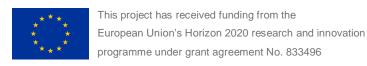# INSTITUTIONAL ARRANGEMENTS IN RESILIENCE AND DISASTER MANAGEMENT

**Project acronym:** BuildERS

**Project title:** Building European Communities' Resilience and Social Capital

**Call:** H2020-SU-SEC-2018-2019-2020/H2020-SU-SEC-2018

# BuildERS

# Disclaimer

The content of the publication herein is the sole responsibility of the publishers and it does not necessarily represent the views expressed by the European Commission or its services.

While the information contained in the documents is believed to be accurate, the authors(s) or any other participant in the BuildERS consortium make no warranty of any kind with regard to this material including, but not limited to the implied warranties of merchantability and fitness for a particular purpose.

Neither the BuildERS Consortium nor any of its members, their officers, employees or agents shall be responsible or liable in negligence or otherwise howsoever in respect of any inaccuracy or omission herein.

Without derogating from the generality of the foregoing neither the BuildERS Consortium nor any of its members, their officers, employees or agents shall be liable for any direct or indirect or consequential loss or damage caused by or arising from any information advice or inaccuracy or omission herein.

| Name | Organization |
|---|---|
| Kati Orru | University of Tartu, Estonia |
| Sten Hansson | University of Tartu, Estonia |
| Sten Torpan | University of Tartu, Estonia |
| Piia Tammpuu | University of Tartu, Estonia |
| Mark Rhinard | University of Stockholm, Sweden |
| Friedrich Gabel | University of Tübingen, Germany |
| Marco Krüger | University of Tübingen, Germany |
| Pirjo Jukarainen | Police University College, Finland |
| Lucia Savadori | University of Trento, Italy |
| Austeja Kazemekaityte | University of Trento, Italy |
| Sunniva Frislid Meyer | Institute of Transport Economics, Norway |
| Gabriella Lovasz | Geonardo, Budapest, Hungary |
| Abriel Schieffelers | Salvation Army, Brussels, Belgium |

**Dissemination level**

| PU | Public |
|---|---|

## History

| Version | Date | Reason | Revised by |
|---|---|---|---|
| 01 | 10.03.2020 | First draft of the plan for manuscripts to be submitted as indexed publication | Kati Orru, Sten Hansson, Sten Torpan |
| 02 | 12.05.2020 | First draft of the manuscript: „Approaches to 'vulnerability' in eight European crisis management systems" | Kati Orru, Sten Hansson |
| 03 | 22.06.2020 | First draft of the manuscript: „Handling false information in emergency management: a cross-country comparative study of European trends and practices" | Sten Torpan, Sten Hansson, Kati Orru |
| 04 | 28.06.2020 | Revised version of the manuscript "Approaches to 'vulnerability' in eight European crisis management systems" | Kati Orru, Sten Hansson, Friedrich Gabel, Piia Tammpuu, Marco Krüger, Lucia Savadori, Sunniva Frislid Meyer, Sten Torpan, Pirjo Jukarainen, Abriel Schieffelers, Gabriella Lovasz, Mark Rhinard |
| 05 | 28.06.2020 | Revised version of the manuscript: „Handling false information in emergency management: a cross-country comparative study of European trends and practices" | Sten Torpan, Sten Hansson, Mark Rhinard, Austeja Kazemekaityte, Pirjo Jukarainen, Sunniva Frislid Abriel Schieffelers, Gabriella Lovasz, Kati Orru |
| 06 | 05.07.2020 | Revisions on the manuscript "Approaches to 'vulnerability' in eight European crisis management systems" | Claudia Morsut |
| 07 | 23.07.2020 | Revisions by the Advisory Board on the manuscript "Approaches to 'vulnerability' in eight European crisis management systems" | Daniela Di Bucci, Pekka Leviäkangas, Bengt Sundelius |
| 08 | 23.07.2020 | Revisions by the Advisory Board on the manuscript „Handling false information in emergency management: a cross-country comparative study of European trends and practices" | Daniela Di Bucci, Pekka Leviäkangas, Bengt Sundelius |
| 09 | 30.07.2020 | Submission of the manuscript "Approaches to 'vulnerability' in eight European crisis management systems" | Kati Orru |

| 10 | 30.07.2020 | Submission of the manuscript „Handling false information in emergency management: a cross-country comparative study of European trends and practices" | Sten Torpan |
|---|---|---|---|
| 11 | 30.07.2020 | Preparation of the deliverable | Kati Orru, Sten Hansson, Sten Torpan |
| 12 | 03.08.2020 | Final version | Kati Orru |
| **Final** | 07.08.2020 | Final revision for submitting | Anna-Mari Heikkilä |

# Executive Summary

BuildERS WP2 looks into the institutional side of crisis management by analysing and comparing the institutional arrangements, structures and processes in several countries. This deliverable follows the broader objective of T2.6 to clarify the interrelations between the characteristics of vulnerable populations, social capital as well as the institutional support structures across the BuildERS country cases in light of the existing academic knowledge. The deliverable aims to contribute to better understanding of two topical questions:

- how vulnerability is defined as well as translated into action by the institutions involved in crisis management in different country contexts;

- how do crisis management institutions understand the causes and effects of false information and what are the various approaches to handling it in different countries.

To address these research questions, we draw on the overview of existing academic literatures and the theoretical framework elaborated in BuildERS WP1 D1.3. "Report presenting the unified theoretical framework on the concepts of risk awareness, social capital, vulnerable segments of society, and their inter-dependencies" and D1.4. "Report on communication behaviour and use of social media in Europe".

In this cross-country comparative study, we explore the variety of crisis management institutions in eight European countries: Germany, Italy, Belgium, Hungary, Sweden, Norway, Finland, and Estonia. The analysis followed a joint research protocol, BuildERS D2.1, for document analysis and expert interviews in case study countries over the period of September 2019 to February 2020. Data for document analysis included legal acts and regulatory documents, official policies/strategies, reports produced by think-tanks, research institutions, and NGOs as well as news media reports. To complement the data gathered via desk research, 95 semi-structured interviews were conducted with public officials working in national government bodies tasked with crisis management as well as representatives of non-government organisations involved in crisis management.

In the manuscript "Approaches to 'vulnerability' in eight European crisis management systems" submitted to the journal *Disasters*, we develop a typology of the dimensions and practices of addressing vulnerability including the ontology of vulnerability; its sources; reduction strategies; and conceptions of who should mitigate vulnerability. We find that countries like Sweden, Norway and Finland tend to have a more contextualised understanding of the objects of vulnerability, whereas Italy, for example, has a more quantified reading of vulnerability. Individual capacities, communication behaviour, and social networks are considered as sources of vulnerability and conceptions of who should mitigate vulnerability tend to place the burden on individuals. Many preparedness measures in the countries studied stem from the communal level, yet except for some evidence of growing municipal-level initiatives in Sweden, Norway, and Belgium, municipalities are usually provided only with limited guidance on how to fulfil that task.

In the manuscript we highlight the importance of differentiated approaches, acknowledging both individual characteristics as well as societal structures in devising collective crisis and disaster management policies. We emphasise the need for European level guidelines in addressing the vulnerabilities in crisis management.

In the manuscript "Handling false information in emergency management: a cross-country comparative study of European trends and practices" submitted to the *International Journal of Disaster Risk*

*Reduction*, we demonstrate that approaches to handling false information vary considerably: some countries have instituted central management of identifying and tackling false information while others prioritise the spreading of accurate information. A review of recent crises cases in the studied countries indicates that the diffusion of false information is mainly related to the lack of timely verified information. In several countries, the emergence of false information is often associated with malicious foreign influence activities.

In the manuscript we underline the significance of local officials in helping educate communities on source critique and information authenticity, while national governments would be well-placed to offer guidelines and resources for combatting false narratives. Further studies should look into how the European-level campaigns and the diversity of national level responses outlined in this article complement, support or possibly contradict each other.

The results presented in this deliverable will be utilised in the co-creation activities in WP 6 that focuses on the cross-fertilisation of concepts, taking into consideration all the experiences gathered throughout the project. They also feed into WP 5 where recommendations for institutional innovation for disaster resilience, and communication tools for preparedness and disaster management will be further elaborated.

# Table of Contents

# List of Acronyms

| | |
|---|---|
| AB | Advisory Board |
| BuildERS | Building European Communities Resilience and Social Capital project |
| D | Deliverable |
| WP | Work Package |

# D2.5 INSTITUTIONAL ARRANGEMENTS IN RESILIENCE AND DISASTER MANAGEMENT

1. **Manuscript "Approaches to 'vulnerability' in eight European crisis management systems" submitted to Disasters Journal**

## Submission Confirmation

🖨 Print

Thank you for your submission

| | |
|---|---|
| **Submitted to** | Disasters Journal |
| **Manuscript ID** | DISA-Jul-20-3099 |
| **Title** | Approaches to 'vulnerability' in eight European crisis management systems |
| **Authors** | Orru, Kati |
| | Hansson, Sten |
| | Gabel, Friedrich |
| | Tammpuu, Piia |
| | Krüger, Marco |
| | Savadori, Lucia |
| | Meyer, Sunniva |
| | Torpan, Sten |
| | Jukarainen, Pirjo |
| | Schieffelers, Abriel |
| | Lovasz, Gabriella |
| | Rhinard, Mark |
| **Date Submitted** | 30-Jul-2020 |

# Approaches to 'vulnerability' in eight European crisis management systems

## Abstract

While social vulnerability in the face of disasters has received increasing academic attention, relatively little is known about the extent to which that knowledge is being translated into practice by institutions involved in crisis management. In this study, we identify general patterns of who is deemed vulnerable and how these individuals and groups are addressed by crisis management institutions in eight European countries: Germany, Italy, Belgium, Hungary, Sweden, Norway, Finland, and Estonia. Based on document analysis and 95 interviews with multiple crisis management-related actors in the studied countries, we develop a typology of the dimensions and practices of addressing vulnerability including the ontology of vulnerability, its sources, reduction strategies, and conceptions of who should mitigate vulnerability. A better understanding of the different approaches to vulnerability helps to identify gaps in support structures, possible reasons for inadequate structures, and to consider positives and negatives of different conceptualisations of vulnerability.

## Introduction

The question of what makes societies and individuals susceptible to extreme events and their consequences is a primary focus of disaster studies (Wisner *et al.*, 2004; Tierney, 2019; Williams and Webb, 2019). Research on the abilities of individuals or societies to access adequate resources to deal with external stressors is framed within the concept of 'social vulnerability' (Wisner *et al.*, 2004; United Nations, 2015). To what degree vulnerability is attributed to individuals, objects, or societies – and what can be done to alleviate vulnerability – depends to a large degree on official understandings of the concept of vulnerability. Definitions not only determine the factors that are considered to influence coping capacity (e.g. individual and social conditions such as age, gender, disability, or socio-economic status; or rather, structural and societal conditions). They also include ontological considerations of the nature of vulnerability: Is vulnerability considered a static characteristic of specific social groups, or rather, a dynamic condition that might apply to anyone at a given point in time, in a

10

given event. How vulnerability is defined shapes the way it is addressed in policies and practice of disaster preparedness and response. Yet a comprehensive, cross-country comparison of how vulnerability is defined as well as translated into action by the institutions involved in crisis management is missing.

To address this research gap, this contribution looks at how vulnerability has been defined in the crisis management systems of eight European countries: Germany, Italy, Belgium, Hungary, Sweden, Norway, Finland, and Estonia. We first review how the concept of vulnerability is presented and defined in institutional systems of different European countries' with varying historical and socio-economic backgrounds. Secondly, we identify the distinct typical ways in which responding to vulnerability has been organised by those systems.

Our comparative study followed a joint research protocol for document analysis and expert interviews in case study countries over the period of September 2019 to February 2020. Data for document analysis included legal acts and regulatory documents, official policies/strategies, reports produced by think-tanks, research institutions, and NGOs as well as news media reports. To complement the data gathered via desk research, 95 semi-structured interviews were conducted with public officials working in national government bodies tasked with crisis management as well as representatives of non-government organisations involved in crisis management. Interviewees were selected based on document analysis and by applying the 'snowballing' technique whereby informants guided researchers on to other relevant informants (Brace-Govan, 2004). The analysis is built on document analysis and interviews from multiple crisis management-related actors in the studied countries, aiming for a broad understanding of differences and similarities in and between countries rather than an in-depth description of each. Therefore, also the results should not be mistaken as an overall position of all the related institutions in one country but an outline of trends or ongoing discussions in these countries. The picture we gained is messier with various competing and partly fuzzy definitions of vulnerability, sometimes even within the same institution. To understand these and to outline how decision-makers in several European states define and operationalise a key concept in disaster management research – vulnerability – is the aim of this article.

We first review the existing research on vulnerability to identify central definitional and conceptual debates. We then present the results of our study, showing how vulnerability is understood and addressed in different countries. We conclude by summarising the analysis and discussing the relative merits of different official approaches to vulnerability.

11

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

## The study of vulnerability

The academic literature on vulnerability is wide and diverse, but we can discern five key debates regarding the concept. The first is on the **referent object of vulnerability**. Throughout the history of disaster research, who or what is considered 'vulnerable' has been highly contested. The concept of vulnerability differs amongst academic disciplines owing to their focus on different aspects of risk, e.g. household responses to risk or welfare outcomes (Paul, 2014). This diversity stretches from geographical referent objects described as vulnerable, such as concrete locations (e.g. villages, city quarters, rural areas) and technical referent objects, such as infrastructure (e.g. buildings, industry) to societal referents, such as organisations (e.g. relief organisations, social support organisations) and individuals (e.g. elderly, persons with disabilities). We might include here a focus on situations that render the respective referent objects vulnerable (e.g. living conditions, situations of distress).

Defining the referent object of vulnerability is important, since it determines how vulnerability, as a phenomenon, is approached (UNDRO, 1976; Wisner *et al.*, 2004; McEntire, 2005; Anonymous, 2006). While geographical location can be mainly referred to in terms of exposure and infrastructure additionally from a susceptibility perspective, the vulnerability analysis of societal entities – and even more at socio-technical entanglements – requires a more sophisticated, and somewhat more contested, approach. Looking at how the referent object(s) of vulnerability are officially treated can thus help to understand gaps in support, as well as trends in the perception and consideration of vulnerabilities of individuals and groups (Anonymous, 2006).

Similarly, the *ontological basis of vulnerability* is contested. This refers to the question of whether vulnerability is defined as a static or dynamic characteristic. In research and practice, vulnerability is often cast as a characteristic attribute of certain societal groups due to their specific conditions (Tierney, 2019). According to this view, groups such as disabled persons or those living in poverty are considered vulnerable, with requisite needs to be considered in disaster preparedness planning. While recent crises and events may confirm the existence of such vulnerable populations, and while this approach is used by many crisis management professionals, there is a risk of ascribing vulnerability in an overly categorical way that effects in an unduly homogenisation of otherwise heterogenic groups (Gabel, 2019). Moreover, if

12

people are deemed ontologically vulnerable, they cannot be emancipated but only protected. This, however, results in the deprivation of their agency, thus in an objectification.

Other authors argue against such an essentialist understanding of vulnerability, describing vulnerability as a situational and relative, and thus dynamic, phenomenon (Hilhorst and Bankoff, 2004, pp. 2–3; United Nations, 2015). This view argues that vulnerability is often in flux and cannot be reduced to a single metric to quantify (Adger, 2006). Such arguments often outline two aspects that must be considered: one's exposure (the interplay of circumstances and individual conditions including abilities to respond without suffering, diversity of social groups (e.g., the capacities differ among elderly) and the interplay of different disadvantages, which lead to a person being vulnerable. In this vein, whether, for instance, a person with disabilities is vulnerable depends on the specific crisis situation but also on existing social structures and the extent to which those empower these persons (Wisner *et al.*, 2004; Mechanic and Tanner, 2007; United Nations, 2015; Gabel, 2019). Therefore Wisner et al. (2004, p. 15) propose speaking of vulnerable situations; a term, which in 2015 was also taken up by the UN Sendai Framework.

Considering these different approaches for disaster management is important for two reasons. On the one hand, we can differentiate between individual conditions and social context as sources of vulnerability, as we do below. While living in poverty can be considered to widely increase vulnerability (Tierney 2019, p. 127), whether a particular disability increases vulnerability is very much dependent on the general social approach to reducing barriers and on the specific context. On the other hand, differentiation means distinguishing between systemic relations and processes on a macro-level (e.g. the definition of vulnerable groups) and the intersectionality of individual living conditions (Sparf, 2016).

To reduce vulnerability, it is important to define what the *sources of vulnerability* are. In line with Blaikie and colleagues (1994, 23), three levels of factors can be distinguished. Meta-level factors are root factors of societal vulnerabilities, which refer to the fundamental societal challenges such as the distribution of wealth and power (Hartman and Squires, 2006). For example, due to differentiating power relations, people are often marginalised due to deviant needs and/or impairments making their interests less heard in planning for disasters (Krüger, 2019).

13

Macro-level factors refer to the degree of society-specific dynamic pressures, such as the given economic development, demographic change and societal inequalities (Christie *et al.*, 2016). This category, for instance, includes the consideration and equality of certain social groups such as persons with disabilities. Policies oriented towards these sources include national guidelines for individual preparedness standards and the responsibilities these set on citizens to prepare for disasters (Kailes, 2015).

Micro-level factors describe the specific policy and procedural situations of dealing with a crisis in a given society, such as economic/planning/housing, accessibility, or the use of media, but also the disaster management strategies in dealing with vulnerable groups (Kailes and Enders, 2007). These strategies, for instance, refer to disaster management trainings in dealing with vulnerable groups or acknowledging their special needs in terms of understanding or reacting to information on hazards.

Different ways to conceptualise vulnerability are linked to varying assumptions regarding *which actors are tasked with reducing it.* These are critical assumptions since identifying obligations suggests which potential capacities both vulnerable individuals have, as well as what role the state (central as well as municipal level) – versus the non-government sector, for instance – have in alleviating vulnerability. Official positions reflect broader societal assumptions and influence the robustness of social structures. Who receives what kind of support depends on the conceptualisation of vulnerability, thus the legitimacy of consuming granted resources, and the prevailing distribution of responsibility to cope with disasters (Kaufmann, 2013).

The question of obligation to reduce vulnerability is important also considering the interaction and co-constitution of disaster management and social structures. In different countries, the institutions and actors responsible for vulnerability reduction vary. Therefore, the approaches to vulnerability in different crisis management systems may depend on the structures of national institutions and policies assigned to mitigate vulnerabilities. The role of state has been emphasised as the key actor for reducing the vulnerabilities and enabling resilience since many individuals are deprived of the economic and social resources necessary for (re)acting in response to hazard or crisis (Krüger, 2019).

That said, the social structures in which individuals are embedded are of utmost importance for disaster management purposes (Sparf, 2016, p. 2). Furthermore, as disasters not only produce vulnerabilities but worsen those which already exist in everyday life (IFCR, 2007; Kelman and

14

Stough, 2015) the reduction of vulnerability is not only a task for disaster management actors but also, for instance, for non-disaster management actor such as care service, social services, disabled persons' institutions.

People outside of formal emergency and disaster management arrangements may help others who are at risk or affected by disasters (Whittaker, McLennan and Handmer, 2015). Taking a closer look at this cooperation between security and civil society actors regarding vulnerability reduction allows for an identification of gaps to improve support (Wisner *et al.*, 2004; Mechanic and Tanner, 2007).

Finally, the question of *what should be done to address vulnerability* arises in conceptual discussions. According to different understandings on the objects of vulnerabilities, not only individuals/groups but also infrastructure might be addressed by measures to reduce social vulnerability. At the same time, similar understandings of vulnerability in different countries might be dealt with by using different approaches (Räsänen *et al.*, 2020). While in one country homeless persons are specially considered within disaster management, in another country, there might be cooperation between security and civil actors. The objects of vulnerability might be addressed differently in vulnerability assessments and in existing data. Knowing about these differences can help to identify gaps in support structures and reasons for currently problematic structures, as well as it allows to identify alternative practises in trying to address current shortcomings.

Our study started from this theoretical background and looked at the form and extent to which vulnerabilities are considered in national crisis planning and responses. Our empirical evidence confirms that different national crisis and disaster management systems reflect different positions on these five central discussions. The following section reviews the empirics, combining the results of country-specific analyses built on official documents, secondary literature, and interview transcripts. The countries analysed here were not sampled in such a way as to allow for generalisation. The selection strategy was mainly a convenience sample: our language competences and access to data led to these countries. The analysis provides a heuristic indication of the variety and diversity of national European approaches to the question of vulnerability. They also represent both large and small member countries, along with countries traditionally seen as 'new' and 'old' members of the European Union.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

# Vulnerability in national disaster policy

Throughout our research, it became clear that few countries take a thorough, in-depth approach to problematising 'vulnerability' or its definitional implications. Moreover, vulnerability was, more often than not, not consensually defined within a single country with various actors holding different definitions of vulnerability. Still, through close analysis and assessment of discourses employed and implications stated, some patterns both within and across countries could be identified.

## *Who or what is vulnerable?*

One clear finding is that, across cases, discussion of individuals as the main vulnerable object is limited. National crisis management systems have been mainly focused on the vulnerability of critical infrastructure rather than on individual vulnerabilities in crises. In several instances (e.g. Germany, Finland, Estonia), individuals or 'vulnerable groups' are simply mentioned in national policy documents without specifying who in particular belongs to these socio-demographic groups (e.g., children, elderly, people with special medical conditions) or what makes certain individuals or groups vulnerable and in which situations. While the term 'vulnerability' is occasionally mentioned in national policy documents on civil protection and crisis management, alternative notions and ways of interpretation are preferred in some countries. For example, in Italy, individual or group vulnerabilities are generally described in terms of 'social fragility' or 'special needs' of individuals who, despite specific welfare and medical  assistance by civil protection authorities, are not self-sufficient (Council of Ministers, 2018; Civil Protection Department, 2019). In Hungary, instead of the vulnerability concept, the term 'disadvantaged group(s)' is frequently used to denote people who are unable to protect themselves against shocks due to their disability, age, health condition, or social status (Endrődi, 2015, p. 126).

A more quantified, and natural-hazards (earthquakes) centred definition of vulnerability related to risk is used by the Italian Civil Protection Department (2018), where it follows the formula: *Risk = probability * vulnerability * exposure*. The larger the probability of the hazard and the extent of the exposure, the greater is the risk. The vulnerability component denotes the propensity of the people and activities or infrastructures affected to suffer damage following the occurrence of events (Civil Protection Department, 2018).

Germany and Belgium use aspects of the quantifiable as well as the more contextualised definitions of vulnerability. The German Federal Office of Civil Protection and Disaster

16

Assistance (BBK, 2014a, p. 13, 2014b, p. 20) has considered vulnerability as comprised by the interplay of three components: *exposure* as the physical affectedness by a (natural) hazard; susceptibility as the likelihood to suffer harm; and coping capacity as the availability of resources to mitigate negative effects of it. In conclusion, the consideration of individual vulnerabilities varies, whereas the definition of vulnerable groups or entities as well as the baseline conditions for rendering situations vulnerable mostly remains vague.

### *What is the ontological basis of vulnerability?*

As the theory section above highlighted, academic discussions on the ontology of social vulnerability (whether vulnerability is an absolute feature of certain population or whether it is dynamic, depending on situations) interact with debates over the meta-, macro-, or micro-sources of vulnerability. We thus examine both analytical questions together here. While we hold that both perspectives do have advantages as well as pitfalls, we primarily aim of depicting the interviewees' stances on vulnerability rather than providing a detailed conceptual discussion.

The relative and situational nature of vulnerability is highlighted in approaches taken by Sweden, Norway, and Finland. For example, a Swedish Civil Contingencies Agency (MSB, 2011, p. 8) study on natural disasters argues that all approaches to the concept of vulnerability must take into consideration the complexities of local contexts. The study concludes that differences in geographical locations and social contexts create a different understanding of vulnerability. Hence, it remains difficult – if not impossible – to establish a universal or even a national definition of vulnerability (ibid).

In some cases, dissimilar conceptual approaches to vulnerability can also be found in the same field or by the same authority. For example, the German Committee for Disaster Reduction has defined vulnerability as future susceptibility (to extreme weather events) (Tetzlaff, Karl and Overbeck, 2007, p. 67). The German Federal Environmental Agency, meanwhile, has approached vulnerability as the capacity to adapt to a changing environment (Umweltbundesamt, 2015, p. 53).

Often individual vulnerabilities are considered in relation to specific hazards and risk scenarios. The threats that appear to be most acute in a particular society or region also determine which kinds of vulnerabilities become acknowledged (or, on the contrary, overlooked). This selection

17

bias is evident in the case of cyber threats, which are paid increased attention in several countries analysed here (Norway, Sweden, Estonia, Finland).

## *What are the sources of vulnerability?*

Several country studies (Germany, Italy, Hungary, and Estonia) indicate that on the operational level of crisis management, vulnerability is mainly related to an individual's limited or as inadequate perceived self-sufficiency in disasters, which results in a higher need for external assistance. This implies that certain people have a higher propensity to rely on help from their social networks or state institutions when it comes to preparing or responding to a crisis.

In most countries, vulnerability is considered as something that can be reduced through preparation. That means becoming aware of threats, acquiring skills, and material sustenance basis for coping. Individuals who have, either independently or in cooperation with their communities, completed necessary preparations for crises, are seen as considerably less vulnerable (Estonian Government Office, 2018, p. 30; FHS, 2019). Whereas self-preparedness is generally advised, existing literature warns of the withdrawal of the state from responsibilities in enabling preparedness also by vulnerable people (for more, see the following section on alleviating vulnerability).

Authorities in several countries (Finland, Sweden, Norway, and Belgium) acknowledge that individual capabilities to influence vulnerability are not for the individual to choose, but rather coping capacities very much depend on the structural as well as situational conditions that shape the opportunities to prepare and protect oneself. The reflections by interviewees in Sweden, Belgium and Estonia problematize the *a priori* identification and acknowledgment of certain individuals or groups as 'vulnerable' in crises, which may lead to stigmatisation and victimisation in society (Interviews at MSB, 12/2019; Brussels-Prevention & Security, 12/2019; Estonian Ministry of Social Affairs, 11/2019).

Combining our first two analytical dimensions (ontological status and sources of vulnerability), we could identify a variety of examples of individuals or groups characterised as 'vulnerable' to certain hazards or in crises in general. The examples of vulnerable individuals and groups, along with the aspects that are seen constitutive of their vulnerabilities and the specific contexts of threats and crises in which they are mainly described as vulnerable, are summarised in Table 1.

18

Table 1. An overview of aspects seen as constitutive of individual and group vulnerabilities

| Aspects constitutive of vulnerabilities | Examples of vulnerable individuals and groups | Crisis contexts which might be problematic for these groups | Reference |
|---|---|---|---|
| **Limited mental and physical capacities, limited mobility** | Elderly; infants and children; disabled; people with specific health conditions (e.g. people with dementia) | Climate-related and natural hazards (e.g. heatwaves); crisis situations that require evacuation; diseases and pandemics | Italy (Council of Ministers, 2018), Germany (BBK, 2014b), Sweden (MSB, 2014b, 2016), Norway (Helsedirektoratet, 2016), Hungary (NDGDM, 2012), Finland (Tuomenvirta *et al.*, 2018), Estonia (Ministry of Interior, 2018) |
| **Communication abilities** | People having limited access to information due to limited mental or physical capacities or poor language skills (e.g. migrants, tourists) | Crisis situations that are preceded by public warnings; (transport) accidents | Germany (BBK, 2014b), Belgium (Interview at BPS, 12/2019), Finland (Hyvonen *et al.*, 2019), Norway (Interviews at Oslo og Viken and Nordland County, DSB, 2019), Estonia (Estonian Government Office, 2018) |
| **Social capital and networks** | People living alone and/or without personal social networks, inhabitants of isolated areas; non-resident groups | Crisis situations that require evacuation and relocation of people, natural hazards and weather-extremes | Germany (BBK, 2014b), Sweden (MSB, 2016), Estonia (Estonian Government Office, 2018) |
| **Socio-economic status** | People living in poverty; recipients of social benefits (e.g. unemployed); socio-economically marginalised (e.g. homeless) | Crisis situations that require self-preparedness and equipment; situations that require evacuation; disruptions of financial services | Finland (Turvallissuuskomitea, 2017; Hyvonen *et al.*, 2019), Estonia (Estonian Government Office, 2018) |

19

| Institutionalised setting | People living in institutional settings (e.g. social and elderly care facilities, hospitals, shelters, prisons etc.); schoolchildren | Crisis situations that require evacuation and relocation of people; on-site accidents (e.g. fires) and attacks (e.g. school shootings); disruptions of vital services | Sweden (MSB, 2016), Norway (Interviews at Oslo og Viken and Nordland County governments and DSB, 2019), Estonia (Estonian Government Office, 2018) |
|---|---|---|---|
| Type and conditions of dwelling | People living at top-floor (e.g. in the case of heatwaves) or basement-floor apartments (e.g. during floods); apartment-buildings depending on central provision of vital services | Climate-related and natural hazards (e.g. heatwaves, floods, storms); disruptions of vital services (electricity, heating, water supply, sewerage) | Germany (BBK, 2014a, 2014b) Hungary (Interview at PVSZ, 12/2019); Estonia (Interview at ERB, 11/2019) |
| Residential area or geographic region | People living in urban areas; in isolated settlements; in areas of hazardous facilities or natural hazards | Climate-related and natural hazards (e.g. heatwaves, floods, storms, earthquakes); industrial accidents; attacks; disruptions of vital services | Germany (BBK, 2014a, 2014b); Sweden (MSB, 2014b, 2016); Estonia (Estonian Government Office, 2018) |
| People on the move | Visitors of an area, tourists, commuters, passers-by | Accidents; attacks; transport disruptions fires; disruptions of vital services; climate related and natural hazards | Belgium (Interviews at BPS, 2020); Norway (DSB, 2019). |

The overview shows that vulnerability factors can be read either as group-characteristic or as situational description. Certain individuals or groups like elderly, children, ill or disabled are generally seen as vulnerable to different kinds of threats. Thereby, individuals with heterogeneous backgrounds are rallied around a certain attribute (e.g. elderly) to determine their vulnerability while neglecting their otherwise different contexts and capacities. Their vulnerability is said to be rooted in individual or group characteristics but can also be deepened by certain situational factors. Individual vulnerabilities primarily explained by situational or contextual factors, on the other hand, are threat-specific rather than universal. As the examples also indicate, the aspects or factors that are seen constitutive of individual vulnerabilities often

20

tend to intersect in the case of certain individuals and groups, for example, elderly who live alone or in an institutional setting.

Broad, societal challenges and pressures are rarely addressed in most conceptions of vulnerability. Typically, individual physical and mental capacities, communication behaviour, but also individual social networks are considered as sources of vulnerability. These are related to the individual's capacities, rather than the availability of policies, procedures and structures to support crisis coping. The macro-level sources of vulnerability become more prominent when the geographic and infrastructural surroundings of an individual or community are stressed (e.g. hazard-prone areas; disruptions of vital services). Institutionalised settings in which certain individuals or groups, who may already have limited or reduced physical and mental capacities are placed, imply further dependency on the environment and its capacity to protect. Interviews revealed also a very situational element of vulnerability – being on the move or happening to be in the place of an accident – highlighting the situational quality of vulnerability that is not easy to document officially.

## *Who is tasked with alleviating vulnerability?*

None of the countries studied here has a specific crisis management authority or civil protection agency whose formal obligation is to respond to the needs of vulnerable individuals or groups. Instead, authorities and actors from different sectors and levels of crisis management (national, regional, municipal) generally deal with vulnerable individuals and groups as part of their overall responsibilities related to crisis management. However, their professional competences and preparedness for that usually vary.

### State and local authorities

At the national level, central authorities (including ministries and agencies) responsible for crisis management generally draft policy guidelines and regulations, conduct assessments, and plan and organise risk and crisis communication. In several countries, such as Germany, the disaster management system is designed in a decentralised and subsidiary manner. Therefore, the national level is in disaster management policies sometimes in a subordinated role. We identified only three countries (Sweden, Finland, and Estonia) in which state-level initiatives were focused specifically on vulnerable groups. For example, the Finnish National Rescue Association (Interview at SPEK, 1/2020) organises trainings, conducts research on

vulnerabilities as well as builds networks with other authorities and research communities to be prepared for working with e.g. the elderly, people with memory disorders and migrants during a crisis. In Sweden, the Civil Contingencies Agency has organised training in collaboration with a non-profit organisation and municipalities to enhance young people's handling multiple types of vulnerabilities, including being socially excluded, in times of crisis (Interview at MSB, 12/2019). In Estonia, the Estonian Rescue Board works on crisis preparedness as part of their home counselling on fire safety, which is targeted at but also aims to identify and advise vulnerable households (Interview at ERB, 11/2019).

At the local level, municipalities and local (social welfare) authorities are generally expected to have information and knowledge about vulnerable individuals and groups among their residents as well as to provide primary emergency assistance to them in crises. However, the extent to which municipalities' respective obligations and tasks are regulated varies significantly between different countries. Social vulnerabilities are addressed by the work of social services on the municipal level following the law for disaster management (in Norway and Finland) (Rapeli, 2018) and by the law of social services applying regardless of the circumstances (in Sweden, Estonia, Germany, Belgium, Italy, Hungary). While in some countries (Sweden and Norway) municipalities are obliged to analyse and consider individual vulnerabilities as part of their risk assessments and/ or emergency plans, in other countries, this is in early stages (Finland, Germany, Belgium, Italy) or missing (Estonia, Hungary).

Voluntary organisations

In most countries (e.g. Germany, Italy, Belgium, Hungary, Norway, Finland), civil societal organisations such as the national Red Cross, voluntary organisations working with certain vulnerable groups (e.g. homeless or disabled people), or associations specialised on providing certain type of assistance (e.g. psychological help) have a crucial role in assisting vulnerable individuals and groups in crisis situations. In Belgium, for instance, the Red Cross supports citizens within the first 48 hours of a crisis (Red Cross Belgium, 2016). By way of example, they were key actors in response to the terrorist attacks in Brussels airport Zaventem and Maalbeek metro station in March 2016. In Italy, the Red Cross and other volunteer organisations provide healthcare as well as psychosocial assistance to the affected population, focusing particularly on minors and the elderly, as occurred, for instance, during the L'Aquila earthquake (Red Cross, 2010). In Germany, the Red Cross and other emergency organisations also provide relief work, as in the 2002 and 2013 flooding (DRK, 2014). Moreover, the church

is actively involved in assisting vulnerable people in crises, especially with psycho-social help, as for example in Finland. In Estonia and Sweden, the Voluntary Defence League has taken the role in helping vulnerable groups in disaster situations (Kaitseliit, 2017).

## Community responsibility

In cases where individual or non-official, informal preparedness for crises is seen to reduce individual vulnerabilities, authorities encourage citizens' acknowledgement and assistance of other community members' vulnerabilities to various hazards and crises.

Public guidelines proposed for crisis preparedness and appropriate behaviour in crises can remind people to pay attention to and, if possible, help those in need (e.g. BBK, 2018). Noticing vulnerable individuals and groups in their community while preparing for or when in crisis is encouraged, for example, in the Estonian (Ministry of Interior, 2018), Finnish (SPEK, 2020), German (BBK, 2018), and Swedish (MSB, 2018) guides for public emergency preparedness. Such reminders, however, are often rather general without giving primary instructions on how to assist one another in a crisis. The German guide "Disasters Alarm" represents rather the opposite by providing a concrete shopping list to prepare for a disaster (BBK, 2018). In Germany and Finland, the government-coordinated first aid and safety courses encompass self-protection as well as acknowledge the needs of certain social groups (e.g. children, care givers, refugees) (BBK, 2019; Suomen Pelastusalan Keskusjärjestö, 2020).

Only Norway, from the interviews and references studied here, do municipalities have a coordinated active role in advising people on how to prepare for crisis situations and recognise those who would need special assistance in such situations. For example, Oslo municipality in Norway in its crisis preparedness guidance, requests people to think about persons with impaired vision, hearing or mobility in their neighbourhood or community, as well as about persons who do not understand Norwegian or English and may thus need help in a crisis situation (Oslo kommune, 2019).

In addition to government and public sector initiatives, voluntary organisations can also significantly contribute to citizens' awareness and acknowledgment of individual and group vulnerabilities, as the findings from different countries (e.g. Finland, Belgium, Italy) suggest. In Belgium, for example, the national Red Cross has volunteering programmes where people can volunteer to visit isolated elderly people in their homes or at asylum centres (Interview at Red Cross Belgium, December 2019). However, these programmes run the risk of unduly

23

transferring responsibility to the individual without regard of the existing coping capacities. This is problematic, if the mitigation of vulnerability remains a demand, rather than a political goal that is pursued by means of providing adequate capacities (Krüger, 2019).

### *How to reduce vulnerability?*

National policies and regulations on crisis management generally do not include specific requirements or tasks concerning how authorities should deal with vulnerable individuals or groups in the context of prevention, preparedness, response and recovery. Even if general principles oblige respective authorities to consider certain individual aspects or needs, the question of how this should be done remains often open.

Finland is one of the few countries in which rescue services responsible for assisting individuals in accidents and crises have their own organisational and procedural guidelines on how to deal with individuals and groups defined as vulnerable. The Finnish National Rescue Association, for example, has prepared trainings and materials focusing on specific vulnerable groups such as ethno-cultural minorities (SPEK, 2020). Rescue services are also prepared to assist certain vulnerable groups such as the elderly in care institutions and people with disabilities (Interviews at SPEK South-West area, 12/2019; South-East area, 1/2020).

In most cases, the responsibility for creating and/or implementing guidelines on how to assess and respond to individual vulnerabilities in crises falls on municipalities and local authorities. Specific guidelines on municipal support to vulnerable groups in crises exist in Norway, Finland and Belgium. For example, Belgian municipal plans need to consider a broad range of vulnerable objects from individuals to institutions who are particularly vulnerable due to their location or activity (FPS, 2019). In Norway, the regulation concerning municipal emergency preparedness includes references to vulnerable groups such as children and youth, and asylum seekers and refugees (Helsedirektoratet, 2016; DSB, 2018).

In other countries (Germany, Italy, Hungary, and Estonia) guidelines for local municipalities exist only on a very general level. For example, the Estonian Civil Protection Concept (Estonian Government Office, 2018) highlights the need for assessing the number of people with special needs in local municipalities. In Hungary, the emergency plans prepared by municipalities or workplaces ought to specify conditions for 'disadvantaged groups' (Ministry of Interior, 2011) but there is no central guideline on how to do that.

24

Assessment of vulnerability

One increasingly used approach to reducing vulnerabilities is to start with a vulnerability assessment. Such assessments are predicated on the idea that results can provide a basis for the allocation of resources for preparedness, response and recovery. We found different types of assessments and surveys that vary in their thematic scope and focus, as well as various methodological approaches conducted in different countries' crisis management systems.

Such assessments are conducted in advance, to improve preparedness. However, they can also be carried out during and after the crises. The few *ex-ante* analyses conducted by the national authorities aim to identify social groups that may be vulnerable to certain hazards or possible crises in society. In several countries (Sweden, Finland, Norway, Belgium, Estonia and Germany) national assessments for climate change mitigation and adaptation also cover the definition of vulnerable individuals following the EU Adaptation Strategy (COM, 2013). The Finnish assessment of climate risks, for instance, indicated that particularly elderly people suffer from heat waves and warmer winter weather (Tuomenvirta *et al.*, 2018).

In Sweden and Norway, national vulnerability assessments also cover other risks. Swedish government agencies are required to conduct annual risk and vulnerability analyses, which primarily concern accidents involving dangerous chemicals, extreme weather conditions, and disruptions in technical infrastructure (Sveriges Riksdag, 2006, p. 942). Here, too, the elderly are singled out as vulnerable with regard to various risks, especially those living alone or in care facilities (MSB, 2014a, 2016). Similarly, in Norway, several national analyses of vulnerable groups regarding various accidents have been conducted over the years (Haldorsen and Munch-Olsen, 2011; Norwegian Government, 2012; Interview at DSB, 12/2019).

In Sweden and Norway, municipalities took the lead on risk assessments and identify vulnerable individuals or groups within their territory as part of their prevention and emergency planning strategies. For example, in Norway, the respective municipal level risk and vulnerability analyses have pre-identified several vulnerable groups: people depending on home care in the case of extreme weather events that hinder mobility; high school students in the case of school shootings; tourists who lack local network (Ibid). In Germany, the Federal Office of Civil Protection and Disaster Assistance (BBK) has published guidelines for assessing individual vulnerability to heat waves, heavy rainfalls and floods at a community level (BBK, 2014a,

2014b). However, as is the case in many of the countries studied here, we did not find evidence on how these guidelines have been used in practice.

Only in Italy we found evidence of assessments conducted during a crisis to identify vulnerable individuals in an emergency (e.g. people who need special assistance). During crises, the Italian Civil Protection Department collaborates with municipalities to assess the immediate needs of those individuals identified as the most fragile, also based on a recently issued questionnaire formula (Civil Protection Department, 2019).

*Ex post* analyses are carried out to learn about the experiences of residents or groups most affected by a disaster. For example, the Finnish National Rescue Association (SPEK, 2017) conducted a survey among the local residents of the City of Pori in Finland after a fire at a titanium dioxide manufacturing facility in 2017. In Hungary, a social impact analysis was conducted after the red sludge disaster in the south-western part of the country in 2010 (Ferencz and Bartal, 2015), indicating the increased tensions between Roma and other inhabitants compared to the relations before the disaster (ibid).

Criticism has been raised against the use of risk assessments, often by state authorities themselves. A study by the Swedish Civil Contingencies Agency (2010, p. 28) argues that identifying vulnerable groups is extremely difficult, and it is challenging to include those results in the preparation of emergency planning measures. The study questions the implications of pointing out vulnerable groups publicly, as well. In other countries, concerns have been raised that the vulnerability assessments conducted by municipalities may be missing, partial, irregular or outdated (DRK, 2018). Collecting and getting adequate information on individual vulnerabilities requires coordinated efforts between different local authorities, services and sectors, which, however, may not always succeed. The results of such analyses can thus be misleading.

Risk and crisis communication
Risk and crisis communication efforts are also growing as a way to address vulnerabilities and needs of individuals. Most countries had communication guidelines in place to that effect. In Hungary, rules related to disaster management mentions that 'disadvantaged groups' should be informed about the eventual crisis appropriately by applying the tailored materials and guidance (Ministry of Interior, 2011). In Norway, the same principles are included in national communication policy and equally applied in the field of crisis management (Fornyings- og

26

administrasjonsdepartementet, 2009). Oslo Municipality, for instance, has translated its guidelines on households' preparedness for crises to several languages and has shared these translations with other Norwegian municipalities (Interview at County Government of Oslo and Viken, 12/2019). The German Ministry of Interior published a guideline on crisis communication that aims at upholding a dialogue with the population that recognises needs and thus grants the authorities credibility in its problem solving competence (BMI, 2014).

Authorities interviewed for this article also pointed out deficiencies in informing vulnerable individuals or groups about hazards and emergencies. In the case of emergencies, it can be difficult to reach foreigners and certain migrant groups who do not have enough knowledge of the national language(s) or English, or who do not use national or local information channels (Interview at Brussels Prevention and Security, 12/2019). The needs of migrant groups as well as foreigners involved in emergencies are increasingly being addressed in the context of crisis management in several countries (e.g. Germany, Italy, Belgium, Sweden, Norway, Finland). Yet, risk and crisis communication may not be adjusted to the needs of other vulnerable groups, such as disabled individuals. For example, in Sweden and Germany, public address systems used for emergency warnings have been criticised for the lack of adaption to sensory impaired individuals (Bachman, 2013; UN-HRC, 2015; DRK, 2018; Interview at MSB, 12/2020).

## Discussion and concluding remarks

This article outlined how vulnerability is currently defined and mitigated in the crisis management systems of eight European countries. By way of conclusion, we offer some further analysis of the findings – including some advantages and disadvantages of various stances.

The analysis shows that vulnerability may not only be addressed in different ways but also to differing extents and via different structures in and across countries and sectors. Countries like Sweden, Norway and Finland tend to have a more contextualised understanding of the *objects and ontology of vulnerability* whereas Italy has a more quantified reading of vulnerability. Belgium and Germany combine aspects of the more contextualised as well as the quantifiable definitions of vulnerability. In Hungary and Estonia, vulnerable groups are mainly pre-determined based on socio-demographic factors (elderly, ill, socio-economically deprived). There are pros and cons to both approaches. By assigning individuals as 'vulnerable' in general, relief operations can focus on speedy response during a disaster. But the downside is a possible

27

stigmatisation of certain populations and a lack of nuance regarding support needs. More dynamic understandings of the nature of vulnerability put the type of disaster or shock upfront in planning, rather than particular groups (Gabel, 2019). This may help avoid the risk of stereotyping people, but it can also lead to a lack of action since the onset of a disaster brings other priorities.

Similarly, broader societal perceptions of groups – including prejudices – can shape the way vulnerabilities are addressed. The notion of 'special needs' individuals is one such example. Following Kailes and Enders (2007), that very term suggest persons posing an extra burden on disaster management structures. The requirement to guarantee all citizens access to information or warnings is by no means 'special', but disaster management organisations may nevertheless see this as an extra burden. In this way, security politics in general and disaster politics specifically represent normative trends within society.

Typically, individual capacities, communication behaviour, and social networks are considered as *sources of vulnerability* that often tend to intersect in the case of some individuals and groups (e.g. elderly in institutional settings) and can also be deepened by certain situational factors. Vulnerability is rarely seen as triggered by local strategies (e.g. segregation due to planning), procedures (e.g. poor crisis preparedness of care homes and hospitals) and structures (e.g. areas lacking alternatives to existing vital infrastructures).

The practical approaches to individual vulnerabilities appear to be rather selective due to the specific national contexts, histories, and the variety of threats recognised by that society. Following Kathrine Tierney (Tierney, 2019), societies co-produce and co-construct disasters. For instance migrants are addressed as a challenge in risk assessments in some countries (Otsla, 2016) but are considered a social group with special support needs in others'. The only commonality seems to be the recognition that extreme weather events, often linked to climate change, may produce coping problems for vulnerable individuals (this is probably due to pan-European disaster management efforts to highlight that problem).

We find that *vulnerability reduction strategies* and conceptions of *who should mitigate vulnerability* tend to place the burden on individuals. Risk and crisis communication strategies are widely used while the provision of economic and social support structures for crisis preparedness and response may be inadequate. Similarly, we found an array of public guidelines urging citizens to look after 'the vulnerable'. But these lack specificity and can easily lead to an abdication of institutional/state responsibilities. Moreover, this stance on vulnerability

28

renders "the vulnerable" to passive receivers of help by depriving any sort of agency or competence (Krüger, 2019).

Many preparedness measures in the countries studied stem from the communal level, including municipalities (social and welfare authorities) and non-governmental actors. Except for some evidence of growing municipal-level initiatives in Sweden, Norway, and Belgium, municipalities are usually provided only with limited guidance on how to fulfil that task. In other countries, this is in early stages (Germany, Italy) or missing (Estonia, Hungary) and vulnerable groups are primarily pre-determined based on the overall social status of certain social groups.

One reason for the lack of nuance and understanding of social and cultural contexts shaping disaster vulnerability is a lack of disaggregated census data on social diversity (Mazurana, Benelli and Walker, 2013). Disaster management agencies tend to be disconnected from social services and any meaningful understanding of societal diversity. They have little training or knowledge of individual needs (IFCR, 2018). This general issue is also represented in the gap between disaster management and social actors (see e.g. Gabel, 2019 for Germany). In general, too little research has been carried out amongst potentially vulnerable individuals and groups to better comprehend their risk perceptions, crisis preparedness and response strategies. Yet, this empirical work is necessary to understand those people identified as vulnerable not just as passive. The importance of differentiated approaches, acknowledging both individual characteristics as well as societal structures, must also be considered by European officials increasingly involved in devising collective crisis and disaster management policies. At best, European level guidelines seem most useful rather than legislation or a 'one size fits all' approach. While understanding the diversity in causes and conditions of vulnerability is just a first step towards a more nuanced approach to effective policy, it is a critical one in tackling the root causes of vulnerability rather than only focusing on its symptoms.

## References

Adger, W. N. (2006) 'Vulnerability', *Global Environmental Change*, 16(3), pp. 268–281. doi: 10.1016/j.gloenvcha.2006.02.006.

Anonymous (2006) 'Vulnerable Populations. Who are They', *American Journal of Managed Care*, 12(13), pp. 348–352.

Bachman, W. (2013) 'Katastrophenschutz für Hörbehinderte Menschen'. Deutscher Gehörlosen-Bund e.V.

BBK (2014a) 'Assessing vulnerability to flood events at a community level'. German Federal Office of Civil Protection and Disaster Assistance. Available at: https://www.bbk.bund.de/SharedDocs/Downloads/BBK/EN/PEiCP_4_Assessing_Vulnerability_to_Flood_Events_at_a_Community_Level.pdf?__blob=publicationFile.

BBK (2014b) 'Assessing vulnerability to heat waves and heavy rainfall at a community level.' German Federal Office of Civil Protection and Disaster Assistance. Available at: https://www.bbk.bund.de/SharedDocs/Downloads/BBK/EN/booklets_leaflets/Assessing_Vulnerability_to_Heat_Waves.pdf?__blob=publicationFile.

BBK (2018) 'Katastrophenalarm. Ratgeber für Notfallvorsorge und richtiges Handeln in Notsituationen'. German Federal Office of Civil Protection and Disaster Assistance. Available at: https://www.bbk.bund.de/SharedDocs/Downloads/BBK/DE/Publikationen/Broschueren_Flyer/Fremdsprach_Publikationen/disasters_alarm_en.pdf?__blob=publicationFile.

BBK (2019) 'Rahmenkonzept Ausbildung in Erster Hilfe mit Selbstschutzinhalten: Selbstschutzausbildung mit kompetenzorientiertem Ansatz'. German Federal Office of Civil Protection and Disaster Assistance. Available at: https://www.bbk.bund.de/SharedDocs/Downloads/BBK/DE/Publikationen/Sonstiges/Rahmenkonzept_Ausbildung_Erste_Hilfe_Selbstschutz.html.

Blaikie, P. *et al.* (1994) *At risk. Natural hazards, people's vulnerability, and disasters*. London: Routledge.

BMI (2014) 'Leitfaden Krisenkommunikation'. German Ministry of Interior. Available at: Online verfügbar unter https://www.bmi.bund.de/SharedDocs/downloads/DE/publikationen/themen/bevoelkerungsschutz/leitfaden-krisenkommunikation.pdf?__blob=publicationFile&v=4, zuletzt geprüft am 28.02.2019.

Brace-Govan, J. (2004) 'Issues in snowball sampling: The lawyer, the model and ethics', *Qualitative Research Journal*, 4(1), pp. 52–60.

Christie, N. *et al.* (2016) 'Private needs, public responses: vulnerable people's flood-disrupted mobility', *Disaster Prevention and Management: An International Journal*, 25(2), pp. 244–260. doi: 10.1108/DPM-11-2015-0254.

Civil Protection Department (2018) 'National risk assessment. Overview of the potential major disasters in Italy: seismic, volcanic, tsunami, hydro-geological/hydraulic and extreme

weather, droughts and forest fire risks'. Italian Civil Protection Department. Available at:
http://www.protezionecivile.gov.it/documents/20182/823803/Documento+sulla+Valutazione
+nazionale+dei+rischi/57f337fd-a421-4cb0-b04c-234b61997a2f.

Civil Protection Department (2019) 'Directive n.67 of 20.03.2019'. Italian Civil Protection
Department.

COM (2013) 'An EU Strategy on Adaptation to Climate Change, COM (2013) 216.'
European Commission, Brussels. Available at: https://eur-lex.europa.eu/legal-
content/EN/TXT/PDF/?uri=CELEX:52013DC0216&from=EN.

Council of Ministers (2018) 'Civil Protection Code, Legislative Decree 1/2018, art. 18
paragraph 1, letter A'. Council of Ministers, Italy. Available at:
http://www.protezionecivile.gov.it/en/transparent-administration/legal-measures/detail/-
/asset_publisher/default/content/decreto-legislativo-n-1-del-2-gennaio-2018-codice-della-
protezione-civi-1.

DRK (2014) *Die Rolle von ungebundenen HelferInnen bei der Bewältigung von
Schadensereignissen. Teil 1. Untersuchung am Beispiel Hochwasser 2013 in Sachsen*. Berlin:
German Red Cross.

DRK (2018) 'Betreuungdienst der Zukunft: Ein Grünbuch der Bundesleitung der
Bereitschaften auf Grundlage von Forschungsergebnissen des DRK'. German Red Cross,
Berlin.

DSB (2018) 'Veileder til forskrift om kommunal beredskapsplikt'. Tønsberg: Direktoratet for
samfunnssikkerhet og beredskap. Available at: https://www.dsb.no/veiledere-handboker-og-
informasjonsmateriell/veileder-til-forskrift-om-kommunal-beredskapsplikt/.

Endrődi, I. (2015) *Polgári Védelmi Ismeret*. Budapest: Magyar Polgári Védelmi Szövetség.
Available at:
https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=2ahUKEwjs
9P7gsJnnAhUKt4sKHe6TDjEQFjABegQIARAB&url=http%3A%2F%2Fwww.mpvsz.hu%2
Fletoltes%2Fdocument%2Fdownload.php%3Fid%3D125-polgari-vedelemi-
ismeret2015.pdf&usg=AOvVaw22ChumiScOHOubMKSkSIcR.

Estonian Government Office (2018) 'The Civil Protection Concept'. Estonian Government
Office & Ministry of the Interior. Available at:
https://www.riigikantselei.ee/sites/default/files/content-
editors/organisatsioon/failid/rakkeryhmad/elanikkonnakaitse_kontseptsioon_15.02.2018.pdf.

Ferencz, Z. and Bartal, A. (2015) 'A vörösiszap katasztrófa társadalmi hatásai'. MTA
Társadalomtudományi Intézet, Szocilológiai Intézet: Argumentum.

FHS (2019) 'Förutsättningar för krisberedskap och totalförsvar i Sverige'. Centrum för
totalförsvar och samhällets säkerhet, Försvarshögskolan, Sweden. Available at:
http://fhs.divaportal.org/smash/get/diva2:1346123/FULLTEXT01.pdf.

Fornyings- og administrasjonsdepartementet (2009) 'Statens kommunikasjonspolitik'.
Fornyings- og administrasjonsdepartementet. Available at:
https://www.regjeringen.no/no/dokumenter/statens-kommunikasjonspolitikk/id582088/.

31

Gabel, F. (2019) 'Chancen dynamischer Konzeptionen von Vulnerabilität für den Katastrophenschutz', in *Resilienz im Katastrophenfall. Konzepte zur Stärkung von Pflege- und Hilfsbedürftigen im Bevölkerungsschutz*. Bielefeld, pp. 77–96.

Haldorsen, I. and Munch-Olsen, Y. (2011) 'Høyrisikogrupper i trafikken. Samlerapport'. Oslo: Vegdirektoratet.

Hartman, C. and Squires, G. (2006) 'There is no such thing as a natural disaster', in *There is no such thing as a natural disaster. Race, class, and Hurricane Katrina*. New York, NY, USA: Routledge, pp. 1–12.

Helsedirektoratet (2016) 'Mestring, sårbarhet og håp. Veileder for psykososiale tiltak ved kriser, ulykker og katastrofer'. Helsedirektoratet, Oslo. Available at: https://www.helsedirektoratet.no/tema/psykososial-oppfolging-ved-ulykker-kriser-og-katastrofer.

Hilhorst, D. and Bankoff, G. (2004) 'Introduction: mapping vulnerability', in *Mapping Vulnerability: Disasters, Development, and People*. Earthscan.

Hyvonen, A. E. *et al.* (2019) 'Kokonaisresilienssi ja turvallisuus: tasot, prosessit ja arviointi', *Valtioneuvoston selvitys-ja tutkimustoiminnan julkaisusarja*.

IFCR (2007) *World Disasters Report 2007. Focus on Discrimination*. Satigny/Vernier, Switzerland: International Federation of Red Cross and Red Cresent Societies.

IFCR (2018) *World Disasters Report 2018. Leaving no one behind*. IFRC.

Kailes, J. I. (2015) 'If people would just prepare!', in *Disability and disaster. Explorations and exchanges*. New York, NY, USA: Palgrave Macmillan.

Kailes, J. I. and Enders, A. (2007) 'Moving Beyond "Special Needs": A Function-Based Framework for Emergency Management and Planning', *Journal of Disability Policy Studies*, 17(4), pp. 230–237. doi: 10.1177/10442073070170040601.

Kaitseliit (2017) 'Kaitseliidu arengukava 2030'. Eesti Kaitseliit. Available at: https://www.kaitseliit.ee/files/kaitseliit/img/files/20171127_KL_arengukava.pdf.

Kaufmann, M. (2013) 'Emergent self-organisation in emergencies: resilience rationales in interconnected societies', *Resilience*, 1(1), pp. 53–68. doi: 10.1080/21693293.2013.765742.

Kelman, I. and Stough, L. M. (2015) '(Dis)ability and (Dis)aster', in *Disability and disaster. Explorations and exchanges. Eds I. Kelman, L. M. Stough*. New York: Palgrave Macmillan, pp. 3–14.

Krüger, M. (2019) 'Building Instead of Imposing Resilience: Revisiting the Relationship Between Resilience and the State', *International Political Sociology*, 13(1), pp. 53–67. doi: 10.1093/ips/oly025.

Mazurana, D., Benelli, P. and Walker, P. (2013) 'How sex- and age-disaggregated data and gender and generational analyses can improve humanitarian response', *Disasters*, 37, pp. S68–S82. doi: 10.1111/disa.12013.

32

McEntire, D. A. (2005) 'Why vulnerability matters: Exploring the merit of an inclusive disaster reduction concept', *Disaster Prevention and Management: An International Journal*, 14(2), pp. 206–222. doi: 10.1108/09653560510595209.

Mechanic, D. and Tanner, J. (2007) 'Vulnerable People, Groups, And Populations: Societal View', *Health Affairs*, 26(5), pp. 1220–1230. doi: 10.1377/hlthaff.26.5.1220.

Ministry of Interior (2011) 'Regulation on implementing the Act No. CXXVIII of 2011 concerning disaster management 234/2011. (XI. 10.)'. Hungarian Ministry of the Interior.

Ministry of Interior (2018) 'Code of Conduct for Crisis Situations'. Estonian Ministry of Interior and the Government Office of Estonia. Available at: https://www.rescue.ee/files/2020-03/elanikkonnakaitse-a4-en.pdf?977eed4edf.

MSB (2011) 'Vägledning för Risk- och sårbarhetsanalyser'. Swedish Civil Contingencies Agency. Available at: https://www.msb.se/RibData/Filer/pdf/25893.pdf.

MSB (2014a) 'Antibiotic resistance and societal security'. Swedish Civil Contingencies Agency. Available at: https://www.msb.se/siteassets/dokument/publikationer/english-publications/antibiotic-resistance-and-societal-security.pdf.

MSB (2014b) 'Research for a safer society – New knowledge for future challenges MSB's research strategy 2014-2018'. Swedish Civil Contingencies Agency. Available at: https://www.msb.se/sv/publikationer/research-for-a-safer-society--new-knowledge-for-future-challenges-msbs-research-strategy/.

MSB (2016) 'A summary of risk areas and scenario analyses 2012–2015'. Swedish Civil Contingencies Agency. Available at: https://www.msb.se/siteassets/dokument/publikationer/english-publications/a-summary-of-risk-areas-and-scenario-analyses-20122015.pdf.

MSB (2018) 'If War or Crisis Comes'. Swedish Civil Contingencies Agency.

NDGDM (2012) 'National Directorate General for Disaster Management: Introduction'. Hungarian Ministry of Interior. Available at: http://www.katasztrofavedelem.hu/letoltes/eng/szervezet/NDGDM_intro.pdf. Ministry of Interior of Hungary. (2012). NDGDM Introduction. National Directorate General for Disaster Management. Retrieved from: http://www.katasztrofavedelem.hu/letoltes/eng/szervezet/NDGDM_intro.pdf.

Norwegian Government (2012) 'Trygg hjemme. Brannsikkerhet for utsatte grupper'. Oslo: Justis- og beredskapsdepartementet. Available at: https://www.regjeringen.no/no/dokumenter/nou-2012-4/id670699/.

Oslo kommune (2019) 'Slik kan du forberede deg. Egenberedskap'. Oslo kommune. Available at: https://www.oslo.kommune.no/politikk-og-administrasjon/egenberedskap/slik-kan-du-forberede-deg/#toc-2.

Otsla, J. (2016) 'Erinevad hädaolukorrad Eestis'. Siseministeerium, Eesti. Available at: https://www.kaitseministeerium.ee/sites/default/files/sisulehed/laiapohjaline/mis_on_hadaolukorrad_jaanis_otsla.pdf.

33

Paul, S. K. (2014) 'Vulnerability Concepts and its Application in Various Fields: A Review on Geographical Perspective', *Journal of Life and Earth Science*, 8, pp. 63–81. doi: 10.3329/jles.v8i0.20150.

Räsänen, A. *et al.* (2020) 'Conceptualizing community in disaster risk management', *International Journal of Disaster Risk Reduction*, 45, p. 101485. doi: 10.1016/j.ijdrr.2020.101485.

Red Cross (2010) 'Emergency Response to the Earthquake in the Region of Abruzzo: A Collective Action of National and International Solidarity'. Rome Emergenza Sisma in Abruzzo terremoto del 6 aprile 2009, relazione di sintesi a sei mesi. Roma. Available at: Ihttps://www.cri.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/2839.

Red Cross Belgium (2016) 'Red Cross Helping at Home and in Brussels'. Red Cross Belgium, (March 26, 2016). Available at: https://www.redcross.org/about-us/news-and-events/news/Red-Cross-Helping-at-Home-and-in-Brussels.html.

Sparf, J. (2016) 'Disability and Vulnerability: Interpretations of Risk in Everyday Life', *Journal of Contingencies and Crisis Management*, 24(4), pp. 244–252. doi: 10.1111/1468-5973.12120.

SPEK (2017) 'Surveys'. Finnish National Rescue Association. Available at: http://www.spek.fi/Suomeksi/Kehittaminen/Tutkimustoiminta/Kyselyt.

SPEK (2020) 'Erityisryhmien asumisturvallisuus'. Finnish National Rescue Association. Available at: https://www.spek.fi/turvallisuus/erityisryhmien-asumisturvallisuus/.

Suomen Pelastusalan Keskusjärjestö (2020) 'Campaign NouHätä'.

Sveriges Riksdag (2006) 'Lag (2006:544) om kommuners och landstings åtgärder inför och vid extraordinära händelser i fredstid och höjd beredskap'. Sveriges Riksdag.

Tetzlaff, G., Karl, H. and Overbeck, G. (2007) 'Wandel von Vulnerabilität und Klima: Müssen unsere Vorsorgewerkzeuge angepasst werden? Workshop des Deutschen Komitee Katastrophenvorsorge e.V. und der Akademie für Raumforschung und Landesplanung am 27.-28.11.2006 in Hannover', *Schriftenreihe des DKKV*. Available at: https://www.dkkv.org/fileadmin/user_upload/Veroeffentlichungen/Publikationen/DKKV_35_Wandel_von_Vulnerabilitaet_und_Klima.pdf.

Tierney, K., J. (2019) *Disasters: A Sociological Approach*. Cambridge: Polity Press.

Tuomenvirta, H. *et al.* (2018) 'Weather and Climate Risks in Finland – National Assessment'. The Prime Minister´s Office of Finland.

Turvallisuuskomitea (2017) 'The Security Strategy for Society', *Finnish Government Resolution*. Available at: https://turvallisuuskomitea.fi/wp-content/uploads/2018/04/YTS_2017_english.pdf.

Umweltbundesamt (2015) 'Vulnerablität in Deutschland gegenüber dem Klimawandel (Climate Change No. 24)'. Umweltbundesamt. Available at: https://www.umweltbundesamt.de/publikationen/vulnerabilitaet-deutschlands-gegenueber-dem.

34

UNDRO (1976) *Guidelines for disaster prevention. Volume I Pre-Disaster Physical Planning of Human Settlement*. Office of the United Nations Disaster Relief Co-ordinator, UNDRO 10/76/Vol.i.

UN-HRC (2015) *Thematic Study on the rights of persons with disabilities under article 11 of the Convention on the Rights of Persons with Disabilities, on situations of risk and humanitarian emergencies*. Office of the United Nations High Commissioner for Human Rights. Available at: http://ap.ohchr.org/documents/dpage_e.aspx?si=A/HRC/31/30.

United Nations (2015) *Sendai Framework for Disaster Risk Reduction 2015 - 2030*. Geneva, Italy: United Nations.

Whittaker, J., McLennan, B. and Handmer, J. (2015) 'A review of informal volunteerism in emergencies and disasters: Definition, opportunities and challenges', *International Journal of Disaster Risk Reduction*, 13, pp. 358–368. doi: 10.1016/j.ijdrr.2015.07.010.

Williams, B. D. and Webb, G. R. (2019) 'Social Vulnerability and Disaster: Understanding the Perspectives of Practitioners', *Disasters*, p. disa.12422. doi: 10.1111/disa.12422.

Wisner, B. *et al.* (eds) (2004) *At risk: natural hazards, people's vulnerability, and disasters*. 2nd ed. London ; New York: Routledge.

**Interviews at institutions, month of interview**

(For the rest of the interview sources used as a background for this analysis - see Orru et al., 2020)

BPS, Brussels-Prevention & Security, December 2019

Belgium Red Cross, December 2019

Estonian Ministry of Social Affairs, November 2019

ERB, Estonian Rescue Board, South Regional Rescue Centre, November 2019

SPEK, Finnish National Rescue Association, January 2020

SPEK, Finnish National Rescue Association, South-West area, December 2019

SPEK, Finnish National Rescue Association, South-East area, January 2020

DSB, Norwegian Inspectorate for Civil Protection, December 2019

Nordland County Municipality, December 2019

Oslo and Viken, County Government, December 2019

35

1
2
3          MSB, Swedish Civil Contingencies Agency, December 2019
4
5          PVSZ, Hungarian Civil Protection Agency, December 2019
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Table 1. An overview of aspects seen as constitutive of individual and group vulnerabilities

| Aspects constitutive of vulnerabilities | Examples of vulnerable individuals and groups | Crisis contexts which might be problematic for these groups | Reference |
|---|---|---|---|
| Limited mental and physical capacities, limited mobility | Elderly; infants and children; disabled; people with specific health conditions (e.g. people with dementia) | Climate-related and natural hazards (e.g. heatwaves); crisis situations that require evacuation; diseases and pandemics | Italy (Council of Ministers, 2018), Germany (BBK, 2014b), Sweden (MSB, 2014b, 2016), Norway (Helsedirektoratet, 2016), Hungary (NDGDM, 2012), Finland (Tuomenvirta et al., 2018), Estonia (Ministry of Interior, 2018) |
| Communication abilities | People having limited access to information due to limited mental or physical capacities or poor language skills (e.g. migrants, tourists) | Crisis situations that are preceded by public warnings; (transport) accidents | Germany (BBK, 2014b), Belgium (Interview at BPS, 12/2019), Finland (Hyvonen et al., 2019), Norway (Interviews at Oslo og Viken and Nordland County, DSB, 2019), Estonia (Estonian Government Office, 2018) |
| Social capital and networks | People living alone and/or without personal social networks, inhabitants of isolated areas; non-resident groups | Crisis situations that require evacuation and relocation of people, natural hazards and weather-extremes | Germany (BBK, 2014b), Sweden (MSB, 2016), Estonia (Estonian Government Office, 2018) |
| Socio-economic status | People living in poverty; recipients of social benefits (e.g. unemployed); socio-economically marginalised (e.g. homeless) | Crisis situations that require self-preparedness and equipment; situations that require evacuation; disruptions of financial services | Finland (Turvallisuuskomitea, 2017; Hyvonen et al., 2019), Estonia (Estonian Government Office, 2018) |

37

| Institutionalised setting | People living in institutional settings (e.g. social and elderly care facilities, hospitals, shelters, prisons etc.); schoolchildren | Crisis situations that require evacuation and relocation of people; on-site accidents (e.g. fires) and attacks (e.g. school shootings); disruptions of vital services | Sweden (MSB, 2016), Norway (Interviews at Oslo og Viken and Nordland County governments and DSB, 2019), Estonia (Estonian Government Office, 2018) |
| Type and conditions of dwelling | People living at top-floor (e.g. in the case of heatwaves) or basement-floor apartments (e.g. during floods); apartment-buildings depending on central provision of vital services | Climate-related and natural hazards (e.g. heatwaves, floods, storms); disruptions of vital services (electricity, heating, water supply, sewerage) | Germany (BBK, 2014a, 2014b) Hungary (Interview at PVSZ, 12/2019); Estonia (Interview at ERB, 11/2019) |
| Residential area or geographic region | People living in urban areas; in isolated settlements; in areas of hazardous facilities or natural hazards | Climate-related and natural hazards (e.g. heatwaves, floods, storms, earthquakes); industrial accidents; attacks; disruptions of vital services | Germany (BBK, 2014a, 2014b); Sweden (MSB, 2014b, 2016); Estonia (Estonian Government Office, 2018) |
| People on the move | Visitors of an area, tourists, commuters, passers-by | Accidents; attacks; transport disruptions fires; disruptions of vital services; climate related and natural hazards | Belgium (Interviews at BPS, 2020); Norway (DSB, 2019). |

38

## 2. Manuscript „Handling false information in emergency management: a cross-country comparative study of European trends and practices" submitted to International Journal of Disaster Risk Reduction

### International Journal of Disaster Risk Reduction
#### Handling false information in emergency management: a cross-country comparative study of European trends and practices
##### —Manuscript Draft—

| Manuscript Number: | |
|---|---|
| Article Type: | Research Paper |
| Keywords: | Misinformation; False information; Information disorder; Vulnerability; Crisis communication; Emergency management |
| Corresponding Author: | Sten Torpan<br>Institute of Social Studies, University of Tartu, Estonia<br>ESTONIA |
| First Author: | Sten Torpan |
| Order of Authors: | Sten Torpan |
| | Sten Hansson |
| | Mark Rhinard |
| | Austeja Kazemekaityte |
| | Pirjo Jukarainen |
| | Sunniva Frislid Meyer |
| | Abriel Scieffelers |
| | Gabriella Lovasz |
| | Kati Orru |
| Abstract: | During emergencies, exposure to false information can make people more vulnerable. More research is needed on how emergency management institutions understand the effects of false information and what are the various approaches to handling it. Our document analysis and 95 expert interviews in eight European countries – Germany, Italy, Belgium, Sweden, Hungary, Norway, Finland, and Estonia – show that approaches vary considerably: some have instituted central management of identifying and tackling false information while others prioritise the spreading of accurate information. A review of recent crises cases in the studied countries indicates that the diffusion of false information is mainly related to the lack of timely verified information. In several countries, the emergence of false information is often associated with malicious foreign influence activities. Our study contributes to a better understanding of how the effects of false information are mitigated by the emergency management systems in Europe. |

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 833496

39

# Handling false information in emergency management: a cross-country comparative study of European trends and practices

Sten Torpan, Institute of Social Studies, University of Tartu, Estonia (corresponding author, sten.torpan@ut.ee)

Sten Hansson, Institute of Social Studies, University of Tartu, Estonia

Mark Rhinard, Department of Economic History and International Relations, Stockholm University, Sweden

Austeja Kazemekaityte, Department of Economics and Management, University of Trento

Pirjo Jukarainen, Police University College, Finland

Sunniva Frislid Meyer, Institute of Transport Economics, Norway

Abriel Scieffelers, Salvation Army, Brussels, Belgium

Gabriella Lovasz, Geonardo, Budapest, Hungary

Kati Orru, Institute of Social Studies, University of Tartu, Estonia

## Abstract

During emergencies, exposure to false information can make people more vulnerable. More research is needed on how emergency management institutions understand the effects of false information and what are the various approaches to handling it. Our document analysis and 95 expert interviews in eight European countries – Germany, Italy, Belgium, Sweden, Hungary, Norway, Finland, and Estonia – show that approaches vary considerably: some have instituted central management of identifying and tackling false information while others prioritise the spreading of accurate information. A review of recent crises cases in the studied countries indicates that the diffusion of false information is mainly related to the lack of timely verified information. In several countries, the emergence of false information is often associated with malicious foreign influence activities. Our study contributes to a better understanding of how the effects of false information are mitigated by the emergency management systems in Europe.

## 1. Introduction

Communication is a fundamental tool in emergency management. The purpose of communication in emergency management is raising awareness about risks and urging for protective behaviour prior to and during hazardous events (Coombs & Holladay, 2012). The truthfulness of sent and received messages becomes essential during emergencies, while a persons' well-being and decisions are dependent on the quality of information.

With the surge of social media use, the spread of unverified and often false information has proliferated (Fernandez & Alani, 2018; Koulolias et al., 2018; Lazer et al., 2018; Nguyen et al., 2012; Shao et al., 2016; Zhang et al., 2016) although user interactions with false content have fallen on some platforms, while rising steadily on others (Allcott et al., 2019). False information includes informational content which may be shared without intending harm or content which may be shared with destructive intent (Wardle & Derakhshan, 2017). In the context of crises and disasters, false or misleading claims, malicious disinformation, rumours, or pranks that people may be susceptible to, may put them to increased risk and/or hamper the normal operation of emergency management institutions.

For normal operation of emergency management, regular and accurate communication is essential (Coombs, 2019; Thai et al., 2017). The necessity to study the effect of false information on the capacity of individuals and institutions to cope with emergencies has been implied in social media false information research (Lazer et al., 2018; Veil et al., 2011; Wang et al., 2019; Wendling et al., 2013). Also the specific mechanisms that are used in emergency management systems in preventing harmful effects of the spread of false information need more scholarly attention to enable establishing appropriate mitigation measures in emergency management (Choy & Chong, 2018; Del Vicario et al., 2016; Jin et al., 2014; Kavanaugh et al., 2012).

In this article we bring the false information posed risks and its mitigation mechanisms to multinational and comparative scope. We work towards a systematic comparative understanding of the practices of institutional handling of false information in the emergency management systems in Europe. We collected and analysed empirical material including relevant legal acts, policy documents, official guidelines, and media reports and carried out 95

semi-structured expert interviews with emergency managers in eight European countries – Germany, Italy, Belgium, Sweden, Hungary, Norway, Finland, and Estonia – between September 2019 and February 2020. We used qualitative thematic content analysis (Nowell et al., 2017) to identify major commonalities and differences in the ways in which false information is defined and treated in different political/administrative systems.

We have divided our study into three parts. First, we explore how different institutions concerned with emergency management in those countries conceptualise false information. Second, we look into the actions taken by emergency management institutions to mitigate the risks posed by false information. Third, we compiled eight small case studies of actual crises to illustrate how false information has been handled by emergency managers. We considered a broad range of crises triggered by natural as well as man-made hazards: earthquake in L'Aquila, Italy (April 2009); terrorist attack on government building in Oslo and at the island of Utøya, Norway (22 July 2011); snowstorm in Hungary (March 2013); flood disaster in Germany (June 2013); increase in asylum seekers in 2015 in Sweden; terrorist attack on Brussels airport and metro (22 March 2016); drinking water contamination in Nousiainen, Finland (January 2017); critical infrastructure failures in Southern Estonia (October 2019).

Before presenting the results of our study, we review existing literature on the principles and practices of handling false information and the related vulnerabilities by emergency management institutions.

## 2. Understanding vulnerability to false information and tools for its mitigation by emergency managers

When emergencies occur, all parties (i.e. first responders, communicators, local and central government) in the emergency management system who participate in managing emergencies have to cooperate in sharing information with the aim of reducing people's vulnerability and increasing resilience (Coombs, 2019). Therefore, emergency management systems and their communicational networks' (e.g. supporting government agencies, local institutions) ought to update and inspect their capabilities to tackle information related problems regularly (Boin & 't Hart, 2010).

Inaccurate institutional communication during emergencies brings about several communication-related vulnerabilities. These include instances where people either believe and act upon false information, where they neglect truthful information because issues of trust, or where they fail to receive any information because of their circumstances. Information behaviour researchers have argued that the peoples' need for information during uncertain situations is impelled by a desire to make confident decisions concerning subsequent actions (Griffin et al., 2004). Emergency situations are occasions when people are likely to engage in information seeking to reduce uncertainty and dissonance (Seeger, 2006; Spence et al., 2016). Hence, when false information happens to be the only information available, the subsequent actions during emergency situations might be ill-based.

Disaster researcher Quarantelli (1997) foresaw the problematic aspects of the diffusion of inappropriate or incorrect disaster-related claims and ideas already before the social-media era. Contemporary technology has changed the ways of communicating and socialising, whereas the speed, scale and anonymity of messages are unprecedented. In addition to traditional official channels, people increasingly use social media during crises to determine their future actions (Stieglitz et al., 2018). This increases their likelihood to run into inaccurate or incomplete information that does not coincide with the official communication of the emergency management institutions. To counteract these tendencies, over a 100 independent fact-checking groups and organisations have emerged around the world during the last decade (Koulolias et al., 2018).

Furthermore, during the COVID-19 pandemic, global and regional institutions joined forces with governments, businesses, non-governmental organisations and individual volunteers to counter massive spread of misinformation and conspiracy theories. For example, the Europol (2020), the International Organisation for Migration (IOM, 2020), the World Health Organisation (WHO, 2020) and the United Nations (2020) launched awareness campaigns to combat harmful information.

Contemporary means of communication have led to the forming of complex informational networks which some scholars call "information disorder" (Wardle & Derakhshan, 2017). In essence, this definition is aimed to go beyond the common and overused term "fake news"

which fails to describe the complexity of the false information phenomenon. Simply put, "information disorder" encompasses the challenges posed by misleading or false information.

To better understand "information disorder", Wardle & Derakhshan (2017) differentiate between three dimensions of informational harm and falseness: *misinformation*, when false information is shared, but no harm is meant; *disinformation*, when false information is knowingly shared to cause harm; and *malinformation*, when genuine information is shared to cause harm (e.g. leaks of private information). Scholars of information related problems have introduced this division of terms also in their works (Piccolo et al., 2019; Tran et al., 2020; Wang et al., 2019; Zubiaga et al., 2018).

From their taxonomy, "disinformation" encompasses phenomena like information operations and influence operations, which are „activities conducted by foreign powers to influence the perceptions, behaviour and decisions of target groups to the benefit of foreign powers" (Berzina & Soula, 2020; MSB, 2018). The state's abilities to respond to disinformation vary due to the differing attribution of threats between nations and international organisations and could result in ineffective and uncoordinated communication response to harmful false information (NATO Strategic Communications Centre of Excellence, 2019).

Previous studies about tackling false information during emergencies have mainly been focused in the area of social media (Jurgens & Helsloot, 2018; Kaufhold et al., 2019; Kavanaugh et al., 2012; Reuter & Kaufhold, 2018; Roshan et al., 2016; Simon et al., 2015; Su et al., 2013). Unequal capacities to deal with false information has been attributed to the countries' varying abilities to accommodate to the new reality of social media (Jurgens & Helsloot, 2018). Because of the rapidity of information flow in social media and the lack of possibilities to verify information in emergency situation, social media becomes a perfect platform for false information (Koulolias et al., 2018; Mavridis, 2018; Tandoc et al., 2018; Velev & Zlateva, 2012).

Research on various guidelines on citizens' social media use during emergencies shows that chaotic use hampers the work of emergency managers (Kaufhold et al., 2019). However, social media may also help to engage the public in the debunking of false information during emergencies (Simon et al., 2015) and may have a positive effect on collaborative problem-solving (Jurgens & Helsloot, 2018; Mavridis, 2018).

An aspect to people's resilience to false information is information literacy (or media literacy), which involves the "careful retrieval and selection of information available … in all aspects of personal decision-making" (Koltay, 2011, p. 215). Commonly, media literacy is understood as "a process or set of skills based on critical thinking" (Bulger & Davison, 2018, p. 3). That, paired with the proven benefit of online collaborative problem-solving, sets a positive example of the possibility to tackle false information by individuals.

A growing body of research deals with vulnerabilities related to false information, including harms to health (Bessi et al., 2015; Wang et al., 2019) as well as harms occurring during humanitarian crises, natural disasters, manmade crises, healthcare crises and complex emergencies (Tran et al., 2020). However, the mechanisms of becoming vulnerable due to false information, including how the false information has hampered the functioning of the institutions tasked with managing emergencies and securing well-being, have remained under-explored.

Communication researchers have shown some evidence that people who use fewer news sources and lack skills of using the internet are most vulnerable to false information (Dutton & Fernandez, 2019). Situational nature of communication-related vulnerabilities, including access to verified information and the ability to distinguish between false and correct information, has been highlighted (forthcoming). For example, lack of official information about the emergency undermines people's ability to respond to disaster scenarios (West & Orr, 2007).

Only a few studies have explored the institutional strategies in handling false information. For example, researchers have recommended emergency managers fill the role of sense-givers who 1) provide instant and accurate information, 2) take a position on circulating rumours and, if necessary 3) debunk misinformation (Mirbabaie & Marx, 2020). A well-regulated use of social media helps to avoid chaotic communication and to support the work of emergency managers (Kaufhold et al., 2019). Veil et al. (Veil et al., 2011) recommend institutions to use social media also for daily communication, to strengthen the relationship of trust with the public that could be employed also at the time of emergency.

Furthermore, the clear labelling of official messages contributes to tackling the spread of unofficial and unverified information (Wendling et al., 2013). Brynielsson et al. (2018), highlighted data acquisition and data analysis as important aspects in social media screening for increasing situational awareness by the emergency management institutions.

Much of the research on the topic of false information has focused on the spreading mechanism of false information during public crises or fast-paced events (Del Vicario et al., 2016; Zhu et al., 2018; Zubiaga et al., 2018) and on the possibilities of mapping it online (Antoniadis et al., 2015; Choy & Chong, 2018; Mavridis, 2018; Nguyen et al., 2012; Zubiaga et al., 2018) or of debunking and correcting it (Lewandowsky et al., 2012). Researchers in an ongoing project called Co-Inform ('Co-Inform', 2020) have proposed a mechanism that might influence people's behaviour while interacting with false information online (Konstantinou et al., 2019).

Another prospect to false information response is the level of centralisation of any emergency management system. In the context of emergency management, researchers have shown that decentralised management and resource allocation helps to avoid high consequence failures that centrally managed systems are more prone to (Ramchurn et al., 2010). The benefits of decentralisation have also been backed by others (Mazereeuw & Yarina, 2017). The issue of centralisation is therefore worth looking into also in the context of false information response.

These kinds of studies enable researchers to develop better mapping and identification tools for false information. Nevertheless, their focus on the technical side of the false information phenomenon tends to neglect the human side of the problem – the vulnerability of people due to false information and the institutional strategies in mitigating these effects.

By exploring the official definitions and current practices of handling false information during emergencies, we will contribute to the empirical study of institutional experience with false information and shed some new light on how false information makes individuals more susceptible to contemporary hazards.

## 3. Results

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 833496

46

Below, we present our findings from eight countries under three thematic sections: 1) conceptualisations of false information; 2) approaches to handling false information, and 3) recent experiences with false information and its effect on vulnerability.

### 3.1. Conceptualisations of false information

While none of the studied institutions have officially defined false information, in most countries (Germany, Italy, Sweden, Finland, Norway and Estonia) the related terms are either mentioned in some documents or conventionally used by emergency managers.

The fact that official definitions existed in none of the studied countries could signify that crisis communication experts' knowledge and existing official guidance related to the subject has been sufficient. This claim is supported by the fact that much of the discourse in our data on the topic of false information derives from guideline documents for officials (Franzén, 2017; Government Office & Ministry of the Interior, 2018; Leib et al., 2011; Ministry of the Interior, 2017, 2018, 2020; MSB, 2019b; Swedish Government regulation, 2018; Security Committee, 2017) and is backed with interviews (Interview at German National Emergency Organisation, 12/2019; Interview at Italian government office, 1/2020).

The conventional use revolves around two sub-terms of false information: misinformation and disinformation. The term "misinformation" is prevalent in the discourse (BBK, 2013, 2014; Government Office & Ministry of the Interior, 2018; Leib et al., 2011; Ministry of the Interior, 2017, 2020); however, it is often used in both meanings (Interview at German National Emergency Organisation, 12/2019; Leib et al., 2011). "Inaccurate" or "unintentional" are repeatedly mentioned properties of misinformation in Sweden and Estonia (e.g. Leib et al., 2011).

False information spread is often blamed on the lack of information (Interview at German National Emergency Organisation, 12/2019), but also on the lack of trust in public institutions (Interview at Italian government office, 1/2020). Notably, the emergency managers interviewed in Italy use the term "bad information" to refer to any false information phenomena (Interview at Italian government office, 1/2020). Overall, the understanding of false information is rather biased towards the malcontent part of it, disinformation (Interview at

German National Emergency Organisation, 12/2019; Kragh & Åsberg, 2017; MSB, 2018; Swedish Government regulation, 2018).

Distinctions of disinformation types emerge according to the effect it has. For example, disinformation is seen as (1) deliberate false information exploited for political purposes or (2) hindering or damaging emergency operations (Interview at German National Emergency Organisation, 12/2019). The Norwegian Directorate for Civil Protection (DSB) conceptualises the same idea by laying down disinformation's two main purposes: "To divert attention from a theme, cover the truth or try to influence the actors to act in a particular way" (Interview at DSB, 1/2020).

Foreign influence activities/operations have been highlighted as one of the primary manifestation of disinformation in Sweden (Kragh & Åsberg, 2017; MSB, 2018; Swedish Government regulation, 2018), Norway (Interview at DSB, 1/2020), Finland (Franzén, 2017; Valtioneuvoston kanslia, 2019), and Estonia (Government Communication Office, 2019; Ministry of the Interior, 2018). The Finnish document of planning municipalities crisis communication goes a step further and attributes the spread of disinformation to the techniques of modern warfare (Franzén, 2017). Similarly, the Norwegian DSB describes disinformation as "misleading information and arguments to influence the public debate or decision making; or undermine democratic processes" (Interview at DSB, 1/2020).

### 3.2. Approaches to handling false information

We found that responding to misinformation is organised relatively loosely in Germany, Italy, Hungary, Norway, Finland, and Estonia and more strictly in Belgium and Sweden.

It appears that countries with decentralised emergency management (Germany, Norway, Finland, Estonia) also have a decentralised system for responding to misinformation. Formal guidelines or regulations for dealing with challenges of misinformation in the context of emergency management exist in Sweden, Norway, Estonia and Finland.

*The level of organisation in tackling false information*

Italy, Belgium, and Sweden have specific agencies dedicated to countering misinformation. Somewhat more decentralised (i.e. using the help of benevolent groups, NGOs, citizen initiatives, on-call volunteers etc.) false information response systems can be found in Germany, Italy (in addition to specific agencies), Hungary, and Norway.

For example, in Italy, the agency responsible for tackling misinformation depends on the scope of the case. The Department of Civil Protection states that in case of an emergency the local mayor tackles false information with the tools available, but on the other hand if the emergency is managed centrally, then the Department of Civil protection prioritises social media as the channel to respond to false information (Interview at Department of Civil Protection, 12/2019). The Italian Ministry of Interior and the Postal Police, in collaboration with the National Cyber Anticrime Centre for the Protection of Critical Infrastructures, have published a simple form for reporting 'fake news' so that the Postal Police will be able to intervene directly (*Commissariato Di P.S. Online*, 2020).

In Belgium, crisis management teams respond to misinformation. Municipal or provincial authorities appoint a crisis management official who develops a crisis communication plan (*Population Information Intervention Plan*) that serves as a guideline for informing the population in an emergency situation (Centre de Crise, 2020). On the federal and provincial levels, there are officials specifically trained in crisis communication and dealing with social media (Interview at University of Liege, 1/2020).

In Sweden, the guidelines for responding to misinformation are presented in the Swedish Civil Contingencies Agency's (MSB) 'regulatory letter' (MSB, 2017) regarding the area of information influence: the agency is instructed to disseminate knowledge and contribute to other relevant actors' preparedness in the area. This includes provision of research funding, education (e.g. to government officials, media companies, political parties, interest groups and companies) and collaboration with the media regarding knowledge enhancement measures. In collaboration with Lund University, MSB produced a manual (MSB, 2019b) that provides concrete tools for independently understanding, identifying and managing the information influence. The agency also has a central responsibility to coordinate action against misinformation campaigns targeting Sweden. This includes monitoring/surveillance to identify problems, analysis to understand problems, actively communicating correct information, and distributing messages to counter misunderstandings and false information (MSB, 2019b).

In Hungary, the National Directorate General for Disaster Management located within the Ministry of Interior publishes official announcements and monitors social media (Interview at Hungarian Civil Protection Agency, 12/2019; Interview at Budapest Waterworks, 11/2019).

In Norway, responding to misinformation is generally organised by the department of communication of the institution that is affected. The guidelines for responding to misinformation are included in the crisis communication guidance for public and private agencies by the DSB (DSB, 2016).

*Emphasis on spreading truthful information*

A different approach has been taken in Finland and Estonia, where emphasis is on spreading truthful information rather than directly tackling misinformation via specific agencies (Interview at Estonian Information System Authority, 11/2019; Valtioneuvoston kanslia, 2013). In these decentralised systems, each emergency management institution and vital service provider (e.g. water and electricity companies) is responsible for their own communication.

The government of Finland has published a general handbook for communication experts titled *Countering Information Influence Activities* (Valtioneuvoston kanslia, 2013) that gives help on how to tackle information operations and influencing, such as false information. It advises communication experts to "…make sure that wrong and misleading information is straightened immediately, and incomplete information is added with new information" (Valtioneuvoston kanslia, 2013, p. 42). The book states that "…authorities must take care that information given is not misleading" (Valtioneuvoston kanslia, 2013, p. 14) and that "media, open sources and observing opinions and analysing them becomes more important in abnormal situations and emergencies. Systematic observation and analysing supports authorities' decision making, and it aims to prevent rumours and disinformation from spreading…" (Valtioneuvoston kanslia, 2013, p. 21). According to a Finnish official, "rescue services don't take part in debates" but "social media is followed and when needed, a correction is posted as a reply to a message" (Interview at Finland Regional Emergency Services, 1/2020). Finland is also participant and host country of the European Centre of Excellence for Countering Hybrid Threats that assists

member states and institutions in understanding and defending against hybrid threats, such as information influencing and cyber warfare (Hybrid CoE, 2020).

In Estonia, official plans for solving different scenario emergencies also include countering misinformation as a task for communication teams (Ministry of the Interior, 2020). The *Handbook on Crisis Communication* states that a crisis communication group should inform the group leader about false information and speculation; and that if false information triggers unwanted behaviour among the population, it should definitely be disproven (Leib et al., 2011). In terms of preparation, the *Estonian Guide for Coping with Information Attacks* (Government Communication Office, 2019) explains how to prepare for malicious information attacks, how to recognise such activity, and how to react when information attacks occur in crisis situations.

*Semi-official tackling mechanisms*

Semi-official groups participate in countering false information in Germany, Italy, Finland, and Estonia.

In Finland, there is an agency called Faktabaari, an impartial journalistic service using social media for collecting and distributing factual information. Faktabaari is run by a transparency NGO (Non-Governmental Organisation) and is managed by a voluntary staff of professional journalists, researchers, EU experts, teachers and technical staff with the help of broader network of topical experts and information and media literacy specialists. The *Finland Security Strategy for Society* highlights the role of good journalism in tackling disinformation: "Media has a significant role in maintaining and creating physical crisis resilience. Improving citizens' media literacy, basic digital competences and trustworthy journalism make participation in society stronger. It also promotes safe control of media environment and helps defend against disinformation" (Security Committee, 2017, p. 23).

Norway has a somewhat similar approach. Faktisk.no AS is a non-profit organisation and independent editorial board for fact-checking of the public debate in Norway. The purpose of Faktisk.no is to contribute to an open, inclusive and fact-based public conversation. By reviewing the basis of claims that affect Norwegians' perception of reality, they work for a fact-based exchange of words and a constructive public debate. Faktisk.no is owned and financed by some of the largest media companies in Norway (Faktisk.no, 2020). Several of

these companies receive public funding. In addition, Faktisk.no gets funding through grants from non-profit organisations, foundations and other sponsors who identify themselves with the company's purpose or who wish to support the objective and purpose behind Faktisk.no (Faktisk.no, 2020).

Germany has implemented a sort of hybrid solution. Crisis management and crisis communication are decentralised and federal in Germany. However, in 2011, Virtual Operations Support Teams were launched that monitor and respond to crises (including misinformation) in social media. These teams are available as a support for every emergency on the German territory, including searching for new information, validating information, and supporting communication (Lüge, 2014).

Italy has online communities that do fact-checking and unmask hoaxes (*BUTAC Homepage*, 2020; *CICAP Homepage*, 2020) and in Estonia, there is a volunteer organisation called Propastop, a part of the Estonian Defence League, which operates to counter misinformation campaigns (*Propastop Homepage*, 2020).

*Campaigns to enhance awareness of false information*

Italy, Belgium, Sweden, Norway, Finland, and Estonia have carried out campaigns for informing the public about the dangers of false information. Existing campaigns have either been addressed to the youth (e.g. Italy, Finland, Norway) or just to unspecified "public" (e.g. Italy, Belgium, Sweden, Finland, Norway, Estonia). However, only a few of them have focused on false information in emergency situations (e.g. Italy, Estonia).

While all campaigns provide suggestions for general media literacy, the Finnish and Italian approaches take a step beyond. By addressing different age groups and maintaining a Media Literacy School (in Finland), the campaigns are aggressively ongoing.

In Italy, the Postal Police and the regional committees for communications, which operate as functional bodies of the Authority for the Guarantees in Communications, have been carrying out information and prevention activities in schools for years to address the risks and dangers associated with the use of the Internet. For instance, the "Good to Know" project, in collaboration with Google, aimed to teach how to defend oneself against online misconduct:

cyberbullying, hate speech, stalking, soliciting, violations of privacy, but also phishing and malware (*Good To Know*, 2020). The annual major campaign for preparedness in Italy is called "Io Non Rischio" (I don't Risk) (*Io Non Rischio Homepage*, 2020). The Twitter page of "Io non rischio" account shares links to documents issued by the Italian Civil Protection.

In Belgium, the website info-risques.be has a page dedicated to "responsible communication", which, amongst other things, asks the public not to share rumours or any other information from unidentified sources (Info-Risques, 2020).

In Sweden, the Swedish Civil Contingencies Agency (MSB) provides advice to the public on their websites on how to evaluate sources of information (MSB, 2019a).

Finland emphasises the high level of education, which stimulates information literacy (Ministry of the Interior, 2018). The term 'multiliteracy' is used to refer to skills of interpreting, producing and evaluating different texts, these skills help pupils to understand forms of multicultural communication and these are promoted among children aged 0–8. The campaign "Skills in the digital era" run by Ministry of Education and Culture and Finnish National Agency for Education seeks to strengthen adults' digital skills. The National Audio-visual Institute (KAVI) promotes media education, children's media skills and the development of safe media environment for children in cooperation with other organisations in the sector. The department develops media education practices and models. They support media education readiness of the educators, for example, by maintaining an online Media Literacy School. KAVI coordinates Media Literacy Week, during which e.g. a Safer Internet Day is celebrated in Finland (*KAVI Homepage*, 2020).

In Norway, critical thinking and source criticism have been reinforced in the new curricula to be implemented in autumn 2020 (Norwegian Directorate for Civil Protection, 1/2020). One of the most important tasks of the Norwegian Media Authority is to increase critical media literacy of the population. For instance, in 2019, the Norwegian Media Authority conducted a campaign called "Stop. Think. Check" (Norwegian Directorate for Civil Protection, 1/2020).

In Estonia, the Code of Conduct for Crisis Situations (Ministry of the Interior & Government Office, 2018) tells the citizens to "watch trustworthy information channels for official crisis communication and follow the code of conduct". Also, the Estonian Information System

Authority's programme "IT-vaatlik" teaches how to reveal frauds on the web. The Government Office organises 'digital competence days' multiple times a year (Estonian Government Office, 11/2019; City of Tartu, 11/2019).

In Germany, there are no campaigns on misinformation threats in crisis situations, but there exists a federal guideline from the Ministry of Interior about crisis and risk communication (Federal Ministry of Interior, 2014), which informs institutions of the Federal Ministry's demand of being perceived as the leading source of information. Likewise, Hungarian institutions tasked with crisis management have put an emphasis on crisis communication rather than on preparedness campaigns.

### 3.3. Experiences with false information caused vulnerabilities

We explored particular country-specific crisis cases where misinformation interfered with crisis management. The cases were chosen so that these would best illuminate the hypothetical crisis communication bottlenecks experienced in Europe. The content of false information, its spreading mechanism, the institutional reactions and harming mechanism in each of these cases are summarised in Table 1.

The case studies of the flood in Germany, the terrorist attack in Belgium, and the snowstorm in Hungary did not reveal any evidence that people were hurt due to misinformation. Nevertheless, the harming potential is alarming, and thus noteworthy. Institutions reacted to false information in all crisis cases. In case of Elbe floods in Germany, officials did not make any coordinated efforts to prevent the spread of misinformation.

We found that the diffusion of false information was most commonly caused by the inability of the authorities to gather and share verified information widely and in time. For example, the 22 July 2011 terrorist attack in Norway illuminates the dangers of the absence of timely official social media statement (Steensen et al., 2018). The dissemination of incorrect information about how far the police had progressed towards the location persisted until the arrest of the culprit.

The studied cases indicate that the vastness of the operations that need to be coordinated to restore normal services may halt the normal information circulation and give room for the spread of rumours and false information. This was the case in the interrupted services of social assistance in Sweden (SOU, 2017), interruption of vital services due to storm in Estonia (Mõttus, 2019), and drinking water contamination in Finland (Belinskij & Saarinen, 2019). The crisis coordination of service restoring efforts overweighed the efforts put into restoring and maintaining communication in crisis situation.

The analysed cases indicated that false information also spread due to the institutionalised, habitual information behaviour by officials, which was not reflexive to the situation at hand. For example, in the interruption of vital services in Estonia, an automated message was sent to clients. The message contained an underestimation of the time it took to restore the electricity connection. In the Finnish drinking water contamination case, official identification of and informing about the source of contamination was delayed.

Unverified risk assessments and projections (e.g. underestimating threats) may cause later harm due to distrust in official sources. For example, in the Italian earthquake case, inaccurate information came from an amateur scientist who predicted an imminent earthquake based on fluctuations in radon gas detected by four homemade radiometers. Coincidentally, the forecast preceded the real earthquake for a few weeks, and this raised many doubts that the L'Aquila 2009 earthquake could have been predicted in advance. Additionally, the consequent court cases with the experts of the government created alarmism and reduced trust in institutions. This case shows that false information creates ill temper among the population, who believe they are being misled by the official institutions.

The duration and foreknowledge of the hazardous event also played a significant effect in the spread of false information. German and Hungarian natural disaster incidents were different from the Italian as in the former cases, the existing forecasts and foreknowledge about the event left less room for the emergence of false information and this might have led to less casualties. In the Italian case, the false alarms interfered with official information prior to the devastating earthquake.

| | What was the false information about? | How did it spread? | What was the institutional reaction? | Who were hurt as a consequence of false information? |
|---|---|---|---|---|
| **Earthquake in L'Aquila, Italy, in April 2009** | Prediction of imminent earthquake based on fluctuations in radon gas detected by four homemade radometers | Mass media and internet highlighted the information | A denunciation for "false alarm" was issued, and an injunction forbade the person from publicising his data on the Internet. | People who evacuated unnecessarily from home and citizens who no longer trust institutions |
| **Red sludge disaster in Hungary in 2010** | Non-toxicity of the red sludge | Company manager | Delayed governmental reaction | People who washed themselves in good faith |
| **Terrorist attack against government complex in Oslo, Norway in 2011** | Messages about it being more than one bomb explosion; and that Islamist terrorists were behind the attacks | The amount of damages in Oslo city was so large that people believed that it had been caused by several bombs<br><br>Social media | Publication of actual number of bombs<br>The police made the offender's identity public | Incidents where "muslim"-looking people were threatened with violence |
| **Terrorist attack at the island of Utøya, Norway in 2011** | The arrival time of the police | Facebook and Twitter | Delayed police reaction | Unsuspecting youth who came out of hiding |
| **Flood disaster in Germany in June 2013** | Misinformation resulting in misallocation of helpers | Facebook and Twitter | No coordinated institutional response | No particular socio-demographic group |
| **Increase in asylum seekers in 2015 in Sweden** | Asylum seekers' confusion about their status (cause: no translation) | Word of mouth | Institutional attempts to change the narrative | Unaccompanied minors registered unknowingly |
| **Drinking water contamination in Nousiainen, Finland in 2018** | Official doubts about the credibility of the contamination of water | Facebook group | Delayed municipal reaction | Water drinkers |

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65

| | | | | |
|---|---|---|---|---|
| **Critical infrastructure failures in Southern Estonia in 2018** | Automatic message: power returning soon | Automatic message | No reaction | Local people who did not start preparing for a long-term power cut |

Table 1. *Handling of false information caused vulnerabilities in particular country cases*

## 4. Discussion and conclusions

False information tackling practises vary among countries considerably, ranging from institutionalised, centralised management of identifying and tackling false information to decentralised guidelines, and from active promotion of official narratives to a hands-off approach emphasising individuals' responsibility.

Official responding to false information is organised relatively loosely in Germany, Italy, Hungary, Finland, Norway, and Estonia; and more strictly in Belgium and Sweden. Formal guidelines or regulations for dealing with challenges of false information in the context of emergency management exist in Sweden, Finland, Norway, and Estonia.

Depending on the structure of the crisis and risk communication systems (centralised or decentralised), identification and response to false information are organised differently. Countries with decentralised emergency management (Germany, Finland, Norway and Estonia) also have a decentralised system for responding to false information. Some countries (Italy, Belgium and Sweden) have specific agencies dedicated to countering false information, whereas others (Finland and Estonia) put an emphasis on spreading truthful information rather than directly tackling false information.

In some countries, specialised communication support teams (like the D5 in Belgium) have been instituted to improve media monitoring and tackling false information on social media. Not bound to any particular crisis management institution, the teams can be called to action in any crisis case regardless of its location in a country. Semi-official groups for refuting false

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 833496

57

information exist also in Germany, Italy, Finland and Estonia. The German solution is a sort of a hybrid: a decentralised management with the opportunity to call to aid specialised central teams for crisis communication.

Our study indicated that the dissemination of false information is (in Sweden, Finland, Norway and Estonia) often associated with malicious foreign influence activities. The varying recognition of information influencing between different countries is problematic since it may hamper effective and coordinated communication response to harmful false information (NATO Strategic Communications Centre of Excellence, 2019).

As for the mechanisms of vulnerability due to false information, commonality among case studies was that the diffusion of falsehoods was mainly caused by the lack of timely officially confirmed information. Furthermore, the existing forecasts and foreknowledge about the event left less room for the appearance and spreading of false information and this might have led to less casualties. Such scientific projections can be available in case of slowly evolving natural hazards like flood or snowstorm, but are more difficult to map in case of malicious acts like terrorist attacks, and almost impossible to predict in case of accidents or sudden natural hazards (e.g. earthquakes).

As an important vulnerability mechanism, distrust towards official sources hampers disaster management. The Italian earthquake case supports the previous understanding that distrust towards the information source might bias how risks are perceived and acted upon. If people trust the institution, the information it spreads has more impact (Slovic, 1993). This indicates, for any given emergency, responsible official institutions should engage with relevant stakeholders (community leaders, volunteer groups, associations etc.) and include them in their communication networks. For example, Veil et al. (2011) recommend institutions to use social media also for daily communication to strengthen the relationship of trust with the public.

As for approaches of mitigating the vulnerabilities to false information in emergencies, case studies indicated that detecting relevant issues in media helps to mitigate the spread of possible false information. Nevertheless, not all countries have instituted monitoring mechanisms. This can be attributed to the varying levels of adopting social media tools altogether (Jurgens & Helsloot, 2018).

Another way of mitigating vulnerabilities to false information in crises situation is the investment in information literacy. Since it is not possible to eliminate all unintentional false information spread by the officials or by the members of the public, it is wise to provide media literacy training and information awareness campaigns (e.g. the Finnish example). This is a reasonable strategy, since vulnerability to false information is higher among people who use fewer news sources and lack skills of using the internet (Dutton & Fernandez, 2019).

Previous experimentation with the spreading mechanisms of false information has also shown that with adaptive emergency communication it is possible to control the prevention or elimination of the false information, but not the direction of it (i.e. protect particular groups) (Zhu et al., 2018). The direction could be controlled with sustainable emergency management, where institutions devote time to comprehend the specific mechanism of any given false information event. One demonstrated, effective option to counter the spreading of false information in any given country is therefore to invest in information literacy of the public (Zhu et al., 2018).

Another solution to mitigate the false information effect in social media could be the further development of social media platforms so that they would not expose users to narrow, targeted information, but would rather increase the users' exposure to a variety of topics and politically diverse information (Messing & Westwood, 2014). Zhu and others (2018) also arrived at this conclusion from their comprehensive studies modelling the spreading mechanisms of false information. They showed that when the susceptibility rate of false information is low, the success of diffusion falls considerably. This supports the media education prevention technique in tackling false information. The approach has been also highlighted in the OECD report on combating misinformation (Koulolias et al., 2018).

Understanding how information disorder affects emergency management will help future decision-makers at multiple governance levels to tackle and alleviate the hampering impact of false information in emergency management. Local officials may be best placed to help educate communities on source critique and information authenticity, while national governments would be well-placed to offer guidelines and resources for combatting false narratives. European Union authorities already engage in these issues through the promotion of official narratives, rooting out and publicising illegitimate sources, and working with technology companies to improve information provision (Bendiek et al., 2019). Officials should carefully

consider whether European-level campaigns complement or contradict the diversity of national level responses outlined in this article.

**References**

Allcott, H., Gentzkow, M., & Yu, C. (2019). Trends in the diffusion of misinformation on

social media. *Research & Politics*, *6*(2), 205316801984855.

https://doi.org/10.1177/2053168019848554

Antoniadis, S., Litou, I., & Kalogeraki, V. (2015). A Model for Identifying Misinformation in

Online Social Networks. In C. Debruyne, H. Panetto, R. Meersman, T. Dillon, G.

Weichhart, Y. An, & C. A. Ardagna (Eds.), *On the Move to Meaningful Internet*

*Systems: OTM 2015 Conferences* (Vol. 9415, pp. 473–482). Springer International

Publishing. https://doi.org/10.1007/978-3-319-26148-5_32

BBK. (2013). *Abschätzung der Verwundbarkeit gegenüber Hochwasserereignissen auf*

*kommunaler Ebene (Praxis im Bevölkerungsschutz No. 4).*

BBK. (2014). *Social Media. BBK Bevölkerungsschutz.*

Belinskij, A., & Saarinen, R. (2019). *Selvitys vesihuollon häiriötilanteista: Lainsäädännön mukaisten vaatimusten täyttäminen ja toimenpidesuositukset*. https://mmm.fi/documents/1271139/1371655/Selvitys+vesihuollon+h%C3%A4iri%C3 %B6tilanteista+raportti+8_2019.pdf/c4dac2da-8f90-ff72-a396- b327ca8d02c9/Selvitys+vesihuollon+h%C3%A4iri%C3%B6tilanteista+raport ti+8_201 9.pdf

Bendiek, A., Schulze, M., & Stiftung Wissenschaft Und Politik. (2019). Disinformation and elections to the European Parliament. *SWP Comment*. https://doi.org/10.18449/2019C16

Berzina, K., & Soula, E. (2020). Conceptualizing Foreign Interference in Europe. *Alliance for Securing Democracy*. https://securingdemocracy.gmfus.org/wp- content/uploads/2020/03/Conceptualizing-Foreign-Interference-in-Europe.pdf

Bessi, A., Zollo, F., Del Vicario, M., Scala, A., Caldarelli, G., & Quattrociocchi, W. (2015). Trend of Narratives in the Age of Misinformation. *PLOS ONE*, *10*(8), e0134641. https://doi.org/10.1371/journal.pone.0134641

Boin, A., & 't Hart, P. (2010). Organising for Effective Emergency Management: Lessons from Research1: Organising for Effective Emergency Management. *Australian Journal of Public Administration*, *69*(4), 357–371. https://doi.org/10.1111/j.1467- 8500.2010.00694.x

Brynielsson, J., Granåsen, M., Lindquist, S., Narganes Quijano, M., Nilsson, S., & Trnka, J. (2018). Informing crisis alerts using social media: Best practices and proof of concept. *Journal of Contingencies and Crisis Management*, *26*(1), 28–40. https://doi.org/10.1111/1468-5973.12195

Bulger, M., & Davison, P. (2018). *The Promises, Challenges, and Futures of Media Literacy*. https://digital.fundacionceibal.edu.uy/jspui/handle/123456789/227

*BUTAC homepage.* (2020). BUTAC Homepage. https://www.butac.it/

Centre de Crise. (2020). *Information à la Population.*

https://centredecrise.be/fr/content/information-la-population

Choy, M., & Chong, M. (2018). Seeing Through Misinformation: A Framework for

Identifying Fake Online News. *ArXiv:1804.03508 [Cs].*

http://arxiv.org/abs/1804.03508

*CICAP Homepage.* (2020). https://www.cicap.org/n/index.php

Co-Inform. (2020). [Homepage]. *Co-Inform.* https://coinform.eu/about/the-challenge-of-

misinformation/

*Commissariato di P.S. Online.* (2020). https://www.commissariatodips.it

Coombs, W. T. (2019). *Ongoing Crisis Communication: Planning, Managing, and*

*Responding.* Sage.

Coombs, W. T., & Holladay, S. J. (2012). *The handbook of crisis communication.* Wiley-

Blackwell.

https://liverpool.idm.oclc.org/login?url=http://search.ebscohost.com/login.aspx?direct

=true&scope=site&db=nlebk&db=nlabk&AN=309421

Del Vicario, M., Bessi, A., Zollo, F., Petroni, F., Scala, A., Caldarelli, G., Stanley, H. E., &

Quattrociocchi, W. (2016). The spreading of misinformation online. *Proceedings of*

*the National Academy of Sciences*, *113*(3), 554–559.

https://doi.org/10.1073/pnas.1517441113

DSB. (2016). *Veileder krisekommunikasjon. Tønsberg: Direktoratet for samfunnssikkerhet og*

*beredskap.* https://www.dsb.no/lover/risiko-sarbarhet-og-beredskap/veileder/veileder-

krisekommunikasjon/

Dutton, W. H., & Fernandez, L. (2019). How Susceptible Are Internet Users? *SSRN*

*Electronic Journal.* https://doi.org/10.2139/ssrn.3316768

This project has received funding from the European Union's Horizon 2020
research and innovation programme under grant agreement No. 833496

62

Europol. (2020). *Fake News. Disinformation and misinformation around COVID-19 – a sneaky threat.* https://www.europol.europa.eu/covid-19/covid-19-fake-news

Faktisk.no. (2020). *Om oss.* https://www.faktisk.no/om-oss

Federal Ministry of Interior. (2014). *Federal guideline from the Ministry of Interior about crisis and risk communication.* Federal Ministry of Interior, Berlin Germany.

Fernandez, M., & Alani, H. (2018). Online Misinformation: Challenges and Future Directions. *Companion of the The Web Conference 2018 on The Web Conference 2018 - WWW '18*, 595–602. https://doi.org/10.1145/3184558.3188730

Franzén, J. (2017). *Kunnan kriisiviestinnän suunnittelu. Pelastusopiston julkaisu D-sarja: Muut 4/2017.* http://info.smedu.fi/kirjasto/Sarja_D/D4_2017.pdf

*Good To Know.* (2020). http://penfoodbank.org/Advice/Internet/i_good_to_know.pdf

Government Communication Office. (2019). *Guide for Coping with Information Attacks [Juhend inforünnakutega toimetulemiseks].* https://www.valitsus.ee/sites/default/files/2019-02-15_juhend_inforunnakutega_toimetulemiseks.pdf

Government Office & Ministry of the Interior. (2018). *The Civil Protection Concept [Elanikonnakaitse kontseptsioon].* Government Office & Ministry of the Interior. https://www.riigikantselei.ee/sites/default/files/content-editors/organisatsioon/failid/rakkeryhmad/elanikkonnakaitse_kontseptsioon_15.02.2018.pdf

Griffin, R. J., Neuwirth, K., Dunwoody, S., & Giese, J. (2004). Information Sufficiency and Risk Communication. *Media Psychology*, *6*(1), 23–61. https://doi.org/10.1207/s1532785xmep0601_2

Hybrid CoE. (2020). *Website of the The European Centre of Excellence for Countering Hybrid Threats (Hybrid CoE).* https://www.hybridcoe.fi/

Info-Risques. (2020). *Communiquez de manière responsable.* https://www.info-risques.be/fr/agissez-efficacement/communiquez-de-maniere-responsible

*Io Non Rischio Homepage.* (2020). http://iononrischio.protezionecivile.it/en/homepage/

IOM. (2020). *IOM Responds to Covid-19.* https://www.iom.int/covid19

Jin, F., Wang, W., Zhao, L., Dougherty, E., Cao, Y., Lu, C.-T., & Ramakrishnan, N. (2014). Misinformation Propagation in the Age of Twitter. *Computer*, *47*(12), 90–94. https://doi.org/10.1109/MC.2014.361

Jurgens, M., & Helsloot, I. (2018). The effect of social media on the dynamics of (self) resilience during disasters: A literature review. *Journal of Contingencies and Crisis Management*, *26*(1), 79–88. https://doi.org/10.1111/1468-5973.12212

Kaufhold, M.-A., Gizikis, A., Reuter, C., Habdank, M., & Grinko, M. (2019). Avoiding chaotic use of social media before, during, and after emergencies: Design and evaluation of citizens' guidelines. *Journal of Contingencies and Crisis Management*, *27*(3), 198–213. https://doi.org/10.1111/1468-5973.12249

Kavanaugh, A. L., Fox, E. A., Sheetz, S. D., Yang, S., Li, L. T., Shoemaker, D. J., Natsev, A., & Xie, L. (2012). Social media use by government: From the routine to the critical. *Government Information Quarterly*, *29*(4), 480–491. https://doi.org/10.1016/j.giq.2012.06.002

*KAVI homepage.* (2020). KAVI Homepage. https://kavi.fi/en/national-audiovisual-institute/

Koltay, T. (2011). The media and the literacies: Media literacy, information literacy, digital literacy. *Media, Culture & Society*, *33*(2), 211–221. https://doi.org/10.1177/0163443710393382

Konstantinou, L., Caraban, A., & Karapanos, E. (2019). Combating Misinformation Through Nudging. In D. Lamas, F. Loizides, L. Nacke, H. Petrie, M. Winckler, & P. Zaphiris

(Eds.), *Human-Computer Interaction – INTERACT 2019* (Vol. 11749, pp. 630–634). Springer International Publishing. https://doi.org/10.1007/978-3-030-29390-1_51

Koulolias, V., Jonathan, G. M., Fernandez, M., & Sotirchos, D. (2018). *Combating Misinformation: An ecosystem in co-creation.* OECD Publishing.

Kragh, M., & Åsberg, S. (2017). Russia's strategy for influence through public diplomacy and active measures: The Swedish case. *Journal of Strategic Studies*, *40*(6), 773–816. https://doi.org/10.1080/01402390.2016.1273830

Lazer, D. M. J., Baum, M. A., Benkler, Y., Berinsky, A. J., Greenhill, K. M., Menczer, F., Metzger, M. J., Nyhan, B., Pennycook, G., Rothschild, D., Schudson, M., Sloman, S. A., Sunstein, C. R., Thorson, E. A., Watts, D. J., & Zittrain, J. L. (2018). The science of fake news. *Science*, *359*(6380), 1094–1096. https://doi.org/10.1126/science.aao2998

Leib, I., Ruul, K., & Vessart, J. (2011). *The Handbook on Crisis Communication. 4th Edition [Kriisikommunikatsiooni käsiraamat. 4. Väljaanne].* Ministry of the Interior [Siseministeerium].

Lewandowsky, S., Ecker, U. K., Seifert, C. M., Schwarz, N., & Cook, J. (2012). Misinformation and its correction: Continued influence and successful debiasing. *Psychological Science in the Public Interest*, *13*(3), 106–131.

Lüge, T. (2014). *Helfer ohne Grenzen: Wie Soziale Medien weltweit Hilfseinsätze verändern.* (3, pp. 4–8). BBK Bevölkerungsschutz.

Mavridis, G. (2018). *Fake news and Social Media: How Greek users identify and curb misinformation online.* Malmö University.

Mazereeuw, M., & Yarina, E. (2017). Emergency Preparedness Hub: Designing Decentralized Systems for Disaster Resilience. *Journal of Architectural Education*, *71*(1), 65–72. https://doi.org/10.1080/10464883.2017.1260928

Messing, S., & Westwood, S. J. (2014). Selective Exposure in the Age of Social Media: Endorsements Trump Partisan Source Affiliation When Selecting News Online. *Communication Research*, *41*(8), 1042–1063. https://doi.org/10.1177/0093650212466406

Ministry of the Interior. (2017). *Handbook for the Emergency Act [Hädaolukorra seaduse käsiraamat]*. Ministry of the Interior. https://www.siseministeerium.ee/sites/default/files/dokumendid/Kriisireguleerimine/hos_kasiraamat_veebi.pdf

Ministry of the Interior. (2018). *National Risk Assessment*. http://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/161351/9_2019_National%20 risk%20assessment.pdf?sequence=1&isAllowed=y

Ministry of the Interior. (2020). *Emergency resolution plans*. https://www.siseministeerium.ee/et/siseturvalisuse-valdkond/kriisireguleerimine

Ministry of the Interior & Government Office. (2018). *Code of conduct for crisis situations [Käitumisjuhised kriisiolukordadeks]*. https://www.siseministeerium.ee/sites/default/files/dokumendid/Kriisireguleerimine/est_elanikkonnakaitse.pdf

Mirbabaie, M., & Marx, J. (2020). 'Breaking' news: Uncovering sense-breaking patterns in social media crisis communication during the 2017 Manchester bombing. *Behaviour & Information Technology*, *39*(3), 252–266. https://doi.org/10.1080/0144929X.2019.1611924

Mõttus, M. (2019, November 6). Mirjam Mõttus: Tormist, infost ja info jagamisest. *ERR*. https://www.err.ee/1000041/mirjam-mottus-tormist-infost-ja-info-jagamisest

MSB. (2017). *Mapping of Risk Perception and Assessment—Inspiring Methods for National Level Risk Mapping in Sweden*.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 833496

66

MSB. (2018). *Countering information influence activities: The state of the art : research report.* Swedish Civil Contingencies Agency.

MSB. (2019a). *Källkritiskt tänkande skyddar dig från disinformation.* https://www.msb.se/sv/aktuellt/nyheter/2019/maj/kallkritiskt-tankande-skyddar-dig-fran-desinformation/

MSB. (2019b). *Om MSB:s arbete med informationspåverkan.* Myndigheten för samhällsskydd och beredskap. Retrieved from https://www.msb.se/sv/amnesomraden/msbs-arbete-vid-olyckor-kriser-och-krig/psykologiskt-forsvar/om-msbs-arbete-med-informationspaverkan/

NATO Strategic Communications Centre of Excellence. (2019). *Hybrid threats: A strategic communications perspective.* NATO Strategic Communications Centre of Excellence.

Nguyen, N. P., Yan, G., Thai, M. T., & Eidenbenz, S. (2012). Containment of misinformation spread in online social networks. *Proceedings of the 3rd Annual ACM Web Science Conference on - WebSci '12*, 213–222. https://doi.org/10.1145/2380718.2380746

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods*, *16*(1), 160940691773384. https://doi.org/10.1177/1609406917733847

Piccolo, L. S. G., Joshi, S., Karapanos, E., & Farrell, T. (2019). Challenging Misinformation: Exploring Limits and Approaches. In D. Lamas, F. Loizides, L. Nacke, H. Petrie, M. Winckler, & P. Zaphiris (Eds.), *Human-Computer Interaction – INTERACT 2019* (Vol. 11749, pp. 713–718). Springer International Publishing. https://doi.org/10.1007/978-3-030-29390-1_68

*Propastop homepage.* (2020). https://www.propastop.org/eng/

Quarantelli, E. L. (1997). Problematical aspects of the information/ communication revolution for disaster planning and research: Ten non‑ technical issues and

questions. *Disaster Prevention and Management: An International Journal*, *6*(2), 94–106. https://doi.org/10.1108/09653569710164053

Ramchurn, S. D., Farinelli, A., Macarthur, K. S., & Jennings, N. R. (2010). Decentralized Coordination in RoboCup Rescue. *The Computer Journal*, *53*(9), 1447–1461. https://doi.org/10.1093/comjnl/bxq022

Reuter, C., & Kaufhold, M.-A. (2018). Fifteen years of social media in emergencies: A retrospective review and future directions for crisis Informatics. *Journal of Contingencies and Crisis Management*, *26*(1), 41–57. https://doi.org/10.1111/1468-5973.12196

Roshan, M., Warren, M., & Carr, R. (2016). Understanding the use of social media by organisations for crisis communication. *Computers in Human Behavior*, *63*, 350–361. https://doi.org/10.1016/j.chb.2016.05.016

Seeger, M. W. (2006). Best Practices in Crisis Communication: An Expert Panel Process. *Journal of Applied Communication Research*, *34*(3), 232–244. https://doi.org/10.1080/00909880600769944

Shao, C., Ciampaglia, G. L., Flammini, A., & Menczer, F. (2016). Hoaxy: A Platform for Tracking Online Misinformation. *Proceedings of the 25th International Conference Companion on World Wide Web - WWW '16 Companion*, 745–750. https://doi.org/10.1145/2872518.2890098

Simon, T., Goldberg, A., & Adini, B. (2015). Socializing in emergencies—A review of the use of social media in emergency situations. *International Journal of Information Management*, *35*(5), 609–619. https://doi.org/10.1016/j.ijinfomgt.2015.07.001

Slovic, P. (1993). Perceived Risk, Trust, and Democracy. *Risk Analysis*, *13*(6), 675–682. https://doi.org/10.1111/j.1539-6924.1993.tb01329.x

SOU. (2017). *'Att ta emot människor på flykt, Sverige hösten 2015'*,.

Spence, P. R., Lachlan, K. A., Edwards, A., & Edwards, C. (2016). Tweeting Fast Matters,

But Only if I Think About It: Information Updates on Social Media. *Communication Quarterly*, *64*(1), 55–71. https://doi.org/10.1080/01463373.2015.1100644

Steensen, S., Frey, E., Hornmoen, H., Ottosen, R., & Konow-Lund, M. T. (2018). Social Media and Situation Awareness during Terrorist Attacks: Recommendations for Crisis Communication. In *H. Hornmoen and K Backholm (eds.), Social media use in crisis and risk communication:emergencies, concerns and awareness* (pp. 277–295). Emerald Publishing.

Stieglitz, S., Bunker, D., Mirbabaie, M., & Ehnis, C. (2018). Sense-making in social media during extreme events. *Journal of Contingencies and Crisis Management*, *26*(1), 4–15. https://doi.org/10.1111/1468-5973.12193

Su, Y. S., Wardell III, C., & Thorkildsen, Z. (2013). *Social Media in the Emergency Management Field 2012 Survey Results*. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.357.3121&rep=rep1&type=pdf

Swedish Government regulation. (2018). *En ny myndighet för psykologiskt försvar (Ju 2018:06)* ((dir. 2018: 80)).

Tandoc, E. C., Lim, Z. W., & Ling, R. (2018). Defining "Fake News": A typology of scholarly definitions. *Digital Journalism*, *6*(2), 137–153. https://doi.org/10.1080/21670811.2017.1360143

Thai, M. T., Wu, W., & Xiong, H. (2017). *Big data in complex and social networks*.

The Security Committee. (2017). *The Security Strategy for Society.* https://turvallisuuskomitea.fi/wp-content/uploads/2018/04/YTS_2017_english.pdf

Tran, T., Valecha, R., Rad, P., & Rao, H. R. (2020). An Investigation of Misinformation Harms Related to Social Media During Humanitarian Crises. In S. K. Sahay, N. Goel,

V. Patil, & M. Jadliwala (Eds.), *Secure Knowledge Management In Artificial Intelligence Era* (Vol. 1186, pp. 167–181). Springer Singapore. https://doi.org/10.1007/978-981-15-3817-9_10

United Nations. (2020). *Verified Homepage*. https://www.shareverified.com/en

Valtioneuvoston kanslia. (2013). *Valtionhallinnon viestintä häiriötilanteissa ja poikkeusoloissa. Valtioneuvoston kanslian määräykset, ohjeet ja suositukset.* https://vm.fi/documents/10616/1093242/M0113_Valtionhallinnon+viestnt%C3%A4+h%C3%A4iri%C3%B6tilanteissa+ja+poikkeusoloissa.pdf/885ccedc-0cd0-4ae6-9352-80143dbb7781/M0113_Valtionhallinnon+viestnt%C3%A4+h%C3%A4iri%C3%B6til anteissa+ja+poikkeusoloissa.pdf?version=1.0

Valtioneuvoston kanslia. (2019). *Informaatiovaikuttamiseen vastaaminen. Opas viestijöille. Valtioneuvoston kanslia.* https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/161512/VNK_11_2019_Inf ormaatiovaikuttamisen%20vastaaminen_web.pdf?sequence=1&isAllowed=y

Veil, S. R., Buehner, T., & Palenchar, M. J. (2011). A Work-In-Process Literature Review: Incorporating Social Media in Risk and Crisis Communication: Social Media and Crisis Communication. *Journal of Contingencies and Crisis Management*, *19*(2), 110–122. https://doi.org/10.1111/j.1468-5973.2011.00639.x

Velev, D., & Zlateva, P. (2012). *Use of Social Media in Natural Disaster Management*.

Wang, Y., McKee, M., Torbica, A., & Stuckler, D. (2019). Systematic Literature Review on the Spread of Health-related Misinformation on Social Media. *Social Science & Medicine*, *240*, 112552. https://doi.org/10.1016/j.socscimed.2019.112552

Wardle, C., & Derakhshan, H. (2017). *Information Disorder*. Council of Europe, DGI.

Wendling, C., Radisch, J., & Jacobzone, S. (2013). *The Use of Social Media in Risk and Crisis Communication* (OECD Working Papers on Public Governance No. 24; OECD

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 833496

70

Working Papers on Public Governance, Vol. 24).

https://doi.org/10.1787/5k3v01fskp9s-en

West, D. M., & Orr, M. (2007). Race, Gender, and Communications in Natural Disasters:

West/Orr: Natural Disaster Preparedness. *Policy Studies Journal*, *35*(4), 569–586.

https://doi.org/10.1111/j.1541-0072.2007.00237.x

WHO. (2020). *Coronavirus disease (COVID-19) pandemic*.

https://www.who.int/emergencies/diseases/novel-coronavirus-

2019?gclid=EAIaIQobChMIu4iH0JXA6gIVlaSyCh1EtwMBEAAYASAAEgIkivD_

BwE

Zhang, H., Alim, M. A., Li, X., Thai, M. T., & Nguyen, H. T. (2016). Misinformation in

Online Social Networks: Detect Them All with a Limited Budget. *ACM Transactions

on Information Systems*, *34*(3), 1–24. https://doi.org/10.1145/2885494

Zhu, X., Hao, J., Shen, Y., Liu, T., & Liu, M. (2018). Diffusion of False Information During

Public Crises: Analysis Based on the Cellular Automaton Method. *Computing and

Informatics*, *37*(1), 23–48. https://doi.org/10.4149/cai_2018_1_23

Zubiaga, A., Aker, A., Bontcheva, K., Liakata, M., & Procter, R. (2018). Detection and

Resolution of Rumours in Social Media: A Survey. *ACM Computing Surveys*, *51*(2),

1–36. https://doi.org/10.1145/3161603

**Interviews**

**Germany**

National Emergency Organisation. (12/2019). Group interview

**Italy**

Italian government office. (1/2020)

Department of Civil Protection. (12/2019)

**Belgium**

This project has received funding from the European Union's Horizon 2020
research and innovation programme under grant agreement No. 833496

71

University of Liege. (1/2020). Personal interview

**Hungary**

Hungarian Civil Protection Agency. (12/2019). Personal interview

Budapest Waterworks. (11/2019). Personal interview

**Finland**

Regional Emergency Services. (1/2020). Personal interview

**Norway**

The Norwegian Directorate for Civil Protection. (1/2020). Personal interview

**Estonia**

Estonian Information System Authority. (11/2019). Personal Interview

City of Tartu. (11/2019). Personal Interview

Estonian Government Office. (11/2019). Personal Interview

**BuildERS**

73

**Declaration of interests**

☒ The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

☐The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

# CONTACT US

www.buildersproject.eu

@BuildERS_EU

https://www.facebook.com/Builders-2762442730463980/

https://www.linkedin.com/company/builders-h2020