

# Societal Risk Communication—Towards Smart Risk Governance and Safety Management



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**Abstract** Risk communication has long been thought and conceptualized as based on a centralized model where experts were detaining knowledge and explaining risks to lay persons. Today's risk communication reality is much more complex. It involves a variety of actors, each of them having multiple interests. Safety is one of them, among many others, but is also understood in different ways. However, acknowledging this complexity allows for building upon all risk communication actors' respective inputs to build the overall risk and stake picture and be potentially an active contributor in relation to safety. Eventually, it leads to proposing a smart and open approach to risk governance and safety management.

**Keywords** Risk governance • Safety management • Risk communication Complexity

Risk communication is now being considered as a part of safety management. But to what extent does it really influence the decisions and actions taken to manage safety? Conversely, how does safety management influence risk communication principles?

Risk communication has long been considered by institutions and high-risk organizations a controlled and centralized process where knowledge was detained by them and disseminated to the rest of the world to explain and justify decisions they would make on their own.

However, times have changed and so has risk communication. Communication means, channels, pace, actors, forums, expectations and inclusion are among the elements that evolved dramatically over the past decade. Can these recent and future risk communication expectations and practices actually contribute to risk governance and safety management practices? If yes, under what conditions?

In order to answer these questions, it is worth reviewing the traditional risk communication model to identify its pitfalls or weaknesses and analysing how risk

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communication works today in practice. It will allow to propose a risk communication approach for the future, both realistic in this new era and leading to a renewed and more efficient way to govern risks and manage safety.

## **Evolution of Risk Communication: A Simplistic Initial Model and Multiple Refinements**

Baruch Fischhoff in 1995 (Fischhoff, 1995) proposed an overview of 20 years of risk communication and characterized its evolution through seven developmental stages. It seems that all lessons have not been learned from the past and that almost all developmental stages can still be observed today. Risk communication now takes place in an environment where communication means, pace and practices have changed, but many organizations and institutions still rely on successive refinements of an early ‘traditional’ risk communication paradigm. Let us further describe and analyse its foundations and evolution to better reach beyond its limits.

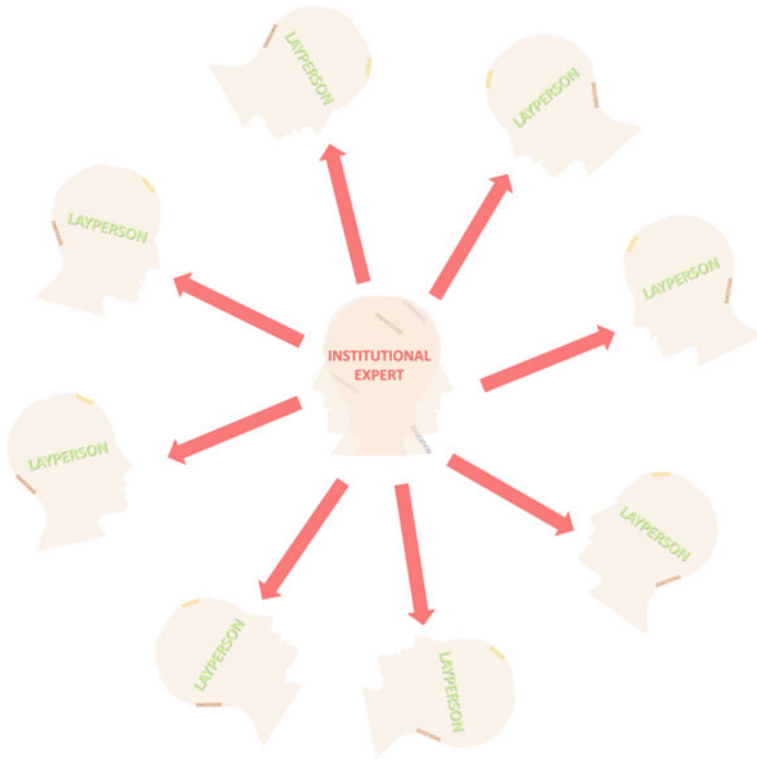
### ***The Early ‘Traditional’ Risk Communication Model: Accredited Experts Watch Over Safety Management***

In this model, risk communication is mainly handled and organized (or believed to be) by a prominent actor that is the company/organization/institution (to improve readability, in the rest of the text, we will only use the word organization) operating or supervising the hazardous activity. The organization and its accredited experts represent the only source of valid knowledge and expertise. Risk communication takes place through formal forums organized by the prominent actor and targeted at pre-identified stakeholders. In brief, risk communication is centric, from a central knowledgeable actor (or a very limited number of actors) to specific audiences that are assumed to be risk-ignorant (Fig. 1).

The purpose of such risk communication is officially to debate about the safety risk or convey science on this topic to predefined stakeholders, thus in a sense, to bridge the gap between experts and society (Nishikawa, *this volume*).

Such a model of risk communication relies on a number of implicit assumptions that are worth reviewing:

- There is one and only one Truth on safety risks that is detained by the company experts. Multiple angles or interpretations of safety risks or any reference to uncertainty are seen as malicious attempts to harm the industry’s or authority’s reputation and destroy the public’s trust. They are considered ill-founded statements without any scientific or justified background.
- Formal forums such as official public participation/consultation meetings around hazardous sites (e.g. plants, airports, etc.) involving the prominent actor and



**Fig. 1** Centralized and controlled risk communication model

pre-identified stakeholders are the only form of risk communication. There is no other place than the formal forums where safety risks are discussed. Risk communication is exclusively about ‘legitimate experts’ explaining safety risks to laypersons.

- The dominating concern of risk communication stakeholders is safety management. Whoever takes part in risk communication does it to defend the common interest of managing the safety risks associated with the hazardous activity or situation at stake; there is a convergence of interest among all risk communication stakeholders.
- Risks/Safety is understood with the same meaning and scope by the prominent actor and its audiences. The safety risks considered by all risk communication stakeholders are similar whatever their nature (e.g. individuals vs. companies or institutions). For example, the impacts or consequences envisaged by people living in the neighbourhood of a high-hazard industry plant are the same as the ones considered by the plant managers or the local or national authority. In other words, the understanding of safety risks and the scope considered are ‘universal’ and are not affected by the different nature of the various stakeholders.

- The audiences targeted by the official risk communication forums listen to, trust and accept what is said by the organization's experts. The public acknowledges that the only valid expertise and judgement on safety are those of the organizations' experts; it relies exclusively on this expertise to get a view on safety.

These assumptions are related to one another and form a consistent framework, where the early 'traditional' risk communication model makes great sense. The overall assumption is that risk communication can be controlled by the prominent actor, not only in terms of messages but also in terms of targets and timing of these messages.

The case of public participation in the debate on industrial risk in France (Kamaté, *this volume*) provides an illustration of the traditional risk communication model. The chapter highlights the formal process for organizing communication from representatives of hazardous industry/local authority towards local residents. It documents how the formal forums involving public participation are publicized in a way that is not so easily or obviously accessible, and organized at times that are not very practical for most people. In other words, everyone is welcome but the conditions make it so difficult to attend that the participation, thus the non-institutional share of voice is limited. To put it more bluntly, everything is organized so as to silence potential dissonant voices. One could interpret this approach as an acknowledgment of the weakness of the assumption that there is a unique scientific truth. Indeed, not leaving room to other viewpoints is a way to artificially make the official experts' truth the only one.

As for the objective of these forums, it is not precisely about safety management in the sense of taking better decisions and actions to manage safety. What industrials/authorities expect thereby is to persuade the public that the decisions they already made on their own are not only the best ones, but are also perceived as collective decisions since the public was involved (even though what they are involved in is not at all a collective decision process but rather an after the fact information process). More than debating with the public about the safety risks of hazardous industrial activities, risk communication is about controlling the public's reaction, both before any safety-critical event occurs but also in the event of an accident. Eventually, the ultimate objective of risk communication, in that case, is to build trust and even further, share responsibility, more than to manage safety.

The weakness of the 'traditional' risk communication model underpinning assumptions is also well exemplified by the healthcare domain, where the risk is not local like in the case of a high-risk facility. In healthcare, there is usually no uphill battle to have access to the risk communication arena, since it is usually a very open one. Nevertheless, risk communication remains one-way and pertains more to public information or public education than to risk communication. Whether the information then actually reaches the intended targets is not always a concern for those who disseminated it. As for the trust placed in the message, the example of the risk communication around A/H1N1 pandemic-influenza vaccination in France in 2009 is eloquent. Convinced that people would trust and follow its recommendation, the French Ministry of Health ordered a massive number of doses that

turned out to far exceed demand. A study of the attitudes and behaviours of the general population towards pandemic vaccination highlighted that the public health messages focused on the severity of the risk were “counteracted by daily personal experience which did not confirm the threat, while vaccine safety was a major issue”. “Acceptability was significantly higher among 8.0% of respondents who were formally advised [by their primary care physician] to get vaccinated, and lower among 63.7% respondents who were not advised to get vaccinated” (Schwarzinger et al., 2010, p. 6). The objective of the risk communication initiative by the government was to convince the public to buy into an allegedly safety management measure decided by the government itself without any consultation.

As we have illustrated, the traditional centralized and controlled risk communication model led to some blatant risk communication failures, pointing to a need for greater sophistication and more specifically a qualification of its foundational assumptions.

### ***Listening to the Potential Victims: A First Refinement of the ‘Centralized and Controlled’ Risk Communication Model***

In the aftermath of the Fukushima accident, if the initial approach to risk communication from the local authorities towards people affected was to explain the radiation phenomena and mechanisms, its failure led authorities to reassess their approach (Nishikawa, *this volume*). An analysis of the initial experience highlighted that some cultural aspects were not considered in the way it was organized, but also that some of the assumptions listed above proved wrong. First of all, it came out of the feedback from the first risk communication experience that what the affected people were interested in was not to know more about radiation in general (i.e. the science of nuclear reactions or disembodied physical phenomena), but rather about the impact on them and their families of consuming locally grown products. In other words, risks, to them, meant the possibility of being harmed by locally grown products or cattle, whereas for local authorities, risks meant the overall impact of radiation due to the nuclear fallout, compared to natural radiation phenomena. The risks considered by the local residents differ from that considered by the authorities and the industry.

What also came out clearly from this risk communication experience in the vicinity of Fukushima is that the mothers spoke a lot among themselves about the risks (their risks) related to food. Information about the risks associated with consuming local products circulated also through informal channels with a high level of trust in the information, thus contributing to developing people’s risk picture. Not only are there other forms of risk communication than the official sessions organized by the authorities, but also people trust other sources than official experts and ultimately make up their own mind about the risks instead of

blindly buying into the official discourse and view on risks. This experience led to adjust the local government's risk communication content to the needs of the affected people and provide them with practical and easily understandable and credible information about the radiation contained in local products and how it compares with other accepted radiation exposure. In this case, risk communication is also about informing the public (the assumption that there are accredited experts vs. laypersons is still prevailing), but this information is meant to help local residents make personal decisions. In that sense, it may be seen as a contribution to safety management, but with a limited understanding of safety. Indeed, information on food radiation helps affected population manage what they perceive as being their safety risks, namely consuming local products.

However, risk communication cannot be considered a pillar or even a contributor to safety management in the widest sense of the word. The disconnect between risk communication and safety management may not be on purpose though. It can be seen as a result of some of the model's assumptions as well. By considering that there is only one interpretation of safety risks (that of the hazardous industry) and that there is only one truth (detained as well by the hazardous industry), involving other parties in risk communication cannot add value to safety management. It may be an information tool, a damage control approach for the industry's reputation, but in no way a useful contribution to safety management.

Is it inevitable, or could risk communication actually contribute to safety management? What would be the conditions to make risk communication a safety management driver? On what grounds should a new model be founded, or how to revisit the underpinning assumptions that prove wrong in reality? To be able to answer these questions, it is worth reviewing and analysing real cases in which risk communication actually made a difference in the way safety was managed.

### ***Crisis of the Foundations of the Centralized and Controlled Risk Communication Model***

Beyond the first step of evolution leading to listening to potentially directly affected people, the evolution of risk communication in the broader context of societal evolution severely challenged several foundational assumptions of the centralized and controlled risk communication model, with some significant impact on safety management.

A key societal factor is the crisis of trust in institutions, experts and science, leading to certain defiance towards companies and authorities and their official messages (Millstone and Van Zwanenberg, 2000). The trust relation has become more horizontal. In addition, the evolution of communication means allowed for new and increased exchanges between a wide range of people located everywhere in parallel to official messages. Newcomers get onto the risk communication scene, being considered troublemakers by some, and key safety actors by others,

depending on their perspective (Guérard, *this volume*). Some recent cases illustrate how new forms of risk communication did contribute to safety management.

In the case of the Ebola outbreak, listening to local people allowed for better understanding why initial risk communication messages did not work and for adjusting the approach to the local social environment (Bastide, *this volume*). As such, the safety management decisions still made in a centralized way ultimately were better informed. Getting these valuable insights though was not part of the initial risk communication approach but came after a blatant failure of a pure top-down generic communication initiative. It revealed the importance of knowing the local context and understanding individuals' views on risks.

In the Daniel case (Wiig et al., *this volume*), the stubbornness of the journalist led to reopen the case and highlight some hazardous practices and atmosphere in the hospital. By so doing, the investigation went further and came out with some recommendations that ultimately translated into safety measures that were not initially mentioned. In that respect, risk communication actually contributed to the decisions and actions taken to managing safety. Interestingly again, risk communication as it took place, initiated by the journalist, was not part of any formal or planned risk communication by the institution. He was not a 'natural' risk communication stakeholder either. The journalist himself was not directly affected as an individual by the safety hazards he contributed to uncover.

Similarly, the role played by local residents immediately after the start of the Paris attacks in 2015 was key in managing the risk of aggravated consequences, although they were neither part of a risk communication plan nor directly individually affected.

Even in 'peace time', far from any accident and emergency situation, some indirect actors like the media or academic researchers may play a role in the engagement in risk communication and ultimately in risk governance like illustrated in the case of the Risavika, Sola municipality (Baram and Lindoe, *this volume*).

## **Risk Communication Today: A Complex Reality**

Behind the two simple words 'risk communication' hides a complex reality that a risk communication model needs to reflect and build upon to be useful and efficient. With the crisis of the assumptions underpinning a centralized and controlled risk communication model, a new set of assumptions, more realistic need to be developed to serve as bases of a new model.

Nowadays, everyone has access to and gets information from multiple sources of which some are already trusted and others unknown. The information circulating quickly and in different arenas contributes to building an idea about risks (including the hazardous activity's safety risks) in the public's minds, a set of beliefs and doubts, that constitutes not only a starting point but also evolves permanently. In other words, risk communication whether it is formal or not, personal or public, almost never intervenes on a virgin land/territory but rather on a moving basis.

Another key aspect that cannot be denied or ignored is the multiplicity of interests among the various stakeholders. The risks associated with (a) safety hazard (s) are of different natures for different parties and may evolve over time. Resulting individual goals can even be conflicting. This diversity of interests and goals is not related to ignorance or thoughtlessness but rather to the specific context and role of each party. One of the groups of residents in Fukushima involved in the risk communication initiative are mothers above all (Nishikawa, *this volume*), locals in West Africa are strongly anchored in ancestral culture and defiant with respect to European settlers' intentions when it comes to public health for historical reasons (Bastide, *this volume*), small towns in the vicinity of a big municipality remain small towns acknowledging the big gap in resources among other differences (Bergé, *this volume*).

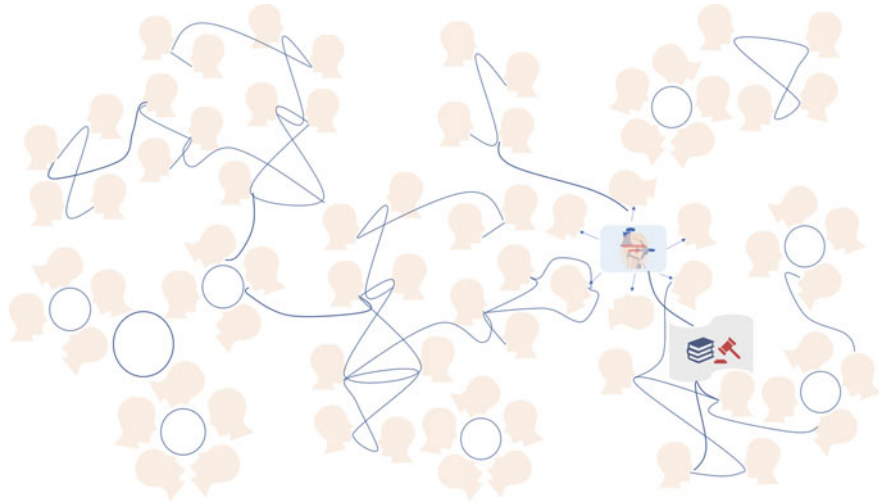
Each risk communication stakeholder has its own goals and interests that make sense with respect to its own context and role or mission. If the risk of an industrial accident can be a common interest to all of them, it is not necessarily the only one or the predominant one. However, each actor through his/her own interests bring a share of the overall picture, some pieces of a distributed knowledge and understanding of a complex reality. Eventually, the global risk picture combines all the stakes and risks perceived by all stakeholders at their own scale, timeline and from their own angle.

Everyone can virtually feel concerned and get involved in risk communication. Whether it is as a direct victim or potential victim or as a citizen or simply a human being, any risk can affect anyone. With the reach and pace of communication using modern means, a huge number of people can be aware of many risk issues and decide to get involved. Formal communication forums are a very limited part of the arenas where risks are discussed.

In the aviation example, self-appointed experts just as extremely knowledgeable aviation fans join the risk discussions, sometimes for a quick participation on a specific topic, sometimes for much deeper and longer debates (Guérard, *this volume*). Likewise, in the Daniel case (Wiig et al., *this volume*), the journalist investigating the case becomes a key actor of risk communication independently from any formal process. Sometimes, anonymous actors have a contribution, sometimes even a very brief one, one-off, like residents in the case of the November 2015 Paris attacks.

The contribution of these many actors may make a difference to safety and safety management. In aviation, by initiating and feeding controversies on some major safety-related aspects, some people who may even not belong to the aviation 'world' have a healthy contribution for they prevent the professional community from drifting into complacency (Guérard, *this volume*). In the Daniel case (Wiig et al., *this volume*), the role of the journalist turns out to be essential in the reopening of the case and ultimately in the safety enhancement measures taken. Likewise, in the case of the Paris attacks, by getting involved in communication, using social media, residents allowed for saving lives.





**Fig. 2** Distributed and dynamic risk communication model

Along with this diversity of actors comes a variety of risk communication arenas and alliances, more or less stable or opportunistic, formal or not, using different channels (official forums, spontaneous networks, e.g. journalist and experts in the Daniel case, private circles, e.g. primary care physicians in the case of the H1N1 influenza pandemic, etc.), running at different paces (instantaneous on social media like in the Paris attacks case, at a more planned frequency for formal forums).

Exchanges take place freely with no control body. They involve whoever wants to take part in the discussion (or any other form of exchange). Several ‘discussions’ involving several sets of actors may take place in parallel, using possibly different means and channels. Risk communication is distributed and dynamic. Topics, actors, communication means evolve with time. In short, there is no dominating actor, not even dominating actors with dominating views remaining unchallenged. Everyone can have a share of voice likely to reach everyone (Fig. 2).

Eventually, an alternative risk communication model for the future needs to start from the following assumptions:

- The interests among the various stakeholders are legitimately diverse (this diversity of interests and goals is related to the specific context and role of each party) and may change over time
- Reality is complex and (risks) must be apprehended from different and complementary viewpoints
- Risk communication actors, alliances and forums/arenas are diverse and evolve with time
- Exchanges take place freely
- The various actors’ viewpoints contribute to the overall (risk) picture.

In such framework, risk communication cannot be considered a defensive centralized and controlled tool for industries and authorities where new stakeholders are considered enemies to be controlled and decisions are made upfront by one actor in isolation and then ‘justified’ or ‘sold’ to other parties by means of predefined messages in formal forums.

In this alternative perspective, controversy and contradiction are inherent to the complexity of reality. In the audit approach proposed by Haferkorn (*this volume*), ‘the audit team does not search for absolute truth in risk communication but strives for connectivity to the client’, auditors’ blind spots are disclosed. Beyond blind spots, diverging views and controversies are normal and even fruitful. They are an incentive to further push the reflection on safety and how to enhance it. There is no such thing as one Truth and wrong perceptions. There is a complex and dynamic reality that can be apprehended from different and complementary viewpoints that all are valuable. Eventually, understanding the various goals and contexts and being aware of one’s own goals and context is necessary to make risk communication constructive.

However, this descriptive perspective on risk communication may not be sufficient to make it a natural contributor to an improved safety management and risk governance.

## **Can Risk Communication Contribute to a Shift of Safety Management and/or Risk Governance Paradigm?**

Historically, risk governance and safety management decisions and actions involved exclusively the ones inducing the risks (as a by-product of other activities) under the scrutiny of governmental authorities that were meant to represent the voice of those likely to bear the potential consequences of the risks, thus of the risk governance and safety management strategies and implementation. The public was not considered directly an actor. It was represented in risk governance by the authorities and not active in safety management.

The crisis of trust in institutions and in accredited experts led to a will of the public to get information from a variety of sources and ultimately get involved directly in decision processes. By having a share of voice and making it accessible to virtually anyone through especially new communication channels and means like social media, some representatives of the public, not necessarily directly affected by the potential consequences, managed to influence risk governance and safety management decisions. In these cases, risk communication contributed to bridge the gap between those who manage the risks and those who bear their potential consequences, thus contributed to the social contract between those parties (Fischhoff 1995).

Accounting for public debates open to all, benefiting from a wider range of information and knowledge (Baumont, *this volume*), combining different

perspectives, establishing dialogue (Haferkorn, *this volume*), listening to controversies is certainly a way to complete the picture in all its complexity. As such, it seems a promising way forward to improve risk governance and safety management. However, can this deepening of the democracy of risk governance and safety management by making it more direct be generalized through risk communication? Reviewing the challenges inherent to risk communication in relation to safety may help defining ways forward to make risk communication play a key role in risk governance and safety management.

## ***Challenges Inherent to Risk Communication in Relation to Safety***

### **A Variety of Perspectives on Safety**

Although most risk communication actors have safety as a major if not main concern, the meaning they associate with safety varies. Safety is not always understood as a societal stake in the sense of preserving lives or property or the environment. In fact, very few of the risks addressed in risk communication refer to this societal sense of safety. Indeed, the risks most stakeholders are concerned with and want to manage are ‘their’ risks, that is the ones they perceive as being likely to affect them.

Depending on how far reaching their line of thought is, the risks they may consider range from the ones likely to affect them individually, directly, almost certainly and immediately, to the ones likely to affect them as citizens or human beings directly or indirectly at various time horizons, i.e. the wider societal and even more global impacts. For example, for local residents living close to a hazardous facility, the scope of risks they may consider could range from the loss of their house value to the wider harm to health/lives, property and environment that an industrial accident at this facility could cause. Some may embrace an even wider scope and consider the potential harm caused by any accident related to this kind of industry worldwide. In an emergency situation, the scope considered may be different and focus on immediate consequences on lives.

For an organization, the scope of risks that might be considered ranges from the immediate restrictions of operations thus economic losses to the same wider societal impact of any accident in this field of activity that can be considered by an individual having a global appreciation of safety. At a governmental or regulatory level as well, the scope of risks considered may vary from regional considerations and impacts to more global societal ones reaching beyond national boundaries. In the case of a nuclear power plant, people may engage in risk communication to manage the risks of living next to a nuclear power plant whereas others would do it to contribute to managing nuclear safety in general. The first ones will focus on the risks associated with the presence and operation of this specific facility by the

specific management in place. The other ones will address more global and transverse risks such as international regulation or the same risks considered at a wider scale such as sub-contracting and include the risks associated with decommissioning and nuclear waste management. In the aviation industry, the passionate debates around automation is a matter of aviation safety management with a broad perspective of safety management. However, communication involving local residents about the risks associated with a new route overflying a specific area is also about safety management.

Eventually, one may say that all stakeholders engage in risk communication to manage safety, in fact, to manage their view of safety. Risk communication is a way to contribute to their perspective of safety management. However, their view of safety may be far narrower than the implicit scope of 'risk governance' or 'safety management' as generally understood, i.e. the management of the wider scope of risks, wider in the sense of the reach of the impacts, at societal level, all time horizons, and encompassing not only known, known–unknowns risks but also unknown–unknown ones (Taleb, 2007). Indeed, the scope of 'safety management' depends on the unit of analysis and the timeframe considered.

### **Scope of Safety, Scope of Control**

Depending on the reach of impacts considered, the role and control of risk communication stakeholders in safety management varies dramatically. For example, if safety is considered with a very narrow scope by a local resident living next to a hazardous industry facility, one measure to manage his/her safety is to move to a different place. This straightforward 'individual safety' management measure does not have any effect on safety management as soon as safety is considered with a wider scope, especially, it does not reduce the risk of an accident occurring or the severity of its consequences. To make the decision to move to a different place (thereby to manage safety at his/her individual scale), a local resident just needs to be informed about the risks of an accident occurring. Listening to the potentially affected ones and providing them with the information they ask for may be a sufficient risk communication strategy. S/he then has the full control over the safety risk reduction measure (the safety risk being considered here at his/her own level as well). If safety management is understood with a broader scope, e.g. managing the risk of an accident occurring at the facility, the role of a local resident in managing safety is far less predominant. Decisions to reduce the risk of an accident are not in the hands of a local resident.

It is with this societal or even more global scope of safety that a new paradigm is needed to bridge the historical disconnect between safety management as an external stake through its potential consequences likely to harm people, property and/or environment and safety management as an internal activity, i.e. performed by the hazardous industry itself under the scrutiny of authorities either national or

international or both. However, aligning risk communication stakeholders' concerns around safety understood as a societal stake requires reaching beyond some difficulties.

### **Multiple Interests in Tension with One Another**

The different views of risks to be managed among risk communication actors lead to a variety of interests at play in risk communication. Among these interests, some are clearly conflicting with others. The reasons for these conflicts can be manifold.

They may be related to the scope of risks considered (e.g. individual vs. societal stakes), for common interest is not the sum of individual ones. The time horizon considered may be another source of conflicting interests including for the same risk communication actor. For example, a company may decide to implement a wide safety awareness and training campaign internally following an accident, whereas a longer term view would have led to other kinds of safety measures including possibly organizational or technological aspects to make its efficiency more sustainable.

Eventually, among the most obvious tension between interests is the conflict between the risks associated with an activity and the benefits associated with this same activity. The attitude around the Chevron facility (Baram and Lindoe, *this volume*) is a perfect illustration of the tension between the socio-economic benefit of having the facility located in this region and the risks associated with the operation of such facility. Likewise, most individuals tend to less and less accept contingencies and risks but are not ready to live without the comfort brought by these same hazardous activities (electric power, cheap food, transport, cf. Bouzon 2001).

These contradictions are no surprise but cannot be overlooked when addressing risk communication as a pillar of improved risk governance and safety management. They are “not the sign of error in complex thinking, but rather that we have reached a deep layer of reality which, because it is deep, cannot be translated in our logic” (Morin, 2005, p. 92).

### **Complex and Dynamic Exchanges Between Complex and Dynamic Actors**

“It is not simply the human society that is complex, but each atom of the human world.”  
(Edgar Morin, 2005, p. 78)

In reality, the interests considered in risk communication not only vary from one actor to another but they may also vary for the same actor in different contexts. Indeed, humans are complex beings (organization or institutions complex bodies). The same individual may sometimes think and act as a local resident considering safety in a rather limited sense (his/her safety risks managed by his/her decisions)

and sometimes as a citizen or even a human being with a much broader scope and far-reaching considerations on safety. “The most daily life is a life where each person plays several social roles whether s/he is at home, at work, with friends (...) Each human being has a variety of identities, a variety of personalities in him/herself.” (Morin, 2005, pp. 77–78) (Fig. 3).

**Fig. 3** Multiple influences and social roles of an individual



**Fig. 4** Multiple roles and influences of a hazardous activity company or facility



**Fig. 5** Multiple roles of government



Likewise, hazardous industry/activity facilities play many roles, partly conflicting with one another, such as economic actor, employer, competitor, socially responsible, etc. (Fig. 4).

The same applies to the government combining several partly contradictory stakes like citizen protection, environment protection, economic development, foreign affairs, climate change, etc (Fig. 5).

With this in mind, claiming that risk communication is a pillar of risk governance and safety management assumes that risk communication stakeholders only and naturally play the social role of citizens or human beings for individuals, safety responsible for organizations and citizen and environment protection for the government. This assumption either denies the multiplicity of roles of risk communication stakeholders, i.e. oversimplifies the complexity of reality, or considers that these roles naturally align when it comes to risk communication.

Yet, such an alignment is far from being natural. Indeed, whereas people tend to look for certainties (Morin, 2001), safety, especially considered with a broader scope, carries lots of uncertainties (e.g. whether an accident will happen or not, when it will happen if at all, what will be the actual reach of its impact, etc.). Therefore, risks with more direct and certain impacts (e.g. loss of property value or public demonstrations affecting reputation or operations) are more easily and generally considered. Individuals then play the role of local resident more easily than citizen or even human being that rely on a higher level of abstraction. Likewise, organizations are managed through a set of indicators, most often short-term and certain or at least easily quantified in which safety is not always represented or does not necessarily fit, apart from the compliance with regulatory requirements that is easy to assess. The same happens at government level through the multiple roles and stakes managed simultaneously.

To this complexity of risk communication actors, adds the complexity of communication practices increased by new communication means and channels and the dramatic acceleration of pace. Interestingly, in the examples provided by the various previous chapters, the more distant an individual from the potential direct safety consequences, the more likely s/he is to adopt a social role adapted to managing the societal and global views of safety. In the Daniel case, for example, the journalist is neither a direct nor indirect victim nor related in any way to the victim except through their citizens and human beings' status. Likewise, in aviation, the bloggers or other newcomers (e.g. aviation passionate) on the risk communication scene keeping controversies alive on global issues like automation do not express themselves as potential victims directly exposed to possible associated hazards. They contribute to the debate as citizens and human beings. From these examples, it seems that being selfless, free from direct individual stakes (negative risks or positive benefits) related to a hazardous activity or facility, may help contributing to a risk communication focused on risk governance and safety management in a societal sense. To what extent can these observations be generalized? Can the number of selfless sources/actors engaging in risk communication

be increased? Under what conditions can risk communication actors have a more selfless contribution to communication around risks? These are questions that still need to be investigated.

### **Appreciating Safety: The Challenge of Navigating Uncertainty**

Eventually, beyond these challenges is another difficulty related to the concepts of risk and safety themselves. Both are closely related to uncertainty, a world most people are not so comfortable with, with no ontological status (Njå, 2017). As such, risks cannot be literally and objectively measured even though they are assessed. They are about the future, whereas loss of property value or financial results, for example, are facts and can easily be measured. “Safety is a dynamic non-event” as stated by Weick and Sutcliffe (2001). This specificity makes it extremely challenging to appreciate the level of safety of an organization or an activity or a region. Safety ‘indicators’ struggle to find a balance between their realism (reflecting the complexity of what actually takes place in an organization and how it contributes to safety) and easiness to handle (number of accidents—extremely rare events in already safe activities with a stochastic dimension—or incidents—with all the known drawbacks such as the non-reporting risk, etc.).

Several ways forward can be envisaged to partly overcome this challenge of navigating uncertainty. Combining all the knowledge, not only the academic and scientific one held by recognized experts but also the one held by the public, including more practical and situated knowledge and information is a way to reduce part of the uncertainty and better inform any decision. By encouraging the public to participate in radioactivity measurement, the IRSN ultimately has access to a formidable source of data that would not be accessible without involving citizens. However, uncertainty cannot be totally eliminated and talking about risks and safety in terms that everyone is comfortable with remains a challenge.

### ***Towards More Collectively Responsible Risk Governance and Safety Management: A Matter of ...***

#### **Trade-Offs**

Each individual or organization or institution manages, in reality, a combination of risks, safety risks being ones among others, to come up with ‘acceptable’ trade-offs, ‘acceptable’ meaning acceptable to them. When it comes to safety though, the impacts of an accident may affect a number of parties and ‘acceptable’ needs to be discussed. The challenge of risk communication for risk governance in ‘peace time’ could be summarized in an equation:



$$\begin{matrix} \text{Multiplicity of} \\ \text{communication actors} \end{matrix} \times \begin{matrix} \text{Multiplicity of individual} \\ \text{interests for each of them} \end{matrix} = \begin{matrix} \text{Common interest} \\ \text{for something uncertain} \end{matrix}$$

Stated this way, it seems like an impossible equation, and it may well be. Nevertheless, one can try to tend towards a common interest for something uncertain. It becomes less challenging in emergency situations where most of the uncertainty is removed and interests converge more easily towards saving lives immediately threatened.

More generally, contributing to risk governance and safety management (with a societal view of it) would require for risk communication to come up with options/decisions that would align the citizen and human-being, safety responsibility ... views of all and make it an acceptable trade-off to each actor (Fig. 6). Easily said, not so easily done.

By promoting the idea that an organization should be responsible for the consequences of its decisions, the attempt of the Corporate Social Responsibility notion was to make this Socially responsible role of industries and organizations prevail over the others. In that sense, it went into the right direction despite all the shortcomings such statement may include in particular with respect to the multiple uncertainties especially related to the future. However, there is no equivalent at individual level even though similar conflicting interests exist and may lead to overlooking the safety aspects and only contemplate the benefits. The race for the lowest costs possible in many deregulated domains involving hazardous activities such as commercial aviation may ultimately have an impact on decisions related to safety. Even if the impact of an individual decision is significantly more limited than that of a company or an industry, the combination of a number of similar

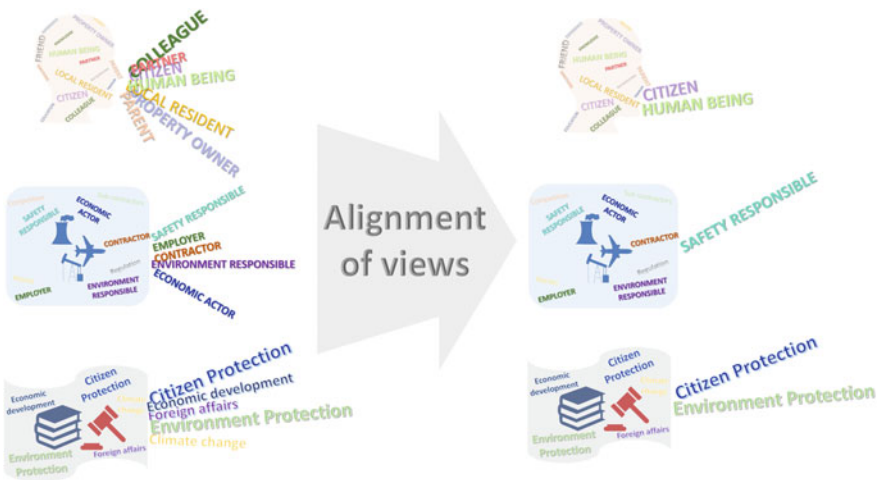


Fig. 6 A required alignment of views among the various stakeholders

individual decisions may have an important weight (like it has in voting). Therefore, finding a way to give the citizen and human being roles a certain weight over the short-term consumer's one at individual level in risk communication seems an important condition to make risk communication a contributor to enhanced risk governance and safety management. Would an individual social responsibility concept make sense? How could it be implemented?

### **Distributed and Dynamic Information, Knowledge and Expertise**

With the multiple sources of complexity mentioned earlier, governing risks and managing safety are not exact 'sciences'. Therefore, multiplying the sources of information, knowledge, perspectives is key to develop as complete a picture as possible and make it evolve as time goes by and conditions and/or knowledge evolve.

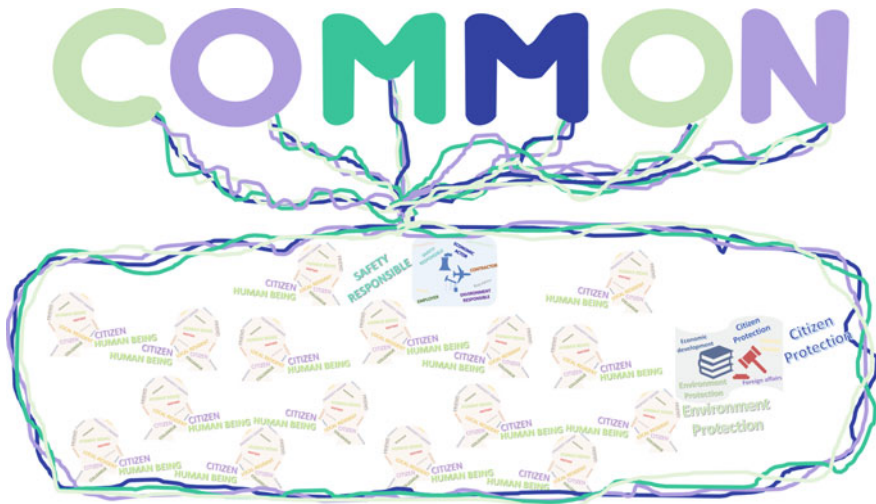
As illustrated in the previous chapters, relying on the public at large allows for having access to unprecedented data both in volume as in the case of personal radioactivity counters (Baumont, *this volume*) and in content, for example, in contextualized qualitative insights as in the Ebola outbreak (Bastide, *this volume*) or the post-Fukushima cases (Nishikawa, *this volume*). In other words, qualifying the notion of expertise and opening it to a wider understanding where several types of expertise in several domains are recognized and valued is a starting point. It allows to reach beyond the 'official' expertise and benefit from the combination of a variety of information, perspectives and expertise needed to apprehend the complexity of actual operations, hazards and the contexts (local, global, etc.) in which they take place.

Thus, the trade-offs and decisions can be contextualized, i.e. account for specificities, and be made flexible enough to be revisited when the context or knowledge evolve, making them eventually more efficient.

In addition, the contextual knowledge and expertise may also enhance the safety of daily operational or practical activities. The role played by local residents in the Paris attacks in 2015 provides an illustration of a crisis situation. But even before any event occurs, the public may play a key role. As an example, a study on medication errors showed that in 11% of the cases where patients were provided with the wrong medication, they detect it themselves and contribute to recovery before any unwanted event (Chenaud, 2011). Eventually, a wider involvement of the public allows for enhancing safety in many ways, from governance to operational practice.

### **Ownership and Empowerment**

Some people consider the challenge of risk communication to be related to the lack of expertise in the technical field to allow for exchanges between the public, government and hazardous industries (Bouzon, 2001). They propose to focus the



**Fig. 7** Common decisions being acceptable trade-offs for each stakeholder

effort on popularizing the technical and scientific elements allowing for understanding the hazards. Yet, part of the challenge may be elsewhere. Indeed, as mentioned earlier, people tend to look for certainties. Therefore, the uncertainties inherent to risk and safety make them difficult subject for most people to live with and communicate about. Beyond widening the scope of knowledge, information and expertise accessible to inform decisions, widely involving the public is also a way to give people some control over their fate (thus, to make uncertainty and risk more tolerable, see Sand, 2017) not only in the present but also in the future. Risk communication can indeed be seen not only as a contributor to managing the present but also building the future, the driving question then being: what future do we collectively want more than how to cope with today’s risks? (Weick and Sutcliffe, 2015) (Fig. 7).

## Conclusion

Risk communication is not naturally exclusively driven towards risk governance and/or safety management, if at all, for many reasons. First, risks and safety as understood by various risk communication actors may vary depending on the scope, time horizon and perspective considered. Therefore, the risks addressed by the ones engaging in risk communication are not necessarily focused on risk governance or safety management in a global sense, i.e. at societal level or beyond.

Second, risk governance and safety management are extremely challenging activities for they take place in a broader context where a number of objectives are competing with one another and refer to uncertain phenomena that are difficult to

appreciate. A non-directive and wide risk communication as it partly takes place today in reality beyond formal information forums could become an efficient contributor to risk governance and safety management in many respects. Indeed, it would allow for widening the scope of information, knowledge, expertise both theoretical but also practical, local and cultural, thus better inform decisions and improve practice. In addition, it would give the public some control over their fate by becoming involved in risk governance and safety management rather than just being informed, thereby making risk more tolerable.

Third, individuals such as industrial or governmental actors are complex beings and bodies. They play several social roles depending on the context and their mood and permanently manage several interests partly conflicting with one another, safety being one among many others. Therefore, focusing the exchanges on safety-related matters requires a certain societal and even more global responsibility both individual, corporate and governmental to allow for useful and constructive debates to take place.

Eventually, risk communication as a pillar of enhanced risk governance and safety management is to be seen as a mutual exchange and learning opportunity whereby viewpoints are confronted, enriched and refined and people are given some control over their fate. The objective is to reveal dilemmas and eventually converge towards respectful trade-offs, thus making risk communication a deepening of democracy. Risk communication would then translate into an open co-construction of both the risk picture/safety stakes/overall context and a contributor to risk governance and safety management for the present and for the future. Trade-offs and decisions would be the result of the social negotiation and construction involved by risk communication as a driver of a global societal responsibility at all levels.

Taking the risk communication challenge and opportunities seriously is not obvious and still requires some research and experiments. It involves bringing the stakeholders, all of them, earlier in the risk governance and safety management processes. As a preliminary, it requires an analysis and mapping of all the actors that can contribute to safety, reaching beyond the usual scope. It means identifying the many people who have information, knowledge, ideas and/or are dissatisfied, and incorporating them from the outset in the risk governance and safety management development processes, and even further, in the development of technologies and industrial strategies. It also means acknowledging from the outset the various roles each of them can play.

Some initiatives are already attempting to address parts of the challenges mentioned before but do not combine them all. Addressing simultaneously all the challenges still remains to be explored ... Making risk communication evolve towards this key role in risk governance and safety management—and even further—may even require some flexibility to switch from one model to another depending on the situation's requirements. Yet, citizen involvement in societal safety seems a promising way to evolve from an 'annoying people' perspective to a brighter side of wider involvement eventually enhancing safety.

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