

Strategic crisis management in the European Union

25 March 2022

Expert workshop report

SA  EA

Science Advice for Policy by European Academies

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About SAPEA

SAPEA brings together outstanding expertise from natural sciences, engineering and technology, medical, health, agricultural and social sciences, and the humanities. We draw on over a hundred academies, young academies and learned societies in more than 40 countries across Europe.

SAPEA is part of the European Commission's Scientific Advice Mechanism. Together with the Group of Chief Scientific Advisors, we provide independent scientific advice to European Commissioners to support their decision-making.

We also work to strengthen connections between Europe's academies and Academy Networks, and to stimulate debate in Europe about the role of evidence in policymaking.

Europe's academies draw on the best scientific expertise to provide independent, balanced and authoritative scientific advice. This approach makes SAPEA a critical source of evidence for policymakers and the wider public.

Our Academy Networks collectively represent over a hundred academies, young academies and learned societies across Europe. SAPEA works to strengthen these academies and provides a means for close collaboration in a unique and interdisciplinary way.

For further information about SAPEA, visit www.sapea.info.

Summary

The expert workshop is a vital part of SAPEA's evidence review process. It provides a critique of the draft SAPEA Evidence Review Report by the wider expert community.

The workshop on strategic crisis management in the EU was held on 25 March 2022 as an online meeting. Participants included the invited experts, members of the SAPEA working group, SAPEA representatives, the Group of Chief Scientific Advisors to the European Commission, and staff of the European Commission.

The workshop format was as follows:

- After a general introduction to the Evidence Review Report, a keynote speaker presented an overall assessment of the report, with initial observations on strengths, possible limitations and gaps.
- Each of the main chapters was then introduced, followed by feedback from an invited discussant and then an opportunity for open discussion.

The suggestions for improvement to the draft Report are summarised at the end of each section (below).

After the workshop, members of the working group considered the feedback and agreed on the actions that should be taken to address it. The draft Evidence Review Report was then revised, prior to undergoing formal peer review. The final version has been published as a SAPEA Evidence Review Report, and is available on the SAPEA website.¹

Introduction

SAPEA's expert workshop is a vital part of the evidence review process. It fulfils several purposes:

- providing a critique of the draft SAPEA Evidence Review Report (ERR) by the wider expert community. Invited experts to the workshop give informal feedback, offering constructive input to the working group that is producing the ERR
- bridging from the evidence review stage to finalising the policy recommendations of the Group of Chief Scientific Advisors to the European Commission, who provide a Scientific Opinion for the European Commission

¹ <https://sapea.info/topic/crisis-management/>

Context and scope

- developing further the case studies, conclusions and evidence-based policy options in the Evidence Review Report

Experts attend and give their views in a personal capacity and not as representatives of their employer or any other organisation with which they are associated. Chatham House rules are observed, with no attribution to any individual.²

This workshop was conducted entirely online. A list of attendees is given on page 28.

Context and scope

The Group of Chief Scientific Advisors provides independent scientific advice to the European Commission. The Advisors work closely with the SAPEA consortium, which conducts comprehensive reviews of the evidence.

The [Scoping Paper](#)³ for the topic *Strategic crisis management in the EU* sets out the formal request for advice from the College of European Commissioners to the Group of Chief Scientific Advisors. The Evidence Review Report by SAPEA synthesises the evidence, in response to the main question from the scoping paper:

Based on a broad and multidisciplinary understanding, how can the EU improve its strategic crisis management?

Report of the workshop

The programme for the workshop is on page 27. A summary of each session is given below.

Welcome

Participants were warmly welcomed. They included invited experts, members of the working group and SAPEA representatives, the Group of Chief Scientific Advisors and staff of the European Commission (see page 28 for a list of attendees).

² More information at: [Chatham House Rule | Chatham House – International Affairs Think Tank](#)

³ https://ec.europa.eu/info/sites/default/files/research_and_innovation/groups/sam/scoping-paper_crisis-management-in-the-eu_june_2021.pdf

Quick overview of the Scientific Advice Mechanism, the need for this Scientific Opinion and the role of SAPEA

The work of the Scientific Advice Mechanism is based on sound scientific evidence, using robust methods such as peer-reviewed literature. The outputs rely on a combination of published evidence, expert knowledge and experience. The role of the Group of Chief Scientific Advisors is to make policy recommendations separately from the evidence base, which is assembled by SAPEA.

Given recent crises like COVID-19 and the war in Ukraine, the topic *Strategic crisis management in the EU* is critically important. At the time of deciding on the topic, the COVID-19 pandemic was at its height but the invasion of Ukraine had not yet taken place.

Introduction to the Evidence Review Report

The scoping paper sets out the questions to be addressed, and was drafted against the backdrop of the COVID-19 crisis. The pandemic has raised a large number of issues that go beyond health, including social and economic inequalities. Since February 2022, the war in Ukraine has led to an influx of refugees into Europe. Another crisis is global warming, and the COP26 Conference in late 2021 highlighted the need for adaptation to a changing climate. The latest IPCC report (*Climate change, 2022*) states that we are at a tipping point, with the threat of more extreme events.

It is no longer possible to focus solely on one crisis. Multiple crises are running in parallel, and are often entangled. Crises can be transboundary in nature, requiring international coordination and alignment. The ERR tries to make sense of the evidence, and presents a set of evidence-based policy options. It conveys a sense of urgency and gives actionable suggestions. The ERR strives to be as generic and cross-cutting as possible, with insight from practical examples and case studies. It has tried to identify lessons learned that are not yet standard practice, as well as highlighting gaps in the scientific evidence. The emphasis is on strategy, and not on operations. Some of the preliminary findings include:

- Complexity and cascading effects are becoming the norm, and we have to be ready for a series of transboundary crises.
- There is a need for some degree of centralised coordination, whilst acknowledging the importance of local context and capacity.
- There is a requirement for training at all levels.

Keynote

In this session, an invited keynote speaker presented an overall assessment of the report, with initial observations on strengths, possible limitations and gaps.

Summary of the keynote presentation

The ERR demonstrates an admirable level of interdisciplinarity and a balance of perspectives, with an impressive bibliography. The ERR highlights areas of consensus, as well as those that are still under debate. The three case studies are interesting, given that much of the published literature tends to take a sectoral view. The structure of the ERR is very clear. The chapter on Participation, Trust and Equality (Chapter 6) is very interesting, as this aspect is not always seen in the literature on crisis management.

A clear roadmap for action is provided. Mentions of protracted crises and long-term crisis management performance are good. It is true that several concurrent or simultaneous crises can overwhelm crisis management infrastructures. However, sometimes such crises are *not* linked, and this could be added to the report. It is clear that we should rethink the conventional and often sectoral approaches to crisis management, offering novel approaches that capture the dynamics and interdependencies of crises at different levels and scales. Response diversity is key, even though some degree of standardisation is needed so that everyone speaks the same 'language'.

It is true to say that vulnerabilities are not always spread equally; the section on spatial inequalities is well done. It would be helpful to look at the *Global assessment report on disaster risk reduction*, conducted by the UN Office for Disaster Risk Reduction (UNDRR, n.d.). They have produced excellent risk indicators in a non-conventional way; for example, the notion of extensive and intensive risk. Extensive risk is absorbed by the lower-income population and leads to impoverishment. Extending the evidence findings from risk management to crisis management is an interesting approach that leads to the idea of a risk-crisis continuum.

Chapter 7 covers data gathering and sharing, along with tools. Tools are very important but the challenge is to create dynamic data, not just static information. It would be helpful to look at the infrastructure called Disaster Aware, run by The Pacific Disaster Centre.⁴ This platform links risk knowledge with crisis management data in one database, which is unique. It also has powerful modelling tools and it monitors 24 different types of hazards. It is also formatted to produce information for crisis managers, to help them make decisions. It demonstrates the risk-crisis continuum at work. It has been made available

⁴ <https://www.pdc.org/disasteraware/>

to the UN Office for the Coordination of Humanitarian Affairs (OCHA⁵), and they have also customised it to meet different needs.

Regarding the clustering of risks into four main groups, the second of these (societal risks) could be questioned as to whether this should be a separate grouping. On risk perception, the notion of 'organised ignorance', put forward by Scott Frickel (2007), as well as the sensemaking process (Weick, 1995), should be mentioned. There is also important work done by Adrot (2013) on improvisation. It is difficult to know if a crisis has been well-handled. 'Uncertainty' should be considered as a methodology by which to think about crisis and its management. Uncertainty is often a blind spot and not addressed adequately in training. The work of Magali Reghezza (2019) and Michel Callon et al. (2009) is interesting in this regard. There are differing types of uncertainty; decision-making has to adapt to this. Different types of knowledge may be required for various types of risk or crisis. For example, for a creeping crisis, a database is needed. A conceptual framework could bring together types of knowledge and crisis (type, scale and duration). The notion of 'anticipation' could be developed more, according to whether it is long-term or short-term. Anticipation can differ according to professional background or the sort of government ministry involved. This could also be integrated into the framework. A paper is available in French (November et al., 2020) and shortly in English (forthcoming).

The suggestion for a European crisis governance and risk management board is a good idea; however, the devil is in the detail. One question is who would work on a coordination board — would it be permanent staff? At what level (strategic or operational)? What sort of training would they need?

Finally, there is the de-escalation of a crisis — how to define when something is no longer a crisis and how to return to a 'normal' situation is not covered extensively in the literature. It can lead to creeping and latent risks, as we see with COVID and other crises.

Response and discussion

Recognition of the need to link risk and crisis is appreciated, as well as recovery and the fact that this is covered less in the literature. The new taxonomy put forward in the ERR has been inspired by the rise of polycrises. The term 'social' risk was chosen because most risks start with a natural or technological hazard, which then becomes amplified within the social and political domains. Some risks are generated within social discourse itself and this has not been highlighted before; the crisis in Ukraine is an example.

Further clarity was requested about the degrees of uncertainty and its framing. The keynote speaker responded that differing levels of uncertainty can lead to different types of decision-making. Sometimes, uncertainty results in waiting or pausing, and this is also

⁵ <https://www.unocha.org/>

Report of the workshop

considered to be a type of decision. It may also involve collecting more data, or gathering it differently, or monitoring a new domain. Uncertainty affects the decision-making process.

Summary of recommendations

The following to be considered:

- mention that sometimes crises are *not* linked
- add suggested references on risk assessment and risk indicators
- add suggested references on data platforms and data modelling
- whether the cluster on 'social/societal risks' is appropriate
- provide reference to differing types and scales of uncertainty
- mention the term 'anticipation' within the framework
- add further detail about the suggested management board, such as composition, remit and training
- include the de-escalation of a crisis and return to 'normality'

Concepts and frameworks (Chapter 2 of the Evidence Review Report)

Introduction

Chapter 1 outlines the nature of strategic crisis management, and Chapter 2 takes a pragmatic approach to highlighting how key concepts interrelate. It provides brief definitions, recognising that there are differing academic views on the concepts. Chapter 2 aims to provide an integrated framework, with a set of key principles.

Summary of comments by the discussant

The chapter is clearly structured, showing how the different terms are connected. It also shows the increasing importance of transboundary and cross-sectoral crises. The term 'prevention' is not used in Chapter 2 but it is elsewhere in the report. This omission should be addressed, as it is important to include it as part of the crisis management cycle. Preparedness stems from prevention.

Response and discussion

There are many risk, disaster and crisis management cycles in the published literature; the differences between them could be mentioned. Attention will be given across the chapter to ensure the consistency of terms and definitions.

A discussant raised concern over the definition of 'resilience', which is more a definition of 'robustness'. Instead, 'resilience' is the ability to recover and adapt in critical functions. 'Absorption' is seen as the ability to slow the degradation of critical functions. It would be worthwhile to check the definitions of the National Academies (National Research Council, 2012). Another discussant noted that transatlantic views can differ from European; there is considerable academic debate, and it is appropriate that this is not covered in great detail.

The response was that 'resilience' is highly contested, which is why there is a broader section dedicated to it in the ERR. Extensive literature was considered, both to consolidate and note divergences. This will be looked at again.

A discussant stated that risk and crisis management are fundamentally different, and this needs more coverage in Chapter 2. 'Risk' is about trying to stop bad things happening, whereas 'crisis management' is about reacting and recovering. 'Strategic crisis management' concerns the ability to facilitate recovery and adaptation, and enhance resilience within the system. Risk management as a tool to handle crisis management may not be sufficient. There is a need to incorporate other tools, including resilience management, supported by resilience analytics. A framework needs to highlight the similarities and differences between risk and crisis management. It was acknowledged that this is an important point and, in addressing strategic crisis management, more emphasis could be given to how the different fields relate. 'Scale' refers not just to the response but the whole trajectory of the response, and this could be made clearer. The European Green Deal⁶ is an example of a response to COVID recovery.

Summary of recommendations

The following to be considered:

- include 'prevention' within the list of terms and definitions
- revisit the list of terms and definitions and ensure consistency throughout the ERR

Risk management in the EU (Chapter 3 of the Evidence Review Report)⁷

Introduction

Chapter 3 is a fresh look at risk management, with a link to Chapter 4, which considers the EU as a crisis manager. The chapter includes a new typology of risks and hazards within the context of polycrises, and their interaction across different domains. It suggests a

⁶ https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

⁷ Subsequently changed to Chapter 4 in the published ERR

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better way of managing risks, and the importance of risk perceptions, framings, narratives and communication. It includes risk governance at EU level.

Summary of comments by the discussant

The chapter is well written, but is primarily focused on risk. Risk and resilience are both required for crisis management, but in the correct balance to achieve robustness (i.e., hardened systems so their functionalities are not degraded) or resilience (i.e. the ability to recover and adapt critical functions following their degradation). References to 'resilience' are rare and used inconsistently across the report, whereas 'risk' is mentioned many times. Resilience is equally important to risk; risk and resilience should not be conflated. Investment in resilience is essential, and systems should be designed to be resilient. Resilience-by-intervention and resilience-by-design (Linkov, Trump, Golan & Keisler, 2021) and stress-testing for the resilience of critical infrastructure (Linkov et al., 2022) are vital.

A crisis can be seen as a turning point, an opportunity to move towards better — or worse — conditions. Risk management is different from crisis management. Risk management starts with the idea that a system is functional but may be vulnerable; resilience starts when a system has already failed. Risk management is usually focused on mitigating threats and reducing vulnerabilities, which is too expensive for governments to deal with for low probability/high consequence events (Bostick, Connelly, Lambert & Linkov, 2018). Modelling, which is at the core of risk management, cannot give a true prediction of the future when underlying mechanisms of systemic processes are changing.

A shift from risk management to crisis management is in the use of resilience. Measuring resilience involves both model and metric-based approaches, as well as decision analytics, some with an AI-driven approach. Resilience can be built by design (so that a system can recover its critical functions) or by intervention (through envisioning external resource that enables the system to recover). Stress-testing is essential, such as what was seen with the financial/banking infrastructure, following the financial crisis of 2007-09. The vision for resilience is to transition from a highly complex world to a system of networks (including social); to quantify resilience; and to know where to act. We need to shift from an emphasis on risk, towards a greater balance with resilience, achieved through analytics. Resilient teams need both inclusiveness and diversity. At governance level, it needs a mix of 'soft' and 'hard' law.

Response and discussion

More emphasis will be put on resilience management. A risk or threat involves an agent and an object or target; risk assessment examines the interaction between the agent and the target. There are different types of management, and in the EU the emphasis is on prevention. With multiple and cascading risks, it becomes more difficult to identify risk

agents. Resilience then becomes much more important. There has been a push towards very lean systems that are not built for adaptation; this could be mentioned in other parts of report.

A discussant suggested renaming the chapter. For government decision-makers, it is important to be very clear; they have to see and understand the differences between risk and resilience, and why change and investment are needed. There is a paradigm shift from risk management to resilience management. Resilience analytics will help governments to justify the necessary investment.

Summary of recommendations

The following to be considered:

- a greater balance throughout the report between 'risk' and 'resilience', with more emphasis on 'resilience management' and appropriate analytics

Crisis management and governance in the EU (Chapter 4 of the Evidence Review Report)⁸

Introduction

The chapter is structured around three different crisis types:

- an EU Member State is overwhelmed
- a transboundary crisis
- a crisis external to the EU

It examines the EU capacities for dealing with them. The EU was not set up to manage crises; rather, this was the prerogative of the Member States. Over time, it has built capacities, through incremental steps. The EU is becoming a crisis manager in a way that it was not designed to be.

Summary of comments by the first discussant

The EU's response is seen most often during 'fast-burning' crises, such as COVID, hurricanes, terrorist attacks. A major challenge is for the EU and the Member States both to have power during a major crisis. Power-sharing is therefore an issue; how does the EU acquire more capability and how is it used? As the EU becomes more integrated, it also becomes more vulnerable. It would be helpful to consider and explain why some of the EU-created crisis management structures are not used to their fullest extent. Consider,

⁸ Subsequently changed to Chapter 3 in the published ERR

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for instance, the Recovery and Resilience Facility (RRF⁹); this could link to the coverage of resilience that is made elsewhere in the report. Existing institutional structures have been built on as a consequence of COVID (Vanhercke & Verdun, 2022). The view that the EU was never intended to be a crisis manager depends on one's analysis and theoretical understanding of European integration. The founding fathers of the EU anticipated transboundary challenges and the need for supranational institutions. This could be highlighted more, although it is difficult to know when the EU would be in such a position. The chapter could link more to others that mention resilience, earlier major crises and governance responses. The EU needs to be more effective in terms of gaining greater public support. Acquiring more competence in the EU can only be done with increased public support. Issues of legitimacy, accountability and democracy should be mentioned briefly.

Summary of comments by the second discussant

The EU's crisis management is rather limited, and Member States do not request help very often. What is the way forward? How do 'top-down' and 'bottom-up' systems in Europe match to the requirements? The report focuses on the highest strategic level, but a lot is happening at the very local level and on the front-line. Crisis management is focused largely on a decentralised approach and work in the field. How can that work be supported by means of designing a more resilient system? We should examine how it works now, and compare it to the design principles of a truly resilient system. How much redundancy is there, what is the buffer capacity, how flexible is it, how diverse, how robust, how does it deal with multiscale problems? Crisis management on the frontline is performed by a diversity of practitioners and volunteers. There is a disconnect between crisis management at the EU level and work being done in the field. This is not only a problem at EU level, but also nationally. Therefore, look at how resilient the EU crisis management system really is and how it can be improved.

Response and discussion

It is difficult to find actual data on public support for EU crisis management; a discussant suggested the recent Eurobarometer survey.¹⁰ In terms of governance, we have to consider how the EU really works; it is more a coordinating than a federal system. A redesigned EU crisis management system would need to be complementary to that of the Member States; complete centralisation of power will not work. Evidence on this

⁹ https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility_en

¹⁰ <https://www.europarl.europa.eu/news/en/press-room/20210504IPR03427/eu-survey-highlights-support-for-greater-crisis-management-role-at-eu-level> and https://ec.europa.eu/commission/presscorner/detail/en/IP_17_1201

could be mentioned more in the report, as the EU is interested in the debate around (de)centralisation.

A discussant noted that centralisation brings efficiency but reduces resilience. Specifics are needed on what mechanisms should be put in place, what combination of soft/hard laws, how to assess the optimal amount of (de)centralisation. For this, we need a quantification of risk, resilience and associated trade-offs.

A discussant suggested that clearer advice is needed on the next steps for the EU. The report mentions a crisis management agency in one chapter, and this could be reinforced across other chapters. The EU has done a lot already, but not enough use is made of what is there. For example, 7000–8000 people have been trained through the Civil Protection Mechanism;¹¹ collective knowledge could be channelled through that, and resources used in a more creative way. Either reinforce the Civil Protection Mechanism with a more strategic approach, or create a different agency. This institutional debate could be reinforced within the report.

A discussant proposed that the report look at the notion of networked organisations. Consideration could be given to the diversity of organisations that need to be involved in crisis management and what integration mechanisms are required within the system. The EU can have role in thinking about how these diverse sets of people can work together. There are models like FEMA in the USA.¹²

The respondent noted that discussion of (de)centralisation had taken place, particularly around the coordination role of the centre. In crises, authority has to be delegated to where the action is. It would be a good idea to look at the existing mechanisms in more detail. A link could also be created to Chapter 6 and 'participation', particularly how to embed volunteerism into a crisis response.

Summary of recommendations

The following to be considered:

- explain why some of the EU-created crisis management structures are not used to their fullest extent
- refer to the Recovery and Resilience Fund (RRF)
- mention the founding principles of the EC in tackling transboundary challenges
- create more linkages to other chapters that mention points relevant to Chapter 4
- mention issues of public support, legitimacy, accountability and democracy
- how to design support to local, in-the-field crisis managers

¹¹ https://ec.europa.eu/echo/what/civil-protection/eu-civil-protection-mechanism_en

¹² [FEMA.gov](https://www.fema.gov)

- how to make better use of existing trained professionals and their collective knowledge

Policy advice in times of crisis (Chapter 5 of the Evidence Review Report)

Introduction

This chapter considers the role of science advice and experts in advising policymakers and crisis managers. SAPEA already published a report in this area (SAPEA, 2019), which is cited in this report. The chapter takes the five functions already discussed in the other report and considers them in the context of crisis management. Science advice here is very goal-oriented, as well as needing to improve processes within a complex advisory ecosystem. A transdisciplinary approach is very important, as well as knowledge from stakeholders and citizens. It is a short but important chapter.

Summary of comments by the discussant

The chapter synthesises a lot of research on the subject. It could consider the distinction between what function science advice *should* have and what it *does* have. For example, science advice bodies may give poor advice or it may be used selectively. The organisations themselves may have their own political agendas. The chapter refers to research on different organisations that provide science advice in Europe, both at EU and national level, but there are organisations that are not listed. It could mention the EU's own mapping of science advice ecosystems.¹³ The L'Aquila case is intriguing, but it would be useful to include a couple more examples of science advice and how it works. Two examples would be the Euro crisis and the role of science advice during COVID. The chapter presents too harmonious a picture of how different sources of knowledge (scientific and stakeholder) work together. Science can be very technical and counterintuitive so not always easily grasped. The public gaze and media attention may easily distort. It is also important to stress the need for the independence and autonomy of science advice, and to safeguard against political pressures.

Response and discussion

There is a need to address complexity and how things work in practice, and also the emphasis on integrity and autonomy. Inclusivity is important, and is taken up in Chapter 6. There is too much emphasis on the taxonomy of functions, and this will be addressed.

¹³ https://knowledge4policy.ec.europa.eu/projects-activities/strengthening-connecting-science-policy-ecosystems-across-eu_en

A discussant mentioned that FEMA is an example of resilience by intervention. During COVID, experts were working for the White House and regional administrators were struggling to get science advice. Scientists may not be able to provide advice at times of crisis, especially within the necessary timescales. It is important to build trust with key policymakers; this takes time. A dedicated body could provide advice to regional administrators or other agencies at a time of crisis. It was acknowledged that combining knowledge from regions or Member States at EU level is a challenge.

Summary of recommendations

The following to be considered:

- the distinction between what function science advice should have and what it does have
- science advisory bodies/organisations that are not listed, including the EU's own mapping of science advisory systems
- a couple more examples of science advice in action, for example, the Euro crisis and COVID
- the possible tension between science and other forms/sources of knowledge and the challenges of synthesis, for example, between local, national and eu knowledge
- the importance of preserving scientific autonomy and independence

Equality, trust and participation during European crises (Chapter 6 of the Evidence Review Report)

Introduction

This chapter looks at social aspects of crisis management. Firstly, it considers social inequalities and their mitigation. Secondly, it examines debates around aspects of trust and distrust, and their importance in designing solutions. Thirdly, it looks at citizen participation and the shift away from the traditional 'top-down' hierarchical approach, often facilitated through online tools. It considers opportunities and challenges.

Summary of comments by the first discussant

The taxonomy of inequalities is well-grouped, but there is a need to introduce race, cultural and religious diversity, perhaps as a cross-cutting theme. Secondly, it is important to look at how they impact on crisis management, and vice-versa. Think of bringing the chapter together through the following groups of themes: access to and cohesion and transparency of information; trust and trustworthiness; coordination and connection. Thirdly, it is important to consider what to *do*, as we need to break the current cycle. The

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chapter could identify interventions that meet the needs of the people who need the support i.e. a neighbourhood approach. It requires a long-term and flexible approach — more participation, more listening, learning and adapting.

Summary of comments by the second discussant

For the crisis manager, it is important to make room for new approaches to governance and for the main players to reinvent their specific role within a crisis. This will not be immediate. It involves training on digital tools and also assessing how stakeholders can work together, recognising their different skills and backgrounds. It will require time and resources. Applying this new governance in a non-crisis situation can help when a crisis then occurs. To succeed, it will require an operational framework and application.

Response and discussion

The three parts are still not sufficiently well integrated within the chapter. It should look beyond solely digital aspects, taking a more inclusive approach to tools that can be used. The chapter can bring in wider aspects of diversity. There are assets that need to be built and then used at a time of crisis; it is an ongoing process to foster trust and participation, so we are ready when crisis hits. The Internet is a public space where things can be done, as well as a sphere for information and misinformation; this aspect will be widened out.

Summary of recommendations

The following to be considered:

- extend the taxonomy of inequalities so include other aspects, such as race, culture and religion; look at the impact on crisis management, and vice versa
- use a set of underlying themes by which to bring the chapter together
- determine what actions and interventions are needed to break the current cycle
- make room for crisis managers and others to reinvent their role, learn about new digital tools and how stakeholders can work together

Intelligence to support EU Crisis Management (Chapter 7 of the Evidence Review Report)

Introduction

This chapter looks at the use of strategic foresight for preparedness, which is difficult to bring into practice. It also considers horizon-scanning and scenario analysis. The key factor is a level of comprehensiveness that reduces uncertainty and enables

decision-making. The chapter also covers training and exercises, education and information. Citizen-generated content is a challenge. Training is needed for individuals and organisations, with results evaluated. The EU is working on harmonisation of data exchange. It need transnational and secure ways of sharing data during crisis, including between sectors.

Summary of comments by the first discussant

Strategic foresight is a critical component of prevention and preparation. Given that uncertainty and instability are the norm, AI should perhaps be considered in creating this foresight. We should think also about how to reach a reasonable compromise between optimisation and agility – between 'good and quick' and 'slower and best'. Should we wait until we have a clearer vision and answer, or try to move more quickly? Decision support involves the human interpretation of massive, heterogenous datasets; automation could also provide data interpretation and decision support. Traditional training approaches offer a low cost-benefit ratio; immersive training exercises via virtual reality and augmented reality are a promising new approach. Data standardisation gives rise to questions about feasibility, particularly since the involvement of volunteers and citizens leads to massive and heterogeneous datasets. The challenge of cybersecurity also has to be considered. Technology is suggested as offering solutions, but we need to weigh up the potential 'costs' to society and the impact on crisis managers.

Summary of comments by the second discussant

The chapter is rich in information but it is not clear that all of it is reaching crisis management professionals. Risk management professionals still turn to classic risk analysis, which is probably not as useful as it used to be. The new ways forward include scenario analysis and other forms of strategic foresight. It would be good to have Civil Protection Mechanism training courses that are more strategic in nature. A European network of risk managers has been trained, but mostly at an operational/tactical level. It could offer a way of providing more skills to policymakers and crisis managers at national and supranational levels. More use could be made of the existing networks to reach professional crisis managers; they are looking for better methods and ways of understanding risk management frameworks. Horizon-scanning is something that could usefully be done at European level. There are decision-support systems that are very elaborate but difficult to use in a fast-burning crisis or in crises where continuous change is not always taken into account by the system itself. Risk communication also has to be cognisant of challenges and concerns, expressed in an effective way to policymakers and citizens. We should also look into enhancing the quality of field exercises; virtual reality has its place and is more mature than it was, but we should not rely on it alone. On data

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standards, the EU is setting up Joint Cyber Unit¹⁴ and we should see what comes out of it. A final point is that we should either reinforce existing institutions with new capabilities, scope and mandate, or establish a new agency or institution. This idea should be strengthened in the key messages.

Response and discussion

A participant asked whether there is any evidence regarding ad-hoc and dynamic databases, and data exchange. The respondent acknowledged that in a complex world, we are looking at a 'system of systems' — a system of interdependent systems. Strategic foresight has to take into account techniques that allow for that. AI and advanced simulation methods can help, and we should continue to develop these. Systems have to be flexible and responsive. We need to move from decision *information* to decision *intelligence*. We should consider expanding training to more people. Field exercises are important, but leaders in policy and crisis management need more training in new techniques, including handling and integrating data for strategic foresight. We need to bridge between the academic world and the field of practice, with strategic work done at European level. There should be coordination of expertise from different levels. The issues around data standardisation are huge.

Summary of recommendations

The following to be considered:

- stress that professionals need new ways forward, including scenario analysis and other forms of strategic foresight, rather than classic risk analysis
- the role of AI, virtual and augmented reality, whilst also acknowledging the potential downsides or 'costs' of more ICT
- more training in *strategic* crisis management
- making better use of existing networks in crisis management
- either reinforce existing institutions or replace them with a new agency

Case studies (Chapter 8 of the Evidence Review Report)

Three case studies presented, with open discussion.

¹⁴ <https://digital-strategy.ec.europa.eu/en/policies/joint-cyber-unit>

Environment (wildfires)

The recent UN Report, *Spreading like wildfire* (UNEP & GRID-Arendal, 2022), provides an update on the analysis of risks. It projects that risks will increase under different climate change scenarios, with particularly high risk in Southern Europe. Recent fires have meant that some Mediterranean countries (e.g. Spain, Portugal) have taken quite substantial steps on proactive measures and upgrading their response capacity. The report suggests there should be five strategies:

- review and analysis
- risk reduction
- readiness
- response
- recovery

These are the '5 Rs'. The European Forest Fire Information System (EFFIS¹⁵) is doing a lot of work on the first of these; Member States deal with the second; RescEU¹⁶ has an increased budget and support for the third and fourth; Member States deal with the fifth. There is a question over whether the EU should do more to help Member States. The UN Environment Programme (UNEP¹⁷) has pointed out that most investment goes into direct emergency response, whereas planning and prevention get little. Money should be redirected towards more proactive work. The EU Green Deal¹⁸ foresees significant tree planting across Europe but this will need to be designed carefully to avoid the risk of creating flammable fuel. On the other hand, the restoration of wetlands will help reduce risk, whilst also reducing land-based greenhouse gas emission and restore biodiversity.

Security (cybersecurity)

Cybersecurity has often been thought of as a nuisance and a cost. Making a system more efficient creates new vulnerabilities; security-by-design should strive to improve processes without introducing new vulnerabilities. Digitisation is non-reversible, and cyber is increasingly connected to the physical world and the Internet of Things. User trust remains surprisingly high; outsourcing can be a double-edged sword. Cyberwarfare is becoming increasingly apparent. We need to enable protection and privacy, whilst cultivating social responsibility and cohesion within cyberspace. We should promote the adoption of strong counter-measures, including certification schemes, especially in the sectors that would benefit most (e.g. transportation, logistics, energy). There should be strong mandates for redundancy, resilience and utmost respect for privacy. We have

15 <https://effis.jrc.ec.europa.eu/>

16 https://ec.europa.eu/echo/what/civil-protection/resceu_en

17 <https://www.unep.org/>

18 https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

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technologies that can achieve both security *and* privacy; tools for crisis management need to be both secure and privacy-enhancing. We need clear steps towards preparedness for a cyber-crisis, identifying issues and infrastructure.

Discussion

A participant asked whether a political focus was needed on data governance in general. The respondent answered that a certain level of privacy could be critical to the adoption of a European scheme. It might be claimed that privacy could be a cloak that hides certain behaviour but there are ways of achieving balance. Another respondent observed that, in a crisis, we would need to have some analogue systems to fall back on (such as radio) and other forms of support. The infringement of privacy can happen in certain crisis situations, and there is a question of how this is balanced with the 'right-to-be forgotten'. A participant asked about security within different sectors. The respondent answered that some sectors are better-prepared e.g. finance. A discussant noted that cyber-resilience is very important. The case study should highlight the interplay between risk management and resilience. The respondent acknowledged that there could be areas where access to sensitive information is permitted, but it has to be done carefully. Regarding sectors, we have to pay attention to where digitisation is fastest and where attention is needed. Cyber-resilience is important.

Health (biothreats)

This case study covers deliberate biothreats. The original request was for cross-border health threats but this is very broad. The risk of biothreats needs more awareness and confidence-building measures. The evidence points to a One Health approach¹⁹. We need to build resilience to deal with health threats and redundancy needs to be built in. The case suggests future scenarios.

¹⁹ https://www.onehealthcommission.org/en/why_one_health/what_is_one_health/

Annexes

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Programme (all times CET)

11:00	Welcome <i>Professor Antonio Loprieno</i>
11:05	Quick overview of the Scientific Advice Mechanism, the need for this Scientific Opinion and the role of SAPEA <i>Professors Maarja Kruusmaa and Antonio Loprieno</i>
11:10	Introduction to the Evidence Review Report <i>Professor Tina Comes</i>
11:20	Keynote: Overview of the Evidence Review Report, with observations on strengths, possible limitations and gaps, with short Q&A <i>Keynote speaker</i>
12:00	Break
12:05	Chapter 2: Concepts and frameworks <i>Overview (5 minutes)</i> <i>Response by discussant (10 minutes)</i> <i>Discussion (10 minutes)</i>
12:30	Chapter 3: Risk management in the EU <i>Overview (5 minutes)</i> <i>Response by discussant (15 minutes)</i> <i>Discussion (10 minutes)</i>
13:00	Break
13:30	Chapter 4: Crisis management and governance in the EU <i>Overview (5 minutes)</i> <i>Response by discussant 1 (10 minutes)</i> <i>Response by discussant 2 (10 minutes)</i> <i>Discussion (10 minutes)</i>
14:05	Chapter 5: Policy advice in times of crisis <i>Overview (5 minutes)</i> <i>Response by discussant (10 minutes)</i> <i>Discussion (10 minutes)</i>
14:30	Break
14:35	Chapter 6: Equality, trust and participation during European crises <i>Overview (5 minutes)</i> <i>Response by discussant 1 (10 minutes)</i> <i>Response by discussant 2 (10 minutes)</i> <i>Discussion (10 minutes)</i>
15:10	Chapter 7: Intelligence to support EU crisis management <i>Overview (5 minutes)</i> <i>Response by discussant 1 (10 minutes)</i> <i>Response by discussant 2 (10 minutes)</i> <i>Discussion (10 minutes)</i>
15:45	Break
15:50	Chapter 8: Case studies <i>Overview of case study 1 by lead author (5 minutes) and discussion (up to 10 minutes)</i> <i>Overview of case study 2 by lead author (5 minutes) and discussion (up to 10 minutes)</i> <i>Overview of case study 3 by lead author (5 minutes) and discussion (up to 10 minutes)</i>
16:35	Next steps and final remarks <i>Professor Antonio Loprieno</i>

List of attendees

Invited experts

- Professor Frederick Benaben, Professor, IMT Mines Albi - Industrial Engineering Research Center
- Commander Bert Bruggemans, Chief Fire Officer for the Antwerp Fire Service
- Dimitri De Fré, Disaster Management Coordinator, Leuven University Hospital
- Dr Bernard Guézo, Expert in urban vulnerability and territorial resilience of local areas, French Association for the Prevention of Natural and Technological Disasters (AFPCNT)
- Dr Igor Linkov, Risk and Decision Science Focus Area Lead with the US Army Engineer Research and Development Center, and Adjunct Professor, Carnegie Mellon University
- Professor Valérie November, Director of Research, CNRS
- Federica Ranghieri, Senior Urban Specialist, World Bank
- Professor Jozef Ristvej, Professor of Crisis Management, University of Zilina
- Professor Amy Verdun, Professor of Political Science, University of Victoria

Working group members

- Professor David Alexander
- Professor Arjen Boin
- Professor Tina Comes (Chair)
- Professor Thomas Elmqvist
- Professor Mattia Fochesato
- Professor Dr Dirk Helbing
- Professor Dominika Latusek-Jurczak
- Dr Eija Meriläinen
- Professor Simo Nikkari
- Professor Panos Papadimitratos
- Professor Orwin Renn
- Professor David Rios Insua
- Dr Enrico Zio

Members of the Group of Chief Scientific Advisors

- Professor Nicole Grobert (Chair)
- Professor Maarja Kruusmaa
- Professor Eric Lambin
- Professor Nebojsa Nakicenovic

European Commission staff

- Alessandro Allegra, DG RTD
- Lucia Aspiroz DG RTD
- Max Brandt, DG HOME
- Leonard Engels DG RTD
- Massimo Farrugia, EEAS
- Olimpia Imperiali, DG ECHO
- Lina Lietzen, EEAS
- Scira Menoni, DG RTD
- Jan-Marco Mueller, EEAS
- Amelia Neascu, EEAS
- Anja Palm, EEAS
- Marzia Santini, JRC, DRMKC
- Ingrid Zegers, DG RTD

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