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Abstract

In public health crises, people need information to help them make decisions about how to protect themselves and others from risk. Successful crisis response is thus dependent on the dissemination of efficacious information. As online news is where most people get the majority of their information, providing it during a crisis is a task for journalists and the news media. However, there are gaps in the knowledge about how the news media fills their role in communicating health information during public health crises. With this thesis, I sought to help lessen the gap of knowledge about how the news media facilitate crisis response by analyzing what they communicated and how communication changed over different stages of the Covid-19 crisis in Norway.

I apply a generative machine learning approach, topic modeling, to analyze more than twenty-two thousand online news articles published by two of Norway's most prominent national newspapers, VG and Aftenposten. The model uses Bayesian statistics to categorize text based on similar words appearing together and their likelihood of appearing with other words. The method allows researchers to discover latent topics and patterns within extensive data, producing comparable results to human coders at a scale that lends itself particularly well to give detailed descriptions of news media communication efforts.

Using the topic model results, I propose and test a method for operationalizing and analyzing how risk and crisis communication changes in news media content over time. I identified topics reflective of the coverage of the crisis according to their conduciveness to sensemaking and self-efficacy in the Norwegian public — building on theory on crisis and emergency risk communication (CERC). The concept of the creeping crisis provided a theoretical basis for differentiating the Covid-19 crisis from other crises. Furthermore, agenda-setting provided an additional theoretical lens to help better understand the effectiveness of this communication on behavioral change and response. The applied method was found to be fruitful in giving insight into how the selected news organizations covered the Covid-19 crisis in Norway.

I identified 200 different topics covered by VG and Aftenposten during the first stages of the Coronavirus crisis. 75 of these topics focused on the crisis itself. Subsequent topics identified staple news topics such as sports teams, culture and movies, social issues, and more. 48 topics were identified as conducive to crisis management, and these were analyzed based on their prevalence over different stages of the crisis. The findings suggest that Norwegian news media disseminated information facilitating crisis response throughout the

first 15 months of the pandemic, starting from the pre-crisis stage to the initial crisis stage and into the maintenance stage of the pandemic. Communication changed dramatically between stages. All in all, these topics reflected 12.5 % of *all* news coverage published by the two newspapers. The results indicate that this coverage largely reflected assumptions about changing communication needs during a crisis, but topics also reflect additional risk communication efforts resulting from the extended timeframe of the Covid-19 crisis.

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1. Introduction

During crises, whether it is an imminent flood, an approaching hurricane, or an emerging pandemic, people need to make sense of the situation and receive information about how to act to mitigate risk for themselves and others. People that do not receive adequate information and experience uncertainty in a crisis are at greater risk of adverse effects (Moynihan, 2008). As a result, effective communication is crucial to managing a crisis (Sellnow et al., 2013). While officials and crisis managers can theoretically reach anyone through the internet, they rely on the news media to disseminate this critical information and put the crisis on the agenda (Reynolds et al., 2002; Veil, 2012; WHO, 2005). This reliance makes the news media important actors in public health crises and makes media coverage an appropriate port of insight into the communication during various stages of a crisis.

A relationship between crisis managers and the news media is natural because many of the communication tasks in a crisis align with journalistic goals of providing the public with the information they need. Still, times of crisis are also when some journalists shift their role from a watchdog to that of a public mobilizer more likely to cooperate with officials (Klemm et al., 2019). As a result, journalists may be less critical of government action and be more inclined to follow leaders' agendas (Sjøvaag, Pedersen, & Lægreid, 2019). With this thesis, I want to help increase the knowledge of how the news media facilitate crisis response during a public health crisis by analyzing how they disseminated information to the public during the first 15 months of the Covid-19 pandemic in Norway.

Two developments, in particular, make the news media and crisis response an exciting area to research now. For one, the Covid-19 crisis has been covered extensively over an extended period by news media worldwide, meaning that a substantial amount of data is available to analyze news coverage and its change over time. Secondly, developments in machine learning now provide tools for the analysis of large textual data (Karlsson & Sjøvaag, 2016); allowing researchers, previously limited to analyzing a few hundred documents at most, to analyze and categorize thousands, and even millions, of documents (Blei et al., 2003; Günther & Quandt, 2016; Roberts et al., 2016). Such methods have been applied in diverse research fields and allow for substantial empirical data to test theoretical assumptions about how communication by the news media changes throughout a crisis. This may help enrich the literature on crisis communication by identifying communication efforts and lessons learned from the crisis and give insight into how the news media fill their role as an important source of information during a crisis.

1.1 Background: The Covid-19 Crisis in Norway

On the second of January 2020, ABC news in Norway wrote about a mysterious new SARS-like virus that had, on December 31st, infected and made 27 people seriously ill in Wuhan, China (Kristoffersen, 2020). A week later, on January 9th, the first mention of the virus in Norway's largest newspaper, VG, appeared (Landmark & Johannessen, 2020). By then, 59 patients had been admitted to a hospital with the virus in Wuhan, China. The virus did not take long to spread out of China. By the end of January, the virus had infected people in Europe (NOU 2021: 6), and Lombardy, Italy, was the first region in Europe to have a significant crisis on its hands, sparking attention from Norwegian news media and officials (NOU 2021: 6, p. 119). By the end of February, the virus had come to Norway through vacationers on ski trips to Italy and Austria (Kolberg et al., 2020).

Attention proliferated as more Norwegians became infected and peaked on the 12th of March 2020, when Norway headed into lockdown. 9 313 articles were published in Norwegian media about the virus that day, more than any since (Retriever, 2022). The lockdown was part of a series of unprecedented draconic measures the Norwegian government undertook once the crisis struck. Stores had to be closed down; public transport was halted; only essential services remained open (NOU 2021: 6). Crisis management strategies shifted from public preparation toward flattening the curve of infection.

After the first few weeks, infections and hospitalizations started to drop. On April the 7th, less than a month after the lockdown, the Norwegian Institute of Public Health (NIPH) declared that the outbreak in Norway was under control and that the R number, signifying how many people on average a person will infect, was lower than 1 (NOU 2022: 5, p. 16). Consequently, infection levels dropped towards the summer. As of May 20th, 8 267 people had been infected, and 234 died of the virus in Norway (Christensen & Laegreid, 2020). By this point, Oslo had 3.7 cases per 1000 capita, while in Nordland county, the number was 0.49 (Christensen & Laegreid, 2020).

The number of infections slowed down significantly by the middle of summer but rose again by late summer. Testing, isolation, tracking of the disease, quarantining, and targeted measures for specific areas were necessary for limiting the spread of infection (NOU 2022: 5). Furthermore, the government halted its planned reopening of Norway on August 7th. New measures included canceling cultural and sporting events and restrictions on sports and nightlife.

During the fall, several large companies made advancements toward developing and testing potential vaccines; on October 15th, Norwegian officials signed the first vaccine deal with the EU (NOU 2022: 5, p. 17). As infections continued to rise over the fall, the government introduced more restrictive measures, including urging people to limit travel and close contact with friends and family. The first vaccines came to Norway right after Christmas of 2020, and vaccination efforts prioritizing at-risk groups ensued. Because of the increasing number of infections and hospitalizations, hospitals needed to deprioritize other treatments and operations to accommodate infected patients.

Around Christmas, newspapers began reporting on a variant of the virus named the Alpha variant, appearing in Great Britain, assumed to be 70 % more contagious than the original coronavirus; this sparked fear that it might come to Norway and further escalate the situation. This fear forced a continuation of restrictive measures, including stopping people from going to work and restarting online schooling (NOU 2022: 5).

In the middle of January, another virus mutation, the Beta variant, started appearing in South Africa. Around the same time, the Norwegian municipality of Follo had an outbreak of the Alpha variant of the virus (NTB, 2021). Consequently, officials put in place restricted and targeted measures for different municipalities in Norway, especially for Follo and the neighboring municipalities, along with Norway's most restrictive travel restrictions since the first lockdown. A period of increased tension between Norwegian municipal electives and national authorities followed.

By the end of February, the number of people hospitalized had started falling, but it would not take long for numbers to start rising again because of a new wave of infection due to the new variants of the virus proliferating. During this time, there was much discussion about who should be prioritized for the vaccine, leading to the government shifting its focus towards a higher priority for health workers and stricter prioritization based on geographical location (NOU 2022: 5). By March 22, Norway reached the peak of infection for the third wave, with 1107 reported infected individuals in a day. Still, the infection rate in Norway was comparatively low compared to other countries such as the USA and Sweden. The response to the new wave followed a similar pattern of new measures, restrictions, and efforts to focus hospital capacities on covid patients.

While these first 15 months do not reflect all of the crisis in Norway, they do represent a significant period, allowing for an exploration of how communication changes throughout a crisis. Thus, this period is the subject of this thesis.

1.2 Literature review

This chapter presents a brief literature review of two relevant research areas: News coverage and journalists' role in public health crises.

1.2.1 *News coverage of public health crises*

News media coverage of epidemics and health crises is a well-researched topic. Examples of works include analyses of how news media organizations have covered the avian flu (Dudo et al., 2007), swine flu (Goodall et al., 2012; Hornmoen, 2011; Klemm et al., 2016; Pan & Meng, 2016), and other diseases and epidemics such as Ebola (Ophir, 2018), HIV-AIDS (Bardhan, 2001) and the West Nile virus (Roche & Muskavitch, 2003). One can also find research into more local public health crises (Barnes et al., 2008; Raupp, 2014; Rogers et al., 2020).

Works have concerned the news media's use of themes and frames (E.g., Bardhan, 2001; Ophir, 2018; Walter & Ophir, 2019), agenda-setting (Barnes et al., 2008), the use of best practices to facilitate self-efficacy and uncertainty reduction (Dudo et al., 2007; Goodall et al., 2012; Pan & Meng, 2016), use of different perspectives (Hornmoen, 2011), the use of threat messaging (Goodall et al., 2012) and use of different sources (Gerken & van der Meer, 2019). Some of these works also address communication through various stages of a crisis (Herovic, 2016; Pan & Meng, 2016).

Pan and Meng (2016) investigated how news media coverage changed from the pre-crisis stage to the crisis stage and into the post-crisis stage of the H1N1 influenza pandemic. Inspired by Bardhan (2001), they categorized articles by six different news frames, including (a) health risk, (b) medical/scientific issues, (c) public prevention/protection, (d) economic consequences, (e) societal problems and (f) political/ legal issues. These frames thus provide a reference for the kinds of articles to expect the news media to publish about a public health crisis. Pan and Meng also analyzed how the news media reported on deaths, finding that they were more likely to report based on qualitative descriptions early in the pre-crisis stage and were more likely to report based on numerical information during and after the crisis. Statistical text (text that put the crisis into perspective by, e.g., reporting on per capita deaths) remained low in prevalence throughout the stages (Pan & Meng, 2016).

These findings reflect a common trend in the literature: News sources, in part, provide quality risk information (Dudo et al., 2007), only with certain limitations. The news media tend to focus on episodic stories dealing with a specific event rather than thematic stories dealing with a broader theme (Dudo et al., 2007; Klemm et al., 2016; Sjøvaag & Kvalheim,

2019). Furthermore, studies have found that news stories often do not provide adequate information for increased self-efficacy (Dudo et al., 2007). Multiple studies also point to a lack of precision in the media coverage, e.g., a lack of context when covering deaths and infections (Roche & Muskavitch, 2003) and inconsistency in the use of best practices of risk communication (Parmer et al., 2016). The findings of these works indicate some of the things one might expect to find in a quantitative analysis of news coverage and provide a reference for comparison. Nevertheless, the more extended timeframe and severity of the Covid-19 crisis in Norway also allows for the possibility that these patterns could be different and possibly change over different stages of a crisis.

Some studies criticize the news media for being sensationalist and exaggerating a crisis (Cortiñas-Rovira et al., 2015; Hornmoen, 2011). Hence, while media are essential for risk communication, the extent to which the information provided to the public is of good quality, accuracy, and appropriate focus has been subject to criticism. This critique speaks to the contentious relationship between journalists and crisis managers and why the media is often seen as in need of “handling” by public relations professionals to shape the messages that reach people.

Different researchers have employed various methods when looking into coverage of health crises. Some scholars have analyzed coverage using quantitative methods, such as Structural Topic Modeling (Lee et al., 2021; Walter & Ophir, 2019) and mixed method approaches (Ophir, 2018). The most common is qualitative research, such as document analysis (Dudo et al., 2007; Hornmoen, 2011; Pan & Meng, 2016) and qualitative interviewing (Cicognani & Zani, 2015; Jukes et al., 2021; Masullo et al., 2021; Neville Miller et al., 2021).

While the body of research is quite vast, some areas have been given less attention. For one, much of the research is focused on media perspectives (Hornmoen, 2011; Pan & Meng, 2016; Walter & Ophir, 2019), such as framing, rather than risk and crisis perspectives (Neville Miller et al., 2021; Ophir, 2018; Parmer et al., 2016). Furthermore, while some scholars have analyzed crisis coverage in different phases of a crisis (Pan & Meng, 2016), this has often been limited to a classical three-stage crisis model and therefore fails to address some of the changes in communication during the crisis’s *active* stage (Neville Miller et al., 2021; Reynolds & W. Seeger, 2005). Hence, there are still gaps in the knowledge about how communication changes during crises that last over an extended period. Analyzing Covid-19 coverage may help us better understand what communication efforts are efficacious at different crisis stages.

1.2.2 News Media's role in crisis management

Increasingly, people in the field of risk and crisis communication see the need for crisis managers to establish relationships and collaborate with the news media (Klemm et al., 2019; Veil, 2012; Veil & Ojeda, 2010), but so far, this is a largely unexplored area of research (Klemm et al., 2019; Vos et al., 2011, p. 197).

Strategies for risk and crisis communication often focus on meeting media needs and presenting messages so that messages are quickly and accurately spread throughout society. Frameworks for effective risks and crisis communication, such as the CERC framework (Reynolds et al., 2002) and the WHO field guide for crisis communication (WHO, 2005), hold specific assumptions about media needs and constraints in a crisis. E.g., expecting that journalists will be less skeptical of officials in crises, favor some sources over others, and seek out certainty when presented with uncertainty (Olsen & Mathiesen, 2019, p. 207; Reynolds et al., 2002; WHO, 2005, p. 134). Although the news media are not risk communicators per se, they are considered a strategic resource (Vos et al., 2011) and valuable allies that crisis managers rely on for disseminating things like public education campaigns (Catalán-Matamoros, 2011; Herovic, 2016, p. 33; Reynolds et al., 2002; Reynolds & W. Seeger, 2005; WHO, 2005). Studying news coverage thus gives us insight into the communication efforts to address the crisis and facilitate a public response conducive to risk reduction.

Some research on news media's role in a crisis has also been conducted from the perspective of journalists (Jukes et al., 2021; Klemm et al., 2019). Studies have found that journalists experienced internal conflict in reporting public health crises. Journalists often shifted to a public mobilizer role, where journalists cooperate with the government more. This makes journalists more likely to follow leaders' agendas in crises (Sjøvaag, Pedersen, & Læg Reid, 2019). Despite this change in roles, journalists lack a paradigm for news reporting during a crisis (Vos et al., 2011, p. 198). Nevertheless, this view of the news media's role in crises implies that we can expect content conducive to a public response that extends beyond traditional media logic and values and is aligned with the goals of political leaders and crisis managers.

1.3 Problem statement and research questions

While coverage of crises and epidemics has been of interest to researchers within the journalism field (Hornmoen, 2011) and risk and crisis communications field (Neville Miller et al., 2021), the presented research indicates that there are gaps in the theory about how crises and crisis communication develop over time (Neville Miller et al., 2021; Reynolds & W. Seeger, 2005; Veil et al., 2008). With this thesis, I want to explore how communication changes over different pandemic stages. To do this, I apply an established framework for communication in a crisis and evaluate whether the change in communication meets the framework's expectations. The Crisis & Emergency Risk Communication (CERC) framework (Reynolds et al., 2002; Reynolds & W. Seeger, 2005) presents such an opportunity. The framework builds on assumptions about how communication changes and should change during a crisis. At the same time, proponents of the framework admit that these assumptions have not been thoroughly tested (Reynolds & W. Seeger, 2005; Veil et al., 2008).

Although CERC makes logically apparent claims about how communication needs and dynamics change as a crisis evolves, many of these assumptions are largely unexplored. In particular, the developmental model of CERC articulates a detailed set of expectations regarding how communication processes are influenced by specific stages and the associated conditions of crisis. The dynamics of changing communication processes have yet to be described in detail (Veil et al., 2008, p. 31S).

This claim is supported by a recent literature review (Neville Miller et al., 2021). The literature presented above also supports the idea that the news media is crucial when it comes to disseminating important information to the public in a health crisis, that the news media is crucial to crisis management and that they are likely to reflect communication from officials and crisis managers (Klemm et al., 2019; Pan & Meng, 2016; Parmer et al., 2016; Veil, 2012). I, therefore, believe that there is value in better understanding how crisis communication is disseminated through the news media in a large-scale crisis and getting a better understanding of how this communication changes throughout a crisis. This line of thought leads me to my problem statement:

In what ways did the Norwegian news media facilitate crisis response by informing the public during different stages of the Covid-19 crisis, and how does this communication reflect expectations of the CERC framework?

I have selected a set of research questions to limit this work's scope and get insight into the problem statement. First, I want to understand better how the Norwegian news media cover the Covid-19 crisis in general, by understanding the common themes and topics they use and how prevalent they are. This should give insight into *how* the crisis affected the national news media agenda. I asked three questions related to this. While I can answer the first questions descriptively (RQ1a and RQ1b), I also ask a question (RQ1c) to put the findings into perspective.

RQ1a: What themes and topics reflect the Norwegian news coverage of the Covid-19 crisis?

RQ1b: How salient is coverage of the coronavirus over the relevant period?

RQ1c: To what extent can these themes and topics be understood in light of prior research?

The following questions go to the heart of the problem statement. I want to understand what topics likely were conducive to fostering a public response to address the crisis and how the prevalence of these topics changed over time (RQ2a and RQ2b). Similar to the previous questions, I also want a chance to put these findings into perspective (RQ2c).

RQ2a: Which topics identified by RQ1a reflect the goals of CERC?

RQ2b: How does the prevalence of these topics change through different stages of the crisis?

RQ2c: To what extent can the CERC topics be understood in light of prior research and theoretical assumptions.

Finally, I want to give some attention to topics that are not reflective of CERC but can, in other ways, give insight into how the news media cover a crisis.

RQ3: What other topics reflect how the Norwegian news media covered the Covid-19 pandemic?

2 Theoretical perspectives

This chapter covers the theoretical perspectives I use in the thesis. First, I present agenda-setting theory and discuss the idea of a crisis and the creeping crisis. These theories help explain why the problem statement and research questions are worth exploring. I address risk and crisis and emergency risk communication and the crisis and emergency risk communication (CERC) framework in the following sections. As further context to the framework, I also address crisis stages, sensemaking and self-efficacy.

2.1 Agenda-setting

How the news media frames a crisis is important because it determines how the public views it. Agenda-setting theory proports that the media determines the agenda, i.e., they influence *what* people think about (Bang, 2021, p. 123; Lynch, 2014, p. 3; McCombs et al., 2014). This effect does not necessarily entail a powerful effects view of news media, which assumes that the media is a strong influence on *how* people think (Newton, 2006); some scholars point out that the media's impact on people's opinions is much more limited than is often assumed (Olsen et al., 2003; Wu & Coleman, 2009; Zaller, 1996). The basic idea of agenda-setting is that there is a correlation between the salience of coverage of an issue and its perceived importance within the public sphere (McCombs, 2005; Russell Neuman et al., 2014). The gatekeeper is a common metaphor; the news media determine what stories are worth publishing and what aspects of the story are worth focusing on. The agenda is set by what journalists choose to write and not to write about (Entman, 1989). Agenda-setting theory has some interesting implications for the work. For one, while crisis and risk communicators would ideally like the news media to cover a crisis how they think it should be covered, what information to disseminate is ultimately in the hands of journalists and the news media organizations. Thus, we can not necessarily expect the news media to only communicate based on ideals and best practices of crisis communication, even if they see themselves as an important source of risk information in a crisis. Second, greater coverage salience is unto itself likely to increase public perception of risk (Miller et al., 2011). Further, if crises are socially constructed phenomena and the news media influence the agenda, the implication is that the news media, in large part, have the power to define the crisis itself (Olsen & Mathiesen, 2019, p. 79; Rosenthal, 2001, p. 12). Finally, reports show that people pay more attention to the news media in crises (Newman et al., 2021), implying a more substantial agenda-setting effect during crises.

2.2 The concept of a crisis

The concept of a crisis has been defined in many ways, e.g., as an event (Fritz et al., 1961; NOU 2000: 24, 2000, p. 21) or as a threat (Rosenthal, 2001). Common for most definitions is that a crisis involves some threat to something a society values, that there is some time pressure, and that it requires non-routine decision-making (Christensen et al., 2016; Rosenthal, 2001). There are some speculations about when something is a crisis and how a crisis differs from emergencies, disasters, and catastrophes. E.g., some researchers differentiate a crisis from emergencies and catastrophes by the scale of the required mobilization to respond to it (Engen et al., 2016, p. 262), similar to conceptions of disaster by Quarantelli (2000). Others use crisis as a blanket term (Vos et al., 2011). To clarify the concept, I employ it as Rosenthal et al. (2001) defined it, where crises are “Periods of upheaval and collective stress, disturbing everyday patterns and threatening core values and structures of a social system in unexpected, often unconceivable, ways.” (p 6).

A crisis, then, is dependent on what we as a society value, which is subjective and will differ across different geographical and cultural borders (Boin et al., 2020; Rosenthal et al., 2001, p. 12). Thus, we can view the Covid-19 crisis in Norway as a crisis unto itself. Furthermore, the focus on a threat to something fundamental that we as a society value leads to a view of crises as socially constructed phenomena (Boin et al., 2017, p. 29; Olsen & Mathiesen, 2019; Rosenthal et al., 2001, p. 6). This view has implications for the news media's importance in a crisis, which I briefly addressed in the previous chapter.

2.2.1 *The creeping crisis*

Rosenthal (2001) developed a typology of a crisis based on two variables. How fast a crisis develops and how long it lasts. The creeping crisis is the crisis where both its onset and resolution is slow. These crises are often ignored and thus hard to deal with politically before they become active (Boin et al., 2020). Unlike fast-burning crises, which are immediate and fast ending, the creeping crisis is often ambiguous before its onset and in its ending. Alternatively, there might not be any discernible triggering event at all. Hence, a creeping crisis does not become a full-blown crisis before politicians, the news media, and the public recognize it as such (Boin et al., 2020). Furthermore, developing and preparing an appropriate response to a creeping crisis is challenging because it is unclear what will work and what will not.

A creeping crisis is a threat to widely shared societal values or life-sustaining systems that evolves over time and space, is foreshadowed by precursor events, is subject to varying degrees of political and/or societal attention, and impartially or insufficiently addressed by authorities (Boin et al., 2020, p. 122).

Table 1

Typology of crises based on the onset and closure speed

		<i>Closure</i>	
		FAST	SLOW
<i>Onset</i>	FAST	Fast-burning	Long-shadow
	SLOW	Cathartic	Slow-burning (or creeping crisis)

Note. Source (Boin et al., 2020; Rosenthal et al., 2001).

The creeping crisis poses some interesting problems for research. First, creeping crises can be notoriously difficult to recognize; political factors, our lack of attention to apparent non-events, and the fact that creeping crises may appear as black swans caused by latent and overlooked system-wide issues are likely to contribute to this recognition problem. Second, creeping crises are often hard to influence even if we know much about their cause and possible consequences (Boin et al., 2020), e.g., climate change. Third, the ambiguity in their onset and termination makes political attention and salience relevant factors to analyze. Hence, these crises are tied to the idea of crises as social constructs. While Boin et al. (2020), when conceptualizing the creeping crisis, do not address more than three stages, the importance of attention to creeping crises allows for the idea that attention is linked to other stages of a crisis as well. Because creeping crises have a long termination, they also offer an opportunity to analyze the change in crisis communication over time. Tasks important later during the crisis may not be the same ones that are important at its recognized onset. Creeping crises are rare and conceptually different from other crisis types. Their rarity also means that they are less researched phenomena. Understanding more about creeping crises and how communication efforts likely differ from other crises may help us better address them in the future.

2.3 Crisis and emergency risk communication

Both risk and crisis communication are critical crisis management tasks but have conceptual differences. Risk communication can be described as “the intentional effort to inform the public about risks and persuade individuals to modify their behavior to reduce risk.” Veil et al. (2008, p. 275). We can also add that this reduction should be appropriate to the risk because we can not remove risk altogether (Aven et al., 2011; Njå et al., 2017; Renn, 2008, p. 165). Hence, risk communication can be seen as aiming to increase or lower the public’s risk perception to match that of the experts (Abraham, 2009). This effort is necessary throughout the risk handling chain (Renn, 2008, p. 197). To make risk messages effective, communication should be tailored to the audience's needs (Renn, 2008, p. 235).

Crisis communication is “communication with the purpose to get people to adapt their behavior to the information communicated in a crisis” (Engen et al. 2016, p. 325) and “seeks to reduce generalized anxiety and concern among the larger public” (Reynolds & W. Seeger, 2005, p. 50). We can distinguish between vertical and horizontal crisis communication. Where horizontal means communication between responding agents or organizations, vertical means communication to the masses. Notably, much of the theoretical work on organizational crisis communication has been about how to effectively communicate in a crisis so that organizations can be perceived as trustworthy and consequently maintain their image (Veil et al., 2008). With this view, crisis communication seeks to “prevent or lessen the negative outcomes of a crisis and thereby protect the organization, stakeholders, and industry from harm” (Coombs, 2021, p. 5). Hence, crisis communication is often seen as a function of public relations and less a function of crisis management (Boin et al., 2017; Reynolds & W. Seeger, 2005; Vos et al., 2011). This function has also led to a lot of crisis communication research focusing on the news media to reach organizational goals in a crisis, e.g., politicians constructing specific frames (Boin et al., 2017, p. 78).

2.3.1 *The CERC framework*

The rise of new public health threats such as new viruses, terrorism, and biological weapons has created the need for a field of development that incorporates both risk and crisis communication (Reynolds et al., 2002). The CERC framework for crisis and emergency risk communication attempts to do just that. The framework is influenced by theories, tools, and methodologies of the health, risk, and crisis communication disciplines (Veil et al., 2008) but is a work of grounded theory (Glaser & Strauss, 2017; Neville Miller et al., 2021; Reynolds & W. Seeger, 2005). It distinguishes itself from other crisis classification models by associating

different communication activities with different stages of a crisis. The framework has two dimensions: The process by which those involved in emergency response respond and craft a message and the content they create and convey in messages to the public (Parmer et al., 2016). This content aims to facilitate self-efficacy and sensemaking in the public (Veil et al., 2008; see chapters 2.4 and 2.5), is mainly conveyed through the media (Reynolds & W. Seeger, 2005), and is the focus of this thesis.

Table 2
Comparison of risk- and crisis communication

	Risk communication	Crisis communication
Information messages	Known probabilities Self-efficacy Technical understanding	The current state of affairs Specific events Magnitude Immediacy Duration Control/remediation Cause Blame Consequence
Source	Scientific/technical experts	Authority figures/ emergency managers
Mainly mediated through	Advertising Public education campaigns	News media Warning systems
Stage	Prominent in pre-crisis	Prominent in the initial crisis Stage.

Note. Source (Reynolds & W. Seeger, 2005)

While the framework was initially criticized for lacking a solid theoretical basis and having limited value for research, a theoretical framework has been developed which addresses specific propositions about communication in a crisis (Veil et al., 2008; Appendix 7). Considering these propositions, we can make some assumptions about how CERC will be disseminated if efforts are successful. (1) How information about a crisis is presented has consequences for people’s ability to appropriately respond to it and consequently impacts the crisis itself. (2) Communication in crises is both top-down and bottom-up. (3) The CERC will change *dramatically* throughout a crisis. (4) Initial communication efforts have implications for the crisis development and future communication efforts. (5) Communication is consequential to specific crisis management outcomes. (6) Some risk messages should be tailored to specific groups.

The first point is central to this thesis as it supports the idea that news media content will impact public response. Understanding what topics the news media covered the crisis through will give an idea of how this occurred. Points four and six also support this. The second point concerns the relationship between the news media, crisis managers, and the public – implying that news media content and opinion articles will also influence crisis managers. Point three is central to the CERC framework and leads to an expectation that some topics will be especially prevalent in specific stages of a crisis. Some of these messages should be targeted at specific groups.

2.3.2 Theory of crisis stages

Understanding the different stages of a crisis can help crisis managers better address it (Sellnow et al., 2013, p. 26). There exists several ways to delimit crisis stages, e.g., by political (Boin et al., 2017) or journalistic (Olsen & Mathiesen, 2019, p. 207) objectives, by analogy to disease (Fink, 1986), or as steps in a socio-cultural process (Turner, 1976). One of the most popular and widely used frameworks is the three-phase crisis model, representing the pre-crisis, crisis, and post-crisis stages. The model has been particularly influential in crisis communication research (Coombs, 2021; Pan & Meng, 2016; Sellnow et al., 2013, p. 30) and allows officials and crisis managers to tailor communication efforts to specific stages. Much of the model's strength comes from its simplicity (Sellnow et al., 2013, p. 33). However, in a creeping crisis, such as a longer pandemic, the model does not offer a clear framework for understanding changing communication needs and trends within the crisis stage itself. Therefore, a three-stage understanding of a crisis has limited explanatory power when exploring risk and crisis communication changes during a creeping crisis.

Figure 1
CERC crisis stages.



Note. Source (Reynolds & W. Seeger, 2005).

The CERC framework categorizes a crisis into five stages and assumes that the crisis will evolve relatively predictably following these stages (Reynolds et al., 2002; Figure 1;

Reynolds & W. Seeger, 2005). Crisis managers use the framework to prepare and adjust communication strategies according to the crisis stage. Nevertheless, Reynolds and W. Seeger (2005) point out that not all crises will follow these patterns because of secondary shocks and the longer timeframe of some crises. This has some obvious implications for this work, as we might expect this non-linearity to apply to creeping crises such as the Covid-19 crisis. Consequently, the Covid-19 crisis in Norway presents an opportunity to better understand how communication activities change in creeping crises. Since data gathered for this work is limited to the first 15 month of the Covid-19 crisis in Norway, this thesis concerns the pre-crisis, initial crisis and maintenance stages.

The pre-crisis stage. During this stage, the main tasks of CERC focus on risk messages, warnings, and preparation (Reynolds & W. Seeger, 2005). Eight main tasks are associated with this stage and target the public and the response community. The first five of these goals concern communications to the public. The model states that communication should facilitate: (1) A recognition and monitoring of emerging risks; (2) general public understanding of risk; (3) public preparation for the possibility of an adverse event; (4) behavioral change to reduce the likelihood of harm and increase self-efficacy; and (5) specific warning messages about imminent threats. The last three tasks concern developing and testing messages, developing recommendations, and establishing alliances. These latter goals are associated with the process of crafting messages rather than content, which is why they will mostly remain unaddressed in this thesis.

The initial crisis stage. Primary goals in this stage shift towards uncertainty reduction, increasing self-efficacy, and reassurances. Communication should target affected groups, as well as the public in general (Reynolds & W. Seeger, 2005). The CERC model list six important communication tasks during this stage: (1) Empathy, reassurance, and reducing emotional turmoil; (2) general and broad-based understanding of the crisis, consequences, and anticipated outcomes; (3) reducing crisis-related uncertainty; (4) specific understanding of emergency management and medical community response; (5) understanding of self-efficacy and personal response activities; and (6) designating crisis spokespersons and formal channels of communication. The latter task does not concern communication directly but is a prerequisite for effective communication in a crisis.

The maintenance stage. During this stage, communication goals are centered around reiterating much of the information provided in previous stages and giving deeper insight into the background factors of the crisis. Goals include facilitating: (1) a more accurate understanding of risk; (2) understanding of background factors and issues; (3) cooperation and support with the response and recovery efforts; (4) ongoing explanation and reiteration of self-efficacy measures and personal response activities; (5) informed decision making based on an understanding of risks and benefits; and (6) feedback from the affected public and misunderstandings and rumors correction. (Reynolds & W. Seeger, 2005).

What can we expect? The goals associated with these stages allow for assumptions about how communication during a crisis might develop. Ideally, we should see warning messages, identification of threats, and information to facilitate self-efficacy and understanding in the pre-crisis stage. Some of these efforts should continue during the initial crisis, but messaging should also be shifted towards reassurances, empathy, emergency management, and medical response. During the maintenance stage, many goals concern the reiteration of established messages. Hence, we could expect similar messaging during this stage. Nevertheless, more specific tasks during the maintenance stage include facilitating cooperation with the response and addressing feedback and rumors. These expectations show that, while many goals are similar throughout the stages, we can expect some changes in general trends from one stage to the next.

The CERC model of crisis stages provides several advantages for this thesis. First, it provides a theoretical basis for why risk and crisis communication changes. Second, it provides a set of predictions about how we might expect crisis communication to change over time. Thirdly, it provides a basis for regarding risk and crisis communication as essential for public response and crisis management. Lastly, researchers have pointed out that assumptions about changes in communication needs have not been thoroughly tested (Neville Miller et al., 2021; Reynolds & W. Seeger, 2005; Veil et al., 2008). Consequently, this thesis provides an opportunity to do that in the context of a creeping crisis.

2.4 Self-efficacy

Self-efficacy refers to a person's belief in their ability to perform a particular task (Bandura, 1982). If a person does not hold a certain level of self-efficacy in crises, they may not manage to deal with a situation even if they have the required skill and know-how to behave accordingly (Park & Avery, 2019; Parrott, 2001). Perceived self-efficacy influences

action, motivation, and affective arousal (Bandura, 1986). The higher the level of self-efficacy, the more likely a person is to succeed in their task. In a crisis, one can foster self-efficacy in the population, allowing communities, stakeholders, and individuals to make the best decisions possible about their continued well-being (Park & Avery, 2019; Reynolds & W. Seeger, 2005). Self-efficacy can be facilitated by increasing knowledge of risk-reducing behavior and measures and exposing people to others who engage in risk-reducing behavior (Parrott, 2001), what Bandura (1998) calls vicarious experience. Increased self-efficacy in the public thus facilitates behavioral change to reduce risk in a crisis, making it an important goal of risk communication and central to efficacious crisis management outcomes.

Regarding the CERC framework, self-efficacy is central because if individuals think they can act to alleviate risk, they are much more likely to do so (Veil et al., 2008). Likewise, people who perceive levels of uncertainty are more likely to have increased risk (Moynihan, 2008). Hence, self-efficacy communication, in the context of CERC, is communication that allows recipients to act in order to reduce their own risk and act to prevent further escalation of the crisis. I.e., *communication is likely to influence behavior towards risk reduction by making people more confident that they understand the risks and how to behave accordingly to protect themselves and others*. This might mean specific steps people can take to reduce risk or information about the risk-reduction capabilities of things like vaccines and masks. Veil et al. (2008) add that CERC facilitates self-efficacy by recognizing the participatory nature of the crisis and giving people something meaningful to do.

Thus, self-efficacy is directly related to crisis communication outcomes and response and is essential to CERC. If communication efforts in a crisis are successful, we should be able to observe communication conducive to self-efficacy in news media content.

2.5 Sensemaking

Sensemaking is another main task of crisis and emergency risk communication. It is the attempt to understand occurred events and anticipate what might happen next (Klein, 2009, p. 177). We make sense of a situation and reduce uncertainty by exploring some phenomena. Klein (2009, p. 127) points out that sensemaking is more than just connecting the dots; it is about determining what constitutes a dot in the first place. Sensemaking thus parallels journalistic work in a crisis, as journalists are reporting on facts in a crisis, but they are also determining what the relevant facts are. Boin et al. (2017, p. 27) separate two main tasks of sensemaking: detecting and understanding.

Detection refers to the task of predicting crises or their escalation. Faced with changing situations, crisis managers and the news media continuously engage in sensemaking by scanning the environment to identify potential threats or cues. Once these threats are identified, communication and collaboration are required to derive meaning (Fridstrøm & Øyaas, 2021; Nowling & Seeger, 2020). Understanding has to do with what we can say about why a crisis occurred in the first place, its characteristics, and what should be done about it (Boin et al., 2017, p. 31). Understanding manifests in news media content by stories focusing on characteristics, background factors, and meaning related to the pandemic.

Similar to the goals of CERC, detection and understanding facilitate an individual's or actor's ability to cope with uncertainty by creating rational situational accounts (Boin & Renaud, 2013; Maitlis, 2005). Sensemaking is necessary throughout the whole communication process. First, crisis managers and the news media have to make sense of the characteristics of the crisis and detected events. When the news media disseminates this information, it is again used to make sense of the crisis by the public, crisis managers, and journalists themselves. Much of this information also comes from the public through opinion articles and as grassroots sources in news articles. This process can hence be seen as an effort of joint sensemaking (Fridstrøm & Øyaas, 2021), which connects with the proposition from Veil et al. (2008) that communication in a crisis happens both top-down and bottom-up.

Furthermore, while sensemaking and self-efficacy are generally, and in this work, addressed as different phenomena, they are not mutually exclusive efforts. Instead, communication facilitating self-efficacy is one way of helping people to make sense of the situation, and both are necessary for an effective response to a public health crisis.

3 Data and Method

A quantitative analysis of media content has traditionally been limited because it could only describe purely descriptive statistics (Jensen, 2002, p. 222). However, recent developments in tools for analyzing text using machine learning now allow researchers to describe data and discover latent patterns in extensive datasets. This thesis uses a quantitative method for analyzing a set of documents, known as a corpus (Russell Neuman et al., 2014). I apply a machine-learning algorithm to mimic a human coder and analyze a large corpus of textual data. The results are later interpreted qualitatively and analyzed based on the data's patterns. The following chapters explain my overall strategy, what data I collected, how I collected it, how it was prepared and processed, how I analyzed the data, and how the results were operationalized such that I could make claims about the news media's facilitation of crisis response during the first 15 months of Covid-19 crisis.

3.1 Research strategy

I employ a mixed-method approach to analyzing extensive data. First, I apply an algorithm that inductively categorizes data based on latent textual patterns. Later I interpret the results of this process. Thus, the work draws on both quantitative and qualitative traditions. An inductive process is collecting data to provide detailed descriptions of a phenomenon (Blaikie & Priest, 2019, pp. 92-94). As such, this logic of inquiry helps answer *what* questions and aligns with the goals of this work, as I aim to describe in what ways news media outlets disseminated CERC. I employ an inductive strategy throughout this work. For initial reliability testing of the model, I apply a largely atheoretical and inductive approach to identifying themes. Hence, a portion of this work also draws on traditions of grounded theory (Blaikie & Priest, 2019, pp. 144-146; Glaser & Strauss, 2017).

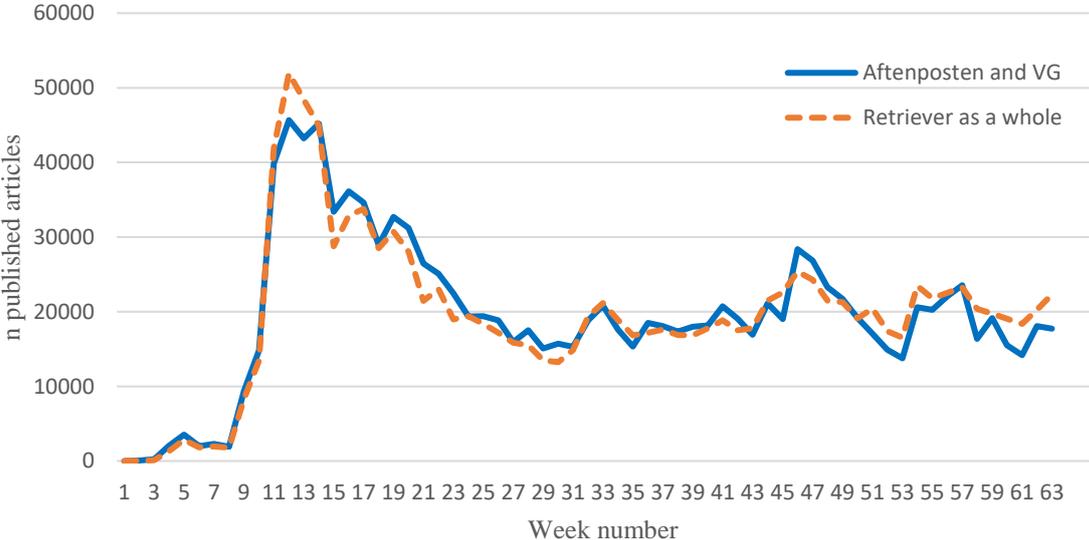
3.2 Data / Corpus

I collected online newspaper articles from two of Norway's largest newspapers, VG and Aftenposten (Newman et al., 2021), using the media archive service Retriever Atekst (Retriever, 2022). VG has been the largest newspaper in Norway since the 90s, while Aftenposten has been the largest in print. These newspapers reflect a significant part of the readership in Norway (Mediebedriftene, 2021) and are both owned by the Schibsted media conglomerate. Because of this relation, they share some of the same content management systems (CMS). However, overall, they are and operate as independent entities and are competitors in the news market (Sjøvaag, Pedersen, & Owren, 2019).

While both are national newspapers, their payment models and journalistic content vary. VG has most of its content open for users without a paid account, especially for their coverage of the coronavirus. They also have additional articles behind a paywall with a VG + account. Aftenposten has most of its content behind a paywall, along with much of its coverage of the coronavirus. The two newspapers also differ regarding their published content. VG is often considered a popular culture/tabloid newspaper (Hovden et al., 2017); Aftenposten is generally considered a more serious newspaper. The fact that these newspapers vary in content and strategies means that they likely reflect the Norwegian national news media much better than they do on their own.

Figure 2

Comparison of articles on Retriever Atekst using key terms



Note. The figure compares articles published by Aftenposten and VG and articles available on Retriever, based on the number of articles published related to the virus per week. Week one is the first week of 2020. The numbers for Aftenposten and VG are adjusted ~1:55.

Figure 2 compares articles published weekly for the corpus and everything available on Retriever about the coronavirus during the same period. The figure shows that the quantity published by week in the two news organizations largely correlates with the quantity of coverage of the virus as a whole. This correlation substantiates that much of the coverage in these two newspapers, at least in terms of salience, is reflective of Norwegian news organizations’ coverage of the coronavirus. Because these newspapers differ and represent a

substantial part of the Norwegian readership, they are likely highly representative of Norwegian national news media.

Theoretically, every Norwegian national news organization could have been analyzed using the same method without limiting the analysis. However, issues with data collection (See chapter 3.8) prevented me from including more outlets. All content analyzed was also published online. While this could present a limitation to the study, sampling online is appropriate as more people access news online or on mobile than in print (Mediebedriftene, 2021; Newman et al., 2021). Online is also continuously updated, whereas print has a fixed deadline (Karlsson & Sjøvaag, 2016).

3.3 Data collection using Retriever

News articles, also referred to as documents, were collected from the media archiving service Retriever Atekst (Retriever, 2022; See chapter 3.8 for an overview of some of the limitations of this service). I used the search terms: “covid* OR corona* OR korona*” to identify and collect documents that mentioned the coronavirus. Using different search terms allowed me to collect news articles using different spellings and terms (See Table 3). The star (*), meaning optional extra characters, was added to capture Norwegian compound words, such as “coronavirus” and “koronasmitte”.

Table 3

Number of stories mentioning key terms

	VG		NRK		Aftenposten		
Ord	n	%	n	%	n	%	Avg. %
Covid*	3 791	20.6 %	3 881	12.5 %	3 651	17.4 %	16.8 %
Corona*	13 370	72.7 %	513	1.7 %	2 362	11.3 %	28.5 %
Korona*	1 227	6.7 %	26 602	85.8 %	14 959	71.3 %	54.6 %

Collected documents represent news articles published between January 1st 2020 and March 26th 2021. This period captures the first mention of the virus in Norway. I initially gathered data from three news outlets: VG, Aftenposten, and NRK. NRK was later dropped, as none of the articles from the news outlet contained more than a headline, which meant content could not be analyzed. I downloaded the data as 50 .txt files, most of which boasted 1 000 news articles each, totaling 46 302 documents.

Once the data was collected, I wrote a script in Python 3.10 (Rossum & Drake, 2009) to go through each file and parse it (See Appendix 1). This allowed me to construct a corpus of documents in a .csv file with six columns (date, headline, summary, body, news organization, number of paragraphs). Each row represented one document. I also manually inspected one of the 50 files for references to the coronavirus in case collected articles included the key terms when linking to other news articles. A worry was that such links, commonly shown in an online news article but not a part of the article itself, would also be included and impact the results. I did not identify any such references after viewing 100 articles, which indicates that they were omitted.

3.4 Preprocessing and preparation

Preprocessing and data preparation was conducted in two stages, using two different programming languages. First, I organized the data in Python, creating a new column for dates, dropping unnecessary columns, combining the text into one column, and dropping all unwanted rows. After that, I imported the data into R and cleaned it. Finally, I prepped the data so that the machine learning model would later recognize it.

3.4.1 Preprocessing with Python

After constructing the corpus, I imported my data into a dataframe (Chapman & Feit, 2015, p. 31), using Pandas (McKinney, 2010), a Python (Rossum & Drake, 2009) library with features for data analysis. A dataframe stores data similar to an Excel sheet (Microsoft Corporation, 2018). I sorted it only to contain rows of data from Aftenposten and VG. This process resulted in 23 000 rows of data. All lines that contained null objects, i.e., any empty cells, were dropped (49 rows). These were rows of data from VG or Aftenposten where there was no body or summary, which meant they did not represent full articles.

Furthermore, I dropped all rows with a body of text less than 100 words, removing 584 rows from the corpus. This is because Topic models (See chapter 3.5) tend to work best with texts that are not too short (Roberts et al., 2016). Nevertheless, this does indicate a limitation. Many of the articles removed contained quick updates that the analysis will not necessarily catch, such as live updates. If these updates deviate in content from the rest of the corpus, the results may be slightly skewed. The final size of the corpus consisted of 22 367 rows of data.

I converted cells in the date column to DateTime objects using the DateTime library in Python (Rossum & Drake, 2009), allowing me to order them by week. Headlines, summaries,

and body were combined into one column named text and dropped, such that each news article was recognized as one continuous body of text rather than a collection of texts. Further, I created another column with the first 200 characters from each document. This choice allows me to later show and plot representative documents (See chapter 4). Finally, the data was saved to a new .csv file and stored for use in R.

3.4.2 *Preprocessing in R*

The STM package in R (R Core Team, 2021) provides tools for preprocessing data (Roberts et al., 2019). I used this tool with the following configurations:

```
processed <- textProcessor(df$text,  
                           metadata = df,  
                           language='norwegian',  
                           customstopwords = c('sier', 'ifølge'),  
                           verbose = TRUE,  
                           onlycharacter=TRUE)
```

Pre-processing for topic modeling involves several steps (Roberts et al., 2016). First, all words are converted to lowercase; the computer interprets lowercase and uppercase letters as distinct characters; converting all characters to lower case allows the computer to match lowercase and uppercase words. Secondly, all characters are removed from the documents except for alphabetical characters, including numbers and special characters, periods, whitespaces, and commas. Further, stopwords (Günther & Quandt, 2016) are removed; these are a list of common words that provide little meaning for quantitative analysis (e.g., All, both was). A list of these is provided in the STM package and can be accessed using the variable “language” and the value “Norwegian” when preprocessing (Roberts et al., 2019).

Additionally, I chose to add “sier” and “ifølge” (says, and according to) as custom stopwords. These are prevalent words in Norwegian newspaper articles and do not provide much meaning for the analysis. Next, words are stemmed. Stemming is the process of converting words into their root. Words like houses, housing, and house are converted to the common stem of hous, making it easier to count how many times words appear in the corpus. This process is also helpful for Norwegian, definite form words such as “huset” (the house).

The processed corpus was prepared (prepped) using the STM package in R by running the PrepDocuments function. This process turns a data frame into an object that the STM model (See chapter 3.5.1) recognizes. The function turns all documents into vectors of numbers associated with a word in a vocabulary. It also lets users choose a lower threshold for

how many documents a word must appear in, allowing researchers to reduce the number of words in the vocabulary. This reduction will make the modeling process (Chapter 3.5) much faster without removing important words (Roberts et al., 2016), assuming the threshold is not too high. Roberts et al. (2016) point out that vocabularies with more than 5 000 words will make the modeling (fitting) process much slower.

Considering the number of compound words in the Norwegian language, I wanted to ensure that I did not remove too many words. I set the lower threshold to 15. This is a relatively low number (e.g., Roberts et al. (2019) used 15 as the threshold when analyzing 13 246 documents), yet it allowed me to remove a large number of insignificant words from the vocabulary, making the process much faster without removing words that were likely to affect the model. This process resulted in a vocabulary of 23 438 terms, while 189 775 terms were removed. This reduction meant that topic models with up to $K=300$ topics were manageable to process with my home computer if left overnight.

3.5 Topic modeling

Topic modeling may be used for quantitative analysis of large corpora of documents (Blei et al., 2003). Research has shown that topic modeling produces similar results to human coding while significantly increasing the amount of data that can be analyzed (Roberts et al., 2019; Rogers et al., 2020). Topic modeling has shown to be effective and fruitful for social science research, but it is not used as widely as qualitative methods such as grounded theory and content analysis (Hannigan et al., 2019, p. 82). With Topic modeling, machine learning and clustering algorithms are applied to a corpus to recognize what words often appear together in documents (Günther & Quandt, 2016). The fundamental assumption is that words that often appear together belong to a topic. This process uses unsupervised machine learning (Chapman & Feit, 2015), meaning that the models are never explicitly told what to look for. Instead, they draw inferences from the data and discover latent – or hidden (Günther & Quandt, 2016) – topics within the corpus. More specifically, this unsupervised method is a Bayesian generative approach.

In a topic model, all documents are considered a bag of words, meaning that the orders of words do not matter (Zhang et al., 2010); the model only cares about what words appear in a document and how many times they appear. This bag of word approach has an advantage over other approaches to natural language processing in that it can process a large amount of data much faster. With a bag of words approach, words are represented as vectors of numbers corresponding to an index value in a vocabulary that stores the word. Every document is a

member of the complete set of documents $d \in [1 \dots D]$, while every instance of a word in a document is a member of the bag of words for that document $n \in [1 \dots Nd]$. Words are instanced by unique terms in a vocabulary $v \in [1 \dots V]$. The models also use a specified number of topics where topic $k \in [1 \dots K]$. Imagine we have two documents:

$d1 = \text{'It was the best of times, it was the worst of times.'}$

$d2 = \text{'A day wasted on others is not wasted on one's self.'}$

If $d1$ is preprocessed and prepped without removing words, the result is the following bag of words representation. The first number represents the index in the vocabulary, and the second number represents the frequency of a word in the document:

$d1 = [1:1, 2:2, 3:2, 4:2, 5:1, 6:2, 7:1]$

Vocabulary = ['best', 'it', 'of', 'the', 'time', 'was', 'worst']

Now, if the same is done for both documents, the vocabulary expands:

$d1 = [2:1, 5:2, 7:2, 12:2, 13:1, 14:2, 16:1]$

$d2 = [1:1, 3:1, 4:1, 6:1, 8:2, 9:1, 10:1, 11:1, 15:2]$

Vocabulary = ['A', 'best', 'day', 'is', 'it', 'not', 'of', 'on', 'one', 'other', 'self', 'the', 'times', 'was', 'wast', 'worst']

When analyzing a corpus using a topic model, each word gets a probability distribution to appear in every topic. E.g., for a word in a model with three topics, a words score could look like this: Topic1 = 0.7, Topic2 = 0.25 and Topic3 = 0.05. The same thing happens on a document level, as every document has a probability distribution of topics. Thus, one document may reflect multiple topics. Once a model has been fitted, researchers can access the most representative words and documents per topic.

Topic models have been used to analyze news articles (Chandelier et al., 2018; Günther & Quandt, 2016; Lee et al., 2021; Terman, 2017; Walter & Ophir, 2019; Wihbey et al., 2019), medical journals (Porturas & Taylor, 2021; Tighe et al., 2020; Yao et al., 2018), social media (Hong & Davison, 2010; Hu & Ester, 2013; Wihbey et al., 2019) and more (Fong & Ratwani, 2015; Kuhn, 2018; Robinson, 2019). It has also been used to analyze Norwegian news coverage (Larsen & Thorsrud, 2019; Sjøvaag & Pedersen, 2018; Sjøvaag,

Pedersen, & Owren, 2019). Multiple papers have also used topic modeling to explore risk and behavior (Lee et al., 2021; Ophir, 2018; Rogers et al., 2020). Hence, topic modeling is a proven method for analyzing large textual data in various fields and is fruitful for analyzing news texts and crisis communication in the Norwegian language. Furthermore, the fact that these methods are less common and can incorporate large sets of textual data makes them particularly apt to discover unknown and latent patterns.

3.5.1 *The structural topic model*

The Structural Topic Model (STM) is a more recently developed topic model that has lately been widely used for social science research (Roberts et al., 2016; Roberts et al., 2019). It distinguishes itself from other topic models, like Latent Dirichlet Allocation (Blei et al., 2003), by allowing the incorporation of metadata about the documents in the corpus. Users can estimate the effect metadata variables, referred to as covariates, like the week of publication and author, have on the data. Because every document represents a distribution of topics, the proportion of a topic in the corpus is calculated to represent its prevalence instead of the number of documents belonging to each topic. This allows researchers to understand how the representation and presentation of a topic changes over time (Roberts et al., 2016).

I use this to test predictions about how the prevalence of topics changes during the crisis. As with other topic models, researchers themselves have to choose the K number of topics they want the model to find. There are no absolute rules around how many topics should be selected for a topic model (Roberts et al., 2016); it will vary based on the size of the corpus, the language used, the documents, and the purpose of the modeling (Küsters & Garrido, 2020; Roberts et al., 2016). A common way of evaluating different K models is to fit multiple models and compare them (Roberts et al., 2016; Sjøvaag & Pedersen, 2018).

For this thesis, multiple topic models with different numbers of topics k (50, 60, 100, 150, 200, 300) were fitted. The model with k=200 was determined to best separate readable topics and convey semantic content; I determined this by reading the 40 most representative words of different topics with different models.

3.6 *Qualitative labeling and reliability testing*

While the data-gathering process and fitting of the topic model are reproducible, the result of the model requires human interpretation. To understand and operationalize topics, they must be coded with a label. Coding involves sorting your data according to what you are researching (Østbye et al., 2013, p. 192), i.e., your problem statement and research question.

Such qualitative research is complex, naturally involves interpretation, and will be affected by the coder's beliefs, knowledge and experiences. One strategy researchers can employ to address this is to use multiple coders to see how accurately they code the same material (Østbye et al., 2013, p. 221). The reliability of this process can then be statistically presented based on a Krippendorff alpha score (Krippendorff, 2011).

I coded the topic model by labeling each topic and categorizing topics based on 13 inductively chosen themes. After interpreting the data, I gave another coder the task of coding the same material by determining whether a topic reflected coverage of the crisis, assigning each topic one of 13 themes, and labeling each topic. The coder was chosen because they had some understanding of topic modeling and had experience with journalism, analysis of journalistic content, and applying codes to data. I gave them written instructions about coding the data (See appendix 4).

Table 4

Krippendorff alpha scores

	Values	α score
Thematic coding	14	.79
Relevance coding	2	.903

The calculated Krippendorff result (Table 4) shows considerable agreement about whether a topic was relevant and less agreement on how to code the data thematically. Notably, we often agreed about the label when we did not agree on the theme. E.g., while I coded topics 20 and 131, about covid in the USA and India and South America, with the covid theme, the other coder coded the same topics with the foreign affairs theme. We both interpreted the topics to be about the coronavirus in the respective countries. Upon reflection, we would likely have achieved a higher Krippendorff alpha if the coding sheet had been more mutually exclusive. Furthermore, highly experienced coders would also likely have achieved higher scores.

Nevertheless, the results show considerable agreement among coders about themes and relevance to the research. $\alpha = .80$, which is close to the score of the thematic coding, is considered reliable, especially when coding using a higher number of values (Krippendorff, 2011; Skalski et al., 2017, p. 168). The score of the relevance coding, $\alpha = .90$, is considered a highly reliable score. This indicates that the labeling process, in general, was highly reliable and that the interpretations of the data in this work likely reflect how most people would

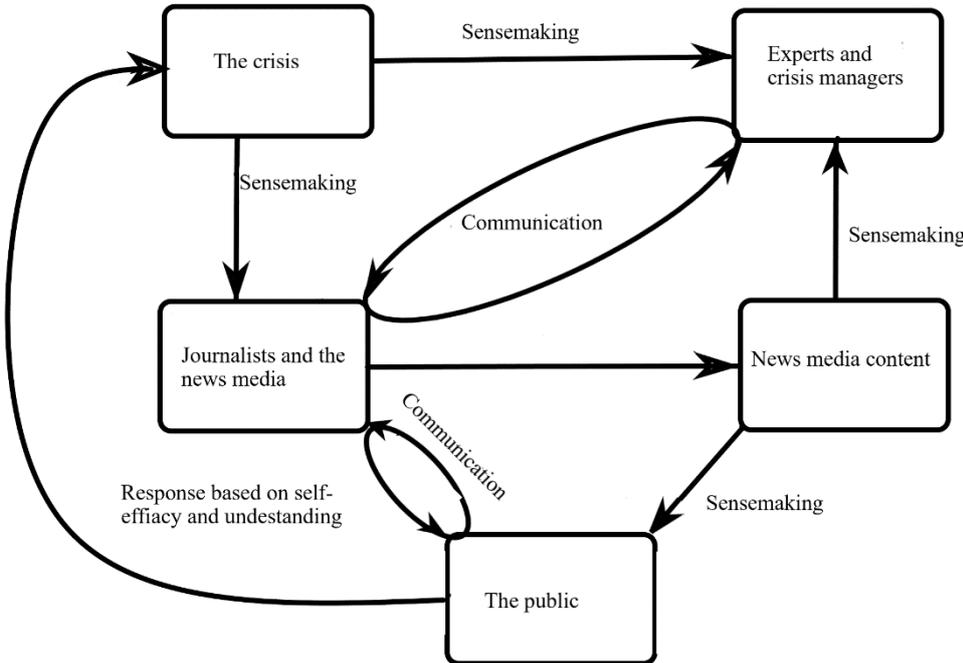
interpret the results. That said, researcher biases, especially shared biases, could affect this process. After coding the topics, we met to discuss our interpretations to agree on the final labels and themes.

3.7 Operationalization

3.7.1 Developing a model

Research shows that people tend to turn to traditional editorial media during times of crisis, and in particular during the coronavirus pandemic (Newman et al., 2021). In this work, I assume that the news media will disseminate CERC, which will in turn affect the public response to the crisis and be conducive to limiting overall societal risk. To illustrate this, I created a conceptual model describing, in simple terms, the relationship between a crisis, experts and crisis managers, the news media, and news media content (Figure 3). The model is based on the literature review (Chapter 1.2) and theoretical CERC propositions (Veil et al., 2008; Appendix 7). It assumes crisis managers and journalists will engage in a joint sensemaking effort (Fridstrøm & Øyaas, 2021). The content produced by the news media will then ideally facilitate sensemaking and self-efficacy in the public, allowing people to make informed decisions about how to respond to the crisis. This response affects the development of the crisis and is thus conducive to crisis management.

Figure 3
News media relationship to public response in crises



While the model explains some aspects of CERC, it is not comprehensive, sticking to how the news media impacts self-efficacy and response in public. Further, one should not interpret the model to mean that all communication from the news media will facilitate a better understanding and response to the crisis, but rather that some communication will. Lastly, it could be the case that some communication facilitates improper response, consequently increasing overall risk.

3.7.2 Delimiting crisis stages

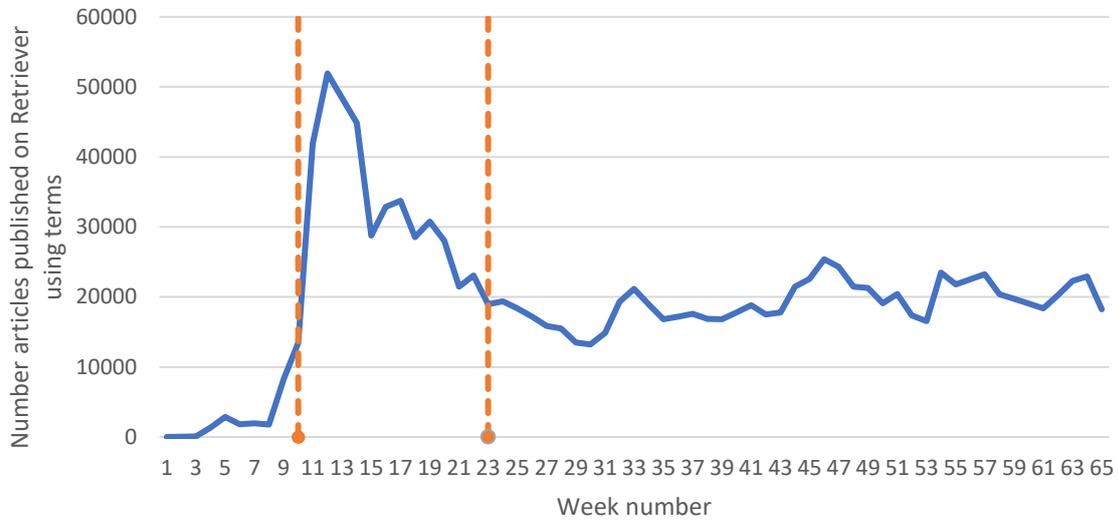
One of the main features of the CERC framework is that it provides a basis for public officials and others communicating about risks and crises to understand changing communication needs throughout a crisis (Reynolds et al., 2002; Reynolds & W. Seeger, 2005). Thus, when analyzing this communication, we should see changes over different stages of the Covid-19 pandemic. To analyze this, I have to identify these different stages. This thesis draws on data from the first 15 months of the pandemic and addresses the crisis's pre-crisis, initial, and maintenance stages.

As is often the case with a creeping crisis (Boin et al., 2020), determining a single event that turned the Covid-19 crisis into a full-blown crisis might not be possible. Instead, we can identify the change from the pre-crisis phase to the initial crisis phase by when the Covid-19 crisis received attention from politicians, journalists, and the public (Boin et al., 2020). This has an advantage for this work, as it implies that crisis stages are linked to the salience of coverage it receives. Understanding the start of the initial crisis this way, we can delimit it by when the salience of news coverage of Covid-19, and consequently its perceived importance (Geiß, 2019), increased drastically in early March of 2020.

While the CERC framework posits the need for change in communication from the initial crisis stage to the maintenance stage, it provides no basis for determining when a crisis enters this stage. Crisis and emergency risk communicators are simply informed that such a change will occur (Reynolds et al., 2002; Reynolds & W. Seeger, 2005). I apply a novel method for delimiting these stages by identifying changes in salience of coverage, similar to the method used to delimit the pre-crisis and initial crisis stages. The assumption is that the salience of coverage will be highest in the initial crisis stage and die down, coupling the maintenance stage, like the pre-crisis stage and post-crisis stages, with the level of attention given in a crisis.

Figure 4

Crisis stages for 15 months of Covid-19 in Norway



Note. The first ten weeks reflect the pre-crisis stage. The initial crisis stage lasts until week 23. Subsequent weeks reflect the maintenance stage.

The maintenance stage was determined as the first week, after the peak in the salience during the initial crisis stage, where the number of news stories published for the week was lower than the average for all the following weeks (week 23). Figure 4 shows three distinct stages of the crisis in Norway. During the initial crisis stage, salience is relatively low. Subsequently, this increases drastically during the initial crisis. After the initial crisis, the salience of coverage remains relatively high and stable.

This delamination of crisis stages allows for testing of topical prevalence over time. If claims about communication efforts change are correct, we should see some topics that are more and less prevalent in different stages.

3.7.3 Identifying CERC topics

Two different approaches to identifying and coding topics were used. First, I labeled and coded topics to test the validity of the topic model, identify themes and identify topics where Covid-19 was the central issue (Chapter 3.6). I applied a second method to identify topics conducive to CERC.

As presented in the theory, sensemaking and self-efficacy facilitation represent the primary communication goals of the CERC framework (Veil et al., 2008). In turn, communication efforts that facilitate sensemaking and self-efficacy are conducive to crisis

response (Figure 3). To limit the scope of the thesis to CERC during the Covid-19 pandemic, only topics that dealt with the health impact of the crisis were considered reflective of CERC; I thus do not include topics dealing with economic impact, impact on culture, and sports.

Operationalizing a concept means binding assumptions and theories to statements one can observe (Johannessen et al., 2019). For this thesis, these variables must represent something observable and interpretable in my data. I developed a coding schema based on presented literature about self-efficacy, sensemaking, crisis and risk communication, and CERC. The schema was developed after I already had an understanding of the data. It states that topics conducive to CERC reflect one of the following:

Table 5

CERC coding table

Self-efficacy

1a: Explores one or multiple concepts that, if engaged with, are likely to reduce risk. (E.g., Mask Wearing, Social distancing, Vaccines)

1b: Explores official preventative measures dictated by public officials. (Community societal level efficacy) (e.g., the lockdown)

1c: Provides information about at-risk groups or how to recognize the risk to oneself and others.

1d: Explores behavior that is likely to increase risk. (E.g., Using public transportation or air travel)

1e: Explores people's engagement in behavior to reduce or avoid increasing risk. (E.g., Traveling in Norway instead of to Europe)

1f: Addresses misinformation that potentially makes people avoid risk-reducing behavior. (E.g., Debunking fake news)

Sensemaking

2a: Explores the health impact of covid 19 on individuals and communities. (Eg. Infections, Deaths)

2b: Explores the response to the crisis. (E.g. medical and municipal response)

2c: Explores new developments and escalation of the crisis (e.g., new virus mutations)

2d: Explores background factors and facilitates a technical understanding of the virus.

2e: Addresses magnitude of the crisis

Crisis communicators

3: Focuses on officials and organizations in charge of the Norwegian crisis management and the response to the covid 19 crisis.

Codes 1a, 1b, and 1d, focusing on self-efficacy, were operationalized similar to Goodall et al. (2012), based on works by Witte (1992) and (Bandura, 1982). These codes

include dictated measures and recommendations for risk reduction. Unlike Goodall et al., I add 1d, which concerns behavior that is not recommended rather than behavior and measures that are; this is consistent with the CERC goal of making sense of activities that might increase or reduce harm (Reynolds & W. Seeger, 2005). 1e also covers recommendations for risk reduction in that it describes people engaging in risk-reducing behavior, which is consistent with *vicarious experience* (Bandura, 1998). 1c was added as it helps people understand if they or others might be at risk either because of experiencing symptoms or recognizing that one is in a risk group. This is described in the CERC framework as an important task (Veil et al., 2008). Dudo et al. (2007) also operationalized descriptions of symptoms as a measure of self-efficacy, and this recognition of risk factors is central to the work by Parrott (2001). 1f was added as it represents a critical task of CERC (Reynolds & W. Seeger, 2005) and is considered likely to facilitate self-efficacy by giving more accurate information on self-efficacy measures and their effectiveness.

Topics coded with 2a are conducive to crisis communication and sensemaking because they help reduce uncertainty in populations about unfolding events and the impact of the crisis (Reynolds & W. Seeger, 2005; Veil et al., 2008). 2b covers the response to the crisis, i.e., the topics that reflect how organizations and communities respond to the health crisis. This facilitates an understanding of what is being done and of control and remediation efforts (Boin et al., 2020; Reynolds & W. Seeger, 2005). 2c includes the topics that explain new developments of the crisis and are consistent with detection efforts of sensemaking (Boin et al., 2020) and efforts to explain current events (Klein, 2009). 2d is added as these topics facilitate understanding of ongoing developments and their characteristics (Boin et al., 2020). Additionally, I added a separate code (3) focusing on crisis communicators, as the information they provide is likely conducive to sensemaking and self-efficacy.

3.8 Addressing challenges and limitations in the data gathering process

Retriever hosts a database of news articles from Norwegian media outlets. Their service “Atekst” allows users to search for news articles based on specific criteria. Users may search for words appearing in articles over chosen periods. Users can subsequently choose articles to download in either PDF, Word, or Text format. Researchers, especially media researchers, use their services to collect news articles for qualitative document analysis. Researchers have also used their services to analyze larger data sets (Larsen & Thorsrud, 2019). Still, using Retriever’s system to collect thousands of documents proved to pose several problems. The

following sections represent some of the limitations of Retriever's Atekst service that caused issues when I attempted to collect data for this thesis.

3.8.1 Page limitation

Every search in Atekst gives a result of n number of news articles and p number of pages, similar to search engines like Google and Bing. However, the tool does not allow the researcher to download all data that fits their search. To collect data, they must select all articles they want to download with the mouse cursor. This creates several issues when looking to download a large amount of data. Firstly, the maximum number of results per page in Atekst is 100, meaning that researchers must select all stories from a page, click on the next page, and repeat. For a search with 58 664 hits, this means 587 pages. However, Atekst does not permit users to access more than the first 100 search results pages. Trying this results in an error. Thus, the maximum number of articles someone may access for each search is 10 000. Secondly, Atekst does not allow users to download more than 1 000 articles at any time. To address these issues, I had to access ten pages, select all stories for each page, and then download the stories, repeating until all data from the search was gathered or I reached page 100.

To get around the maximum page count, I used multiple searches over the period in question, splitting the search into periods of three months. This process gave results of fewer than 10 000 news articles at a time. All data from these searches were collected, which is assumed to be the same data collected for any combination of searches over this period using the exact keywords. However, this could be false given further issues with how Retrievers database works. In this case, the data-gathering process will not be wholly reproducible.

3.8.2 Subscription limitation

Historically Atekst has been an open service for researchers from institutions having access to it. However, since 2018 this access has been limited. Consequently, some news articles are no longer open, and institutions have access to a limited number of them based on their contract with Retriever. Most of these paid articles consist of articles from print newspapers, but this also includes articles published online. Unfortunately, there is no way for users to distinguish between open and paid articles on Atekst, which creates issues when seeking to collect large amounts of data.

For my research, this meant that I was not allowed to download any more articles after I had exceeded the number allowed to be accessed by my university. After several weeks of

contact with Retriever to attempt to resolve the issue, I was asked not to use the service anymore. Although the search was initially planned to cover all of 2020 and 2021 and include more news organizations, the limitation constrained this effort.

3.8.3 Challenges when parsing data

Parsing the data collected from Retriever also presented some issues. Each text file consisted of several documents, a body of text separated into sections. A general structure of a document consists of four paragraphs: the first paragraph would contain the headline, a line with the source and date, and a third line describing that the article was published online. The second paragraph would contain the summary, and the third contained the article's body and a line with copyright information. The last paragraph contained a line with a URL redirect to the original article. However, some documents deviated from this general structure; no NRK article had a summary or body, but all had the line with copyright information. Some articles, as well as some from NRK, had headlines spanning multiple lines. Others had a separate headline or copyright line. This variation meant a minimum of three paragraphs and a maximum of six.

Table 6

Number of articles with different numbers of paragraphs

Number of paragraphs	All articles N = 46 302	Aftenposten and VG n = 23 000	Processed data n = 22 366
3	23152	40	0
4	19925	19735	19201
5	3088	3088	3030
6	137	137	136

Note. The table compares the number of articles with different numbers of paragraphs.

To parse the data, I wrote separate functions in Python (Rossum & Drake, 2009) to handle each possible case and its subcases. E.g., a six-paragraph article could either have the copyright as its own paragraph or the headline as its own paragraph, but not both. After structuring the data, I looked for edge cases to ensure no issues. I found some, but they were all from NRK articles and dropped from the corpus. NRK articles only contained headlines because they have a separate agreement with Retriever because of their system for storing articles. Thus, Retriever only stores limited information from NRK (Retriever support 2022). I was unaware of this before collecting data, as the articles appear online on Retriever's service.

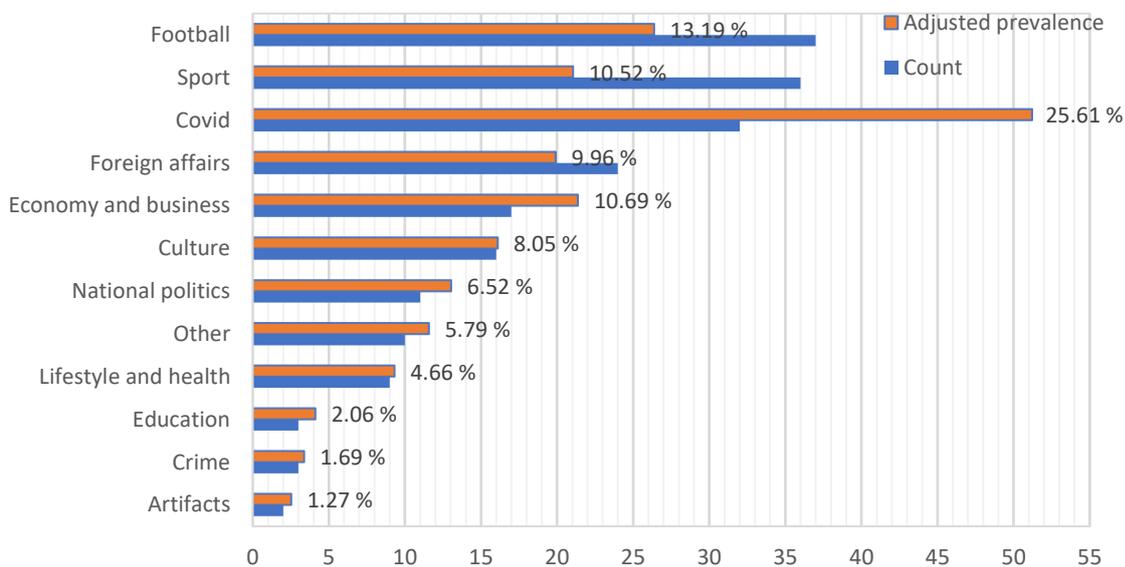
4 Results

The topic modeling process results in a model with K=200 different topics reflecting how Aftenposten and VG referenced the coronavirus (See Appendix 5 and 6). In order, this chapter is structured to present results associated with RQ1, RQ2, and RQ3. Reference to themes and topics primarily concerns their prevalence over time. This prevalence is indicative of how common each topic is in the corpus. I.e., the more prevalent a theme or topic is, the more documents, or larger portion of documents, are reflective of that topic or theme.

4.1 Presenting themes and topics

Figure 5

Comparison of the number of topics and prevalence of themes in corpus



The most common theme in the corpus was the sports theme, representing 73 out of 200 topics. Football was coded as a different theme due to the pervasiveness of football topics, but is considered a subtheme of sports. The sports theme consists of 36 topics ranging from more prevalent topics, such as “Topic 162 – Guidelines for sports and training” (0.68%) and “Topic 172 – The Norwegian sport Federation” (0.53%), and less prevalent topics such as “Topic 6 – Female martial arts” (0.14%) and “Topic 108 – International tennis” (0.11%). The football theme consisted of 36 topics, ranging from the most prevalent: “Topic 145 - English football” (0.72%) and “Topic 182 - Infections and quarantines for soccer players” (0.75%), to less prevalent: “Topic 162 – English soccer personalities” (0.15%) and “Topic 125 – Football

players addressing poverty” (0.12%), which mainly focuses on the football player Marcus Rashford’s efforts to help poor children with school lunches.

The second most common theme was the covid theme, consisting of 32 topics. The theme consists of less than half the topics compared to football and sport but is more prevalent. The covid theme has a 25.61 % prevalence in the corpus, compared to the 23.71 % prevalence of the sport and football themes. The theme consists of topics where the virus, preventative responses, and measures to fight it are in focus. The two most prevalent topics in the covid theme are “Topic 154 – National solidarity” (1.98 %) and “Topic 54 – Infection rate” (1.75 %), and the least prevalent topics are “Topic 18 - Infections in Italy and on cruise ships” (0.38 %) and “Topic 157 - Other covid texts”.

The foreign affairs theme covered 24 topics, and the national politics theme covered 11. These themes mainly focus on policy. The foreign affairs theme focuses on other countries, foreign policy, and elections. The most common topics are “Topic 55 – The American presidential elections” (0.73 %) and “Topic 174 – Foreign policy” (0.65 %), while “Topic 143 – American presidential debates” (0.25 %) and “Topic 118 – Turkey” (0.24 %) were the least prevalent foreign affairs themes. The national politics theme covered prevalent topics like “Topic 47 – The Corona law” (0.95 %) and “Topic 165 – Travel restrictions” (0.84 %) and less prevalent topics such as “Topic 51 – Abid Raja and Tom Cruise” and “Topic 188 – The National defense” (0.28 %)

The *Economy and business* theme was also common, consisting of 17 topics. The most prominent topic in the theme was “Topic 4 – Norwegian statistics” (1.66 %), followed by “Topic 187 – Economic results” (0.96 %). Less prevalent topics were “Topic 45 – Covid impact on rich and poor” (0.36 %) and “Topic 12 – Foreign workers” (0.25 %). As with the economy and business theme, the culture theme had one largely prevalent theme: “Topic 100 – Cancellations and postponements of events” (1.68 %), followed by a less prevalent theme: “Topic 64 – Popular culture” (0.74 %). “Topic 14 – Theater” (0.23 %) and “Topic 74 – Celebrities and controversies” (0.21 %) were the least prevalent cultural topics. The culture theme consists of 16 topics altogether. The *Lifestyle and health* theme consist of 9 topics coded based on their relevance to psychology, travel, health, nutrition, lifestyle, relationships, and family health. “Topic 161 – Psychological impact of covid” (0.84 %) and “Topic 67 – Lifestyle advice and psychology” (0.84 %) were the most prevalent of these topics, while “Topic 199 – Travel tips and walking trips” (0.24 %) and “Topic 28 – Pregnancy, births, and operations” (0.23 %) were less prevalent. Notably, “Topic 140 – Travel suggestions”, was

also coded with the lifestyle and health theme, meaning that three separate topics focus on travel advice and suggestions.

Further, three topics were coded to the crime theme: “Topic 107 – Breach of covid regulations” (0.66 %), “Topic 42 – Trials” (0.52 %), and “Topic 158 – Violence and crime” (0.51 %). Three topics were coded to the *education* theme: “Topic 38 – Homeschooling”, “Topic 92 – Students,” and “Topic 105 – Exam grades,” and two topics were coded to the debate: “Topic 59 – Personal narratives” and “Topic 169 – SiD (Aftenposten Youth opinion articles)”. I later chose to drop this theme; instead, I coded the topics as *other*. The *other* theme was coded for topics that did not fit with any of the other themes. The *artifacts* theme was coded for topics with little coherence or that represented a collection of words grouping disclaimer statements, markup words, or non-topical words. Some such artifact themes are a common byproduct of topic modeling (Roberts et al., 2016; Sjøvaag & Pedersen, 2018).

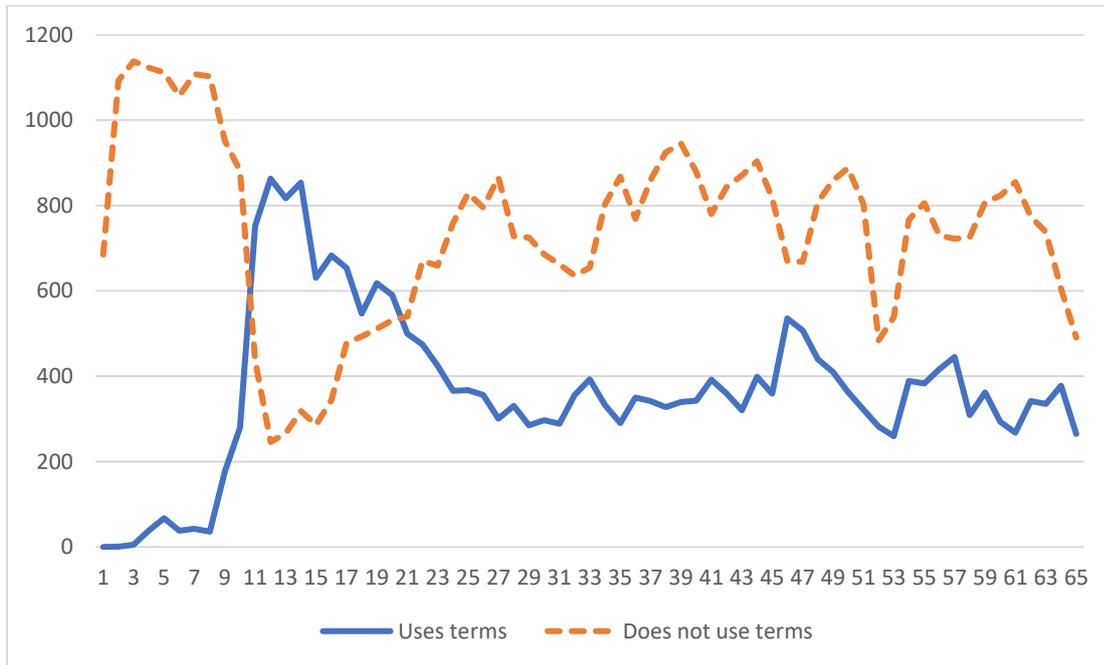
Table 7

Topics with other or artifact themes

Others		
59	Personal narratives	1.80 %
196	Debunking fake covid stories	0.87 %
111	Climate	0.60 %
169	SiD (Aftenposten yung)	0.57 %
117	Public transport	0.50 %
43	Natural disasters	0.38 %
87	Cars	0.34 %
147	Quizzes and summaries	0.33 %
11	Podcasts	0.24 %
123	Historical accounts	0.17 %
Artifacts		
Topic 1	Artifacts	1.25 %
Topic 200	Artifacts	0.02 %

Figure 6

Prevalence of news stories mentioning covid



The figure above compares the number of documents published by the VG and Aftenposten that either mention or do not mention the search terms described in chapter 3.3. Figure 6 shows that once the Covid-19 crisis started, the number of stories mentioning the three terms published by the two Norwegian national news organizations changed drastically. Before week 10, a relatively small portion of news articles mentioned the virus. Subsequently, around week 10, attention proliferated. For the first weeks of the initial crisis, more news stories mentioned the search terms than ones that did not. Only 246 articles were published in week 13 and did not mention the coronavirus. During the same week, newspapers published 863 news articles mentioning one of the terms. Over the covered period, articles mentioning covid represent 33.14 % of the coverage in the two newspapers. This coverage reflected 6.27 % percent of all coverage of the two newspapers in the pre-crisis stage, 59.26 % during the initial crisis stage, and 31.51 % during the maintenance stage.

4.2 Topics conducive to sensemaking and self-efficacy

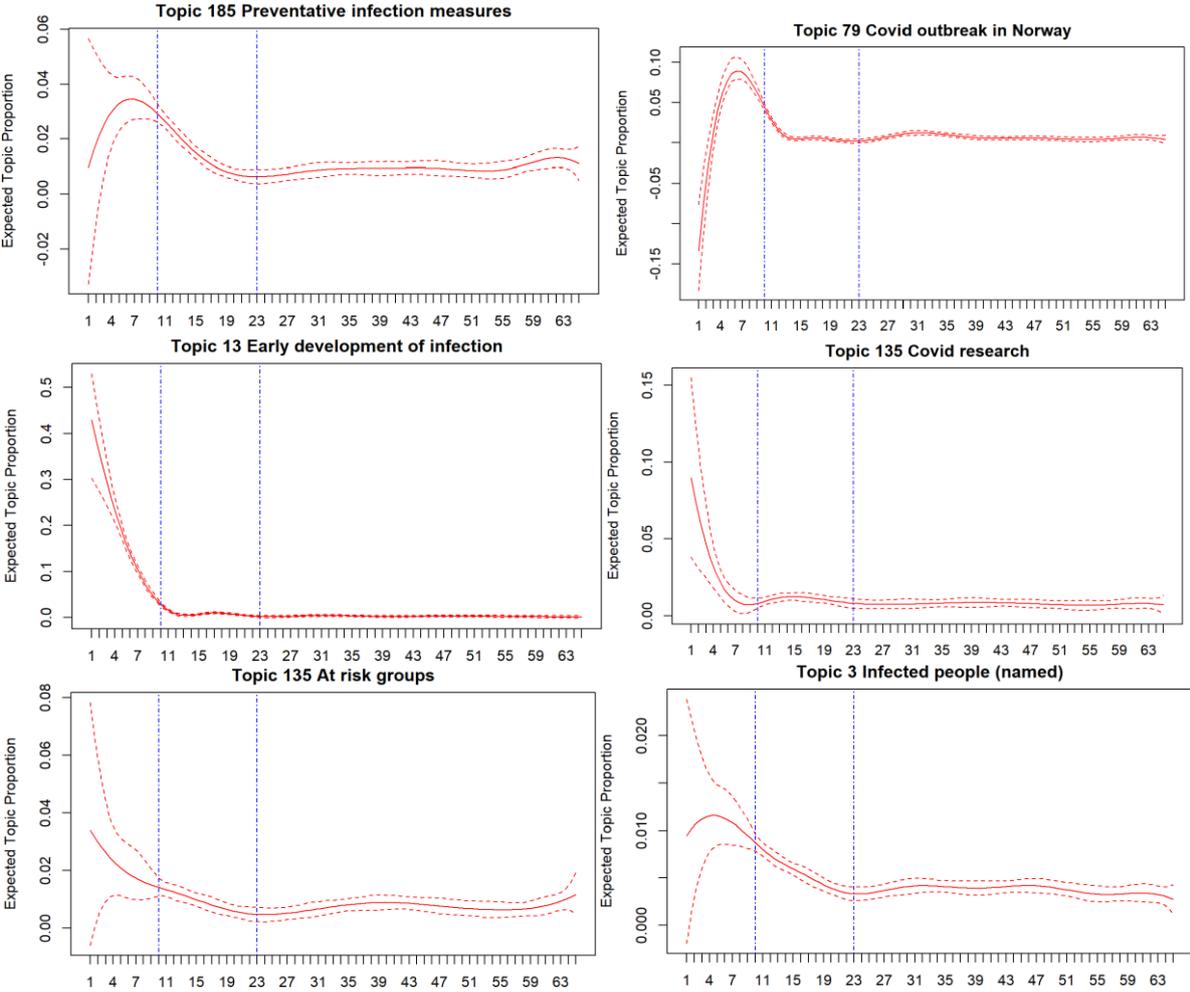
Table 8

CERC Topics

Topic #	Label	List of seven most representative words
2	Donald Trump infected	trump, presidenten, hvite, hus, donald, testet, presid
3	Infected people (Named)	corona, coronaviruset, skriver, viruset, vgs, smittet, fortel
5	Notable deaths	døde, ham, død, livet, mistet, gammel, familien
13	Early development of infection	viruset, døde, smittet, smitted, kina, mennesk, koronaviruset
18	Infection in Italy/ on cruise ships	italia, italiensk, skipet, bord, lombardia, land, milano
20	Covid in the USA	new, usa, york, time, delstaten, amerikansk, the
21	Vaccines	vaksin, vaksinen, norg, doser, første, vaksinert, pfizer
26	Virus mutations	danmark, norg, viruset, varianten, dansk, storbritannia, mer
30	Air travel	fli, flyet, flyplassen, gardermoen, hjem, sas, passasjer
31	Smittestopp-appen (Covid phone app)	fhi, folkehelseinstituttet, norg, appen, tiltaken, tiltak, regjeringen
36	Infections on Hurtigruten (Event)	hurtigruten, tromsø, bord, amundsen, roald, passasjer, skipet
38	Home schooling	skolen, elev, skoler, skole, barnehag, eleven, barn
46	Restrictions for football practice	nff, trene, fotballen, gang, fotbal, spill, igjen
47	The Corona law (Norwegian law)	regjeringen, stortinget, mener, forslag, forslaget, leder, loven
48	Deaths in care institutions	sykehjem, eldr, pårørend, beboer, døde, besøk, ansatt
49	Health officials	høie, bent, helseminist, nakstad, helsedirektør, espen, helsedirektoratet
54	Infection rate	nye, sist, registrert, uken, smitted, uke, smittetilfel
56	Rules for traveling into Norway	norg, grensen, karanten, reglen, unntak, kommer, regjeringen
57	Covid in Oslo	oslo, johansen, raymond, byrådet, byrådsled, steen, hovedstaden
58	Experience of being infected	fikk, mar, smittet, hjem, dager, fortel, feber
60	Covid testing	test, testet, positivt, tester, testen, posit, person
79	Covid infections	karanten, ansatt, smittet, person, kontakt, smitt, symptom
82	Municipal response to covid	kommun, kommunen, ordfører, lokal, nasjonal, bærum, mener
89	Vaccine side effects	vaksinen, astrazeneca, bivirkning, astra, zeneca, legemiddelverket, norg
93	New official covid measures	tiltak, tiltaken, person, hold, gjelder, bør, regjeringen
98	Global virus collaboration	who, verden, land, helseorganisasjon, global, vaksin, covid
103	Covid in hospitals	pasient, sykehus, sykehuset, pasienten, innlagt, legen, behandl
114	Nightlife restrictions under covid	oslo, gjester, stengt, folk, avstand, hold, gjesten
117	Public transport	oslo, ruter, tog, folk, flere, buss, bussen
124	At risk groups	covid, alvorlig, sykdom, syke, sykdomm, risiko, symptom
130	Covid in Sweden	sverig, svensk, norg, stockholm, tegnel, finland, danmark
131	Covid in India and South America	brasil, india, landet, bolsonaro, presid, amerika, døde
133	Lockdown	stengt, landet, innført, steng, myndigheten, igjen, åpne
135	Covid research	viruset, forsker, virus, forskern, studien, covid, mennesk
140	Travel suggestions	hytta, påsken, norg, folk, hytt, hytter, nordmenn
142	Outbreak of virus mutation	kommunen, follo, nordr, mutert, kommun, britisk, utbruddet
149	Mask wearing	munnbind, bruke, bruk, avstand, bruker, anbefal, offentlig
154	National solidarity	folk, hjemm, hold, får, andr, litt, sammen
157	Other covid texts	ansatt, innsatt, fengsel, arbeidsgiv, jobb, andr, annet
161	Psychological impact of covid	barn, ung, psykisk, barna, hels, hjelp, ungdom
162	Guidelines for exercise and sports	trene, aktivitet, barn, stengt, igjen, idrett, idretten
163	Hospital capacities	norg, utstyr, pasient, hels, smittevernustyr, norsk, behandl
165	Travel restrictions	land, reis, reiser, norg, nordmenn, karanten, landen
175	Care institutions under covid	bergen, ansatt, beboer, sykehjemmet, beboern, flere, smitt
182	Infections and quarantines in football	karanten, spiller, spillern, kampen, laget, dager, smitt
185	Preventative infection measures	tiltak, norg, smitt, tiltaken, viruset, smitten, folk
196	Debunking fake covid stories	facebook, medier, aftenposten, twitter, sosial, debatten, mening
197	Outbreaks at events	kommunen, kommun, person, smitt, ordfører, karanten, flere
199	Travel tips and walking trips	kristiansand, turen, agder, sørlandet, tur, flere, rundt

Out of 200 topics, I coded 48 topics as reflective of either sensemaking or self-efficacy based on the coding schema presented in chapter 3.7.3. The following sections categorize topics by which stage they peak in prevalence. Notably, not all topics are prevalent in one stage, and not that are have the same curve. I will present topics in chronological order based on their peak stage. Each plot represents the topic's prevalence across the relevant time, with the x-axis depicting the week number, starting from the first week of January 2020. The y-axis depicts prevalence. Each plot has a trend line and two error lines that describe the confidence of the trend lines. The error lines have a confidence of 95 percent, meaning that there is a calculated 95 percent chance that the prevalence of each topic at any point is within the area between the two error lines. Some plots will have a trendline that seems to peak in the pre-crisis stage but has not been considered prevalent because of the trend line's uncertainty.

4.2.1 Topics prevalent in the pre-crisis stage



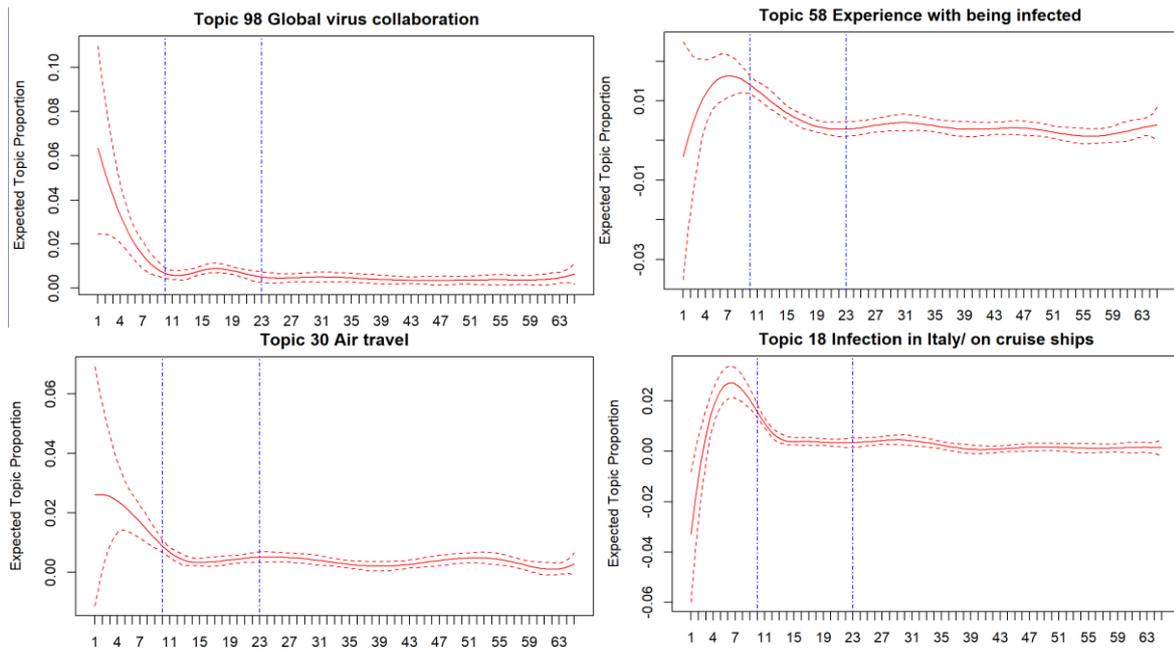


Table 9

Topics prevalent in the pre-crisis stage

Prevalence	Topic Label	Code	Topic #
1.45 %	Preventative infection measures	Self-efficacy	185
1.05 %	Covid outbreak in Norway	Sensemaking	79
0.99 %	Early development of infection	Sensemaking	13
0.94 %	Covid research	Sensemaking	135
0.85 %	At-risk groups	Self-efficacy	124
0.76 %	Infected people (Named)	Sensemaking	3
0.55 %	Global virus collaboration	Sensemaking	98
0.42 %	Experience with being infected	Self-efficacy	58
0.41 %	Air travel	Self-efficacy	30
0.38 %	Infection in Italy/on cruise ships	Sensemaking	18

The topics listed above peaked in their prevalence in the pre-crisis stage. Some of these topics have a clear peak and tapered off before the initial crisis stage (e.g., Topic 98), while others tapered off during the initial crisis stage (e.g., Topic 58) but stabilized by the maintenance stage of the pandemic. During this stage, the most prevalent topic (Topic 185) focused on infection and preventative measures people could take to avoid spreading the virus and has been coded as conducive to self-efficacy. The topic explores concepts like social distancing and washing hands, likely to reduce personal risk. It was most prevalent in the pre-crisis stage but remained so for much of the initial crisis. Several topics focused on the spread of infection during the pre-crisis stage (Topic 3, Topic 13, Topic 18, Topic 79). Topic 3 mainly concerns infected individuals, often famous, e.g., Tom Hanks. Topic 13 concerns the

countries and places first affected by the virus, e.g., Wuhan in China and Japan. Topic 18 is similar but covers texts about Italy and infections onboard cruise ships, where some early infections outside of Asia happened, and was less prevalent than topic 13. Topic 79, the more prevalent infection-related topic of this stage, is about the infections and smaller outbreaks in Norway. Representative documents mainly describe early detection efforts in Norwegian hospitals.

Topic 79 documents 1:5 (short)

CNN: Trump kalte Fauci «katastrofe» Ifølge TV-kanalen kom president Donald Trump med nedsettende kommentarer om mannen som står i front av USAs kamp mot coronaviruset: Dr. Anthony Fauci. - Fauci er e

Trump dropper pressebrifing - og tordner mot media USAs president Donald Trump avstår lørdag fra å holde sin daglige pressebrifing i Det hvite hus om coronaepidemien, og sier nyhetsdekningen ikke er

Trump til kamp mot sin egen koronarådgiver Donald Trumps rådgivere forsøker å svekke Anthony Faucis sterke omdømme, ifølge amerikanske medier. Presidenten selv mener smitteverneksperter «har begått m

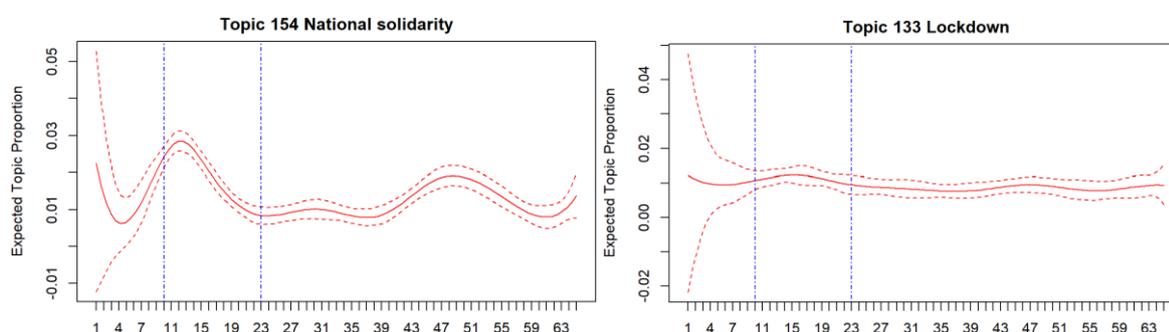
Smitteverneksperter Fauci har fått ny sjef: - Befriende følelse Han ble kjent for å tørre å si imot Donald Trump. Tilbake i presserommet i Det hvite hus sier smitteverneksperter Anthony Fauci at det er «

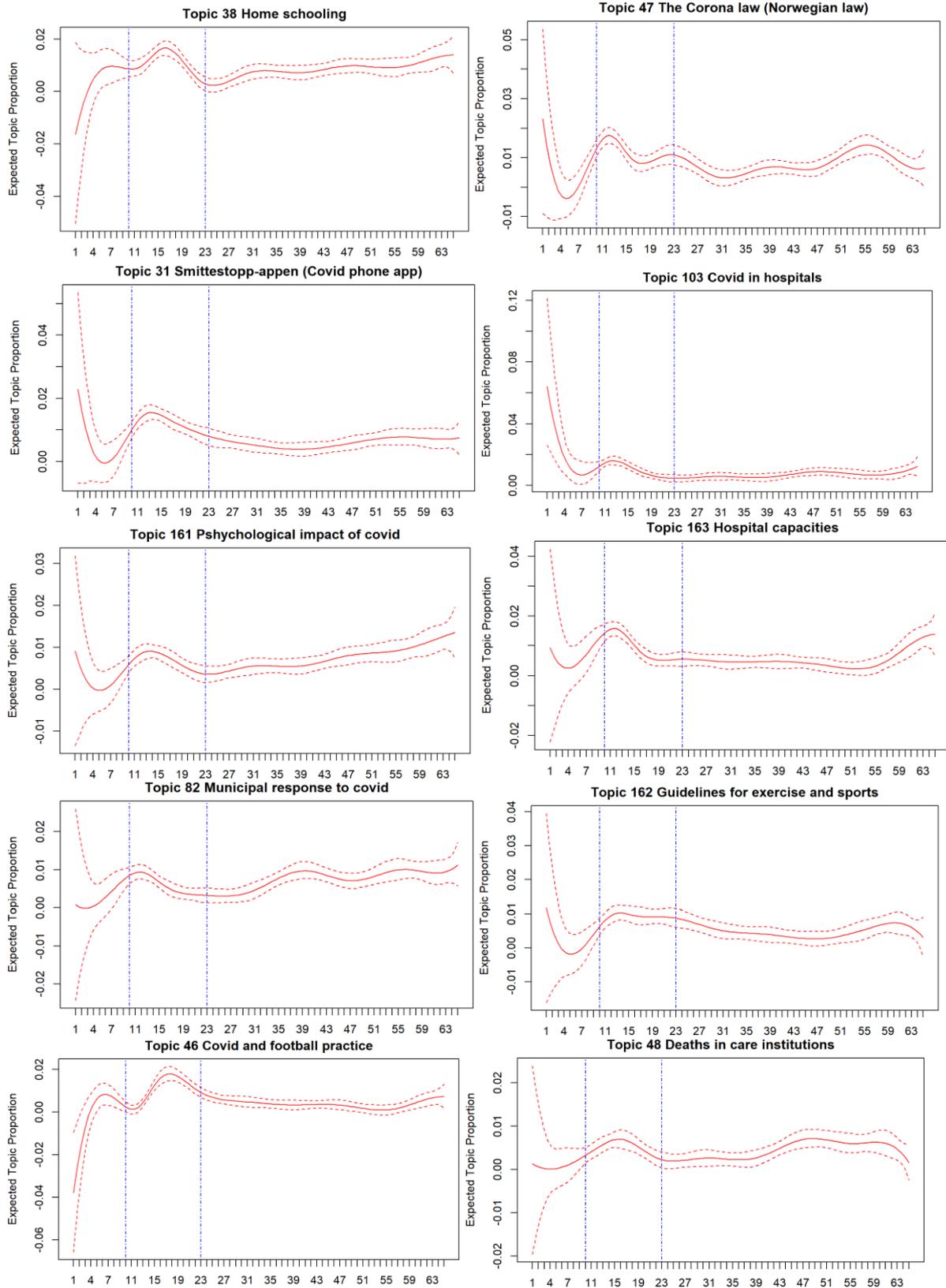
Trump på krigsstien med journalister USAs president Donald Trump ble stilt til veggs av CNNs reporter etter å ha brukt den daglige pressekonferansen til selvskyt. Trump brukte deler av søndagens pre

Note. The presented textbox reflects the first 200 characters of the five most representative documents of topic 79.

Other sensemaking topics which peaked during this stage concern international cooperation and response in the face of the virus threat (Topic 98) and research into the qualities and origins of the virus (Topic 135). Along with the previously mentioned Topic 185, three other topics were considered reflective of communications about self-efficacy. Topic 30 includes documents about the options for traveling by air, recommendations, and preventative measures. Topic 124 consists of text about population segments most at risk of the virus, and Topic 58 is about people's experiences with infections.

4.2.2 Topics prevalent in the initial crisis stage





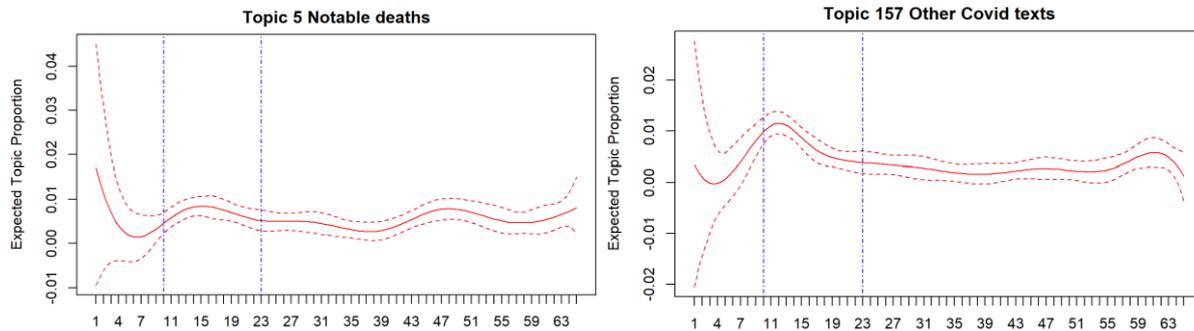


Table 10

Topics prevalent in the initial crisis stage

Prevalence	Label	Code	Topic #
1.98 %	National solidarity	Self-efficacy	154
1.10 %	Lockdown	Self-efficacy	133
1.07 %	Homeschooling	Self-efficacy	38
0.95 %	The Corona law (Norwegian law)	Self-efficacy	47
0.93 %	Smittestopp-appen (Covid phone app)	Self-efficacy	31
0.85 %	Covid in hospitals	Sensemaking	103
0.84 %	The psychological impact of covid	Sensemaking	161
0.77 %	Hospital capacities	Sensemaking	163
0.73 %	Municipal response to covid	Sensemaking	82
0.68 %	Guidelines for exercise and sports	Self-efficacy	162
0.57 %	Covid and football practice	Self-efficacy	46
0.41 %	Deaths in care institutions	Sensemaking	48
0.41 %	Notable deaths	Sensemaking 5	5
0.36 %	Other covid texts	Sensemaking	157

Topics that were prevalent in this stage range from topics with a small peak (e.g., Topic 133, 162) to topics with a more prominent peak (e.g., topic 31, 38). Some of these topics became prevalent again later in the maintenance stage (e.g., Topic 154, 163, 82). The most prevalent topic was Topic 154, about national solidarity. It covers texts about life under the pandemic, people's struggles and sacrifices, solidarity, celebrating holidays while keeping distance, and more. The topic became prevalent early in the initial crisis stage and had a relatively low prevalence until later in the maintenance stage, around the time of the second and third waves of the crisis.

Topic 154 National solidarity 1:5 (short)

Klara (86) savner besøk: - Jeg tror mange har det vondt nå Klara Lie har astma og er i risikogruppen for coronasmitte. Hun prøver å komme seg ut hver dag og holder behørig avstand, men skulle gjerne

Folket er positive til en koronapreget jul: - Vi skal huske 2020 som året vi var sabla kreative Onsdag ble det offentliggjort at julen blir preget av strenge restriksjoner. Oslos befolkning holder f

Regjeringens budskap til barn: - Det skal gå bra Statsminister Erna Solberg holdt mandag formiddag en tale for barn. Hun sier det er lov å være redd, men understreker at barn stort sett bare blir litt

De holder Norge i gang Publisert 24. mars 2020 Annemor Larsen Holder Norge i gang Store deler av Norge er stengt ned. VG har snakket med noen av dem vi ikke klarer oss uten. SVEIP OPPog les hva de for

14 historier fra coronakrisen: - Har ikke sett kona på en måned Les hvordan coronaviruset har snudd hverdagen opp ned for folk i Liflaten borettslag i Bergen. Jeg er vant til å reise hjem til Kvinnhe

Other Self-efficacy related topics reflect guidelines for training at wreck centers and sports (Topic 162), covid and football practice (Topic 46), the topic concerning an app designed to track infection (Topic 31), and homeschooling (Topic 38). The plot for Topic 31 suggests it might also have peaked earlier in the initial crisis stage, but the broad error lines make that highly uncertain.

The two final topics coded as sensemaking were the lockdown topic (Topic 133) and the topic about covid in hospitals (Topic 103). While Topic 133 did peak in the pre-crisis stage, this peak was relatively small and, in general, the topic had a consistent prevalence throughout the crisis. It illustrates that, while topics can be categorized as prevalent in one stage to show a general trend, every topic varied in prevalence in different ways over the analyzed period.

Many of the topics presented followed a similar trend of peaking in prevalence early in the initial crisis stage and then were gradually increasing in prevalence or peaked again later in the maintenance stage (Topic 5, 47, 48, 82, 154, 157, 161, 163). This collection includes topics concerning national solidarity, the corona law, homeschooling, the psychological impact of covid, municipal response to covid, and notable deaths. These topics peaked around the time of the second and third waves of infection, but they do not all share a similar curve. The least prevalent topic in this group (Topic 157) was challenging for the coders to interpret, as it reflected several different types of texts, including documents focusing on the impact of covid on inmates in prison and documents about working at a home office.

Topic 157 documents 1:5 (short)

Fremdeles hjemmekontor? Dette kan du kreve at arbeidsgiveren din dekker. - Enkelte arbeidsgivere velger å gi de ansatte en bestemt sum til dekning av hjemmekontorutstyr, svarer advokat Runar Hombø.

Sivilforsvaret bistår i corona-krisen Direktoratet for samfunnssikkerhet og beredskap bekrefter overfor VG at Sivilforsvaret får en rekke forespørsler flere steder i landet. - Det er en rekke ulike s

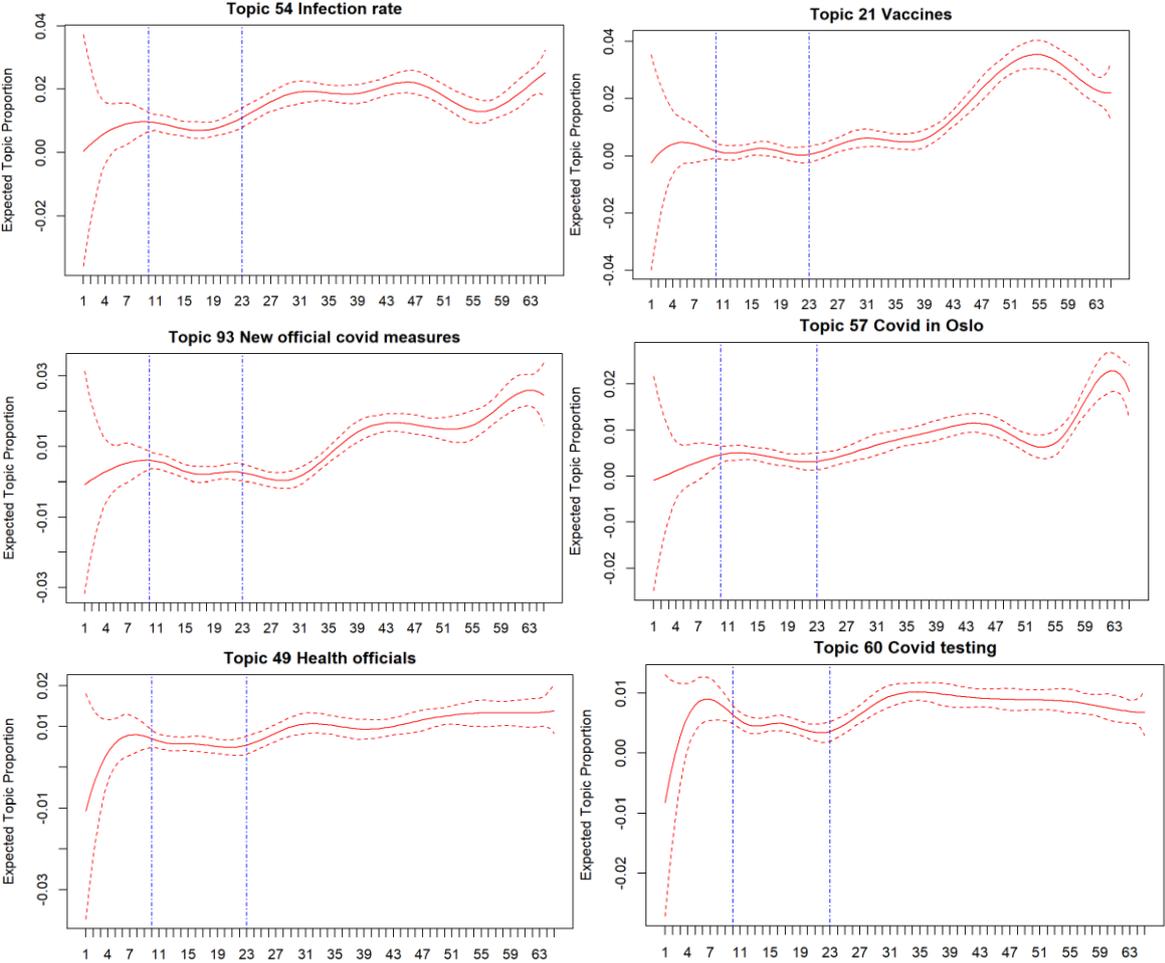
Regjeringen har laget liste over jobber som er viktigst under coronakrisen Regjeringen la mandag fram listen over hvilke jobber som nødvendig for å holde Norge i gang i krisetid. Ansatte kan ha rett

Innsatte sitter isolert i 21 timer i døgnet I dette fengselet fikk de innsatte nok av isolasjonen i desember, da de sto midt i et stort coronautbrudd. En innsatt tente på cellen sin. - Da kjente jeg

Ap anklager justisministeren for lovbrudd. Mmener innsatte får ulovlig streng straff som følge av coronakrisen. Fanger som ikke vurderes som farlige, må nå sone i et fengsel med høyt sikkerhetsnivå.

Topic 47, about the corona law, was mainly prevalent in the initial crisis stage, with two peaks, then tapered off and peaked again later in the maintenance stage. This topic, along with the lockdown topic (Topic 133), represents two significant preventative measures dictated by officials. Topic 161, about the psychological impact of the crisis, also peaked in the initial crisis stage and slowly built in prevalence again throughout the maintenance stage. Topic 82 covers the municipal response to covid. It peaked in the initial crisis stage and later in the maintenance stage, similar to Topic 163, about hospital capacities, Topic 5, notable deaths, and Topic 48, death in institutions. Topic 103, about covid in hospitals, also became prevalent later in the maintenance stage.

4.2.3 Topics prevalent in the maintenance stage



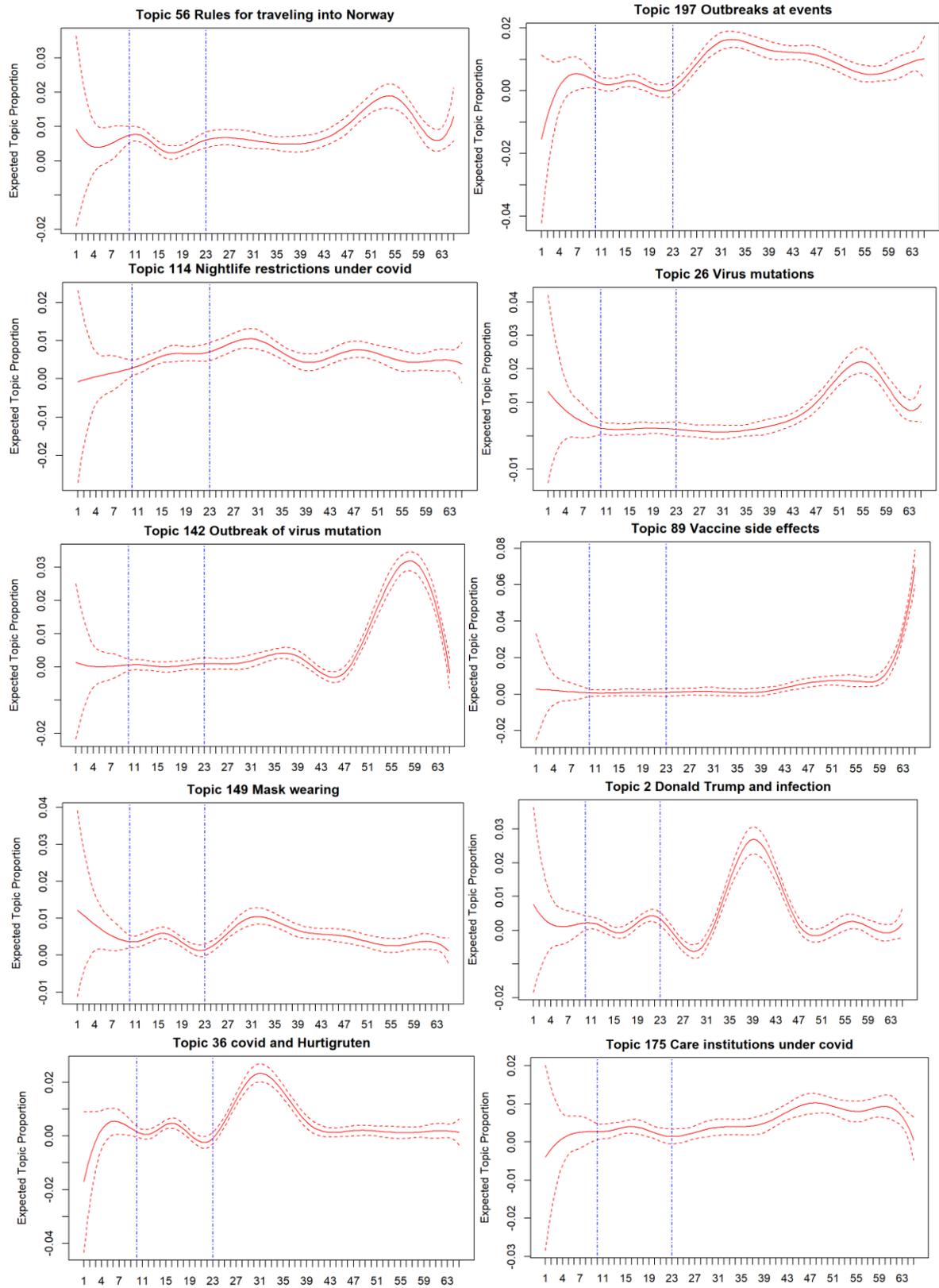


Table 11*Topics prevalent in the maintenance stage*

Prevalence	Label	Code	Topic #
1.75 %	Infection rate	Sensemaking	54
1.21 %	Vaccines	Self-efficacy	21
1.01 %	New official covid measures	Self-efficacy	93
0.91 %	Covid in Oslo	Sensemaking	57
0.89 %	Health officials	Crisis communicators	49
0.82 %	Covid testing	Self-efficacy	60
0.75 %	Rules for traveling to Norway	Self-efficacy	56
0.69 %	Outbreaks at events	Sensemaking	197
0.59 %	Nightlife restrictions under covid	Self-efficacy	114
0.55 %	Virus mutations	Sensemaking	26
0.53 %	Outbreaks of virus mutation	Sensemaking	142
0.53 %	Vaccine side effects	Self-efficacy	89
0.48 %	Mask wearing	Self-efficacy	149
0.45 %	Donald Trump infected (Event)	Sensemaking	2
0.45 %	Hurtigruten (Event)	Sensemaking	36
0.41 %	Care institutions under covid	Sensemaking	175

The topics that peaked in the maintenance stage varied between topics with a more marked change in prevalence from the initial crisis stage (Topic 49, Topic 60, Topic 197) to topics that had an even and low prevalence for most of the three crisis stages, but peaked later in the maintenance stage (Topic 89, 26, 142). As presented in the previous chapter, some topics that peaked during this stage also peaked earlier in the initial crisis stage.

The most prevalent topic that peaked in the maintenance stage of the crisis was the infection rate topic (Topic 54). It gradually became more prevalent after the end of the initial crisis stage. The topic is distinct from other topics focusing on the spread of infection (e.g., Topic 3, 13, 17, 79) in that it is more statistical and includes texts about the daily number of infections. Many of these texts also appear very similar, presenting the number of infections per day with added context.

Topic 54 documents 1:5 (short)

555 NYE REGISTRERTE SMITTETILFELLER I NORGE 555 NYE REGISTRERTE SMITTETILFELLER Søndag ble det ble 555 bekreftet smittet av coronaviruset i Norge. Det er 110 tilfeller færre enn gjennomsnittet de for
1034 nye registrerte smittetilfeller av corona i Norge Torsdag ble det registrert 1034 nye smittetilfeller med coronaviruset i Norge. Det 126 tilfeller flere enn gjennomsnittet de foregående syv dage
865 nye registrerte smittetilfeller i Norge Mandag ble det registrert 865 nye smittetilfeller med coronaviruset i Norge. Det 78 tilfeller flere enn gjennomsnittet de foregående syv dagene, som er på
250 nye koronasmittede siste døgn - 32 færre enn for en uke siden Det siste døgnet er det registrert 250 koronasmittede i Norge. Det er 22 færre enn dagen før og 32 færre enn samme dag i forrige uke.
160 nye koronasmittede registrert siste døgn Det var ved midnatt natt til torsdag registrert 15.952 koronasmittede personer her i landet. Det er en økning på 160 meldte tilfeller siste døgn. Det er p

Four other topics that were prevalent in the maintenance stage concern infections. Topic 175 describes infections and their consequences to care homes across the country;

Topic 57 is about infection levels in Oslo, the place hit hardest by the crisis in Norway; Topic 197 focuses on outbreaks of the virus at events; Topic 142 focuses on outbreaks of different mutations of the virus. The latter topic, along with Topic 26, about covid mutations, peaked later in the maintenance stage, as new developments of the crisis presented new challenges to public health. Topic 2 also concerns infection but focuses exclusively on Donald Trump. The prevalence of this topic peaked over the period when the American president got infected with the virus. Hence, this topic represents an event-centered topic. Similarly, the Norwegian coastline ferry route “Hurtigruten” (Topic 36) topic peaked early in the maintenance stage after several issues with infection and a lack of preventative measures resulted in an outbreak of the virus.

Multiple topics concern official communications and preventative measures (Topic 49, 56, 93). Topic 49 reflects direct communications by health officials, the Norwegian Directorate of Health (Hdir), The Norwegian Institute of public health (FHI), and the Norwegian Health minister. The topic is the only one coded with the crisis communicators code and increased gradually in prevalence from the initial crisis to the maintenance stage. Topic 93, about new covid restrictions, followed a similar but steeper curve and became more prevalent a few weeks into the maintenance stage.

Topic 93 documents 1:5 (short)

Regjeringen innfører tiltak i ti nordlandskommuner Regjeringen innfører det strengeste tiltaksnivået i Bodø som følge av et pågående utbrudd av den sørafrikanske virusvarianten. - Bodø kommune har et
Innfører regionale tiltak i seks kommuner i Vestfold og Telemark Kommunene og statsforvalteren ba selv om hjelp fra regjeringen til å innføre strengere tiltak. Nå har de fått svar. - Det er en betyde
Kommunene fra Halden-utbruddet får lettelse onsdag Kommunene som søndag fikk forsterkede tiltak etter et utbrudd i Halden, skal onsdag få samme lettelse som de andre kommunene som er definert som «
Koronatiltak: Nå er det ring 1, ring 2 pluss tiltaksnivå A, B, C og D som gjelder Helseminister Bent Høie (H) presiserer at systemet med ring 1 og ring 2 ikke i seg selv forklarer hvor strenge korona
Ringtiltak i Oslo og Viken oppheves Regjeringens tiltakspakker i 20 kommuner i Oslo og Viken blir ikke forlenget fra og med 18. februar. Det opplyser helseminister Bent Høie i en pressekonferanse tir

New topics conducive to self-efficacy also became prevalent at this stage, e.g., topics concerning mask-wearing (Topic 149), covid testing (Topic 60), rules for traveling into Norway (Topic 56), restrictions for nightlife (Topic 114), and the vaccine (Topic 21). The vaccine topic (Topic 21) was the most prevalent self-efficacy topic during the maintenance stage. It increased slightly after the initial crisis stage but had a much steeper curve later in the maintenance stage. The topic also decreased in prevalence later when Topic 89, about the vaccine's side effects, became prevalent.

4.2.4 Other CERC topics

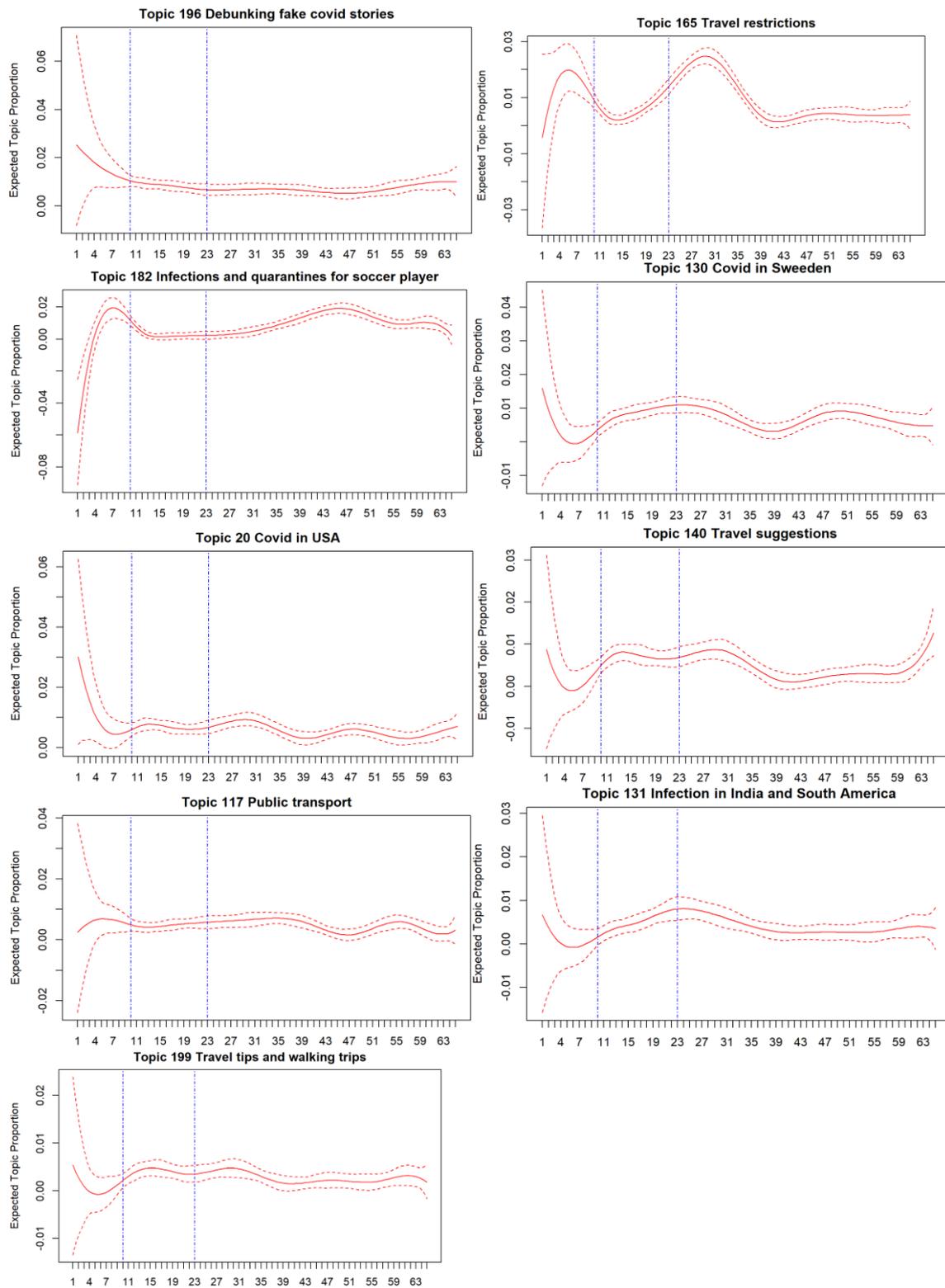
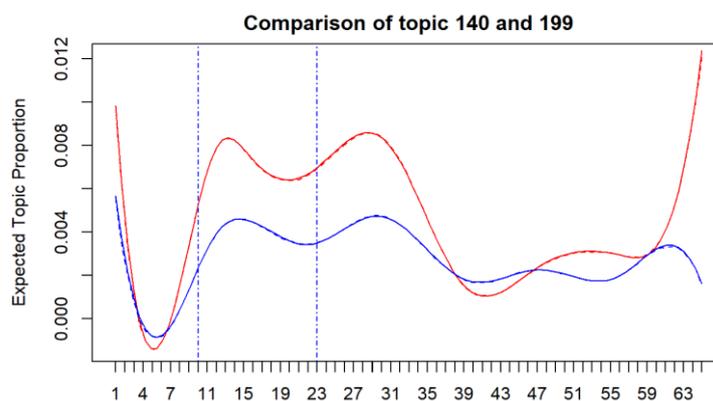


Table 12*Other CERC topics*

Prevalence	Label	Code	Topic #
0.87 %	Debunking fake covid stories	Self-efficacy	196
0.84 %	Travel restrictions	Self-efficacy	165
0.75 %	Infections/quarantines for soccer players	Sensemaking	182
0.72 %	Covid in Sweden	Sensemaking	130
0.60 %	Covid in the USA	Sensemaking	20
0.57 %	Travel suggestions	Self-efficacy	140
0.50 %	Public transport	Self-efficacy	117
0.41 %	Covid in India and South America	Sensemaking	131
0.24 %	Travel tips and walking trips	Self-efficacy	199

Several topics did not have a clearly defined peak in any of the stages. These topics range from topics that have a consistent prevalence throughout all the crisis stages (e.g., Topic 196, 117) and topics that fluctuate continuously throughout the crisis stages (e.g., Topic 140, 199). Two topics are prevalent in the pre-crisis and maintenance stages but are less prevalent during the initial crisis stage (Topic 165, 182).

Three topics were labeled as either travel suggestions or restrictions (Topic 165, 140, 199). Topic 165 is distinct from topic 140 and Topic 199 in that it consists of text about travel restrictions communicated by public officials. Topics 140 and 190 are similar in prevalence over time but slightly differ in content. These were all considered self-efficacy, as they explore how people were able to travel in ways that did not increase the risk of infection, consistent with exploring risk-reducing behavior.



Note. The figure compares the prevalence of topics 140 and 199 over time. For readability, error lines are removed.

Three topics have a focus outside of Norway. Topic 20 includes texts about covid in the USA, Topic 131 includes texts about India and South America, and Topic 130 includes texts about covid in Sweden. These topics were considered sensemaking as they gave some context to what a potential crisis escalation might have looked like in Norway, exploring how the crisis affected communities in other countries.

The most prevalent topic in this group is Topic 196, which concerns false information about the coronavirus. The topic had a relatively even prevalence across all stages and was coded as facilitating self-efficacy. Topic 182 peaked in the initial crisis and maintenance stages and is about infections and quarantines for football players. Finally, topic 117 was also coded as facilitating self-efficacy as it addresses what to do and not to do concerning public transportation.

4.3 Presenting other topics reflective of coverage of Covid-19

Table 13

Non-CERC topics reflecting the news coverage of the crisis

#	Label	Theme	Prevalence
9	The national budget	Economy and business	0.81 %
10	Boris Johnson and controversy	Foreign affairs	0.46 %
12	Foreign workers	Economy and business	0.25 %
16	Erna Solberg and controversy	National politics	0.60 %
22	Canceled world cup	Sport	0.34 %
40	Layoffs and benefits	Economy and business	0.71 %
41	Canceled events	Culture	0.40 %
45	Covid impact on rich and poor	Economy and business	0.36 %
78	Consequences for the air travel industry	Economy and business	0.44 %
88	Consequences for winter sports	Sport	0.39 %
91	Trump against Fauci	Foreign affairs	0.80 %
92	Students	Education	0.56 %
100	Postponements and cancellations	Culture	1.68 %
105	School exams and grades	Education	0.43 %
113	Layoffs in football	Football	0.55 %
116	Stock exchange	Economy and business	0.60 %
107	Breach of covid regulations	Crime	0.66%
122	Canceled sporting events	Sport	0.50 %
128	Economic support for businesses	Economy and business	0.59 %
139	Consequences for the hotel and travel industry	Economy and business	0.52 %
144	Critique of China	Foreign affairs	0.61 %
166	Restaurant and bar industry consequences	Economy and business	0.45 %
183	Refunds	Economy and business	0.52 %
184	Food prices	Economy and business	0.58 %
191	Cultural support	Culture	0.59 %
195	Cancelation of the Olympics	Sport	0.32 %

The following section presents a brief overview of 26 potentially relevant topics not considered reflective of CERC. Multiple topics focus on cancellations of different kinds of events, including postponements and cancellations, canceled sporting events, and cancellation/postponement of the Olympic games (Topic 22, 41, 100, 188, 122, 195); these were consequences of preventative measures and restrictions in place during the crisis, but are not reflective of the measures themselves. Hence, these topics were not considered conducive to self-efficacy. Chapter 6.3 presents some more discussion on this point.

Other topics cover economic consequences such as layoffs and remedial financial help (Topic 40, 113), effects on the stock exchange, economic support (Topic 128, 191), refunds (Topic 183), and increasing food prices (Topic 184). The national budget and stock exchange topics were included in this group (Topic 9, 116) since the crisis heavily influenced both. Topic 45 focuses on the impact of covid on the rich and the poor. Further, multiple topics deal with consequences for business and education, including the travel industry (Topic 139), the air travel industry (topic 78), the restaurant and bar industry (Topic 166), consequences in higher education (Topic 92), and in high schools (Topic 105), and consequences to the farming industry as a result of a lack of migrant workers (Topic 12).

Multiple topics seemingly focused on criticism and controversy (Topic 10, 16, 91, 107, 144). Topic 144 focuses on texts critical of China. This topic was added because of covid's origin in Wuhan, China, but the topic mainly covers other aspects of Chinese politics. Topic 107 focuses on people breaking covid restrictions. The topic concerns people hosting or attending events and parties when it was not allowed or they were otherwise quarantined or infected. Topic 16 focuses on Erna Solberg, the Norwegian prime minister during the relevant time. The most representative stories of this topic deal with an incident stemming from the mayor of the City of Molde criticizing officials in Oslo for their response. At this time, Oslo had a higher infection rate than the rest of the country. Other representative texts on this topic covered Erna Solberg when she broke covid restrictions.

Like Topic 16 and Erna Solberg, the most representative texts for Topic 10 center around criticism of officials close to Boris Johnson. I.e., some controversy surrounding the British prime minister. Topic 91, about Trump and his health official Anthony Fauci, follows a similar trend of topics about heads of state and controversy. However, representative documents focus on Donald Trump criticizing his officials. Examples of these documents are presented in the analysis (Chapter 5.3).

5 Analysis

In this chapter, I systematically go through the presented results and note the patterns I find in light of the presented crisis development, literature, theory, and theoretical framework. I avoid discussing broader practical and theoretical implications, as this is saved for the discussion. Instead, I will make several Ox observations. These observations are addressed in the discussion. I end the chapter by describing the Norwegian news media's crisis and emergency risk communication throughout the three relevant stages.

5.1 Identifying thematic and topical patterns

Scholars including Bardhan (2001) and Pan & Meng (2016) have categorized news stories about public health crises using the different frames of (a) health risk, (b) medical/scientific issue, (c) public prevention/protection, (d) economic consequences, (e) societal problems and (f) political/ legal. An implication of this is that news stories about health crises will fall under one of these frames. However, the presented results indicate that this is not the case for the Covid-19 crisis in Norway. While some presented topics do reflect these frames, many do not. Sports, particularly football, are prevalent themes not captured by this categorization. While the large number of topics within the sport and football themes may be explained in part by the fact that coverage of different sports uses distinct language and is, therefore, more easily recognized by the STM model (Roberts et al., 2016), this does not explain the high prevalence of the theme, which accounts for almost a fourth of the corpus.

Furthermore, the model includes topics focusing on football teams (e.g., Topic 7, 126, 136), individual sports (e.g., Topic 22, 85, 190), national economy (e.g., Topic 155, 184), popular culture (e.g., Topic 64, 110, 120), political topics such as elections (e.g., Topic 55, 95, 72), societal issues such as racism (Topic 156), climate change (Topic 111), and common cultural topics not typically associated with a crisis, such as book reviews (Topic 189), food (Topic 193), quizzes (Topic 147) and podcasts (Topic 11). These specific news topics are not unusual for topic models to pick up on (Jacobi et al., 2016), as the language used for concepts such as quizzes and book review is often quite distinct. However, the prevalence of these themes is hard to explain, given that all topics and themes reflect documents that reference the coronavirus.

O1: The breadth and variety of coverage mentioning the coronavirus indicate a ubiquity in how the crisis impacted news media content.

These results also make sense in light of the number of references to the search terms by *Aftenposten* and *VG* over the relevant time (33.14 % of coverage). I.e., the Covid-19 crisis represented a substantial part of the agenda of the two newspapers during the first 15 months after the coronavirus first appeared.

O2: The breadth and salience of coverage referencing the coronavirus indicate that the Covid-19 crisis in Norway reflected a significant part, and at times the majority, of the agenda of the two newspapers.

Contrary to findings in some of the presented literature (Dudo et al., 2007; Klemm et al., 2016), few topics reflect a single event (episodic). However, there are some exceptions: Topic 195 concerns the cancelation and postponement of the Olympic games; Topic 2 focuses on Donald Trump, when he became infected with covid, and Topic 18, about infection in Italy and on cruise ships, concerns the specific episodes of infection occurring earlier in the pandemic. An important distinction is that both Klemm et al. (2016) and Dudo et al. (2007) coded individual texts. While, for a topic to be episodic, the episode must be covered enough for the topic model to recognize it. This is exemplified by Topic 18, as this topic focuses on two episodes: The crisis in Lombardia, Italy, and infections onboard cruise ships that happened around the same time. Other topics seem not to reflect events (e.g., Topic 54).

O3: Individual texts are often episodic but generally reflect a broader topic. However, some events are covered so extensively that they become a topic or represent a substantial part of a topic.

5.2 Analyzing changes in crisis communication over time

The CERC framework posits that communication needs will change over time in a public health crisis through a five-stage crisis development model (Veil et al., 2008). Theoretically, as the news media provide a medium for disseminating CERC, we should observe some change in communication through these stages. I analyzed these changes in light of CERC goals at different stages of a crisis (Reynolds & W. Seeger, 2005; Chapter 2.3.2; Appendix 8). The results indicate that topical prevalence was related to a change from the pre-crisis stage to the initial crisis stage. Ten topics showed a clear peak in prevalence over the pre-crisis stage before losing prevalence early or during the initial crisis phase. 14 topics peaked during the initial crisis stage, though not all exclusively. This change is consistent with the Veil et al. (2008) proposition that communication will change drastically through different stages of a crisis, especially from the pre-crisis to the initial crisis. 16 topics

peaked in prevalence or were substantially more prevalent during the maintenance stage. However, when topics peaked during this stage differed and often reflected new crisis developments and current events.

O4: The results indicate that the news media CERC changed drastically from the pre-crisis to the initial crisis stage and that changes in CERC after the initial crisis stage were less predictable.

5.2.1 News media CERC during the pre-crisis stage

According to the CERC framework, CERC topics should concern detecting events, conveying early signs of risk, public preparation of risk to facilitate behavioral change (self-efficacy), and fostering understanding of risk during the pre-crisis stage (Reynolds & W. Seeger, 2005). As presented in the results, multiple topics were found conducive to facilitating self-efficacy. Topic 185 addresses the preventative measures individuals can take to limit their risks and how we can limit risk as a society, allowing people to better decide how to limit risk for themselves. Topic 124, about at-risk groups, allows people in these groups to understand they need to act to mitigate risk to themselves and allows others to understand who might need extra support. Identifying at-risk groups is considered an important part of CERC (Veil et al., 2008). Topic 58, about experiences of infection, allows people to understand when they and others have symptoms, which allows them to modify their behavior. It also provides a better understanding of risk. Topic 30 facilitates self-efficacy by addressing risk-increasing behavior associated with traveling. These topics indicate that VG and Aftenposten focused on disseminating information about self-efficacy during this stage. Hence, their communication was conducive to the goal of facilitating self-efficacy in the public during the pre-crisis stage.

O5: The results indicate that the Norwegian news media coverage facilitated self-efficacy in the pre-crisis stage by disseminating information about at-risk groups, symptoms, preventative measures, and air travel. Some of these topics remained prevalent through much of the initial crisis stage.

Four topics prevalent during the pre-crisis stage concern infections (Topic 3, 13, 18, 79): Topic 13 covers the early spread of the virus from Wuhan to Southeast Asia. Topic 18, which is less prevalent, covers the developments in Lombardia, Italy, and infections on cruises worldwide. Both topic 13 and topic 18 reflect sensemaking through detection, i.e., public monitoring of risk (Boin et al., 2017), in the sense that they are about a possible threat

that had not reached Norway at the time they were prevalent. These topics allow Norwegian readers to understand what could happen in Norway. Topic 79 reflects the coverage of early infections in Norway, including identifying the virus in Norwegian hospitals. The topic reflects early detection efforts within the country and is conducive to the CERC goal of identifying and recognizing risk and facilitating public preparation.

***06:** The results indicate that Norwegian news media reported early signs that a crisis might be imminent, conducive to public monitoring of emerging risk.*

Further, Topic 135, about the coronavirus research, may have helped increase technical understanding of the virus by understanding how such viruses spread, likely conducive to a better understanding of risk. This topic reflects text about the research into the coronavirus. An increased understanding might also have been facilitated by topics such as people's experience with being infected (Topic 58), infected named individuals (Topic 3), and infections in Italy and on cruise ships (Topic 18).

***07:** The results indicate that the Norwegian news media covered developments in other countries, infected people, and their experiences and therefore likely contributed to a better public understanding of risk during the pre-crisis stage.*

To put the coverage during the pre-crisis stage into perspective, the salience of coverage mentioning the coronavirus was substantially lower at this time than in later stages. The coverage reflected 6.27 % of the total coverage of the two newspapers for the first ten weeks of 2020. This indicates that, while communications of the virus largely centered around meeting CERC goals, the virus was not as high on the agenda as during later stages.

***08:** Coverage of the coronavirus represented a small part of the news organization's agenda during the initial crisis stage.*

5.2.2 News media CERC during the initial crisis stage

Contrary to the pre-crisis stage, Figure 6 shows that the coronavirus influenced most of the agenda during the initial crisis stage; from week 11 through week 23, coverage mentioning the coronavirus reflected 59.26 % of all coverage from the two newspapers.

***09:** Coverage of the coronavirus reflected the majority of the agenda of the two newspapers during the initial crisis stage.*

14 topics spiked in prevalence during the initial few weeks after the Covid-19 pandemic became a crisis in Norway. During this stage, communication goals shift from threat identification toward uncertainty reduction, reassurances, and informing about crisis management and medical response (Reynolds & W. Seeger, 2005).

Topic 154, about national solidarity, was the most prevalent topic during this stage. It covers the national effort to address the crisis, people's sacrifices, and reassurances from public officials.

Topic 154 documents 1:5 (short)

Klara (86) savner besøk: - Jeg tror mange har det vondt nå Klara Lie har astma og er i risikogruppen for coronasmitte. Hun prøver å komme seg ut hver dag og holder behørig avstand, men skulle gjerne
Folket er positive til en koronapreget jul: - Vi skal huske 2020 som året vi var sabla kreative. Onsdag ble det offentliggjort at julen blir preget av strenge restriksjoner. Oslos befolkning holder f
Regjeringens budskap til barn: - Det skal gå bra Statsminister Erna Solberg holdt mandag formiddag en tale for barn. Hun sier det er lov å være redd, men understreker at barn stort sett bare blir lit
De holder Norge i gang Publisert 24. mars 2020 Annemor Larsen Holder Norge i gang Store deler av Norge er stengt ned. VG har snakket med noen av dem vi ikke klarer oss uten. SVEIP OPP og les hva de for
14 historier fra coronakrisen: - Har ikke sett kona på en måned Les hvordan coronaviruset har snudd hverdagen opp ned for folk i Liflaten borettslag i Bergen. Jeg er vant til å reise hjem til Kvinnhe

Reading coverage of people's struggles is likely to foster empathy (Halpern, 2003; Oliver et al., 2012). Further, some of these texts reflective of this topic directly address assurances by public officials (See the third document in the textbox above). In this way, the topics also reflect official reassurances to the public. Topic 161, about the psychological impact of covid, is also likely conducive to empathy and reduction of emotional turmoil, as it allows readers to see that people are going through emotional struggles.

O10: *The results indicate that the Norwegian news media coverage of Covid-19 during the initial crisis stage may have facilitated solidarity, empathy, reassurance, and a reduction of emotional turmoil by covering people's emotional struggles and sacrifices and a collective national effort to address the crisis.*

Multiple topics appear conducive to understanding emergency management and medical response. Topics 103, 163, and 175 address the covid situation in hospitals, hospital capabilities, and deaths in institutions such as care homes. While Topic 175 slightly increases in prevalence during the initial crisis stage, it becomes more prevalent in the maintenance stage. Topic 38 addresses deaths in care institutions, also contributing to a public understanding of the consequences of the crisis. These topics deal with the impact on these medical institutions, their capacities, and their response.

O11: *The results indicate that the Norwegian news media coverage of Covid-19 during the initial crisis stage contributed to a specific understanding of medical response by reporting on infections, deaths, response activities, and capabilities in hospitals and institutions.*

Multiple topics address crisis management during this stage, mainly through officially dictated measures to address the crisis, e.g., Topic 38, homeschooling, Topic 133, lockdown and Topic 47, The Corona Law, Topic 162, guidelines for exercise and sports, Topic 46, guidelines for football practice, and Topic 82 Municipal response to the crisis. Since most of these topics concern dictated measures, they are also conducive to self-efficacy in public. I.e., they address the measures people must follow to protect themselves and others.

O12: *The results indicate that the Norwegian news media coverage of Covid-19 during the initial crisis stage contributed to a specific understanding of crisis management by reporting official measures to address the crisis and municipal response.*

Topic 31, “Smittestopp-appen,” is a public effort of crisis management in the form of an application to track infection. The app had limited success and garnered criticism for breaching data privacy regulations. Because of the limited success of the app, one could argue about its self-efficacy effect. As a result, Topic 31 reflects a topic that fits the identification criteria based on the coding scheme for self-efficacy but could be interpreted differently given this context. This exemplifies that each topic's effect on self-efficacy within the public will differ.

Topic 157 covers the effects of the virus on different groups. However, this topic was difficult to label, as it represents different texts that have to do with the effect of covid. Likely, this topic represents covid stories that do not reflect other topics, e.g., how covid affects inmates in Norwegian prisons. Similar to Topic 3, prevalent in the pre-crisis, Topic 5 addresses named people that die. Likely, this topic facilitates sensemaking by understanding how the crisis affects particular people, but this topic is also likely reflective of the media logic of focusing on individuals, often famous.

O13: *The results indicate that the Norwegian news media were likely to report on the effect of the virus by reporting on individuals, often famous, whom both got sick and died.*

5.2.3 News media CERC during the maintenance stage

Sixteen topics peaked in prevalence during the maintenance stage of the crisis. During this stage, CERC goals concern continuing to facilitate sensemaking and self-efficacy-based communication established in previous stages. Further, specific goals of this stage concern correction of rumors and facilitating broad-based support for recovery efforts.

New topics conducive to self-efficacy became prevalent during the maintenance stage (Topic 21, 56, 60, 89, 93, 114, 149). These topics reflect new developments in the crisis, e.g., new measures because of new developments (Topic 93), vaccine development (Topic 21), and better testing capabilities (Topic 60), indicating that, in a protracted crisis, we could expect some measures not to be communicated about until later stages. Some measures taking time to develop and uncertainty and disagreement about other measures' efficacy may explain the later prevalence of some of these topics. On the other hand, self-efficacy topics that were prevalent in the earlier stages were much less prevalent during this stage, e.g., people's experiences with infection (Topic 58) and at-risk groups (Topic 124). This could be because the news organizations saw them as less important to reiterate. Measures for increased self-efficacy prevalent in previous stages may have been so ingrained in the public psyche that there was no need to continue pushing these messages.

O14: The news media coverage during the maintenance stage of the pandemic facilitated self-efficacy by reporting on new self-efficacy measures based on developments of the Covid-19 crisis in Norway, while self-efficacy topics of earlier stages generally became less prevalent.

Some of the topics presented in the maintenance stage might be explained by the fact that, in a creeping crisis, a public response can be hard to actuate, as it is unclear what will work and what will not (Boin et al., 2020). The mask-wearing topics did not become prevalent before later in the pandemic. Earlier in the pandemic, the Norwegian government viewed mask-wearing as having little effect on risk reduction. This later changed. Hence, the salience of coverage of mask-wearing did not increase until officials deemed it an efficacious measure. This seemingly substantiates the idea that journalists are likely to follow leaders' agendas in crises, though other factors might also explain this later prevalence.

A consequence of the creeping crisis is that the crisis itself is often ambiguous (Boin et al., 2020) and that there are not always set solutions. Therefore, during the pandemic in Norway, official regulations and people's attitudes towards them may have changed.

***O15:** Some preventative measures existing throughout the crisis did not become a prevalent topic before the maintenance stage of the pandemic.*

Topic 26 and Topic 142 focus on making sense of new forms of mutated viruses and their subsequent outbreaks. Similar to topics about infections in the pre-crisis stage, one could interpret these topics as new detection efforts, i.e., they identify a new risk. These topics also reflect news organizations' propensity to report on new developments in the crisis. Topic 197, outbreaks at events, similarly, did not become prevalent before the maintenance stage, likely since few events were happening during the initial crisis stage. While the news media reporting on new developments is central to what they do, and thus not surprising, detection efforts during the maintenance stage are not something the CERC model captures as a main goal of the stage. Hence, these topics are likely a consequence of an extended timeframe of a crisis that the CERC framework does not consider.

***O16:** The results indicate that the Norwegian news media reported on new developments and escalation of the crisis if and when they occurred.*

Topic 175, about issues concerning care institutions, became prevalent around the time of the second and third waves of infection. The topic addresses some of the issues with response in different care homes across the country, especially Bergen. Five topics followed a trend: they peaked early in the initial crisis stage and later in the maintenance stage (Topic 5, 47, 48, 82, 163). These topics reflect notable deaths, the corona law, deaths in care institutions, municipal covid handling, and hospital capacities. Topic 161, about the psychological effect on the populace, followed a similar pattern; it peaked in the initial crisis stage and gradually became more prevalent during the maintenance stage. To a large extent, the peaks of these topics reflect new escalations of the crisis due to changing regulations and new virus mutations. They thus seem to be correlated with the intensity level of the crisis.

***O17:** The results indicate that some topics prevalent in the initial crisis stage became prevalent again during the maintenance stage of the pandemic when new developments presented an increased risk to the public.*

The most prevalent topic during the maintenance stage was Topic 54, about the infection rate. This topic addresses and allows readers to make sense of the scale of the crisis in Norway by giving information about the number of infections, as well as providing additional context. In their research on the coverage of the west-Nile virus, Roche and

Muskavitch (2003) analyzed how the news media covered infection. They found that much of the news coverage on infections and deaths provided little context to readers because infections were often presented through qualitative (non-numerical) information or simple numerical information with little context. Topic 54 seemingly reflects the best practice statistical coverage that news coverage on the west Nile virus seemingly lacked. Furthermore, this topic is one of the most prevalent, especially in the maintenance stage.

Topic 54 Infection rate 1:3 (Full)



Possibly, many of the news stories reflective of this topic may be a result of an automated text robot fed with daily statistics about infections in Norway. Norwegian news media organizations are increasingly using this kind of text automation (Holand & Engan, 2020). The topic hence likely reflects texts written by an algorithm which are then identified by another algorithm, i.e., some form of algorithmic kinship. Since these texts are similar, they are also more easily recognizable for a topic model. Nevertheless, the presented articles suggest that they provided context and are therefore likely reflective of statistical coverage. During the crisis, the Norwegian news media also used dynamic dashboards to track infections and give context about infections around Norway and the world, which substantiates that statistical coverage was present at earlier stages as well.

***O18:** The results indicate that the Norwegian news media covered infections with context and statistics. This coverage became more prevalent during the maintenance stage of the crisis.*

One of the goals of CERC in the initial crisis stage is to establish spokespeople. One topic, Topic 49, was coded as reflecting crisis communicators. This topic became gradually more prevalent after the initial crisis stage. While establishing these spokespeople is a goal of the initial crisis stage, since this goal is related to process rather than messaging, coverage of

these spokespeople should not necessarily be expected to be more prevalent in this stage. Nevertheless, the topic indicates that efforts to establish spokespeople were successful.

***O19:** The results indicate that the Norwegian news media coverage of crisis communicators became more prevalent throughout the maintenance stage of the pandemic.*

Topic 57 focuses on covid in Oslo. Similar to other topics that include text about covid based on geographical location (e.g., Topic 20, 130), the topic likely helped people outside of Oslo make sense of their situation by understanding how the crisis could develop for them, especially for people living in other densely populated areas. The topic also helps with sensemaking for people living in and around Oslo. Topic 2 and Topic 36 represent two of the rare event-centric topics. Topic 36, about Hurtigruten, a Norwegian coastal route that received attention after an outbreak of infection resulting partly from a lack of preventative measures (NRK, 2020), became prevalent early in the maintenance stage and dropped off again. Topic 2 focuses on the event of Donald Trump becoming infected with Covid-19. The topic is coded with, and likely contributed to, sensemaking, focusing on an individual becoming infected and very sick with the virus. Similar to other examples focusing on individuals (Topic 3, 5), the prevalence of this topic is possibly due to the news media's interest in Donald Trump rather than it being a way to make sense of the crisis for the public. It thus illustrates that, while topics that facilitate sensemaking and self-efficacy in public can be identified, some topics are likely a result of the news media's own logic rather than a deliberate effort to inform the public about risk.

The salience of coverage during the maintenance stage was relatively steady, with some troughs and peaks likely attributable to developments in the crises. During this period, the coverage of the coronavirus reflected 31,51 % of the coverage in the two selected newspapers, reflecting that the virus was still a significant part of the agenda.

5.2.4 Analysis of remaining CERC topics

Three topics focus on other countries and help facilitate sensemaking by understanding how other communities are affected and respond to the crisis (Topic 20, 130, 131). These topics mainly focus on the USA (Topic 20), Sweden (Topic 130), and India and South America (Topic 131). The fact that these topics are not distinctive in one stage is likely because coverage of these countries followed a crisis with different development patterns than the Norwegian crisis. While the topic model identified these countries, they were not the only

countries mentioned in journalistic content during the crisis. However, they were likely the countries that coverage of infections outside of Norway most centered around. The coronavirus hit all these countries hard, indicating that the Norwegian news media were more likely to focus on countries with high rather than low infection rates.

***O20:** The results indicate that the Norwegian news media coverage often focused on countries in a more severely affected crisis than Norway, while there was likely less coverage of countries that managed to address the crisis well.*

Topic 117, about public transportation, and Topic 196, which covers texts about fake news and conspiracy theories, follow a similar even level of prevalence throughout the different stages of the pandemic. Topic 196 likely has a similar function to the feedback and correction of misunderstandings and rumors goals of the CERC framework. This goal is one of the main tasks associated with the maintenance stage, but results suggest that the news media addressed this issue during all stages.

***O21:** The results indicate that the Norwegian news media addressed misunderstandings and rumors by reporting on them throughout the different crisis stages, which is conducive to the public's self-efficacy.*

Two different topics (Topic 140, 199) reflected texts about travel within the country, with suggestions for trips likely not to increase risk. These topics were prevalent at the onset of the initial crisis stage, then dropped over the stage, and peaked again over the summer of 2020, indicating that the news media are also likely to reiterate and report on self-efficacy measures when people have time off work and school. Hence, these risk messages are likely a consequence of the protracted timeframe of the crisis. Risk communication should be tailored to the target audience's needs (Renn, 2008, p. 235). These topics reflect communication targeted to the audience's needs as a result of seasonal specificities.

***O22:** The results indicate that the news media in Norway facilitated self-efficacy when people were likely to have time off work by reporting on people traveling in Norway in less risky ways and promoting safe behavior.*

5.3 Exploring other topics

Twenty-six topics were coded as relevant yet not reflective of CERC. Most of these dealt with consequences of the Covid-19 crisis that were not directly related to health, e.g.,

economic consequences (Topic 40, 116, 128, 183), consequences for industry (Topic 12, 139, 166, 78), and consequences to sport and athletes (Topic 88, 100, 195, 122).

O24: *The news media also substantially covered the crisis' consequences and economic impact on organizations and individuals. These topics may interest other researchers looking into news media coverage during crises.*

Topic 107 focused on people that breached covid regulations. Mainly, this coverage focused on police reports about people having parties or, at other times, quarantined individuals attending events. I deliberated whether this topic should be considered to facilitate self-efficacy. However, since I could not find any research about people engaging in risk-increasing behavior and self-efficacy, I chose not to consider this topic CERC. I.e., I found no basis for operationalizing the topic as facilitating self-efficacy. Three topics follow a similar trend of focusing on heads of state and criticism (Topic 10, 16, 91). Topic 10 focuses on Boris Johnson, Topic 16 focuses on Erna Solberg, and Topic 91 Focuses on Trump. Interestingly all of these topics also involve criticism. Though, not necessarily always targeted at these individuals.

Topic 10 documents 1:3 (short)

Britiske medier: Johnsons topprådgiver slutter Dominic Cummings, statsminister Boris Johnsons fremste politiske rådgiver, slutter før nyåret, ifølge Sky News og BBC. En høytstående kilde ved statsmin

Johnson: Cummings gjorde det enhver far ville gjort Storbritannias statsminister Boris Johnson forsvarer sin toppgiver Dominic Cummings. Rådgiveren anklages for å ha brutt karantenereglene da han var

Dominic Cummings går av Boris Johnsons omstridte og utskjelt rådgiver Dominic Cummings går av. Det melder flere britiske medier fredag kveld. Cummings snakket med statsministeren fredag og det ble b

Topic 16 documents 1:3 (short)

Molde-ordfører hadde fire samtaler med Erna Solbergs statssekretær Molde-ordfører Torgeir Dahl (H) sier han hadde fire telefonsamtaler på til sammen 26 minutter med statssekretær Peder W. Egseth (H)

Molde-ordfører: Hadde fire samtaler med Erna Solbergs statssekretær Moldes ordfører Torgeir Dahl (H) har tidligere nektet for at han hadde kontakt med noen i regjeringsapparatet før angrepet på Oslos

Dette nekter Solberg å svare på Statsminister Erna Solberg (H) avviser alle nye spørsmål om Statsministerens kontors rolle i Oslo-kritiske coronautspill. Regjeringen nekter også innsyn i kommunikasjon

Topic 91 documents 1:3 (short)

CNN: Trump kalte Fauci «katastrofe» Ifølge TV-kanalen kom president Donald Trump med nedsettende kommentarer om mannen som står i front av USAs kamp mot coronaviruset: Dr. Anthony Fauci. - Fauci er e

Trump dropper pressebrifing - og tordner mot media USAs president Donald Trump avstår lørdag fra å holde sin daglige pressebrifing i Det hvite hus om coronaepidemien, og sier nyhetsdekningen ikke er

Trump til kamp mot sin egen koronarådgiver Donald Trumps rådgivere forsøker å svekke Anthony Faucis sterke omdømme, ifølge amerikanske medier. Presidenten selv mener smitteverneeksperten «har begått m

All of these topics involve some form of criticism of public officials. The topics about Boris Johnson mainly reflect stories of his cabinet members; when it comes to Erna Solberg, the most reflective stories concern a party member's criticism of the response in Oslo, which

became a controversy. Other stories reflect a critique of Erna Solberg after she did not follow her own cabinet's restrictions during a birthday celebration.

In the case of Topic 91, the most reflective stories are about the American president criticizing top health official Anthony Fauci. These topics indicate that, while scholars have found the news media to be less critical in crises, they seem likely to report on controversies around top officials and their associates. This phenomenon may be an avenue for future research.

O25: The results indicate a correlation between coverage of top officials and controversy during the Covid-19 crisis, even when criticism was leveled against others.

5.4 How VG and Aftenposten facilitated crisis response during the Covid-19 crisis

The analysis indicates that, to a large extent, the newspapers' coverage of the crisis reflected the goals of CERC. In the pre-crisis stage, VG and Aftenposten communicated detected events and early risk signs in China and southeast Asia (Topic 13) and later in Italy and developments on different cruise ships (Topic 13). They provided information about the spread of infection through known or otherwise named individuals (Topic 3) and information about infection in Norway and measures taken (Topic 79). The news media content also facilitated personal response and self-efficacy and a general understanding of risk by exploring people's experience of being infected (Topic 58), identifying at-risk groups (Topic 124), informing the public about personal preventive measures (Topic 185), and disseminating information of background factors (Topic 135). Further, the newspapers facilitated sensemaking by providing information about the coming crisis and the global response (Topic 98). Furthermore, the newspapers addressed misinformation and fake news during the pre-crisis stage and continued to do the same in subsequent stages (Topic 196).

In the initial crisis stage, demarcated by a spike in the salience of coverage, VG and Aftenposten's coverage likely contributed to empathy, reassurance, and reduction of emotional turmoil by covering people's struggles, sacrifices, and solidarity (Topic 154) and the psychological impact of Covid-19 (Topic 161). News coverage provided a specific understanding of emergency management and reduced uncertainty by covering preventative measures like homeschooling (Topic 38), the national lockdown (Topic 133), and the corona law (Topic 47). The coverage also contributed to a specific understanding of medical community responses by disseminating information about infections in hospitals (Topic 103), deaths in care institutions (Topic 48), and hospital capacities (Topic 163). The news media content further facilitated understanding of self-efficacy and personal response activities by

relaying information about travel (Topic 140, 199), which became prevalent again later over the summer, and public transportation (Topic 117). They continued to disseminate information about preventative measures (Topic 185), at-risk groups (Topic 124), and people's experiences of being infected. The news media also facilitated a broader understanding of the covid 19 crisis in other countries like the USA (Topic 20), India and South America (Topic 131), and Sweden (Topic 130) throughout the crisis.

After the initial crisis stage, new topics facilitating self-efficacy and personal preventative measures like vaccines (Topic 21), testing (Topic 60), and other new measures (Topic 93) became prevalent after there was time to develop them and new developments of the crisis necessitated them. Less focus was put on self-efficacy topics prevalent in the pre-crisis and initial crisis stages (Topic 185, 135). Moreover, the news media published more stories reflecting coverage of infections with context (Topic 54), and the topic of mask-wearing (Topic 149) became prevalent as there was more consensus around its efficacy. The news media also helped people make sense of developments by providing information about virus mutations (Topic 26) and outbreaks of mutated viruses (Topic 142) as they happened. When developments such as new variants presented an increased risk to the public, and the crisis became active again, the news organizations were likely to reiterate some of the topics associated with CERC goals of the initial crisis stage (e.g., Topic 103, 148, 154).

6 Discussion

With this thesis, I have analyzed how the Norwegian national news media facilitated crisis response by disseminating CERC to the public during the Covid-19 crisis in Norway, using a generative machine learning approach and data from two of Norway's largest newspapers during the first 15 months after the virus first started appearing in Wuhan, China. I wanted to ask relatively open-ended questions and see how the data and the presented theory may answer them. I asked three different main research questions, two of which are separated into three questions each. This chapter will address these questions and discuss how findings relate to the problem statement.

6.1 Coverage of the coronavirus

This section will briefly recap how I have answered RQ1a and RQ1b. Then, I answer RQ3c by discussing these findings and how they might relate to the problem statement.

6.1.1 Themes, topics, and prevalence of coverage

To answer *RQ1a*, I used a generative machine learning approach and found a model with 200 topics to have sufficient semantic coherence and granularity (Blei et al., 2003) so that topics were distinct and easily interpretable. Two coders (myself and one other coder) labeled the topics and gave each topic one of 12 inductively inferred themes by reading the most representative words and documents for each topic. After coding individually, we agreed on labels for each of the topics. This process gave the thematic coding a Krippendorff alpha score of 7.9 for the thematic coding, indicating that these results were reliable. To answer *RQ1b*, I compared the salience of coverage mentioning the coronavirus in the two national newspapers with the number of articles that did not mention the virus. The results show that the salience of coverage on the coronavirus was very high in general but changed dramatically through the different stages of the pandemic (Figure 6).

6.1.2 To what extent can the presented literature describe these themes and topics?

In the analysis (See Chapter 5.1), I observe a ubiquity of the coverage of the coronavirus (O1). Researchers applying topic modeling often find topics outside of what they are looking for (Jacobi et al., 2016); Nevertheless, the results presented in this thesis indicate that the *majority* of topics found had little to do with the coronavirus at all. The sports and football themes, representing more than a third of all topics identified, include many such topics seemingly unrelated to the crisis. This finding might not be surprising if the data

collection consisted of all news stories published during the same period, as sports, and football, are prevalent themes in journalistic texts (Sjøvaag & Kvalheim, 2019). However, that does not explain why the sports theme is so prevalent in texts collected when searching based on stories that use terms related to the coronavirus. Pan and Meng (2016) used similar search words to mine when they searched for stories about the swine flu, using the key terms: 'Swine Flu,' 'H1N1' and 'H3N2'. They found that they ignored some stories because the stories were not focused on the virus, but it was not described how they determined this. They specify that they excluded 83 out of 363 documents from their analysis. However, some of these documents were excluded on account of being too short. They do not describe how many documents were excluded based on relevance. Even if all the excluded articles were articles with a different focus, I found a much larger proportion of topics that were not considered relevant (125 out of 200 topics, having 48.31 % prevalence in the corpus). Both Goodall et al. (2012) and Gerken and van der Meer (2019), analyzing coverage of the Swine Flu and Ebola, used similar terms when selecting articles but did not mention many irrelevant articles. This seems to be a difference between the Covid-19 crisis and other previously studied public health crises that extends beyond just the increased salience of coverage and scale of the crisis. Though, this is only indicated and will require further research.

Finding: *Results of the analysis suggest that there is a ubiquity to the Covid-19 crisis coverage that makes it prevalent throughout the agenda-setting process. The crisis becomes a frame of reference or a lens through which the news media view other societal factors, issues, and other news.*

News coverage of the coronavirus remained high throughout the analyzed period (Figure 6), representing a large proportion of the coverage published by the news organizations (O2). Not only was much news media coverage influenced by the crisis, Figure 6 indicates that the coronavirus, at times, reflected most of the agenda. The early spike in the salience of coverage likely had a significant agenda-setting effect on the public (Geiß, 2019), making them perceive the coronavirus as important. This salience may have influenced the crisis itself, as the public might have been more inclined to seek out further information, make sense of the crisis, and better understand how to respond if they perceived it as important. This claim is supported by the fact that more people were paying attention to news media during the Covid-19 crisis (Newman et al., 2021), which again indicates an increased need for orientation (McCombs et al., 2014).

While a salience spike likely increases an issue's agenda-setting effect, a longer timeframe will weaken it (Geiß, 2019). Hence, people were likely less influenced by agenda-setting during the maintenance stage. With a creeping crisis, the attention to it has considerable implications for the crisis itself, i.e., it can be characterized by significant attention (Boin et al., 2020). When the attention fades, the crisis fades along with it. Possibly, creeping crises that are seen as important enough will influence the news media's whole agenda.

Finding: *The results and analysis indicate that the Norwegian news media facilitated crisis response by putting the Covid-19 crisis high on the agenda.*

6.1.3 RQ1's connection to the problem statements

My findings indicate that the crisis influenced the news organizations' agenda through a broad set of themes and topics and that the salience of coverage of the coronavirus was substantial over the relevant period. This salience possibly means that there is something about creeping crises that makes it likely to become ubiquitous in the news media's agenda. This phenomenon is something that I suggest could be explored further by other researchers. The ubiquity and salience also likely affected the crisis by making it more likely that people saw the crisis as important, consequently increasing the likelihood that they would seek out information to better respond to it, which is supported by the fact that more people did seek out information during the crisis. Such salience will hence likely facilitate efficacious crisis response in the public in connection with accurate information.

6.2 Change in CERC in the news media over time

RQ2 is the most central question for the problem statement. Thus, I want to devote some space to discuss this question and some possible implications. First, I will touch briefly on RQ2a, and RQ2b, before giving greater attention to RQ2c. To answer the question of *to what extent the CERC can topics be understood in light of prior research and theoretical assumptions*, I will systematically go through how the Norwegian news media facilitated public response to the crisis in each crisis stage and discuss it in relation to the literature and theory. I will then cover some of the findings that may deviate from expectations. Subsequently, I will discuss the use of best practices with the presented literature and theory. I will lastly sum up the chapter and address agenda-setting during the crisis.

6.2.1 What topic reflected CERC?

I developed a set of criteria for what topics to be considered to facilitate sensemaking and self-efficacy (Chapter 3.7.3). Topics focused on officials and crisis communicators were also considered CERC but were labeled with another code. The result was a list of 49 topics (See chapter 4.2 or Appendix 6), including more general topics, e.g., covid testing, and more specific and event-centric topics, e.g., Donald Trump becoming infected. Several topics were considered conducive to self-efficacy by exploring risk-reducing behavior, explaining at-risk groups, and presenting information about official measures.

I plotted every topic and organized them by at which stage of the Covid-19 crisis they peaked in prevalence. This was helpful because it allowed me to categorize the data while still presenting each plot. Four groups were presented: 10 topics were identified as most prevalent in the pre-crisis stage; 14 topics were considered most prevalent in the initial crisis stage; 16 topics were considered most prevalent in the maintenance stage; 9 topics were not considered especially prevalent in one of the stages. While this approach helped me get a broad overview of the topics, it is important to recognize that every topic will develop somewhat differently throughout the three stages. Multiple topics are also prevalent in more than one stage, most of these being prevalent in both the initial crisis and maintenance stages. While most of the topics prevalent in the pre-crisis stage were easily defined and often lost prevalence at the start or during the initial crisis stage, other topics developed less predictably.

6.2.2 In what ways did the topics reflecting CERC facilitate crisis response?

Veil et al. (2008) claim that the “communication processes will change dramatically as a risk evolves through the phases of a crisis”. The result and analysis I present in this thesis suggest that this was the case during the first three stages of the crisis in Norway (O4), but the change was not as dramatic from the initial crisis to the maintenance stage.

Pre-crisis coverage. During the pre-crisis stage, VG and Aftenposten presented topics that reflected monitoring and recognition of emerging risks by identifying where and how the virus was spreading (O6). They generated public understanding of risk and public preparation for a possible adverse event by reporting on the research into the virus and its consequence for affected communities (O7). They helped facilitate changes in behavior to reduce the likelihood of harm by reporting on symptoms, at-risk groups, and preventative measures people could take (O5). This suggests that coverage largely reflected CERC goals in the pre-crisis stage (Reynolds & W. Seeger, 2005). The number of self-efficacy topics also seems to

differ from findings from previous pandemics about a lack of self-efficacy communication in the news media early in a crisis (Dudo et al., 2007). However, this raises the question of how much self-efficacy communication is enough and ideal, which is not something addressed in this thesis. Nevertheless, a substantial part of the coverage of the coronavirus at this time was conducive to self-efficacy. Looking at overall coverage, the salience of coverage of Covid-19 was much lower during the initial crisis stage than at any other point (O8), representing around 6 percent of the total coverage of the two newspapers for the first ten weeks of 2020.

***Finding:** The analysis indicates that the news media met CERC goals during the pre-crisis stage and likely facilitated public response to the crisis by disseminating information conducive to sensemaking, self-efficacy, and public preparation for the coming crisis. Because the salience of coverage was lower than in subsequent stages, the agenda-setting effect was likely lower at this stage.*

Initial crisis coverage. During the initial crisis, the dissemination of information by the news media likely helped facilitate solidarity, reassurance, and a reduction in emotional turmoil by reporting on the public effort and people's individual sacrifices during the initial crisis stage (O10). These efforts also reflect and likely contributed to a form of national solidarity. Along with empathy and reduction of emotional turmoil, an effort to foster solidarity could be viewed as a communication goal unto itself. This is partially addressed by Veil et al. (2008) when they make the claim that communicating about the participatory nature of crisis management and that giving someone something meaningful to do encourages self-efficacy.

The news media helped foster a specific understanding of emergency management and the medical community's response by reporting on hospital capacities, covid and deaths in hospitals, the corona law, municipal response, and the lockdown (O11, O12). They continued to facilitate an understanding of self-efficacy and personal response by disseminating information about preventative measures (O5). These efforts reflect CERC goals during this stage. The salience of coverage was also substantial during the initial crisis, comprising most of the two newspapers' coverage (O9). This indicates that the covid pandemic, and CERC, were high on the agenda during the initial crisis stage, and also speaks to the news media's role as likely conducive to the crisis response of the public (As described in Figure 3). This spike also likely had a significant agenda-setting effect on the public (Geiß, 2019) and may have had an agenda-setting effect on officials themselves.

Finding: *The analysis indicates that the news media coverage met CERC goals and helped put the crisis substantially on the agenda during the initial crisis stage, thus likely affecting the response to the crisis.*

Maintenance stage coverage. Much of the CERC goals during the maintenance stage reflect a continuation and reiteration of information established during the first two stages. Proponents of the CERC framework also recognize that some crises, including pandemics, might not predictably follow these expectations (Reynolds & W. Seeger, 2005). The results from this thesis indicate that this is likely the case during the Covid-19 crisis in Norway. New measures, like the vaccine, became prevalent. Self-efficacy topics of previous stages generally were much less prevalent (O14). One exception was Topic 117, about public transport, which remained evenly prevalent throughout the stages. Further, some measures available from the start did not become prevalent topics before the maintenance stage (O15). This late prevalence could likely result from the ambiguity brought about by a creeping crisis. “A key challenge is the translation from ambiguous information to a strategic decision making agenda. If you don't know, exactly, what is going on, what decisions should be made?” (Boin et al., 2020, p. 133).

While debunking false rumors is considered a critical task of this stage (Reynolds & W. Seeger, 2005), the topic about covid and conspiracy theories was prevalent throughout all the three stages (O21). Fake news and misinformation being so pervasive in recent times have made them spread quickly in crises and are more likely to be addressed by the news media (Egelhofer & Lecheler, 2019; Newman et al., 2021). Likely, this is something that the CERC framework should address as well, as the problem of misinformation is only worsening (Newman et al., 2021).

During the maintenance stage, the salience of coverage was relatively stable. Overall, the coronavirus was mentioned in around a third of the coverage, reflecting a large part of the agenda. Though substantially less than during the initial crisis. Even when the crisis became *active* again, when infections and deaths increased, salience did not increase to previous levels. Still, even if the salience of coverage had spiked during these new waves of infection, the news media's agenda-setting effect may have been reduced, as this effect generally diminishes over time (Geiß, 2019).

Finding: *The Norwegian news media coverage met general CERC goals of facilitating self-efficacy and sensemaking throughout the maintenance stage by reporting on*

new developments and covering preventative measures. As new waves of infection came to Norway, CERC tasks associated with goals in the initial crisis stage became more prevalent.

What is not explained by the CERC framework? During the maintenance stage, new topics were likely to become prevalent due to new developments in the crisis and response (O16). This coverage pattern is unsurprising, as journalists and the news media are likely to be focused on new developments (Galtung & Ruge, 1965). Nevertheless, this is not described by the CERC framework as it largely avoids the implications of crises with longer timeframes. Thus, some communication efforts conducive to crisis response deviate from the framework's expectations.

Results show that the news media likely contributed to self-efficacy by reporting potential risk-limiting ways to take vacations (O19), which would indicate that some communication is associated with the time of year and seasonal news agendas and specificities. Similarly, topic 157, about national solidarity, had its second spike around Christmas of 2020. This was also around the time of the second pandemic wave, which likely also contributed to this spike. Still, this coverage reflects a consequence of the extended timeframe of a creeping crisis, which indicates that certain types of communication facilitating self-efficacy and sensemaking were associated with different seasonal specificities. Such communication patterns support the idea that communication needs to be tailored based on societal and cultural values and that some cultural and societal processes are dependent on the time of year. This is something the CERC framework could consider relevant during prolonged and creeping crises.

Furthermore, some topics prevalent during the initial crisis stage again became prevalent around the time of the second and third waves of the coronavirus in Norway (O17). These include topics associated with the communication tasks during the initial crisis stage, including topics conducive to an understanding of medical and crisis management response and the national solidarity topic. This indicates that the news media saw it important to reiterate these messages when the crisis became more *active*. I.e., their communication represented some form of new initial-crisis-like stage. Though, it should be noted that these topics did not always peak simultaneously. So, while many of these topics did become prevalent again during these waves, some were later and others earlier. Seemingly, these goals can and maybe should be more linked to the severity of crisis development – or crisis activity level – rather than the crisis stage. In this case, the initial crisis stage reflects the first time a crisis reaches an active phase (Boin et al., 2020).

Furthermore, at least one topic, mask-wearing, reflects a self-efficacy measure available throughout the crisis that did not become prevalent until later in the maintenance stage (O15), which could also be explained by the ambiguity and uncertainty about measures associated with a creeping crisis.

As pointed out in chapter 2.3.1, the CERC framework has received criticism for assuming crises will move predictably, something that is likely not to happen in a more extended crisis (Neville Miller et al., 2021; Reynolds & W. Seeger, 2005; Veil et al., 2008). Consequently, crisis communication tasks will not follow a predictable pattern either. The findings of this thesis suggest that this is likely the case during the Covid-19 crisis in Norway. The CERC framework could benefit from reiteration to better address crises with a long duration.

Finding: *The results and analysis indicate that the new organizations' CERC efforts during the crisis developed less predictably after the initial crisis stage. Possible predictors for communication tasks include new developments, the activity level of the crisis, changing communication efforts due to seasonal specificities, and uncertainty concerning the efficacy of some measures.*

The use of best practices over time. Chapter 1.3.1 covered how researchers have analyzed news media content in different health crises by analyzing the use of best practices (Dudo et al., 2007; Pan & Meng, 2016; Roche & Muskavitch, 2003). Researchers use different measures, e.g., whether infection coverage used qualitative, quantitative, or statistical information (Pan & Meng, 2016) and whether coverage was episodic or thematic (Dudo et al., 2007). Presented results suggest, at least for the first two stages of the pandemic, that the news media were likely to report on individuals being infected and dying of the virus (O13), reflecting qualitative coverage (Pan & Meng, 2016). This coverage is also often centered around celebrities. In particular, Donald Trump got massive attention when he became sick. Some quantitative and statistical coverage was present at all times, but the statistical coverage, which gives context and is considered best practice (Pan & Meng, 2016; Roche & Muskavitch, 2003), became more prevalent over time (O18) and was likely one of the most prevalent topics during the maintenance stage. This kind of statistical coverage was also consistently available on the news organizations' websites as dashboards.

Finding: *The results indicate that infection coverage was more likely to reflect best practice by providing statistical information and context in later stages of the crisis. Though, such coverage was present to some degree throughout the crisis stages.*

The results indicate that Norwegian news media were more likely to focus on countries hit hard by the virus than countries that managed it well (O20). This observation aligns with the idea that the news media tend to focus on negative aspects rather than positive developments (Galtung & Ruge, 1965; Harcup & O'Neill, 2017). More focus on countries and places that managed the virus well might have been more conducive to societal level efficacy (Bandura, 1998; Goodall et al., 2012). Another finding is that, while topics often reflect broader coverage, many texts are episodic, i.e., they focus on a single event rather than a broader theme. Although we can see that different topics are more and less reflective of episodes, I do not have data to make claims about the proportion of this coverage. Nevertheless, some episodes were covered so extensively that they were labeled as their own topic.

Finding: *The results indicate that the news media were likely to focus on some particular events, and when covering the situation abroad, they were more likely to focus on countries with more adverse effects than countries that did better. However, the method used is not suited to make claims about how much.*

6.2.3 A brief reflection on crisis stage delamination

To delimit between the initial crisis stage and the maintenance stage of the pandemic, I proposed and applied a novel method based on the assumption that a spike in the salience of news coverage correlated with the initial crisis stage (Boin et al., 2020). From this point of view, a crisis is a socially constructed phenomenon, and the news media's agenda-setting is reflective of this construct and influences how the crisis is defined (Rosenthal, 2001, p. 12).

Nevertheless, determining an exact point of change between stages is complex. Consequently, the chosen transition from the initial crisis stage to the maintenance stage presented should not be viewed as a precise point of change. Selecting one point to compare before and after allows for observing a general change in the communication from one time to the next. After analyzing the changes, I found that we tend to see a change around week 23 and that we do see topics that peak during the initial crisis stage, suggesting that this method was appropriate to delimit stages for this thesis and that some topics will be associated with the initial crisis stage. However, the method may not be appropriate for every crisis or creeping crisis.

6.3 A discussion on topics not covered

Asking and answering RQ3 allows me to present and discuss some topics not included in the analysis associated with RQ2. For one, this serves the function of transparency, as I present some of the topics that I did not analyze in depth. An argument could be made that some of these topics should have been included in the analysis. Second, this allows me to present some of the communication patterns that could be of interest for future research. These topics were coded as relevant to an analysis of how the Norwegian news media covered the Covid-19 crisis, but not as CERC. The intercoder reliability test for relevance gave a Krippendorff alpha score of 9.03, indicating significant agreement about which topics reflected media coverage of the Covid-19 crisis (Krippendorff, 2011). 26 were not considered CERC and are addressed in this section.

These results show some of the non-health-related coverage concerning the crisis. Topics concern the impacts on different businesses, sporting events, and cultural events (O23). Some of these topics cover canceled events (e.g., Topic 22, 41, 122, 195) and therefore are very closely related to codes 1b: *Explores official preventative measures dictated by public officials* and possibly 2b: *Explores the response to the crisis*. There may be some debate around whether these topics should be included in the analysis. My reason for not including them is that they represent the consequences of measures and are not reflective of the measures themselves. Therefore, these topics are not likely conducive to sensemaking or self-efficacy and unlikely affect crisis response. Notably, excluding these topics does not impact the other findings I present in this thesis. Nevertheless, their exclusion should be noted. This also brings up another point: an exhaustive analysis could have been done on all 200 topics. Such an effort may have allowed me to pick up on more patterns and more accurately describe how the news media covered the pandemic. Therefore, the choice of analyzing 49 topics limits the scope of this thesis and presents a limitation on its own.

Multiple topics have in common that they focus primarily on heads of state and controversies (O24), supporting the idea that the news media tend to focus on powerful elites and conflict (Galtung & Ruge, 1965; Harcup & O'Neill, 2017) and illustrating the news media's propensity to attempt to find someone to cast some blame on in a crisis (Boin et al., 2017; Olsen & Mathiesen, 2019). This seems to support the idea that the news media are very likely to report on infractions made by people responsible for crisis management (Boin et al., 2017, pp. 78-80) and may point to the importance of meaning-making in a crisis for these individuals. Christensen and Laegreid (2020) found that the Norwegian government

successfully framed its response to the crisis during the first months; these results indicate a small chink in that armor.

This kind of coverage also likely reflects some of the adverse effects news media coverage can have on the reputation of individuals in power, thereby possibly compromising public trust in them. This, in turn, could lead to less willingness in some individuals to engage in risk-reducing behavior (Christensen & Laegreid, 2020). In that case, these topics represent issues where news media values and traditional news roles are seen as more important than CERC. Hence, while there is agreement that news media tend to be less critical in crises (Saroj & Pal, 2020), this does not mean that they will avoid reporting on actions by powerful officials that may promote public criticism. In fact, results indicate that this is a priority.

6.4 News media content and agenda-setting during the crisis

The results of this analysis indicate that VG and Aftenposten disseminated CERC throughout the 15 months after the coronavirus was first detected in Wuhan, China. During the pre-crisis and initial crisis stages, the news media largely contributed to the CERC communication goals (Reynolds & W. Seeger, 2005; Veil et al., 2008). Throughout all stages, the news media contributed to sensemaking and self-efficacy in the public by disseminating information about new developments, new official measures, and new self-efficacy measures. When new waves of the virus appeared and the crisis became active again, they were likely to disseminate information aligned with CERC goals of the initial crisis stage. The framework was found to explain some of the communication activities of the newspapers during this period of the Covid-19 crisis in Norway, while it struggles to explain new patterns resulting from new developments of the crisis, likely in part a consequence of the ambiguity and long shadow that a creeping crisis casts (Boin et al., 2020). Some best practices in CERC reflected more of the coverage later in the crisis.

Further indicated, communication efforts to facilitate sensemaking and self-efficacy were on the agenda throughout the analysis, some becoming more and others becoming less prevalent over time. *The news media disseminated information facilitating self-efficacy and sensemaking and likely facilitated public crisis response throughout the first 15 months of the crisis.* Though not in wholly predictable ways.

Agenda setting theory states that the news media have the power to determine the agenda and choose what to communicate and what not to communicate (McCombs et al., 2014). Hence, if the news media chooses to disseminate this kind of information, they likely see it as a part of their role during a public health crisis. This supports the idea that the goals

of crisis and emergency risk communication and the goals of the news media align during a crisis. Precisely what the motivation for publishing these texts are, though, is beyond the scope of this work. Media logics, crisis management agendas, and role change during crises are likely influences. Also, as studies show that agenda-setting effects might decrease over time (Geiß, 2019), covering a crisis through new topics about escalations and current events thus could increase the likelihood that the agenda-setting effect of the news media remains higher throughout the crisis. I.e., if topics remained prevalent for too long, they might be less effective in influencing behavior.

Some researchers have taken a more critical look at journalistic content during crises, finding that the news media tends to exaggerate and sensationalizes problems. After all, a crisis presents good content (Olsen & Mathiesen, 2019, p. 133). Since people pay more attention during a crisis, this is also an incentive to keep the crisis going by continuing to put it on the agenda. While affecting behavior such that people engage in risk reduction is important, it is also important that this behavior change is appropriate to the risk (Abraham, 2009). High salience of coverage may increase risk perception beyond what is appropriate for the actual risk. Miller et al. (2011) point out that the primary way the news media affect our risk perception is probably through the number of articles, i.e., the salience of some issues. Perceiving risk as higher than what it is may negatively affect how we behave and our ability to make adequate personal choices. Still, similar to the news media's agenda-setting power, Miller et al. (2011) point out that while this salience of coverage affects general risk perception, it is less likely to impact personal risk perception. This minimal effect would indicate that even if the news media content may impact risk perception in the public beyond actual risk, this likely does not have a significant negative impact on people's decision-making.

6.5 Limitations

This thesis has several limitations. I could only get data for the first 15 months after the coronavirus first appeared. An analysis of the coverage at a later stage might also pick up on patterns of the resolution and post-crisis stages. I also only cover one crisis and one country. If the method were applied to other countries and/or other crises, some of these patterns would likely differ because of different cultural and social processes. Furthermore, the thesis is limited because I could only get data from two national newspapers and all the data came from online news articles. Similarly, the news disseminated on TV and radio could also be different.

The benefit of the quantitative approach I use in this thesis is that the STM model provides a reproducible result, similar to, and even exceeding in precision, that produced by a human coder (Karlsson & Sjøvaag, 2016; Roberts et al., 2016) while at the same time analyzing a much larger set of data. Still, while the separation of topics is left to an algorithm, human coders are needed to interpret the data. Hence, this thesis is limited in some of the same ways qualitative research is; the data has to be interpreted by the researcher and is therefore influenced by my interpretation and heuristics. To compensate for this, I included another coder.

Furthermore, while the STM method can find latent topics in the data, it cannot be used to answer questions about things it does not find organically (Roberts et al., 2016). I.e., the method cannot comprehensively address how newspapers contributed to crisis management, but it can address some of the ways they likely did.

Further, while I have identified main topics that likely contribute to sensemaking and self-efficacy, I cannot say anything about the strength of this effect. It will likely be influenced by factors such as the use of best practices and salience but may also be influenced by other variables related to the coverage of these topics. Future research will still have to be done to explain these findings and explore the effect of different topics, e.g., by interviews, discourse analysis, and questionnaires.

Other methods could have been applied to code topics thematically. For example, Pan and Meng (2016) and Bardhan (2001) coded news articles based on five different frames. I found their themes to have limited explanatory power for this thesis. E.g., while the sports theme (along with football) was by far the largest theme in the corpus in terms of the number of topics, none of the themes from Bardhan (2001) seem to reflect these sports topics well. Another popular method used by researchers using topic modeling is inferring themes by applying cluster analysis (Lee et al., 2021; Ophir, 2018; Walter & Ophir, 2019). I.e., clustering topics together by similarity. This was something that I did try, but while it did seem to capture groups to a certain extent, I found that interpreting such themes became more arduous than with my methodological approach.

7 Conclusions

The goal of this thesis has been to contribute to a better understanding of how the news media facilitate crisis response by disseminating information to the public. I address the following problem statement:

In what ways did the Norwegian news media facilitate crisis response by informing the public during different stages of the Covid-19 crisis, and how does this communication reflect expectations of the CERC framework?

I identified, labeled, and coded 200 topics based on more than 22 000 news articles from two national Norwegian newspapers published over 15 months after the first infections in Wuhan, China. I identified 49 topics that facilitated self-efficacy or sensemaking in the public. These topics help reduce uncertainty, facilitate personal response, and are likely conducive to wide-ranging crisis response in a public health crisis, where risk reduction is a collective effort. Topics reflective of CERC had a 33.15 % prevalence in the data, which translates to 12.26 % of all coverage of the two newspapers over the relevant period.

Topics about social distancing and hygiene, early developments of infection in Asia, and outbreaks in Norway were prevalent during the pre-crisis stage, when the salience of coverage was lower. Topics about national solidarity, the corona law, and the lockdown were prevalent in the initial crisis stage when coverage of the coronavirus reflected most of the agenda. Other topics, such as topics about virus mutations and vaccines, became prevalent later in the crisis after new medical developments and developments in the crisis itself. Some topics associated with the medical and emergency management response to the crisis were prevalent in the initial crisis and became prevalent again during the maintenance stage when new waves of infection reached Norway, and the crisis became *active* again. The news media content reflected detected events and supplied information about self-efficacy measures, official measures and restrictions, and new crisis developments during the maintenance stage. They were also likely to address the spread of misinformation during all stages.

My findings indicate that coverage conducive to CERC changed drastically through different crisis stages, both when it came to content and salience. These changes reflect expectations from the CERC framework to a high degree. The salience of coverage reached its peak during the initial crisis stage, with coverage mentioning the coronavirus reflecting the

vast majority of all coverage in the two newspapers. Coverage during this point was much higher than later coverage, even when the crisis intensified and became active again due to new waves of infection. The continued salience of coverage likely had an effect by keeping the crisis on the agenda. Nevertheless, most topics identified did not reflect coverage of the crisis itself, which raises some questions about the ubiquitous nature of the crisis in the news media.

Nevertheless, the CERC framework was shown to have limited explanatory power regarding new developments in the crisis due to it casting a long shadow. The news media provided self-efficacy information about new developments, and topics associated with goals of the initial crisis stage were likely to become prevalent again when Norway had to face new waves of infection. Furthermore, some results indicate that the news media were likely to disseminate information conducive to self-efficacy based on time of year and seasonal specificities. Furthermore, findings indicate that the news media were more likely to focus on countries in a more severe crisis than countries that managed the crisis well. They were more likely to report on infections using qualitative descriptions early in the pandemic, and they would give significant attention to some events and controversies surrounding people responsible for crisis management. Risk descriptions providing greater context were available and disseminated throughout the different stages but increased in prevalence during the maintenance stage of the pandemic. While these findings are descriptive and do not inherently imply communication norms, this communication likely positively impacted the crisis and could be considered when evaluating and updating the CERC framework and other communication frameworks to address creeping crises better.

***To conclude,** the news media played an important role in facilitating crisis response by providing high salience of information conducive to sensemaking and self-efficacy in the public throughout the crisis and, to a large extent, met CERC goals. Furthermore, the news media coverage also likely contributed to crisis response in ways not addressed by the CERC framework, likely in part due to the Covid-19 crisis' status as a creeping crisis.*

7.1 Recommendations

I suggest the CERC framework should be evaluated based on lessons learned from the Covid-19 pandemic. Multiple findings suggest that, while some assumptions made in the framework are likely correct and valuable, adjustments could be made to better address creeping crises. Suggestions include recognizing that some crises will not move in a

straightforward, predictable manner and that some of the communication goals should be considered based on whether the crisis is in an active phase, I.e., some stage where risk is heightened. Still, the initial active phase, the initial crisis, will likely receive greater attention than future active stages, even if the risk is higher later. Getting communication right early is thus essential for an effective response throughout the crisis.

Furthermore, proponents of the framework may also want to evaluate whether to include guidelines on communication based on developments of the crisis, guidelines for reiteration of self-efficacy measures, and the usefulness of time-specific communication, i.e., communication based on time of year and dates. Also, the CERC framework should consider debunking false rumors and misinformation an important task throughout all stages of a crisis.

Furthermore, findings indicate that news media are likely willing to work to disseminate CERC goals. It is thus pertinent to consider how communication frameworks can better address cooperation with the news media to get risk messages out in the most effective ways. This would mean deviating from the idea that the news media need handling in a crisis.

Journalists may want to use the results of this thesis to evaluate coverage and the salience of coverage of the Covid-19 crisis. Moreover, they may want to apply similar methods used in this thesis to analyze their coverage of different issues. Journalists may also want to use lessons learned from this crisis and the CERC framework to develop their own models for reporting during crises. The following recommendations could be considered for evaluating and expanding crisis communication models.

- *Some crisis communication tasks should be associated with the activity level of the crises.*
- *Fostering solidarity could be included as a primary goal of CERC during active stages.*
- *Addressing rumors and fake news is necessary through all crisis stages.*
- *Some risk messages could be adjusted to seasonal specificities.*
- *The news media are highly likely to focus on public leaders and controversies. These individuals need to be extra careful about how they conduct themselves.*
- *Communicators should encourage journalists to employ best practices of CERC already in the pre-crisis stage by providing contextual information.*
- *Promoting communities that handle the crisis well may improve societal efficacy.*
- *Risk messages are likely to be more effective in the initial crisis stage than later.*

7.2 Contributions

I have suggested a model for how the news media affect the public response during a public health crisis and suggested a way to delimit crisis stages based on the salience of coverage. Furthermore, I have suggested a method for analyzing this coverage using big data, machine learning, and operationalizing the process' results based on sensemaking and self-efficacy. Using these methods, I have described how the communication efforts of two Norwegian newspapers changed over different stages during the Covid-19 crisis in Norway. The approach has provided insight into various aspects of how the news media cover a crisis and has allowed me to point out communication efforts likely conducive to crisis response – lessons learned – that could be applied to frameworks of communication in crises. I found this an appropriate method for providing a broad general picture of changes in CERC in news media content over time. The same methods could be applied to other news organizations, countries, and crises.

This work substantiates claims about how crisis communication changes over different stages of a crisis. It substantiates parts of the CERC framework, finding that communication efforts largely reflected expectations during the pre-crisis and initial crisis stages. Further, the clear peak in salience and associated peaks in topics during the initial crisis stages support the idea that a crisis' initial stage is qualitatively different from the maintenance stage and ensuing active phases, though many of the goals may be the same. This work points to several recommendations for improving the framework to address future creeping crises, including recommending communication models to couple specific tasks with activity levels of a crisis.

7.3 Avenues for future research

Researchers may want to look into the ubiquitous nature of coverage of the coronavirus by comparing results from different crises, crises in different countries, and coverage in local and print newspapers. Researchers could also compare these covariates by tagging articles depending on whether it is in a local or national newspaper or by country and analyzing how the covariates affect topical content and prevalence. Future research may also want to look into the effects coverage of the crisis had on people regarding self-efficacy and sensemaking. Researchers could ask questions about the different effects topics have had and what kind of coverage of these topics is likely to beset facilitate sensemaking and self-efficacy. Similarly, future research could focus on the agenda-setting effect over time during creeping crises to see if the effect of this communication diminished over time and, if so, how fast.

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Appendices

Appendix 1

Computer code for parsing text documents

```
import pandas as pd
import os
import sys
import re

df = pd.DataFrame(columns=['date', 'headline', 'summary', 'body', 'media_house',
'paragraph_length'])

'''
This next section of the code defines the functions used to extract
data from text files. All functions assume an input of an article consisting
of a headline, date and time, and media house description.
'''

def media_and_date_to_metadata(last_string_in_first_paragraph):

    '''This function takes a string consisting of a date and time as well
    as a media house and splits it into two separate elements. The delimiter
    here is ',' as this consistently separates these two elements.
    '''

    split_string = last_string_in_first_paragraph.split(',')

    try:
        return split_string[0], split_string[1]
    except:
        return 'problem', 'problem ' + str(file) + ' ' +
str(liste_med_artikler.index(article))

'''
The next functions are designed to handle each of the possible cases based on
the number of paragraphs in an article. A paragraph is defined as a continuous
body of text not separated by a line without text.
'''

def four_paragraph_article(article, paragraph_length):
    first_paragraph_list = article[1].split('\n')

    headline = ' '.join( first_paragraph_list[:-2])
    media_house, date = media_and_date_to_metadata(first_paragraph_list[-2])

    summary = None
    body = None

    return {'date': date,
            'headline':headline,
            'summary':summary,
            'body':body,
            'media_house':media_house,
            'paragraph_length':paragraph_length}

def five_paragraph_article(article, paragraph_length):
    first_paragraph_list = article[1].split('\n')
```

```

if len(first_paragraph_list) < 3:
    headline = article[1]
    media_house, date = media_and_date_to_metadata(article[2].split('\n')[-2])
    summary = None
    body = None

    return {'date': date,
            'headline':headline,
            'summary':summary,
            'body':body,
            'media_house':media_house,
            'paragraph_length':paragraph_length}

headline = ' '.join( first_paragraph_list[:-2])
media_house, date = media_and_date_to_metadata(first_paragraph_list[-2])
summary = article[2]
body = article[3].split('©')[0]

return {'date': date,
        'headline':headline,
        'summary':summary,
        'body':body,
        'media_house':media_house,
        'paragraph_length':paragraph_length}

def six_paragraph_article(article, paragraph_length):

    first_paragraph_list = article[1].split('\n')

    if len(first_paragraph_list) < 3: # Denne delen av koden møter problemer om en
overskrift er så lang som tre linjer. Det vil i tilfelle være sjeldent.
        headline = article[1]
        media_house, date = media_and_date_to_metadata(article[2].split('\n')[-2])
        summary = article[3]
        body = article[4].split('©')[0]

    else:
        headline = ' '.join( first_paragraph_list[:-2])
        media_house, date = media_and_date_to_metadata(first_paragraph_list[-2])
        summary = article[2]
        body = article[3].split('©')[0]

    return {'date': date,
            'headline':headline,
            'summary':summary,
            'body':body,
            'media_house':media_house,
            'paragraph_length':paragraph_length}

def seven_paragraph_article(article, paragraph_length):

    first_paragraph_list = article[1].split('\n')

    try:
        if len(first_paragraph_list) < 3:
            headline = article[1]
            media_house, date = media_and_date_to_metadata(article[2].split('\n')[-2])
            summary = article[3]
            body = article[4].split('©')[0]
    except:
        return {'date': None,

```

```

        'headline': 'ERROR',
        'summary': 'Split on ", " ERROR',
        'body': article,
        'media_house': None,
        'paragraph_length': length}

    return {'date': date,
            'headline': headline,
            'summary': summary,
            'body': body,
            'media_house': media_house,
            'paragraph_length': paragraph_length}

'''
This next section lists every file, opens every file,
reads every document in the file, and appends
every document as a row of data.
'''

for file in os.listdir('path/to/directory'):
    print(file)
    with open('path/to/directory/' + str(file), 'r', encoding="utf-8") as articles:
        list_of_articles = [article for article in
articles.read().split('=====')
=====')]

    liste_med_artikler = list_of_articles
    list_of_lengths = []

    for article in liste_med_artikler:

        if article == liste_med_artikler[0]:
            article = '\n'.join(article.split('\n')[3:])

        if article == liste_med_artikler[-1]:
            article = '\n'.join(article.split('\n')[:-2])

        article_list = article.split('\n\n')
        length = len(article_list)

        if length == 4:
            df = df.append(four_paragraph_article(article_list, length), ignore_index =
True)
        elif length == 5:
            df = df.append(five_paragraph_article(article_list, length), ignore_index =
True)
        elif length == 6:
            df = df.append(six_paragraph_article(article_list, length), ignore_index =
True)
        elif length == 7:
            df = df.append(seven_paragraph_article(article_list, length), ignore_index
= True)
        else:
            df = df.append({'date': None,
                            'headline': 'ERROR',
                            'summary': 'Length ERROR',
                            'body': article,
                            'media_house': None,
                            'paragraph_length': length},
                            ignore_index = True)

df.to_csv('Full_data.csv')
```

Appendix 2

Computer code for preprocessing in Python

```
#!/usr/bin/env python
# coding: utf-8
# This code is converted from an IPNYB (Jupyter notebook) file to a python file.

# In[1]:
import pandas as pd
import datetime
import re

# In[2]:
df = pd.read_csv('dataframe/of/documents.csv', index_col=0)

# In[3]:
df.info()

# In[4]:
media_house_counts = df.groupby(['media_house']).count().reset_index(inplace=True)
media_house_counts

# In[5]:
VA_df = df[(df['media_house'] == 'VG Nett') | (df['media_house'] == 'Aftenposten -
Login')].reset_index(drop=True)
VA_df[VA_df.isna().any(axis=1)].reset_index()

# In[6]:
VA_df.info()

# In[7]:
VA_df = VA_df.dropna()
VA_df.info()

# In[8]:
less_than_100 = VA_df[VA_df['body'].apply(lambda x: len(str(x).split(' ')) <= 100)]
less_than_100

# In[9]:
VA_df = VA_df[VA_df['body'].apply(lambda x: len(str(x).split(' ')) >
100)].reset_index(drop=True)
VA_df

# In[10]:
VA_df.info()

# In[11]:
new_group = VA_df.groupby(['paragraph_length'])['date'].count().reset_index()
new_group

# In[12]:
VA_df['text'] = VA_df['headline'] + ' ' + VA_df['summary'] + ' ' + VA_df['body']
VA_df = VA_df.drop(columns=['summary', 'body', 'paragraph_length'])

# In[13]:
problemer = VA_df[VA_df.date.str.match('\s\d{2}[\.]d{2}[\.]d(NOU 2000:
24)\s\d{2}:\d{2}') == False]
problemer

# In[14]:
problemer2 = VA_df[VA_df.text.isnull()]
problemer2
```

```
# In[15]:
test = VA_df[VA_df.date.str.match('\s\d{2}[\.]?[\d{2}[\.]?\d(NOU 2000:
24)\s\d{2}:\d{2}')]==True]
test

# In[16]:
VA_df['date'] = pd.to_datetime(VA_df['date'], dayfirst=True)

# In[17]:
VA_df.groupby(['media_house'])['headline'].count()

# In[18]:
VA_df['Year-Week'] = VA_df['date'].dt.strftime('%Y-%W')
VA_df

# In[19]:
VA_df['Short'] = VA_df['text'].apply(lambda x: x[:200])
VA_df

# In[20]:
VA_df.to_csv('Processed_with_python.csv', encoding='UTF-8')
```

Appendix 3

Computer code for processing and fitting the STM model

```
---
title: "STM_TEST_2"
author: "Jo"
date: "14 2 2022"
output: html_document
---

```{r setup, include=FALSE}
knitr::opts_chunk$set(echo = TRUE)
```

```{r}
library(stm)
library(tidyr)
library(stringr)
library(tidytext)
library(dplyr)
library(ggplot2)
library(quanteda)
library(reshape2)
library(geometry)
```

```{r}
df <- read.csv("Test_final.csv",
 header = TRUE,
 fileEncoding = "UTF-8")
```

```{r}
df$text <- iconv(df$text, to = "UTF-8")
df$Short <- iconv(df$Short, to = "UTF-8")
```

```{r}
processed <- textProcessor(df$text, metadata = df, language='norwegian',
 customstopwords = c('sier', 'ifølge'),
 verbose = TRUE, onlycharacter=TRUE)
```

```{r}
out <- prepDocuments(processed$documents, processed$vocab,
 processed$meta, lower.thresh = 15)
docs <- out$documents
vocab <- out$vocab
meta <- out$meta
```

```{r}
plotRemoved(processed$documents, lower.thresh=seq(from = 10, to = 1000, by = 10))
```

```{r}
covidnewsPrevFit <- stm(documents = out$documents,
 prevalence=~ media_house + s(week_number),
 vocab = out$vocab, K = 200, seed = 245411,
 max.em.its = 75,data = out$meta, init.type = "Spectral")
```
```

```

```{r}
summary(covidnewsPrevFit)
...

```{r}
thought <- findThoughts(covidnewsPrevFit, texts=meta$Short, n = 1,
                        topics = 1)$docs[[1]]
plotQuote(thought)
...

```{r}
relationship <- topicCorr(covidnewsPrevFit)
plot(relationship)
...

```{r}
cloud(covidnewsPrevFit, topic = 3, scale = c(3, 0.40))
...

```{r fig.height = 9, fig.width=5}
plot(covidnewsPrevFit, type = "summary", n = 6, xlim = c(0, 0.1))
...

```{r}
thought <- findThoughts(covidnewsPrevFit, texts=df$text, n = 5,
                        topics = 1)$docs[[1]]
...

```{r}
print(thought[1])
...

```{r}
prep <- stm::estimateEffect(~ media_house + s(week_number), covidnewsPrevFit,
                           meta = out$meta, uncertainty = "Global")
summary(prepare, topics = 1)
...

```{r}
plot(prepare, "week_number", method = "continuous", topics = 3,
 printlegend = FALSE, xlab = "Week and year")
...

```{r}
saveRDS(covidNewsFit, file = 'RData/K200STM.rds')
...

```

Appendix 4

Coding guide for labeling topics

ReadMe

Coding guide for labeling topics

The analysis conducted by the author is based on n=22366 news stories from Aftenposten and VG within the period of 01.01.2020-15.03.2021. ‘covid* OR corona* OR korona*’ was the search phrase used to pick out news-stories, meaning every news story contains one of these three terms.

An STM model has been fitted with 200 topics based on this data. The STM model uses a TF-IDF (term frequency-inverse document frequency) method to categorize similar news stories into topics based on each word's likelihood of appearing in a certain topic.

As a coder, your job is to interpret the most representative words for each topic. These words are represented in four different categories (Highest Prob, Frex, Lift, and Score); these are explained on the last page of this document.

Coders will receive four documents. The first is this README file; the second is an Excel sheet used to code the material, and the third is a PDF document containing the 200 topics and each topic's most representative words. Forty words are presented in each category. The last file is the project outline for the thesis. It should be noted that the focus of the project has changed somewhat since the outline was written because of limitations of data gathering and changing events. The author argues that the outline is still relevant for the coder to understand the context in which they are coding the material and labeling topics.

For simplicity, the coder is asked to code the material in Norwegian. This is because the data is presented in Norwegian. Coding in the language of the data will prove simpler and more intuitive for the coder.

Explanation of variables and how to code them.

The coders are tasked with assigning values to the different variables for each topic represented in the given Excel document, as explained below. For each variable, the coder is to assign one, and only one, value. If the coder does not know which value best fits a variable for a topic, the coder should give the variable the value “Usikker” (Unsure). This also applies to topics

that do not have a singular focus, for example, a topic that both covers the war in Syria and Brazilian footballers that otherwise have nothing to do with the Syrian war.

For some topics, knowledge of current events for the period presented is needed to interpret the topic's relevance, theme, and label.

Emnenummer (Topic Number)

Type = String (This type is static and should not be changed by the coder)

This represents a value (Topic x) corresponding to a value in the PDF file “LabelsK200”. For each topic x, find the corresponding topic in the PDF file.

Emnet er relevant

(Topic is relevant to an analysis of the media portrayal of covid.)

Type = Boolean

The most relevant question to ask here is whether the topic in question would be a topic if not for Covid-19. For example, a topic about badminton is not relevant to an analysis of the portrayal of covid unless the topic is specifically about how the sport is affected by Covid-19, for example, due to canceled events. The coder should determine whether the topic is relevant for analyzing the media coverage of covid 19. Topics about covid should have the True value; other topics should be given the False value. In some cases, this will require knowledge of current events. For example, topics focusing on certain places may be relevant if these places have been prominent in the coverage of Covid.

The values of the variable should represent a Boolean (True or False) of whether the topic is relevant to an analysis of the portrayal of covid in the media. If the coder does not know whether the topic is relevant or not, they should give the value “Usikker”.

Tema (Topic theme)

Type = A predefined string from a list of themes

This variable asks you to categorize the topic based on a predefined set of themes. To make the analysis simpler, themes are to be coded with the most representative theme for that topic. Only one theme will be chosen for each topic. The following 13 themes are used:

Sport

The theme represents any story about organized sports, except football, which has its own theme due to its prevalence. This goes for all organized sports; therefore, other topics about

physical activities should not be in the sports theme. The theme includes topics about specific sports, topics about sports personalities, sporting events, and topics relating to covid's effect on sport.

Fotball (Football)

Any theme about certain football clubs, personalities, leagues, tournaments, matches etc. Topics coded with the Boolean "True" for whether they are relevant for the analysis, i.e. that they are about covid, should still be considered a football theme if it focuses specifically on covid's impact on football. Football topics fall under the sports category but has its own listing due to the prevalence of the theme. Therefore, all football topics are sports topics also, but no other sports topics are football topics.

Økonomi og Næringsliv (Economy and Business)

Any theme about currency, economic impact, rent increase, and decrease, markets, budgeting, etc., as well as topics about certain businesses or sectors of businesses, topics about layoffs, and strikes. The topic also focuses on the coverage of prominent business personalities. This theme will also include relevant topics for the analysis, for example, topics focused specifically on the economic impact of covid and topics focused on its consequence on the whole and its consequence for specific businesses. Topics about business projects should also be given this theme.

Kultur (Culture)

This theme represents all topics about culture, cultural events, holidays, and prominent cultural personalities. The exception is topics that are about cultural politics, for example, topics about The Ministry of Culture and Equality. These should be coded as "Politikk" (Politics). This theme may contain topics relevant to the analysis, for example, topics about canceled cultural events.

Nasjonal politikk (National politics)

This theme encompasses all topics that are about politics, political events, or prominent politicians. However, topics about political figures outside of their role as a politician, for example, in a criminal trial or in their role as an athlete or actor, should not be given the cultural theme, but rather "Kriminalitet" (crime) or "Sport". This theme may contain topics relevant for the analysis, for example, topics about the political response to covid.

Utenriks (Foreign affairs)

This theme encompasses all topics about events, situations, and structures outside of Norway that is not directly related to another theme. This might encompass international relations, war, and poverty abroad. This theme also encompasses international politics. Topics about Norway's political relation to other countries should also be coded with this theme. This may contain topics relevant to the analysis, for example, topics about international cooperation in the face of covid. Topics about Covid deaths and contagion in other countries should not be coded with this theme. Rather, they should be given the theme "Covid-19".

Utdanning (Education)

This theme encompasses all topics about education, from preschool to higher education. This may include topics relevant to the analysis, such as homeschooling.

Livsstil og helse (Lifestyle and health)

All topics about psychological health, nutrition, fitness, relationships, family life, etc. The theme should also encompass topics about travel and vacation. The theme may include topics relevant to the analysis, such as vacation recommendations given the covid situation. The theme also encompasses topics about health questions and procedures that are not about Covid 19, as covid has its own theme.

Leserinnlegg og debatt (Opinion)

This theme encompasses all topics of opinion pieces. The theme may include topics that are relevant, for example, if there are debate topics about the covid response.

Kriminalitet (Crime)

This theme encompasses all topics about crimes and trials. Topics about prominent people facing criminal charges and criminal investigation should also be given this theme. This theme takes precedence over other themes, for example, when the topic covers prominent politicians or cultural figures and their trials. The theme should also take precedence over the "Uriks" theme.

Covid-19

This theme encompasses all topics that are specifically about covid-19. For example, this will include topics about the spread of covid 19, topics about the vaccines and vaccination, and topics about covid deaths.

Tull (Gibberish)

When using a topic model, some of the categories may only contain common words but give little meaning beyond this. This often means the topic is a collection of stories that do not fit well anywhere and will mean very little for the analysis. All such topics should be assigned to this theme.

Andre (Others)

The final theme should be given to all topics that do not fit in any other theme.

Emneknagg (Label)

Type = String

The label variable is represented by a string (In Norwegian) that represents the coder's interpretation of what the topic is about. This could, for example, be a topic that represents the coverage of an event or a sport. Topics can also be broader, for example, a topic that represents the coverage of wars.

When assigning a label, the coder is asked to be as specific as possible.

Kommentar (Comment)

Type = String (Optional)

The coder is encouraged to comment on the topic, especially if the coder has issues coding the material and has given an “Usikker” value in one or multiple fields.

Word weightings

Highest Prob: are the words within each topic with the highest probability (inferred directly from topic-word distribution parameter β).

FREX: are the words that are both frequent and exclusive, identifying words that distinguish topics. This is calculated by taking the harmonic mean of rank by probability within the topic (frequency) and rank by distribution of topic given word $p(z|w = v)$ (exclusivity). In estimating exclusivity we use a James-Stein type shrinkage estimator of the distribution $p(z|w = v)$. More information can be found in the documentation for the internal function `calcfrex` and `js.estimate`.

Score and Lift are measures provided in two other popular text mining packages. For more information on type Score, see the R package `lda` or the internal function `calcscore`. For more information on type Lift, see the R package `maptpx` or the internal function `calclift`.

Note. Source Roberts et al. (2016)

Appendix 5

A list of topics and most representative words

Topic 1 Top Words:

Highest Prob: mer, kanskje, nok, alt, mye, helt, andr, fall, heller, mest, likevel, igjen, altså, godt, like, langt, akkurat, rett, enda, mindr, litt, bedr, lite, vel, gang, sett, særlig, folk, lett, eksempel, leng, dessuten, hvert, virker, sikkert, fortsatt, pandemien, går, store, ser

Topic 2 Top Words:

Highest Prob: trump, presidenten, hvite, hus, donald, testet, presid, smittet, positivt, fredag, sykehuset, lørdag, melania, skriver, flere, covid, legen, walter, kveld, rådgiver, twitter, reed, conley, penc, under, mike, tid, amerikansk, fikk, lege, bra, mandag, tidliger, imag, fått, rundt, sykehus, meadow, hick, oksygen

Topic 3 Top Words:

Highest Prob: corona, coronaviruset, skriver, viruset, vgs, smittet, fortel, coronasmitt, tidliger, fått, coronavirus, følge, coronapandemien, vider, veldig, dager, fortsett, bekreftet, torsdag, mennesk, mar, fredag, oversikt, fikk, avisen, coronasmittet, saken, mistet, tirsdag, kjent, kveld, onsdag, hatt, coronakrisen, melder, viser, legger, covid, bekreft, rammet

Topic 4 Top Words:

Highest Prob: prosent, viser, tall, mer, norg, tallen, fjor, færre, flere, blant, sammenlignet, høyer, under, antal, økt, mindr, pandemien, mar, laver, undersøkel, halvparten, men, økning, tror, undersøkelsen, tallet, stor, april, mye, ser, nedgang, rapporten, året, nesten, andelen, mest, antallet, større, sist, text

Topic 5 Top Words:

Highest Prob: døde, ham, død, livet, mistet, gammel, familien, fikk, maradona, sist, sorg, liv, faren, dag, moren, bort, farvel, diego, famili, dager, sener, aldri, åringen, mennesk, sammen, alltid, kjent, gaml, mannen, covid, gjennom, sønnen, sykehus, sykehuset, begravelsen, venn, rundt, dør, trist, hele

Topic 6 Top Words:

Highest Prob: brækhus, cecilia, kampen, mccaskil, kamp, boks, bokser, norg, ringen, tror, sist, første, jessica, arn, norsk, veldig, riis, verdensmest, mye, alt, andr, tilbak, kati, fikk, kamper, trener, tid, karrieren, vant, belten, taylor, tidliger, gang, victoria, får, møte, amerikansk, box, text, imag

Topic 7 Top Words:

Highest Prob: brann, nilsen, ingebrigtsen, bamba, soltvedt, forren, johannesen, bergen, kåre, haugen, arn, spiller, lar, rune, spill, vegard, erik, stadion, trener, opdal, ham, daouda, sesongen, kamper, ballspark, laget, sportssjef, treneren, huseklepp, vibek, får, ole, god, klubben, hustad, veldig, mye, sist, kolskogen, ahamada

Topic 8 Top Words:

Highest Prob: madrid, real, spania, spansk, ødegaard, martin, sociedad, liga, barcelona, spiller, sist, atlético, sesong, tilbak, sesongen, spill, nordmannen, zidan, første, laget, klubben, kampen, imag, mer, text, søndag, catalonia, nest, valencia, under, spanjol, kamp, spilt, sergio, pedro, champion, veland, ramo, plass, sevilla

Topic 9 Top Words:

Highest Prob: milliard, regjeringen, kroner, tiltak, mer, krisepak, sanner, staten, kutt, får, revidert, bruke, penger, frem, krisepakken, nye, tiltaken, statsbudsjettet, finansminist, tore, budsjett, kommer, jan, foreslår, økonomisk, øke, sikr, bedrift, reduser, forslag, økt, pakken, nest, krisen, ekstra, budsjettet, norsk, økte, skatt, flere

Topic 10 Top Words:

Highest Prob: johnson, storbritannia, britisk, london, bori, statsminist, the, england, statsministeren, cum, regjeringen, britten, bbc, down, skriver, domin, street, mandag, reuter, guardian, briter, landet, sky, folk, news, covid, søndag, flere, kveld, matt, raab, hancock, tilbak, rådgiver, men, fikk, mener, under, avisen, imag

Topic 11 Top Words:

Highest Prob: øystein, uken, podkasten, aftenposten, lar, christina, podkast, langberg, pletten, usa, episod, glomn, aftenpodden, diskuter, korrespond, giæver, trump, episoden, nye, høre, hør, spotifi, giertsen, litt, andr, magn, donald, gir, uke, sist, store, ser, kjetil, antonsen, junior, quiz, poeng, forklart, korona, komment

Topic 12 Top Words:

Highest Prob: norg, norsk, utenlandsk, arbeider, arbeidskraft, polen, ansatt, wizz, air, arbeidern, jobb, land, utlandet, flere, andr, europa, kommer, jobber, arbeid, avhengig, arbeidsinnvandrere, landbruket, under, verftet, bøndene, bønder, mener, selskapet, fikk, industri, polakk, får, blant, store, arbeidstager, rundt, landet, sesongarbeider, mye, mat

Topic 13 Top Words:

Highest Prob: viruset, døde, smittet, smitted, kina, mennesk, koronaviruset, dødsfall, person, påvist, wuhan, første, tilfel, land, bekreftet, januar, verden, nye, fått, utbruddet, flere, registrert, februar, smitt, who, provinsen, norg, italia, langt, dødd, flest, million, hubei, koronaviruset, utenfor, oppdaget, myndigheten, byen, andr, antal

Topic 14 Top Words:

Highest Prob: teater, publikum, forestilling, forestillingen, operaen, teatret, nye, nationaltheatret, teateret, norsk, scenen, andr, peer, får, spill, sand, forestil, gynt, opera, teatren, helt, under, scene, dyreparken, premier, går, mer, oslo, alt, scener, skuespillern,

Topic 15 Top Words:

Highest Prob: magnus, carlsen, turneringen, spill, chess, sjakk, fide, caruana, spiller, kandidattureringen, verden, best, poeng, lagrav, vachier, veldig, com, første, bae, spillern, mener, play, russland, spilt, tror, gang, grønn, remi, turnering, trekk, vant, fabiano, ding, andr, jan, maxim, mer, kamp, nett, fire

Topic 16 Top Words:

Highest Prob: solberg, erna, statsminist, statsministeren, regjeringen, dahl, søndag, pressekonferans, kveld, kontor, flere, statssekretær, kontakt, politisk, tirsdag, fikk, mener, høyre, saken, ordfører, hatt, pressekonferansen, gjort, mold, komm, spørsmål, norg, gjøre, andr, sammen, tiltaken, landet, håndtere, burd, frem, egseth, helt, nrk, folk, under

Topic 17 Top Words:

Highest Prob: sørloth, spilt, berg, spiller, norg, alexand, klubben, kamper, ajer, klubb, celtic, fredrik, landslaget, tidliger, tyrkia, sander, tyrkisk, gulbrandsen, king, sist, landskamp, sesongen, får, martin, norsk, trabzonspor, lagerbäck, åringen, troppen, normann, ham, kristoff, bort, ligaen, sesong, ulvestad, tre, fotbal, joshua, fikk

Topic 18 Top Words:

Highest Prob: italia, italiensk, skipet, bord, lombardia, land, milano, roma, regionen, bergamo, venezia, flere, karanten, mannskapet, myndighet, fikk, søndag, fått, kai, cont, får, giusepp, norsk, byen, italienern, nord, europa, veneto, ligger, skip, italiener, passasjer, havn, rederiet, hele, landet, rundt, utenfor, cruiseskip, situasjonen

Topic 19 Top Words:

Highest Prob: solbakken, københavn, dansk, ståle, danmark, hareid, trener, sist, åge, norsk, norg, fck, fikk, landslagssjef, spiller, veldig, første, bendtner, tidliger, spilt, dansken, andr, laget, tre, får, fotbal, jobben, østigård, spill, åringen, tid, igjen, litt, kamper, sammen, godt, ledet, tok, fått, mye

Topic 20 Top Words:

Highest Prob: new, usa, york, time, delstaten, amerikansk, the, guvernør, cuomo, flere, california, texa, delstat, skriver, zealand, andrew, pandemien, guvernøren, washington, byen, covid, døde, florida, million, dødsfall, amerikaner, andr, cnn, staten, under, rundt, john, hardt, verden, center, los, post, angel, uken, reuter

Topic 21 Top Words:

Highest Prob: vaksiner, vaksinen, norg, doser, første, vaksiner, pfizer, får, vaksiner, fhi, godkjent, million, dose, først, andr, vaksinedos, moderna, vaksineringen, flere, fått, dosen, kommer, mer, allerede, desember, tre, biontech, nok, rundt, fordel, januar, befolkningen, text, imag, effektiv, effekt, bruk, bukholm, coronavaksin, godkjen

Topic 22 Top Words:

Highest Prob: holmenkollen, fis, skiforbundet, langrenn, renn, kild, norg, lillehamm, avlyst, verdenscupen, sesongen, røste, kollen, ski, kombinert, internasjonal, riiber, snø, menn, publikum, erik, aamodt, sist, hopp, helgen, konkurrans, skiskyt, sesong, alpint, mar, kvinner, vinteren, under, helg, desember, jarl, aleksand, skiforbund, rennen, får

Topic 23 Top Words:

Highest Prob: ruud, vidar, casper, open, første, rund, turneringen, sett, verden, vant, spill, christian, andr, french, nummer, grand, best, litt, tredje, kamp, turner, nordmannen, slam, tenni, atp, kampen, gang, spiller, settet, eurosport, spilt, tapt, tre, thiem, pappa, imag, text, veldig, god, åringen

Topic 24 Top Words:

Highest Prob: barcelona, messi, klubben, lionel, kontrakten, kontrakt, forlat, sist, euro, spansk, klubb, spiller, liga, champion, leagu, kommer, mener, ham, ønsker, juni, sesongen, argentineren, bartomeu, fifa, flere, camp, best, rundt, nou, imag, text, sesong, mulig, hevder, går, overgang, skriver, veland, men, spilleren

Topic 25 Top Words:

Highest Prob: ingebriksen, jakob, meter, bislett, henrik, filip, gjert, under, game, friidrett, grøvdal, løpe, bjerk, diamond, løp, norg, norsk, brødrene, imposs, karolin, rekord, monaco, august, leagu, team, trener, stevnet, konkurrans, sist, tiden, juni, sesongen, trene, friidrettsforbundet, satt, løper, stadion, gang, tre, utøver

Topic 26 Top Words:

Highest Prob: danmark, norg, viruset, varianten, dansk, storbritannia, mer, nye, britisk, mutasjonen, variant, virusvarianten, mutasjon, fhi, mutert, flere, andr, frederiksen, oppdaget, mett, påvist, land, mink, smittsom, dansken, desember, virus, landet, vurder, vold, folkehelseinstituttet, langt, sør, sett, får, endring, ritzau, allerede, københavn, afrika

Topic 27 Top Words:

Highest Prob: nord, sør, korea, landet, kim, afrika, jong, leder, sørkoreansk, asia, flere, seoul, johnsen, grensen, nordkoreansk, mener, første, via, melder, nyhetsbyrået, finn, april, gang, ekspert, verden, offentlig, satt, tidliger, ser, statlig, rundt, øst, under, iran, tid, tror, reuter, land, klart, imag

Topic 28 Top Words:

Highest Prob: gravid, silj, fødsel, aas, fødselen, kvinner, barn, føde, fikk, får, under, første, måneder, tuva, kommer, venter, ronni, brede, tre, norend, julia, fått, uke, cathrin, flere, paret, barnet, gang, andr, tidlig, operasjon, smerter, fødend, går, partner, magen, eva, fødsler, alexand, fortel

Topic 29 Top Words:

Highest Prob: nye, bygg, prosjektet, oslo, museet, prosjekt, bygget, nytt, flere, nor, planen, blokken, kunst, bane, bergen, rive, ferdig, nasjonalmuseet, munch, hele, står, store, gang, arbeidet, andr, kode, bjørvika, mer, mye, aftenposten, mener, kunsten, dag, frem, kunstner, åpningen, statsbygg, gaml, utstillingen, ligger

Topic 30 Top Words:

Highest Prob: fli, flyet, flyplassen, gardermoen, hjem, sas, passasjer, flyplass, reis, lufthavn, reisend, passasjeren, landet, norg, avgang, bord, flyvning, komm, flyen, avinor, oslo, flyr, kansellert, kommer, satt, norwegian, land, flyselskap, bakken, flyging, flere, vider, reist, tilbak, norsk, rundt, flyselskapet, timer, air, reiser

Topic 31 Top Words:

Highest Prob: fhi, folkehelseinstituttet, norg, appen, tiltaken, tiltak, regjeringen, vurder, stoltenberg, mar, helsedirektoratet, data, skriver, rapporten, camilla, direktør, helsemyndigheten, rapport, befolkningen, viktig, fhis, smittestopp, mer, smittespor, viser, bruke, aftenposten, norsk, mulig, samfunnet, april, andr, flere, effekt, under, påske, myndigheten, frem, smittespredningen, barnehag

Topic 32 Top Words:

Highest Prob: tilskuer, sandn, stavang, tribun, tomm, publikum, arena, kampen, ulf, stadion, spill, tribunen, kamp, får, flere, aftenbladet, leder, billett, daglig, supporter, hus, klubben, første, komm, hjemmekamp, landro, slipp, esped, plass, kommer, treningskamp, fotballkamp, arenaen, rune, imag, kamper, text, rundt, går, foran

Topic 33 Top Words:

Highest Prob: trump, tidliger, ham, donald, presid, fengsel, the, usa, anklag, blant, skriver, amerikansk, presidenten, cohen, fikk, hevder, under, flere, dømt, anklagen, new, michael, york, saken, annet, politisk, anklaget, pompeo, imag, advokat, andr, føderal, mener, text, obama, sist, fbi, time, hevdet, post

Topic 34 Top Words:

Highest Prob: johaug, theres, kalla, karlsson, charlott, svensk, frida, ski, norsk, gull, sverig, vant, fikk, tilbak, sist, tre, mye, andersson, sesongen, best, bjørgen, kilomet, weng, tok, svensken, norg, bak, bra, northug, olsson, text, imag, gikk, ebba, foran, første, linn, marit, tidliger, litt

Topic 35 Top Words:

Highest Prob: unit, manchest, solskjær, gunnar, ole, leagu, ham, spiller, pogba, sesongen, chelsea, premier, tottenham, sist, spill, paul, leicest, kamper, laget, sesong, greenwood, fernand, kampen, sheffield, kamp, mourinho, klubben, europa, mye, imag, champion, manag, bruno, best, nest, tilbak, spillern, harri, west, text

Topic 36 Top Words:

Highest Prob: hurtigruten, tromsø, bord, amundsen, roald, passasjer, skipet, passasjeren, ansatt, juli, skjeldam, karanten, skip, mannskapet, wilhelmsen, svalbard, daniel, fått, selskapet, rune, smitt, første, kommun, fhi, fikk, mannskap, bekreftet, seilassen, kai, covid, smittet, land, stoltz, flere, bertinussen, fredag, skriver, person, fire, text

Topic 37 Top Words:

Highest Prob: christian, ander, mol, sørum, holt, norg, trene, best, andr, mye, næss, spill, veldig, verden, norsk, får, flere, sammen, nil, trener, fikk, litt, god, helt, mathia, gang, første, godt, gull, thea, oslo, sist, hele, spilt, bedr, hjemm, gjør, fjor, berntsen, bra

Topic 38 Top Words:

Highest Prob: skolen, elev, skoler, skole, barnehag, eleven, barn, barnehagen, barna, videregående, lærere, melbi, foreldr, hjemm, stengt, ansatt, igjen, får, hjemmeskol, nivå, rektor, flere, åpne, tilbak, steng, rødt, undervisn, mer, guri, trinn, lærern, mener, thorkildsen, blant, andr, hold, lærer, klass, mart, går

Topic 39 Top Words:

Highest Prob: usa, biden, trump, presid, amerikansk, joe, donald, obama, under, nye, første, landet, washington, administrasjonen, hvite, verden, flere, ønsker, mer, politisk, politikk, presidenten, amerikaner, amerikanern, blant, mexico, lovet, barack, igjen, fire, påtroppend, gjøre, januar, hus, sist, iran, økonomisk, land, pandemien, annet

Topic 40 Top Words:

Highest Prob: nav, permittert, jobb, dagpeng, arbeid, isaksen, ledig, dager, folk, jobber, røe, får, lønn, jobben, arbeidsledig, mar, flere, tilbak, ansatt, helt, permitt, torbjørn, fått, person, ordningen, søknader, nye, dagen, arbeidslivet, betal, tid, dag, uker, første, arbeidsgiv, rett, midlertidig, andr, sosialminist, coronakrisen

Topic 41 Top Words:

Highest Prob: mai, arrangement, festivalen, oslo, feir, avlyst, året, konsert, digitalt, store, festiv, digital, festival, norsk, publikum, pride, flere, marker, andr, avlys, feiringen, gjennomfør, mulig, hele, person, arranger, fysisk, leder, mer, arrang, arrangementet, kommer, arrangøren, live, juni, mennesk, arrangør, dagen, gang, saml

Topic 42 Top Words:

Highest Prob: saken, retten, mener, advokat, saker, sak, skriver, tidliger, under, fikk, vurder, dømt, feil, dommen, fått, frem, domstolen, annet, tiltalt, tingrett, norsk, forsvar, spørsmål, blant, behandl, bertheussen, oslo, kommenter, skjedd, sendt, ham, grunn, gjort, ment, andr, flere, fengsel, tatt, viser, grunnlag

Topic 43 Top Words:

Highest Prob: flere, solen, rundt, store, orkanen, mennesk, evakuert, gjerdrum, området, brannen, person, under, skriver, rammet, texa, kraftig, jorden, delstaten, imag, folk, grader, vann, lokal, louisiana, torsdag, tid, men, onsdag, text, vannet, temperatur, meter, kilomet, lang, deler, byen, komm, minst, ntb, land

Topic 44 Top Words:

Highest Prob: moen, sondr, nordstad, maraton, norg, hjem, guttormsen, løpe, kilomet, kenya, lang, løpet, andr, sist, tre, mai, løp, norsk, får, meter, tid, litt, thoma, tiden, fire, måneder, sett, trene, tilbak, trener, flere, dager, komm, kommer, fem, best, under, vant, ham, timer

Topic 45 Top Words:

Highest Prob: million, milliard, dollar, verden, reuter, the, skriver, under, amerikansk, rikest, rundt, kroner, amazon, tom, imag, moor, text, doner, nesten, samlet, året, john, gate, blant, listen, sammen, bloomberg, hele, donert, kjent, ntb, fjor, største, tilsva, forb, saml, koronapandemien, mest, gikk, mann

Topic 46 Top Words:

Highest Prob: nff, trene, fotballen, gang, fotbal, spill, igjen, kamper, får, start, spillern, eliteserien, toppfotballen, spiller, fotballforbund, juni, divisjon, norg, komm, norsk, toppfotbal, klubben, sesongen, gjennomfør, myndigheten, treningskamp, kontakt, oppstart, lov, mulig, kamp, kommer, flere, håper, andr, seriestart, toppserien, leder, ligaen, kvinner

Topic 47 Top Words:

Highest Prob: regjeringen, stortinget, mener, forslag, forslaget, leder, loven, ber, bør, støre, tiltak, nødvendig, arbeiderpartiet, opposisjonen, gjøre, nye, lysbakken, sikr, lov, vedtatt, jona, forleng, viktig, sett, endr, behandl, gir, gahr, enig, raskt, flertal, endring, innfør, frem, mulig, vurder, talsperson, kritisk, kjerkol, blant

FREX: stortinget, lysbakken, forslaget, forslag, kjerkol, loven, arbeiderpartiet, fullmakt, støre, moxn, opposisjonen, gahr, audun, regjeringen, forslagen, forskrift, høring, vedtatt, arnstad, svs, forleng, senterpartiet, koronaloven, parlamentarisk, vedta, talsperson, partien, graver, jona, vedtak, fremmet, foreslår, helsepolitisk, flertal, ber, ingvild, opposisjonspartien, kriselov, opphev, kriseloven

Topic 48 Top Words:

Highest Prob: sykehjem, eldr, pårørend, beboer, døde, besøk, ansatt, pasient, smitt, sykehjemmen, fikk, flere, smittet, dødsfall, covid, sykehjemmet, institusjon, skjedd, sykehus, bærum, andr, mar, første, april, pasienten, beboern, dødsfallen, smitten, syke, alvorlig, fått, skriver, besøksforbud, dødd, blant, pandemien, sykehuset, person, får, rammet

Topic 49 Top Words:

Highest Prob: høie, bent, helseminist, nakstad, helsedirektør, espen, helsedirektoratet, regjeringen, guldvog, assisterend, norg, pressekonferans, bjørn, helseministeren, hels, mener, rostrup, råd, veldig, omsorgsminist, viktig, mer, fortsatt, folk, smitt, kommer, spørsmål, larsen, imag, text, andr, samtidig, pressekonferansen, under, helsedirektøren, landet, helsemyndigheten, understrek, smitten, hele

Topic 50 Top Words:

Highest Prob: start, spiller, hardarson, trener, sesongen, trene, fædrelandsvennen, jesper, tilbak, rasmussen, laget, spill, mye, veldig, igjen, sist, kommer, får, mathisen, god, joey, godt, tidliger, spillern, litt, gang, bra, kamper, kampen, ramsland, fjor, kamp, spilt, steffen, første, klubben, mål, ser, text, imag

Topic 51 Top Words:

Highest Prob: raja, abid, kulturminist, norg, regjeringen, kultur, kulturministeren, tom, cruis, norsk, mission, imposs, likestillingsminist, komm, møte, mener, under, får, spill, fått, kommer, statsråden, hele, kulturdepartementet, august, ønsker, bollestad, gisk, åpne, terj, film, andr, forstår, imag, text, tidliger, dag, deler, gjør, landet

Topic 52 Top Words:

Highest Prob: andersen, game, norg, kleveland, røisland, marcus, første, vant, birk, tok, tre, utøver, under, big, sist, gull, norsk, aspen, fikk, mon, heni, konkurransen, best, mener, konkurrans, slopestyl, veldig, air, går, litt, hen, text, imag, plass, sølv, helt, nest, status, hafjel, blant

Topic 53 Top Words:

Highest Prob: leiren, moria, norg, hella, barn, gresk, flyktning, barna, flere, migrant, norsk, imot, hent, asylsøker, øya, land, andr, regjeringen, hjelp, myndighet, lesvo, migranten, mennesk, syria, brannen, kommer, flyktningen, europa, situasjonen, hol, mener, leir, blant, europeisk, person, enslig, lesbo, onsdag, satt, komm

Topic 54 Top Words:

Highest Prob: nye, sist, registrert, uken, smitted, uke, smittetilfel, tilfel, antal, flere, norg, smitten, person, dagen, tallet, dag, antallet, landet, tallen, smitt, viser, forrig, økning, smittetallen, smittet, tall, fhi, høyest, dødsfall, ser, meldt, per, totalt, innlagt, økt, smittetal, blant, imag, døgn, text

Topic 55 Top Words:

Highest Prob: trump, biden, joe, demokraten, donald, presid, usa, valget, velger, mener, tror, presidenten, partiet, sist, florida, presidentkandidat, velgern, vinn, stemm, obama, mer, fire, ham, stemmer, sander, clinton, republikanern, landsmøt, wisconsin, republikansk, tidliger, demokratisk, under, ser, vinner, vant, valg, meningsmålingen, flere, politisk

Topic 56 Top Words:

Highest Prob: norg, grensen, karanten, reglen, unntak, kommer, regjeringen, mæland, karantenehotel, dager, innreis, person, utlandet, monica, gjelder, regler, obligatorisk, norsk, ankomst, borger, opphold, nye, karantenereglen, land, reis, dersom, gjennomfør, forskriften, får, stengt, komm, landet, nødvendig, annet, utlending, reisend, januar, karanteneregl, importsnitt, justisminist

Topic 57 Top Words:

Highest Prob: oslo, johansen, raymond, byrådet, byrådsled, steen, hovedstaden, bydel, bydelen, flere, folk, kommun, byen, smitten, uken, tiltak, robert, aftenposten, smitt, mener, byrådslederen, stovner, mer, uke, blant, helsebyråd, sist, mye, får, gjør, går, nok, mest, smittetallen, veldig, bor, hatt, bekymret, tiltaken, høyt

Topic 58 Top Words:

Highest Prob: fikk, mar, smittet, hjem, dager, fortel, feber, østerrik, symptom, kontakt, syk, norg, beskj, dagen, hotellet, karanten, mannen, testet, andr, solgården, ischgl, spania, veldig, litt, nordmenn, frisk, flere, dag, sener, helt, hatt, norsk, fått, kvinnen, åringen, tok, host, måtte, dro, først

Topic 59 Top Words:

Highest Prob: fikk, mye, alt, litt, igjen, helt, gikk, aldri, måtte, veldig, livet, ham, tenkt, ting, gang, fortel, dag, tok, vet, første, jobb, alltid, hele, tilbak, begynt, går, dagen, tror, mer, gjord, egentlig, fått, andr, gjøre, rundt, folk, kanskj, kommer, satt, sist

Topic 60 Top Words:

Highest Prob: test, testet, positivt, tester, testen, posit, person, symptom, covid, positiv, smittet, svar, prøver, negativt, negativ, dager, koronatest, hurtigtest, flere, dag, coronatest, text, imag, tatt, testingen, uke, løpet, testkapasiteten, første, negat, uken, tre, andr, korona, hurtigtesten, timer, fem, gang, smitt, resultat

Topic 61 Top Words:

Highest Prob: berg, tuft, skarstein, stig, birgit, andré, olaf, tokyo, norg, trene, strand, brun, nest, sist, sammen, andr, får, utøver, veldig, mye, under, dans, litt, går, borch, fortsett, tid, gull, are, utsatt, sats, gjøre, trener, fire, fikk, paralymp, best, medalj, måneder, imag

Topic 62 Top Words:

Highest Prob: israel, netanyahu, israelsk, arabisk, benjamin, statsminist, landet, palestinsk, land, jerusalem, vestbredden, avtalen, forent, palestinern, mener, politisk, saudi, arabia, ultraortodoks, emirat, israeler, flere, under, bahrain, midtøsten, store, dubai, nye, leder, gantz, valg, regjeringen, emiraten, befolkningen, statsministeren, regjer, avtal, tel, blant, aviv

Topic 63 Top Words:

Highest Prob: meter, best, løp, rekord, under, norg, veldig, trene, gull, konkurrans, satt, norsk, fjor, tiden, god, nest, verden, vant, sist, christiansen, løpe, trener, hynn, får, mål, mye, rekorden, åringen, tror, litt, konkurrer, store, bra, helt, trent, junior, sekund, henrik, kristiansand, lørdag

Topic 64 Top Words:

Highest Prob: instagram, the, under, skriver, serien, kjent, imag, flere, tiktok, videoen, text, best, blant, sammen, følgere, stjernen, netflix, medier, sist, skuespilleren, verden, fortsett, åringen, fikk, artikkelen, skuespil, youtub, annet, tidliger, fjor, sesong, video, coronapandemien, award, angel, tiden, show, amerikansk, artisten, fått

Topic 65 Top Words:

Highest Prob: norg, kampen, norsk, spill, uefa, nff, serbia, landslaget, lagerbäck, romania, ulleva, østerrik, spiller, fotbal, nation, lar, landskamp, fotballforbund, fotballforbundet, israel, landslagssjef, leagu, kamper, kamp, spillern, svendsen, oktob, bjerketvedt, under, avlyst, landslag, kommer, irland, europa, viktig, europeisk, novemb, elabdellaoui, omar, får

Topic 66 Top Words:

Highest Prob: trump, valget, usa, flere, stemm, stemmer, georgia, delstaten, donald, presid, høyesterett, demokraten, valg, poststemm, pennsylvania, republikanern, delstat, velger, presidentvalget, mener, valgfusk, republikansk, kommer, amerikansk, novemb, stemmen, valgresultatet, biden, valgdagen, texa, post, posten, barrett, resultatet, via, under, tell, vinner, andr, postvesenet

Topic 67 Top Words:

Highest Prob: mer, andr, hjemmekontor, jobb, gjør, mye, tid, finn, sosial, mener, kanskj, gir, gjøre, ting, bedr, tror, oft, psykolog, viktig, digital, flere, kvinner, spørsmål, jobber, mindr, livet, nye, tip, trenger, opplev, hjemm, får, kommer, sammen, tenk, god, gjern, ser, snakk, menn

Topic 68 Top Words:

Highest Prob: norg, danmark, håndball, mesterskapet, norsk, herrem, spiller, hergeirsson, spill, ofted, desemb, myrhol, mesterskap, stine, sist, landslaget, håndballforbundet, camilla, mener, lio, gull, bredal, thorir, veldig, håndballjenten, laget, best, solberg, kristiansen, dansk, kommer, mye, under, polen, erevik, spilt, silj, kold, györ, mørk

Topic 69 Top Words:

Highest Prob: olj, equinor, kutt, aker, norsk, oljeprisen, dollar, fat, dag, utslippen, energi, oljeselskapen, investering, utslipp, norg, verden, per, opec, gass, prosjekt, saudi, prisen, oljenæringen, arabia, andr, mye, store, får, global, produksjonen, fatet, under, sett, flere, land, mindr, sokkel, million, nye, laver

Topic 70 Top Words:

Highest Prob: innvandrere, norg, blant, flere, viktig, født, norsk, mener, informasjon, debatten, språk, nyborg, andr, person, solvang, nrk, leder, bakgrunn, mer, frem, folk, myndigheten, organisasjon, grupper, under, sian, oslo, innvandrerbakgrunn, pakistan, høi, ytringsfriheten, mye, samfunnet, somalia, juli, minoritetsbakgrunn, annet, enkelt, somalisk, sosial

Topic 71 Top Words:

Highest Prob: russen, russ, russetiden, eurovis, mgp, året, ulrikk, feir, finalen, avlyst, tix, brandstorp, norg, får, mai, hele, nrk, fest, låten, andr, håper, prix, flere, russetid, litt, grand, under, mye, norsk, helt, bussen, landstreff, carina, contest, melodi, stavang, song, første, nest, vant

Topic 72 Top Words:

Highest Prob: russland, russisk, putin, moskva, vladimir, navalnyj, presid, presidenten, myndighet, aleksej, russern, under, sputnik, landet, flere, russer, store, mener, kreml, andr, prosent, sist, aftenposten, politisk, folk, ntb, land, fikk, nye, myndigheten, mann, still, ham, annet, tidliger, stemm, grunnloven, gang, statlig, hele

Topic 73 Top Words:

Highest Prob: europa, spill, leagu, kampen, norsk, norg, østerrik, kamp, færøyen, lag, første, uefa, aberdeen, champion, wien, august, laget, spiller, onsdag, smerud, island, kamper, spilt, motstand, sist, lagen, grunn, text, imag, septemb, trekk, møter, gruppespillet, tidliger, rund, gunnar, troppen, spillern, kveld, kvalifiseringen

Topic 74 Top Words:

Highest Prob: harri, penc, kamala, visepresid, meghan, under, mike, kate, the, visepresidentkandidat, første, britisk, prin, skriver, usa, blant, storm, hertuginn, california, verden, men, annet, tidliger, olsen, svart, text, retten, imag, amerikansk, flere, medier, mari, canada, sammen, kjent, visepresidenten, angel, frem, andr, gikk

Topic 75 Top Words:

Highest Prob: libanon, drept, beirut, eksplosjonen, iran, angrepet, landet, flere, skadet, mennesk, hassan, angrep, byen, fortel, døde, andr, hjelp, skjedd, folk, libanesisk, mistet, tirsdag, sist, person, rammet, gaten, iransk, tre, rundt, ødelagt, under, minst, angrepen, pakistan, skutt, men, utenfor, politisk, havnen, store

Topic 76 Top Words:

Highest Prob: hovland, hull, viktor, pga, golf, slag, par, under, første, turneringen, plass, runden, spilt, sist, best, nummer, nordmannen, touren, spill, turner, hullet, open, norsk, rund, fire, championship, tre, imag, spiller, delt, blant, gang, topp, vant, seieren, reitan, dagen, endt, million, seier

Topic 77 Top Words:

Highest Prob: viper, champion, leagu, mørk, spiller, katrin, nora, gjekstad, lund, kamper, spill, kampen, kristiansand, spilt, veldig, marcussen, tre, emili, gustav, får, ole, arntzen, trener, kommer, kamp, norg, tror, tilbak, rostov, lag, best, flere, hegh, laget, malin, bucuresti, reistad, aun, spillern, klubben

Topic 78 Top Words:

Highest Prob: norwegian, selskapet, milliard, sas, aksjer, staten, kroner, selskap, prosent, flyselskapet, schram, norsk, krisen, nye, gjeld, aksjonæren, andr, konkur, gjennom, fli, aksjen, tre, ansatt, igjen, eier, under, får, kreditoren, flyselskap, statlig, største, jacob, lån, sikr, aksjonær, coronakrisen, luftfarten, frem, konsernsjef, flere

Topic 79 Top Words:

Highest Prob: karanten, ansatt, smittet, person, kontakt, smitt, symptom, folkehelseinstituttet, satt, fhi, andr, påvist, nærkontakt, smitted, opplys, bekreftet, jobb, fredag, fått, vedkommend, hjemm, personen, sykehus, kveld, hjemmekaranten, norg, hold, dager, ullevål, lørdag, fikk, tre, mandag, får, sykehuset, tirsdag, helsedirektoratet, beskj, skriver, informasjon

Topic 80 Top Words:

Highest Prob: pettersen, zuccarello, mat, nhl, wild, minnesota, sesongen, spiller, spill, kamper, nba, laget, første, spilt, klubben, sesong, lag, sluttspillet, norsk, tilbak, best, tid, kampen, igjen, sist, ranger, norg, nordmannen, spillern, new, usa, imag, kamp, dag, under, york, fjor, calgari, gang, tre

Topic 81 Top Words:

Highest Prob: klubben, trener, styret, leder, valakari, styreled, tidliger, fløya, itromsø, jobben, tromsø, spillern, johansen, høydal, ønsker, laget, spiller, hovedtren, nye, sportslig, alfheim, jobb, daglig, helstrup, fikk, tid, treneren, simo, hatt, vider, flere, morten, årsmøtet, klubb, nest, nilsen, gjort, kristian, gjøre, til

Topic 82 Top Words:

Highest Prob: kommun, kommunen, ordfører, lokal, nasjonal, bærum, mener, skriver, helsedirektoratet, landet, fikk, innført, flere, innbygger, vurder, asker, fylkesmannen, pandemien, hatt, gjøre, kommunal, egn, enkelt, vedtak, besøksstan, andr, får, sendt, lokalt, møre, viser, viken, romsdal, ordføreren, innbyggern, hele, ønsker, behov, gjelder, utviklingshemmed

Topic 83 Top Words:

Highest Prob: sagosen, norg, sander, elverum, egypt, kiel, berg, spiller, norsk, frankrik, håndball, champion, best, leagu, color, mathisen, christian, spill, første, får, januar, lag, line, tre, kampen, helt, kairo, andr, kommer, flere, veldig, laget, sist, sveit, reinkind, fire, spillern, kamp, imag, gang

Topic 84 Top Words:

Highest Prob: verden, land, mennesk, million, afrika, fattig, syria, pandemien, fns, landet, kvinner, jemen, fattigdom, mat, grenser, flere, andr, landen, krig, afrikansk, hjelp, under, humanitær, sult, rammet, står, økonomisk, får, organisasjonen, allerede, konflikt, mer, flukt, lever, koronapandemien, krigen, mest, jenter, venezuela, flyktning

Topic 85 Top Words:

Highest Prob: oiler, sesongen, kamper, ishockey, klubben, storhamar, stavang, thoresen, sluttspillet, sparta, spill, spiller, vålerenga, sesong, christiansen, sist, hockey, norg, spilt, igjen, ligaen, higson, får, aftenbladet, laget, tore, lag, spillern, avlyst, nye, tre, narvik, isen, frisk, lillehamm, sluttspil, kommer, patrick, jordal, arena

Topic 86 Top Words:

Highest Prob: haug, milan, jen, zlatan, petter, ibrahimov, bodøglimt, seri, spiller, europa, italiensk, kamper, mål, sesongen, norsk, san, sist, leagu, italia, inter, kampen, scoret, fikk, siro, sampdoria, spill, milano, klubben, thorsbi, imag, igjen, tre, laget, helt, text, ham, første, svensken, kamp, mer

Topic 87 Top Words:

Highest Prob: bilen, bil, kjøre, biler, kjører, kjørte, kjørt, veien, første, staten, kilomet, bobil, vegvesen, flere, taxi, lang, kommer, oliv, hauger, elbil, parkeringsplassen, helt, fortel, ralli, kmt, gjennom, får, fart, mye, hele, sist, ser, sjåføren, gjør, mer, dag, vei, går, rundt, bobilen

Topic 88 Top Words:

Highest Prob: ski, norg, tour, norsk, klæbo, ruka, finland, bjervig, johann, får, høsflot, bolsjunov, verdenscupen, nossu, andr, weng, fis, beitostølen, løpern, iversen, kommer, klassisk, langrenn, valn, vant, tatt, løpere, eirik, finsk, utøver, går, emil, renn, espen, myhr, sprint, kilomet, nummer, johaug, skirenn

Topic 89 Top Words:

Highest Prob: vaksinen, astrazeneca, bivirkning, astra, zeneca, legemiddelverket, norg, blodpropp, madsen, vaksiner, ema, alvorlig, fått, flere, andr, land, fhi, europeisk, vurder, person, vaksiner, mener, sammenheng, satt, vaksineringen, bruk, steinar, tilfel, blant, torsdag, tre, hos, paus, dødsfall, undersøk, data, fda, medisinsk, mulig, sett

Topic 90 Top Words:

Highest Prob: rbk, rosenborg, adresseavisen, horneland, klubben, dyrhaug, lerkend, helland, moe, hareid, eggen, dorsin, koteng, eirik, trener, tilbake, tove, korona, rbks, sist, ranheim, får, tid, leder, igjen, samtidig, kommer, spillern, trondheim, godt, ting, mye, alt, tre, tror, men, går, imag, text, rasmus

Topic 91 Top Words:

Highest Prob: trump, usa, donald, presid, presidenten, amerikansk, hus, hvite, fauci, under, pressekonferans, cnn, mener, kommer, anthoni, viruset, tidliger, twitter, amerikaner, skriver, flere, washington, landet, ham, folk, intervju, annet, kritikk, uttalels, gjort, håndtere, gjøre, post, blant, veldig, spørsmål, ekspert, svart, spurt, pressekonferansen

Topic 92 Top Words:

Highest Prob: student, studenten, asheim, universitetet, universitet, flere, utdan, henrik, høyer, undervisn, mener, studer, får, mer, fysisk, ntnu, norsk, uio, studien, bergen, fått, nye, forskn, andr, oslo, fadderuken, digit, leder, praksi, høyskol, lånekassen, utdanningsminist, campus, universiteten, under, vanskelig, studier, mye, rektor, stipend

Topic 93 Top Words:

Highest Prob: tiltak, tiltaken, person, hold, gjelder, bør, regjeringen, nye, avstand, nivå, innfør, arrangement, nasjonal, mulig, vurder, andr, innendør, kommun, meter, besøk, innført, strenger, nødvendig, unngå, barn, rødt, privat, forbud, lokal, anbefal, kommunen, fritidsaktivitet, streng, munnbind, regler, steder, under, serveringssted, unntak, steng

Topic 94 Top Words:

Highest Prob: haaland, dortmund, erl, braut, borussia, bayern, mål, münchen, bundesliga, lewandowski, kamper, scoret, spiller, schalk, kampen, champion, norsk, første, fire, lørdag, best, leagu, robert, sesongen, sist, tysk, kamp, spill, fotbal, verden, tidliger, store, tre, ham, største, ser, åringen, europa, imag, spilt

Topic 95 Top Words:

Highest Prob: the, året, ord, mer, and, nye, album, låter, you, låt, mest, taylor, like, andr, artist, best, musikk, mye, swift, blant, låten, nok, annet, sangen, albumet, verden, nesten, helt, text, imag, sang, koronaen, språkrådet, likevel, syng, synger, dylan, første, nytt, gjennom

Topic 96 Top Words:

Highest Prob: venstr, høyre, leder, partiet, støre, vedum, grand, arbeiderpartiet, mdg, jona, får, rotevatn, gahr, melbi, politisk, politikk, mener, regjer, senterpartiet, parti, trine, nestled, skei, folk, velger, rødt, trygv, partiled, valget, målingen, slagsvold, under, sveinung, sist, valg, frem, guri, politikken, valgkomiteen, gisk

Topic 97 Top Words:

Highest Prob: frp, jensen, listhaug, krf, siv, sylvi, leder, frps, partiet, stortinget, fremskrittspartiet, mener, ropstad, høyre, regjeringspartien, regjeringen, norg, kjell, mer, partien, regjer, nestled, venstr, andr, enig, forhandlingen, får, ingolf, kommer, hagen, gundersen, gjennomslag, går, helt, imot, fikk, mye, talsperson, flertal, saken

Topic 98 Top Words:

Highest Prob: who, verden, land, helseorganisasjon, global, vaksin, covid, pandemien, usa, pandemi, utvikl, internasjonal, whos, organisasjonen, norg, cepi, samarbeid, mener, covax, tedro, landen, milliard, sikr, ghebreyesus, fattig, viruset, tilgang, dag, brundtland, røttingen, gjennom, viktig, globalt, arbeidet, adhanom, rike, leder, tidliger, under, internasjonalt

Topic 99 Top Words:

Highest Prob: klæbo, johann, høsflot, iversen, oberstdorf, emil, ski, sist, best, northug, under, adresseavisen, monsen, får, litt, nok, langrenn, mye, sesongen, morfar, helt, trene, alt, sagen, petter, sammen, gull, flere, tror, godt, sesong, nest, god, tønseth, skiforbundet, norsk, veldig, mer, viktig, fikk

Topic 100 Top Words:

Highest Prob: ntb, scanpix, mar, koronaviruset, april, utsatt, text, imag, mai, juni, nest, grunn, planlagt, torsdag, følge, utsett, tirsdag, planen, situasjonen, uke, avlyst, mandag, vent, onsdag, fram, allered, fredag, skriver, koronapandemien, vider, uken, tid, gjennomfør, opplys, uker, februar, koronakrisen, slutten, all, satt

Topic 101 Top Words:

Highest Prob: warholm, karsten, meter, leif, hekk, aln, tiden, olav, løp, litt, mye, under, veldig, trene, amali, best, satt, friidrett, sesongen, andr, sist, monaco, mer, trener, gjøre, verden, nest, får, gull, året, verdensrekord, iuel, godt, diamond, norsk, bedr, leagu, rekord, imag, løpe

Topic 102 Top Words:

Highest Prob: spiller, lag, hansen, tromsø, klubben, veldig, spilt, divisjon, spill, laget, kamper, litt, får, sesong, sesongen, trener, bra, fløya, mye, håper, sist, trene, johansen, året, tilbak, fjor, fotbal, fått, tror, kommer, tre, tidliger, fikk, klar, andr, klubb, del, igjen, itromsø, utvikl

Topic 103 Top Words:

Highest Prob: pasient, sykehus, sykehuset, pasienten, innlagt, legen, behandl, leger, syke, covid, sykehusen, får, sykepleier, flere, helsepersonel, helsevesenet, sykeplei, jobber, respir, jobb, ligger, hjelp, intensivavdelingen, andr, ansatt, alvorlig, fortel, lege, ahus, helsearbeider, trenger, kommer, redd, under, avdelingen, veldig, situasjonen, første, helt, universitetssykehus

Topic 104 Top Words:

Highest Prob: polen, ungarn, partiet, polsk, valget, regjeringen, duda, parti, landet, under, valg, abort, kvinner, orbán, statsminist, politisk, leder, presid, prosent, andr, pis, demokrati, fikk, parlamentet, mer, regjer, nye, europa, warszawa, første, pandemien, viktor, loven, mener, land, demokratisk, største, flere, makt, kandidat

Topic 105 Top Words:

Highest Prob: eksamen, eleven, elev, videregående, melbi, guri, får, avlys, gjennomfør, mener, skole, skriftlig, utdan, avlyst, fag, vurder, skolen, høyer, karakter, muntlig, året, mer, våren, mulig, grunn, viktig, regjeringen, fått, komm, andr, urettferdig, elevorganisasjonen, fikk, rettferdig, kunnskapsminist, tidliger, flere, derfor, lærern, imag

Topic 106 Top Words:

Highest Prob: konsert, artist, musikk, oslo, konserten, artisten, publikum, norsk, spill, flere, live, kveld, musikken, nye, andr, første, spiller, spilt, blant, sammen, bandet, sang, hele, musiker, facebook, scenen, sist, helt, litt, under, mye, digital, nett, gjennom, synger, text, imag, gang, annet, teigen

Topic 107 Top Words:

Highest Prob: politiet, flere, person, brudd, politidistrikt, fest, natt, folk, oslo, festen, melding, politi, søndag, fester, operasjonsled, mannen, andr, lørdag, fortel, fått, anmeldt, avhør, fikk, samlet, øst, ulovlig, saken, stedet, skriver, opplys, straff, bøter, klokken, imag, rundt, etterforsk, text, privat, alvorlig, bot

Topic 108 Top Words:

Highest Prob: roger, djokov, tenni, open, novak, turneringen, nadal, andr, flere, rafael, spiller, feder, grand, første, mer, william, slam, under, spill, litt, mye, best, helt, verden, fikk, sett, tror, turner, wimbledon, dommeren, kampen, blant, positivt, ballen, imag, finalen, ser, testet, text, får

Topic 109 Top Words:

Highest Prob: kongen, kong, harald, prin, dron, prinsess, dronningen, under, slottet, haakon, sonja, kronprin, kongeparet, kongelig, kongefamilien, philip, carl, prinsen, märtha, kronprinsen, fikk, kongehuset, fredag, ntb, elizabeth, imag, text, louis, dagen, tale, norg, sverr, sammen, norsk, marit, sofia, grunn, dag, magnus, kronprinsess

Topic 110 Top Words:

Highest Prob: farmen, deltagern, fikk, paradis, hotel, produksjonen, gården, innspillingen, andr, hansen, litt, mad, kjendi, tidliger, mener, får, helt, programmet, beach, programled, veldig, deltager, fortel, sesong, the, under, måtte, kariann, mye, dans, spill, hele, cecili, legger, flere, deltag, text, mexico, mer, imag

Topic 111 Top Words:

Highest Prob: norg, norsk, nye, mer, arbeidsplass, bygg, viktig, utvikl, store, industri, skape, trenger, bærekraftig, grønne, klima, innen, gjør, sats, gang, koronakrisen, gjøre, verden, fremtiden, flere, teknolog, bruke, bedrift, krisen, grønn, jobber, hele, sikr, innovasjon, bidra, derfor, gjennom, våre, kommer, olj, bør

Topic 112 Top Words:

Highest Prob: nrk, året, serien, best, norsk, prisen, norg, sesong, nominert, første, veldig, får, flere, vant, lauritzen, nye, seri, litt, skuespil, programled, sett, blant, under, mest, kommer, kjent, programmet, mye, seer, nrks, oslo, sammen, fikk, stor, annet, flesvig, komik, episod, tror, helt

Topic 113 Top Words:

Highest Prob: klubben, spiller, spillern, permittert, klubber, ansatt, norsk, permitter, situasjonen, permittering, leder, andr, økonomisk, fotbal, situasjon, trener, daglig, norg, prosent, lønn, lønnskutt, gjør, mener, klubb, toppfotbal, niso, kommer, gjøre, gjelder, mulig, hele, permitteringen, permitt, vurder, helt, dager, enig, ntf, får, følge

Topic 114 Top Words:

Highest Prob: oslo, gjester, stengt, folk, avstand, hold, gjesten, alkohol, meter, utested, steng, server, åpent, åpne, flere, igjen, restauranten, steder, restaurant, serveringssted, reglen, smittevern, utelivet, utesteden, drikk, parken, smittevernreglen, tett, byen, person, restaur, klokken, mat, skjenkestopp, åpnet, skjenk, bord, holder, midnatt, daglig

Topic 115 Top Words:

Highest Prob: aafk, vik, klubben, aalesund, spiller, bohinen, får, litt, lar, geir, igjen, veldig, sunnmørsposten, mye, hødd, spill, trene, sesongen, lie, godt, ove, tilbak, kommer, rundt, imag, text, god, tror, fått, andr, spillern, ser, første, helt, tidliger, sist, castro, laget, del, mener

Topic 116 Top Words:

Highest Prob: prosent, kvartal, falt, kraftig, fall, første, dollar, milliard, usa, nedgang, børs, skriver, fallet, kronen, indeksen, børsen, oslo, imag, text, uken, oljeprisen, mar, amerikansk, torsdag, bnp, andr, markedet, dagen, oppgang, forrig, steg, mandag, børsene, største, faller, mer, rundt, verden, coronaviruset, sist

Topic 117 Top Words:

Highest Prob: oslo, ruter, tog, folk, flere, buss, bussen, passasjer, busser, bane, kollektivtrafikken, reis, reiser, går, plass, hjemmekontor, andr, banen, kommer, trafikken, dag, bruke, jobb, hold, reisend, lang, mer, oppfordr, kollektivtransport, viken, kollektivt, sett, transport, unngå, toget, komm, stasjon, avstand, passasjeren, nye

Topic 118 Top Words:

Highest Prob: tyrkia, kirken, kirk, gud, gudstjenest, tyrkisk, kristn, erdogan, moskeen, istanbul, muslim, verden, under, sofia, ramadan, land, andr, muslimsk, prester, flere, religiøs, biskop, islam, kirker, moskeer, bønn, første, presid, moské, presten, katolsk, holdt, paven, hellig, landet, recep, prest, moham, religion, påsken

Topic 119 Top Words:

Highest Prob: hviterussland, landet, lukasjenko, presid, hviterussisk, flere, valget, arrestert, minsk, presidenten, sist, opposisjonen, aleksandr, myanmar, tikhanovskaja, politisk, valg, under, makten, folk, europa, fikk, andr, tidliger, mener, store, myndigheten, regimet, demonstrant, land, prosent, russland, folket, demonstrasjonen, svetlana, august, tre, gaten, rundt, hovedstaden

Topic 120 Top Words:

Highest Prob: filmen, film, kino, filmer, the, norsk, kinoen, netflix, hollywood, nye, kinoer, oscar, premier, norg, regissør, kommer, store, serien, verden, første, usa, regi, får, sett, best, bond, amerikansk, spiller, disney, serier, hovedrollen, mest, hbo, jame, tror, helt, dokumentar, flere, tilgjengelig, hele

Topic 121 Top Words:

Highest Prob: hegerberg, kvinnelig, ada, kvinner, tilbak, lyon, fotbal, gang, igjen, best, første, kvinnen, norg, menn, mer, veldig, verden, mener, kommer, mye, spiller, trener, kvinn, tatt, norsk, kneet, fikk, ser, alt, fått, ting, golden, mannlig, tiden, sist, andr, aldri, åringen, får, tror

Topic 122 Top Words:

Highest Prob: avlys, arranger, avlyst, gjennomfør, cup, arrangøren, arrangementet, arrangement, bergen, arrang, arrangert, deltaker, løpet, lag, får, store, leder, påmeldt, arrangør, turneringen, rundt, septemb, planlagt, året, norg, deltager, norway, løp, håper, flere, delta, kommer, avlysn, ønsker, veldig, mulig, allered, går, situasjonen, daglig

Topic 123 Top Words:

Highest Prob: usa, folk, fikk, andr, første, kennedi, thoma, rundt, christoph, mennesk, ham, robert, gikk, mener, flere, mer, hele, the, familien, amerikansk, men, hverandr, ann, fortsatt, mye, tallet, alt, aldri, tok, john, jone, hjelp, kristin, utenfor, bor, dagen, bergan, begynt, sist, dag

Topic 124 Top Words:

Highest Prob: covid, alvorlig, sykdom, syke, sykdomm, risiko, symptom, eldr, hos, andr, sykdommen, person, influensa, blant, får, folkehelseinstituttet, pasient, behandl, under, underliggend, alder, norsk, dødeligheten, kronisk, overleg, bør, smitt, lege, syk, utsatt, frisk, sykehus, flere, infeksjon, vet, dødelighet, vanlig, risikogruppen, fhi, mer

Topic 125 Top Words:

Highest Prob: marcus, rashford, unit, barn, manchest, grati, england, britisk, mat, fikk, solskjær, million, pund, ole, blant, nok, gunnar, storbritannia, hjelp, fått, engelsk, under, famili, omsetn, barna, imag, the, text, medier, tre, rose, tottenham, cavani, gjøre, sosial, johnson, stjernen, får, fattigdom, flere

Topic 126 Top Words:

Highest Prob: start, klubben, leder, styreled, daglig, avtalen, reed, sponsor, langeland, idrettslag, kommer, avtal, christoph, klubber, drøm, gjennom, macconnach, andr, fædrelandsvennen, robin, flere, komm, ønsker, får, økonomisk, håper, nye, veldig, viktig, sparebanken, samtidig, mye, klubb, god, blant, jobb, ser, koronakrisen, investoren, rundt

Topic 127 Top Words:

Highest Prob: rosenborg, rbk, henriksen, hareid, lerkend, skjelbr, kampen, ciljan, åge, zachariassen, børven, tilbak, adegbenro, spill, andré, islamov, trondheim, markus, per, sist, konradsen, første, hols, horneland, tagseth, kamp, fikk, samuel, kristoff, adresseavisen, laget, carlo, litt, åsen, får, sesongen, igjen, imag, text, spilt

Topic 128 Top Words:

Highest Prob: bedrift, bedriften, ordningen, støtte, staten, fast, hjelp, får, næringslivet, prosent, skatteetaten, regjeringen, fått, kostnad, kompensasjonsordningen, under, mar, betal, søke, virksomhet, kontantstøtt, kompensasjon, ansatt, andr, april, små, sanner, steng, norg, foretak, selskap, utbytt, misbruk, kommer, følge, tore, jan, mener, mer, utbetalt

Topic 129 Top Words:

Highest Prob: frankrik, fransk, pari, macron, nederland, presid, europa, emmanuel, reuter, jean, belgia, torsdag, nice, saint, michel, kveld, tidliger, statsminist, psg, andr, text, afp, imag, marseill, flere, nederlandsk, presidenten, franskmenn, lyon, ntb, neymar, skriver, germain, sveit, blant, første, nyhetsbyrået, van, spania, nye

Topic 130 Top Words:

Highest Prob: sverig, svensk, norg, stockholm, tegnel, finland, danmark, ander, svensken, mener, andr, land, flere, nordisk, hatt, svensker, norsk, landen, aftonbladet, statsepidemiolog, grensen, löfven, mer, folkhälsomyndigheten, stengt, stor, strategi, dødsfall, stefan, døde, norden, valgt, tidliger, landet, fått, pandemien, hele, mye, region, gjort

Topic 131 Top Words:

Highest Prob: brasil, india, landet, bolsonaro, presid, amerika, døde, dødsfall, verden, pandemien, mexico, flere, million, jair, covid, presidenten, registrert, reuter, latin, byen, viruset, myndigheten, blant, brasiliansk, folk, land, peru, amazona, indisk, manaus, under, rio, mener, usa, mennesk, paulo, text, rammet, argentina, imag

Topic 132 Top Words:

Highest Prob: liverpool, klopp, leed, jürgen, leagu, citi, manchest, klubben, premier, manag, kampen, anfield, chelsea, spiller, van, sist, spill, sesongen, dijk, tre, første, lag, everton, villa, vinn, mye, feir, spillern, vant, salah, poeng, fansen, laget, best, kamp, newcastl, andr, sesong, gang, spilt

Topic 133 Top Words:

Highest Prob: stengt, landet, innført, steng, myndigheten, igjen, åpne, hold, folk, streng, portforbud, byen, restriksjon, tiltak, restaurant, andr, nye, restriksjonen, gjenåpn, europa, tiltaken, mar, flere, uker, innbygger, land, hele, butikk, får, stenger, mandag, lov, statsminist, barer, under, fortsatt, belgia, første, hjemm, nedstengn

Topic 134 Top Words:

Highest Prob: storbritannia, britten, johnson, avtalen, brexit, avtal, bori, britisk, statsminist, eus, forhandlingen, leder, politisk, irland, landet, nye, partiet, brussel, sist, regjeringen, labour, konserv, mener, igjen, mer, desemb, ham, andr, nord, parlamentet, fortsatt, står, gang, ntb, starmer, tidliger, politikk, frem, egn, mest

Topic 135 Top Words:

Highest Prob: viruset, forsker, virus, forskern, studien, covid, mennesk, antistoff, forskn, dyr, koronaviruset, studi, finn, andr, kroppen, universitetet, hos, mer, studier, flere, sar, nye, professor, ulik, vist, effekt, vet, smitt, viktig, gir, grødeland, viser, mye, derfor, smittet, flaggermus, medisin, publisert, utvikl, bakteri

Topic 136 Top Words:

Highest Prob: mold, mfk, moe, stadion, aker, stavrum, rbnett, klubben, ole, erl, erik, sist, spiller, romsdal, kampen, spill, får, sesongen, eikrem, europa, veldig, spilt, hestad, første, fjor, godt, fotballklubb, kamper, spillern, laget, direktør, kjell, budstikk, derfor, tre, tidliger, ove, tida, litt, magnus

Topic 137 Top Words:

Highest Prob: oslo, byen, bolig, sentrum, folk, flere, ligger, nye, mer, gaml, leilighet, rundt, bor, dag, første, går, steder, andr, området, tallet, bystyret, gate, plass, marka, stein, lang, under, godt, sted, hele, store, rett, bygg, finn, flyttet, leiligheten, mest, får, ser, annet

Topic 138 Top Words:

Highest Prob: odd, vålerenga, stabæk, eliteserien, spiller, fagermo, fjor, mjøndalen, sandefjord, dag, trener, klubben, sarpsborg, strømsgodset, sist, eilev, får, plass, tre, flere, vif, tror, kommer, god, kamper, jonsson, helt, sesong, litt, fotbal, håndlykken, best, ntb, eurosport, ser, scanpix, spill, sesongen, børven, rosenborg

Topic 139 Top Words:

Highest Prob: virk, bransjen, nybø, reiseliv, hotel, kommer, igjen, konkur, turist, norg, regjeringen, sommeren, reiselivet, norsk, iselin, frykter, nho, mener, prosent, næringsminist, tilbak, flere, direktør, tror, store, sommer, ser, komm, håper, nordmenn, konkurs, administrerend, helt, hardt, går, utenlandsk, kristensen, rammet, juni, situasjonen

Topic 140 Top Words:

Highest Prob: hytta, påsken, norg, folk, hytt, hytter, nordmenn, dra, sommer, kommer, lofoten, reis, flere, sommeren, norsk, turist, rundt, ligger, fjellet, hytten, feri, tur, hytteforbudet, øya, lang, hemsed, mer, telt, andr, hjem, helt, flest, naturen, hele, går, trysil, sett, turen, store, besøk

Topic 141 Top Words:

Highest Prob: holm, verdenscupen, eckhoff, sesongen, thingn, johann, best, første, norsk, fikk, vant, sist, renn, tiril, røiseland, sammenlagt, tre, litt, plass, nummer, olsbu, skiskyt, gikk, sesong, lægreid, dale, veldig, skiskyttern, tarjei, poeng, tok, gull, får, mer, helt, norg, sturla, mart, fire, mye

Topic 142 Top Words:

Highest Prob: kommunen, follo, nordr, mutert, kommun, britisk, utbruddet, utbrudd, fhi, moss, viruset, påvist, tiltak, januar, flere, tilfel, stengt, varianten, prøver, virus, fredag, oslo, virusvarianten, fått, mutasjonen, lørdag, kveld, regionen, halden, nye, februar, søndag, posit, østlandet, ring, mer, ulvik, folkehelseinstituttet, kjent, hatt

Topic 143 Top Words:

Highest Prob: trump, biden, debatten, joe, debatt, donald, presidenten, første, fikk, sist, presid, flere, usa, svart, fox, demokraten, mer, kandidaten, hunter, amerikansk, blant, mener, valget, ganger, under, andr, natt, annet, tidliger, mye, spørsmål, gang, news, natten, wallac, imag, gjort, post, snakket, gjord

Topic 144 Top Words:

Highest Prob: kina, kinesisk, wuhan, hongkong, myndighet, beij, myndigheten, taiwan, nye, flere, andr, byen, viruset, australia, usa, land, landet, sist, verden, utbruddet, jinp, blant, mener, scanpix, reuter, kinesern, januar, tidliger, kineser, skriver, china, annet, ntb, virusutbruddet, global, shanghai, informasjon, wang, fikk, singapor

Topic 145 Top Words:

Highest Prob: mål, minutt, kampen, fikk, ballen, første, poeng, scoret, satt, seier, spilt, omgang, paus, score, kamp, tre, tok, gikk, keeper, vant, slutt, gjord, ledelsen, fire, andr, måtte, fem, igjen, derm, slo, klart, målet, seieren, like, hjemmelaget, tapt, sto, endt, laget, bak

Topic 146 Top Words:

Highest Prob: trump, kongressen, senatet, demokraten, hus, presid, dollar, representanten, republikanern, donald, pelosi, presidenten, republikansk, biden, amerikansk, flertal, nanci, januar, mcconnel, senatoren, mener, usa, støtte, leder, flere, senator, washington, republikaner, skriver, senat, joe, riksrett, riksrettssaken, gjøre, hvite, krisepakken, stormingen, andr, krisepakkk, tidliger

Topic 147 Top Words:

Highest Prob: les, expand, saken, dagen, bøker, publisert, mer, more, lese, less, foto, peil, norg, mar, sist, uken, nyhet, last, gir, oversikt, trenger, norsk, måte, vite, flere, enkel, afp, annerled, saker, heter, tre, komplisert, hvilket, kjapp, svar, helg, iphon, får, quiz, android

Topic 148 Top Words:

Highest Prob: lund, pedersen, sverr, håvard, lorentzen, meter, ida, veldig, norg, kongshaug, stavang, gull, første, peder, tiden, heerenveen, plass, mye, skøyter, hege, gikk, bøkko, fikk, best, wiklund, under, januar, bedr, bra, andr, tok, mer, sist, går, februar, god, tre, helgen, får, sesong

Topic 149 Top Words:

Highest Prob: munnbind, bruke, bruk, avstand, bruker, anbefal, offentlig, meter, andr, påbud, smitt, munnbindet, masker, folk, ansiktsmask, hold, bør, brukt, beskytt, råd, mask, masken, under, rom, anbefalt, medisinsk, smittevern, tar, anbef, effekt, påbudt, folkehelseinstituttet, transport, dersom, flere, hansker, rundt, tett, myndigheten, ansiktet

Topic 150 Top Words:

Highest Prob: tour, kristoff, franc, alexand, rittet, laget, etapp, hagen, rytter, sven, ritt, uae, etappen, lag, året, vant, bystrøm, sist, august, andr, norsk, kilomet, giro, blant, tre, ryttern, nice, første, flere, ditalia, rundt, erik, sykl, igjen, frankrik, kommer, får, imag, tror, text

Topic 151 Top Words:

Highest Prob: åsane, øygarden, jerv, bryne, divisjon, sogndal, blink, lillestrøm, mandag, ranheim, stjørdal, grorud, kongsving, sotra, rund, strømmen, raufoss, eliteserien, sesongen, kfum, hamkam, start, ulf, søndag, sandn, obo, desemb, haugesund, poeng, oslo, ullkisa, aalesund, mjøndalen, kamp, kampen, opprykk, laget, kamper, tre, nest

Topic 152 Top Words:

Highest Prob: sola, byåsen, tertn, sesongen, håndball, kolstad, spiller, sesong, trener, mhk, sist, spill, eliteserien, nærbø, laget, fana, igjen, klubben, veldig, kamp, elit, spillern, spilt, fredrikstad, gjerd, kampen, mye, flere, tor, johannessen, godt, nye, første, karlsen, nest, lag, fikk, kamper, obaid, storhamar

Topic 153 Top Words:

Highest Prob: nho, norsk, leder, parten, streik, gabrielsen, fellesforbundet, almlid, mener, industri, ansatt, hansen, eggum, lier, streiken, forhandlingen, medlemm, erik, ole, direktør, jobb, året, ntb, fagforbundet, tatt, parat, bedrift, avtal, får, jørn, imag, text, enig, blant, enighet, viktig, lønn, jobber, går, tillegg

Topic 154 Top Words:

Highest Prob: folk, hjemm, hold, får, andr, litt, sammen, mye, kommer, veldig, gjør, gjøre, går, hverandr, tror, avstand, viktig, holder, bor, tar, tid, redd, sitter, tiden, godt, mer, venner, komm, hele, syne, kanskje, hjem, igjen, håper, sosial, situasjonen, ser, jobb, vet, famili

Topic 155 Top Words:

Highest Prob: norg, økonomisk, økonomien, økonomi, bank, norsk, banken, krisen, tror, renten, kommer, andr, finanskrisen, store, coronakrisen, dnb, fremov, tid, sett, igjen, sentralbanken, mye, olsen, fall, ser, sjeføkonom, mer, vekst, nest, styringsrenten, land, flere, gang, laver, bedrift, ssb, arbeidsledigheten, boligmarkedet, hold, lån

Topic 156 Top Words:

Highest Prob: svart, rasism, georg, floyd, politiet, usa, drept, live, black, matter, hvite, flere, kvinner, rasistisk, drapet, amerikaner, minneapolis, politivold, amerikansk, under, demonstrasjon, demonstrasjonen, skutt, drap, andr, bevegelsen, asiatisk, mennesk, vold, cooper, mann, folk, ser, sist, hele, gaten, kvinn, verden, døde, ham

Topic 157 Top Words:

Highest Prob: ansatt, innsatt, fengsel, arbeidsgiv, jobb, andr, annet, gjelder, blant, fengselet, frisøren, vurder, bruke, isolasjon, hjemmekontor, forsvarlig, dersom, grunn, nødvendig, fengsler, norg, bruk, jobber, situasjonen, rett, arbeid, spørsmål, kriminalomsorgen, gjøre, mener, samfunnskritisk, timer, får, enkelt, eksempel, kritisk, mulig, arbeidsgiveren, under, norsk

Topic 158 Top Words:

Highest Prob: demonstrasjon, politiet, demonstrasjonen, flere, demonstrant, demonstranten, under, protest, lørdag, mennesk, byen, michigan, trump, gaten, skriver, person, samlet, protesten, pågrepet, guvernør, utenfor, blant, fredag, twitter, vold, usa, mener, andr, demonstrer, store, tulsa, tusenvis, folk, imag, foran, føderal, text, tusen, qanon, whitmer

Topic 159 Top Words:

Highest Prob: kvinner, vålerenga, toppserien, lsk, spiller, sandviken, ingrid, veldig, arna, spill, sist, bjørnar, får, rosenborg, mye, engen, hansen, laget, sesongen, norg, litt, klepp, best, klubben, spilt, første, syrstad, wolfsburg, mer, tror, lag, helt, graham, kamper, sesong, kamp, emili, avaldsn, reiten, chelsea

Topic 160 Top Words:

Highest Prob: glimt, bodøglimt, knutsen, bodø, spiller, tuil, sebastian, berg, kjetil, klubben, mener, spillern, tounekti, mer, mye, trener, litt, tror, veldig, best, andr, ser, leder, fotbal, laget, kommer, patrick, lag, gjort, helt, gode, eliteserien, aspmyra, hele, rundt, thomassen, ting, god, nok, får

Topic 161 Top Words:

Highest Prob: barn, ung, psykisk, barna, hels, hjelp, ungdom, flere, voksn, under, bekymret, foreldr, pandemien, ungdommen, stengt, utsatt, sårbare, sliter, vold, kontakt, andr, viktig, mer, trenger, vanskelig, barnet, ungdomm, får, mental, sosial, hos, opplev, vet, fortel, bekymr, mener, famili, snakk, kor, selvmord

Topic 162 Top Words:

Highest Prob: trene, aktivitet, barn, stengt, igjen, idrett, idretten, åpne, hold, avstand, organisert, norg, banen, treningssentr, person, meter, åpnet, medlemm, treningssentren, får, leder, breddefotballen, flere, aktiviteten, åpner, mener, trener, grupper, ung, sat, all, voksn, andr, reglen, frafal, åpnes, gang, gjelder, drive, klubben

Topic 163 Top Words:

Highest Prob: norg, utstyr, pasient, hels, smittevernustyr, norsk, behandl, sykehus, sykehusen, universitetssykehus, flere, øst, beredskap, helsepersonel, medisinsk, utstyret, nok, behov, kapasitet, mangel, direktør, medisinen, andr, kapasiteten, sør, medisin, mar, bruke, ous, ahus, helsetjenesten, fått, legemidl, respirator, bruk, covid, pandemien, annet, remdesivir, personel

Topic 164 Top Words:

Highest Prob: premier, leagu, sesongen, klubben, spill, nfl, bradi, sesong, ligaen, spiller, spillern, super, england, bowl, fotbal, klubber, sist, tom, under, gjøre, igjen, gang, liverpool, blant, ferdig, mener, fotballen, ham, the, imag, første, tidliger, store, britisk, flere, andr, mye, nest, fullfør, mest

Topic 165 Top Words:

Highest Prob: land, reis, reiser, norg, nordmenn, karanten, landen, europa, spania, grensen, europeisk, norsk, regjeringen, utlandet, juli, røde, danmark, reiseråd, juni, rødt, turist, gjelder, landet, kommer, fraråder, island, vurder, region, andr, åpnet, åpne, fhi, smitt, regionen, åpner, dersom, dager, per, norden, hella

Topic 166 Top Words:

Highest Prob: ansatt, hotel, permittert, eier, krisen, stordalen, hotellet, mar, stengt, jobb, igjen, flere, bedriften, helt, thon, veldig, coronakrisen, fortel, kommer, petter, selskapet, driver, nye, måtte, permitter, gjennom, under, store, våre, ser, konkur, andr, tilbak, steng, bergen, leder, norg, hold, komm, rundt

Topic 167 Top Words:

Highest Prob: citi, manchest, spiller, guardiola, klubben, pep, spillet, david, bell, walker, spill, leagu, premier, newcastl, kampen, kyle, kevin, flere, beckham, spillern, kamp, andr, lag, sport, spilt, best, unit, imag, phil, text, sammen, england, mls, burnley, tidliger, gjør, bruyn, mer, jesus, mandag

Topic 168 Top Words:

Highest Prob: tyskland, tysk, berlin, merkel, hertha, angela, bundesliga, jarstein, tyskern, union, igjen, skjelbr, per, bayern, forbundskansl, sist, hoffenheim, lørdag, kampen, dpa, schalk, rune, leipzig, imag, får, andr, under, ciljan, text, spillern, spiller, reuter, bild, klubben, almen, fotbal, michael, kamp, frankfurt, ryerson

Topic 169 Top Words:

Highest Prob: aftenposten, innlegg, send, ung, skrive, mer, skriver, lese, ønsker, ungdom, anonym, sid, tydelig, dersom, under, extra, info, text, imag, oppgi, dag, privat, debattinnlegg, mailen, stemmer, publiser, frem, andr, norg, korona, mennesk, skrevet, uken, nekrolog, papir, våre, gjøre, innlegget, løfte, får

Topic 170 Top Words:

Highest Prob: trene, fysisk, kroppen, trener, aktivitet, minutt, mye, litt, tre, mer, hold, løpe, aktiv, gjør, god, uken, får, gjøre, treningen, bedr, går, tur, viktig, bør, gang, tilbak, tid, lang, sett, under, igjen, form, godt, gir, trent, løper, finn, best, øvelser, rolig

Topic 171 Top Words:

Highest Prob: kampen, smith, kamp, ufc, jack, white, mma, fikk, første, norsk, verden, sist, gikk, joshua, best, kamper, seirer, tapt, rund, knockout, tittelen, tiden, imag, ham, dana, tidliger, tid, fight, veldig, kommer, igjen, store, vant, tungvekt, natt, står, går, lett, runden, amerikansk

Topic 172 Top Words:

Highest Prob: idretten, idrett, norsk, norg, kjøll, andr, bør, mye, tid, mulig, berit, nif, fotbal, utøver, idrettsforbund, mer, sett, mener, flere, rundt, finn, dersom, viktig, idrettspresid, annet, frem, store, gjelder, ulik, toppidretten, grunn, vanskelig, helt, høydehus, nok, under, fotballen, får, saken, generalsekretær

Topic 173 Top Words:

Highest Prob: vike, berntsen, bjarn, berisha, aftenbladet, laget, sesongen, bank, veton, sist, spiller, fikk, sandvik, arena, tilbak, god, bytyqi, trener, løkberg, høiland, tre, spillern, får, sesong, kamper, lag, fjor, mer, flere, litt, best, zymer, sondr, kommer, tommy, mye, fredrik, kampen, haugesund, igjen

Topic 174 Top Words:

Highest Prob: norg, land, landen, europa, nato, europeisk, kommisjonen, samarbeid, eus, andr, mer, norsk, stoltenberg, søreid, økonomisk, utenriksminist, fell, viktig, eriksen, politisk, krisen, verden, internasjonal, usa, står, ine, sammen, sikkerhetsrådet, internasjonalt, samarbeidet, leder, tidliger, presid, under, koronakrisen, sikkerhet, fns, store, sist, kriser

Topic 175 Top Words:

Highest Prob: bergen, ansatt, beboer, sykehjemmet, beboern, flere, smitt, sykehjem, kommunen, jobb, valhamm, smittet, smitten, jobber, arbeidstilsynet, smitted, mener, byggeplass, husa, fått, skaar, situasjonen, andr, hos, villa, byggeplassen, sist, roger, sykehjemsetaten, kommun, påvist, skriver, smittevern, hansen, tidend, kommuneoverlegen, veldig, sykehjemmen, blant, eidsvol

Topic 176 Top Words:

Highest Prob: halvorsen, andrea, team, litt, laget, veldig, sykl, nygaard, mye, tror, god, sesongen, sist, store, nest, helt, godt, kommer, uno, kjartan, best, åringen, bra, sykler, går, norsk, kristoff, syklist, sesong, fått, komm, får, gjøre, igjen, tid, tre, første, imag, text, andr

Topic 177 Top Words:

Highest Prob: familien, barn, sammen, mor, barna, famili, far, datteren, foreldren, sønnen, mamma, moren, pappa, faren, besøk, foreldr, hjem, norg, kona, får, bor, fortel, fikk, under, norsk, gift, komm, hverandr, paret, datter, tre, gaml, sønn, født, veldig, alen, bodd, første, gang, mannen

Topic 178 Top Words:

Highest Prob: granerud, halvord, maren, hopp, egner, johansson, lundbi, norsk, forfang, bråthen, norg, oberstdorf, best, stöckl, sesongen, andré, sist, veldig, første, gull, fikk, lindvik, tand, meter, johann, hoppet, under, hoppert, stor, verdenscupen, hopper, plass, clas, robert, hoppuka, daniel, brede, laget, får, marius

Topic 179 Top Words:

Highest Prob: juventus, ronaldo, napoli, seri, portug, italia, cristiano, spill, inter, kamper, atalanta, kampen, spiller, italiensk, spilt, portugisisk, leagu, klubben, torino, sport, mål, lazio, kveld, kamp, champion, imag, onsdag, laget, text, andr, europa, tidliger, lisboa, flere, scoret, sesongen, brescia, valencia, daniel, tre

Topic 180 Top Words:

Highest Prob: offentlig, privat, norg, tangen, bør, staten, sektor, mer, andr, aftenposten, viktig, flere, norsk, gir, hels, trenger, oljefondet, gjennom, politisk, statlig, gode, bedr, store, ansatt, direktoratet, derfor, stor, arbeid, grad, ulik, større, samfunnet, leder, hos, system, debatten, best, bruke, dagen, mulighet

Topic 181 Top Words:

Highest Prob: formel, løp, denni, grand, ferrari, hamilton, prix, sesongen, lewi, bull, løpet, red, verden, søndag, laget, banen, vant, sporten, sist, første, norsk, andr, tre, største, hesten, sesong, fikk, lag, året, bak, under, kommer, seier, fører, helgen, best, gulbrandsen, tidliger, text, imag

Topic 182 Top Words:

Highest Prob: karanten, spiller, spillern, kampen, laget, dager, smitt, klubben, fredag, onsdag, mandag, kamp, smittet, kveld, trene, lørdag, tirsdag, søndag, fått, hele, får, trener, fikk, satt, positivt, utsatt, testet, andr, torsdag, imag, text, påvist, uke, hjem, spilleren, situasjonen, morgen, leder, kontakt, isolasjon

Topic 183 Top Words:

Highest Prob: selskapet, ansatt, selskap, tilbak, kunden, kontakt, kunder, skriver, pengene, flere, får, forbrukerrådet, selskapen, post, betal, våre, mar, fått, refusjon, sendt, mener, tid, krav, betalt, henvendels, bestilt, opplys, fikk, ønsker, konkur, andr, penger, hos, tilbyr, direktør, fortel, dager, gjelder, måneder, norg

Topic 184 Top Words:

Highest Prob: butikk, butikken, varer, folk, salg, solgt, kunder, selger, prisen, salget, selg, kunden, flere, vinmonopolet, mer, norg, hos, kjøpe, mat, nordmenn, økt, handl, kjøper, andr, varen, norsk, sist, fortel, stengt, markedet, hamstr, annet, store, blant, kiwi, uke, kjeden, uken, nett, nye

Topic 185 Top Words:

Highest Prob: tiltak, norg, smitt, tiltaken, viruset, smitten, folk, befolkningen, samfunnet, mener, mer, syke, myndigheten, andr, epidemien, mye, ser, store, vet, kommer, alvorlig, kontrol, land, stor, nok, tid, hold, tror, svært, mulig, bør, begren, helt, raskt, professor, mest, hele, spredn, steng, sett

Topic 186 Top Words:

Highest Prob: trondheim, trøndelag, adresseavisen, granåsen, wolden, morten, byen, spektrum, trøndersk, får, ski, røststad, kommer, kommunedirektør, under, tove, kallestad, rita, mener, gorm, anlegget, desemb, helt, nytt, kommun, rundt, leangen, arranger, imag, text, fis, ottervik, roar, ser, stor, håvard, sett, heimdal, fikk, leder

Topic 187 Top Words:

Highest Prob: kroner, million, penger, betal, inntekt, pengene, økonomisk, får, rundt, fått, året, store, mye, tapt, fikk, tillegg, inntekten, støtte, koster, betalt, fjor, totalt, utgift, norsk, per, midler, tap, andr, daglig, taper, nesten, går, leder, gjennom, tre, halv, del, mer, gir, dekk

Topic 188 Top Words:

Highest Prob: forsvaret, soldat, norg, norsk, militær, krigen, kristoffersen, bakk, flere, sivil, afghanistan, soldaten, hæren, etiopia, nye, under, jensen, dag, mer, forsvarsminist, frank, nato, eirik, landet, regjeringen, andr, sjef, kabul, heimevernet, forsvarssjef, styrker, fire, planen, krig, oppdrag, abiy, mali, konflikten, alliert, får

Topic 189 Top Words:

Highest Prob: boken, andr, verden, bok, mennesk, liv, norsk, forfatt, forfatteren, tid, skriver, livet, histori, frå, gjennom, politisk, mest, nye, skrive, finn, kanskj, kronikk, handler, samfunn, roman, historien, våre, alt, sett, skrevet, ser, gir, bøker, godt, dag, tallet, står, store, tillit, ord

Topic 190 Top Words:

Highest Prob: litt, sundbi, gull, får, mye, jacobsen, martin, iversen, sist, veldig, sesong, dyrhaug, langrenn, sprint, under, sesongen, falla, fikk, trener, weng, mer, landslaget, best, johnsrud, røthe, trene, toppidrettsveka, åringen, plass, holund, bra, sammen, vant, går, ski, god, kommer, verdenscupen, klassisk, helt

Topic 191 Top Words:

Highest Prob: ordningen, kulturlivet, kompensasjon, raja, million, arrangement, får, inntekt, norsk, støtte, tapt, kultur, søke, kompensasjonsordningen, kulturrådet, søkt, regjeringen, abid, fått, mener, krisepakke, kulturdepartementet, flere, krisepakken, kompensert, søknaden, kompenser, under, kulturminist, arrangør, avlyst, hele, idretten, aktivitet, blant, andr, kultursektoren, store, fikk, billettinntekt

Topic 192 Top Words:

Highest Prob: tromsø, itromsø, til, espejord, spiller, helstrup, jenssen, adressen, azemi, sesongen, alfheim, litt, mye, runar, gutan, tilbak, kamper, igjen, sist, klubben, spill, antonsen, lar, lag, gaut, får, kampen, fitim, komm, eliteserien, mer, yttergård, laget, rune, klar, spilt, sett, helt, mål, første

Topic 193 Top Words:

Highest Prob: mat, litt, mye, godt, får, god, vann, huset, vin, spise, maten, kommer, best, pris, mer, vask, smak, står, tre, fisk, andr, egen, lage, alt, laget, store, finn, små, gjern, lang, hagen, gaml, men, flere, lite, glass, kjøkkenet, tar, gode, oft

Topic 194 Top Words:

Highest Prob: leagu, premier, arsenal, champion, spill, klubben, sesongen, kamper, fotbal, kampen, spiller, ligaen, europa, england, juni, spilt, engelsk, igjen, manchest, tottenham, uefa, kamp, citi, manag, chelsea, flere, spillern, fotballen, sport, poeng, utsatt, tre, første, sist, europeisk, london, rund, west, fullfør, tidliger

Topic 195 Top Words:

Highest Prob: tokyo, japan, ioc, leken, olympisk, sommer, utøver, japansk, utsett, internasjonal, verden, utsettels, komité, abe, juli, bach, norg, astrid, mener, presid, norsk, utøvern, planlagt, nest, gjennomfør, under, utsatt, sommeren, arranger, heiberg, olympiatoppen, øvrebø, august, thoma, idrett, nif, situasjonen, andr, går, flere

Topic 196 Top Words:

Highest Prob: facebook, medier, aftenposten, twitter, sosial, debatten, mening, informasjon, falsk, skriver, medien, folk, hos, følg, bruker, andr, delta, nyhet, googl, norsk, journalist, flere, mener, gjør, kritisk, digital, innhold, feil, sagt, kort, innlegg, avisen, faktisk, konspirasjonsteori, norg, mer, finn, eksempel, kortinnlegg, sett

Topic 197 Top Words:

Highest Prob: kommunen, kommun, person, smitt, ordfører, karanten, flere, smittet, kommuneoverleg, smitten, ordføreren, smitted, nærkontakt, sarpsborg, smitteutbrudd, utbruddet, kommuneoverlegen, østfold, smittespor, utbrudd, kontrol, satt, påvist, fått, oversikt, fredrikstad, indr, nye, drammen, smittetilfel, mandag, opplys, bekreftet, tre, text, imag, smitteutbruddet, torsdag, fortel, søndag

Topic 198 Top Words:

Highest Prob: mye, litt, veldig, mer, godt, bra, bedr, tror, god, kommer, spill, spiller, får, mener, nok, tid, fotbal, fått, andr, laget, fikk, ham, åringen, gjøre, helt, komm, hatt, best, gjør, gode, alltid, banen, kanskj, føler, ting, gjort, trene, alt, sett, jobb

Topic 199 Top Words:

Highest Prob: kristiansand, turen, agder, sørlandet, tur, flere, rundt, går, svein, folk, lang, tar, andr, kilomet, fædrelandsvennen, finn, leder, kart, gang, abrahamsen, gård, per, dag, turer, tre, kommer, toppen, hele, litt, men, daglig, flott, fem, blant, får, godt, ligger, meter, flest, haarr

Topic 200 Top Words:

Highest Prob: text, imag, norsk, norg, under, andr, rundt, får, annet, flere, blant, stor, hele, store, fått, finn, går, står, lang, pandemien, ser, landet, sett, kommer, alt, mest, igjen, helt, gjør, tid, mye, nylig, gjøre, gang, folk, del, gått, stort, gjennom, langt

Appendix 6

List of topics, labels and codes

Topic #	Label	Relevant	Theme	CERC	Prevalence	Stage	Code
1	Artifacts	Nei	Artifacts	Artifacts	1.25 %		
2	Donald Trump infected	Ja	Foreign affairs	Sensemaking	0.45 %	3	2a
3	Infected people (Named)	Ja	Covid	Sensemaking	0.76 %	1	2a
4	Norwegian statistics	Nei	Economy and business	Other	1.66 %		
5	Notable deaths	Ja	Covid	Sensemaking	0.41 %	2	2a
6	Female martial arts	Nei	Sport	Other	0.14 %		
7	Brann football club	Nei	Football	Other	0.44 %		
8	La Liga	Nei	Football	Other	0.33 %		
9	The national budget	Ja	Economy and business	Other	0.81 %		
10	Critique of public officials (Britan)	Ja	Foreign affairs	Other	0.46 %		
11	Podcast	Nei	Other	Other	0.24 %		
12	Foreign workers	Ja	Economy and business	Other	0.25 %		
13	Early development of infection	Ja	Covid	Sensemaking	0.99 %	1	2a b
14	Teater	Nei	Culture	Other	0.23 %		
15	Chess	Nei	Sport	Other	0.25 %		
16	Critique of public officials and Covid handling	Ja	National politics	Other	0.60 %		
17	Norwegian football players	Nei	Football	Other	0.29 %		
18	Infection in Italy/ on cruise ships	Ja	Covid	Sensemaking	0.38 %	1	2a b
19	Norwegian football coaches	Nei	Football	Other	0.21 %		
20	Covid in USA	Ja	Covid	Sensemaking	0.60 %	4	2a b
21	Vaccines	Ja	Covid	Self-efficacy	1.21 %	3	1a
22	Canceled ski-events (world cup)	Ja	Sport	Other	0.34 %		
23	Casper Ruud	Nei	Sport	Other	0.24 %		
24	Barcelona football club	Nei	Football	Other	0.20 %		
25	Track and field	Nei	Sport	Other	0.29 %		
26	Virus mutations	Ja	Covid	Sensemaking	0.55 %	3	2c
27	North and South Korea	Nei	Foreign affairs	Other	0.27 %		
28	Operasjoner, Graviditet og fødsel	Nei	Lifestyle and health	Other	0.23 %		
29	Museums	Nei	Culture	Other	0.43 %		
30	Air travel	Ja	Lifestyle and health	Self-efficacy	0.41 %	1	1d
31	Smittestopp-appen (Covid phone app)	Ja	Covid	Self-efficacy	0.93 %	2	1a
32	Rogaland football	Nei	Football	Other	0.40 %		
33	International public scandals	Nei	Foreign affairs	Other	0.36 %		
34	Cross country ski (female)	Nei	Sport	Other	0.28 %		
35	Premier League	Nei	Football	Other	0.41 %		
36	Infections on Hurtigruten (Event)	Ja	Covid	Sensemaking	0.45 %	3	2a
37	Volleyball	Nei	Sport	Other	0.20 %		
38	Homeschooling	Ja	Education	Self-efficacy	1.07 %	2	1a

39	American politics	Nei	Foreign affairs	Other	0.42 %	
40	Layoffs and (dagpenger)	Ja	Economy and business	Other	0.71 %	
41	Canceled events	Ja	Culture	Other	0.40 %	
42	Trials	Nei	Crime	Other	0.52 %	
43	Natural disasters	Nei	Other	Other	0.38 %	
44	Cross country running	Nei	Sport	Other	0.18 %	
45	Covid impact on rich and poor	Ja	Economy and business	Other	0.36 %	
46	Restrictions for football practice	Ja	Football	Self-efficacy	0.57 %	2 1b
47	The Corona law (Norwegian law)	Ja	National politics	Self-efficacy	0.95 %	2 1b
48	Deaths in care institutions	Ja	Covid	Sensemaking	0.41 %	2 2a
49	Health officials	Ja	Covid	Crisis communicators	0.89 %	3
50	Start football club	Nei	Football	Other	0.31 %	
51	Abid Raja and Tom Cruise	Nei	National politics	Other	0.30 %	
52	Action sports	Nei	Sport	Other	0.17 %	
53	Flyktninger, IDPer og asylsøkere	Nei	Foreign affairs	Other	0.40 %	
54	Infection rate	Ja	Covid	Sensemaking	1.75 %	3 2a
55	USA elections	Nei	Foreign affairs	Other	0.73 %	
56	Rules for traveling to Norway	Ja	National politics	Self-efficacy	0.75 %	3 1b
57	Covid in Oslo	Ja	Covid	Sensemaking	0.91 %	3 2a
58	Experience with being infected	Ja	Covid	Self-efficacy	0.42 %	1 1c
59	Personal narratives	Nei	Other	Other	1.80 %	
60	Covid testing	Ja	Covid	Self-efficacy	0.82 %	3 1a
61	Paraolympic athletes	Nei	Sport	Other	0.32 %	
62	Isreal and Palestine	Nei	Foreign affairs	Other	0.27 %	
63	Track and field records	Nei	Sport	Other	0.32 %	
64	Popular culture	Nei	Culture	Other	0.74 %	
65	Landslagskamper	Nei	Football	Other	0.47 %	
66	Election fraud in the USA	Nei	Foreign affairs	Other	0.46 %	
67	Lifestyle advise and psychology	Nei	Lifestyle and health	Other	0.76 %	
68	Female handball team	Nei	Sport	Other	0.42 %	
69	Oil production and companies	Nei	Economy and business	Other	0.36 %	
70	Immigration	Nei	National politics	Other	0.33 %	
71	Russetid, yuth culture and MGP	Nei	Culture	Other	0.25 %	
72	Russia presidential debates	Nei	Foreign affairs	Other	0.35 %	
73	National football matches	Nei	Football	Other	0.28 %	
74	Celebrities and controversies	Nei	Culture	Other	0.21 %	
75	Explosions and terror	Nei	Foreign affairs	Other	0.29 %	
76	Golf	Nei	Sport	Other	0.19 %	
77	Vipers handball team	Nei	Sport	Other	0.38 %	
78	Consequences for the air travel industry	Ja	Economy and business	Other	0.44 %	
79	Covid infections	Ja	Covid	Sensemaking	1.05 %	1 2a
80	American sports	Nei	Sport	Other	0.19 %	

81	Tromsø sports club	Nei	Football	Other	0.34 %	
82	Municipal response to covid	Ja	National politics	Sensemaking	0.73 %	2 2b
83	Handball wordl cup (male)	Nei	Sport	Other	0.24 %	
84	Hunger and poverty	Nei	Foreign affairs	Other	0.50 %	
85	Ice hockey	Nei	Sport	Other	0.36 %	
86	Serie A	Nei	Football	Other	0.21 %	
87	Cars	Nei	Other	Other	0.34 %	
88	Consequences for winter sports	Ja	Sport	Other	0.39 %	
89	Vaccine side effects	Ja	Covid	Self-efficacy	0.53 %	3 1e
90	Rosenborg footbal club	Nei	Football	Other	0.44 %	
91	USA Covid press conferences	Ja	Foreign affairs	Other	0.80 %	2
92	Students	Ja	Education	Other	0.56 %	
93	New official covid measures	Ja	Covid	Self-efficacy	1.01 %	3 1b
94	Bundesliga	Nei	Football	Other	0.33 %	
95	Musikal albums	Nei	Culture	Other	0.37 %	
96	Political party leaders and party elections	Nei	National politics	Other	0.70 %	
97	FRP and KRF	Nei	National politics	Other	0.45 %	
98	Global virus collaboration	Ja	Foreign affairs	Sensemaking	0.55 %	1 2b
99	Cross cuntry ski personalities	Nei	Sport	Other	0.39 %	
100	Postponements and cancelations	Ja	Culture	Other	1.68 %	
101	Hurdles	Nei	Sport	Other	0.19 %	
102	Tromsø Sports club	Nei	Football	Other	0.51 %	
103	Covid in hospitals	Ja	Covid	Sensemaking	0.85 %	2 2b
104	Poland and Hungary	Nei	Foreign affairs	Other	0.32 %	
105	School exams and grades	Ja	Education	Other	0.43 %	
106	Concerts	Nei	Culture	Other	0.47 %	
107	Breach of covid regulations	Ja	Crime	Other	0.66 %	3
108	International Tennis	Nei	Sport	Other	0.11 %	
109	Royal family	Nei	Culture	Other	0.38 %	
110	Norwegian reality TV	Nei	Culture	Other	0.39 %	
111	Climate	Nei	Other	Other	0.60 %	
112	Norsk Tv	Nei	Culture	Other	0.45 %	
113	Layoffs in football	Ja	Football	Other	0.55 %	
114	Nightlife restrictions under covid	Ja	National politics	Self-efficacy	0.59 %	3 1b
115	Ålesund football club	Nei	Football	Other	0.30 %	
116	Stock exchange	Ja	Economy and business	Other	0.60 %	
117	Public transport	Ja	Other	Self-efficacy	0.50 %	4 1d
118	Turkey	Nei	Foreign affairs	Other	0.24 %	
119	Belarus	Nei	Foreign affairs	Other	0.29 %	
120	Theatrical film releases	Nei	Culture	Other	0.35 %	
121	Ada Hegeberg	Nei	Football	Other	0.16 %	
122	Canceled sporting events	Ja	Sport	Other	0.50 %	
123	Historical accounts	Nei	Other	Other	0.17 %	

124	At-risk groups	Ja	Covid	Self-efficacy	0.85 %	1	1c
125	Football players addressing poverty	Nei	Football	Other	0.12 %		
126	Start football team	Nei	Football	Other	0.34 %		
127	Rosenborg	Nei	Football	Other	0.29 %		
128	Economic support	Ja	Economy and business	Other	0.59 %		
129	France	Nei	Foreign affairs	Other	0.25 %		
130	Covid in Sweden	Ja	Covid	Sensemaking	0.72 %	4	2a b
131	Covid in India and South America	Ja	Covid	Sensemaking	0.41 %	4	2a b
132	Premier League	Nei	Football	Other	0.30 %		
133	Lockdown	Ja	Covid	Self-efficacy	1.10 %	2	1b
134	Brexit	Nei	Foreign affairs	Other	0.28 %		
135	Covid research	Ja	Covid	Sensemaking	0.94 %	1	2d
136	Molde	Nei	Football	Other	0.49 %		
137	Culture in Oslo	Nei	Culture	Other	0.39 %		
138	Eliteserien	Nei	Football	Other	0.29 %		
139	Consequences for the hotel and travel industry	Ja	Economy and business	Other	0.52 %		
140	Travel suggestions	Ja	Lifestyle and health	Self-efficacy	0.57 %	4	1e
141	Biathlon	Nei	Sport	Other	0.29 %		
142	Mutated virus outbreaks	Ja	Covid	Sensemaking	0.53 %	3	2c
143	American presidential debates	Nei	Foreign affairs	Other	0.25 %		
144	Critique of China	Ja	Foreign affairs	Other	0.61 %		
145	English football	Nei	Football	Other	0.79 %		
146	Impeachment and Congress	Nei	Foreign affairs	Other	0.40 %		
147	Quizzes and summaries	Nei	Other	Other	0.33 %		
148	Skating	Nei	Sport	Other	0.26 %		
149	Mask wearing	Ja	Covid	Self-efficacy	0.48 %	3	1a
150	Cycling	Nei	Sport	Other	0.31 %		
151	The Obos league	Nei	Football	Other	0.25 %		
152	National Handball league	Nei	Sport	Other	0.39 %		
153	Strike	Nei	Economy and business	Other	0.50 %		
154	National solidarity	Ja	Covid	Self-efficacy	1.98 %	2	1e
155	Interest rate	Nei	Economy and business	Other	0.73 %		
156	Hate crimes and racism	Nei	Foreign affairs	Other	0.35 %		
157	Other covid texts	Ja	Covid	Sensemaking	0.36 %	2	2a
158	Protests, violence and crime	Nei	Crime	Other	0.51 %		
159	Female football	Nei	Football	Other	0.35 %		
160	Bodø Glimt football club	Nei	Football	Other	0.18 %		
161	The psychological impact of covid	Ja	Lifestyle and health	Sensemaking	0.84 %	2	2a
162	Guidelines for exercise and sports	Ja	Sport	Self-efficacy	0.68 %	2	1b
163	Hospital capacities	Ja	Covid	Sensemaking	0.77 %	2	2b
164	Super Bowl and premier league	Nei	Sport	Other	0.19 %		
165	Travel restrictions	Ja	National politics	Self-efficacy	0.84 %	4	1b

166	Consequences for the restaurant and bar industry	Ja	Economy and business	Other	0.45 %	
167	English footballers	Nei	Football	Other	0.15 %	
168	German football	Nei	Football	Other	0.29 %	
169	SiD (Aftenposten yung)	Nei	Other	Other	0.57 %	
170	Exercise and health	Nei	Lifestyle and health	Other	0.38 %	
171	Martial arts	Nei	Sport	Other	0.16 %	
172	Idrettsforbundet	Nei	Sport	Other	0.53 %	
173	Football in Rogaland	Nei	Football	Other	0.37 %	
174	Foreign policy	Nei	Foreign affairs	Other	0.65 %	
175	Care institutions under covid	Ja	Covid	Sensemaking	0.41 %	3 2a
176	Cycling	Nei	Sport	Other	0.25 %	
177	Family life	Nei	Lifestyle and health	Other	0.67 %	
178	Ski jumping	Nei	Sport	Other	0.27 %	
179	Serie A	Nei	Football	Other	0.21 %	
180	The oil fund	Nei	Economy and business	Other	0.65 %	
181	Formula 1	Nei	Sport	Other	0.17 %	
182	Infections and quarantines for soccer players	Ja	Football	Sensemaking	0.75 %	4 2a
183	Refunds	Ja	Economy and business	Other	0.52 %	
184	Food prices	Ja	Economy and business	Other	0.58 %	
185	Preventative infection measures	Ja	Covid	Self-efficacy	1.45 %	1 1a
186	Sporting events in Trøndelag	Nei	Sport	Other	0.25 %	
187	Economic results	Nei	Economy and business	Other	0.96 %	
188	National defence	Nei	National politics	Other	0.28 %	
189	Book reviews	Nei	Culture	Other	0.71 %	
190	Cross country skiing	Nei	Sport	Other	0.35 %	
191	Cultural support	Ja	Culture	Other	0.59 %	
192	Football in Troms	Nei	Football	Other	0.32 %	
193	Food	Nei	Lifestyle and health	Other	0.56 %	
194	Premier League	Nei	Football	Other	0.47 %	
195	Cancelation of the Olympics	Ja	Sport	Other	0.32 %	
196	Debunking fake covid stories	Ja	Other	Self-efficacy	0.87 %	4 1f
197	Outbreaks at events	Ja	Covid	Sensemaking	0.69 %	3 2a
198	Other football texts	Nei	Football	Other	0.46 %	
199	Travel tips and walking trips	Ja	Lifestyle and health	Self-efficacy	0.24 %	4 1e
200	Artifacts	Nei	Artifacts	Artifacts	0.02 %	

Appendix 7

Propositions of CERC by Veil et al. (2008).

1. Risks and crises are equivocal and uncertain conditions that create specific informational needs and deficiencies: The literature on crisis and disaster has always emphasized the role of communication, primarily as a management tool from centralized authorities to the public through mass media channels. The CERC positions communication more centrally throughout the risk and crisis communication process. Although much is known about the role of communication, a comprehensive picture of the process in risks and crises has yet to emerge.
2. Ongoing, two-way communication activities are necessary for the public, agencies and other stakeholders to make sense of uncertain and equivocal situations and make choices about how to manage and reduce the threat(s) to their health: Self-efficacy and sensemaking are fundamental processes in crisis response. Traditionally, research and practice have emphasized on crisis managers communicating information to the public. The CERC builds on a more dynamic interchange between crisis stakeholders. Few investigations have explored the feedback processes, whereby the public alerts crisis managers about the effectiveness of communication.
3. Communication processes (channels, needs, information, etc.) will change dramatically as a risk evolves into a crisis introducing new risks and as a crisis evolves to postcrisis and recovery: Although CERC makes logically apparent claims about how communication needs and dynamics change as a crisis evolves, many of these assumptions are largely unexplored. In particular, the developmental model of CERC articulates a detailed set of expectations regarding how communication processes are influenced by specific stages and the associated conditions of crisis. The dynamics of changing communication processes have yet to be described in detail.
4. Risk and crisis communication are highly interrelated such that risk messages communicated before a crisis occurs influence perceptions, expectations, and behavior after the crisis erupts. In turn, these crisis responses then influence subsequent risk messages: One of the key features of CERC is the emphasis on developmental sequences and enactment processes to create an integrated framework. Building on the assumptions of sensemaking, CERC argues that acting toward (or communicating about) a crisis in a particular way influences the development of the event and determines the kinds of communication that subsequently occur. Research should explore how communication constrains and influences subsequent communication processes.
5. Communication is consequential to specific risk and crisis management outcomes by promoting self-efficacy. Messages of self-efficacy contribute to risk reduction, crisis preparation, family and community organization, and learning, among others: Some of the ways communication affects outcomes, such as self-efficacy, have been described. Other impacts, such as risk reduction, crisis preparation, family, and community organization, have not been systematically examined.
6. Risks and crises affect a wide variety of publics with variable needs, interests, and resources, which in turn affects their communication capacities, needs, and activities: One of the recurrent themes in CERC and in many communication models is audience diversity. Although scholars

have traditionally written about audiences differences, efforts to craft a detailed understanding of audience diversity is a comparatively recent phenomenon. Health communication research has identified that risk levels are uneven across diverse populations, and unfortunately, often those with the highest frequency of health burdens have the least access to the essential “information, communication technologies, health care, and supporting social services” (USDHHS, 2000, p. 9). Given that audience diversity during a crisis often translates into uneven vulnerabilities, understanding these variables within the crisis context is a particularly important area of research

Appendix 8

CERC tasks of different crisis development stages (Reynolds & W. Seeger, 2005).

Pre-crisis

- Monitoring and recognition of emerging risks
- General public understanding of risk
- Public preparation for the possibility of an adverse event
- Changes in behavior to reduce the likelihood of harm (self-efficacy)
- Specific warning messages regarding some eminent threat
- Alliances and cooperation with agencies, organizations, and groups
- Development of consensual recommendations by experts and first responders
- Message development and testing for subsequent stages

Initial crisis

- Empathy, reassurance, and reduction in emotional turmoil
- Designated crisis=agency spokespersons and formal channels and methods of communication
- General and broad-based understanding of the crisis circumstances, consequences, and anticipated outcomes based on available information
- Reduction of crisis-related uncertainty
- Specific understanding of emergency management and medical community responses
- Understanding of self-efficacy and personal response activities (how=where to get more information)

Maintenance

- More accurate public understandings of ongoing risks
- Understanding of background factors and issues
- Broad-based support and cooperation with response and recovery efforts
- Feedback from affected publics and correction of any misunderstandings=rumors
- Ongoing explanation and reiteration of self-efficacy and personal response activities (how=where to get more information) begun in Stage II.
- Informed decision making by the public based on understanding of risks=benefits