



Universiteit
Leiden
The Netherlands

Pandemic Publishing: a bibliometric review of COVID-19 research in the crisis and disaster literature

Kuipers, S.L.; Wilt, A.M. van der; Wolbers, J.J.

Citation

Kuipers, S. L., Wilt, A. M. van der, & Wolbers, J. J. (2022). Pandemic Publishing: a bibliometric review of COVID-19 research in the crisis and disaster literature. *Risk, Hazards & Crisis In Public Policy*. doi:10.1002/rhc3.12262

Version: Not Applicable (or Unknown)
License: [Leiden University Non-exclusive license](#)
Downloaded from: <https://hdl.handle.net/1887/3503729>

Note: To cite this publication please use the final published version (if applicable).

Pandemic publishing: A bibliometric review of COVID-19 research in the crisis and disaster literature

Sanneke Kuipers¹ | Annemarie van der Wilt² | Jeroen Wolbers¹

¹Editor-in-Chief Risk, Hazards and Crisis in Public Policy, Leiden University's Institute of Security and Global Affairs, The Hague, The Netherlands

²Leiden University's Institute of Security and Global Affairs, The Hague, The Netherlands

Correspondence

Sanneke Kuipers, Risk Hazards and Crisis in Public Policy, Leiden University's Institute of Security and Global Affairs, The Hague, The Netherlands.
Email: s.l.kuipers@fgga.leidenuniv.nl

Abstract

Iconic events have traditionally instigated progression in the fields of crisis and disaster science. In the wake of the COVID-19 pandemic, the pressing question is how this global health emergency impacted the research agendas of our field. We reviewed contributions in ten important crisis and disaster journals in the two and a half years following the COVID-19 outbreak from 1 January 2020 to 30 June 2022. Specifically, we conducted a bibliometric review using thematic mapping analysis to distill the major themes covered by the emerging COVID-19 literature within crisis and disaster science ($N=239$ articles). Our results indicate that several well-known topics are applied to the COVID-19 pandemic, such as risk, crisis communication, governance, resilience and vulnerability. The pandemic also gave rise to new topics, such as citizen behavior, state power, and the business and mental health impact of crisis measures. Several studies are already looking ahead by identifying lessons for preparedness and mitigation of future pandemics. By taking stock of the surge of COVID-19 studies while this academic literature is still taking shape, this review sets the stage for future contributions to the crisis and disaster literatures. It provides valuable lessons for what topics are studied and what themes need more attention. The COVID-19 pandemic is destined to become an iconic event for our literature that not only strengthens and deepens existing debates, but

also clearly offers the opportunity to draw in new perspectives and broaden the horizon of crisis and disaster science.

KEYWORDS

bibliometric review, Covid, crisis and disaster research, pandemic

INTRODUCTION

Progression in the crisis and disaster literature has traditionally emerged in the wake of iconic events (Quarantelli, 1987). Early disaster scholars tend to refer to Samuel Prince's dissertation on the catastrophic Halifax harbor explosion in 1912 as one of the earliest social science accounts of disaster response (Drabek, 1986; Dynes & Quarantelli, 1993). Subsequently, different groups of disaster sociologists codified and indexed the responses to a variety of natural hazards, such as hurricanes, tornados, and floods (Barton, 1969; Dynes, 1970; Mileti et al., 1975; Quarantelli & Dynes, 1977). These studies played a key role in the initial development of disaster literature (Drabek, 1986; Scanlon, 1997). In the following years, high-profile accidents caused by industrial plant failures, such as Bhopal (Weick, 1988), Chernobyl (Alexievich, 1997), and the Challenger Space Shuttle explosion (Vaughan, 1990) drew attention to the field, as they exposed the dangers associated with high-risk technology. It instigated the literature on normal accidents (Perrow, 1984) and high-reliability organizations (Roberts, 1990).

Similarly, it was the 1973 oil crisis and the Cuban Missile Crisis (Allison, 1971) that took hold of various scholars and instigated the crisis approach (Boin et al., 2018; Rosenthal et al., 1989). Subsequent crises and accidents like the Hillsborough Stadium disaster, the Herald of Free Enterprise ferry disaster, the King's Cross Station fire, and the Piper Alpha oil platform fire pushed the field forward (Turner, 1976; Rosenthal et al., 1991). As the groundwork was laid throughout the 60s–90s, it was the 9/11 terrorist attacks in 2001, followed by Hurricane Katrina in 2005 that opened the field to scholars from various disciplines to advance the scientific interest in crises and disasters (Kendra & Wachtendorf, 2016; Picou et al., 2007; Tierney, 2003). Both iconic events drew the attention of scholars around the world. As such, the historical development of the field exemplifies the importance of the event-based focus as one of its core foundations (Wolbers et al., 2021).

This event-based focus has also been criticized. The risk is that it lures our attention away from slowly emerging threats (Roux-Dufort, 2007) as it tends to neglect the incubation phase of crises (Turner, 1976). Focusing primarily on specific catastrophic events also limits our capacity to draw conclusions across cases (Wolbers et al., 2021). While these are serious challenges in our field, attention to the incubation and evolution of creeping crises is on the rise (Boin et al., 2020a). Sudden-onset crises bring the advantage of converging attention and calling for immediate action. In a creeping crisis, powerful images that could propel a society into action are absent. The threat keeps smoldering and public actors often actively belittle the problem. Weak signals are overpowered by more pressing policy issues when suddenly all involved realize it is too late to contain the crisis.

Likewise, when in December 2019 a new coronavirus was detected in China, few could imagine it would take hold of the world for the subsequent years. As epidemiologists struggled to determine whether this was “the big one,” the virus propagation progressed under the radar. By the time news bulletins exposed the overcrowded hospitals in Italy, countries all over the world braced themselves for impact. Still, it took several weeks before governments realized it was impossible to trace and contain the virus. The COVID-19 pandemic would push the medical capacity across the world to its limits. In a couple of months' time, the initial creeping crisis would morph into a full-scale compound crisis, with huge economic, solidarity, and public safety implications.

Now, 3 years into the COVID-19 pandemic, it is time to take stock. If anything, COVID-19 has provided the field of crisis research with a comprehensive test bed for studying all possible theories and mechanisms on crisis preparedness, response capacity and agility, decision-making, communication, coordination, accountability, and endless other core themes of crisis research. No other crisis has been so comparably threatening so many different countries and communities across the globe, in such a compound way, for such a long period of time. Massive amounts of data have been generated and released, and the number of studies on the pandemic proliferated accordingly.

Similar to 9/11 and Hurricane Katrina, COVID-19 has the potential to instigate a paradigm shift in the disaster and crisis literature. We have visualized academic attention for these events in Figure 1, which shows the relative share of COVID-19 articles, as compared to the two preceding iconic crises in the past two decades: the terrorist attacks on 9/11 2001 and Hurricane Katrina in 2005. The articles are visualized in their relative share (%) compared to all articles for that particular year in 10 selected crisis and disaster journals. It is important to show the relative share here because the body of crisis literature itself expanded drastically in the same period (see Wolbers et al., 2021). The total of publications in the 10 journals surveyed has increased from 71 in 2002 to 1749 in 2021. Perhaps due to the increased speed of turnover in reviewing processes and the availability of early view pages and online first options in most journals, we see a difference in reaction time as well. It took a

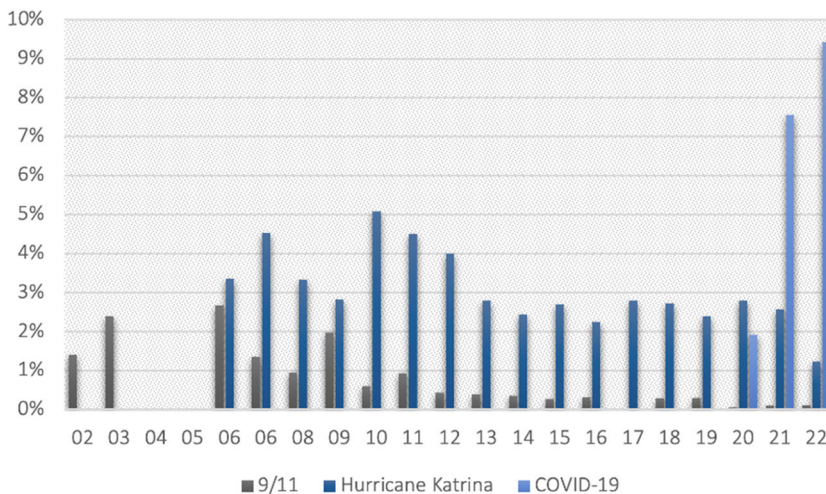


FIGURE 1 The percentage of publications in the crisis and disaster research fields focused on 9/11, Hurricane Katrina, and COVID-19

full year to build up a substantial share of publications on the first two crises; the highest number of studies on 9/11 was published in 2006 and the share of Katrina studies peaked in 2010. By contrast, the recent pandemic was subject to scholarly attention in publications almost immediately after it had first been defined as such in the first months of 2020.

The impact of COVID-19 studies on the crisis and disaster literature already seems to have become substantial by all standards. It will probably continue to grow in the coming years, as we have seen with the other iconic crises. Here, we seek to address the following question in this annual editorial review: *how did the COVID-19 pandemic initially impact the field of crisis and disaster studies, and on what themes did these studies focus?* We are interested in the first impact on the literature, in both *Risk, Hazards and Crisis in Public Policy*, as well as in “sibling” journals, 3 years into this crisis.

It could very well be the case that COVID-19 as a global compound crisis is about to change the literature in crisis and disaster science. From a methodological standpoint, the COVID-19 pandemic can be seen as offering an “ideal” testbed for comparative academic research in a wider variety of fields (Alemanno, 2020, p. 188; Sheridan, 2020, p. 1010; Vasilopoulos et al., 2022, p. 2). Given this opportunity, it is interesting to see what crisis scholars in fact do focus on and whether they exploit the infinite possibilities for comparative research on offer. What themes dominate or emerge? Did scholars apply their existing knowledge of the pandemic, or did they develop new theories and concepts? What substantial patterns appear, and no less important: what remains underexplored? With this editorial, we build both on our contribution in the previous year, which mapped the main themes, methods, and approaches before COVID-19 (Wolbers et al., 2021), and on the contribution in 2019 when we first used structural topic modeling and thematic mapping to identify the main themes and clusters in existing crisis and disaster research (Kuipers et al., 2019).

In the following section, we first explain the methods of data collection and analysis used to construct this review. In the Analysis: relative increases and quantitative overview section, we map the increased (quantitative) attention to the COVID-19 pandemic in the crisis and disaster research fields generally. We highlight the specific themes that emerge in the Thematic overview of covid-19 pandemic studies: basic, motor, niche, and emerging themes section, and subsequently discuss the avenues for further research in the field in the final section.

METHODOLOGY

For our complete quantitative overview, we analyzed all articles that have been published in 10 of the most prominent crisis and disaster journals (see Table 1) in the two and a half years since the pandemic's outbreak—that is, from January 1, 2020, the day after the World Health Organization (WHO, 2021) took notice of cases of viral pneumonia in Wuhan, China, to 30 June 2022.

We collected the publications from the *Web of Science Core Collection (All Editions)* database. To find those studies that focus on the COVID-19 pandemic specifically, we searched within all of the articles published in these 10 journals in this timeframe for those publications with “covid” in either the title, abstract, author keywords, and/or Keywords Plus. Similarly, to create Figure 1 in the Introduction, we found the 9/11 studies with the following query: “9/11” OR “11 September” OR “world trade center” OR “twin towers” OR “pentagon”; and the Hurricane Katrina studies

TABLE 1 The 10 crisis and disaster journals that constitute the crisis and disaster research fields in this editorial

#	Journal (oldest to newest)	Range in volumes (years)	Publisher	Impact factor 21
1	<i>Disasters</i>	Vol. 1 (1977)–Vol. 46 (2022)	Wiley	3.3
2	<i>Natural Hazards</i>	Vol. 1 (1988)–Vol. 114 (2022)	Springer	3.2
3	<i>Disaster Prevention and Management</i>	Vol. 1 (1992)–Vol. 36 (2022)	Emerald	1.8
4	<i>Journal of Contingencies and Crisis Management</i>	Vol. 1 (1993)–Vol. 30 (2022)	Wiley	3.4
5	<i>Natural Hazards Review</i>	Vol. 1 (2000)–Vol. 24 (2022)	ASCE	4.2
6	<i>Journal of Homeland Security and Emergency Management</i>	Vol. 1 (2004)–Vol. 19 (2022)	De Gruyter	0.5
7	<i>Risk, Hazards & Crisis in Public Policy</i>	Vol. 1 (2010)–Vol. 13 (2022)	Wiley	-
8	<i>International Journal of Disaster Risk Science</i>	Vol. 1 (2010)–Vol. 13 (2022)	Springer	4.5
9	<i>International Journal Disaster Risk Reduction</i>	Vol. 1 (2012)–Vol. 83 (2022)	Elsevier	4.8
10	<i>International Journal of Emergency Services</i>	Vol. 1 (2012)–Vol. 11 (2022)	Emerald	-

TABLE 2 The 10 selected journals divided into three types of journals

Crisis management	Disaster management	Emergency management
<i>Journal of Contingencies and Crisis Management</i>	<i>Disaster Prevention and Management</i>	<i>International Journal of Emergency Services</i>
<i>Risk, Hazards & Crisis in Public Policy</i>	<i>Disasters</i>	<i>Journal of Homeland Security and Emergency Management</i>
	<i>International Journal of Disaster Risk Reduction</i>	
	<i>International Journal of Disaster Risk Science</i>	
	<i>Natural Hazards</i>	
	<i>Natural Hazards Review</i>	

using the keyword “katrina.” To collect these publications, we took January 1, 2002 as the starting point. We collected and exported the metadata of the publications on September 6, 2022, covering more than 20 publication years (Table 2).

To find out which themes the COVID-19 pandemic studies cover, we used thematic mapping, a specific type of bibliometric analysis. A thematic map depicts the themes covered by a specific literature in a defined period as colored clusters of research represented by, in this case, five keywords (Aria et al., 2021). In a thematic map, density, a measure of a theme's internal coherence, is on the Y-axis, and centrality, a measure of a theme's importance to a field, is on the X-axis. Crossing the map's two axes creates four quadrants that represent four categories of themes: (1) Basic

themes, (2) Motor themes, (3) Niche themes, and (4) Emerging or declining themes (Cahlik, 2000; Callon et al., 1991; Cobo et al., 2011, 2015). We shall here focus on emerging rather than declining themes since we are here studying only the immediate post-covid period (in 10 years from now, we can see what declines).

We created the thematic map using the R-tool “bibliometrix” (version 4.0.0) developed by Aria and Cuccurullo (2017), and on the basis of co-occurrences between the publications' Keywords Plus, keywords assigned automatically to publications in the database which are particularly useful for analyzing a literature (Aria et al., 2021; Zhang et al., 2016). The network clustering algorithm we applied to generate the thematic map is the Louvain method. The Louvain method stands out for its excellent performance on community detection (Emmons et al., 2016; Lee et al., 2020). The algorithm is nondeterministic, therefore we applied it 10 times and selected the thematic map that best represents the trends found by the algorithm on most turns (the best aggregate) for the analysis.

Finally, to deepen our understanding of the COVID-19 pandemic subthemes, we complemented the thematic mapping with a qualitative analysis of the abstracts of the publications underlying the themes represented on the thematic map. To do so, we read a number of abstracts—94 in total—per theme and described the most important topics covered by these articles.

ANALYSIS: RELATIVE INCREASES AND QUANTITATIVE OVERVIEW

In the analysis, we provide a first glimpse of how the COVID-19 pandemic is impacting the crisis and disaster research fields by describing the attention to the COVID-19 pandemic in general, and the specific themes covered by these studies.

Attention to the COVID-19 pandemic in the crisis and disaster research fields

Between January 1, 2020, and June 30, 2022, in total of 4164 articles were published in our 10 selected journals of the crisis and disaster literature. Out of those 4164 articles, 239 (5.74%) focused specifically on the COVID-19 pandemic. This average for the past three publication years means that the relative share of COVID-19 pandemic studies is already greater than the relative shares of 9/11 and Hurricane Katrina studies had ever been. Yet, the number of publications that focus on the COVID-19 pandemic is, in fact, still relatively limited due to the duration of the empirical and publication cycles of research conducted in the first years of the pandemic.

Figure 2 presents the relative share of studies that focus on the COVID-19 pandemic per journal. It shows that the relative portion of COVID-19 studies differs per type of journal. Journals in the crisis and disaster literature can be divided according to three types of focus: (1) crisis management, (2) disaster management, and (3) emergency management (Kuipers et al., 2019). Journals of both the first and second type focus on a variety of aspects of managing threats and destructive events. The difference lies in the type of event that needs managing: crises versus disasters. Crisis research tends to focus on “minimizing the impact of urgent threats” (Kuipers et al., 2019, p. 390). The threats that constitute crises are, however, not necessarily concrete or tangible; a threat to the legitimacy of government can also be a crisis in need of management, for instance. By contrast, disaster research focuses on natural hazards

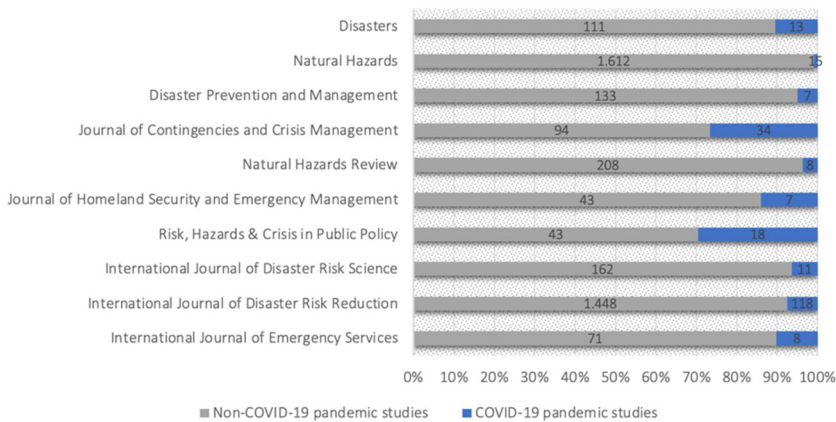


FIGURE 2 The relative share of studies focused on the COVID-19 pandemic per journal

with concrete and tangible consequences for, typically, “physical human well-being, or to property and infrastructure” (Kuipers et al., 2019, p. 389). Journals of the third type focus on a specific aspect of crisis and disaster management: emergency management, that is, the work emergency services routinely do as a fast response organization (Wolbers et al., 2018), but also in preparation for, and during a crisis or disaster (Wolbers, 2022).

Of course, the distinction above is not absolute: crisis journals include disaster studies and vice versa, and emergency response is also not exclusively addressed by emergency management journals. The distinction does help, however, to interpret the different amounts of attention for the COVID-19 pandemic in 10 selected journals. Figure 3 presents the relative share of COVID-19 publications broken down by these three types of journals.

Figure 3 shows that the relative share of COVID-19 pandemic studies is much greater in the crisis management journals (27.51%), as compared to the disaster or emergency management journals (4.47% and 11.63%, respectively). Still, the disaster management journals together publish the great majority of articles: 92.36%. This indicates that the number of articles on the pandemic is still considerable, while overall attention has been limited in all fields together in the initial period following the outbreak. We do see an increase in publication in this short period since the average of two and half years conceals the increased share of the later period versus the initial year, where publications trickled in at a slower rate.

THEMATIC OVERVIEW OF COVID-19 PANDEMIC STUDIES: BASIC, MOTOR, NICHE, AND EMERGING THEMES

COVID-19 clearly is the iconic case of our decade. With attention to the pandemic on the rise, it is vital to identify what the actual themes are that scholars focus on. Figure 4 offers a thematic map of the 239 COVID-19 studies published in the crisis and disaster research fields between January 1, 2020, and June 30, 2022. We will discuss the nine key themes identified in this body of literature in turn, presented as colored clusters on this map. To structure our discussion, we will follow the four overarching bibliometric categories: basic themes, motor themes, niche themes, and emerging themes.

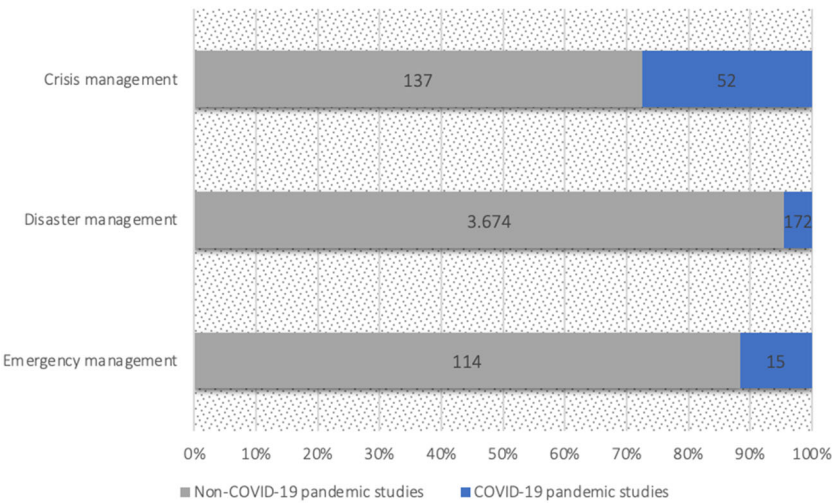


FIGURE 3 The relative share of COVID-19 pandemic studies broken down by the three types of journals

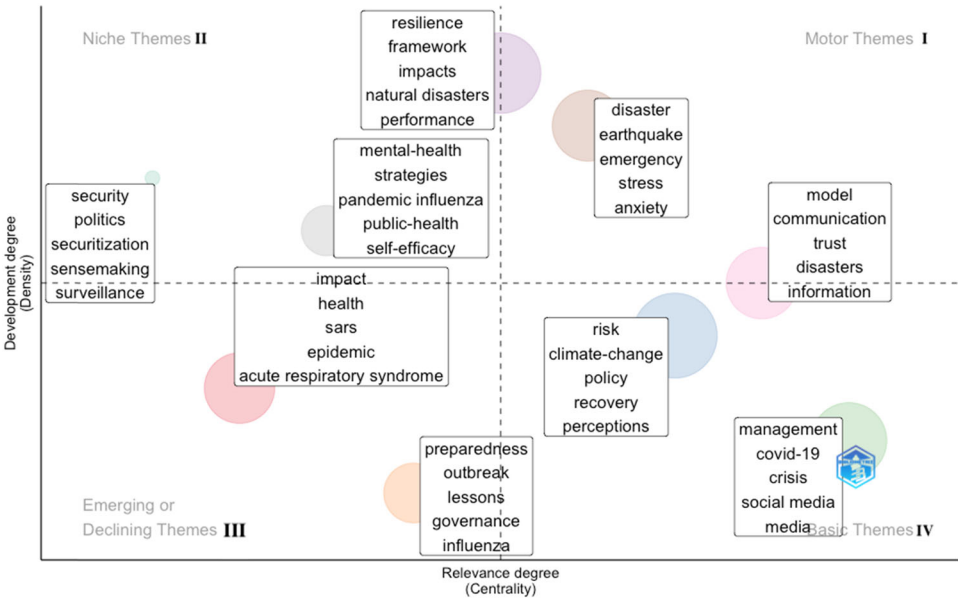


FIGURE 4 Thematic map of COVID-19 publications in the crisis & disaster fields between 1 January 2020 and 30 June 2022 ($N = 239$)

Basic themes in the COVID-19 literature (Quadrant IV)

Basic themes consist of topics that are very important to a field, as these topics have a high centrality in the total body of literature. They share relatively many keywords with studies in other themes. As topics covered by a basic theme have connections with multiple themes, it signals their foundational position for literature. Internally, basic themes have low density. This means that the internal coherence of a basic

theme is relatively limited because the articles within the theme have relatively few keywords in common (Cahlik, 2000; Callon et al., 1991; Cobo et al., 2011, 2015).

The first basic theme is presented as the green “crisis management” cluster (in the outer lower-right corner), in which the main topics are crisis communication (Bernard et al., 2021; Malik et al., 2021; Sledge & Thomas, 2021), organizational resilience (Guo et al., 2021), network collaboration (Liu et al., 2020), and learning (Feitelson et al., 2022). The well-versed crisis scholars will recognize that these topics are well-known within the crisis management literature, but often discussed separately by different communities of researchers. The COVID-19 studies that focus on resilience illustrate this, as in the individual articles, resilience is studied at different levels, ranging from specific organizations, supply chain logistics, and broader disaster response systems (Dwaikat et al., 2022; de La Garza & Lot, 2022). The studies discuss the necessity of developing dynamic capabilities in logistics and production capacity, recalibrating and reconfiguring operations, as well as the importance of emotions as an intrinsic element of resilience during pandemic governance.

Crisis communication is the second topic in this lower-right cluster that is highly relevant for understanding the Covid response. Crisis communication is studied both at the political level, for instance regarding the Prime Minister of Australia (Bernard et al., 2021), and on the organizational level, in the analysis of social media use of four key health organizations such as the WHO and Great Britain's NHS (Malik et al., 2021). These studies argue that organizations had to adapt their communication strategies to the speed and propagation of the pandemic. An important part of their strategies focused on countering disinformation.

Finally, network governance and learning represent the last two foundational topics in the field in the “green” crisis management cluster. An interesting study on learning poses the question of whether lessons from SARS/MERS have been learned and implemented during the first wave of COVID-19 (Feitelson et al., 2022). Results indicate that learning occurred in the countries that experienced either SARS or MERS, but there was little cross-hazard or cross-country learning. In terms of network governance, Liu et al. (2020) describe how more effective network governance in the Hubei Province in China emerged due to the tightly, central, and connective structures and more powerful and strong collaborative relationships. Overall, the “green” cluster shows what key crisis management topics are addressed in research on the COVID-19 pandemic. Pandemic governance forced specific new requirements for crisis communication, resilience, network governance, and translating learned lessons from previous epidemics.

The second basic theme in quadrant IV is formed by the blue cluster (in the lower-right center) of studies focusing on “risk governance.” This theme focuses on two aspects of risk governance: risk perceptions and risk distribution. Studies on risk perception, for instance, pertained to how medical students volunteering during the COVID-19 pandemic experienced the risk that this work posed to their health (Bazan et al., 2021). Risk distribution studies, for example, use the concept of vulnerability to demonstrate how the COVID-19 pandemic impacted groups in society unequally, and discuss policies that address that inequality. The cluster's top keyword “climate-change” is relevant in this regard, as multiple studies aim for the relevance of their pandemic insights in preparation for the next contingency: the climate crisis. Das et al. (2021), for example, use a technique to measure people's vulnerability in relation to the COVID-19 pandemic that, they argue, is also potentially valuable to measure vulnerability in relation to climate change. Yang et al. (2022a) combine the two aspects of risk into one study when they discuss how risk perceptions, too, differ starkly among communities. They show, for example, that people express their panic more strongly in areas surrounding an outbreak, and in economically developed areas.

Motor themes in the COVID-19 literature (Quadrant I)

Motor themes include topics that are both very important to a field, because of their high centrality, and also have relatively strong internal coherence, because of their high density. In other words, the studies within a motor theme not only share many keywords among themselves but also with studies in other themes. The topics covered by a motor theme are thus highly developed topics that are crucial to a field (Cahlik, 2000; Callon et al., 1991; Cobo et al., 2011, 2015).

The brown cluster (in the upper center-right) forms a key motor theme in Covid research, focusing on “mental health and resilience” in societies on the community and city levels. This is an important topic in the literature, which is exemplified by the commentary of Clark-Ginsberg and Petrun Sayers (2020) as one of the key studies in this cluster, who state that missteps in communication strategies during Covid hurt those already most at risk. Vulnerable groups are experiencing disproportionately negative outcomes. Similarly, Thomas and James (2022) discuss that the implementation of mass quarantine was associated with a rise in societal levels of depression, anxiety, and posttraumatic stress. Chen and Quan (2021) develop an index for urban resilience towards Covid mental health impacts and find significant differences in the level of urban resilience in the Yangtze River Delta of China, which explains variation in social and economic recovery. As such, these studies show that the mental health impact of pandemics is crucial to address in future disaster risk reduction policies.

In contrast, Aruta et al. (2022) find how pandemics and disasters can also bring communities together and stimulate social cohesion, similar to traditional studies of disaster sociology that stress the important role of altruism in the wake of disasters. This study relates community resilience during Covid in the Philippines with resilience during frequent extreme weather events. The authors conclude that social responsibility mediated the positive impact of community resilience on the emotional, social, and psychological well-being of Filipinos in times of great adversity. A final study worth mentioning in the brown cluster focuses on the phenomenon of panic buying in the initial phases of the pandemic. Yuen et al. (2021) discuss that this crisis phenomenon results from an interplay between normative social influence, observational learning, perceived severity, and perceived scarcity. Overall, this “brown” motor theme thus signals the importance of mental health and community resilience for pandemic governance.

The pink cluster (on the fence between Quadrants I and IV) with the keyword “model” forms the second motor theme of the COVID-19 pandemic studies. Studies on this theme discuss two types of behavioral models. First, some studies aim to develop models of how people behave during a pandemic. Bartolucci et al. (2022), for instance, analyze how students move through university buildings when physical distancing requirements are in place, and Zhao and Tsang (2022) model how individual information seeking during the COVID-19 pandemic affects individuals' preventive behaviors such as frequent handwashing. Second, other studies model organized and collective behavior in response to Covid. Tu (2022) studies the role of citizen self-organization in the Chinese COVID-19 response and draws lessons for future disaster responses. Scaini et al. (2022) study the negative effect of the COVID-19 pandemic on the involvement of students in developing an earthquake exposure database.

Communication and information are important topics in the pink cluster that are related to the behavioral models. Many studies emphasize the crucial role of communication for both how citizens behave and engage in the COVID-19 response: clear communication was crucial for establishing community resilience (Fenxia, 2022);

people actively engaged in information seeking were more likely to follow government recommendations (Zhao & Tsang, 2022); and trust in government might be the decisive factor for people to be actively engaged in information seeking and sharing (Wang & Xiong, 2022). This theme has a high centrality compared to the other themes, meaning that it is one of the most important themes in the COVID-19 studies. Understandably so, as the topics covered by this theme are relevant to and covered by many of the other themes: the role of civil society, for instance, resurfaces in the next motor theme headed by the topic “resilience,” and communication and information are also a key focus of the theme with lead topic “management.”

The purple cluster (upper central, divided by Quadrants I and II) with “resilience” at the top is the final motor theme of the COVID-19 pandemic studies. Specifically, many studies within this theme focus on how the pandemic impacts the performance of businesses—hence this theme's topic “performance.” Fasth et al. (2022), for example, study the crisis management practices of business leaders through 1000 interviews in Swedish small- and medium-sized enterprises. Others, such as Yang et al. (2022a) develop a framework for businesses recovery from the pandemic impact, which explains why “framework” is also a key topic of this theme. Resilience mostly refers to the performance of those businesses that “bounce back” quickly and manage to recover from the impact of the pandemic strongly (Katara et al., 2021). This theme has the highest density of all, relating to the theme's strong focus on COVID-19 impact. Whereas the other themes feature a variety of contingencies, this theme has a distinct focus and therefore has strong internal coherence.

Niche themes in the COVID-19 literature (Quadrant II)

Niche themes are less important to a field, because of their low centrality. They do, however, have a relatively strong internal coherence, because of their high density. Studies within a niche theme share many keywords between them, but not so many with studies in other themes. This means that despite having a strong and specific focus, niche themes remain isolated within a field (Cahlik, 2000; Callon et al., 1991; Cobo et al., 2011, 2015).

This is clearly visible in the gray cluster (left of center) that has relatively high internal coherence and focuses on personal “mental health.” This cluster emphasizes individual coping with the effects of the pandemic. Coping strategies are studied within different occupations, such as farmers (Yazdanpanah et al., 2021), police officers (Laufs & Waseem, 2020), emergency managers (Oostlander et al., 2020), and within the larger social working class of India (Syed et al., 2021). Psychological factors and stressors turn out to limit the ability to cope with COVID-19, while perceived collective efficacy to make a difference in certain professions has a positive effect on the coping style and behavior (Yazdanpanah et al., 2021). Findings suggest that different social groups have varying vulnerabilities, and the demographic buildup of these groups within different types of cities suggests vulnerable groups are more likely to exhibit the negative psychological states caused by this pandemic.

The smallest “turquoise” cluster on the far left is rather isolated and covers, covering conceptual studies on the pandemic related to debates on securitization, surveillance, and politics. Fraundorfer and Winn (2021), for example, discuss how nation-states retained and underlined their sovereignty, and how this played a key role in the fragmented, and sometimes an ineffective response to COVID-19 globally. Klauser and Pauschinger (2022) claim that pandemic responses were primarily shaped by the search for the right balance between openness and closure, mobility, and

public safety. The authors suggest that surveillance initially emerged in the pandemic as a means to step up border control. Indeed, as lockdowns and contact tracing apps emerged as key measures focused on isolating the virus, debates on surveillance and state control do hold important lessons for pandemic governance. Finally, in this conceptual cluster, Boin et al. (2020a, 2020b) discuss COVID-19 as a creeping crisis, which can erode public trust in institutions. The authors discuss how creeping crises deeply challenge both academics and practitioners as their potential for societal disruption is not well understood.

Emerging themes in the COVID-19 literature (Quadrant III)

Emerging themes are not (yet) of key importance to a field—they have low centrality—nor do they have strong internal coherence (low density). The studies within a theme share relatively few keywords between themselves, but also hardly relate to studies in other themes. They share enough topics to form a cluster, but their focus is not strongly developed and connections with topics covered by other themes are lacking (Cahlik, 2000; Callon et al., 1991; Cobo et al., 2011, 2015).

The red cluster (lower left) with the lead topic “impact” is such an emerging theme of the COVID-19 pandemic studies. The studies within the theme cover a great variety of types of pandemic impact, revealing the theme's weak internal coherence. One of the types of impact discussed is the effect of the COVID-19 pandemic on the healthcare sector. Özyer and Yanmış (2021) describe the impact on cancer care and how to mitigate that impact. Both He et al. (2021) and Qiu et al. (2021) discuss how the pandemic impacted the mental well-being of hospital staff. The studies within this theme cover many more varieties such as the pandemic impact on businesses (Lee et al., 2022), on specific slum areas in Indian cities (Das et al., 2021), and on how household preparedness for hurricanes (Botzen et al., 2022).

The orange cluster (center-low) with the lead topic “preparedness” is also an emerging theme in COVID-19 studies. Here too the cluster covers a variety of topics, indicating that the theme's internal coherence is minimal. This theme has the lowest density of all of the themes but still demonstrates some connections between the topics. Many studies in this cluster seek to draw lessons on pandemic governance for either the next wave of this pandemic or outbreaks of future influenza pandemics. Liu et al. (2021) draw the lesson from the success of the Taiwanese COVID-19 response that trust in government and coproduction is key. Another common thread in this theme is a focus on effective pandemic preparedness by way of making plans, protocols, and guidelines. Aros-Vera et al. (2021), for example, study how to support mothers with newborn children in a crisis situation. Tekeli-Yesil and Kiran (2020) evaluate existing hospital disaster and emergency plans on whether they take into consideration non-standard employment, an issue that has gained renewed importance because of the outbreak of the COVID-19 pandemic. While preparedness will probably be a key theme in future COVID-19 studies, the debate on this topic is currently still very much scattered.

DISCUSSION AND CONCLUSIONS

The purpose of this bibliometric review was to provide a first overview of how the COVID-19 pandemic has impacted the crisis and disaster research fields. It came as no surprise that the surge of articles was most pronounced in the crisis management-oriented

journals, rather than in the disaster research journals. After all, the COVID-pandemic presented authorities, organizations, and communities with governance challenges of the kind that trigger the interest of crisis management scholars. Whereas disaster research focuses on prevention, mitigation, and consequences of extreme events, crisis researchers typically focus on a temporal slice in between. The “crisis approach” dictates researchers study the phase where government intervention can still limit the effects of an emerging or escalating threat becoming manifest (Boin et al., 2018). The crisis management research toolbox builds on insights from adjacent fields such as political science, communication studies, public administration, and policy studies (Kuipers & Wolbers, 2021). This offers multiple models and theories to study the lengthy pandemic, in which consecutive waves of infections of different mutations of the virus challenged governments around the globe (Boin et al., 2020b).

Perennial central themes to the field, such as studies on risk perception and risk distribution, have demonstrably taken COVID-19 along as one of the empirical topics of interest. The same goes for crisis communication research, which seems to divide attention between studies on the role of (social) media and on the relationship between trust, communication, and information. These are basic themes with low to medium internal density that is well embedded in the literature that we examined. A clear motor theme is a cluster focusing on mental health and community resilience in COVID-19 research. The theme covers topics traditionally well-represented in both the disaster-oriented and the crisis management journals and firmly relates these topics such as vulnerability, well-being, and individual, community, and city-level resilience and recovery in the empirical study of pandemics. Our knowledge and insights on infectious diseases are no longer the exclusive domain of public health studies but broadened to include all kinds of societal factors and consequences.

Meanwhile, we also see the presence of more niche themes with a strong focus on public health and healthcare with high internal density, but much less centrality to the field. Another small niche theme is formed by the studies relating COVID-19 to security, securitization, and surveillance. The seemingly increasing connection between safety and security implications of extreme events and contingencies (the use of extraordinary powers in times of crisis, controlling riots and civil unrest, the use of advanced technology for contact tracing, domestic polarization as a consequence of crises, the sovereignty of nation-states in combatting transboundary crises) may push this theme more center stage in the future.

Emerging themes are equally vital for future avenues of research on pandemics in both the crisis and disaster literature. The theme “impact” represents the variety of consequences of the pandemic in society which was previously underrepresented in research. The theme “preparedness” seems at the other end of the crisis and disaster spectrum, and also thrust itself on the pandemic research agenda as an emerging theme. Researchers take note of the fact that this COVID-19 pandemic seemed to defy all preparation efforts and countries diverged widely in their crisis response performance, independent of how high they ranked in healthcare indexes (van der Wilt, 2022).

Now that we have identified what crisis scholars have focused on and what themes dominate and have emerged in the COVID-19 literature, we can conclude that many scholars have applied their existing knowledge to the field. Many of the themes we identified, such as vulnerability, resilience, communication, and risk, already have strong roots in the literature. Scholars did not so much develop new theories or concepts, which could also be seen as a positive sign that many of our explanatory models and concepts remain relevant. At the same time, we argue that our experiences of the COVID-19 pandemic also forwarded important themes that are

underemphasized and underexplored in the debate. This offers an interesting future research agenda on pandemic crisis governance.

Conceptually, we note that few studies seem to engage with how the changing nature of the crisis itself challenged the viability of different governance strategies. COVID-19 can be regarded as a compound crisis (Rosenthal et al., 2001), which spilled over from the health sector to morph into an economic crisis, and eventually a solidarity crisis. Each type of crisis has its own distinct population of affected and asks for its own response and communication strategy by different sets of actors (Boin et al., 2020a). Crisis measures that seem to work in one type of crisis, needed to be changed or countered in the next phase of the crisis, which has put tremendous strains on crisis communication strategies (Wodak, 2021). We plea for specific attention to such spillover effects: crises are triggered in one domain, but become transboundary in terms of affecting other sectors of society or governance jurisdictions. Moreover, the creeping nature of the COVID-19 crisis also affected the response, with the crisis flaring up and disappearing under the radar again across different cycles (Boin et al., 2020a). Public attention, compliance, civil unrest, and trust seemed to vary accordingly. This kept on challenging the chosen response strategies of governments. Thus, when investigating crisis governance scholars might take the changing nature of the crisis into account more extensively, opting for a longitudinal approach that can capture the shifts between different phases and spill-over effects between crisis types.

In terms of perspective, we note that a range of studies start to provide attention to the experience of the affected, while this still remains an underexplored topic (Jong & Dückers, 2019). While scientific research into vaccines is what really got us out of the crisis, for some people the public debate turned into vaccine hesitancy, which remains a serious issue to be addressed by government policy and public communication. Still, for most people COVID-19 was not primarily a health crisis—instead, it primarily impacted their social lives, financial sustainability, and psychological well-being. The impact of the virus containment measures was especially felt: lockdowns and closures of schools, sports activities, cultural facilities, gyms, bars, and restaurants. Although a number of studies describe mental health issues and vulnerability of different groups in society, we wonder whether the specific groups that have suffered the most are sufficiently on the radar of crisis scholars? Can we explain how and why many governments struggled to adequately protect the most vulnerable? Essential examples are our elderly citizens in care homes, who have suffered the most significant loss of lives; children who were kept away from schools; adolescents on whom the measures greatly impacted their ability to explore and develop their social lives. These examples illustrate that it is crucial to understand the impact of the crisis containment measures on the people affected by the crisis. We need to increase our understanding of what may be expected from government officials in the aftermath of a catastrophic event.

Similarly, attention to the political dynamics of crisis governance has proven to be crucial given the far-reaching consequences of the measures taken to halt the rapid spread of the coronavirus. If one element stands out, it is the framing of the crisis approach and corresponding containment measures in the context of the perceived value of scientific knowledge and other voices in the public debate. As the COVID-19 crisis prolonged and spilled over into different domains in subsequent waves, the political infighting and framing attempts became fiercer and continued to dominate the policy agendas of many governments and parliaments. It is crucial to study how also in the creeping phase of the crisis, governments attempted to reconnect to the audiences that were pushed to the margins in a hardened debate. We have seen that some niche studies do give some attention to the sovereignty of nation-states and security and surveillance issues raised by COVID-19. However, up until now, this theme has remained in its niche, with only small effects on the literature at large.

Taking up these questions as questions central to the crisis and disaster literature is important as they might very well rise again in the response to now-looming crises. Mitigation of the consequences of climate change, for instance, could also mean that people's freedom of movement could be seriously restricted—indicating the importance of such themes. We wonder whether the COVID-19 pandemic has indeed functioned as a game-changer for the politics of crisis management?

Methodologically, we note that even though the COVID-19 pandemic provides a unique testbed for comparative research, as of yet few studies take on this challenge. In line with our previous editorial review (Wolbers et al., 2021), we call for more international comparisons, to increase the external validity of findings beyond the single-country context. What effects did the measures have in different countries? Did preparation translate into an effective crisis response? What crisis communication strategies are deemed effective for different audiences? How did communication and misinformation play into government trust and legitimacy (or vaccine hesitancy)? To what extent were laws and regulations changed to allow for extraordinary crisis measures? Under what conditions did civil unrest emerge? These questions address some of the most difficult challenges that emerge in a compound crisis that stretch beyond an event-based, single-case study perspective. COVID-19 provides us with the unique opportunity to draw lessons beyond the single case to uncover comparable and universal patterns.

Writing this editorial review made us realize that we are likely standing at the beginning of the peak of the COVID-19 crisis- and disaster management studies. Especially the bigger and more complex questions and research designs will take more time to complete and publish. If 9/11 and Hurricane Katrina are any indication, we still have the full surge of social science articles ahead of us. Meaningful advances in our debate do not just require more studies, it requires major rethinking. Like Quarantelli (1994, p. 2) already lamented: “we must think through what we should do that is different in fundamental ways from what we are doing.” Our hope is that this editorial review helps to do just that.

It is important not to do just more empirical studies but invest in developing our theories and explanations. Was COVID-19 really a game-changer in terms of crisis management? What did permanently change into the “new normal,” as the crisis slowly returns to the shadows? Is there a way to prevent, or mitigate the effects of a compound crisis? These are important questions to address in the coming years. At the same time, we can already see new types of crises looming on the horizon. Therefore, it is imperative to critically examine our existing theories and concepts that constitute crisis and disaster management. As COVID-19 is one of the first catastrophic events that hits so many countries around the world simultaneously, it can be of huge value to test and advance our theories on the multifaceted nature of crisis and disaster management. We hope to welcome studies in RHCPP that advance our understanding of risk, crisis, and disaster management in such a fundamental way.

REFERENCES

- Alemanno, Alberto. 2020. “Taming COVID-19 by Regulation: An Opportunity for Self-Reflection.” *European Journal of Risk Regulation* 11: 1–8. <https://doi.org/10.1017/err.2020.43>
- Alexievich, Svetlana. 1997. *Voices from Chernobyl: The Oral History of a Nuclear Disaster*. Editions Ostojie.
- Allison, Graham T. 1971. *Essence of Decision Making: Explaining the Cuban Missile Crisis*. Pearson.
- Aria, Massimo, Alessandra Alterisio, Anna Scandurra, Claudia Pinelli, and Biagio D'Aniello. 2021. “The Scholar's Best Friend: Research Trends in Dog Cognitive and Behavioral Studies.” *Animal Cognition* 24(3): 541–53. <https://doi.org/10.1007/S10071-020-01448-2>
- Aria, Massimo, and Corrado Cuccurullo. 2017. “Bibliometrix: An R-Tool for Comprehensive Science Mapping Analysis.” *Journal of Informetrics* 11(4): 959–75. <https://doi.org/10.1016/j.joi.2017.08.007>

- Aros-Vera, Felipe, Semyon Melnikov, and Ilana R. Azulay Chertok. 2021. "Emergency and Disaster Response Strategies to Support Mother-Infant Dyads During COVID-19." *International Journal of Disaster Risk Reduction* 65: 102532. <https://doi.org/10.1016/j.ijdr.2021.102532>
- Aruta, John Jamir Benzon R., Karina A. Crisostomo, Nenuca Fe Canlas, Joseph U. Almazan, and Gerald Peñaranda. 2022. "Measurement and Community Antecedents of Positive Mental Health Among the Survivors of Typhoons Vamco and Goni During the COVID-19 Crisis in the Philippines." *International Journal of Disaster Risk Reduction* 72: 102853. <https://doi.org/10.1016/j.ijdr.2022.102853>
- Bartolucci, Andrea, Anne Templeton, and Gabriele Bernardini. 2022. "How Distant? An Experimental Analysis of Students' COVID-19 Exposure and Physical Distancing in University Buildings." *International Journal of Disaster Risk Reduction* 70: 102752. <https://doi.org/10.1016/j.ijdr.2021.102752>
- Barton, Allen H. 1969. *Communities in Disaster: A Sociological Analysis of Collective Stress Situations*. Garden City, New York: Doubleday and Company, Inc.
- Bazan, Dominika, Michał Nowicki, and Piotr Rzymiski. 2021. "Medical Students as the Volunteer Workforce During the COVID-19 Pandemic: Polish Experience." *International Journal of Disaster Risk Reduction* 55: 102109. <https://doi.org/10.1016/j.ijdr.2021.102109>
- Bernard, Natalie R., Abdul Basit, Ernesta Sofija, Hai Phung, Jessica Lee, Shannon Rutherford, Bernadette Sebar, Neil Harris, Dung Phung, and Nicola Wiseman. 2021. Analysis of crisis communication by the Prime Minister of Australia during the COVID-19 pandemic. *International Journal of Disaster Risk Reduction* 62: 102375. <https://doi.org/10.1016/j.ijdr.2021.102375>
- Boin, Arjen, Paul 't Hart, and Sanneke Kuipers. 2018. *The Crisis Approach*. In *Handbook of Disaster Research. Handbooks of Sociology and Social Research*, edited by Havidán Rodríguez, William Donner, and Joseph E. Trainor, 23–38. Cham: Springer. https://doi.org/10.1007/978-3-319-63254-4_2
- Boin, Arjen, Magnus Ekengren, and Mark Rhinard. 2020a. "Hiding in Plain Sight: Conceptualizing the Creeping Crisis." *Risk, Hazards & Crisis in Public Policy* 11(2): 116–38. <https://doi.org/10.1002/rhc3.12193>
- Boin, Arjen, Martin Lodge, and Marte Luesink. 2020b. "Learning From the COVID-19 Crisis: An Initial Analysis of National Responses." *Policy Design and Practice* 3(3): 189–204.
- Botzen, Wouter J., Jantsje Mol, Peter J. Robinson, Juan Zhang, and Jeffrey Czajkowski. 2022. "Individual Hurricane Evacuation Intentions During the COVID-19 Pandemic: Insights for Risk Communication and Emergency Management Policies." *Natural Hazards* 111(1): 507–22. <https://doi.org/10.1007/s11069-021-05064-2>
- Cahlik, Tomas. 2000. "Comparison of the Maps of Science." *Scientometrics* 49(3): 373–87. <https://doi.org/10.1023/A:1010581421990>
- Callon, Michel, Jean-Pierre Courtial, and Florent Laville. 1991. "Co-Word Analysis as a Tool for Describing the Network of Interactions Between Basic and Technological Research: The Case of Polymer Chemistry." *Scientometrics* 22(1): 155–205. <https://doi.org/10.1007/bf02019280>
- Chen, Xiansheng, and Ruisong Quan. 2021. "A Spatiotemporal Analysis of Urban Resilience to the COVID-19 Pandemic in the Yangtze River Delta." *Natural Hazards* 106(1): 829–54. <https://doi.org/10.1007/s11069-020-04493-9>
- Clark-Ginsberg, Aaron, and Elizabeth L. Petrun Sayers. 2020. "Communication Missteps During COVID-19 Hurt Those Already Most at Risk." *Journal of Contingencies and Crisis Management* 28(4): 482–84. <https://doi.org/10.1111/1468-5973.12304>
- Cobo, Manuel J., Antonio G. López-Herrera, Enrique Herrera-Viedma, and Francisco Herrera. 2011. "An Approach for Detecting, Quantifying, and Visualizing the Evolution of a Research Field: A Practical Application to the Fuzzy Sets Theory Field." *Journal of Informetrics* 5(1): 146–66. <https://doi.org/10.1016/J.JOI.2010.10.002>
- Cobo, Manuel J., Maria Angeles Martínez, Maria Gutiérrez-Salcedo, Hamido Fujita, and Enrique Herrera-Viedma. 2015. "25 Years at Knowledge-Based Systems: A Bibliometric Analysis." *Knowledge-Based Systems* 80: 3–13. <https://doi.org/10.1016/J.KNOSYS.2014.12.035>
- Das, Manob, Arijit Das, Biplab Giri, Raju Sarkar, and Sunil Saha. 2021. "Habitat Vulnerability in Slum Areas of India—What We Learnt From COVID-19?" *International Journal of Disaster Risk Reduction* 65: 102553. <https://doi.org/10.1016/j.ijdr.2021.102553>
- de La Garza, Cecilia, and Nicolas Lot. 2022. "The Socio-Organizational and Human Dynamics of Resilience in a Hospital: The Case of the COVID-19 Crisis." *Journal of Contingencies and Crisis Management* 30(3): 244–56. <https://doi.org/10.1111/1468-5973.12419>
- Dwaikat, Nidal Yousef, Saad Zighan, Moheeb Abualqumboz, and Ziad Alkalha. 2022. "The 4Rs Supply Chain Resilience Framework: A Capability Perspective." *Journal of Contingencies and Crisis Management* 30(3): 281–94. <https://doi.org/10.1111/1468-5973.12418>
- Dynes, Russell R. 1970. *Organized Behavior in Disaster*. Lexington, MA: Heath Lexington Books.

- Dynes, Russell R., and Enrico L. Quarantelli. 1993. *The Place of the 1917 Explosion in Halifax Harbor in the History of Disaster Research: The Work of Samuel H. Prince*. Preliminary paper 189. University of Delaware Disaster Research Center.
- Drabek, Thomas E. 1986. "Human System Responses to Disaster: An Inventory of Sociological Findings." Springer Series on Environmental Management. New York: Springer-Verlag.
- Emmons, Scott, Stephen Kobourov, and Mike Gallant, Katy Börner. 2016. "Analysis of Network Clustering Algorithms and Cluster Quality Metrics at Scale." *PLOS ONE* 11(7): e0159161. <https://doi.org/10.1371/journal.pone.0159161>
- Fasth, Jonas, Viktor Elliot, and Alexander Styhre. 2022. "Crisis Management as Practice in Small- and Medium-Sized Enterprises During the First Period of COVID-19." *Journal of Contingencies and Crisis Management* 30(2): 161–70. <https://doi.org/10.1111/1468-5973.12371>
- Feitelson, Eran, Pnina Plaut, Eli Salzberger, Deborah Shmueli, Alex Altshuler, Smadar Amir, and Michal Ben-Gal. 2022. "Learning From Others' Disasters? A Comparative Study of SARS/MERS and COVID-19 Responses in Five Polities." *International Journal of Disaster Risk Reduction* 74: 102913. <https://doi.org/10.1016/j.ijdr.2022.102913>
- Fenxia, Zhang. 2022. "The Community Resilience Measurement Throughout the COVID-19 Pandemic and Beyond—An Empirical Study Based on Data from Shanghai, Wuhan and Chengdu." *International Journal of Disaster Risk Reduction* 67: 102664. <https://doi.org/10.1016/j.ijdr.2021.102664>
- Fraundorfer, Markus, and Neil Winn. 2021. "The Emergence of Post-Westphalian Health Governance During the Covid-19 Pandemic: The European Health Union." *Disasters* 45(S1): S5–S25. <https://doi.org/10.1111/disa.12511>
- Guo, Xuesong, Naim Kapucu, and Jixin Huang. 2021. "Examining Resilience of Disaster Response System in Response to COVID-19." *International Journal of Disaster Risk Reduction* 59: 102239. <https://doi.org/10.1016/j.ijdr.2021.102239>
- He, Qiuyang, Jianhua Ren, Guoyu Wang, Jinling Zhang, Jie Xiang, and Dongning He. 2021. "Psychological Effects of the COVID-19 Outbreak on Nurses Working in Tertiary Women's and Children's Hospitals From Sichuan, China: A Cross-Sectional Study." *International Journal of Disaster Risk Reduction* 58: 102188. <https://doi.org/10.1016/j.ijdr.2021.102188>
- Jong, Wouter, and Michel L. Dückers. 2019. "The Perspective of the Affected: What People Confronted With Disasters Expect From Government Officials and Public Leaders." *Risk, Hazards & Crisis in Public Policy* 10(1): 14–31.
- Katare, Bhagyashree, Maria I. Marshall, and Corinne B. Valdivia. 2021. "Bend or Break? Small Business Survival and Strategies During the COVID-19 Shock." *International Journal of Disaster Risk Reduction* 61: 102332. <https://doi.org/10.1016/j.ijdr.2021.102332>
- Kendra, James M., and Tricia Wachtendorf. 2016. *American Dunkirk: The Waterborne Evacuation of Manhattan on 9/11* (p. 181). Philadelphia: Temple University Press.
- Klauser, Francisco, and Dennis Pauschinger. 2022. "Searching for the Right Balance Between Openness and Closure: Spatial Logics of Crisis Management and Control in the Policy Response to Pandemic Disease Such as COVID-19." *Journal of Contingencies and Crisis Management* 30(1): 32–40. <https://doi.org/10.1111/1468-5973.12392>
- Kuipers, Sanneke, Jaroslaw Kantorowicz, and Jan Mostert. 2019. "Manual or Machine? A Review of the Crisis and Disaster Literature." *Risk, Hazards & Crisis in Public Policy* 10(4): 388–402. <https://doi.org/10.1002/rhc3.12181>
- Kuipers, Sanneke, and Jeroen Wolbers. 2021. "Organizational and institutional crisis management." In *Oxford Research Encyclopedia of Politics*, edited by William R. Thompson. Oxford University Press.
- Laufs, Julian, and Zoha Waseem. 2020. "Policing in Pandemics: A Systematic Review and Best Practices for Police Response to COVID-19." *International Journal of Disaster Risk Reduction* 51: 101812. <https://doi.org/10.1016/j.ijdr.2020.101812>
- Lee, Seong-Jin, Joong-Hoo Park, Seung-Min Cha, and Donghyun Kim. 2022. "A Regional Economy's Resistance to the COVID-19 Shock: Sales Revenues of Micro-, Small-, and Medium-Sized Enterprises in South Korea." *International Journal of Disaster Risk Science* 13(2): 190–98. <https://doi.org/10.1007/s13753-022-00402-9>
- Lee, Youngho, Yubin Lee, Jeong Seong, Ana Stanescu, and Chui Sue Hwang. 2020. A Comparison of Network Clustering Algorithms in Keyword Network Analysis: A Case Study with Geography Conference Presentations. *International Journal of Geospatial and Environmental Research*, 7(3):1.
- Liu, Jie, Jingyu Hao, Zhenwu Shi, and Helen X. H. Bao. 2020. "Building the COVID-19 Collaborative Emergency Network: A Case Study of COVID-19 Outbreak in Hubei Province, China." *Natural Hazards* 104(3): 2687–717. <https://doi.org/10.1007/s11069-020-04379-w>
- Liu, Li-Yin, Wei-Ning Wu, and David A. McEntire. 2021. "Six Cs of Pandemic Emergency Management: A Case Study of Taiwan's Initial Response to the COVID-19 Pandemic." *International Journal of Disaster Risk Reduction* 64: 102516. <https://doi.org/10.1016/j.ijdr.2021.102516>

- Malik, Aqdas, M. Laeeq Khan, and Anabel Quan-Haase. 2021. "Public Health Agencies Outreach Through Instagram During the COVID-19 Pandemic: Crisis and Emergency Risk Communication Perspective." *International Journal of Disaster Risk Reduction* 61: 102346. <https://doi.org/10.1016/j.ijdr.2021.102346>
- Mileti, Dennis S., Thomas E. Drabek, and Eugene J. Haas. 1975. *Human Systems in Extreme Environments*. Boulder, CO: Institute of Behavioral Science, The University of Colorado.
- Oostlander, Samantha A., Vanessa Bournival, and Tracey L. O'Sullivan. 2020. "The Roles of Emergency Managers and Emergency Social Services Directors to Support Disaster Risk Reduction in Canada." *International Journal of Disaster Risk Reduction* 51: 101925. <https://doi.org/10.1016/j.ijdr.2020.101925>
- Özyer, Yasemin, and Safiye Yanmış. 2021. "Managing Cancer Patients Care During the COVID-19 Outbreak: A Literature Investigate." *International Journal of Emergency Services* 10(1): 101–11. <https://doi.org/10.1108/IJES-06-2020-0031>
- Perrow, Charles. 1984. *Normal Accidents: Living with High-Risk Technologies*. Basic Books. Reprinted Princeton University Press.
- Picou, J. Steven, David L. Brunsma, and David Overfelt. 2007. "Katrina as Paradigm Shift: Reflections on Disaster Research in the Twenty-First Century." In *The Sociology of Katrina: Perspectives on a Modern Catastrophe*, edited by David L. Brunsma, David Overfelt and Picou J. Steven, 1–21. Lanham: Rowman & Littlefield Publishers.
- Qiu, Yinggui, Qian Wu, Rui Chen, and Cuiling Guan. 2021. "Research on Psychological Stress and Mental Health of Medical Staff in COVID-19 Prevention and Control." *International Journal of Disaster Risk Reduction* 65: 102524. <https://doi.org/10.1016/j.ijdr.2021.102524>
- Quarantelli, Enrico L. 1994. "A Sociological Disaster Research Agenda for the Future: Theoretical, Methodological and Empirical Issues." DRC Preliminary Paper #228. University of Delaware Disaster Research Center.
- Quarantelli, Enrico L. 1987. "Disaster Studies: An Analysis of the Social Historical Factors Affecting the Development of Research in the Area." *International Journal of Mass Emergencies and Disasters* 5(3): 285–310.
- Quarantelli, Enrico L., and Russell R. Dynes. 1977. "Response to Social Crisis and Disaster." *Annual Review of Sociology* 3: 23–49. <https://doi.org/10.1146/annurev.so.03.080177.000323>
- Reyes Bernard, Natalie, Abdul Basit, Ernesta Sofija, Phung Hai, Jessica Lee, Shannon Rutherford, and Bernadette Sebar, et al. 2021. "Analysis of Crisis Communication by the Prime Minister of Australia During the COVID-19 Pandemic." *International Journal of Disaster Risk Reduction* 62: 102375. <https://doi.org/10.1016/j.ijdr.2021.102375>
- Roberts, Karlene H. 1990. "Some Characteristics of One Type of High Reliability Organization." *Organization Science* 1(2): 160–76. <https://doi.org/10.1287/orsc.1.2.160>
- Rosenthal, Uriel, Michael T. Charles, Paul 't Hart. 1989. *Coping with Crises: The Management of Disasters, Riots and Terrorism*. Springfield, IL: C.C. Thomas.
- Rosenthal, Uriel, Paul't Hart, and Alexander Kouzmin. 1991. "The Bureau-Politics of Crisis Management." *Public Administration* 69(2): 211–33. <https://doi.org/10.1111/j.1467-9299.1991.tb00791.x>
- Rosenthal, Uriel, Arjen Boin, and Louise Comfort. 2001. "The Changing World Of Crisis and Crisis Management." In *Managing crises: Threats, Dilemmas, Opportunities*, edited by Uriel Rosenthal, Arjen Boin and Louise K. Comfort, 5–27, Springfield, IL: Charles C. Thomas.
- Roux-Dufort, Christophe. 2007. "Is Crisis Management (Only) A Management of Exceptions? *Journal of Contingencies and Crisis Management* 15(2): 105–14. <https://doi.org/10.1111/j.1468-5973.2007.00507.x>
- Scaini, Chiara, Antonella Peresan, Alerto Tamaro, Valerio Poggi, and Carla Barnaba. 2022. "Can High-School Students Contribute to Seismic Risk Mitigation? Lessons Learned From the Development of a Crowd-Sourced Exposure Database." *International Journal of Disaster Risk Reduction* 69: 102755. <https://doi.org/10.1016/j.ijdr.2021.102755>
- Scanlon, T. J. 1997. "Rewriting a Living Legend Researching the 1917 Explosion." *International Journal of Mass Emergencies and Disasters* 15(1): 147–78.
- Sheridan, Cormac. 2020. "Massive Data Initiatives and AI Provide Testbed for Pandemic Forecasting." *Nature Biotechnology* 38: 1007–15.
- Sledge, Daniel, and Herschel F. Thomas. 2021. "Public Perceptions of the Role of Government and Nonstate Actors In Responding to COVID-19." *Risk, Hazards & Crisis in Public Policy* 12(3): 266–82. <https://doi.org/10.1002/rhc.3.12216>
- Syed, Aamir Aijaz, Swati Gupta, and Divya Rai. 2021. "Psychological, Social and Economic Impact of COVID 19 on the Working Population of India: Exploratory Factor Analysis Approach." *International Journal of Disaster Risk Reduction* 66: 102617. <https://doi.org/10.1016/j.ijdr.2021.102617>
- Tekeli-Yesil, Sidika, and Sibel Kiran. 2020. "A Neglected Issue In Hospital Emergency and Disaster Planning: Non-Standard Employment in Hospitals." *International Journal of Disaster Risk Reduction* 51: 101823. <https://doi.org/10.1016/j.ijdr.2020.101823>

- Thomas, Justin, and James P. Terry. 2022. "Containing COVID-19 Risk in the UAE: Mass Quarantine, Mental Health, and Implications for Crisis Management." *Risk, Hazards & Crisis in Public Policy* 13(1): 9–27. <https://doi.org/10.1002/rhc3.12237>
- Tierney, Kathleen. 2003. "Disaster Beliefs and Institutional Interests: Recycling Disaster Myths in the Aftermath of 9–11." In *Terrorism and Disaster: New Threats, New Ideas*, edited by Lee Clarke, Vol. 11, 33–51. Bingley, UK: Emerald Group Publishing Limited.
- Turner, Barry A. 1976. "The Organizational and Inter-Organizational Development of Disasters." *Administrative Science Quarterly* 21(3): 378–97. <https://doi.org/10.2307/2391850>
- Tu, Xuan. 2022. "Understanding the Role of Self-Organizations in Disaster Relief During COVID-19: A Case Study From the Perspective of Co-Production." *International Journal of Disaster Risk Reduction* 74: 102927. <https://doi.org/10.1016/j.ijdrr.2022.102927>
- Van der Wilt, Annemarie. 2022. *The Preparedness-Response Paradox of the COVID-19 Pandemic: Towards Robust Preparedness for Crises to Come*. Leiden University Security and Global Affairs Blog. <https://www.leidensecurityandglobalaffairs.nl/articles/the-preparedness-response-paradox-of-the-covid-19-pandemic-towards-robust-preparedness-for-crises-to-come>
- Vasilopoulos, Pavlos, Haley McAvay, Sylvain Brouard, and Martial Foucault. 2022. "Emotions, Governmental Trust and Support for the Restriction of Civil Liberties During the Covid-19 Pandemic." *European Journal of Political Research*. <https://doi.org/10.1111/1475-6765.12513>
- Vaughan, Diane. 1990. "Autonomy, Interdependence, and Social Control: NASA and the Space Shuttle Challenger." *Administrative Science Quarterly* 35(2): 225–57. <https://doi.org/10.2307/2393390>
- Wang, Houcai, and Li Xiong. 2022. "Understanding the Antecedents of Mobile Social Media Acceptance During the Public Health Crisis Maintenance Stage." *International Journal of Disaster Risk Reduction* 74: 102925. <https://doi.org/10.1016/j.ijdrr.2022.102925>
- Weick, Karl E. 1988. "Enacted Sensemaking in Crisis Situations." *Journal of Management Studies* 25(4): 305–17. <https://doi.org/10.1111/j.1467-6486.1988.tb00039.x>
- Wodak, Ruth. 2021. "Crisis Communication and Crisis Management During COVID-19." *Global Discourse* 11(3): 329–53. <https://doi.org/10.1332/204378921X16100431230102>
- Wolbers, Jeroen. 2022. "Understanding Distributed Sensemaking in Crisis Management: The Case of the Utrecht terrorist Attack." *Journal of Contingencies and Crisis Management* 30(4): 401–11. <https://doi.org/10.1111/1468-5973.12382>
- Wolbers, Jeroen, Kees Boersma, and Peter Groenewegen. 2018. "Introducing a Fragmentation Perspective on Coordination in Crisis Management." *Organization Studies* 39(11): 1521–46. <https://doi.org/10.1177/0170840617717095>
- Wolbers, Jeroen, Sanneke Kuipers, and Arjen Boin. 2021. "A Systematic Review of 20 Years of Crisis and Disaster Research: Trends and Progress." *Risk, Hazards & Crisis in Public Policy* 12(4): 374–92. <https://doi.org/10.1002/rhc3.12244>
- World Health Organization. 2021. *Listings of WHO's Response to COVID-19*. World Health Organization, January 29. <https://www.who.int/news/item/29-06-2020-covidtimeline>
- Yang, Lijiao, Yu Chen, Xinyu Jiang, and Hirokazu Tatano. 2022a. "Multistate Models for the Recovery Process in the Covid-19 Context: an Empirical Study of Chinese Enterprises." *International Journal of Disaster Risk Science* 13(3): 401–14. <https://doi.org/10.1007/s13753-022-00414-5>
- Yang, Yixin, Yingying Zhang, Xiaowan Zhang, Yihan Cao, and Jie Zhang. 2022b. "Spatial Evolution Patterns of Public Panic on Chinese Social Networks Amidst the COVID-19 Pandemic." *International Journal of Disaster Risk Reduction* 70: 102762. <https://doi.org/10.1016/j.ijdrr.2021.102762>
- Yazdanpanah, Masoud, Tahereh Zobeidi, Maryam Tajeri Moghadam, Nadejda Komendantova, Katharina Löhr, and Stefan Sieber. 2021. "Cognitive Theory of Stress and Farmers' Responses to the COVID 19 Shock; A Model to Assess Coping Behaviors With Stress Among Farmers in Southern Iran." *International Journal of Disaster Risk Reduction* 64: 102513. <https://doi.org/10.1016/j.ijdrr.2021.102513>
- Yuen, Kum Fai, Joey Zu Er Leong, Yiik Diew Wong, and Xueqin Wang. 2021. "Panic Buying During COVID-19: Survival Psychology and Needs Perspectives in Deprived Environments." *International Journal of Disaster Risk Reduction* 62: 102421. <https://doi.org/10.1016/j.ijdrr.2021.102421>
- Zhang, Juan, Qi Yu, Fashan Zheng, Chao Long, Zuxun Lu, and Zhiguang Duan. 2016. "Comparing Keywords Plus of WOS and Author Keywords: A Case Study of Patient Adherence Research." *Journal of the Association for Information Science and Technology* 67(4): 967–72. <https://doi.org/10.1002/asi.23437>
- Zhao, Xinyan, and Stephanie J. Tsang. 2022. "Self-Protection By Fact-Checking: How Pandemic Information Seeking and Verifying Affect Preventive Behaviours." *Journal of Contingencies and Crisis Management* 30(2): 171–84. <https://doi.org/10.1111/1468-5973.12372>

AUTHOR BIOGRAPHIES



Sanneke Kuipers is Editor-in-Chief of Risk, Hazards & Crisis in Public Policy. She is professor of Crisis Governance at the Institute of Security and Global Affairs, Leiden University. Her research focuses on crisis response, accountability, blame, organizational survival and organizational reform. She publishes in leading journals such as *Governance*, *West European Politics*, *Public Administration*, the *Journal of Contingencies and Crisis Management* and *Risk, Hazards & Crisis in Public Policy*.



Annemarie van der Wilt is a PhD candidate at Leiden University's Institute of Security and Global Affairs. Her research focuses on the relationship between crisis preparedness and response.



Jeroen Wolbers is Editor-in-Chief of Risk, Hazards & Crisis in Public Policy. He is Assistant Professor of Crisis Governance, and Director of Education at the Institute of Security and Global Affairs, Leiden University. His research focuses on coordination, sensemaking, and decision-making. His work is published in leading journals, such as *Organization Studies*, *Human Relations*, the *Journal of Contingencies and Crisis Management* and *Risk, Hazards & Crisis in Public Policy*.