

Total Defence Resilience: Viable or Not During COVID-19? A Comparative Study of Norway and the UK

Kevin Pollock*  and Riana Steen 

The total defence (TD) concept aims to provide an effective crisis response structure by increasing society resilience. However, the complexity of its structure regarding resource mobilization and management process highlights the need for a complexity-oriented approach in the operationalising of TD. We study the application of TD during the COVID-19 crisis and explore what makes the TD a viable system with resilience capabilities in the face the crisis. We apply the Viable Systems Model as a methodology to compare the viability of the United Kingdom and Norwegian TD systems, both of which use systems networks to achieve resilience, and contrast the different outcomes of each country. Our analysis highlights that: Managing the complexity of the TDS requires that all of the involved agencies proactively adopt a transparent approach to a joint decision making. This demands a wide range of sources of innovative solutions at different levels. Joint exercises, developed by the responsible agencies, enhance mutual understating of roles and responsibilities and crisis response structure. This calls for institutionalized support to dedicate resources. To avoid communications challenges, involved agencies in the TDS need to adopt an open messaging strategy, highlighting how to deal with uncertainties in communicating of decisions and action.

KEY WORDS: collaboration, COVID-19, crisis management, resilience, total defence, viable systems model (VSM)

全面防卫之复原力: 新冠肺炎期间能否得以生存?关于挪威和英国的比较研究

全面防卫(TD)理论旨在通过增加社会复原力, 以提供一个有效的危机响应架构。然而, 该架构在资源动员和管理过程方面的复杂性强调了在将TD操作化时需要使用以复杂性为导向的方法。我们研究了新冠肺炎(COVID-19)危机期间TD的应用, 并探究了是什么让TD成为一个在应对危机时具备复原力的可生存系统。我们将生存系统模型(Viable Systems Model)作为方法论, 比较英国和挪威TD系统的生存性, 这两个系统都使用系统网络来实现复原力, 我们还对比了两国的不同结果。我们的分析强调: 管理全面防卫系统(TDS)的复杂性要求一切相关机构主动采取透明措施, 以实现共同决策。这要求一系列不同层面的创新解决方案。由责任机构提出的共同实践, 能增进对角色、责任、以及危机响应架构的相互理解。此举要求对相关支持进行制度化, 以充分使用资源。为避免沟通障碍, TDS相关机构需采用公开信息策略, 强调在传播决策和行动时如何应对不确定性。

关键词: 全面防卫, 复原力, 危机管理, 生存系统模型(VSM), 新冠肺炎(COVID-19), 协作

Resistencia de defensa total: ¿viable o no durante COVID-19? Un estudio comparativo de Noruega y el Reino Unido

El concepto de Defensa Total (TD) tiene como objetivo proporcionar una estructura de respuesta a crisis eficaz aumentando la resiliencia de la sociedad. Sin embargo, la complejidad de su estructura con respecto a la movilización de recursos y el proceso de gestión destaca la necesidad de un enfoque orientado a la complejidad en la operacionalización de la TD. Estudiamos la aplicación de TD durante la crisis de COVID-19 y exploramos qué hace que el TD sea un sistema viable con capacidades de resiliencia ante la crisis. Aplicamos el modelo de sistemas viables como metodología para comparar la viabilidad de los sistemas TD del Reino Unido y Noruega, los cuales utilizan redes de sistemas para lograr resiliencia y contrastan los diferentes resultados de cada país. Nuestro análisis destaca que: Manejar la complejidad del TDS requiere que todas las agencias involucradas adopten de manera proactiva un enfoque transparente para una toma de decisiones conjunta. Esto exige una amplia gama de fuentes de soluciones innovadoras a diferentes niveles. Los ejercicios conjuntos, desarrollados por las agencias responsables, mejoran la comprensión mutua de los roles y responsabilidades y la estructura de respuesta a crisis. Esto requiere un apoyo institucionalizado para dedicar recursos. Para evitar desafíos de comunicación, las agencias involucradas en el TDS deben adoptar una estrategia de mensajería abierta, destacando cómo lidiar con las incertidumbres en la comunicación de decisiones y acciones.

PALABRAS CLAVES: Defensa total, resiliencia, gestión de crisis, modelo de sistemas viables (VSM), COVID-19, colaboración

Introduction

On January 9, 2020, a new coronavirus outbreak, subsequently named COVID-19, was reported in China. The number of cases rapidly increased globally (ECDPC, 2020), and on March 12, 2020, the World Health Organisation (WHO) declared the COVID-19 outbreak as a pandemic (WHO, 2020). It became a global crisis. Labeling the situation as crisis indicates that the pandemic is perceived as a threat against the core values or life-sustaining functions of a social system, which requires urgent remedial action under conditions of deep uncertainty (Rosenthal, Charles & 't Hart, 1989). When a crisis occurs, it is expected to be managed by leaders (Ansell & Boin, 2019). Thus, the crisis management system has a crucial role to play in protecting people against threats. The purpose of the total defence (TD) concept, as a part of the crisis management system, is to ensure “the integrity of a nation and maintaining its identity” (Bowen, 1997).

The idea behind the TD system (TDS) is to maximise the utilization of society's total resources by developing a civil-military cooperation. The Norwegian TDS evolved from a close cooperation between the Ministry of Defence and the Ministry of Justice and Public Security, in which each of these governmental bodies has their key roles and responsibilities in the TDS (NMDJP, 2018, p. 5). The U.K. equivalent of TDS is set out in the U.K. National Security Strategy (HM Government, 2016) and is referred to as “whole-of-government approach to national security.” It includes response to emergencies working with partners in government, the private sector, communities, and the public. There is a specific focus on improving preparedness to

deal with infectious diseases and health security, crisis response and U.K. resilience (HM Government, 2016). Therefore, each TDS includes both military and civil defence resources. The approach of such emergency management networks has an inherently collaborative nature (Robinson, Eller, Gall, & Gerber, 2012). It involves institutionalized collaboration between government ministries, civic organisations, the private sector, and the general public (Wither, 2020).

In any multi-dimensional system, such as TD, the system's vigilance and responsiveness require an effective collaborative *policy network*. Network refers to an alternative or a supplementary coordination mechanism (Christensen, Andreas Danielsen, Laegreid, & Rykkja, 2016). It should be ideally characterized by discursive properties, specifically reciprocity, representation, equality, participatory decision making, and collaborative leadership (DeLeon & Varda, 2009). The success of networks depends on the ability of their leaders to organize structures, resources, and interactions when bringing together participants with different authority, motivations, interests, skills, and access to information (Moynihan, 2008). These elements make collaboration a challenging task for public leaders, especially in the face of uncertainty and complexity (Ansell & Boin, 2019).

The TDS seeks to overcome these challenges, enhance national resilience, and manage complex problems, like pandemics. Both Norway and the United Kingdom use legislation to ensure the integration of health with the many other services and agencies necessary to provide societal resilience and civil protection. In Norway, the National Health Preparedness Act 2000 requires the provision of adequate health preparedness, and to ensure that necessary health care and social services are available to the population in the event of war, and in the event of crises and disasters in peacetime (NMDJP, 2018). In the United Kingdom, the Civil Contingencies Act 2004 requires organisations in the health system (emergency services, local authorities, NHS bodies) to prepare for adverse events and incidents (UK Legislation, 2004).

However, the institutions designed to take care of civil defence and protection have undergone reorganization that caused growing complexity, interdependence, and near-simultaneous connectivity among operations (Granot, 1998). Moreover, not all the system actors are necessarily coordinated in terms of establishing a common standard of robustness for daily activities and the management of critical situations (Olsen, Kruke, & Hovden, 2007). The complexity of the resource mobilization and management process of such networks highlights the need for a complexity-oriented approach (Dekker, 2006) in operationalising of TD. Resilience studies offer methods to enhance the capacity of a system or organisation to adapt to changes and helps them to survive in turbulent times. When we refer to resilience, here, we mean the capability of a TDS, in terms a community of interest with mutually supporting relationships capable of self-governance, semi-autonomously coordinating and communicating situational assessment, plan generation and execution, to be prepared for, to cope with and to recover from COVID-19 threats and its impacts, and exploit opportunities to build a desirable future through proactive learning.

The focus in designing a resilient system is on how to adjust resource allocation, coordinate activities for conflict resolution and the achievement of shared goals

(Provan, Woods, Dekker, & Rae, 2020). Vital in this respect is the system's capability to anticipate, respond, synchronize, and learn proactively (Ibid).

The four capabilities mentioned above highlight that every resilient system must have the capacity to adapt to its environment. The concept of adaptation is also the essential attribute of any viable system. The current worldwide pandemic (COVID-19) is an example which uncovers how the complexity of a situation may paralyse crisis response authorities when dealing with the direct and indirect impact of the crisis. Remembering the mission of TDS as defending society against the threats, in a resilient manner, this study aims to investigate what makes the TD a viable system with resilience capabilities in the face of COVID-19 crisis?

To answer this question, we base our research on the concept of resilient organisations. In the operationalisation of TD, as a set of dynamic systems, there is a need to consider the complexity of the systems in question (Woods & Allspaw, 2019). Moreover, performance variability is necessary to provide the adaptations needed for ensuring responses to varying conditions (Hollnagel, Wears, & Braithwaite, 2015). Rather than managing systems based on strategic planning and diagnostic controls, a potential solution to the highly uncertain situations, such as pandemics, is to develop a holistic crisis management approach, integrating risk and resilience-based thinking. Resilience-based crisis management is here proposed as a management system which is able to anticipate threats and increase preparedness to deal with the future crisis, through proactive learning.

We apply the Viable System Model (VSM) (Beer, 1985) as roadmap to explore our research question. We consider the VSM as a suitable approach for this study, as it is based on a systemic diagnosis of the viability of a system, hence exploring its resilience capacity (Ruiz-Martin, et al., 2017). We examine how the United Kingdom and Norway apply TD to achieve societal resilience through policy networks and contrast their outcomes in responding to COVID-19 crisis structures (NMDJP, 2018; UK Cabinet Office, 2013). Based on our theoretical foundation, five distinct hallmarks of viability for the crisis management system that successfully manage crises are identified, namely anticipation and monitoring; leadership and decision making; collaboration and joint effort; coordination structure; and crisis communication.

However, managing a pandemic requires tackling the health consequences of the outbreak, as well as its social, political, security, and economic dimensions. Politicians must balance multiple competing demands, such as the need to lockdown and constrain individual liberties to prevent the virus spreading against the values of liberal democracy, protecting the health service to save lives against economic damage, bankruptcies, and unemployment. The political decisions made will be influenced by whether the government values collective responsibility or individual responsibility. The ideological position of the government will affect its financing of the public services essential to the pandemic response. In the United Kingdom, there has been a decade of "austerity" following the financial crash of 2007, which has reduced budgets across public services and impacted on public health outcomes (Boseley, 2020). In Norway, we can find evidence where the government priorities, shaped by political interest, affects resource allocation to various governmental services. An example of this political-derived decisions is the so-called de-bureaucratization and efficiency reform (the ABE

reform), introduced in 2015 (Fafo-rapport, 2019). Based on this reform, by cutting 0.5 percent of the operating expenses of all state enterprises and distributing the cuts to politically prioritized areas, the government attempted to provide incentives for more efficient state operations (Ibid). A budget cut might lead to a goal conflict where despite fewer resources, it is expected that performances will improve.

Through our analysis of TDS in Norway and the United Kingdom, our findings indicate that despite many similarities between the United Kingdom and Norway in their approaches to TD and the COVID-19 crisis, they achieved different outcomes. The similarities include their parliamentary structures, conservative prime ministers (at the time of writing this paper) as leaders, comparable crisis response structures, and government measures taken to tackle the pandemic. However, the analysis showed differences in the leadership style and decisions taken by the Prime Ministers. Norway adopted a collaborative style of leadership and acted quickly imposing a precautionary strategy and early lockdown. The U.K. Prime Minister relied on a small group of trusted advisors with limited collaboration with other stakeholders, and the decision to take lockdown action was not taken immediately. There was also a difference in how the crisis communication was perceived by the public. It is argued that these are causal factors which could explain the different health outcomes achieved.

Theoretical Foundation

Crisis Management

Drennan, McConnell, and Stark (2014) describe a crisis as a unique set of circumstances that threaten life, property, safety and security, with high levels of time pressure and uncertainty about the causes and the scope of the severity of its impacts. COVID-19 is a relevant example of a crisis with these elements.

Crisis management depends on the characteristics of the crisis, such as its speed of development and termination. Boin, Ekengren, and Rhinard (2020) describe the COVID-19 situation as a creeping crisis. These do not get enough attention to mobilize crisis response authorities until "citizens, journalists, policymakers, and politicians recognize the 'damage capacity' of the emerging threat and demand immediate remedial action (Ibid)." The creeping crises present an unusual combination of challenges. They have long incubation periods (Turner, 1976), and are involved with complex sociotechnical systems which are tightly coupled (Perrow, 1999). Such a highly uncertain and complex situation requires a sustained attention of politicians to resolve challenges. However, due to its character, the ownership of creeping crises tends to be ill-defined (Boin et al., 2020), as it is involved with multi-organizational and trans-jurisdictional response networks. The uncertainty elements involved in the crisis response processes are related to "coordination capacity, mutual trust, and administrative level" (Christensen & Læg Reid, 2008).

The crisis management literature divides crises into three phases: pre-crisis, acute crisis, and post-crisis (Coombs, 2015). The pre-crisis phase involves *prevention/mitigation* and *preparedness activities*, including identifying potential risks and preventive actions to be taken before the acute crisis phase occurs. The acute crisis phase deals with *responding* adequately to the crisis to minimize damage and negative consequences. Resource allocation and implementation of the plans are crucial here, as well as the cooperation and communication among the actors involved. In this phase (acute), it is not unusual that the involved actors face uncertainty in terms of sharing responsibility, being able to work efficiently and choosing the appropriate response strategies. The post-crisis phase looks for ways to *recover* from the impacts of a crisis and identify necessary changes that need to be made in any future pre-crisis and acute crisis phases to improve crisis management.

A crucial element in all the crisis management activities inside the three phases is coordination. Coordination is referred to as “a form of directive action” (Boin & Bynander, 2015) and as “the process of bringing together a set of differentiated activities into a unified arrangement” (Wolbers, Boersma, & Groenewegen, 2018). Coordination revolves around two dimensions, vertical and horizontal. The first concerns different levels of governance, ranging from the international to the local levels. The second concerns actors who need to coordinate at the same level (Christensen & Lægheid, 2008). Coordination in crisis management confronts two broad areas of challenges. The first area incorporates the characteristics of the crisis—for instance, the creeping one. The second area refers to cross-organizational issues, such as the number of actors involved, and cultural and communication issues. We argue that building resilience in crisis management is a potential solution to these broad categories of challenges.

A way to deal with the coordination challenges might be the application of systemic view in crisis management. In this regard, Bayne (2006) describes the command axis recursion as the accountability hierarchy. Bayne's hierarchy refers to the enterprise's command and control line in the entire organisation. He identifies three key elements in the recursion, (i) the object of governance; (ii) a control services model providing for situation assessment, plan generation and plan execution, and (iii) a command services model, defining the principle command actors, their relationships and supporting applications they require to be effective.

Designing Resilience in Crisis Management System

The UN defines resilience as the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions (UNISDR, 2009). Resilience has also been defined as “a society's ability to resist and recover easily and quickly from shocks and stresses, combining civilian, economic, commercial and military factors” (SACT, 2017, p. 1). The ability of society to maintain critical functions will largely depend on what has been done to prevent and prepare for crises before they

arise (Comfort, 1988; Boin, Bynander, Stern, & 't Hart, 2020). This research considers resilience as a combination of proactive and reactive capacity (Comfort, 2014; Steen & Morsut, 2019). With this approach, organisations can achieve resilience through an anticipatory style, which enables them to plan and adapt to changes in their environment before they occur. Vital in this respect is the system's capability to anticipate, respond, synchronize, and learn proactively (Provan et al., 2020):

- Anticipation is about creating foresight on future operating conditions and revising risk models. Anticipating future scenarios allows the organisation to monitor the conditions and threats associated with these scenarios, as well as to build resources and capacities to respond.
- Readiness to respond concentrates on the maintaining deployable reserve resources to be available to keep pace with demand. Deployment entails that employees have sufficient autonomy to make decisions about their work in real-time. This requires employees to have the psychological safety to apply their judgement without fear of repercussion.
- Synchronization focuses on the coordinate information flows and actions across the networked system. This synchronization provides a constant opportunity to understand the changing shape of the system, the extent to which operations remain within safe operating boundaries.
- Proactive learning is about seeking context and understanding what is needed to support safe adaptation and success on the front line. It emphasizes on a search for brittleness, gaps in understanding underlying elements trade-offs and reprioritisations. Organisations should embrace and monitor the adaptive cycles of work to create proactive learning.

From a resilience perspective, readiness to respond is about an organisation's adaptive capacity, robustness, and rapidity to response, in a timely manner. Proactive learning enhances strategic planning and adaptive capacity, hence being prepared for managing crises. Elements that contribute to an organisation's learning ability include the recognition of interconnectedness (systems view), the ability to change how the world is viewed (generative learning), and the ability to adapt to the changed environments (adaptive learning) (Murray & Longo, 2018; Senge, 1990).

Proactive learning shapes the precautionary norms the organisation has in place (Smith & Elliott, 2007). It embeds lessons identified before, during and after crises by ensuring that, at the individual and organizational levels, beliefs, values, and defence mechanisms are changed to reflect the new understanding of the potential threats or opportunities now faced and the necessary response capability. Failure to learn from crises has been termed as "a failure of foresight" (Turner, 1976), and also as a "failure of hindsight" (Toft & Reynolds, 2005). To avoid such failures, whether before or after a crisis, organisations need to be vigilant, prepared, and responsive to potential crises and be prepared to swiftly adapt to the new risk environment. This requires the collaboration of all network stakeholders with sufficient capabilities ready to support the response.

Beside the multiple and interdisciplinary skills in human resources, the ability for the individuals (e.g., leaders) and teams to express critical thinking capabilities is crucial in crisis management. While policies, standards and regulations are important elements of crisis management operations, improvisation and autonomy indicates critical thinking capability. In the response process, to achieve results in a turbulent environment, and social and political fragmentation, collaborating and building consensus among stakeholders in the planning process, is vital. In this way, network power shapes the results (Booher & Innes, 2002). An appropriate network can support planning and adapt the management responses (Margerum, 2011). Yet, this requires robust coordination, so the system can withstand demands without degradation or loss of function (Keating et al., 2017). The underlying drivers in such networks are joint effort, goal alignment, predictable behaviors, and the ability to communicate (Klein, Feltovich, Bradshaw, & Woods, 2005).

VSM

The VSM was developed by the British cybernetician Beer (1979, 1981, 1985) as a holistic management model which involves the interactions of five identifiable but not separate subsystems. Fernandes and Tribolet (2019) describe the following principles in the application of VSM (p. 3):

- Principle of recursion: describe an organisation as a viable system that is contained within a set of viable systems.
- The essentiality of existing a set of functional interrelated subsystems, which provide the necessary and sufficient conditions for the viability of any social technical system.
- Any types of incompleteness or ineffectiveness in the management functional system, weakens or threatens the viability of the organisation.
- The viability, cohesion, and self-organisation of an organisation depend upon these functions being iteratively working at all its levels. A recursive structure comprises autonomous wholes within autonomous units.

Like the policy network used to deliver TD and societal resilience, the essential aspects of a viable system are its structures and the relationships between them, including key processes, communications, information flows, and how they deal with complexity and the changing environment. Beer (1985) identified five systems which together forms a holistic view of the entire network system. These five systems are illustrated in the following figure, and the correspondent descriptions of each of these five systems is presented in Table 1 below:

Beer's VSM model has been used extensively as a conceptual tool for understanding organisations, redesigning them where appropriate, and supporting the management of change (Espejo & Gill 1996). For instance, it is applied to study the knowledge management systems (Leonard, 2000), to analyse the role of

Table 1. Summary of the Viable Systems Model

System	Beer's Title	Purpose	Description
One	Produces	Implementation	Primary 'activities' which the organisation exists to provide. The part of the viable system that produces it.
Two	Anti-oscillatory	Coordination	Ensures different primary activities do not conflict with each other and dampen oscillations.
Three	Inside and Now	Control/cohesion	Builds the primary activities into a greater whole by linking subsystems with the system of which they belong.
Three*	Sporadic audit	Monitoring	By-passes unit management and engages with the reality of the 'unit's activities.
Four	Outside & Future	Intelligence	Intelligence looks outside the organisation and into the future. It provides self-awareness for the system-in-focus
Five	Policy	Policy	The organizational ethos and distinctive identity. Strategic decision making is a process of matching current reality to future needs.

*Indicate how Beer labelled the audit function of the VSM.

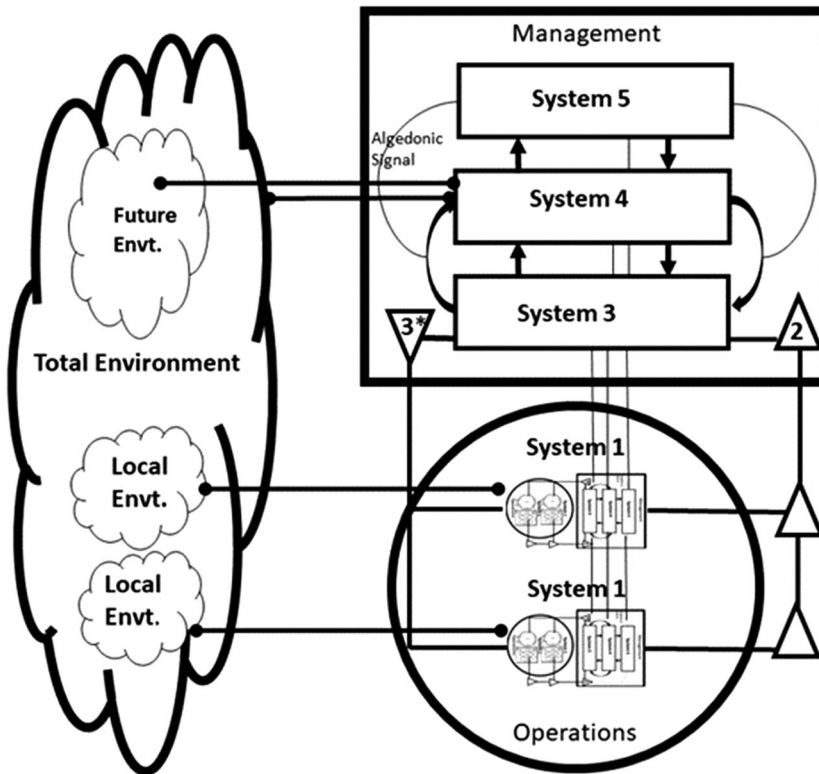


Figure 1. The Viable System Model, Adapted by the Authors From Beer (1985).

leadership in viable organisations (Rowe, 2010), to enhance organizational resilience (Ruiz-Martin et al., 2017), as a framework to guide adaptive organizational response (Cardoso-Cadro, 2019), and most recently to review disaster risk reduction activities (Shaw, Fattoum, Moreno, & Bealt, 2020) (Figure 1).

Methodology

This work analysed the viability of Norway and the United Kingdom's TDSs. Because of the conceptual nature of viability, sensitizing concepts (Blumer, 1954) were adopted, which enabled a general sense of reference and guidance in approaching empirical instances to produce evidence of chosen aspects (Faulkner, 2009). Subsequently, an explanation-based approach, entailing the use of implicit counterfactual reasoning was applied (Stern, 1997). We explored our research question on the grounds of triangulation of qualitative approaches, including document analysis and media analysis, in two stages (Figure 2).

The first stage gathered the domain of the study. We reviewed relevant literature, including, TD concept, resilience and TD and resilient society. The scope of the analysis was determined as the period from January 1, 2020 until July 8, 2020, during which the governments of Norway and the United Kingdom initially responded to the pandemic, subsequently began easing the emergency measures and moving back to normality (Balmer & Heavy, 2020). The number of the cases and deaths for each country is shown in Table 2 below (Worldometer, 2020):

In the second stage, the VSM was used to diagnose the TDS, in particular, the health and military aspects in responding to the COVID-19 pandemic. The TDS is considered as a recursive system with each System 1 as a viable system in its own right. By zooming in, VSM would have allowed us to contract the system boundary

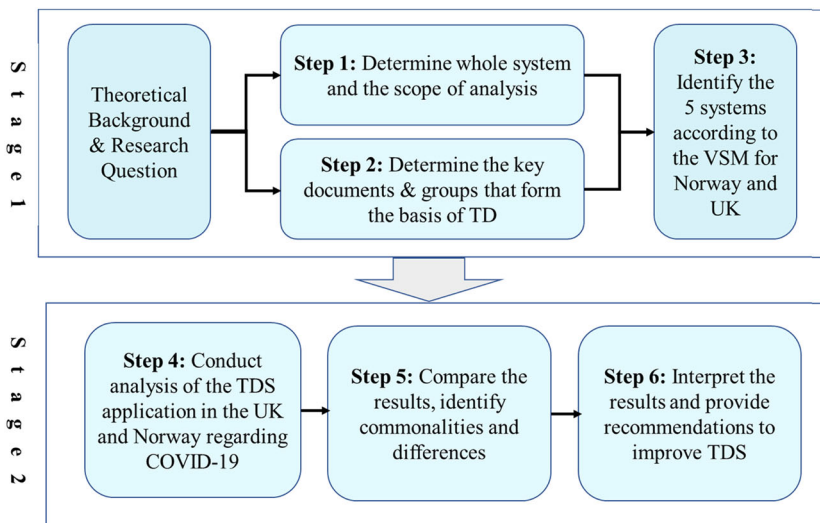


Figure 2. Research Design.

to focus on a single operational function carrying out its activities while still reflecting the whole system. For example, looking at the military or the health service individually. However, for the scope of this research, we focused on the TDS at the national-strategic level rather than at the operational function. This enabled making a comparison between the United Kingdom and Norwegian TDSs as well as insights into the different national approaches. The focus on COVID-19 provided topicality. But more notably, this topic involves a health crisis, which is relatively rare and requires responses that are less frequently exercised than traditional major scenarios, such as an act of terrorism. It also brings the critical aspects of the TD into play: health and military, operating beyond their standard capacity or function.

For our research, we applied the diagnostic enquiry methodology from *Diagnosing the System* (Beer, 1985). Using the VSM enabled us to identify problems that may compromise the viability of the TDS of the United Kingdom and Norway in the face of extreme complexity during a global pandemic. The following approach was adopted:

- Identify the system-in-focus.
- Model the system-in-focus structural activities.
- Model the system-in-focus structural activities by unfolding of complexity.
- Model the organizational structure.

The VSM proposes that viable systems are recursively organized. That is, they are identical and contained within themselves. The analogy often used is like a set of Russian dolls, each similar but contained within themselves in recursion. The recursions of the viable system can be extended upwards and downwards. Beer (1985) suggests studying a trio of viable systems. First, the system-in-focus. Second, the system in which the system-in-focus is contained. Third, the set of subsystems the system-in-focus includes. The viable system-in-focus will exist in a number of different recursive dimensions. Therefore, to identify the system-in-focus, it is necessary to ask, “what business are we in?” In the context of this study, it is how the application of TDS enhances responding to a global pandemic. Therefore, the system-in-focus is the TDS, from which several viable systems are linked in recursive dimensions with the TDS at the center. The process of unfolding the complexity of the TDS and identifying the system-in-focus of Norway and the United Kingdom is illustrated below.

Recursion 0 represents the wider system in which the TDS is embedded. In reality, there may be many more viable systems; however, for simplicity, only one is

Table 2. COVID-19 Cases and Deaths—World, United Kingdom, and Norway (July 8, 2020)

	Cases	Deaths	Deaths PMP	Population
World	11,976,310	547,142	70.2	7.8 Billion
United Kingdom	286,349	44,391	654	67,892,858
Norway	8,947	251	46	5,422,001

PMP, per million of the population.

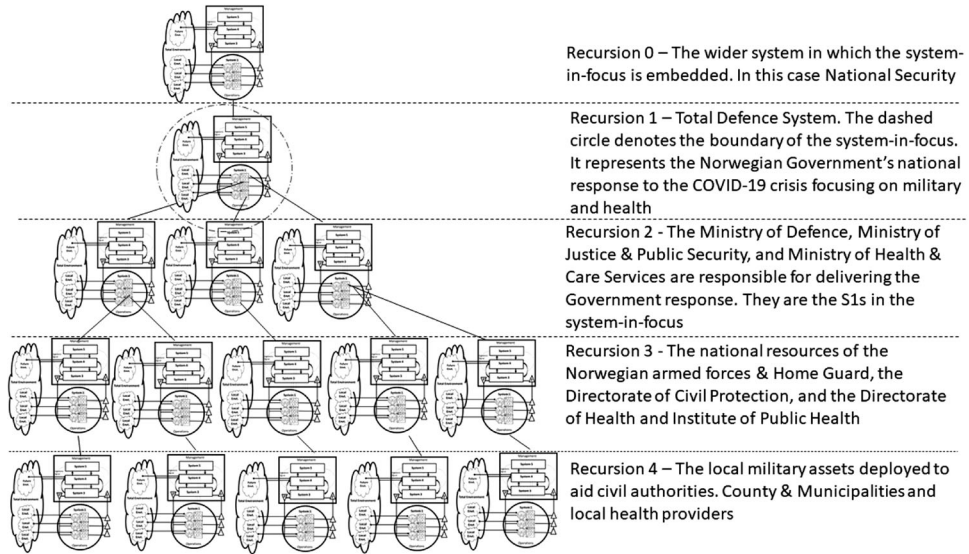


Figure 3. Unfolding the Complexity of the Total Defence System Norway.

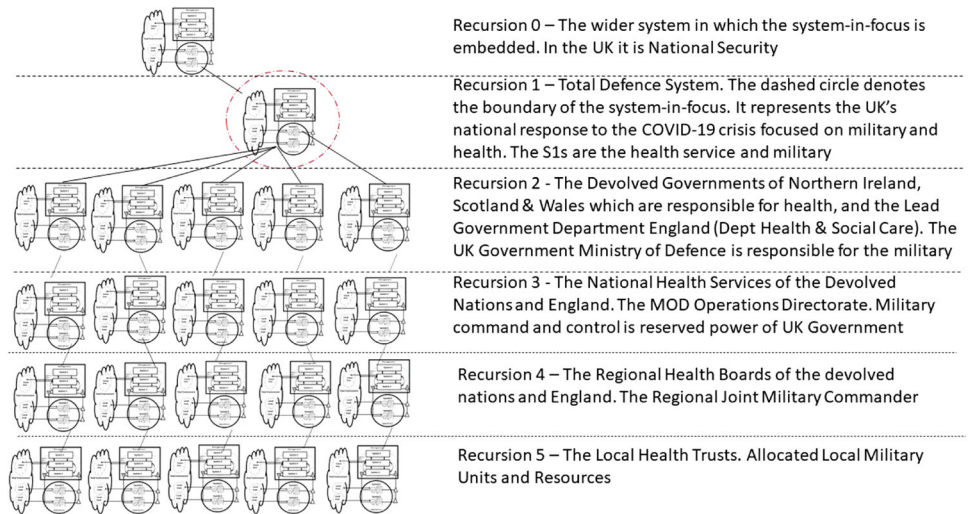


Figure 4. Unfolding the Complexity of the Total Defence System UK.

included in each diagram. The system-in-focus, which is subject to the study, is the TDS contained in Recursion 1. It is only one of the viable systems embedded in the wider system but has been ring-fenced with the dashed circle to represent the boundary of the national responses of Norway and the United Kingdom to the COVID-19 crisis, regarding the scope of this study.

Recursion 2 includes the systems, which will produce (S1) the system in focus response to the global pandemic. In Norway it consists 3 S1s, The Ministry of

Defence, the Ministry of Justice and Public Security, and the Ministry of Health and Care Services. In the United Kingdom, there are 2 S1s, the National Health Service, and the Ministry of Defence. These entities form the essential elements of each country's TDS in pandemic response.

Recursion 3 is also different for the United Kingdom. Health is a devolved responsibility of the governments of Northern Ireland, Scotland, and Wales. In England it is the responsibility of the Department of Health and Social Care. Moreover, the command and control of the military assets remain reserved power of the U.K. Government. The devolved nations bring additional recursive levels and complexity to the U.K. response structure. It is illustrated with five recursions to represent the U.K. level, devolved nations, regions, and local response tiers. In contrast, Norway has a less complex structure with four recursions. The S1s controlling resources at a national level. The local deployment is the responsibility of the county and municipalities. Each recursion contains the units that will produce at that level. Each is a viable system in its own right. The square management box of recursion is the S1 of the recursion above it.

In stage two of this study, we analysed our empirical findings and discussed them in five distinct areas of concern as follows:

- i. Anticipation and monitoring: highlighted the critical elements in crisis preparation.
- ii. Leadership and decision making: the focus was on the two critical decisions, made in response to COVID-19 (lockdown arrangements and issuing new legislation).
- iii. Collaboration and joint effort: Founded on the consultation to obtain feedback, shared information, and mutual agreement.
- iv. Coordination structure: conduct joint operation, toward a common goal, mutual adaptation, and adjustment.
- v. Crisis communication: the attention is paid on the public trust on decision maker.

In our discussion, we used data gathered through a digital news-archive and analysis platform, *Retriever*. Media and news analysis were essential for this work, as it provided us valuable insights about how crisis response authorities communicate with different stakeholders, as well as the extent of openness and trustworthiness of shared information. It also reveals many areas of crisis response operations which were criticized.

Based on our theoretical foundation (previous sections), five distinct hallmarks of viability for the crisis management system that successfully manage crises are identified in Table 3.

Application of the VSM and TD in the United Kingdom and Norway

There are many similarities in the Norwegian and U.K. political systems and their response to crises. Each has a government policy network with strategic objectives

Table 3. Five Distinct Hallmarks of Viability for the Crisis Management System

Hallmarks	VSM	Viable System
Anticipation and monitoring	S4 S3*	Crisis preparation is about bottom-up strategy formation, with the iterative linear planning process, driven by an interest in understanding a situation and imaginative visioning and learning.
Leadership and decision making	S5	Relies on several critical groups and organisations to play their parts in a concerted and sustained manner.
Collaboration and joint effort	S3	The collaborative processes founded on a shared vision, consultation to obtain feedback, shared information, and a mutual agreement.
Coordination structure	S2	Participants work jointly toward a common end, as well as functioning together that allows mutual adaptation and adjustment.
Crisis communication	S1	An operational resilience-oriented communication strategy. Openly, proactively, directly and honestly communicating with the public about what is known/unknown, which action is being done, what is to be done, etc. The goal is to protect people.

which seeks to bring coherence to the national response. However, the devolved nations of the U.K. mean that its crisis structure has more components than Norway, which makes coordination and communication more challenging.

The VSM system-in-focus of Norway and the U.K. is at the national strategic level of the TDS, identified in the previous section as Recursion 1. The crisis response structure of Norway (Figure 5) and the application of the VSM (Figure 6), as well as the diagnosis of pathologies, are illustrated bellow, followed by those of the U.K. (Figures 7 and 8).

Using the VSM as a diagnostic enquiry of the TDS highlights components that are suboptimal. Of particular concern is when the balance of central direction and local autonomy induces stress in the system by “trying to disobey” the cybernetic “Law of Cohesiveness” (Beer, 1985, p. xii). Other pathologies include:

- Functional: Some subsystems do not work too well.
- Structural: Some inter-connections are too formal or too informal.
- Communication: Some communication channels cannot carry their due informational load.

System 5, which Beer named “Policy” equates to Government National-Strategic level and reflects the ethos, identity, and purpose of the TDS and the necessary national response to COVID-19. System 5 “masterminds” the metasystem of S3, S4, and S5, and deals with the “outside and then” management.

The national governments of Norway and the United States, as System 5 in the VSM, sets the policy that the entire system seeks to achieve strategic goals. Government, therefore, underwrites the viability of the whole TDS. Their active job is to monitor the situational feedback from the broader risk environment received from System 4 as intelligence and adjust its control of the delivery via System 3 to

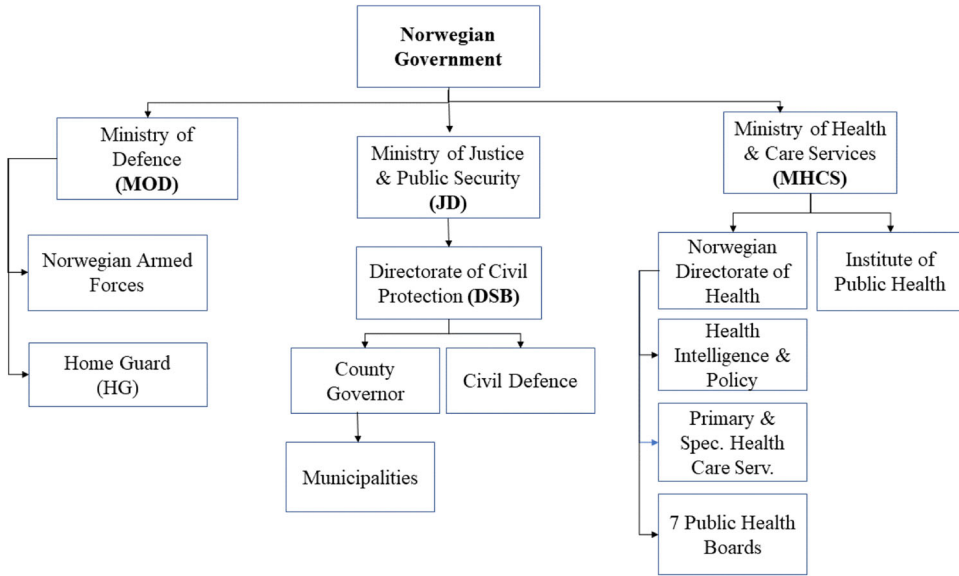


Figure 5. Norway Crisis Response Structure for COVID-19.

maintain overall cohesion. In the United Kingdom there was evidence of functional and communication pathologies. In particular, it had what Cardoso-Castro and Espinosa (2019) termed an ill-defined identity. In contrast to the United Kingdom, Norway explicitly names the TDS and refers to its purpose in key publications. The U.K.'s “whole of Government” approach is not as explicit; its functions being documented in a number of disparate and uncoordinated documents. Moreover, the U.K. Government failed to effectively monitor the algedonic loop. Therefore,

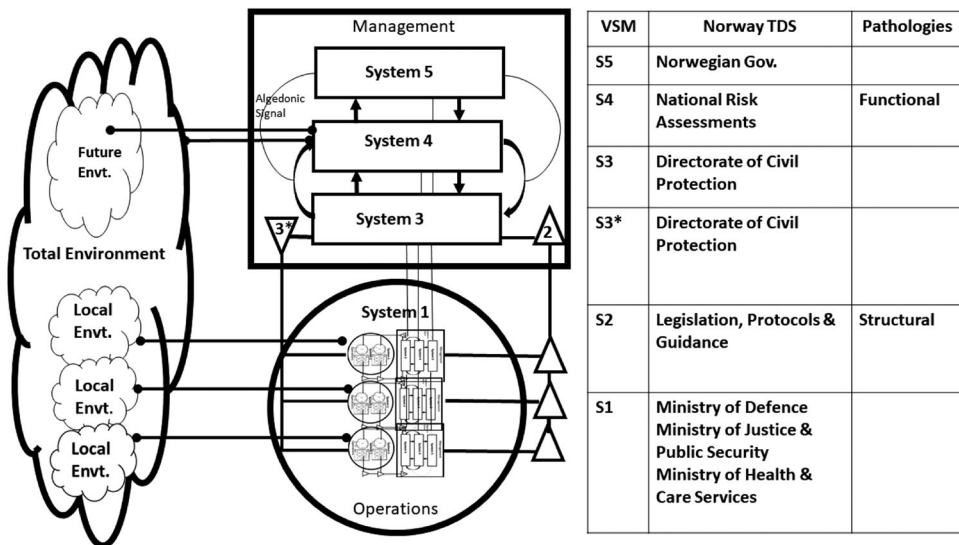


Figure 6. Norway TDS, The VSM and Pathologies.

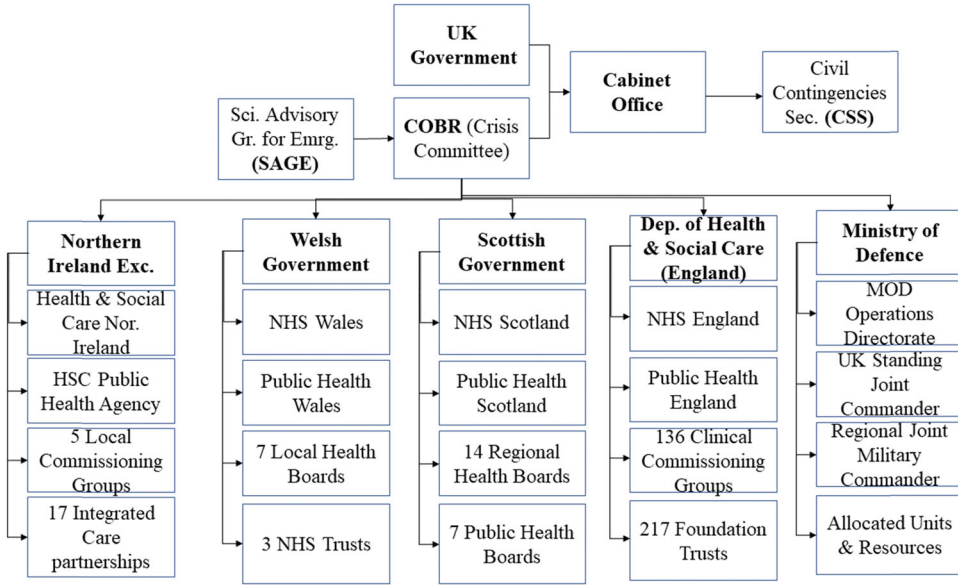


Figure 7. The U.K. Crisis Response Structure for COVID-19.

insufficient feedback from the environment resulted in a lack of alignment between organizational tasks, especially in relation to the health service and devolved governments.

In the VSM, System 4 represents the “outside and future” and provides self-awareness for the system-in-focus. System 4’s role is to observe the anticipated future environment, so it can offer alternative paths from the present System 3, which is the “here and now,” to the future. This adaptive capacity ensures the

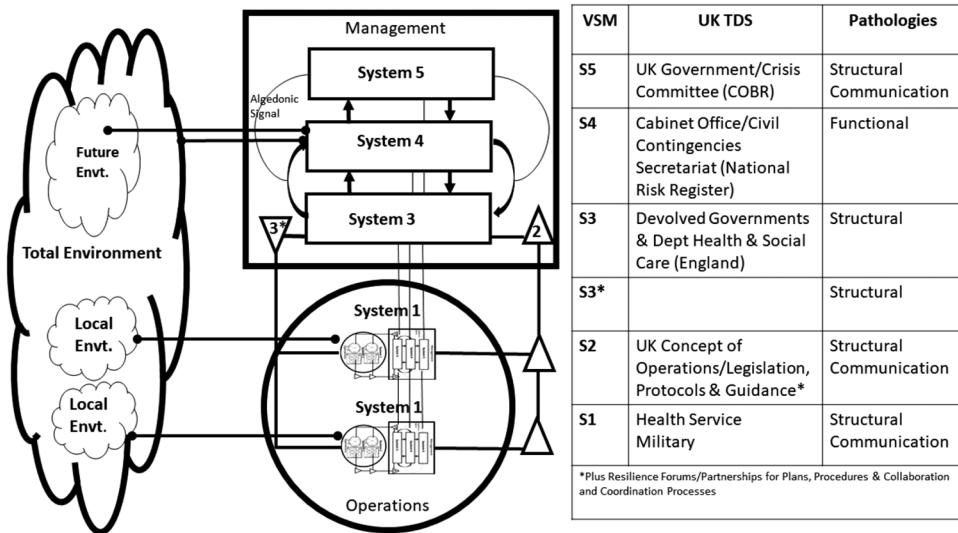


Figure 8. U.K. TDS, The VSM and Pathologies.

whole TDS remains viable by adjusting to its current and future environment. A successful System 4 will ensure that the Government is aware of the necessary resources to meet the anticipated demands of its TDS. According to the OECD report on national risk assessments, in Norway, the intelligence is provided by the Ministry of Justice and Public Security (JD), which has overall responsibility. Norway has developed and analysed a set of crisis scenarios (ACS), formerly known as the National Risk Assessment, and a methodology for making such analyses. The purpose of the ACS is: To provide decision makers an easily accessible comparative overview of disaster risks; To provide input to risk analyses and emergency planning in the ministries, sectors, and authorities at a regional and local level; and To contribute to capacity planning for worst-case scenarios that might occur in the future. The work is coordinated by the Directorate for Civil Protection (DSB). The ACS are firmly rooted in legislation outlining the roles and responsibilities of government bodies and municipal authorities.

Similarly, in the United Kingdom, the primary source of intelligence is the National Risk Assessment (NRA), which is guided by legislation. The process is coordinated by the U.K. Cabinet Office. It has all of the government approach using evidence to determine the range of risk that the United Kingdom should be prepared for every 5 years. The NRA is designed to function as a top-down process and guides the identification of risk for the whole of the United Kingdom, guiding regional entities in the identification of their own risks as mandated by the Civil Contingencies Act 2004 (OECD, 2017). Both Norway and the United Kingdom demonstrated functional pathologies concerning S4. The S4s were weak and there was evidence of disassociation between the S3s and S4s. Consequently, they did not communicate and interact with each other properly.

System 3 in the VSM, “inside and now” is responsible for the internal and immediate functions of the enterprise. That is the day-to-day management. S3 builds the primary activities of System 1 (i.e., health and the military), into a greater whole by linking subsystems with the system of which they are apart. In a compelling and viable system, the Government, acting as System 5, will respond to System 4 feedback and provide adequate resources for System 3 to control and bring cohesion to the strategy. The strategies are then transformed into actions which will enable System 1 to deliver an effective response to the identified threats. Failure to do so will result in insufficient resources for System 1 to deal with the crisis.

However, System 3 is different in each country. In Norway, System 3 is a unified government entity within the Ministry of Justice and Public Security. The DSB is in charge of supervising all national actors involved in civil protection, in terms of preventing, preparing, and responding to an emergency. In the United Kingdom, System 3 is split between the lead government department in England, and the devolved governments in Northern Ireland, Scotland, and Wales, each of which has responsibility for health in their country. Therefore, coordination, collaboration, and communication between each devolved Government and the U.K. Government is influenced by political agendas, which in turn, makes effective outcomes more difficult to achieve. These resulted in structural and communication

system pathologies. Furthermore, the U.K. S3* audit function was undermined because of complexity and poor governance, especially in relation to the health services, which resulted in silo working. The U.K. Government, like S5, was unable to assure cohesive delivery of its policy because it lacked control of S3 and S3*.

Coordination in a viable system is the function of System 2. Beer (1985) called this "anti-oscillatory." In the VSM the top triangle is the regulatory center for the system-in-focus. It does not lie on the command axis. Its function is to damp oscillations. In Norway, responsibilities for coordination in relation to health crises are set out in legislation. The municipalities, county governors, and health organisations have specific coordinating roles. But some are retained at the state level, causing potential confusion.

Similarly, in the United Kingdom, the primary legislation, Civil Contingencies Act 2004, sets out roles and responsibilities and the duty to coordinate and share information. Other doctrines have also been published to improve interoperability in multiagency responses. Despite these, our research shows that effective interoperability and coordination in large scale emergencies remain a challenge for each of the TDSs. That is evidence of structural and communication system pathologies. This manifested in poor coordination and cohesion from the disparate elements of the health service. And was exacerbated by the fragmentation of information systems across the U.K. "National Health Service."

System 1 is the part of the viable system that "produces" it. But there were structural pathologies in the United Kingdom. The implementation of System 5, government strategy, is the responsibility of the System 1s, health and military. Norway's coronavirus response is centralized under a single government ministry, Health & Care Services, with a national directorate of health. The crisis response is supported by the Directorate of Civil Protection. The Norwegian health system is semi-decentralized: the state is responsible for specialist care and municipalities for primary health care, long-term care, and social services (OECD, 2019).

In the United Kingdom, the NHS, is fragmented. Since 1999, health care has been a devolved responsibility in the four nations of the United Kingdom (England, Northern Ireland, Scotland, and Wales) and the way in which services are organized and paid for have diverged as devolved governments have chosen different ways of addressing the issues they faced. However, all home nations have retained the tax-funded NHS model. Each nation has its own planning and monitoring frameworks and their own public health agencies (OECD, 2019). The result is clear differences across policy areas with hundreds of disparate components working within different national and regional structures, with vague responsibilities for key issues such as procurement of Personal Protective Equipment (PPE). Consequently, the lack of adequate interaction resulted in disjointed behavior, referred to as The Yo-Yo pathology (Cardoso-Castro & Espinosa, 2019).

In contrast, the U.K. military has a central command and control structure which can provide military aid to the civil authorities. It operated effectively, ensuring that the NHS was not overwhelmed.

To shed lights on how VSM system pathologies are linked to operationalisation of TDS in Norway and the United Kingdom, Table 4 links it to the five distinct hallmarks of viability for the crisis management system (Section Methodology).

Discussion

Based on the main elements of viability of crisis management system, (Table 4 and Section Methodology), in this section, we look closer at the COVID-19 crisis management operation in Norway and the United Kingdom, during January–July 2020 and explore the resilience of the crisis management system.

Anticipation and Monitoring

Anticipation (S4) and monitoring (S3*) process provides insights to develop plans to deal with an emerging situation. Both Norway and the United Kingdom demonstrated S4 functional pathologies in failing to respond to earlier warnings from simulation exercises and risk assessments to improve their TDS. The U.K. also experienced S3* pathologies due to its political structure.

In attention-based theory, Ocasio and Joseph (2018) state that attentions distributed throughout the organisation structure and its communication channels, shapes the strategy to deal with future events. The authors argue that attention structures such as a change in the “rules of game” and participation of “new players” (Ocasio, 1997, p. 196) affect the degree to which decision makers focus their attention on external or internal latent possibilities. A strategic plan based on the four cornerstones of resilient organisations (potential to anticipate, respond, synchronize and learn), with appropriate metrics and targets will provide direction for attention. At a strategic level (i.e., system 5), planning activities and resource allocation, in its traditional sense, are still primarily centered on political interests. Whereas, from a system viability perspective, strategy formation invites and fosters autonomous strategic initiatives in a *bottom-up approach*, contesting its content continuously. It develops from front-line operators and middle managers—through processes of strategic and structural context determination, to uncover the existing and potential opportunities in the resource base. Training activities, procedures, structures, and plans are elements that reinforce anticipation capacities.

Exercise Trident Juncture (TRJE18, 2018), a NATO exercise hosted by Norway in 2018 is a relevant example of the role of joint training in crisis preparation between all actors in civil protection. It provided an opportunity to evaluate the extent to which the logistics system helps to meet requirements for the TD system's operational deliveries. The evaluation report for the TRJE18 reveals many areas of improvement in operationalising of TDS. For instance, “clarification of responsibilities and increased competence in certain fields, are factors that can increase the utilization of resources, reduce reaction time and increase the endurance of the logistics system” (Birkemo, Graarud, & Halvorsen, 2019, p. 1). The same report also uncovered a lack of capacity within a functional area regarding personnel with “movement and transport” competence in the Armed Forces.

Similar observations could be made regarding the application of TDS in response to COVID-19 crisis. For example, in 2016 a pandemic influenza exercise, Exercise Cygnus, hosted by Public Health England on behalf of the U.K.

Table 4. A Summary of the Pathologies Identified in the Norwegian and U.K. Total Defence Systems

Hallmarks	VSM System	Norway System Pathologies	U.K. System Pathologies
1. Anticipation and monitoring	S4 S3*	Functional: In Norway, S4 did not work properly. Pandemic was an identified risk, but preparations were inadequate. In Norway, the more centralized approach (Single lead ministry and coordinating agency, DSB), enabled S5 to be agile and adaptive in its response.	Functional: In the United Kingdom, S4 did not work properly. Pandemic was an identified risk, but preparations were inadequate. Structural: U.K. inadequate integration in the vertical unfolding inhibited sporadic audit.
2. Leadership and decision making	S5		Structural: In the United Kingdom S5 was not adequately defined, and there was a failure to balance S4 and S3. Communication: In the United Kingdom, there was a lack of key communication channels, including the algedonic channels to ensure a prompt response.
3. Collaboration and joint effort	S3		Structural: S3 in the United Kingdom is fragmented resulting in a lack of cohesiveness. Communication: In the United Kingdom, S3 communication channels were inadequate or incomplete.
4. Coordination structure	S2	Structural: In Norway, health crisis coordination is set in legislation. But confusion exists between State and Local responsibilities. The Home Guard deployment is constrained by regulations.	Structural: In the United Kingdom legislation, statutory guidance and protocols were not adhered to by S5. Moreover, the devolved nations have separate arrangements. Communication: In the United Kingdom, there is fragmentation in the communication channels, many of which have inadequate capacity.
5. Crisis communication	S1		Structural: In the United Kingdom health is devolved, and each home nation applies a different structure and approach. Communication: In the United Kingdom, the complexity of the Health Service inhibits effective information flow. This contrasts with the Military which has a central command and control structure with sufficient recursive unfolding

Government Department of Health, recommended that the U.K.'s capability to respond to a worse case pandemic influenza should be critically reviewed. That there was a need to rationalize guidance and undertake further work to on preparedness planning arrangements. It also identified several aspects of response that could be strengthened, particularly concerning surge and triage management in the health care system, management of excess deaths and business continuity (PHE, 2017, pp. 28–29). The full results of the exercise remained unpublished, despite many requests by the media, until being unofficially leaked and published by the Guardian Newspaper on May 7, 2020 (Pegg, 2020). The reluctance to publish the report by the U.K. Government undermined trust in relation to current planning and preparation to deal effectively with a pandemic in the United Kingdom. This was reinforced when it was revealed that a 2018 exercise in Scotland with a MERS outbreak scenario had also found a “clear gap” in readiness, as well as concerns over sufficient PPE (Scottish Government, 2018; Titheradge & Kirkland, 2020). Despite the recommendations made the relevant pandemic plans were not updated. Hence the U.K.'s initial strategy focusing on reducing demand on the NHS and the need to deploy the military to aid the civil authorities in the response.

A central aspect of crisis preparation is planning. In a viable system, such as TD, planning requires flexibility to adjust to any changes in the environment. Therefore, plans are “living” or working documents which require frequent updates. The frequency depends on the lessons learned from day-to-day operations as well as emergency response evaluation after each operation. But there are enduring issues of failing to implement recommendations and lessons identified from incidents and exercises in the United Kingdom (Pollock, 2013, 2017). Moreover, from an interpretive planning view, flexibility means that planning process is “iterative rather than linear” (Davoudi, 2012), driven by an interest in understanding a situation (Innes & Booher, 2017) and imaginative visioning as well as learning (Sandercock, 2003). However, as this study indicates these features seemed to be lacking in the anticipation, monitoring and response to COVID-19.

Regarding anticipation and monitoring capacities in TDSs, the distinction between COVID-19 and the other type of crisis (Section Crisis Management) is related to its creeping characteristics. As Boin et al. (2020) put it “Governments seem unprepared to deal with crises that do not crystallize in sudden outbursts.” Being unprepared in the context of this study means that the authorities overlooked the COVID-19 signals, as they paid insufficient political or social attention to the lesson learned from the previous crisis or scenario-based exercises. Accordingly, both leaders were criticized for inadequate planning. In Norway, the Opposition Labor Party Leader criticized the Prime Minister, claiming failures to follow existing risk and vulnerability analyses. The Directorate for Public Safety and Emergency Planning (DSB) has repeatedly in its reports on possible crisis scenarios in Norway highlighted the global pandemic as both serious and probable (DSB, 2019). Similarly, an influenza pandemic has been one of the U.K.'s highest risks since the first issue of the national risk register in 2008 (UK Cabinet Office, 2008). The current issue states that the emergence of new infectious diseases is unpredictable,

but evidence indicates it may become more frequent, and the likelihood of this risk has increased since 2015 (UK Cabinet Office, 2017). Yet, neither the Norwegian nor U.K. Government had heeded the warnings.

The research indicates that despite the early warning signals and high probability of a pandemic occurring, it seems that there was a gap in the planning and preparation for an epidemic.

Leadership and Decision Making

Crisis management authorities (S5) have made many decisions during the coronavirus pandemic. Crisis decision making is often political, and most politicians will seek to avoid the blame that may be assigned to them in the wake of a crisis (Boin, 't Hart, Stern, & Sundelius, 2017). This section focuses on the decisions about the lockdown arrangements and issuing new legislation.

Lockdown Strategy. Government Leaders, (S5) in both Norway and the United Kingdom demonstrated a different attitude to collaborative decision making. These attitudes could be related to what Power and Alison (2018) refer to as decision inertia. It appears typically in contexts in which: (i) choices are multi-attributable (Lockdown strategy with economic consequences vs. business as usual-strategy with health-related consequences); involve (ii) one-time, irreversible consequences (when decision maker fails to lock down the country in a timely manner, health damages are inevitable); (iii) take place in dynamic environments in (COVID-19 crisis characteristic) which (iv) anticipated adverse effects are linked not only to action but also to inaction.

The distinction between action and inaction could be perceived in relation to Norway and the United Kingdom. Norway's Prime Minister acted decisively, imposing strict lockdown measures on March 12, 2020, the day the global pandemic was declared. Norway enacted what the Prime Minister described as the most far-reaching measures its population has ever experienced in peacetime to stop the spread of the virus. The lockdown included, all of the country's kindergartens, schools, secondary schools, colleges, and universities (Solberg, 2020, 12,0303 #637). In contrast, the U.K. Prime Minister was accused of failing to take the COVID-19 threat seriously and ignoring repeated warnings given almost a month before action was taken (O'Neill, 2020). The Prime Minister announced the United Kingdom lockdown measures on March 23, 2020.

In the United Kingdom, COVID-19 was deemed a "Catastrophic Emergency" (Level 3). That is one, which has an exceptionally high and potentially widespread impact and requires immediate central government direction and support, where the Prime Minister would lead the response (UK Cabinet Office, 2013). However, on April 6, 2020, the U.K.'s Prime Minister contracted the disease and was so seriously ill that he was admitted to a Hospital Intensive Care Unit during the response, only returning to work three weeks later (BBC, 2020a). On the Prime Minister's return, instead of bringing people together and organizing resources (Moynihan, 2008), all

critical decisions were taken by the Prime Minister and a small trusted group. Exhibiting a communication pathology, he excluded most of the U.K. Government Cabinet (Swinford, Smyth, Wright, & Elliott, 2020). This contrasted with Norway's Prime Minister who was an advocate of collaborative working, saying "when you are in a crisis, you manage it and you do it jointly with others" (Balmer & Heavy, 2020). Consequently, a YouGov poll found that most Britons thought the Government was doing a "bad job" in handling the crisis (Smith, 2020). In stark contrast to the criticisms of the U.K. Government, the Norwegian Prime Minister and the ruling party received public support and increased polling for their effective crisis management (Haugsbø, Røsvik, Holmes, & Vågenes, 2020; Røsvik, 2020). This evidence perhaps indicates that decisive actions by political leaders enhanced public trust and support during the crisis.

Leadership Use of New Legislation. Although both leaders took different approaches to deal with the crisis, they adopted a similar use of passing new legislation, rather than relying on existing measures. Both were subject to criticism for top-down control and attempting to circumvent parliamentary scrutiny. In Norway, the new Corona Act was processed "at rocket speed" (Libell, Mohseni, & Haugen, 2020). The new Act afforded major crisis powers to the Government, allowing them to override other laws when dealing with the crisis, and act without regular parliamentary scrutiny, weakening the democratically elected politicians influence and control of the legislation (Ibid). Consequently, the opposition parties attempted to stop passing the new Act, as it was considered as too broad and too ill-founded (Sørenes, 2020, 06 April). In the United Kingdom, the Government had previously planned for and included emergency powers in its principal legislation, the Civil Contingencies Act 2004, which requires the U.K. Government to consult with the devolved Governments of Northern Ireland, Scotland, and Wales, and limits excessive use of the emergency powers through parliamentary review (Blick & Walker, 2020). However, instead of activating those emergency powers to deal with COVID-19, it passed new legislation, the Coronavirus Act 2020 (UK Legislation, 2020). Like Norway, this was criticized because it enabled the Government to impose top-down controls and evade essential safeguards.

Nevertheless, the political dynamics and centralization tendencies of a top-down, command-and-control style (Boin et al., 2017), may weaken the ability to improvise elsewhere in the system. A viable TDS assumes that actors across sectors and levels understand and accept each other's roles, responsibilities, and authority. Through discussion and collaboration, the involved actors should identify the gray zones between the sectors, as well as challenges in the cross-sectoral processes. For example, Norway set aside existing law on state-employees and proposed regulations involving civilians in the Armed Forces so that civilian employees could be ordered against their will (Berge, 2020). This was a profound change for the civilian employees of the Armed Forces. In the United Kingdom, the devolved nations were excluded from policy decisions (McLaughlin & Andrews, 2020). These examples highlight the absence of reciprocity, representation, equality, participatory decision making, and collaborative leadership that characterize an effective collaborative network (deLeon & Varda, 2009), which will bring problems of

control and coordination (Kapucu, 2005). These typify challenges related to networks in crisis operations and demonstrate evidence of structural pathology and a failure to balance S4 and S3.

Operations are often involved with multi-organizational, trans-jurisdictional response networks. They require lateral coordination, not centralized, top-down command, and control (Boin et al., 2017) and this study's findings indicate that these elements created many particular challenges for the U.K. Government.

Collaboration and Joint Effort

Collaboration and joint effort (S3) are the core aspects of TDS. Margerum (2011) describes the collaboration as an approach “to solving complex problems in which a diverse group of autonomous stakeholders deliberates to build consensus and develop networks for translating consensus into results.” (p. 6). This definition matches the core belief of the TD concept. The theory is that military and civilian resources operate together to prevent, mitigate, and manage crises. In the context of this paper, the collaboration issue includes successful interoperability with all of the subsystems in system 1, military and health, together with the others which constitute the whole viable system.

The defence resources of both Norway and the United Kingdom have been used extensively in various ways to successfully support the health services as part of the TDS. They achieved this through effective cooperation, resource distribution, and trust (Rhinard & Sundelius, 2010). As an operating system, both the United Kingdom and Norwegian Armed Forces are obligated to collaborate with civil authorities.

In the United Kingdom, 4,000 military personnel were deployed daily (UK MOD, 2020). The military aid to the civil authorities included helping to build temporary 'Nightingale' hospitals, delivering PPE to hospitals and Local Resilience Forums, carrying out medical evacuations of patients from across the entire United Kingdom, and setting up Mobile Testing Units. The coordination of resources by the military assets in the United Kingdom to meet the COVID-19 health challenges was vital. It undoubtedly enhanced the resilience capacity of the U.K. health service. However, trust in the health service was undermined when as part of its contingency planning and implementation of the U.K.'s response to COVID-19, the NHS canceled and delayed elective medical operations to focus on COVID-19 related demand (BMA, 2020). This resulted in an “enormous disruption” with reports of almost 2.5 million Britons not being screened, tested, or treated for cancer (Campbell, 2020). The complex NHS structure and the responsibilities of the devolved nations with different political agendas resulted in the manifestation of structural and communication pathologies.

In Norway in March 2020 the military supported hospital construction and provided medical facilities, assisted in ensuring airport operations, the Home Guard aided the police with enhanced border patrols, and improved liaison between the DSB and Norwegian Joint Headquarters was put in place. Moreover, the Norwegian

Defence Research Establishment (FFI) supported the development of a new emergency ventilator which increased the ventilator capacity of Norwegian hospitals. As a part of a collective effort, FFI's role was to "lead, coordinate and quality-assure the innovation and development process from idea to prototype, and prepare the Norwegian authorities for rapid procurement and implementation" (Government, 2020).

However, a joint effort requires resources to be allocated by involved parties. The allocation of military resources appeared to be challenging to do within the Norwegian TDS because of a coordination (S2) regulation, which resulted in a structural pathology. An example related to operations conducted by the Norwegian Home Guard (HG) highlights this. According to HG's commander-in-chief, there has been a significant focus on the fact that engaging the HG shall not go beyond other socially critical institutions. This means, for example, that an HG soldier who works in the intensive care unit of a hospital should not be set to guard the border in an airport (Thommessen, 2020). The New regulations for how civil authorities can ask the Armed Forces for assistance emphasizes that the armed forces shall only assist if civil society does not have the ability or capacity to handle the incident itself (Instructions, 2020). Therefore, this seems a gray zone in the Norwegian government's instruction about seeking assistance from Armed Forces. On the one hand, armed forces shall help if civil authorities do not have the capacity to deal with the problem, but on the other hand, engaging the military resources shall not go beyond other socially critical institutions. The research indicates that such resourcing issues may adversely impact the efficiency of the coordination response structure.

Coordination Structure

Coordination (S2) is the process that brings cohesion to the disparate stakeholders involved in developing and implementing effective crisis management strategies to deal with a particular crisis. It also enables improvements in preparation and response, through proactive learning and the training of resources, to ensure capacity and capabilities to manage the next crisis effectively. This type of coordination faces several challenges that can jeopardise the crisis management process. These challenges touch upon four broad areas. The first incorporates the characteristics of the crisis (See Section Crisis Management). The second refers to organizational issues, such as the number of actors involved and cultural and communication issues. The third relates to administrative capacities, including coordination capacity, regulatory capacity, delivery capacity and analytical capacity that is necessary to "encourage and sustain innovative problem-solving" (Lodge & Wegrich, 2014, p. 6). The fourth area is related to the accountability hierarchy (Bayne, 2006), the issue of the real-time governance, as the collaboration and synchronized action are critical in managing COVID-19 crisis. Both Norway and the United Kingdom exhibited structural pathologies that had the potential to impact on their governance. In Norway, the point was the demarcation of responsibility

between national, municipalities and counties. In the United Kingdom, the Government (S5) failed to adhere to existing legislation and guidance, which caused communication pathologies between S5 and the devolved Governments.

There are similarities in both Norway and the United Kingdom's coordination structures (NMDJP 2018; UK Cabinet Office, 2013). The armed forces have clear command and control structures, which allow effective national coordination of resources. The health services in both countries are delivered at a more local level. In Norway and the United Kingdom, crisis coordination is based on a set of underlying principles. First, each adopts the principle of responsibility. That is the organisation routinely responsible for service delivery retains responsibility for emergency preparations, response, and service delivery during crises. Second, the principle of similarity means that the organisation that comes into operation during crises is as similar as possible to the organisation that operates routinely in steady-state. Third, the principle of proximity or subsidiarity, that crises are handled at the lowest possible organizational level. This point reflects that those closest to the actual crisis are usually the most capable of understanding the situation, and thus are best suited to manage it. This means that internal and external coordination activities within and between organisations in routine day-to-day operations should not be changed in times of crisis. Even during the crisis caused by COVID-19, while the governments provide guidelines and present recommendations, responsibility for response lies with each entity. Fourth, the principle of collaboration ensures that authorities have the responsibility to achieve the best possible cooperation with relevant actors and agencies in the prevention, preparedness and, in general, in crisis management. However, despite both Norway and the United Kingdom have similar coordination structures, our analysis indicates they achieved markedly different health outcomes, in terms of the number of infected people and fatalities, related to the COVID-19 crisis.

One possible explanation is the effectiveness of the coordination structure in practice. Unlike Norway, with DSB's roles as the key actor to coordinate TDSs, the coordination within the TD in the United Kingdom is based on ministerial responsibility. This requires the coordination of resources across sectors with potential uncertainty about responsibilities and authorities. If a crisis creates uncertainties about who is responsible for coordination or authority to decide, this will hamper cooperation (Gamst, 2020). To alleviate the uncertainties, in the United Kingdom, the Civil Contingencies Act 2004 clearly defines the means of coordination in a U.K. response. The structures and roles and responsibilities are also detailed in guidance, and the protocols and procedures are well-publicized and practised. However, as the COVID-19 crisis continued, the cooperation and capacity of the U.K. Government's united response diminished. It was reported that fatigue and strain were affecting the response and that those at the top of the civil service were exhausted, lacking in appropriate capacity (Swinford et al., 2020). The practical and political challenges were testing ministers and stretching government structures. One government minister said, 'It's a mess', and a senior official said, "The system simply wasn't ready to deal with what we have got" (Kuenssberg, 2020).

Our empirical findings show that the cross-sectoral coordination between different actors involved with the TDS, with different culture and a power structure caused many challenges for crisis response authorities, especially in the United Kingdom, which may have impacted on the effective management of the COVID-19 situation.

Crisis Communication

Crisis communication (S1) is one of the most critical aspects of crisis management that affects the government's capability to make meaning about the strategic choices at the outset of a crisis (Boin et al., 2017). It has a direct influence on getting support from the public for its different crisis initiatives. A resilient and viable crisis management system is built on trust. Although many elements shape the viability of crisis communication, in this section, our focus is on the role of communication in building trust between crisis communicators and the public. Our empirical research finds that trust in decision makers was different in the United Kingdom, compared with Norway. In the United Kingdom, there was evidence of both structural and communication pathologies.

Decisions made by the U.K. Government on COVID-19, were informed by the Scientific Advisory Group for Emergencies (SAGE). However, there were very public disputes between groups of scientists concerning the efficacy of the advice being provided, especially concerning the potential numbers of COVID-19 deaths (Ghosh, 2020). Moreover, the Prime Minister was publicly criticized by a member of SAGE for not taking COVID-19 seriously and causing a delay which cost thousands of lives (O'Neill, 2020; Smyth, 2020). Sir David King, a former chief scientific adviser to the U.K. Government, was reported as saying the delay in bringing in the lockdown was "grossly negligent" especially when the Government was so poorly prepared (Sunday Times, 2020). It was also suggested that the Government's flat-footed response betrayed its lack of emergency planning experts (Alexander, 2020).

The breakdown of trust became apparent when scapegoating and blaming started between politicians and scientists in the United Kingdom. A government minister was accused of shifting the blame by suggesting that the U.K. Government had made mistakes because they were given the 'wrong' advice by scientists (Swinford & Smyth, 2020). A member of SAGE urged the Government to stop saying they were led by science as it was "slightly misleading" (Ghosh, 2020). This was reinforced by the President of the Royal Society who posited, "the public will feel misled if ministers use 'the science' as a prop to create a false sense of security and certainty only to change tack later. It will lead to an erosion of public trust" (Ramakrishnan, 2020).

The public trust was further eroded in the United Kingdom when the media reported on several lockdown breaches, which undermined the effectiveness of crisis communication. These included, the resignation from SAGE by a prominent scientist after breaking the lockdown rules he publicly advocated (BBC, 2020b), which came a month after Scotland's Chief Medical Officer resigned after breaking

the rules (BBC, 2020c). A police chief was criticized over lockdown trips from Glasgow to Yorkshire (BBC, 2020d). A Labor MP quit after lockdown breach (BBC, 2020e). The Scottish National Party's (SNP) leader in the United Kingdom Parliament traveled over 600 miles from London to his home on the Isle of Skye three days after lockdown (Williams, 2020). Finally, the PM's senior advisor traveled 270 miles from London to Durham after the lockdown, which resulted in headlines that he "thinks the rules do not apply to him" (Shipman, Wheeler, & Das, 2020). Consequently, the public began flouting the rules of the lockdown and social distance strategies (Waterson, 2020).

In contrast, Norway's crisis communicators demonstrated consistent respect for scientific advice. As an example, in an interview with CNN, Norway's Prime Minister made a clear point of letting scientists, not politician, make critical decisions regarding medication against COVID-19, when she commented on Norway's early lockdown and testing program as a significant measure (CNN, 2020). There were also differences in the behaviors of leaders, in terms of transparency and openness, when communicating with the public. The Norwegian Prime Minister insisted that "we have to be honest" (Piene & Wikan, 2020). This type of behavior led to more supportive and trusting feedback from media about political leaders. Boin and Bynander, agree, saying that *tone matters* (2015, p. 133). Consequently, the lockdown rules were obeyed by the public (Røsvik, 2020).

Our research indicates that having made difficult decisions, to manage the crisis, an essential element is being able to communicate it to others. Failure to do so effectively is likely to diminish public trust in the government handling of the crisis. This seemed to be more problematic in the United Kingdom than in Norway.

Conclusion and Final Remarks

The complexity of the COVID-19 crisis response presented many challenges for societal resilience in both Norway and the United Kingdom when operationalising of their TDS. Based on the theoretical foundation we developed for our study, the following section details the factors our research has found necessary for a viable TDS with resilience.

Anticipation and Monitoring

Crisis preparation is a crucial aspect of resilience. It requires a bottom-up strategy formation, with an iterative rather than linear planning process, driven by an interest in understanding a situation and imaginative visioning and learning. However, despite the early warning signals and high probability of a pandemic occurring, it seems that there was a gap in the planning and preparation for an epidemic by both Norway and the United Kingdom. The research shows that neither the Norwegian nor U.K. Government had heeded the warnings from their national risk assessments to prepare for the pandemic and provide necessary

resources adequately. Therefore, the required resources were not immediately available. To avoid this, TDSs should adopt a formal and proactive method of monitoring the implementation of the lessons identified from exercises and crises, for instance, by ensuring that the relevant government minister who has sectoral responsibility, implements the recommendation in the crisis management system. These reports need to be transparent and available for public and subject to parliamentary scrutiny. It is also crucial that there are information-sharing systems with standard reporting criteria which are properly funded for all the TDS agencies.

Leadership and Decision Making

Leadership enhances resilience through effective decision making. There was a significant difference in leadership styles between the Prime Ministers. Norway acted decisively and adopted a precautionary strategy in imposing an immediate lockdown. In contrast, the Prime Minister of the United Kingdom was criticized for delaying government actions. Moreover, unlike the U.K. Prime Minister, Norway's Prime Minister was an advocate of collaborative working. The leaders set the tone and can encourage collaboration and coordination, taking advice from a wide range of perspectives. Failure to do so restricts opportunities to learn from the past. Both Prime Ministers were, however, criticized for passing new legislation to deal with the crisis, which could allow them to act without the normal parliamentary scrutiny. The consequence was a potential reduction in trust of the decision makers. To deal with this challenge, it is recommended that TDSs proactively adopt an open and transparent approach to decision making, drawing on a wide range of sources and encourage innovative solutions at a local level.

Collaboration and Joint Effort

The collaborative process is founded on a shared vision, consultation to obtain feedback, information sharing and mutual agreement. All of these elements are critical to enhancing resilience capacity. However, it is difficult for the TDS because of the complexity of the structure and involving the multiple stakeholders with different underlying values and perceptions. The complex network of responders within the TDS requires clarity about roles and responsibility, together with clear demarcation of areas of activity. Both the Norwegian and U.K. Military worked in support of their health services. However, in Norway there is a gray area in relation to resources and when they can be called upon which may lead to confusion in the Norwegian TDS. To avoid this, it is recommended that the TDSs develops clear guidance for prolonged crises such as the pandemic. In addition, stakeholders regularly engage in joint exercises, at the local, regional and the national level. These exercises should be developed by the responsible agencies to enhance mutual understating of roles and responsibilities and crisis response structure. The aim of

these exercises should be to focus on the clear objectives of a viable system which we outlined in Table 3.

Coordination Structure

Participants must work jointly toward a common end, as well as functioning together to allow mutual adaptation and adjustment. In Norway and the United Kingdom, defence resources have been used extensively in various ways to support health services. The coordination of military resources to meet the COVID-19 challenges was vital. It undoubtedly enhanced the resilience capacity of health services. Because of its clear structure and underlying culture, the military achieved this through effective cooperation, resource distribution, and trust. We have seen that the application of the TDS enhances crisis management adaptability to stressful circumstances. However, our findings also reveal suboptimal problem solving and insufficient management capacity that was not prepared to respond with the speed that the COVID-19 situation required. In this regard, we suggest that further research might have a focus on understanding the conditions under which mindful decision making and problem-solving thrives and promotes coordination within the TDSs.

Crisis Communication

An operational resilience-oriented communication strategy requires an open and proactive approach in informing the public honestly about what is known or not known, and what is being done about the crisis. Trust in decision makers was different in the United Kingdom, compared with Norway. The breakdown of trust became apparent when scapegoating and blaming started in the United Kingdom, and the public felt the government was managing the crisis poorly. In contrast, in Norway, political leaders and scientists were trusted and recognized as working well to manage the crisis. But the TDS may be distorted by personal or political perceptions influencing decisions leading to unintended or unforeseen outcomes. To avoid interpersonal, institutional and procedural communications challenges, it is recommended that TDSs adopt a transparent messaging strategy, disclosing the evidence on which the crisis is being managed and acknowledging when there are uncertainties. The decision makers from all relevant agencies in the TDS should recognize the difficulties in communicating in a context of crisis response structure. In this way the overall results might be more resilient, as it develops trust between public and political decision makers.

Final Remarks

The contribution of this work was threefold. (i) By linking VSM to the implementation of the TDS, we sought to contribute to the increased practical relevance

of the VSM approach in a crisis management context. We believe it has also made an important contribution to the study of defence systems by the application of systemic tools based on empirical evidence. Moreover, it has made a methodological and conceptual contribution to the study of TDSs by using Beer's VSM (Beer, 1979, 1981, 1985). The VSM enabled the examination of TDS relationships. The diagnosis assisted in identifying areas where pathologies exist, and which could undermine system viability. The use of the model resulted in a greater understanding of the TDS. This enabled recommendations on the improvement of the TDS to make them more viable and adaptive to their environment. (ii) A structure developed to understand and analyse viability of TDS and its resilience in a unified approach, which connects the fields of crisis management and systemic view. In exploring the complexity of the underlying factors, which affect the resilience, and viability of the TDS, this research has highlighted several issues about resource mobilization and crisis management. These points could provide useful insights to further developing the TDS. (iii) As a case study research, we illustrated (justify) how an application of TDS might affect the adaptive capacity in crisis management. In line with Eisenhardt (1989), this work attempts to increase knowledge about how to use a case study as a roadmap for building theories.

As final remarks, we conclude that the effectiveness of a viable system is dependent on all subsystems operating in concert. A deficiency in one subsystem may impact on the outcomes of the whole system. Application of the VSM as a roadmap has shown its benefits in exploring how distinctions between TDS, in Norway and the United Kingdom, influenced the outcomes of the crisis management process. Second, the actions and decisions of leaders within the system will affect the effectiveness of an otherwise viable system. Third, without current intelligence, strategic decisions and policies are unlikely to meet the immediate needs of the crisis. Fourth, stakeholder collaboration is key to successful policy implementation. Fifth, planning requires a continuous commitment to maintain adequate resources to manage crises effectively. We finally highlight the importance of proper funding research on resilience and its effect on the viability of TDS.

Kevin Pollock, Emergency Planning College, UK [kevin@pfrresilience.com].

Riana Steen, BI Norwegian Business School.

References

- Alexander, David. 2020. "Britain is in a State of Emergency. So Where Are Its Emergency Planners?" *Guardian* (May 5). <https://www.theguardian.com/commentisfree/2020/may/05/britain-emergency-planners-pandemic-government>. Accessed May 5, 2020.
- Ansell, Chris, and Arjen Boin. 2019. "Taming Deep Uncertainty: The Potential of Pragmatist Principles for Understanding and Improving Strategic Crisis Management." *Administration & Society* 2019 51 (7): 1079–112, <https://doi.org/10.1177/0095399717747655>
- Balmer, Crispian, and Susan Heavy. 2020. "Masked and Standing Apart, the World Tiptoes Out of Lockdown." *Reuters* (May 4). <https://www.reuters.com/article/us-health-coronavirus/masked-and-standing-apart-the-world-tiptoes-out-of-lockdown-idUSKBN22G1AK>. Accessed June 27, 2020.

- Bayne, Jay S. 2006. "A Theory of Enterprise Command and Control." *Proceedings —IEEE Military Communications Conference*. <https://doi.org/10.1109/MILCOM.2006.302294>
- ECDPC. 2020. *Coronavirus Disease 2019 (COVID-19) Pandemic: Increased Transmission in the EU/EEA and the UK—Seventh Update*. Stockholm: ECDC.
- HM Government. 2016. *National Security Strategy and Strategic Defence and Security Review 2015 First Annual Report 2016*. London: Published by UK Government. <https://www.gov.uk/government/publications/national-security-strategy-and-strategic-defence-and-security-review-2015-annual-report-2016>
- PHE. 2017. *Exercise Cygnus Report, Tier One Command Post Exercise, Influenza Pandemic 18-20 October 2016*. London: Public Health England.
- BBC. 2020b. *Coronavirus: Prof Neil Ferguson Quits Government Role After 'Undermining' Lockdown*. (May 6). <https://www.bbc.co.uk/news/uk-politics-52553229>. Accessed May 11, 2020.
- BBC. 2020a. *British PM Boris Johnson is Back at Work After Recovering from Covid-19*. <https://www.bbc.co.uk/programmes/p08bmcps>. Accessed May 11, 2020.
- . 2020c. *Coronavirus: Scotland's Chief Medical Officer Resigns Over Lockdown Trips*. (April 6). <https://www.bbc.co.uk/news/uk-scotland-52177171>. Accessed May 11, 2020.
- . 2020d. *Police Chief Criticised Over Lockdown Trips from Glasgow to Yorkshire Home*. <https://www.bbc.co.uk/news/uk-scotland-52690635>. Accessed May 16, 2020.
- . 2020e. *Coronavirus: Labour MP Quits Role After Lockdown Breach*. <https://www.bbc.com/news/uk-politics-52867324>. Accessed June 1, 2020.
- Beer, Stafford. 1979. *The Heart of the Enterprise*. Chichester: Wiley.
- . 1981. *Brain of the Firm*, 2nd ed. Chichester: Wiley.
- . 1985. *Diagnosing Systems for Organisations*. Chichester: Wiley.
- Berge, H. (Producer). 2020. *The Government Shall Respect the Corona Act*. <https://www.ntl.no/artikkel/203885>
- Birkemo, Gunn Alice, Emil Graarud, and Ola Krogh Halvorsen. 2019. *FFI Report: A Credible Ally Reception—Experiences from Trident Juncture 2018*. <https://publications.ffi.no/nb/item/asset/dspace:5894/19-01068.pdf>
- Blick, Andrew, and Clive Walker. 2020. "Why Did Government Not Use the Civil Contingencies Act?" *The Law Society Gazette* (April 2). <https://www.lawgazette.co.uk/legal-updates/why-did-government-not-use-the-civil-contingencies-act/5103742.article>. Accessed June 5, 2020.
- Blumer, Herbert. 1954. "What is Wrong With Social Theory?" *American Sociological Review* 19 (1): 3–10.
- BMA. 2020. *Impact of Cancelled Operations Due to the COVID-19 Pandemic*. British Medical Association Parliamentary Brief. Oral Question, House of Lords June 10, 2020. Published by bma.org.uk
- Boin, Arjen, and Fredrik Bynander. 2015. "Explaining Success and Failure in Crisis Coordination." *Geografiska Annaler: Series A, Physical Geography* 97 (1): 123–35, <https://doi.org/10.1111/geoa.12072>
- Boin, Arjen, Magnus Ekengren, and Mark Rhinard. 2020. "Hiding in Plain Sight: Conceptualising the Creeping Crisis." *Risk, Hazards & Crisis in Public Policy* 11 (2): 116–38, <https://doi.org/10.1002/rhc3.12193>
- Boin, Arjen, Paul 't Hart, Eric Stern, and Bengt Sundelius. 2017. *The Politics of Crisis Management: Public Leadership Under Pressure*. Cambridge: Cambridge University Press.
- Boin, Arjen, Fredrik Bynander, Eric Stern, and Paul 't Hart. 2020. *Leading in a Crisis: Organisational Resilience in Mega-Crises*. <https://www.anzsog.edu.au/resource-library/research/organisational-resilience-in-mega-crises>
- Booher, David, and Judith Innes. 2002. "Network Power in Collaborative Planning." *Journal of Planning Education and Research* 21 (3): 221–36.
- Boseley, Sarah. 2020. "Austerity Blamed for Life Expectancy Stalling for First Time in Century." *The Guardian*. (February 25). <https://www.theguardian.com/society/2020/feb/24/austerity-blamed-for-life-expectancy-stalling-for-first-time-in-century>. Accessed February 25, 2020.
- Bowen, Ken. 1997. "Total Defence: What is Being Defended and What Are the Threats?" *OR Insight* 10: 2–7, <https://doi.org/10.1057/ori.1997.1>
- Campbell, Denis. 2020. "Millions in UK Miss Cancer Screenings, Tests and Treatments Due to Covid-19." *The Guardian* (June 1). <https://www.theguardian.com/society/2020/jun/01/millions-in-uk-miss-cancer-screenings-tests-and-treatments-due-to-covid-19>. Accessed June 5, 2020.

- Cardoso-Castro, Pedro Pablo. 2019. "The Viable System Model as a Framework to Guide Organisational Adaptive Response in Times of Instability and Change." *International Journal of Organizational Analysis*, <https://doi.org/10.1108/IJOA-01-2018-1334>. 27(2), 289–307.
- Cardoso-Castro, Pedro Pablo, and Angela Espinosa. 2019. "Identification of Organisational Pathologies: Exploration of Social Network Analysis to Support the Viable System Model Diagnostic." *Kybernetes* 49: 285–312, <https://doi.org/10.1108/K-10-2018-0557>
- Christensen, Tom, and Per Læg Reid. 2008. "The Challenge of Coordination in Central Government Organizations: The Norwegian Case." *A Global Journal* 8 (2): 97–116, <https://doi.org/10.1007/s11115-008-0058-3>
- Christensen, Tom, Ole Andreas Danielsen, Per Laegreid, and Lise Rykkja. 2016. "Comparing Coordination Structures for Crisis Management in Six Countries: Comparing coordinating structures for crisis management." *Public Administration (London)* 94 (2): 316–32, <https://doi.org/10.1111/padm.12186>
- CNN (Producer). 2020. *Norwegian PM: Defunding WHO the 'Wrong Decision'*. <https://edition.cnn.com/videos/tv/2020/04/08/erna-solberg-amanpour-norway-coronavirus-world-health-organization.cnn>
- Comfort, Louise Kloos. 1988. *Managing Disaster: Strategies and Policy Perspectives*. Durham, NC: Duke University Press.
- . 2014. *Designing Resilience: Preparing for Extreme Events*. University of Pittsburgh Press.
- Coombs, W. Timothy. 2015. *Ongoing Crisis Communication: Planning, Managing, and Responding*. 4th ed. Los Angeles: Sage.
- Davoudi, Simin. 2012. "Resilience: A Bridging Concept or a Dead End?" *Planning Theory & Practice* 13: 299–307, <https://doi.org/10.1080/14649357.2012.677124>
- Dekker, Sidney. 2006. "Resilience Engineering: Chronicling the Emergence of Confused Consensus." In *Resilience Engineering: Concepts and Precepts*, eds. E. Hollnagel, D. D. Woods, and N. Leveson. Aldershot, UK: Ashgate Publishing, Ltd. 77–94.
- DeLeon, Peter, and Danielle Varda. 2009. "Toward a Theory of Collaborative Policy Networks: Identifying Structural Tendencies." *Policy Studies Journal* 37 (1): 59–74, <https://doi.org/10.1111/j.1541-0072.2008.00295.x>
- Drennan, Lynn, Allan McConnell, and Allastair Stark. 2014. *Risk and Crisis Management in the Public Sector*, London: Taylor and Francis.
- DSB. 2019. *Analysis of Crisis Scenarios 2019*. https://www.dsb.no/globalassets/dokumenter/rapporter/p1808779_aks_2018.cleaned.pdf
- Eisenhardt, Kathleen. 1989. "Building Theories from Case Study Research." *Academy of Management Review* 14 (4): 532–50.
- Espejo, Raul, and Antonia Gill. 1996. *SYCOMT Handbook*. Aston Science Park, Birmingham, UK: Syncho Ltd.
- Fafo-rapport. 2019. *The ABE Reform in Norway*. <https://www.fafo.no/en/publications/english-summaries/item/acpd-as-an-efficiency-tool-the-abe-reform-in-norway>
- Faulkner, Robert. 2009. "Improvising on Sensitising Concepts. A. Puddephatt W. Shaffir & S. Kleinknecht." *Ethnographies Revisited: Conceptual Reflections from the Field*, 1st, 79–91). London: Routledge. <https://doi.org/10.4324/9780203876503>
- Fernandes, Antonio, and Jose Tribolet. 2019. "Enterprise Operating System: The Enterprise (self) Governing System." *Procedia Computer Science* 164 (2019): 149–58, <https://doi.org/10.1016/j.procs.2019.12.167>
- Gamst, Borge. 2020. We need to work together better in crises. Forsvarets forum. In Norwegian. <https://forsvaretsforum.no/totalforsvaret/vi-ma-samarbeide-bedre-i-kriser/120618>. Accessed May 12, 2020.
- Ghosh, Pallab. 2020. *Coronavirus: Some Scientists Say UK Virus Strategy is "Risking Lives"*. By Pallab Ghosh, BBC Science correspondent. <https://www.bbc.co.uk/news/science-environment-51892402>. Accessed May 11, 2020.
- Government. 2020. *Norwegian Production of Emergency Ventilators [Press Release]*. <https://www.regjeringen.no/en/aktuelt/norwegian-production-of-emergency-ventilators/id2695890/>

- Granot, Hayim. 1998. "The Dark Side of Growth and Industrial Disasters Since the Second World War." *Disaster Prevention and Management* 7 (3): 195–204.
- Haugsbø, Frank, Erik Røsvik, Martha Holmes, and Hallgeir Vågenes. 2020. Erna is Praised for Crisis Management in a New Opinion Poll VG. <https://www.vg.no/nyheter/innenriks/i/vQ7lmB/erna-hylles-for-krisehaandtering-i-ny-meningsmaaling>
- Hollnagel, Erik, Robert Wears, and Jeffrey Braithwaite. 2015. *From Safety-I to Safety-II: A White Paper. The Resilient Health Care Net: Published Simultaneously by the University of Southern Denmark*. Australia: University of Florida, USA and Macquarie University.
- Innes, Judith, and David Booher. 2017. *Planning With Complexity: An Introduction to Collaborative Rationality for Public Policy*. 2nd ed. Routledge.
- Instructions, T. A. (2020). *New Regulations for How Civil Authorities Can Ask the Armed Forces for Assistance*. Government.no <https://www.regjeringen.no/no/aktuelt/ny-forskrift-for-hvordan-sivile-myndigheter-kan-be-forsvaret-om-bistand/id2694353/>
- Kapucu, Naim. 2005. "Interorganisational Coordination in Dynamic Context: Networks in Emergency Response Management." *Connections* 26 (2): 33–48.
- Keating, Adriana, Karen Campbell, Michael Szoenyi, Colin Mcquistan, David Nash, and Meinrad Burer. 2017. "Development and Testing of a Community Flood Resilience Measurement Tool." *Natural Hazards and Earth System Sciences* 17 (1): 77–101, <https://doi.org/10.5194/nhess-17-77-2017>
- Klein, Gary, Paul Feltovich, Jeffrey Bradshaw, and David Woods. 2005. "Common Ground and Coordination in Joint Activity." In *Organisational Simulation*, eds. William Rouse, and Kenneth Boff. New York: Wiley. 139–84.
- Kuenssberg, Laura. 2020. *Coronavirus: A Government Under Great Strain*. BBC Political editor. May 14, 2020. <https://www.bbc.co.uk/news/uk-politics-52670086>. Accessed May 15, 2020.
- Leonard, Allenna. 2000. "The Viable System Model and Knowledge Management." *Kybernetes* 29 (5/6): 710–15.
- Libell, Henrik, Mina Mohseni, and Maren Haugen, (Producer). 2020. *Strong Reactions to Emergency Powers in Proposed New "Corona Law"*. <https://juridika.no/innsikt/reaksjoner-p%C3%A5-koronaloven>
- Lodge, Martin, and Kai Wegrich. 2014. "Governance Innovation, Administrative Capacities, and Policy Instruments." In *The Problem-Solving Capacity of the Modern State: Governance Challenges and Administrative Capacities*, eds. Martin Lodge, and Kai Wegrich. United Kingdom: Oxford University Press. 1–25.
- Margerum, Richard. 2011. *Beyond Consensus: Improving Collaborative Planning and Management*. Cambridge, MA: MIT Press.
- McLaughlin, Mark, and Keiran Andrews. 2020. "Sturgeon's Demand at Number Ten." *The Times, Scotland News, Friday* (May 8). <https://www.thetimes.co.uk/article/lockdown-nicola-sturgeons-demand-to-no-10-p2kqh6fr>. Accessed May 8, 2020.
- Moynihan, Donald. 2008. "Learning Under Uncertainty: Networks in Crisis Management." *Public Administration Review* 68 (2): 350–65.
- Murray, Philomena, and Michael Longo. 2018. "Europe's Wicked Legitimacy Crisis: The Case of Refugees." *Journal of European Integration* 40 (4): 411–25, <https://doi.org/10.1080/07036337.2018.1436543>
- NMDJP. 2018. *Support and Cooperation: A Description of the Total Defence in Norway*. Published by the Norwegian Ministry of Defence and Minister of Justice and Public Security 8 May 2018.
- Ocasio, William. 1997. "Towards an Attention-Based View of the Firm." *Strategic Management Journal* 18 (SPEC. ISS.): 187–206.
- Ocasio, William, and John Joseph. 2018. "The Attention-Based View of Great Strategies." *Strategy Science* 3: 289–94, <https://doi.org/10.1287/stsc.2017.0042>
- OECD. 2017. *National Risk Assessments: A Cross Country Perspective*, OECD Publishing, Paris. Cross Country Perspective, OECD Publishing, Paris. <https://doi.org/10.1787/9789264287532-en>
- . 2019. *OECD Development Co-Operation Peer Reviews: Norway 2019*, OECD Development Cooperation. Peer Reviews, OECD Publishing, Paris, <https://doi.org/10.1787/75084277-en>

- Olsen, Odd Einar, Bjørn Ivar Kruke, and Jan Hovden. 2007. "Societal Safety: Concept, Borders and Dilemmas." *Journal of Contingencies and Crisis Management* 15 (2): 69–79.
- Olsson, Eva-Karin. 2014. "Crisis Communication in Public Organisations: Dimensions of Crisis Communication Revisited." *Journal of Contingencies and Crisis Management* 22 (2): 113–25, <https://doi.org/10.1111/1468-5973.12047>
- O'Neill, Sean. 2020. "Boris Johnson' Failed to Take Coronavirus Threat Seriously'." *The Times* (June 3). <https://www.thetimes.co.uk/article/boris-johnson-failed-to-take-coronavirus-threat-seriously-rs2n7vd0w>. Accessed June 3, 2020.
- Pegg, David. 2020. "What Was Exercise Cygnus and What Did it Find?" *The Guardian* (May 7). <https://www.theguardian.com/world/2020/may/07/what-was-exercise-cygnus-and-what-did-it-find>. Accessed May 7, 2020.
- Perrow, Charles. 1999. *Normal Accidents—Living With High-Risk Technologies*. New Jersey: Princeton University Press.
- Piene, Bibiana, and Vilde Skorpen Wikan. 2020. *From Corona Crisis to a New Jobs Crisis [Press release]*. <https://www.aftenposten.no/norge/politikk/i/Op43j3/erna-solberg-vi-vil-gaa-fra-koronakrise-til-jobbkrise>
- Pollock, Kevin. 2013. *Review of Persistent Lessons Identified Relating to Interoperability from Emergencies and Major Incidents since 1986. A report commissioned by the Cabinet Office Civil Contingencies Secretariat and the Emergency Planning College*. Emergency Planning College Occasional Papers New Series Number 6, October 2013. <https://www.epcresilience.com/EPC.Web/media/documents/Papers/Occ6-Paper-v3.pdf>
- . 2017. *Local Interoperability in UK Emergency Management: A Research Report Commissioned by the Cabinet Office and the Emergency Planning College*. Emergency Planning College Occasional Papers New Series Number 19, February 2017 <https://www.epcresilience.com/EPC.Web/media/documents/Papers/OP19-Local-Interoperability-Feb-2017.pdf>
- Power, Nichola, and Laurance Alison. 2018. "Decision Inertia in Critical Incidents." *European Psychologist* 24 (3): 209–18.
- Provan, David, David Woods, Sidney Dekker, and Andrew Rae. 2020. "Safety II Professionals: How Resilience Engineering Can Transform Safety Practice." *Reliability Engineering and System Safety*, 195, 1, <https://doi.org/10.1016/j.ress.2019.106740-14>.
- Ramakrishnan, Venki. 2020. *President of the Royal Society, Addresses Trust in Science During the Coronavirus (COVID-19) Pandemic*. <https://royalsociety.org/blog/2020/05/following-the-science/>
- Rhinard, Mark, and Sundelius Bengt. (2010). "The Limits of Self Reliance: International Cooperation as a Source of Resilience." *Designing Resilience: Preparing for Extreme Events*. eds. Louise Comfort Arjen Boin and Chris Demchak, 196–219. Pittsburgh: Pittsburgh University Press.
- Robinson, Scott, Warren Eller, Melanie Gall, and Brian Gerber. 2012. "The Core and Periphery of Emergency Management Networks: A Multi-Modal Assessment of Two Evacuation Hosting Networks from 2000-2009." In *Disaster and Crisis Management Public Management Perspectives*, eds. Naim Kapucu, and Arjen Boin. Abingdon, Oxon: Routledge.
- Rosenthal, Michael Charles, and Paul, Hart. (1989). *The World of Crises and Crisis Management. Coping with crises: The management of disasters, riots, and terrorism*, Springfield, IL: Charles C Thomas Publisher Ltd.
- Røsvik, Eirik. 2020. *Historical Erna-Jump*. VG. <https://www.vg.no/nyheter/innenriks/i/y3dzbx/historisk-hopp-for-hoeyre-i-ny-meningsmaaling>
- Rowe, James. 2010. "The Cybernetics of Organising: Management and Leadership." *Kybernetes* 39 (7): 1100–11.
- Ruiz-Martin, Christina, Jose Perez Rois, Gabel Wainer, Javier Pajares, Cesareo Hernandez Iglesias, and Adolfo Lopez-Paredes. 2017. "The Application of the Viable System Model to Enhance Organisational Resilience." In *Advances in Management Engineering, Lecture Notes in Management and Industrial Engineering*, ed. Cesáreo Hernández Cham: Springer International Publishing AG.
- Sandercock, Leonie. 2003. "Out of the Closet: The Importance of Stories and Storytelling in Planning Practice." *Planning Theory & Practice* 4: 11–28, <https://doi.org/10.1080/1464935032000057209>

- Scottish Government. 2018. *Final Report Exercise Iris*. <https://www.gov.scot/publications/exercise-iris-report/>
- Senge, Peter. 1990. *The Fifth Discipline: The Art and Practice of the Learning Organisation*. New York: Doubleday.
- Shaw, Duncan, Ayham Fattoum, Jenny Moreno, and Jennifer Bealt. 2020. "A Structured Methodology to Peer Review Disaster Risk Reduction Activities: The Viable System Review." *International Journal of Disaster Risk Reduction* 46 (2020): 1–14.
- Shipman, Tim, Charles Wheeler, and Shanti Das. 2020. "Dominic Cummings' Thinks the Rules do Not Apply to Him." *The Sunday Times*. <https://www.thetimes.co.uk/edition/news/dominic-cummings-thinks-the-rules-do-not-apply-to-him-kmpjdh8wk>
- Smith, Denis, and Dominic Elliott. 2007. "Exploring the Barriers to Learning from Crisis." *Management Learning* 38 (5): 519–38.
- Smith, Matthew. 2020. *Approval of Government Handling of Coronavirus Sinks to Lowest Level*. Published by YouGov (June 3). <https://yougov.co.uk/topics/politics/articles-reports/2020/06/03/approval-government-handling-coronavirus-sinks-low>. Accessed June 27, 2020.
- Smyth, Chris. (2020). "Coronavirus: Lockdown delay cost lives, says Sage member." *The Times Friday* (May 22). <https://www.thetimes.co.uk/article/coronavirus-lockdown-delay-cost-lives-says-sage-member-dkgp2pwd8>. Accessed May 22, 2020.
- Solberg, Erna. 2020. *The Prime Minister's Introduction at a Press Conference on New Measures Against Coronary Infection [Press Release]*. <https://www.regjeringen.no/no/aktuelt/statsministerens-innledning-pa-pressekonferanse-om-nye-tiltak-mot-koronasmitte/id2693335/>
- Sørenes, Kjetil Magne. 2020. *The Labour Party is Open to Dropping the Corona Act. It Could Give Parliament Less Power Over Emergency Measures, Warns the Lawyer*. <https://www.aftenposten.no/norge/politikk/i/Vb84xl/arbeiderpartiet-aapner-for-aa-droppe-koronaloven-det-kan-gi-stortinget-mindre-makt-over-krisetiltak-advarer-jurist>
- Steen Riana, Morsut Claudia. (2020). "Resilience in Crisis Management at the Municipal Level: The Synne Storm in Norway." *Risk, Hazards & Crisis in Public Policy*, 11(1), 35–60. <http://dx.doi.org/10.1002/rhc3.12178>
- Stern Eric. (1997). "Crisis and Learning: A Conceptual Balance Sheet." *Journal of Contingencies and Crisis Management*, 5(2), 69–86. <http://dx.doi.org/10.1111/1468-5973.00039>
- Sunday Times. 2020. "Revealed: UK's Lockdown Dithering Led to Worst Death Toll in Europe." *Insight, Sunday Times* (May 24). <https://www.thetimes.co.uk/article/revealed-uk-s-lockdown-dithering-led-to-worst-death-toll-in-europe-w86pt3hh5>. Accessed April 24, 2020.
- Supreme Allied Commander Transformation (SACT). (2017). *Building resilience – Collaborative proposals to help nations and partners*. Norfolk, VA: SACT. <https://norfolk.gov/DocumentCenter/View/30383/Interdependency-in-Resilience?bidId=>
- Swinford, Steven, and Smyth, Chris. (2020). Make lockdown science public, Jeremy Hunt urges as minister shifts blame. *The Times*, Wednesday May 20, 2020. <https://www.thetimes.co.uk/article/scientists-and-mps-urge-no-10-to-publish-its-advice-hmhzd99nm>. Accessed May 20, 2020.
- Swinford, Steven, Chris Smyth, Oliver Wright, and Francis Elliott. 2020. "Cracks Widen as Fatigue Takes Its Toll at Downing Street: Test, Track and Trace is Vital to Reopening Britain but Infighting and Divisions Are Making it Far From Easy." *The Times* (May 23). <https://www.thetimes.co.uk/article/cracks-widen-as-fatigue-takes-its-toll-at-downing-street-vhckzkgpm>. Accessed May 23, 2020.
- Thommessen, Louise 2020. *She Leads the Home Guard From Her Own Living Room*. <https://forsvaretsforum.no/heimevernet-koronavirus/hun-leder-heimevernet-fra-egen-stue/114156>
- Titheradge, Noel, and Faye Kirkland. 2020. *Coronavirus: Outbreak Exercise Showed 'Clear Gap' in Readiness*. BBC (June 5). <https://www.bbc.co.uk/news/uk-52927462>. Accessed June 5, 2020.
- Toft, Brian, and Simon Reynolds. 2005. *Learning from Disasters: A Management Approach*. 3rd ed. Leicester: Perpetuity Press.
- TRJE18. 2018. *Facts and Information: Exercise Trident Juncture 2018 (TRJE18)*. <https://forsvaret.no/en/ForsvaretDocuments/Facts-English.pdf>

- Turner, Barry. 1976. "The Organizational and Interorganizational Development of Disasters." *Administrative Science Quarterly* 21 (3): 378–97, <https://doi.org/10.2307/2391850>
- UK Cabinet Office. 2008. *National Risk Register of Civil Emergencies: Updating the Public on the Government's Current Assessment of the Potential Impact of a Range of Different Civil Emergency Risks*. <https://www.gov.uk/government/publications/national-risk-register-of-civil-emergencies>. Accessed May 10, 2020.
- . 2013. *Responding to Emergencies: The UK Central Government Response. Concept of Operations*. <https://www.gov.uk/government/publications/the-central-government-s-concept-of-operations>. Accessed May 10, 2020.
- . 2017. *National Risk Register of Civil Emergencies: The National Risk Register 2017 Explains the Risks of Major Emergencies that Could Affect the UK in the Next Five Years and Provides Resilience Advice and Guidance*. <https://www.gov.uk/government/publications/national-risk-register-of-civil-emergencies-2017-edition>. Accessed May 10, 2020.
- UK Legislation. 2004. *Civil Contingencies Act 2004*. UK Public General Acts 2004.
- . 2020. *Coronavirus Act 2020*. UK Public General Acts 2020. <http://www.legislation.gov.uk/ukpga/2020/7/contents/enacted>. Accessed June 5, 2020.
- UNISDR. 2009. *Terminology on Disaster Risk Reduction*. Geneva, Switzerland: Published by the United Nations International Strategy for Disaster Reduction.
- Waterson, Jim. 2020. "Public Trust in UK Government Over Coronavirus Falls Sharply." *The Guardian*. <https://www.theguardian.com/world/2020/jun/01/public-trust-in-uk-government-over-coronavirus-falls-sharply>. Accessed June 2, 2020.
- WHO. 2020. *WHO Announces COVID-19 Outbreak a Pandemic*. <http://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/news/news/2020/3/who-announces-covid-19-outbreak-a-pandemic>. Accessed June 4, 2020.
- Williams, Martin. 2020. "Why Ian Blackford Isolated Himself After 600-Mile Trip to Skye Home During Lockdown." *The Herald*. <https://www.heraldscotland.com/news/18478298.coronavirus-ian-blackford-isolated-600-mile-trip-skye-home-lockdown/>. Accessed June 1, 2020.
- Wither, James Kenneth. 2020. "Back to the Future? Nordic Total Defence Concepts." *Defence Studies* 20 (1): 61–81, <https://doi.org/10.1080/14702436.2020.1718498>
- Wolbers, Jeroen, Kees Boersma, and Peter Groenewegen. 2018. "Introducing a Fragmentation Perspective on Coordination in Crisis Management." *Organisation Studies* 39 (11): 1521–46, <https://doi.org/10.1177/0170840617717095>
- Woods, David, and John Allspaw. 2019. "Revealing the Critical Role of Human Performance in Software." *Queue* 17 (6): 28–40.
- Worldometer. 2020. <https://www.worldometers.info/coronavirus/>. Accessed July 9, 2020.