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Total Defence Resilience: viable or not during COVID-19?
A comparative study of Norway and the UK.

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Abstract

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 mobilisation and management process highlights the need for a complexity-oriented approach in the operationalising of TD. We study the application of TD during the COVID19 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 UK 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 institutionalised 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.

Keywords: Total defence, resilience, crisis management, viable systems model (VSM), COVID-19, collaboration.

Introduction

On 9th January 2020, a new coronavirus outbreak, subsequently named COVID-19, was reported in China. The number of cases rapidly increased globally (ECDPC, 2020), and on 12th March 2020, the World Health Organisation (WHO) declared the COVID-19 outbreak as a pandemic (WHO, 2020). It became a global crisis. Labelling 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 is to maximise the utilisation of society's total resources by developing a civil-military cooperation. The Norwegian TD system 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 TD system (NMDJP, 2018, p. 5). The UK equivalent of TDS is set out in the UK National Security Strategy (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 UK resilience (HM Government, 2016). Therefore, each TD system includes both military and civil defence resources. The approach of such emergency management networks has an inherently collaborative nature (Robinson et al., 2012). It involves institutionalised 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 et al., 2016). It should be ideally characterised 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 organise 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 Total Defence System (TDS) seeks to overcome these challenges, enhance national resilience, and manage complex problems, like pandemics. Both Norway and the UK 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 UK, 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 reorganisation 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 et al., 2007). The complexity of the resource mobilisation 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. 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, synchronise, 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 adaption 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 Total Defence 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 et al., 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 UK 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 UK, 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 (Fafu-rapport, 2019). Based on this reform, by cutting 0.5 per cent 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 UK, our findings indicate that despite many similarities between the UK 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 UK 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.

1. Theoretical Foundation

2.1 Crisis management

Drennan et al., (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 COVID19 situation as a creeping crisis. These do not get enough attention to mobilise crisis response authorities until "citizens, journalists, policymakers, and politicians recognise 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-organisational 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 & Lægheid, 2016).

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 minimise 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-organisational 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.

1.2 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 et al, 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, synchronise, 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.
- **Synchronisation** focuses on the coordinate information flows and actions across the networked system. This synchronisation 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 emphasises on a search for brittleness, gaps in understanding underlying elements trade-offs and re-prioritisations. 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 organisational 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.

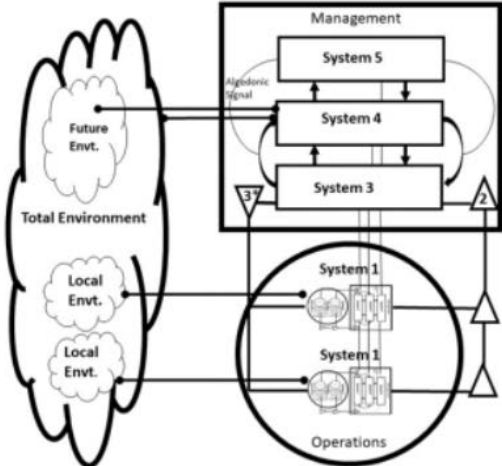
Beside the multiple and interdisciplinary skills in human resources, the ability for the individuals (e.g., leaders) and teams to express critical thinking capabilities is crucial in crisis management. While policies, standards and regulations are important elements of crisis management operations, improvisation 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 behaviours, and the ability to communicate (Klein, Feltovich, Bradshaw, & Woods, 2005).

2.3 Viable System Model (VSM)

The Viable Systems Model (VSM) was developed by the British cybernetician Stafford 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 Total Defence 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:



Insert Figure 1 The Viable System Model, adapted by the authors from Beer (1985)

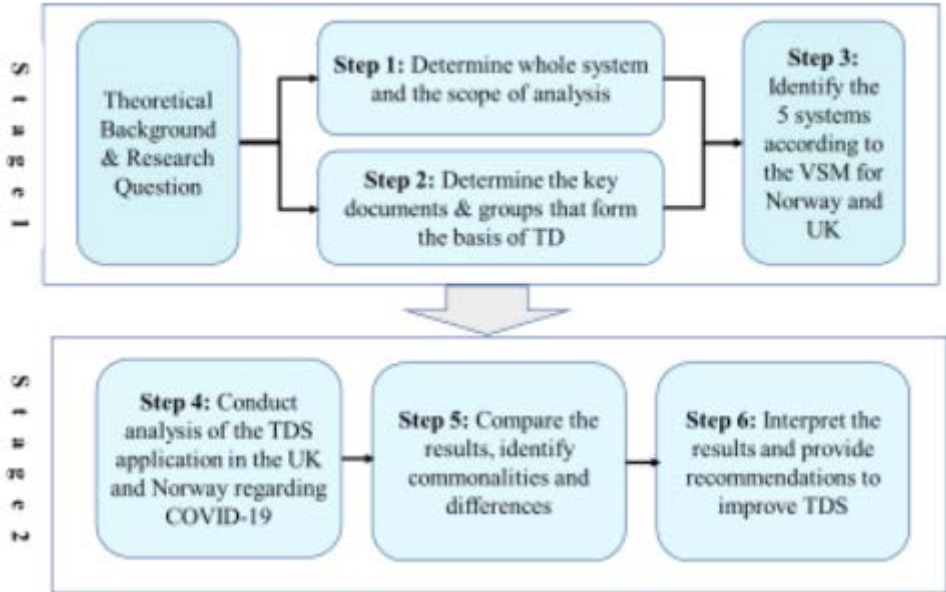
Insert Table 1 Summary of the Viable Systems Model

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 & 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 organisational ethos and distinctive identity. Strategic decision making is a process of matching current reality to future needs.

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 leadership in viable organisations (Rowe, 2010), to enhance organisational resilience (Ruiz-Martin et al., 2017), as a framework to guide adaptive organisational response (Cardoso-Cadro, 2018), and most recently to review disaster risk reduction activities (Shaw et al., 2020).

3. Methodology

This work analysed the viability of Norway and the UK's Total Defence Systems (TDS). Because of the conceptual nature of viability, sensitising 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 counter-factual 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 (Fig. 2).



Insert Figure 2 Research design

The first stage gathered the domain of the study. We reviewed relevant literature, including, total defence concept, resilience and total defence and resilient society. The scope of the analysis was determined as the period from 1st January 2020 until 8th July 2020, during which the governments of Norway and the UK 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):

Insert Table 2 COVID-19 Cases & Deaths – World, UK & Norway (8th July 2020)

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

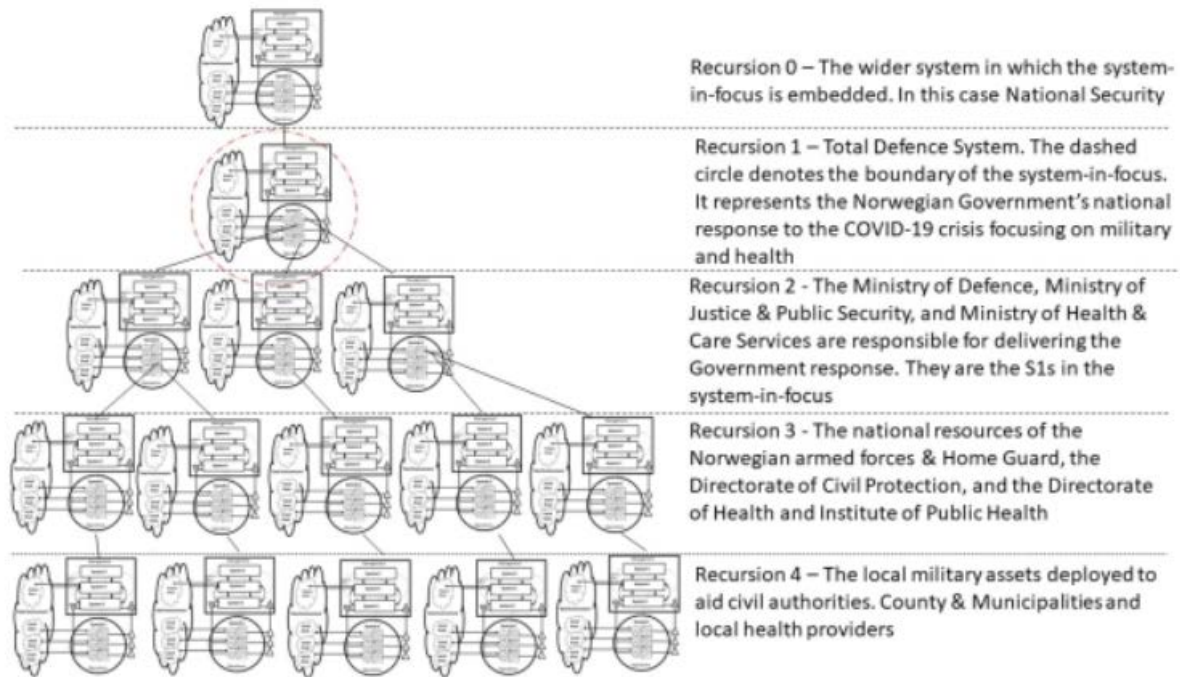
In the second stage, the VSM was used to diagnose the TDS, in particular, the health and military aspects in responding to the COVID-19 pandemic. The TDS is considered as a recursive system with each System 1 as a viable system in its own right. By zooming in, VSM would have allowed us to contract the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

The VSM proposes that viable systems are recursively organised. 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. Firstly, the system-in-focus. Secondly, the system in which the system-in-focus is contained. Thirdly, 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 centre. The process of unfolding the complexity of the TDS and identifying the system-in-focus is illustrated below:



Insert Figure 3 Unfolding the complexity of the Total Defence System

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 included in the 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 response 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. That is the military and the health systems, which form the essential elements of the TDS in pandemic response. Recursion 3 contains the units that will produce at the local 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 criticised.

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:

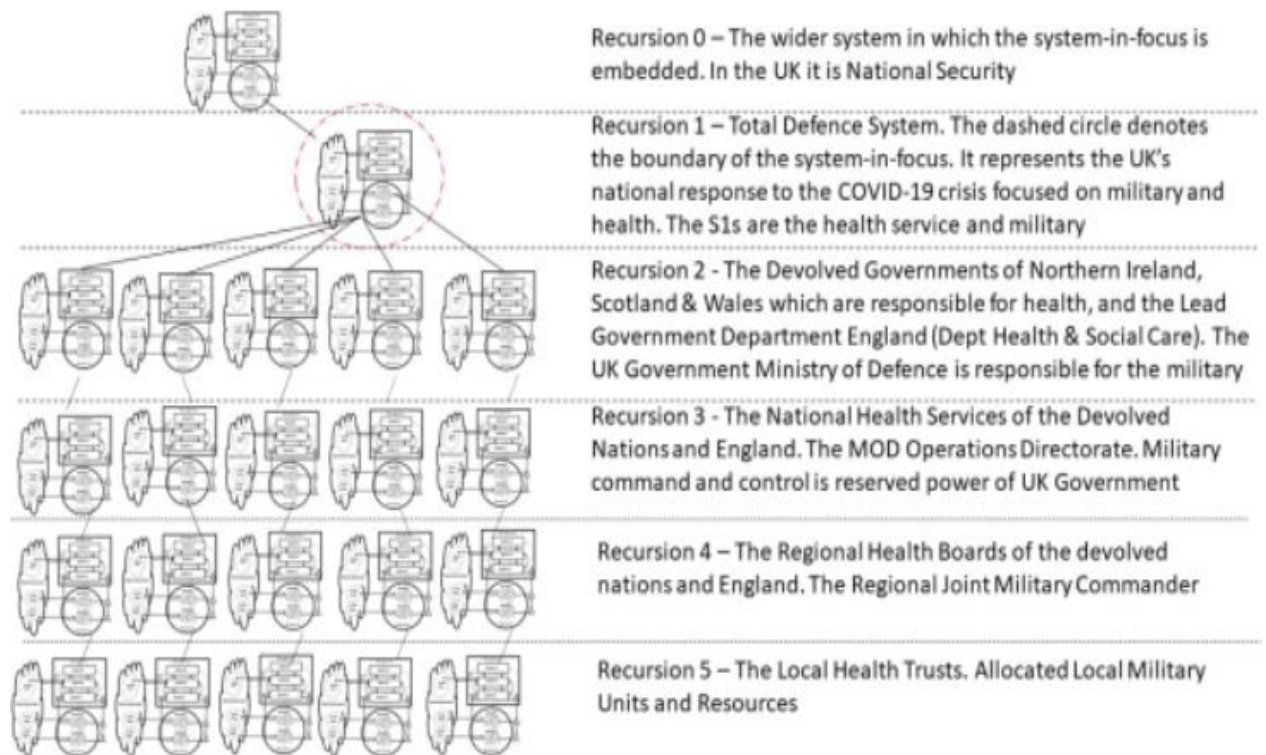
Insert Table 3 Five distinct hallmarks of viability for the crisis management system

Hallmarks	VSM	Viable system
1. 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.
2. Leadership and decision making	S5	Relies on several critical groups and organisations to play their parts in a concerted and sustained manner. ¹
3. Collaboration and joint effort	S3	The collaborative processes founded on a shared vision, consultation to obtain feedback, shared information, and a mutual agreement.
4. Coordination structure	S2	Participants work jointly toward a common end, as well as functioning together that allows mutual adaptation and adjustment. ³
5. Crisis communication	S1	An operational resilience-oriented communication strategy. ² 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.

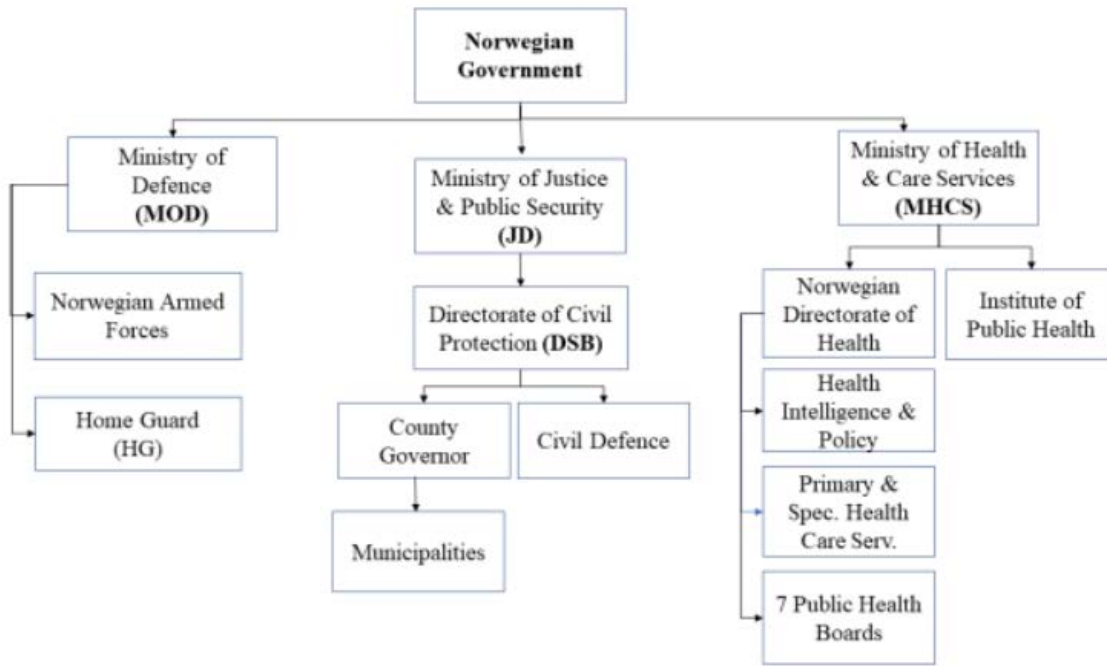
1: Boin, Bynander, Stern, & t Hart (2020) 2: Olsson (2014) 3: Margerum (2011, p. 7)

4. Application of the VSM and Total Defence in the UK and Norway

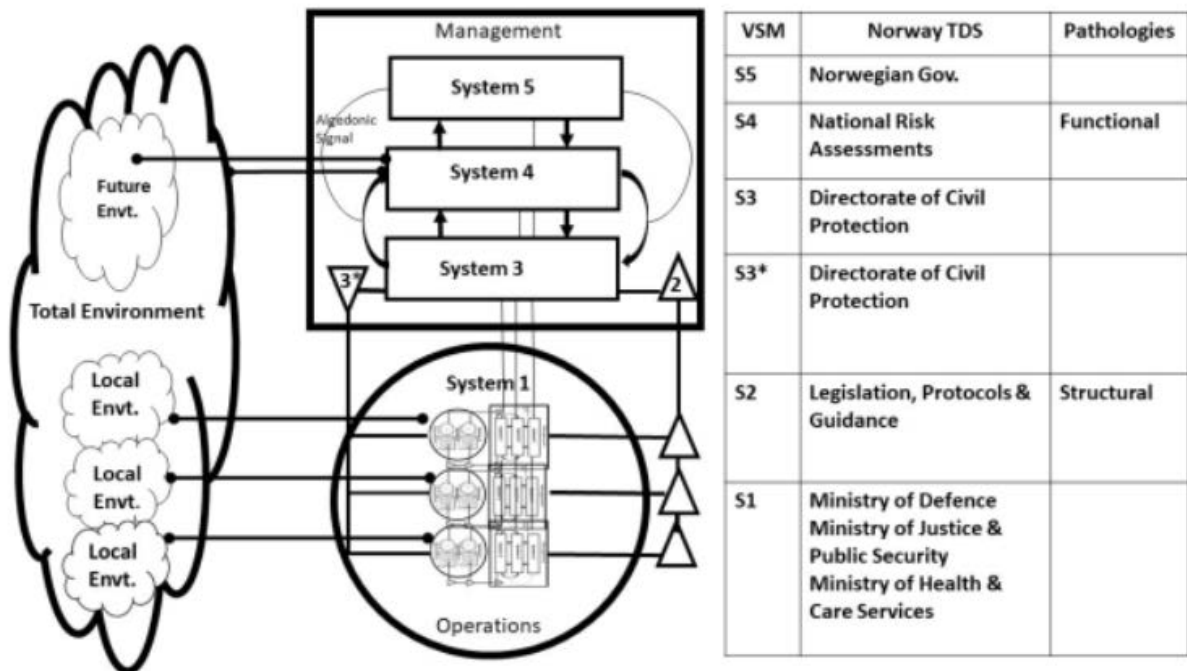
There are many similarities in the Norwegian and UK political systems and their response to crises. Each has a government policy network with strategic objectives which seeks to bring coherence to the national response. However, the devolved nations of the UK mean that its crisis structure has more components than Norway, which makes coordination and communication more challenging. The VSM system-in-focus is at the national strategic level of the TDS, identified in the previous section as Recursion 1. The crisis response structures (Fig. 4 & 5) and the application of the VSM (Fig. 6) are illustrated below:



Insert Figure 4 Norway Crisis Response Structure for COVID-19



Insert Figure 5 The UK Crisis Response Structure for COVID-19



Insert Figure 6 The VSM applied to the Norway and UKs crisis response structure to COVID-19

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 Total Defence System 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 UK, 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 TD system. 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 maintain overall cohesion. In the UK there was evidence of functional and communication pathologies.

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 whole TD system 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 Total Defence System. 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 UK, the primary source of intelligence is the National Risk Assessment (NRA), which is guided by legislation. The process is coordinated by the UK Cabinet Office. It has an all of the government approach using evidence to determine the range of risk that the UK 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 UK, guiding regional entities in the identification of their own risks as mandated by the Civil

Contingencies Act 2004 (OECD, 2017). Both Norway and the UK demonstrated functional pathologies concerning S4.

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 the 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 the System 1 to deal with the crisis. But 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 Directorate for Civil Protection (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 UK, 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 UK Government is influenced by political agendas, which in turn, makes effective outcomes more difficult to achieve. These resulted in structural and communication system pathologies.

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 centre 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 UK, 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 TD systems. That is evidence of structural and communication system pathologies.

System 1 is the part of the viable system that 'produces' it. But there were structural pathologies in the UK. The implementation of the System 5, government strategy, is the responsibility of the System 1s, health and military. Norway's coronavirus response is centralised 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-decentralised: the state is responsible for specialist care and municipalities for primary health care, long-term care, and social services (OECD, 2019). In the UK, the 'National Health Service' 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 organised 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). The UK military has a central command and control structure which can provide military aid to the civil authorities.

To shed lights on how VSM system pathologies are linked to operationalisation of TDS in Norway and the UK, Table 4 links it to the five distinct hallmarks of viability for the crisis management system (Section 3).

Insert Table 4 A summary of the pathologies identified in the Norwegian and UK Total Defence Systems

Hallmarks	VSM System	System Pathologies
1. Anticipation and monitoring	S4	Functional – In the UK and Norway, S4 did not work properly. Pandemic was an identified risk, but preparations were inadequate. Structural – UK inadequate integration in the vertical unfolding inhibited sporadic audit. In Norway, the more centralised approach (Single lead ministry and coordinating agency, DSB), enabled S5 to be agile and adaptive in its response.
2. Leadership and decision making	S5	Structural – In the UK S5 was not adequately defined, and there was a failure to balance S4 and S3. Communication – In the UK, 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 is different in the UK and Norway. Norway has a unified entity. The UK is fragmented resulting in a lack of cohesiveness Communication – In the UK, the 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. In the UK legislation, statutory guidance and protocols were not adhered to by S5. Moreover, the devolved nations have separate arrangements Communication – In the UK, there is fragmentation in the communication channels, many of which have inadequate capacity.
5. Crisis communication	S1	Structural – the health service of Norway is under a single ministry and is supported by the Directorate of Civil Protection. In the UK health is devolved, and each home nation applies a different structure and approach. Communication – In the UK, 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

5. Discussion

Based on the main elements of viability of crisis management system, (Table 4, Sec. 3), in this section, we look closer at the COVID19- crisis management operation in Norway and the UK, during the January-July 2020 and explore the resilience of the crisis management system.

5.1 Anticipation and monitoring

Anticipation and monitoring process provides insights to develop plans to deal with an emerging situation. 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, synchronise 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 centred 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 TD system. For instance, "clarification of responsibilities and increased competence in certain fields, are factors that can increase the utilisation 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 TD system 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 UK Government Department of Health, recommended that the UK's capability to respond to a worse case pandemic influenza should be critically reviewed. That there was a need to rationalise 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 7th May 2020 (Pegg, 2020). The reluctance to publish the report by the UK Government undermined trust in relation to current planning and preparation to deal effectively with a pandemic in the UK. 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 UK'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 UK (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 TD systems, the distinction between COVID-19 and the other type of crisis (Section 2.1) is related to its creeping characteristics. As Boin et al., (2020) put it "Governments seem unprepared to deal with crises that do not crystallise 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 criticised for inadequate planning. In Norway, the Opposition Labour Party Leader criticised 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 UK'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 UK 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.

5.2 Leadership and decision making

Crisis management authorities 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 et al., 2017). This section focuses on the decisions about the lockdown arrangements and issuing new legislation.

Lockdown strategy:

Leaders in both Norway and the UK 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 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 UK. Norway's Prime Minister acted decisively, imposing strict lockdown measures on the 12th March 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 UK 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 UK lockdown measures on the 23rd March 2020.

In the UK, 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 the 6th April 2020, the UK'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, 2020). On the Prime Minister's return, instead of bringing people together and organising resources (Moynihan, 2008), all critical decisions were taken by the Prime Minister and a small trusted group. He excluded most of the UK Government Cabinet (Swinford et al., 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 UK 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 UK, the Government had previously planned for and included emergency powers in its principal legislation, the Civil Contingencies Act 2004, which requires the UK 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 criticised because it enabled the Government to impose top-down controls and evade essential safeguards.

Nevertheless, the political dynamics and centralisation 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 Total Defence System 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 grey 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 UK, 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 characterise 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.

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

5.3 Collaboration and joint effort

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 Total Defence (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 UK have been used extensively in various ways to successfully support the health services as part of the TD system. They achieved this through effective cooperation, resource distribution and trust (Rhinard & Sandelius, 2010). As an operating system, both the UK and Norwegian Armed Forces are obligated to collaborate with civil authorities. In the UK, 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 UK, and setting up Mobile Testing Units. The coordination of resources by the military assets in the UK to meet the COVID-19 health challenges was vital. It undoubtedly enhanced the resilience capacity of the UK health service. However, trust in the health service was undermined when as part of its contingency planning and implementation of the UK response to COVID-19, the NHS cancelled 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). 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 TD system. 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 emphasises 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 grey 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.

5.4 Coordination structure

Coordination 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 three broad areas. The first incorporates the characteristics of the crisis (See Section 2.1). The second refers to organisational 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 and Wegrich, 2014, p. 6).

There are similarities in both Norway and the UK 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 UK, 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 organisational 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 COVID19, 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 UK 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 TD systems, the coordination within the TD in the UK 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 UK, the Civil Contingencies Act 2004 clearly defines the means of coordination in a UK response. The structures and roles and responsibilities are also detailed in guidance, and the protocols and procedures are well publicised and practised. However, as the COVID-19 crisis continued, the cooperation and capacity of the UK 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 UK, which may have impacted on the effective management of the COVID-19 situation.

5.5 Crisis communication

Crisis communication 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 UK, compared to Norway.

In the UK, COVID-19 related decisions, made by the Government, 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 criticised by a member of SAGE for not taking COVID19 seriously and causing a delay which cost thousands of lives (Smyth, 2020; O'Neill, 2020). Sir David King, a former chief scientific adviser to the UK 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 UK. A government minister was accused of shifting the blame by suggesting that UK 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" (Ramakrishan, 2020).

The public trust was further eroded in the UK 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 criticised over lockdown trips from Glasgow to Yorkshire (BBC, 2020d). A Labour MP quit after lockdown breach (BBC, 2020e). The Scottish National Party's (SNP) leader in the UK Parliament travelled 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 travelled 270 miles from London to Durham after the lockdown, which resulted in headlines that he 'thinks the rules do not apply to him' (Shipman et al., 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 programme as a significant measure (CNN, 08. Apr. 2020). There were also differences in the behaviours 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 behaviour 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 UK than in Norway.

6. Conclusion and final remarks

The complexity of the COVID-19 crisis response presented many challenges for societal resilience in both Norway and the UK when operationalising of their Total Defence system (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 Total Defence System 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 UK. The research shows that neither the Norwegian nor UK 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, TD systems 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 TD system 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 by imposing an immediate lockdown. In contrast, the Prime Minister of the UK was criticised for delaying government actions. Moreover, unlike the UK 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, criticised 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 TD systems 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 Total Defence System 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 TD System requires clarity about roles and responsibility, together with clear demarcation of areas of activity. Both the Norwegian and UK Military worked in support of their health services. However, in Norway there is a grey area in relation to resources and when they can be called upon which may lead to confusion in the Norwegian TD

system. To avoid this, it is recommended that the TD systems 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 UK, 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 TD system enhances crisis management adaptability to stressful circumstances. However, our findings also reveal sub-optimal 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 TD systems.

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 UK, compared to Norway. The breakdown of trust became apparent when scapegoating and blaming started in the UK, and the public felt the government was managing the crisis poorly. In contrast, in Norway, political leaders and scientists were trusted and recognised 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 TD systems 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 TD system should recognise 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. (1) By linking VSM to the implementation of the TD system, we sought to contribute to the increased practical relevance of the VSM approach in a crisis management context. It made a methodological and conceptual contribution to the study of Total

Defence Systems by using Beer's VSM (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. (2) A structure developed to understand and analyse viability of TD system 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 mobilisation and crisis management. These points could provide useful insights to further developing the TDS. (3) As a case study research, we illustrated (justify) how an application of TD system 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 UK, 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 TD system.

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