue with the specific target audiences, to understand their needs, perspectives and perceptions in order to deliver effective messages on science, crisis and risks. Therefore, the strategy, form and content of these messages must be carefully curated by the communicator, in this case KWR and partners, in order to deliver effective, timely and coherent messaging to the public, upholding and improving public trust and safety.

The following sections will dive into the guiding principles across three categories: *Strategy, Form* and *Content*, to achieve these communication goals in times of a public health crisis, by understanding the urgency and complexity of messaging, and the role KWR has to play in delivering these messages and overcoming misconceptions entrenched in today's science and crisis communications.

Definitions

- Science communication is communicating science to an audience to help them make informed decisions.
- Crisis communication attempts to manage public perceptions of a crisis event so that harm is minimised.
- Risk communication focuses on the identification of risks and consequences in order for the audience to change their behaviour to reduce the risks in question.

2 Methodological approach

This report is based on an extensive review of the science communication and the crisis communication literature. The literature review was complemented with 8 case studies of crisis communication across the globe (Netherlands, US, Canada, New Zeeland, and UK) and 2 case studies within KWR (sewage surveillance and toxicology communication).

The cases were selected according to a number of criteria. Specifically, we chose official messages to the general public released by public (research) authorities through popular and conventional media channels such as television, radio, newspaper and magazines. Social media were excluded. For the purpose of this study, official messages are all written and verbal press releases and interviews given by the organisations' spokesperson or chief/lead scientist, and public (research) authorities are all public/governmental research institutes. Messages released jointly by governmental authorities and research institutes were also included. The content of the messages needed to be related to scientific results on COVID19. The release of official statistics on numbers of infected citizens were excluded. Furthermore, the selected cases needed to reflect different levels of implementation of the guiding principles, thus providing examples of do's and don'ts. The cases were analysed through the lens of the identified guiding principles, using a content analysis method. The analysis is summarised in Annex II and examples of do's and don'ts are presented in Section 4.

As for KWR cases, 2 examples were selected according to whether they concerned communication of a current crisis or of a potential crisis. The selected cases are: communication on the current study on COVID-19 sewage surveillance; and communication with stakeholders on a toxicology study whose topic is to remain confidential. For these two case studies, two KWR colleagues were interviewed. An interview questionnaire was developed that included questions on how the colleagues designed and executed the communication, comparison with the guiding principles and reflection on how the guiding principles could help improve the communication. A summary of the interviews is presented in Section 4.

3 Guiding Principles for Effective Communication during a Public Health Crisis

The breakdown of a crisis response plan includes: strategy, form and content (Coombs, 2019). Following the guiding principles organised into these three categories will help organisations like KWR to formulate and deliver clear and effective crisis communications, while carefully considering the target audience.

One key element that is vital across all the guiding principles is the element of **building the public's trust** in the communicating organisation. In the literature, the notion of building trust is mentioned frequently, and is inherent in many of the principles whether as a component or an outcome. For example, delivering timely, honest, empathetic messages, communicating clearly and transparently, while managing and communicating uncertainties, will all lead to the public and other stakeholders trust in the communicating organisation. Building trust through these types of messages only strengthens the organisation's image, and thus its credibility to deliver effective messaging and support in future crisis events (Babacan & Babacan, 2013; Coombs & Holladay, 1996; Covello, 2003; Fischhoff, 2013; Fischhoff & Scheufele 2013; Dahlstrom, 2018; Kappel & Holmen, 2019; Manski, 2018; Palttala et al., 2012; Scrimshaw, 2019; WHO, 2008).

Definitions

- **The public** are the non-experts and more general target audiences.
- **Stakeholders**, for the purpose of this report, are other target audiences that have a relevant tie (or stake) with the communicating organisation.

The guiding principles are listed in the table below and illustrated in detail in Sections 1, 2 and 3.

Table 1 Overview of guiding principles

Category	Guiding Principles
Strategy	Getting to know the audience: consider, understand and research
	Listening, dialoguing, and remaining available to the public
	Monitoring and Evaluating the Success of the Communications
Form	Consider the Timing and Rapidity of Communicating Messages *Responding quickly*
	Style and Forms of the Messaging *Consistency of Messaging* *Transparency* *Contextualise, Adjust and Clarify Scientific Data through Appropriate Framing*
	Internal and External Stakeholder Coordination *Internal coordination* *External coordination* *Mixed crisis communication teams*
Content	Prioritise messages with instructive information Understanding and communicating uncertainty Empathetic messages

3.1 Strategy – Gain Understanding, Define Outcomes & Evaluate

The overarching objective of effective communications during a public health crisis is to minimise physical and psychological harm to the public, within either the content of the information, or the method in which it is delivered (Coombs, 2019; Covello, 2003; Han, Klein & Arora; 2011; Palttala et al., 2012; Reynolds & Seeger, 2005). Therefore, the objectives and desired outcomes of the messages communicated during a crisis must be defined by knowing and listening to the audience, and monitoring and evaluating the effect of the messages. These are vital components to an effective crisis communications strategy, and are explained in further detail below.

3.1.1 Getting to Know the Audience – Consider, understand and research

An important first step in any form of communications is getting to know the audience. In doing so, the communicator gains a better understanding of the audience's current needs, beliefs, cultural context, literacy and mental models, enabling the formation of messages based on these different elements among different audiences. The elements below are key points to consider in this first step.

It is vital to consider and understand the target audience, and any other contextual factors that might affect perceptions because these shape interpretation and action, as well as trust in authorities (Brashers, 2006; Bruine de Bruin & Bostrom, 2013; Dahlstrom, 2014; Fischhoff, 2013; Fischhoff & Scheufele 2013; Palttala et al., 2012; WHO, 2008). This understanding of the audiences will help to fill the gaps between what people know and need to know (Fischhoff, 2013).

Furthermore, when a crisis event occurs, different communication types and audiences emerge (Reynolds & Seeger, 2005). The types of audiences affected in a crisis include: victims, non-victims, potential victims and voyeurs (Coombs, 2019), as well as family, emergency workers and first responders, to name a few (Reynolds & Seeger, 2005). Identifying these groups and timely communications with them can mitigate or contain harm, limiting and alleviating damage both to the organisation and these audiences (Reynolds & Seeger, 2005).

3.1.2 Listening, Dialoguing and Remaining Available to the Public

By first getting to know and entering into a dialogue with the audience, communications can effectively serve the most immediate needs. As a result, effective responses can be formulated that will empower the public to make informed decisions and take actions to protect their health in times of crisis.

Understanding the realities of the affected groups, as identified above, is an important part of delivering targeted crisis communications. Communicators must understand:

- How the audience understands and reacts to a crisis;
- The potential spread of rumours and misinformation during and after a crisis;
- The level of trust in authorities; and
- The potential contextual barriers that might inhibit protection actions or the ability to follow guidance provided by the authorities (WHO, 2008).

In understanding these different elements, communicators can begin to formulate targeted messages to specific audiences to enable effective responses and protective measures. Anticipating rumours and the spread of misinformation at the outset enables the communicator to deliver counter and clarified messages. Afterward, engaging in a dialogue with the audience ensures their voices and concerns are consistently being heard (Babacan & Babacan, 2013; Covello, 2003; Heath, 2006; Palttala et al., 2012; Reynolds & Seeger, 2005; SciDev, NA; WHO, 2008).

Engaging with the public with a constant availability and accessibility offers the chance to make better and more informed choices and conveys a sense of transparency and trust (Babacan & Babacan, 2013; Brashers, 2006; Reynolds & Seeger, 2005; Scrimshaw, 2019).

3.1.3 Monitoring and Evaluating the Success of the Communications

An important part of any communications strategy must include monitoring and evaluation, thereby understanding the communication's impact and the public's perceptions, and therefore continuously updating the messages. In other words, answering the question "did the communications fulfil its objective?"

This comes back to the strategy of the communications, as well as timing and consistency of the messaging. Communications need to be consistently updated based on the virtuous circle or feedback loops of understanding the audience and their needs for information, by constantly listening and responding through effective communications (Babacan & Babacan, 2013; Bruine de Bruin & Bostrom, 2013; Covello, 2003; Palttala et al., 2012; Reynolds & Seeger, 2005; Scheufele, 1999; 2013 in Scrimshaw, 2019).
Monitoring and evaluation of communications methods also produces lessons learned for future crises (Bruine de Bruin & Bostrom, 2013; Palttala et al., 2012).

3.2 Form – Why and How to Present the Response

After understanding your audience and establishing their needs and context, the next step is to work on the form of the communication. The form must be well defined in order to craft and send content that can be clearly understood by the audience, especially in times of crisis.

The form of a message is defined as the actual means and ways in which to achieve the communications objective (Coombs, 2019). It is important to consider that during a crisis, the target audiences will not have their full mental capacity for receiving information, as research suggests that the ability to process information is reduced by up to 80% during emotionally charged situations (Gilman, 2004 in Coombs, 2019). Therefore, timely, consistent, transparent, and contextualised messages, as part of a coordinated approach, are vital guiding principles to follow in communicating during times of crisis, and are summarised in the guiding principles below.

3.2.1 Consider the Timing and Rapidity of Communicating Messages

Responding quickly

A rapid response is necessary to alert those affected, as well as to minimise and quickly fill any information gaps, which inevitably surround every crisis. These gaps in information can otherwise can be filled with rumour, speculation and misinformation (Caruba, 1994 in Coombs, 2019; Covello, 2003; Palttala et al., 2012; WHO, 2008). However, it is important to note that speed can increase risks of mistakes and inaccuracies, and a communicator might need to inform the public with an incomplete story highlighting that more information will be provided once it becomes available (Coombs, 2019). A late response or lack of information could reduce trust in the organisation to respond to and manage a crisis (WHO, 2008), so literature recommends to share more information than less, as people may think information is being withheld. It is also important to communicate the levels of uncertainty in the current scientific data, if there is any. If errors are made, correct them in a timely manner to uphold public trust (Covello, 2003).

Once messages are communicated, they must be monitored, evaluated and updated based on understanding the responses and perceptions of the public. Questions and criticisms must be anticipated from key audiences and the

media, and answers should be delivered rapidly (Babacan & Babacan, 2013; Bruine de Bruin & Bostrom, 2013; Covello, 2003; Palttala et al., 2012; Reynolds & Seeger, 2005; Scheufele, 1999; 2013 in Scrimshaw, 2019).

Additional Consideration
A crisis can also be a strategic opportunity to provide information that is otherwise difficult to communicate to specific target audiences. Depending on the crisis and the timing, it could be timely to communicate other more general key messages about the organisation which could not be publicised or promoted in ordinary times (Heath, 2006).

3.2.2 Style and Forms of the Messaging

Consistency of Messaging

Consistent messaging assists the public in managing uncertainty, feelings of self-efficacy and reassurance (Reynolds & Seeger, 2005). This ensures effective communications throughout, including effectively entering into a dialogue with the public (Bruine de Bruin & Bostrom, 2013; Reynolds & Seeger, 2005). Consistent and regular messages are also perceived as more believable than inconsistent ones (Clampitt, 1991 in Coombs, 2019).

Transparency

Transparency is vital for all communications, but especially during a crisis to build trust and sound relationships with the audience. For an organisation, transparency boils down to:

- Availability to the media;
- Willingness to disclose information; and
- Honesty, candour and openness (Coombs, 2019; Covello, 2003; Heath, 2006; Manski, 2018; Palttala et al., 2012; Reynolds & Seeger, 2005)

However, it is important to note that disclosing information is not the same as full disclosure (Coombs, 2019). There is a choice between limited and full disclosure, and the key question should be "What does the public need to know right now?" (Coombs, 2019).

Contextualise, Adjust and Clarify Scientific Data through Appropriate Framing

Communicating technical data alone is insufficient for the public, and especially during times of crisis when their emotional capacity is reduced. As such, contextualising or clarifying data is needed; essentially translating or adjusting the science and data into a suitable format for the audience based on the "human scale" of comprehension. This "human scale" of communication and interpretation is based on people's experiences, culture and beliefs (Bruine de Bruin & Bostrom, 2013; Dahlstrom, 2014). Therefore, efforts to communicate on the human scale and level of interpretation, as messages are more effective when they are strategically matched to the audience's needs, values, background, culture, and experience (Bruine de Bruin & Bostrom, 2013; Dahlstrom, 2014; Murray-Johnson, Witte, Liu, & Hubbel, 2001 in Reynolds & Seeger, 2005).

Further, adjusted information can help the public cope psychologically during a crisis (Coombs, 2019). Part of managing perceived uncertainty and confusion during a crisis can be done by explaining and clarifying scientific information to non-expert audiences (Stephens & Malone, 2009, 2010 in Coombs, 2019).

Scientific terms and words may be unclear to non-experts, so communicators must pay attention to what the audiences are hearing and asking (Scrimshaw, 2019) and therefore use simple terms and brief sentences so that

the public better understands the science and potentially corresponding uncertainty (Bruine de Bruin & Bostrom, 2013; Fischhoff, 2013; Scrimshaw, 2019).

Special Considerations on Narrative Style as a Form of Communication

Storytelling (or a narrative) is the most common form in which people interpret and understand the world around them, and it is the most common format in which the mass media communicates. As a result, stories are the most common format in which people receive information on a daily basis, through the news and from their social circles. In contrast to science communication, which is more logical and analytical, stories use inductive reasoning whereby the credibility of the message is based on the believability of the situation (Avraamidou & Osborne, 2009; Dahlstrom, 2014). Furthermore, research suggests that people are more willing to accept information told in a story format, as opposed to the logical and analytical scientific facts (Dahlstrom, 2014).

Narrative formats can help to overcome several of the challenges identified in science and crisis communication. Stories enable:

- An effective method of "translating" science to non-expert audiences;
- The potential to influence people's understandings and beliefs;
- Increased engagement, recall and enhanced learning;
- Less cognitive resources for comprehension; and
- Knowing the audience and communicating at the human scale of interpretation (Avraamidou & Osborne, 2009; Dahlstrom, 2014).

However, narratives can also perpetuate misinformation and inaccuracies about science. Narratives are not subject to the same truth requirements as scientific communication, and therefore not easily countered once communicated and accepted by the public. Once accepted as truths, individuals rarely allow evidence to contradict the story, and often evidence is altered to fit within that story (Avraamidou & Osborne, 2009; Dahlstrom, 2014). As such, telling the correct story and monitoring its impact is paramount.

Therefore, the following questions must be considered before using narratives in science communication (Dahlstrom, 2014):

- Is the underlying goal to use the narrative for persuasion or for comprehension?
- What levels of accuracy need to be maintained within the narrative?
- Should narratives be used at all?
- Would using narratives override the public's expectations of scientists?
- Do narratives help to build trust?

For all types of communications, it will be important to maintain the integrity of the scientific information while translating it into common language without minimising or oversimplifying (Avraamidou & Osborne, 2009).

3.2.3 Internal and External Stakeholder Coordination

Internal coordination

Internal crisis communication coordination across employees is vital, as they are trusted and seen as credible sources of information among wider communities and close relations (i.e. family, friends, etc.). Research shows that employees are perceived as more credible than directors of organisations to wider communities (Edelman, 2013 in Coombs, 2019). Therefore, they must be kept well-informed of the communications strategy and messaging during a crisis to prevent inaccuracies, confusion and uncertainty for the wider public (Coombs, 2019; Covello, 2003).

External Coordination

A coordinated approach is necessary with concerned stakeholders and communicating authorities as it supports the development of coherent messages and building trust across all entities. Such an approach therefore coordinates a response network of communicators to deliver cohesive and timely messages, as breakdowns and contradictions between authorities can cause confusion and uncertainty (Bruine de Bruin & Bostrom, 2013; Palttala et al., 2012; Reynolds & Seeger, 2005). Furthermore, coordinating and partnering with credible sources (organisations, NGOS, public authorities, media, etc.) helps to build trust as a respectable source of information (Covello, 2003).

Mixed Crisis Communication Teams

For clear and effective messaging to take place, a diversity of experts are necessary, including:

1) Subject matter scientists to get the facts right;
2) Social and behavioural scientists, to co-formulate and evaluate communications; and
3) Communication practitioners, to create trusted channels among the parties (Fischhoff, 2013).

These experts must collaborate to develop communications that are targeted, understandable, relatable and trustworthy (Bruine de Bruin & Bostrom, 2013; Fischhoff, 2013; Scrimshaw, 2019). A coordinated approach and structure internally and externally for crisis communications will also alleviate the time pressure and stress to respond (Palttala et al., 2012).

3.3 Content – What is communicated

"The content of the communication is what is said" (Coombs, 2019).
It is important that the messages communicated are not based on what the communicating organisation assumes should be communicated, but on knowing the audience and identifying what the audience needs to know to make decisions and reduce harm, as outlined above in Section 1. Knowing the audience as a starting point enables the communicator to define the content that is most effective and appropriate within the current context, shaping the messages into a suitable format for the target audience (Desai & Potter, 2006 in Babacan & Babacan, 2013).

Based on the literature, the content of crisis communication messages should include instructive information, explanations of uncertainty and clarifications, as well as empathetic messaging. Each of these content types are explained in further detail below. These guiding principles will help the communicating organisation to define what is communicated, building on Sections 1 and 2.

3.3.1 Prioritise Messages with Instructive Information

The primary concern of a health-related crisis response is to provide information to the public that can prevent illness, injury and death, therefore protecting their wellbeing (Reynolds, 2002 in Roberts & Veil, 2016) and enabling understanding of how the crisis might affect them. Therefore, instructive and/or protective information is needed to inform the public about how to protect themselves during the crisis, and which actions to take in order to do so (Coombs, 2019; Roberts & Veil, 2016).

Citizens ask themselves the four following questions before taking action (Stubbé and Veldhuis 2014):

- Is something wrong?
- Does it affect me?
- Can I do something about it?
- What can I do about it?

As the communicator, it is vital to understand how the public may answer these questions and empower them with instructive and protective information for each. Instructive messages combine risk and crisis communications, helping the public to understand what to do and how to do it, enabling an increased sense of self-efficacy to maintain their health and safety. For the organisation, these feelings among the public help to increase observed credibility (Heath, 2006).

3.3.2 Understanding and Communicating Uncertainty

Uncertainties, or unknowns, are common occurrences. A first step to communicating uncertainty begins with understanding how the public interprets and reacts to uncertainty. The following section will describe how audiences interpret uncertainty, and this will be followed about how to formulate messages based on this information.

There are a multitude of types of uncertainty, and thus many psychological responses (Han, Klein & Arora, 2006), and these are based on people's understanding and assessment of the uncertainty, their emotions and experiences (Brashers, 2001, 2006). As such, communicators have an important role in supporting the public's ability to manage uncertainty: it can help people make more informed decisions, or it can also lead to increased uncertainty as a result of conflicting stories or misinformation (Brashers, 2006). A lack of information can make decisions difficult, whereas increased amounts of information does not necessarily lead to reduced uncertainty or informed decision-making, and could even lead to information avoidance if people are overwhelmed (Babrow, 1992 in Brashers, 2006).

Furthermore, people judge the meaning of an event based on how it will affect them negatively or positively (i.e. the appraisal process (Lazarus & Folkman, 1984 in Brashers, 2006). Additionally, voluntary risks (e.g. smoking) are much more accepted than involuntary risk (e.g. Covid-19 or chemical spills). Uncertainty can be viewed negatively or positively, and as such will elicit corresponding emotional responses as a result (Lazarus, 1991; Scherer, Schorr & Johnstone, 2001 in Brashers, 2006). Therefore, communicators must come up with content and messages that minimise anxiety and maximise the processing ability of uncertainty (Bottorff, Ratner, Johnson, Lovato & Joab, 1998) by concentrating content on the most effective activities and messages (Bruine de Bruin & Bostrom, 2013).

In addition, communicators must convey messages of uncertainty honestly to enable a trustworthy assessment of what is known and unknown, remaining transparent, accessible and understanding (Manski, 2018). It is also important that the audience is aware of the investigative process of science and that periodic updates will be given, even if inconclusive results are reported (Heath, 2006). At the same time, the communication must emphasise the appropriate reservations about the current information's reliability, and link to other credible sources that are reporting similarly (Covello, 2003). It is important to communicate updates, scientific discoveries and further unknowns or uncertainties, and to express a willingness to get back to the audience with a deadline (Covello, 2003).

3.3.3 Empathetic Messages

As mentioned previously, the public's ability to interpret information is reduced by up to 80% during emotionally charged situations (Gilman 2004) such as during a public health crisis. Therefore, messages should be clear and simple, appeal to reason and emotion, and offer solutions to problems (Friemuth et al., 2000 in Reynolds & Seeger, 2005). The messages should also be communicated with compassion, concern and empathy, further building trust and credibility in the communicating organisation (Heath, 2006).

Messages of empathy towards the public must maintain encouraging and non-judgemental tones, as well as a focus on a "possibility centric" approach rather than focus on problems (Boyd & Bright, 2007 in Babacan & Babacan, 2013; Bruine de Bruin & Bostrom, 2013). As part of a storytelling format, the literature also shows that personification allows greater identification and a sense of empathy compared to other communication types, such as logical and analytical messages (Dahlstrom, 2014).

Special Considerations for Communicating with the Media in Times of Crisis

Most of the elements of the guiding principles outlined above also apply in communicating with the media; however, there are some key points that are important to emphasise in particular when communicating with the media. The mass media can be very helpful with dissemination of information, but they may present oversimplified, sensational or inaccurate reports (Babacan & Babacan, 2013). Therefore, scientists must be careful how messages are conveyed, and how they will be interpreted by the audience. Some tips are mentioned below on how to effectively deliver messages to the media during a public health crisis, with regards to building and maintaining trust and explaining complexity and uncertainty. It is also important to note that in addition to these tips, the regular media communication rules also apply.

Tips on communicating with the media during a public health crisis:

- Be accessible and respect deadlines
- Prepare a limited number of key messages before media interactions
- Take control of the interview, instead of passively answering questions
- Repeat your key messages several times
- Give visibility to your organization by mentioning its name
- Keep interviews short
- Say only what you want the media to repeat
- Tell the truth and be honest about your information gaps
- Provide background materials about complex risk issues
- Provide information tailored to each type of media, e.g. sound bites and visuals
- If you cannot provide the information or answer, say it and focus on what you do know and tell the reporter when and how you will follow up
- Anticipate and respond carefully to tricky questions
- Avoid saying "no comment"
- Work to establish long-term relationships with editors and reporters

In summary, be the best source of information and provide clear, honest and empathetic messages to the audiences. Know the audience your media is reporting to, to effectively tailor the key messages.

4 Cases of Crisis Communications

As illustrated in the previous sections, there are a number of principles derived from the literature that, when applied correctly, can help an effective and well perceived communication in times of crisis. In this section, real world examples concerning the COVID-19 public health crisis are presented and analysed based on the principles derived from the literature (Table 1 Overview of guiding principles presented on page 9 in Section 3). Eight Dutch and international examples are provided. An overview of the cases can be found in Table 2 and a detailed analysis is provided in Annex II.

Table 3 shows a synthesis of the analysis. For some of the principles it was difficult to understand from the communication message whether they were implemented or not, because they entail work that is done before or after the communication itself. These include: getting to know the audience, monitoring and evaluation, and communication team. With that caveat, overall, we can observe that the guiding principles found in the literature are implemented to a different extent in practice when communicating in times of crisis. Whether these communication messages were effective or not is difficult to say, as an assessment of the perception and behaviour of the target audience in response to the messages is needed. However, it appears that there is correspondence between what is suggested in the literature and the practice of crisis communication.

Table 2 Case description

Case no.	Case name
Case 1	RIVM video about COVID19 and Immunity - May 12th, 2020
Case 2	Interview Wim van der Poel (Wageningen Bioveterinary research) about COVID19 and pets – April 29th, 2020
Case 3	Debriefing on current state of the corona crisis by Jaap van Dissel (RIVM) – May 7th, 2020
Case 4	Press conference Dutch prime minister Mark Rutte & Jaap van Dissel (RIVM) – May 9th, 2020
Case 5	US White house press briefing on COVID19 – April 23rd, 2020
Case 6	Canadian Epidemiologist Dr. Bruce Aylward on WHO International Research - February 25th, 2020
Case 7	Prime Minister of New Zealand, Jacinda Ardern News Conference - March 31st, 2020
Case 8	UK Government Press Release on COVID19 Research - Department of Health and Social Care – May 13th, 2020

Table 3 Overview cases and principles

Legend: Green = principle is used; Orange = principle is somewhat used; Red = principle is not used; Grey = It cannot be derived from the example if the principle is used.

Principle	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8
1.1 Getting to know the audience								
1.2 Listening, dialoguing, and remaining available to the public								
1.3 Monitoring and Evaluating the Success of the Communications								
2.1.1. Responding quickly								
2.2.1.Consistency of Messaging								
2.2.2 Transparency								
2.2.3. Contextualise, Adjust and Clarify Scientific Data through Appropriate Framing								
2.3.1. Internal coordination								
2.3.2 External coordination								
2.3.3 Mixed crisis communications team								
3.1.1. Prioritise messages with instructive information								
3.1.2. Understanding and communicating uncertainty								
3.1.3. Empathetic messages								

4.1 Examples of the use of the principles in practice

The analysis of the cases (see Annex II for details) yielded a number of examples of how to articulate a crisis communication message effectively according to the guiding principles derived from the literature. Table 4 provides an overview of such examples.

Table 4 Examples from practice of communication messages implementing the guiding principles

Principle	Quotes from the cases
Getting to know the audience: consider, understand and research	"What I can tell the press today…" (Case 6) "We are a level-headed country and this level-headedness leads to an approach that fits with that. We are only doing things that are strictly necessary" (Case 4)
Listening, dialoguing, and remaining available to the public	"The most common messages [received from a communications program] were the prices of cauliflower, prices of hand sanitiser, bread, meat, etc. We are taking these messages seriously and in some cases it will be about change in supply, but we are investigating complaints that are made and we want NZers to be treated fairly" and "I'm happy to take questions…" (Case 7)
Monitoring and Evaluating the Success of the Communications	"The process of dealing with complaints is being worked through and fact checked, and we will involve traders so that they have a chance to respond" (Case 7)
Responding quickly	"Following up on some of the questions from yesterday, I want to give you some updates…" (Case 7)
Consistency of Messaging	"I will repeat like I always do…." (Case 7) "We have to give updates and adapt" (Case 6)
Transparency	"I've also asked the same question [to the experts]" (Case 7)
Contextualise, Adjust and Clarify Scientific Data through Appropriate Framing	"61 new cases today, while that may seem a heartening number, it is still too early to measure if our measures are successfully reducing transmission" (Case 7) "We only need to look at clusters in some of our communities to see how fast it spreads" (Case 7)
Internal coordination	"Today we gathered again with the most involved ministers and secretaries of state and to discuss the current state of affairs on the coronavirus in the Netherlands and abroad" (Case 4)
External coordination	"In Brabant, by the chairs of the safety regions in Brabant. There are 3 of them. We had the mayor of Den Bosch with us today. He is chair of one of these safety regions, and chair of all safety regions. They are discussing large gatherings in Brabant." (Case4) "Tomorrow there will be a new update from the three collaborating safety regions in Brabant" (Case 4)
Mixed crisis communication teams	*This is not specifically mentioned and no quotes are available. However, it became clear in case 6 by the presence of different expertise across the different team members.*
Prioritise messages with instructive information	"I want to ensure that people continue to stay at home… as we are at level 4" (Case 7) "I will repeat as I always do, stay home, stick to your bubble, act like you have the virus" (Case 7) "We can only do this together, with 17 million people" (Case 4) "I'm going to repeat the general hygiene measures" (Case 4) "Follow the general hygiene measurements, we can only do this together" (Case 4)
Understanding and communicating uncertainty	"We also don't have a full picture of community transmission and that is why we are focusing on increasing testing capacity" and "The technical advisory group has changed the definition to increase testing capacity" (Case 7) "As with all ground breaking science, we don't know what the answer is yet – but we are convening the finest minds in academia and industry to try to find out" (Case 6)
Empathetic messages	"I am aware this is a challenge unlike any other we have faced, but rest assured if we continue as we are, continuing applying the rules, it gives us the best hope to move into other alert levels" (Case 7) "I want to start with saying that we're deeply concerned for the people affected by the virus" (Case 4)

4.2 Cases of KWRs crisis communication

This section provides a summary of the two KWR's examples: whether they meet the guiding principles, how successful they were and whether the identified guiding principles are helpful to improve KWRs future crisis communication.

4.2.1 COVID-19 communication

In interviewing Frederic Béen, Chemical Water Quality and Health Research at KWR, it became clear that many of the guiding principles for effective communication during a public health crisis were met, but were not necessarily thought out beforehand. Rather, Frederic and the sewage surveillance team had experience in communicating sensitive public health topics, and adopted similar methods for this specific case while at the same time dealing with time sensitivities and high workloads.

The guiding principles that were successfully met based on the definitions in the report include:

- *1.2 Listening, dialoguing, and remaining available to the public* – Frederic would consider his target audience and adapt his messages, and was always readily available to the media and thus the public through connections with the communication team.
- *2.1.1. Responding quickly* – The team effectively communicated quickly, with an initial webinar on the research, as well as outreach to the scientific community and the media.
- *All guiding principles under 2.2. Style and forms of messaging* – Frederic mentioned he ensured the consistency and transparency of messages, as well as contextualised scientific data based on the target audiences.
- *All guiding principles under 3 on Content* – Frederic discussed how he prioritised messages with instructive information given the target audience, i.e. methodologies to scientists, and protective information for the public and wastewater treatment plant staff. Uncertainty was addressed upfront and communicated as needed.

Some guiding principles were not met, or met only partially as a result of a lack of time and capacity, and also perhaps time for effective planning and coordination. They include the following principles:

- *1.1. Getting to know the audience* – Not met due to a lack of time.
- *1.3. Monitoring and Evaluating the Success of the Communications* – Partially met, Frederic and the team would ask for the transcripts and written interviews to make sure everything was communicated and interpreted correctly, but if through an intermediary or a live interview, it was harder to control the output and monitoring. Unclear if monitoring of the communications was done.
- *All guiding principles under 2.3 - Internal and External Stakeholder Coordination* - These were partially met. Internal coordination was partially met through a Sewage Surveillance team that was set up, but the coordinated communication to other colleagues was not done. External coordination occurred with communicating partners nationally, but no effort from either side to ensure cohesive messages with partner institutions. Mixed crisis communications teams was partially met through the Sewage Surveillance team, as it included subject matter experts and communications practitioners, but there was a lack of co-formulation of messages with other experts (i.e. social scientists, behavioural scientists, etc.) due to lack of time and necessity to communicate quickly.

During the interview, Frederic noticed areas where he and the team were lacking in terms of coordination internally and getting to know the audience. He noted that this could be improved for future scenarios, and also potentially for continued communications on the current coronavirus pandemic.

4.2.2 Toxicology case

The interview with Milou Dingemans, toxicologist and Chemical Water Quality and Health department Researcher at KWR, demonstrated that communicating about a sensitive public health topic can take on many different forms, whether in a crisis or not. In this case, the sensitive topic cannot be disclosed, as her research and deliverable was delivered to a client, and is only to be used by the client. Milou however did demonstrate that many of the guiding principles from this report are useful in terms of crafting messaging on sensitive and confidential topics, and could be further integrated into her research and communication practice with some support from communication experts at KWR.

In this specific example, Milou had to effectively research and communicate the toxicology facts in a clear and neutral tone for the client, who would then use excerpts from the text, should journalists or the public raise a concern about the topic in question.

The guiding principles that were successfully applied and slightly adapted to this specific example include:

- *1.2 Listening, Dialoguing and Remaining Available to the Public* – This occurred because Milou provided factual information relevant for all possible scenarios and needs for further research, therefore anticipating what the audience and media might need, should an issue occur.
- *2.1.1. Responding quickly* – The response was delivered to the client, and the client was able to use the information as responses to questions from the public and the media. The responses are timely and managed by the client, from Milou's observations.
- *2.2.1 Consistency of Messaging* – During the work, Milou contacted researchers of a partner institution on this topic to pursue cohesiveness in the message. Also see 2.1.1.
- *2.2.2. Transparency* – Milou described how this is very important for the health-related topics she deals with as a toxicologist, and to ensure that messages are communicated clearly and effectively.
- *3.2. Understanding and communicating uncertainty* – Milou said that this is very important in her role as a toxicologist; explaining what we know and do not know, and explaining a potential impact thereof on conclusions in reports and communications.

The guiding principles that were not met, or met only partially were due to the nature of the topic and the way in which the content was delivered and its intent of use by the client. They include the following principles:

- *1.3 Monitoring and Evaluating the Success of the Communications* – Milou mentioned this project took into account the possibility of potential questions/requests from the public or journalists to the client, to be able to follow up accordingly. However, Milou was unsure on what other monitoring the client performed on the success of the communications.
- *2.2.3 Contextualise, Adjust and Clarify Scientific Data through Appropriate Framing* – This was not really done, because it was a specific factual report provided to a client, who could then use the data and information to provide to journalists and the public.
- *2.3.1 Internal coordination* – This was not really done as it was a sensitive topic, and also not common practice at KWR. However, Milou does see the value in improving sharing mechanisms across colleagues and departments.
- *2.3.2 External Coordination* – This was managed by the client.
- *2.3.3. Mixed Crisis Communication Team* – There was a multidisciplinary team of water professionals and toxicologists working on the report for the client, however, there were no social scientists or communications experts who contributed.
- *3.1 Prioritise Messages with Instructive Information* – Milou mentioned that in the case of the report to the client, they had to deliver the facts in a neutral way, so did not focus on mitigation or a response. There were some suggestions for further research included.

- *3.3. Empathetic Messages* – This was partially achieved as the messages were delivered in an easy to understand way and for communication purposes by the client. However, how the messages were delivered by the client is not monitored. Also, other styles and tactics such as storytelling were not employed by Milou.

4.2.3 Lessons learned from the cases on the relevance of the principles for practical application in KWR

In interviewing the two colleagues from KWR, it was observed that:

- These principles can only really be applied in their entirety to a crisis scenario. When applied to sensitive public health topics, some of the principles become less relevant, such as responding quickly. However, many of the other principles are also relevant for all topics and situations, such as getting to know your audience, transparency and contextualising information.
- The two interviewed researchers applied principles intuitively, but noted that they would need more support from a communications expert. This approach may be shared by other researchers in KWR, as generally researchers do not have time or do not identify the need to communicate their research results more widely than to the client.
- There is no system in place at KWR for effective and tailored internal sharing and coordination of research and information. In the case of the sewage surveillance research, it remains important to communicate the results to all colleagues, so that they are aware and up-to-date and can effectively communicate these messages as needed to their networks without any misinterpretation.
- Finally, both interviewees described how the principles would be an effective tool to assist them in future communications (in collaboration with communication experts) and to consider best practices in communicating science during a crisis situation.

5 Conclusion

This report included a literature review, a list of guiding principles, applications of the principles in real world examples, and input from KWR colleagues, all delivering an overview of science and crisis communications practices during a public health crisis. The report first defined science, crisis and risk communications, and then highlighted the guiding principles within three categories of crisis communications planning: strategy, form and content. The cases provided examples of how to frame communication messages according to the principles and how these principles could be useful for crisis communication in KWR.

The report shows that overall, building and maintaining trust, showing empathy and consistent, coherent and timely messages are vital elements of crisis communication – while ensuring that messages are tailored by listening and understanding the different target audiences and their needs. Communications are effective only if they reach people with the information that they need in a form that they can use, at the right point in time (Fischhoff, 2013).

Effective and timely science communication practice offers extended possibilities both for disseminating research and for establishing dialogue between scientists and public target groups, which in turn can be beneficial to the research process. Research in this domain is within the scope of KWR's research. This study revealed a number of key gaps and areas for future research for science and crisis communications that could be addressed in future KWR projects. Specifically:

- There is a need for a clear protocol for applying the principles in practice, with an opportunity (and time reserved in projects) to gather feedback from the researchers who apply them for subsequent iterations.
- These principles are limited to the scope of crisis communications situations. Further research would be needed to determine or reconfigure the application of these principles for other communications of general public health concerns or sensitive topics in non-crisis situations.
- Comparing real world cases with the principles demonstrated that there is a need for developing an assessment of the effectiveness or impact of applying and using the principles for communications in crisis situations, and how the communications are interpreted by the target audience. In comparing the principles with real world cases, it was difficult to gather information on many of the principles due to the random samples chosen and a lack of data.
- Further research areas could include: communicating uncertainty, empathy and other approaches for interpretation of scientific information by diverse target audiences, motivation for researchers to communicate science; capacity of different media to effectively communicate health issues related to water research, including social media; and the ethical aspects of science communication.

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ANNEX 1 – Step-by-step guidance

This guidance is available as one pager document (both digitally and printed version).

Effective Crisis Communication: Step-by-step guidance

This guide serves as a checklist of consecutive steps to assist in communicating during a crisis situation. The full report can be found here [*a hyperlink is added to this report in the standalone guidance].*

What makes crisis communication effective?

Effective crisis communication consists of a continuous loop of understanding your target audience, defining your communication objectives and strategy, and communicating content that is useful and actionable for the audience. This is followed by monitoring and evaluating the effectiveness of your communications, and further listening and understanding the interpretation of the communications by the audience, therefore restarting the loop.

Step 0: What is the topic of communication?

You start with identifying a clear, focussed topic of what you want to communicate, such as specific research results, updates in a specific field, clarification/specification of previous messages, etc.

Step 1: Knowing your audience

The audience is the public, i.e. non-experts and more general target audiences, and stakeholders, i.e. target audiences that have a relevant tie (or stake) with the communicating organisation. You want to understand:

- Their perspectives, culture, beliefs, and local context, i.e. economic status, literacy rate, current struggles such as psychological distress, risk exposure, and other current happenings;
- What they currently know or do not know.

This can be done through research, interviews, surveys, word-of-mouth, etc. This may take a lot of time, while in a crisis you need to respond quickly. In this light, it makes sense to have a long term plan ready for communication in times of crisis, with an in-depth investigation of typical audiences you communicate to. In this way, when the crisis hits, you can more quickly understand your target audience's current situations.

By knowing the audience, you can then more easily identify what will help the audience to take action during a public health crisis, filling the gaps between what people know and need to know.

Step 2: Defining the communication objective and strategy

You develop a communication strategy consisting of:

- Objective: What do you want to achieve with your communication? What impact? What does the public need to know right now? E.g. reduce fear, avoid panic, disprove rumors, provide instructions for safety, etc.
- Target Audience: Specify the audience you want to reach and identify what will help them to take action, as mentioned in Step 1.
- Methods: How do you want to achieve the objective? E.g. Adjust and prepare messages that are empathetic, touch on uncertainty, provide instructive and/or protective information, etc.
- Dissemination and outreach: Define the best way to reach that audience and disseminate your message. E.g. through a press briefing, social media, a blog, news report, research, etc.

As part of dissemination and outreach, make sure you plan also internal and external coordination with staff and stakeholders *(Report Ch. 2).* This includes ensuring all colleagues are updated regularly on latest findings from research and communications that have been sent out. Also, developing relationships with other organisations, media and communication partners is essential to ensure a coordinated approach (i.e. joint messages), as well as to ensure consistent messaging to the public from the specific communicating parties in question. This will help to reduce confusion for the public.

Step 3: Communicating

- Consider timing and rapidity of communicating messages – quick responses can help prevent harm to target audiences *(Report Ch. 2).*
- Contextualise and adjust information, i.e. consider the format and/or framing of the message most appropriate for your target audience (narrative, consistency, transparency, etc.) *(Section 2).*
- Communicate instructive and empathetic messages. This also includes communicating uncertainty by letting the audience know what you do not know, and when and how you will share new information *(Section 3).*
- Remain available to your audience, communicate consistently and transparently to build trust and reduce confusion *(Report Ch. 1)*.

Step 4: Monitor and Evaluate

Understand and monitor the impact and the public's perceptions. You can do this through data from your communications (attendance rates, viewings, ratings) and listening to the public's responses to your messages if they are live or after-the-fact *(Report Ch. 1)*.

Step 5: Repeat!

Getting to know your audience and communicating information is a dialogue, and the messages must be adjusted and contextualised based on new information, responses of the target audiences, and new research and insights, in order to guide the audience to take effective action to prevent harm during a public health crisis. Repeat Steps 1-4 continuously!

Special Considerations for Communicating with the Media in Times of Crisis

Most of the elements of the guiding principles outlined above also apply in communicating with the media; however, there are some key points that are important to emphasise in particular when communicating with the media.

The mass media can be very helpful with dissemination of information, but they may present oversimplified, sensational or inaccurate reports (Babacan & Babacan, 2013). Therefore, scientists must be careful how messages are conveyed, and how they will be interpreted by the audience. Some tips are mentioned below on how to effectively deliver messages to the media during a public health crisis, with regards to building and maintaining trust and explaining complexity and uncertainty. It is also important to note that in addition to these tips, the regular media communication rules also apply.

Tips on communicating with the media during a public health crisis:

- Be accessible and respect deadlines
- Prepare a limited number of key messages before media interactions
- Take control of the interview, instead of passively answering questions
- Repeat your key messages several times
- Give visibility to your organization by mentioning its name
- Keep interviews short
- Say only what you want the media to repeat
- Tell the truth and be honest about your information gaps
- Provide background materials about complex risk issues
- Provide information tailored to each type of media, e.g. sound bites and visuals
- If you cannot provide the information or answer, say it and focus on what you do know and tell the reporter when and how you will follow up
- Anticipate and respond carefully to tricky questions
- Avoid saying “no comment”

In summary, be the best source of information and provide clear, honest and empathetic messages to the audiences. Know the audience your media is reporting to, to effectively tailor the key messages.

ANNEX 2 – Illustration of the cases

Case 1 RIVM: COVID-19 and Immunity

- What: Video of RIVM researcher answering 4 common questions about the corona virus and immunity.
- Who: Researcher at The National institute on public health and the environment.
- How: Online press release, article on the institutes website.
- Link: https://vimeo.com/417533046

In the RIVM information video, it was simply not possible to derive whether all the principles were applied or not. The principles of which it was not clear whether they were applied or not are: listening to the audience, monitoring success of the communication, coordination of external communication and presence of a mixed crisis communications team. This case, however, does score poorly on the reacting quickly principle, as it was posted only a few weeks after the debate on herd immunity. On the positive side, the language used in the video is simple and clear, with scientific content explained in layman terms, and with no contradictions. The researcher mentions uncertainty related to whether or not immunity from the virus is acquired permanently. Moreover, the video is personified as it stresses that *your* immune system is *your* biggest weapon against corona. It is more an explanatory video and an instructive message. The actions to take against corona are mentioned, but the message would be stronger if they were repeated at the end of the video. The tone of the video is rather formal, showing little empathy. Overall, a lot of aspects are unknown and the response could have come more quickly.

Case 2: Wim van der Poel - Wageningen Bioveterinary Research

- What: News article in Trouw with an interview with Wim van der Poel (Wageningen Bioveterinary research about COVI-19 and pets)
- Who: Wim van der Poel -Wageningen Bioveterinary research
- How: Printed interview in newspaper
- Link: https://www.trouw.nl/binnenland/moet-uw-kat-in-quarantaine-5-vragen-en-antwoorden-over-het-coronavirus-in-dieren~b2f0f174/

In this interview, it is unclear whether all the principles are applied. This holds for the strategy principles and the internal and external coordination. However, Wageningen Bioveterinary research is quick to respond and also to adjust the information when new insights become available. For example, they quickly communicated their findings that it is, indeed, possible to spread COVID-19 to pets, while previous Chinese research said that COVID-19 is not transmittable to pets. Moreover, the messaging is consistent, and there are many related articles on the institutes' webpages. Wim van der Poel contextualises scientific terms. For example, the term *ACE2-receptor* is explained by making an analogy to coat rack. He also talks in terms of what *you* can do to prevent the spread of COVID-19 to pets, thus personifying the message with focused, instructive information. The transparency could be improved, in terms of more presence in the media, where the WUR receives little attention.

Case 3: Debriefing - Jaap van Dissel (RIVM)

- What: Debriefing of the coronavirus situation to the government on public television. Audience is both the government as well as the national public. Update on the developments in NL concerning covid 19.
- Who: Jaap van Dissel Director infection disease prevention RIVM.
- How: Debriefing the parliament on television
- Link: https://www.youtube.com/watch?v=tUTWGgqMEDs

The debriefing to the parliament shows that many principles are applied. Nothing can be said, though, about the speaker knowing the public, having a coherent internal communication approach, and a mixed communications team. On the positive side, the speaker does open the floor for questions of the Parliament and shows that he has been monitoring his previous communications by mentioning he is going to explain something a bit more clearly as he received many questions about it in the past. He also responds quickly and shows consistency in messaging, by providing a recap of his latest debriefing, using graphs (he showed the graph from the latest status update). He contextualises the information by making comparisons to SARS and translates it to a comprehensible scale. He often presents scientific findings followed by the words “this means”. He presents information in an instructive manner and mentions possible biases and findings that require more information, thus addressing uncertainty. This debriefing to the Parliament itself shows external coordination, but when this is translated into measures, it seems that politics and science are not on the same page. In fact, while the speaker states that masks do not reduce the spread of coronavirus significantly, wearing masks on public transports became national policy. Finally, the tone of the debriefing is very neutral and formal, more empathy could have been shown.

Case 4: Press conference - Mark Rutte & Jaap van Dissel

- What: Press conference of Prime Minister Mark Rutten and Jaap van Dissel, RIVM
- Who: Mark Rutte (VVD) and Jaap van Dissel (RIVM)
- How: Live broadcasted press conference.
- Link: https://www.youtube.com/watch?v=xz%2DDtYHGdLA

In this case, many principles are applied. The video does not make clear, however, whether there has been monitoring on previous communications, and whether there is internal communication and a mixed crisis communications team. On the positive side, the Prime Minister mentions the qualities of the Dutch people and states that based on that they designed the measures, and remains open to questions of the press. The government keeps responding quickly and in a consistent way: there are weekly press conferences where the necessary measures are consistently repeated. However, at the end of the conference the Prime Minister shakes Jaap van Dissels hand, when he just said that handshaking should be avoided (showing inconsistent behavior). The Prime Minister does use very simple terms and personifies the measures as in: “these are things that *you* can do”, he also repeats the measures several times. His message is therefore instructive. The Prime Minister is also empathetic. He expresses his condolences to the people who lost family and friends to the virus, he expresses his admiration for how people are following the measures, and mentions the feeling that we are in this together and that he understands the citizens worries about the economy. He also addresses the uncertainty by saying that he cannot promise how the virus will develop. The transparency could be improved when it comes to possible future measures. Research is mentioned, but he does not explain what is investigated.

Case 5: US White House Press Briefing

- What: US Whitehouse press briefing from 26:25 seconds – 27:25 mins
- Who: President of the U.S., Task Force, The Science and Technology Director of the Department of Homeland Security
- How: Official message, verbal press conference
- Link(s):
    - https://edition.cnn.com/2020/04/26/politics/trump-briefings-media-blame-disinfectant-comments/index.html
    - https://www.cnbc.com/2020/05/01/coronavirus-trump-tendency-to-deny-past-statements-becomes-more-glaring.html

The US white house press briefing shows very little evidence that the principles are used. The only principle fully applied was to respond quickly. To some extent the Whitehouse also communicated uncertainty, as the Director of Homeland Security talks about what they currently cannot measure. However, this is communicated in such a way that it is neither explicit nor clear for the general public. There is some indication that there is a mixed crisis communications team as the White house bodies are collaborating for the press briefing, but there are no health officials from other bodies present. Moreover, the messages of the President and the other governmental bodies appears to be inconsistent with previous messages, as the President denies previous statements, increasing confusion and showing a lack of internal coordination. Furthermore, the presented science was not contextualized to be understood by the citizens and there were no behavioral instructions given based on science. Overall, the messages were difficult to understand, lacked empathy and understanding of the public's ability to absorb and interpret information. The messages did not offer solutions to problems, but avoided or oversimplified science and research.

Case 6: Canadian Epidemiologist Dr. Bruce Aylward on WHO International Research

- What: WHO Press Briefing, WHO International Mission with the Chinese Government
- Who: Dr. Bruce Aylward, Canadian Epidemiologist, Senior Advisor to the WHO Director-General
- How: Live/recorded press briefing, held on February 25th 2020
- Link(s):
    - https://www.who.int/emergencies/diseases/novel-coronavirus-2019/media-resources/press-briefings/4#
    - https://www.theglobeandmail.com/world/article-covid-19-not-beyond-control-canadian-who-expert-bruce-aylward-says/

In this example, all principles are used with the exception of monitoring and evaluation of the success of the communications, for which it is not clear from this fragment whether it is implemented or not. This example does show that the speaker familiarized with the audience and listens to it. In fact, he talks about what is most useful for the press and makes himself available for questions during the briefing. He gives daily updates on the current situation, he is transparent about the partners who are involved in the research, and he contextualises the research for the target audiences. There is both internal and external coordination of the messages. He describes the different partners, their expertise, what they do. The research team includes different expertise. While he does not specifically prioritises instructive information, he does provide some instructions at different points in the briefing. Finally, he speaks in easy, simple terms and expresses empathy for the team he's working with.

Case 7: Prime Minister of New Zealand, Jacinda Ardern News Conference

- What: News conference updates on COVID19
- Who: Prime Minister Ardern, New Zealand
- How: Video news conference
- Link(s): https://www.youtube.com/watch?v=E319ClMzI3k

In this example, all principles are used except getting to know the audience and having a mixed crisis communications team. For the two missing principles it is not clear from the example whether they are applied or not. During the news conference, the prime minister is open for questions and mentions the process of dealing with complains, showing that she is willing to listen to the audience and that there is monitoring of the communications. She provides the public with frequent updates, and she mentions that she is repeating information. She is also transparent about updates and plans to boost the economy. This shows transparency, consistency and also that she is quick to respond. She also contextualises the death rate for the public to better understand the numbers. While there is internal (with ministries) and external (collaboration between multiple groups, agencies coordination), it is not clear from this news conference whether there is a mixed crisis communications team. The New-Zealand prime minister does express her empathy by stating that she is aware that this crisis is a big challenge for citizens. She also prioritises instructive messages such as: "I want to ensure that people continue to stay at home". Finally, she honestly states what the government and researchers don't know yet.

Case 8 UK Government Press Release on Research - Department of Health and Social Care

- What: Press Release on "New partnership to sequence human genomes in fight against coronavirus"
- Who: Department of Health and Social Care, Secretary of State for Health and Social Care Matt Hancock, Chris Wigley, CEO of Genomics England, Dr Kenneth Baillie, Chief Investigator at the University of Edinburgh, Sir Mark Caulfield, Chief Scientist at Genomics England, Paula Dowdy, General Manager and SVP Illumina, EMEA, Sharon Peacock CBE, Director of COG-UK, Sir Mark Walport, Chief Executive of UK Research and Innovation (UKRI), John Bradley CBE, Chief Investigator of the NIHR BioResource, Dame Sue Hill, Chief Scientific Officer and SRO for Genomics at NHS England and NHS Improvement
- How: Online Press Release
- Link(s): https://www.gov.uk/government/news/new-partnership-to-sequence-human-genomes-in-fight-against-coronavirus

The UK government press release only fully implements 5 principles and one to some extent. It is unclear whether they applied the following principles: getting to know the audience, listening to the audience, responding quickly, internal coordination and having a mixed crisis communications team. Despite not being able to report on everything, the press release is transparent on disclosure of costs and funding of the project and the organisations involved. There is external coordination, many different actors are contributing to the research and each organisation is contributing to the press release. The press release does provide specific information on what to do. It also highlights uncertainty by saying: "As with all ground breaking science, we don't know what the answer is yet – but we are convening the finest minds in academia and industry to try to find out. Moreover, empathy is expressed "I am very grateful to all the staff, patients and families who are working on and participating in this study, at what is a very challenging time." This example is not so much a bad example per se, but it is just not clear for a lot of principles whether they are applied or not.