Risk governance during the COVID-19 pandemic: A quantitative content analysis of governors' narratives on twitter

Nagwan R. Zahry1 | Michael McCluskey1 | Jiying Ling2

1Department of Communication, University of Tennessee at Chattanooga, Chattanooga, Tennessee, USA
2Michigan State University College of Nursing, East Lansing, Michigan, USA

Correspondence
Nagwan R. Zahry, Department of Communication, University of Tennessee at Chattanooga, 227E Lupton Hall, 615 McCallie Ave. Dept 3003, Chattanooga, TN 37403, USA.
Email: nagwan-zahry@utc.edu

Abstract
The current study addresses the communication aspect of risk governance during the COVID-19 pandemic by examining whether governors' tweets differ by political party, gender and crisis phase. Drawing on the Centers for Disease Control and Prevention's Crisis Emergency Risk Communication (CERC) model and framing literature, we examined the salience of five CERC's communication objectives, namely acknowledge crisis with empathy, promote protective actions, describe preparedness/response efforts, address rumours and misunderstanding and segment audience. Using a deductive and inductive approach, we analysed 7000 Twitter messages sent by the 50 US state governors during the period of 13 March 2020 to 17 August 2020. Our findings suggest that governors' tweets aligned with CERC's communication objectives to a varying degree. We found main and interaction effects of political party, gender and crisis phase on governors' communication objectives. New emergent communication objectives included attention to mental health, call for social influencers and promoting hope. Implications are discussed.

KEYWORDS
CERC model, COVID-19, governor gender, political partisanship, risk governance

1 | INTRODUCTION

The global outbreak of the novel coronavirus disease pandemic (hereinafter, ‘COVID-19’) is an unprecedented crisis that severely affects public health and poses economic challenges. The novelty of COVID-19 accentuates the need for timely and effective communication to address peoples’ health concerns and risk perceptions at each phase of the crisis. The capacity of political leaders/public authorities to effectively communicate public information can help ordinary citizens better understand a crisis, make the best possible health decisions and respond effectively to potential risks (Rao et al., 2020; Wang & Zhuang, 2017).

The crisis management literature underlies the importance of communication as a management tool that helps political leaders/public authorities to ‘protect health, safety, and the environment by keeping the public informed’ and ‘to restore public confidence in the ability to manage an incident’ (Mileti & Sorensen, 1990, p. 4). One example is the Centers for Disease Control and Prevention (CDC)’s Crisis and Emergency Risk Communication (CERC) model that emphasizes specific communication objectives to help public leaders and health professionals respond to the public’s needs of information during large scale crisis (Crisis Emergency and Risk Communication, 2014).

During COVID-19, state governors in the United States played a central role in enacting and communicating statewide measures to regulate, reduce and control risks (Grossman et al., 2020; Rao et al., 2020). In this context, risk governance is an important function that underscores the role of leadership in framing, predicting and implementing decisions to mitigate risks (Renn, 2008; Renn et al., 2011). Risk governance can be defined as ‘the application of
governance principles to the identification, assessment, management and communication of risk’ (Renn, 2008, p. 9). Central to risk governance is ‘how risk information is collected, analysed and communicated, and how management decisions are taken’ (Renn, 2008, p. 9).

The current research is particularly concerned with the communication aspect of risk governance, along with the effect of political partisanship and gender on governors’ communications during the initial and maintenance phases of COVID-19. Drawing on the CDC’s CERC model, we use a deductive and inductive approach to content analyse 7000 Twitter communications sent by the 50 US state governors during the period of 13 March 2020 to 17 August 2020, a period characterized by health and economic challenges.

The current study is conducted with three main goals in mind. We seek to (1) further our understanding of the role of individual factors (i.e., political partisanship and gender) on leaders’ communications during two critical phases of COVID-19, (2) identify commonalities and discrepancies in governors’ communications to enrich the risk and crisis communication scholarship based on a real-time health emergency and (3) extend and validate the application of the CERC model by looking at state governors’ communications while considering whether gender and political partisanship are inextricably linked during crises.

This study is organized as follows: First, we discuss the literature on risk governance and CDC’s CERC model, followed by an overview of the framing literature with special focus on political partisanship and gender. Second, we outline the methodology and analysis. Third, we present the results. Fourth, we draw conclusions and discuss implications of the study, limitations and future work.

2 LITERATURE REVIEW

2.1 Risk governance during crises

The concept of risk governance emerged in the macropolitical context of risk-related decision-making at the governmental level to reflect how actors, including leaders and institutions, address and regulate risk and crisis issues (Van Asselt & Reen, 2011). Risk governance—in its entirety—can be defined as “the totality of actors, rules, conventions, processes and mechanisms concerned with how relevant risk information is collected, analysed and communicated and management decisions are taken” (Society of Risk Analysis, 2015). It serves as a conceptual frame that emphasizes the core principles of governance during complex and ambiguous risk-related situations (Van Asselt & Reen, 2011).

Risk governance is a multilayered process that encompasses risk identification, assessment, management and communication to help individuals and institutions handle risk situations (Aven & Renn, 2020). It underscores risk-management strategies that help leaders assess risk and develop response plans to overcome the potential consequences of complex risk situations (Aven & Renn, 2020). Some key elements of risk governance involve (a) risk preassessment to identify the problem and understand early warnings, (b) risk appraisal to assess causes and consequences of hazards, (c) risk management to monitor and control the situation and (d) communication with various stakeholders (Fiorin & Bürkler, 2017).

One important principle of risk governance is communication through which information is shared among different stakeholders, experts, policymakers and the general public to reach an agreement on mitigation measures that should be followed collectively (Van Asselt & Reen, 2011). Effective communication, at the heart of risk governance, aims to ensure “meaningful interactions in which knowledge, experiences, interpretations, concerns and perspectives are exchanged” (Van Asselt & Reen, 2011, p. 440). In complex and ambiguous risk situations, communication can facilitate risk decision-making processes and ensure mutual acceptance of risk management measures (Van Asselt & Reen, 2011).

Central to risk governance are decision makers who manage and regulate risks in situations characterized by high complexity and uncertainty. During health emergencies and natural disasters in the United States, state governors play a strategic leading role that involves, among others, enacting politically and legally acceptable risk responses and publicly communicating with different stakeholders (Jong et al., 2016; Sadiq et al., 2020). For example, state governors issued mitigation measures (e.g., stay-at-home orders), communicated health information (e.g., availability of testing units) and initiated economic measures (e.g., financial assistance for businesses) during COVID-19 (Grossman et al., 2020; Rao et al., 2020). Thus, the communication aspect of risk governance is crucial for governors’ efforts to frame existing and potential risks, discuss mitigation efforts and influence citizens’ decisions to voluntarily adopt protective measures.

2.2 CDC’s CERC model

According to the CDC, crisis communication is ‘the process of providing facts to the public about an unexpected emergency, beyond an organization’s control, that involves the organization and requires an immediate response’ (Crisis Emergency and Risk Communication, 2018), whereas risk communication captures ‘the intentional effort to inform the public about risks and persuade individuals to modify their behavior to reduce risk’. During risk and health emergencies, the CDC underscores the importance of information as ‘a necessity not a luxury’ (Reynolds et al., 2004, p. 5), suggesting that ‘the right message at the right time from the right person can save lives’ (Crisis Emergency and Risk Communication, 2018).

When people experience a crisis with unanticipated ‘threats that are dynamic, global, and becoming increasingly prominent... A successful component of successful management [of these threats] is a sophisticated, dynamic, and comprehensive approach to communication’ (Seeger & Reynolds, 2008, p. 18). Thus, the amount and relevance of information from political leaders during crises is crucial to communicate response efforts to laypersons and influence
constituents’ decisions to voluntarily comply with preventive measures. One challenge that faces leaders is how to tailor effective crisis and risk communication that can help laypersons feel safe, understand risk and survive crises (Reynolds & Seeger, 2005).

The CDC recognizes the importance of official spokespersons’ communications to reduce risk perceptions and empower people during crises (Veil et al., 2008). One example of CDC’s efforts to help spokespersons communicate during crises is the CERC model that integrates health and risk communication with crisis and disaster literatures. The CERC model underpins specific strategic communication objectives to help public leaders and health professionals develop ‘strategic, broad based, responsive, and highly contingent’ communication plans to convey risk and crisis information to different stakeholders during emergencies (Reynolds & Seeger, 2005, p. 49).

One important tenet of the CERC model is that crises evolve through four phases namely, preparation, initial, maintenance and resolution. In each crisis phase, the CERC model emphasizes specific communication objectives that can help spokespersons communicate effectively with the public. For example, during the precrisis phase, communicators should focus on crafting and testing warning messages. During the initial crisis phase, communicators should explain risk, describe response efforts and express empathy to help people understand the nature of risk and mitigation measures against risk. In the maintenance phase, communicators should focus on explaining ongoing risks, segmenting audiences, addressing rumours, promoting self-efficacy and fostering reassurance. In the resolution phase, communicators should provide updates and create consensus about lessons learned throughout the crisis (Crisis Emergency and Risk Communication, 2014). The CERC model’s communication objectives are presented in Table 1.

Although prior studies used the CERC model to examine agencies’ emergency communications during natural disasters (e.g., Lachlan et al., 2016) and health authorities’ crisis communications during epidemic (e.g., Lwin et al., 2018), to the best of our knowledge, no study looked at whether and how political leaders’ communications align with the CERC’s communication objectives during public health emergencies. We, therefore, venture the following research question:

Research question 1: Which CERC’s communication objectives are salient in governors’ tweets during the two phases of COVID-19?

### 2.3 Framing research, political partisanship and gender

The concept of framing is a central focus of research related to risk communication and disaster preparedness (e.g., Parida et al., 2021) and political communication (Dennison & Geddes, 2019). Framing is rooted in the agenda setting, priming and media effects research that focuses on how communicators influence audiences’ perceptions by

### Table 1 CERC model’s communication objectives, conceptual definition and question items

| Communication objective                  | Conceptual definition                                                                 | Question items                                                                 |
|-----------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Acknowledge the crisis with empathy      | Empathy involves taking perspectives of others. It involves perspective shifting to imagine how others are affected by a crisis (Longstaff & Yang, 2008; Seeger, 2006) | Does it show an understanding people’s challenges? Does it show concern about others and provide solutions? Does it acknowledge people’s feelings? Does it involve sharing people’s emotions? Does it express feelings for affected people? |
| Promote protective actions               | Encourage people to take protective actions                                            | Does it encourage self-protection actions? Does it encourage others to take protective actions? Does it incite people to follow state’s policies? |
| Describe response efforts                | Provide information about structural measures that are infrastructure-related (e.g., hospital, testing centres). Provide information about nonstructural measures such as task forces/committees. Provide information about financial assistance (e.g., stimulus check). | Does it include infrastructure measures? Does it include nonstructural responses? Does it mention financial assistance? |
| Address rumours and misunderstanding     | Provide accurate information and specify reliable sources of information               | Does it warn against fake news/misinformation? Does it promote specific media platforms? Does it provide updates about COVID-19? Does it provide clarifications? |
| Segment audience                         | Specific messages to a specific audience                                               | Does it address a specific audience? |

Abbreviation: CERC, Crisis Emergency Risk Communication.

*It* refers to the tweet under investigation.
selecting which aspects of issues to feature and what information to emphasize (McCombs & Ghanem, 2001; Shah et al., 2009). Framing research positst that frames are ‘persistent patterns of cognition, interpretation, and presentation, of selection, emphasis, and exclusion’ through which communicators organize and present information to influence their audiences (Gillitn, 1980, p. 7). ‘A frame suggests what the controversy is about, the essence of the issue’ (Gamson & Modigliani, 1987, p. 143).

In the political communication literature, message framing has been used extensively to evaluate political leaders’ persuasive communications (e.g., Dennison & Geddes, 2019; Lee & Kim, 2017). The premise is that frames are ‘interpretative schemata that enable participants to locate, perceive, and label occurrences’ (Snow et al., 1986, p. 464) and ‘selectively punctuating and encoding objects, situations, events, experiences, and sequences of actions within one’s present or past environment’ (Snow & Benford, 1992, p. 137). Message framing thus entails that communicators selectively prioritize and present information to ‘define and construct a political issue or a public controversy’ (Chong & Druckman, 2007, p. 100) and ‘identify relevant policy problem and specify potential solutions’ (Entman, 1993, p. 52).

Of relevance to the current study is the concept of issue salience, which refers to ‘the relative importance and significance that an actor ascribes to a given issue on the political agenda’ (Oppermann, 2010, p. 3). It was originally used by political actors to influence public perceptions about an issue at hand by emphasizing the most important aspects of this issue at the expense of others (Hutchings, 2001). As such, a political actor can increase the salience of some aspects of an issue (i.e., increase the presence of a frame) so that the more often these aspects are mentioned, the more salient they become and the more important they appear, relative to other aspects (Druckman, 2011; Wezien, 2005). Put differently, political leaders tend to selectively emphasize certain issues at the expense of others so they can promote issues favourable to them and demote unfavourable issues (Rovny & Edwards, 2012). Research shows that higher salience of an issue can be indicative of a party’s position on a variety of issues such as healthcare policies (Carson et al., 2020) and climate change (Bromley-Trujillo & Poe, 2020).

Inspired by the above research, we draw on emphasis framing and salience to take advantage of prior findings in framing research that link crisis and risk communication to political partisanship and gender. The work we describe here is premised on the notion that a frame ‘generally implies a policy direction’ (Gamson & Modigliani, 1987, p. 143) that presents communicators’ positions towards issues, and suggests how these issues should be perceived and understood (Entman, 1993). In other words, the more important a particular idea is to a governor, the more he or she makes it salient and emphasizes it in Twitter narratives during the COVID-19. This premise aligns with the literature on emphasis framing and also echoes work in political communication related to issue salience (e.g., Bromley-Trujillo & Poe, 2020; Carson et al., 2020).

### 2.3.1 The role of political partisanship during crises

The political communication literature suggests that the choice of frames are often ‘driven by ideology and prejudice’ (Edelman, 1993, p. 132). Research shows that political partisanship is a central factor that shapes elite rhetoric (Green et al., 2020; Grossman et al., 2020) and influences policy preferences during crises (Gadarian et al., 2021). For example, President Trump dismissed concerns about the severity of COVID-19 in the first 2 months of the outbreak, claiming that the virus is a democratic ‘hoax’ (Gusmano et al., 2020, p. 380) that would disappear ‘like a miracle’ (Watson, 2020). Following Trump’s lead, Republican governors were less worried about COVID-19 compared to their Democratic counterparts in early spring 2020 (Tyson, 2020), a pattern that remained throughout the first year of COVID-19 (Deane et al., 2021).

Furthermore, studies showed that Republican governors were significantly slower than Democratic governors to adopt protective measures including mask wearing and stay-at-home orders (Baccini et al., 2020; Wang et al., 2021). Conversely, Democrats were more likely to take precautions such as changing travel or gathering plans and stocking up on supplies than were Republicans (Hamel et al., 2020). A study on tweets sent by members of 116th US Congress during the onset of COVID-19 found that Democrats discussed COVID-19 threats to public health more frequently, while Republicans placed greater emphasis on China and businesses (Green et al., 2020). That said, Democratic governors issued state emergency orders and initiated response measures to draw citizen attention to COVID-19 as a public health crisis as opposed to Republican governors who were reluctant to do so until the White House declared a national emergency on March 13, 2020 (Fowler et al., 2021).

In light of the above studies, we test the main effect of political partisanship on the communication objectives related to addressing rumours/misunderstanding and promoting preparedness/response measures and protective actions by proposing the following set of hypotheses:

**Hypothesis 1.** Compared to Democratic governors, Republican governors will be more likely to address rumours/misunderstanding.

**Hypothesis 2.** Compared to Republican governors, Democratic governors will be more likely to promote preparedness/response measures and protective actions.

Given the exploratory nature of our study, we seek to examine the main effect of political partisanship on governors’ communication objectives related to acknowledging crisis with empathy and segmenting the audience by posing the following research question:

Research question 2: Do governors’ communication objectives related to acknowledging crisis with empathy and segmenting the audience differ by political partisanship?
2.3.2 | The role of gender during crises

The gender of political leaders also matters in political communication. For example, female congressional candidates posted more negative tweets to attack their opponents and focused on female's issues (e.g., health, education) more than male candidates (Evans & Clark, 2016). In their press releases, female senators emphasized communal issues (e.g., the environment and child welfare), whereas their male counterparts emphasized competitive issues (e.g., the economy and foreign policy) (Fridkin & Kenney, 2014). Studies showed that female leaders were more communal and empathetic than male leaders, especially in stressful situations (Sweet-Cushman, 2016). For example, a recent study found that female governors expressed more empathy in their governmental briefings than male governors during COVID-19 (Sargent & Stajkovic, 2020).

Building on the reviewed studies, we seek to test the main effect of gender on the communication objective of acknowledging COVID-19 with empathy by venturing the following hypothesis:

Hypothesis 3. Female governors will be more likely to acknowledge the crisis with empathy compared to male governors.

Some other research showed that leader gender does not influence political communication. For example, one study found no significant difference between male and female governors’ enforcement language in executive order responses during COVID-19 (Curley et al., 2021). Another cross-national study found that leader gender did not influence the timing of implementing COVID-19 containment policies such as stay-at-home orders and schools closure (Aldrich & Lotito, 2020). Based on these studies, we venture the following hypothesis:

Hypothesis 4. Governors’ communication objectives related to promoting protective actions, describing response efforts, addressing rumours and misunderstanding and segmenting audience will not vary by gender.

Given that our overarching goal is to explore governors’ communications during the two phases of COVID-19, we draw on CERC model’s principle suggesting that communication objectives should differ per crisis phase to examine the main effect of crisis phase on governors’ communications. We, therefore, venture the following research question:

Research question 3: Do governors’ communication objectives differ by crisis phase?

As the majority of existing studies focused on gender and controlled for political partisanship in the context of COVID-19 (e.g., Garikipati & Kambhampati, 2021; Sergent & Stajkovic, 2020), we have limited evidence on the interaction effects of political partisanship and gender on governors’ communications. Thus, rather than proposing a hypothesis, we examine the interaction effects between political partisanship and gender on governors’ communications by proposing the following research question:

Research question 4: Do governors’ communication objectives vary by political partisanship and gender?

To further investigate whether governors’ communication objectives vary by political partisanship across two phases of COVID-19, we examine the interaction effects between political partisanship and crisis phases on governors’ communications by proposing the following research question:

Research question 5: Do governors’ communication objectives vary by political partisanship and crisis phase?

3 | METHOD

3.1 | Study setting: Twitter

Twitter is a social networking site that allows users to communicate in real time through short messages with a limited number of characters. One feature that drives Twitter’s popularity is its ability to allow ongoing communication between public authorities and the public (Kim et al., 2016). Prior work showed the relevance of Twitter in public authorities, elected officials and politicians’s emergency and risk communication during natural disasters (e.g., Panagiotopoulos et al., 2016; Wang & Zhuang, 2017) and public health emergencies (e.g., McNeill et al., 2016). Specific to COVID-19, political leaders used Twitter to communicate with the public about a variety of topics including health threats and aid to healthcare workers (e.g., Rufai & Bunce, 2020).

3.2 | Procedure

3.2.1 | Search methods, data extraction and selection criteria

We downloaded tweets that were sent out from all 50 U.S. governors during 13 March 2020 to 17 August 2020, from the Vicintas.com website. This duration covers two phases of COVID-19 namely, the initial phase that started after the US declaration of national emergency (13 March 2020 to 30 April 2020) and the maintenance phase during which all states were in some phases of reopening (1 May 2020 to 17 August 2020).

The downloaded data included tweet ID, state name, date and time, number of retweets and favourites and hyperlinks (including video and photos) for each tweet generated. In total, we downloaded 51,470 tweets into Excel. We identified tweets related to COVID-19 through a manual review of tweets using keywords (e.g., coronavirus, pandemic, outbreak, quarantine, virus, corona), followed by a tweet-by-tweet examination. The total number of COVID-19 related tweets was 38,384. After excluding retweets and non-English tweets, the data set included 28,010 tweets. We used a random sampling technique that involved every fourth tweet. The final data set included 7000 tweets.
3.2.2 | Codebook development

We used a hybrid coding approach (i.e., deductive and inductive). Our deductive approach was based on the CDC’s CERC model. An integral part of the deductive coding process was to develop conceptual and operational definitions for the CERC model’s communication objectives. We adapted CERC model’s five communication objectives as coding frames. For each communication objective, we developed conceptual and operational definitions derived from the risk and crisis communication literature. We followed Entman et al.’s suggestion (2009) by developing a series of question items ‘i.e., frame indicators’ that measure different aspects of each coding frame to ensure frame validity. Conceptual and operational definitions for CERC’s communication objectives are presented in Table 1.

Our inductive approach involved creating new codes to extend our understanding beyond the CERC’s communication objectives. Thereafter, subcategories were identified, read once again, grouped, compared and classified into new categories. The two authors independently extracted new emergent frames/subframes and met regularly to discuss and reach a consensus in each step of the analysis. The need to develop new codes was necessary to capture new communication objectives that can enrich the CERC model.

Tweets were manually coded using the predetermined CERC’s communication objectives. Next, inductive coding was conducted during the coding process to capture new themes. Our choice of this method is consistent with prior studies (e.g., Fereday & Muir-Cochrane, 2006; Matthes, 2009), suggesting that the use of deductive and inductive approaches enhances the rigour of qualitative studies, since it provides balanced data coding based on an existing model (i.e., deductive coding) while being open for new codes that might emerge from the data (i.e., inductive coding).

3.2.3 | Coding procedures

Each tweet served as a unit of analysis. We limited our analysis to the narrative content of each tweet. Hyperlinks, videos and photos were excluded from the analysis. The two authors discussed the conceptual and operational definition of each communication objective, reviewed sample tweets for each objective, and then independently coded a practice set of 75 tweets to verify the applicability of the codebook. Each tweet was analysed in isolation from previous tweets. Through regular meetings and discussion, the two authors compared categorization of tweets, discussed discrepancies, revised and modified the codebook. Examples of coded items and tweets are presented in Table 2.

Intercoder reliability was conducted on 300 tweets randomly selected and independently evaluated by two coders. Intercoder reliability was calculated with Cohen’s $\kappa$ coefficient which takes chance agreement into account (Krippendorff, 2011). Coefficients equal to or higher than .80 were considered to be reliable (Lombard et al., 2002). For intercoder reliability, we calculated Cohen’s $\kappa$ for each communication objective. Cohen’s $\kappa$ ranged from .84 to .98. Each coder independently coded 3500 tweets, followed by two rounds of joint review to examine samples of coded tweets, resulting in approximately 3% of the total sample of tweets was reviewed by the two coders.

For score index, we calculated an average score and a standard percent of each communication objective. Each score reflects the degree to which a tweet includes the communication objective under investigation such as a higher score indicates more use of that specific communication objective in the tweet.

3.3 | Data analysis

All data management and analyses were conducted using IBM SPSS Statistics 27. Categorical variables were described using frequencies and percentages, while continuous variables were described using means and standard deviations. To examine the main and interaction effects of governor’s political party (Democrat vs. Republican), gender (man vs. woman) and crisis phases (initial phase vs. maintenance phase) on CERC’s communication objectives, generalized linear models were analysed. Interaction terms, political partyxgender, genderxcrisis phase and political partyxcrisis phase, were included in the linear models to examine the interaction effects. Maximum likelihood estimates were calculated. Results with $p < .05$ indicate statistically significant.

4 | RESULTS

There were 3658 tweets during the initial phase and 3342 during the maintenance phase. During the initial phase, about 47.1% of the tweets were from the 24 Democratic governors, 11.3% were from the nine female governors. During the maintenance phase, 57.5% were posted by Democratic governors, 9.6% were from female governors. Table 3 presents the descriptions of the study variables.

For research question 1 related to the salience of CERC’s communication objectives in governors tweets, we found that the most salient communication objectives aimed to address rumours and misunderstanding (61%), describe preparedness/response efforts (42%) and promote protective actions (17%). The communication objectives related to acknowledge crisis with empathy (14%) and segment audience (9%) were the least salient communication objectives.

Hypothesis 1, which stated that compared to Democratic governors, Republican governors would be more likely to address misunderstanding and rumours, was confirmed, ($B = -0.08, p < .001$). Hypothesis 2 was partially confirmed as Republican governors were more likely to promote protective actions ($B = 0.07, p < .001$), but less likely to describe preparedness/response efforts ($B = -0.07, p < .001$) compared to Democratic governors.

For research question 2 about whether governors’ communication objective related to acknowledging crisis with empathy and


| Question items                                                                 | Sample tweets                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| **Communication objective 1: Acknowledge crisis with empathy**               | Utah’s case counts concern me. We are monitoring hospital capacity in our densely populated counties. Their risk status has not changed. #StayStrong Utah! Let’s continue to keep safe by wearing face coverings, keeping our distance and practicing excellent hygiene.                                                                                   |
| Does it show concern about others by suggesting solutions?                  | I know New Mexicans are disappointed that the state fair is cancelled—I am too. We did not ask for this virus, but we have got it, and we’ve got to beat it—and that means avoiding large groups and events. I am confident that the state fair will be back next year, better than ever.                                                                 |
| Does it acknowledge people’s emotions?                                     | The past 2 months have been difficult and many of us have experienced hardships and uncertainty. I share everyone’s frustration and anger. I get it. But it is not going to do businesses and employees any good if we get it wrong. If we get it wrong, we will have a medical mess and a mess in the economy. The best thing we can do is get this right. |
| Does it involve sharing people’s emotions?                                  | Our hearts go out to the families of the four Granite Staters we lost to #COVID19 today.                                                                                                                                                                                                                                                |
| Does it express feelings for affected people?                               | Wash your hands and do it often 😇. Good hand hygiene can #SlowtheSpread of #COVID19. Make sure you are washing your hands for 20 s or more and getting those commonly-missed areas. #YourActionsSaveLives                                                                                                                                 |
| Does it encourage others to take protective actions?                        | It also requires all essential retail locations to require their staff to wear face coverings, and requires those businesses to put appropriate social distancing measures in place to keep customers and their staff safe. Help kids follow social distancing. Play at home. No group sports and no playgrounds. |
| Does it incite people to follow state’s policies?                          | Californians are required to wear masks when they are in public and unable to keep 6 feet of distance from others. @GovKemp, @GaDPH Dr. Toomey Urge Georgians to Wear Face Coverings to Fight.                                                                                                                                  |
| **Communication objective 2: Promote protective actions**                  | Iowa will further expand access to COVID-19 testing with new sites opening this week, including one in Dallas County to better serve the Des Moines metro area, and four clinic sites in rural communities.                                                                                                                 |
| Does it mention structural measures?                                       | Today I mandated the indefinite closure across New Jersey of all indoor portions of retail shopping malls, and all indoor and outdoor places of public amusement. This aggressive step will help us #FlattenTheCurve and combat #COVID19.                                                                                                             |
| Does it mention nonstructural measures?                                    | We are also working expeditiously to mitigate the unprecedented challenges small businesses are facing. @IllinoisDCEO yesterday submitted the necessary documentation to declare a statewide Economic Injury Declaration with @SBAgov—covering all of our 102 counties.                                    |
| Does it mention financial assistance measures?                             | Our office is unaware of the origin of this graphic, but it is FALSE. While on social media, please verify any and all information before sharing. Follow @GaDPH, @CDCgov and @GovKemp for regular updates.                                                                                                                                                 |
| **Communication objective 3: Describe preparedness/response efforts**      | I will be on @CNN’s @CuomoPrimeTime with host @ChrisCuomo tonight at 9PM to discuss the latest updates on COVID-19.                                                                                                                                                                                                                           |
| Does it warn against fake news/ misinformation?                            | Today’s #COVID19 update: 143 new COVID-19 cases, totalling 8,940 positive tests statewide Four additional COVID-19 deaths, bringing the total to 396 deaths statewide 177 individuals currently hospitalized with COVID-19 statewide.                                                                                       |
| **Communication objective 4: Address misunderstanding and rumours**        | I want to be clear about something: This isn’t the end of learning, it’s just the end of students physically going to school campuses for the remainder of the semester. #lagov #lalege                                                                                                                                 |
| Does it provide clarifications?                                            | Dear Nurses, You see the pain of this pandemic up close, and continue to fight for us—saving lives and touching hearts. You put yourself at risk so that we can be safe. This #NursesWeek, we honour you, and all our nurses throughout New Jersey and across the world. Thank you. |
| **Communication objective 5: Segment audience**                           |                                                                                                                                                                                                                                                                                                                                                     |
| Does it address a specific target audience?                                |                                                                                                                                                                                                                                                                                                                                                     |
TABLE 3 Descriptions of study variables

| Variable                      | Initial phase (n = 3658) | Maintenance phase (n = 3342) |
|-------------------------------|--------------------------|------------------------------|
|                               | n   | %  | n   | %  |
| Party                         |     |    |     |    |
| Democrat                      | 1724| 47.1| 1920| 57.5|
| Republican                    | 1934| 52.9| 1422| 42.5|
| Gender                        |     |    |     |    |
| Female                        | 412 | 11.3| 320 | 9.6 |
| Male                          | 3246| 88.7| 3022| 90.4|
| Segment audience              |     |    |     |    |
| Acknowledge crisis with empathy|     |    |     |    |
| Promote protective actions    |     |    |     |    |
| Describe preparedness/response efforts |     |    |     |    |
| Address misunderstanding and rumours |     |    |     |    |

For research question 3 related to whether governors' communication objectives vary by political partisanship and gender, we found that Democratic governors were more likely to acknowledge crisis with empathy compared to their Republican counterparts ($B = 0.04, p < .001$). We found no significant difference in the communication objective related to segmenting audience as a function of governor's political party.

Hypothesis 3, which predicted that female governors would be more likely to acknowledge crisis with empathy compared to male counterparts, was confirmed, ($B = 0.06, p < .001$). Hypothesis 4, which predicted that governors' communication objectives related to promoting protective actions, describing preparedness/response efforts, addressing rumours and misunderstanding and segmenting audience would not vary by gender, was confirmed. However, we found that female governors were more likely to promote protective actions ($B = 0.03, p = .045$) in their tweets compared to male governors.

For research question 3 about whether communication objectives differ by crisis phase, we found that governors tended to acknowledge crisis with empathy ($B = 0.03, p < .001$) during the initial phase, whereas they tended to promote protective actions ($B = -0.04, p = .001$) and address misunderstanding and rumours ($B = -0.04, p = .018$) during the maintenance phase. We found no significant differences in the communication objectives related to describing preparedness/response efforts and segmenting the audience as a function of the crisis phase. Table 4 demonstrates the main effects of gender, political party and crisis phase on governors' communication objectives.

For research question 4 related to whether governors' communication objectives vary by political partisanship and gender, we observed significant interaction effects of governor gender and political party on acknowledging crisis with empathy ($B = 0.13, p < .001$) and describing preparedness/response efforts ($B = 0.10, p = .040$). Female Democratic governors were most likely to acknowledge crisis with empathy in their tweets, compared to female Republican governors (Figure 1). Further, male Republican governors were most likely to describe preparedness/response efforts in their tweets compared to male Democratic governors (Figure 2). There were no interaction effects of gender and political party on promoting protective actions and segmenting audiences.

For research question 5 related to whether governors' communication objectives vary by political partisanship and crisis phase, we observed significant interaction effects of political party and crisis phase on promoting protective actions ($B = -0.05, p = .008$) and describing preparedness/response efforts ($B = 0.13, p < .001$) as Democratic governors were most likely to promote protective actions during the maintenance phase (see Figure 3), whereas Republican governors were most likely to describe preparedness/response efforts during the maintenance phase (see Figure 4). There were no interaction effects of political party and crisis phase on acknowledging crisis with empathy and segmenting audience. Table 4 demonstrates the main and interactions effects of gender, political party and crisis phase on governors' communication objectives.

New themes emerged during the coding process. These included (a) attention to mental health issues, (b) call for social influencers to promote protective measures and (c) and foster hope and optimism. The two authors discussed emergent themes, extracted tweets for each theme and suggested to include the new themes to CERC model. Table 5 presents the new themes and sample tweets.

5 | DISCUSSION

This study examined the communication aspect of risk governance through a content analysis of 7000 tweets from 50 governors during the period of March 13 to August 17, 2020, a period that marks the outbreak of COVID-19 and a sudden upsurge in infection and death cases. To understand state governors' communications during this period, we drew on CDC's CERC model to examine the salience of CERC's communication objectives in governors' tweets and explore whether these objectives differ by political partisanship, gender and two phases of COVID-19. We focused on five CERC's communication objectives, namely acknowledge crisis with empathy, promote protective actions, describe preparedness/response efforts, address rumours and misunderstanding and segment audience.

Although we do not have evidence that governors intentionally adopted CDC's CERC model in their communications, our findings suggest that governors' tweets aligned with CERC's communication objectives to a varying degree. Drawing on the framing literature, we found that governors made some communication objectives more salient at the expense of others to draw public attention to particular issues. This suggests that the salience of these communication objectives can be indicative of governors' political priorities during COVID-19.

One interesting finding is that acknowledging crisis with empathy was one of the least salient communication objectives in governors'
TABLE 4
Main and interaction effects of gender, political party and crisis phase on CERC communication objectives

| Predictor                | B     | 95% CI       | p      |
|--------------------------|-------|--------------|--------|
| Female                   | .06   | .03, .09     | <.001  |
| Democrat                 | .04   | .01, .03     | <.001  |
| Initial phase            | .03   | .01, .05     | <.001  |
| Female × initial phase   | .003  | -.006, .01   | .21    |
| Democrat × initial phase | -.003 | -.006, .01   | .21    |

Note: The bold values indicate the significance of p < .05.

Table 4: Main and interaction effects of gender, political party, and crisis phase on CERC communication objectives. The table shows the coefficients (B), 95% confidence intervals (95% CI), and p-values for each predictor. The highlighted effects indicate significance at p < .05. The predictors include gender (Female), political party (Democrat), and crisis phase (Initial). The interaction effects are also shown for the combination of gender and initial phase, and political party and initial phase.

It is conceivable that Republican governors trusted President Trump or may have feared the political consequences of disagreeing with his policies so they may have followed his lead. From a risk governance perspective, those governors’ communications may have emphasized topics relevant to the federal government, irrespective of particular health risk that emerged within their states. By contrast, tweets. That is, governors posted more empathetic tweets to acknowledge COVID-19 during the initial phase, whereas they focused on promoting protective actions and addressing rumours/misunderstanding during the maintenance phase. Drawing on prior work underscoring the beneficial impact of communicating empathy during crises (e.g., Pfattheicher et al., 2020; Schoofs et al., 2019), we suggest that governors used empathy during the phases of health crises given that ‘being perceived as empathetic and caring provides greater opportunity for [the leader’s] message to be received and acted upon’ (Reynolds et al., 2004, p. 21). Relatedly, leaders who do not show empathy during crises can be perceived as ‘cold and uncaring’ (Reynolds & Seeger, 2005, p. 241).

Furthermore, segmenting the audience was the second-least salient communication objective in governors’ tweets, irrespective of governor political party, gender and crisis phase. Governors tended to target their followers as one homogenous group, without paying attention to the concerns, information needs and fears of each subgroup of the population. In part, this could be a byproduct of Twitter’s design, in which people decide who to follow, such that governors may see their audience as like-minded citizens. In light of crisis communication research calling for audience segmentation as a strategic risk management approach (e.g., Fraustino & Liu, 2017; Ihm & Lee, 2021), we suggest that governors recognize the diversity of audiences by targeting specific subgroups (e.g., vulnerable populations) instead of combining the audience into one—what Marwick and Boyd (2011) coined as ‘context collapse’ (p. 9). Segmenting and prioritizing subgroups of the population can help governors engage and empower specific audiences. Thus, tailoring messages to address different groups can an effective strategy during health crises.

Another interesting finding is related to the effect of political party on governors' tweets such as Republican governors tweeted less to promote protective actions but tweeted more to address rumours/misunderstanding compared to their Democratic counterparts. This can be explained in light of the Trump administration's rejection of protective measures such as mask wearing (Cathey, 2020). One plausible hypothesis is that Republican governors did not promote protective measures to avoid conflict with their party leader (i.e., President Trump), which in turn can result in perilous implications on their political careers. Recent work supports this hypothesis by showing that Republican governors and governors with term limits were significantly slower than Democratic governors and governors without term limits to adopt protective measures (e.g., statewide orders) (Baccini et al., 2020). Another plausible hypothesis is that Republican governors focused on addressing rumours/misunderstanding (vs. promoting protective measures) to refute allegations related to their reluctance to adopt protective measures such as stay-at-home orders (Wang et al., 2021).
FIGURE 1  Interaction effects of gender and political party on acknowledging the crisis with empathy

FIGURE 2  Interaction effects of gender and political party on describing response efforts

FIGURE 3  Interaction effects of political party and crisis phase on promoting protective actions
Democratic governors may have turned to more aggressive COVID-19 policies driven by their perception of risk or their party’s political agenda. Thus, it is evident COVID-19 did not normalize Republican and Democratic governors’ risk and crisis communication during the two phases of COVID-19, which lends support to the notion of ‘vertical partisan coalition’ emphasizing that governors ‘face pressure to act as committed, loyal party members’ to support party leaders at the federal level (Thompson et al., 2018).

Our findings showed that female Democratic governors posted more tweets to acknowledge COVID-19 with empathy compared to female Republican governors, which shows the effect of political party on governors’ tweets. Another related finding is that female governors tweeted more to acknowledge COVID-19 with empathy compared to their male counterparts, which is consistent with a vast literature on leadership style and psychology (e.g., Peterson & Bartels, 2017; Rosette & Tost, 2010), suggesting that female leaders are more communal and empathetic than male leaders, especially in a high-pressure leadership context (Sweet-Cushman, 2016). Our finding is also compatible with a recent psycholinguistic study showing that female governors expressed more empathy in their governmental briefings than male governors during COVID-19 (Sergent & Stajkovic, 2020).

When it comes to the implications of our study, we believe we made several significant contributions related to how political discourse in the US varied based on state governors’ political partisanship and gender during COVID-19. Unlike prior studies that focused on gender and controlled for political partisanship in the context of COVID-19 (e.g., Garikipati & Kambhampati, 2021; Sergent & Stajkovic, 2020), we analysed the interaction between political partisanship and gender on governors’ communications. In so doing, we extended the literature on the communication aspect of risk governance by using CDC’s CERC model to examine the commonalities and differences in governors’ communications as a function of political partisanship and gender during a global health emergency. Our findings are not only important given the scarcity of studies on the interaction effect of political partisanship and gender on governors’ communications, but also because this relationship can influence constituents’ compliance with preventive behaviours (e.g., Grossman et al., 2020).
We extended the notion of risk governance by looking at two main aspects, namely the effects of political partisanship and gender on political leaders’ communications during two critical phases of a public health emergency and the intersection between risk governance, crisis literature and framing research. Our approach enriches the communication aspect of risk governance by showing that political leaders' tweets can be politically polarized during crises and can be influenced by the leader gender.

In view of the significance of framing in political discourse, our findings extend the scope of partisan communication by showing how the intersection of gender and politics can shape elected politicians' communications during an unprecedented public health crisis. It is interesting to find discernable differences in when and how governors tweet about specific topics during such a life-threatening crisis. It appears that governors tended to reflect their party's priorities by making some topics more salient than others, which suggests that Republican and Democratic governors' risk/crisis communications can be another mean to manage political narrative and ensure political power during crises.

Unlike prior work that used conventional issue generic frame in content analysis (e.g., Semetko & Valkenburg, 2000), our study provides operational frame indicators to test the applicability of CDC's CERC communication model. We operationalized CERC's communication objectives during a real-time crisis, thus providing insights to use CERC model as a viable frame to content analyse political narratives in future crises. To the best of our knowledge, CERC model has yet to be fully tested and adapted in the context of social media during health emergencies. Therefore, our study is the first to examine the applicability of CERC's communication objectives across two phases of COVID-19 with special focus on governor's gender and political partisanship to provide useful insights about the adaptability of CERC model in different contexts including global health emergencies.

Although the CERC model was developed based on well-grounded research, it is important that the CDC and scholars update its content in light of the new challenges induced by COVID-19. Our findings provide practical implications to refine the CERC model based on the new themes that emerged during the analysis. These include attention to mental health, use of social influencers and fostering hope and optimism. Specifically, we suggest that the theme of paying attention to mental health becomes part of CERC's communication objective related to crisis response measures. Given that people experience negative emotional responses (e.g., fear, stress) during stressful events (Lwin et al., 2020), it is thus important that leaders’ messages provide substantive updates about the availability of mental health services, and convey simple facts to dissipate the stigma about mental health and help people manage their mental wellbeing during crises. The theme of using social influencers can be part of the CERC’s communication objective related to promoting protective actions. As studies showed that celebrities can positively influence people's attitudes and behaviours (e.g., Jackson, 2018), political leaders can enlist and train celebrities to encourage people to adopt preventive actions. Finally, the theme of fostering hope and optimism can be included as an additional communication objective in the CERC’s maintenance phase to help leaders enhance public resilience during crises.

One limitation is our approach to examine governors’ narratives on Twitter, which is one of many communication platforms that governors use to communicate with their constituents. This calls for additional work to examine governors’ communication objectives vary across multiple platforms. Another limitation is that our study did not examine public engagement with governors’ tweets. New venues for research, therefore, can focus on analyzing the content of followers’ comments and examining followers’ online reactions to governors’ tweets using engagement metrics (e.g., share, likes) to better understand the effect of political leaders’ narratives on public attitudes and behaviours during health emergencies.

One major extension of this study would be to use audience segmentation techniques in testing risk and crisis messages to move past the tendency to communicate 'one message that fits all segments' during health emergencies. This suggestion resonates with scholarly work calling for a more specific targeted communication that takes into consideration the characteristics of diverse audiences especially in the context of social media (e.g., Ihm & Lee, 2021). Future research can empirically test persuasive messages derived from CERC's communication objectives to enrich the risk and communication literature. As far as the CERC model is concerned, one new direction would focus on increasing CDC’s outreach efforts to draw attention to the CERC model as a road map for political leaders and spokespersons’ risk and crisis communication during crises. To complement this, CDC can provide examples of messages/tweets for each communication objective in different phases of a crisis.

Our study raises several questions about the impact of political polarization on crisis discourse, partisan divide, public risk perceptions and crisis responses. Given that political leaders are trusted sources of information for their constituencies (Montanaro, 2020), governors’ framing of risk/crisis communication could, for example, encourage or discourage public’s adherence to health recommendations. For example, one study showed that citizens’ decisions to voluntarily engage in physical distancing was influenced by governors’ political party affiliation (Grossman et al., 2020). One implication thus could be that governors’ communications have exposed the public to inconsistent messages about the severity of COVID-19, which might have contributed to differential perceptions of and reactions towards COVID-19 among the public.

Given that the CERC model is theoretically grounded on public health and risk/crisis communication literatures, we suggest that governors consider it as a strategic framework to convey preparedness/response measures, reduce people’s risk perceptions, reach different target audiences and promote effective protective measures. In light of CERC model's objectivity that undermines individual factors (e.g., political partisanship), governors may need to integrate CERC’s communication objectives into their risk management strategies to ensure they address people's needs for information during crises, irrespective of political party affiliation. As the CERC is
a five-phase model that specifies different communication objectives in each phase of a crisis, it offers governors a systematic structure to address a variety of communication objectives that can help them manage their public communication during crises.

To sum up, our study showed that governors’ tweets included CERC’s communication objectives, however, the salience of some objectives varied as a function of political partisanship, gender and crisis phase. Such salience can be indicative of governors’ priorities, which can further our understanding of the dynamic nature of risk governance, communication and individual/political factors (e.g., political partisanship, gender) during public health emergencies.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID

Nagwan R. Zahry https://orcid.org/0000-0003-3454-8763
Jiying Ling https://orcid.org/0000-0003-1997-7914

REFERENCES

Aldrich, A. S., & Lotito, N. J. (2020). Pandemic performance: Female leaders in the Covid-19 crisis. Politics & Gender, 16(4), 960–967.
Aven, T., & Renn, O. (2020). Some foundational issues related to risk governance and different types of risks. Journal of Risk Research, 23(9), 1121–1134.
Baccini, L., Brodeur, A., & Weymouth, S. (2020). The COVID-19 pandemic and the 2020 US presidential election. Journal of Population Economics, 1–29.
Bromley-Trujillo, R., & Poe, J. (2020). The importance of salience: public opinion and state policy action on climate change. Journal of Public Policy, 40(2), 280–304.
Carson, A., Martin, A. J., & Ratcliff, S. (2020). Negative campaigning, issue salience and vote choice: assessing the effects of the Australian Labor party’s 2016 “Medicare” campaign. Journal of Elections, Public Opinion and Parties, 30(1), 83–104.
Cathey, L. (2020, October 2). Trump, downplaying virus, has mocked wearing masks for months. ABC News. https://abcnews.go.com/Politics/trump-downplaying-virus-masked-wearing-masks-months/story?id=73392694
Chong, D., & Druckman, J. N. (2007). A theory of framing and opinion formation in competitive elite environments. Journal of Communication, 57(1), 99–118.

Crisis Emergency and Risk Communication (2014). CERC: Crisis Communication plans. https://emergency.cdc.gov/cerc/ppt/CERC_Crisis_Communication_Plans.pdf
Crisis Emergency and Risk Communication (2018). CERC: Introduction. https://emergency.cdc.gov/cerc/ppt/CERC_Introduction.pdf
Curley, C., Harrison, N., & Federman, P. (2021). Comparing motivations for including enforcement in US COVID-19 state executive orders. Journal of Comparative Policy Analysis: Research and Practice, 23(2), 191–203.
Deane, C., Kim, P., & John, G. (2021, March 5). A year of U.S. public opinion on the Coronavirus pandemic. https://www.pewresearch.org/2021/03/05/a-year-of-u-s-public-opinion-on-the-coronavirus-pandemic
Dennison, J., & Geddes, A. (2019). A rising tide? The salience of immigration and the rise of anti-immigration political parties in Western Europe. The Political Quarterly, 90(1), 107–116.

Druckman, J. N. (2011). What’s it all about? Framing in political science. In Gideon Keren (Ed.), Perspectives on framing (pp. 279–301). Psychology Press/Taylor & Francis.
Edelman, M. J. (1993). Contestable categories and public opinion. Political Communication, 10, 231–242.
Entman, R. M. (1993). Framing: Toward clarification of a fractured paradigm. Journal of Communication, 43, 51–58.
Entman, R. M., Matthes, J., & Pellicano, L. (2009). Nature, sources, and effects of news framing. The Handbook of Journalism Studies, 175–190.
Evans, H. K., & Clark, J. H. (2016). “You tweet like a girl!” How female candidates campaign on Twitter. American Politics Research, 44(2), 326–352.
Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. International Journal of Qualitative Methods, 5(1), 80–92.
Florin, M. V., & Bürkler, M. T. (2017). Introduction to the IRGC Risk governance framework (No. Rep Work). EPFL.
Fowler, L., Kettler, J. J., & Witt, S. L. (2021). Partisanship and issue salience. Quarterly Journal of Speech, 97(3), 378–396.
Fraustino, J. D., & Liu, B. F. (2017). Toward more audience-oriented approaches to crisis communication and social media research. Social Media and Crisis Communication, 129–140.
Fridkin, K., & Kenney, P. (2014). The changing face of representation: The gender of US senators and constituent communications. University of Michigan Press.
Gadarian, S. K., Goodman, S. W., & Pepinsky, T. B. (2021). Partisanship, health behavior, and policy attitudes in the early stages of the COVID-19 pandemic. PLoS One, 16(4), e0249596.
Gamson, W. A., & Modigliani, A. (1987). The changing culture of affirmative action. In R. G. Braungart, & M. M. Braungart (Eds.), Research in political sociology (pp. 137–177). JAI Press.
Garikipati, S., & Kambhampati, U. (2021). Leading the fight against climate change: Does gender really matter? Feminist Economics, 27(1-2), 401–418.
Gitlin, T. (1980). The whole world is watching: Mass media in the making and unmaking of the new left. University of California Press.
Green, J., Edgerton, J., Naftel, D., Shoub, K., & Cranmer, S. J. (2020). Elusive consensus: Polarization in elite communication on the COVID-19 pandemic. Science Advances, 6(28), eabc2717.
Grossman, G., Kim, S., Rorer, J. M., & Thirumurthy, H. (2020). Political partisanship influences behavioral responses to governors’ recommendations for COVID-19 prevention in the United States. Proceedings of the National Academy of Sciences, 117(39), 24144–24153.
Gusmano, M. K., Miller, E. A., Nadash, P., & Simpson, E. J. (2020). Partisanship in initial state responses to the COVID-19 pandemic. World Medical & Health Policy, 12(4), 380–389.
Hamel, L., Lunna, L., Cailey, M., Jennifer, K., Josh, M., & Mollyann, B. (2020, March 3). KFF Coronavirus Poll: March 2020. https://www.kff.org/global-healthpolicy/poll-finding/kff-coronavirus-poll-march-2020/
Hutcheson, V. L. (2001). Political context, issue salience, and selective attentiveness: Constituent knowledge of the Clarence Thomas confirmation vote. Journal of Politics, 63(3), 846–868.
Ihm, J., & Lee, C. J. (2021). Toward more effective public health interventions during the COVID-19 pandemic: Suggesting audience segmentation based on social and media resources. Health Communication, 36(1), 98–108.
Jackson, D. J. (2018). The effects of celebrity endorsements of ideas and presidential candidates. Journal of Political Marketing, 17(4), 301–321.
Jong, W., Dückers, M. L., & van der Velden, P. G. (2016). Leadership of mayors and governors during crises: A systematic review on tasks

ZAHRY ET AL.

WILEY

13

https://orcid.org/0000-0003-3454-8763
https://orcid.org/0000-0003-1997-7914
and effectiveness. *Journal of Contingencies and Crisis Management*, 24(1), 46–58.

Kim, Y., Miller, A., & Chon, M. G. (2016). Communicating with key publics in crisis communication: The synthetic approach to the public segmentation in CAPS (communicative action in problem solving). *Journal of Contingencies and Crisis Management*, 24(2), 82–94.

Krippendorf, K. (2011). Agreement and information in the reliability of coding. *Communication Methods and Measures*, 5(2), 93–112.

Lachlan, K. A., Spence, P. R., Lin, X., Najarian, K., & Del Greco, M. (2016). Social media and crisis management: CERC, search strategies, and Twitter content. *Computers in Human Behavior*, 54, 647–652.

Lee, T. K., & Kim, H. K. (2017). Differential effects of message framing on obesity policy support between democrats and Republicans. *Health Communication*, 32(12), 1481–1490.

Lombard, M., Snyder-Duch, J., & Bracken, C. C. (2002). Content analysis in mass communication: Assessment and reporting of intercoder reliability. *Human Communication Research*, 28(4), 587–604.

Longstaff, P. H., & Yang, S. U. (2008). Communication management and trust: Their role in building resilience to “surprises” such as natural disasters, pandemic flu, and terrorism. *Ecology and Society*, 13(1), 3–14.

Lwin, M. O., Lu, J., Sheldenkar, A., & Schulz, P. J. (2018). Strategic uses of Facebook in Zika outbreak communication: implications for the crisis and emergency risk communication model. *International Journal of Environmental Research and Public Health*, 15(9), 1974.

Lwin, M. O., Lu, J., Sheldenkar, A., Schulz, P. J., Shin, W., Gupta, R., & Yang, Y. (2020). Global sentiments surrounding the COVID-19 pandemic on Twitter: analysis of Twitter trends. *JMIR Public Health and Surveillance*, 6(2), e19447.

Marwick, A. E., & Boyd, D. (2011). I tweet honestly, I tweet passionately: Twitter users, context collapse, and the imagined audience. *New Media & Society*, 13(1), 114–133.

Matthes, J. (2009). What’s in a frame? A content analysis of media framing studies in the world’s leading communication journals, 1990-2005. *Journalism & Mass Communication Quarterly*, 86(2), 349–367.

McCombs, M., & O’Hara, J. I. (2001). The convergence of agenda setting and framing. In R. Stephen, D. O. H. Gandy, Jr., & A. E. Grant (Eds.), *Framing public life: Perspectives on media and our understanding of the social world* (pp. 67–81). Routledge.

McNeill, A., Harris, P. R., & Briggs, P. (2016). Twitter influence on UK vaccination and antiviral uptake during the 2009 H1N1 pandemic. *Frontiers in Public Health*, 4, 26–39.

Miletic, D. S., & Sorensen, J. H. (1990). Communication of emergency public warnings: A social science perspective and state-of-the-art assessment (No. ORNL-6609). Oak Ridge National Lab.

Montanaro, D. (2020, March 17). Poll: Americans don’t trust what they’re hearing from Trump on coronavirus. NPR. [https://www.npr.org/2020/03/17/816680003/poll-americans-dont-trust-what-they-are-hearing-from-trump-on-coronavirus](https://www.npr.org/2020/03/17/816680003/poll-americans-dont-trust-what-they-are-hearing-from-trump-on-coronavirus)

Oppermann, K. (2010). The concept of issue salience in foreign policy analysis: Delineating the scope conditions of theoretical approaches in the field, In *SGIR 7th Pan-European Conference on IR* (pp. 9–11).

Panagiotopoulos, P., Barnett, J., Bigdeli, A. Z., & Sams, S. (2016). Social media in emergency management: Twitter as a tool for communicating risks to the public. *Technological Forecasting and Social Change*, 111, 86–96.

Parida, D., Moses, S., & Rahaman, K. R. (2021). Analyzing media framing of cyclone Amphan: Implications for risk communication and disaster preparedness. *International Journal of Disaster Risk Reduction*, 59, 102272.

Peterson, S. J., & Bartels, A. L. (2017). Using neuroscience methods to explore gender differences in leadership. In S. R. Madsen (Ed.), *Handbook of research on gender and leadership*. Edward Elgar Publishing Ltd.

Pfattheicher, S., Nockur, L., Böhm, R., Sassenrath, C., & Petersen, M. B. (2020). The emotional path to action: Empathy promotes physical distancing and wearing of face masks during the COVID-19 pandemic. *Psychological Science*, 31(11), 1363–1373.

Rao, H. R., Vemprala, N., Akello, P., & Valecha, R. (2020). Retweets of officials’ alarming vs reassuring messages during the COVID-19 pandemic: Implications for crisis management. *International Journal of Information Management*, 55, 102–187.

Renn, O. (2008). White paper on risk governance: Toward an integrative framework. In O. Renn, & K. D. Walker (Eds.), *Global risk governance: Concept and practice using the IRGC framework* (pp. 3–73). Springer.

Renn, O., Kline, A., & Van Asselt, M. (2011). Coping with complexity, uncertainty and ambiguity in risk governance: a synthesis. *Ambio*, 40(2), 231–246.

Reynolds, B., & Seeger, W. M. (2005). Crisis and emergency risk communication as an integrative model. *Journal of Health Communication*, 10(1), 43–55.

Reynolds, B., Hall, W., Vanderford, M. L., & Wolfson, M. (2004). Crisis+ emergency risk communication by leaders for leaders. [https://stacks.cdc.gov/view/cdc/24058](https://stacks.cdc.gov/view/cdc/24058)

Rossette, A. S., & Tost, L. P. (2010). Agentic female and communal leadership: how role prescriptions confer advantage to top female leaders. *Journal of Applied Psychology*, 95, 221–235.

Rovny, J., & Edwards, E. E. (2012). Struggle over dimensionality: Party competition in Western and Eastern Europe. *East European Politics and Societies*, 26(1), 56–74.

Rufai, S. R., & Bunce, C. (2020). World leaders’ usage of Twitter in response to the COVID-19 pandemic: a content analysis. *Journal of Public Health*, 42(3), 510–551.

Sadiq, A. A., Kapucu, N., & Hu, Q. (2020). Crisis leadership during COVID-19: The role of governors in the United States. *International Journal of Public Leadership*, 17(1), 65–80.

Schoofs, L., Claey, A. S., De Waele, A., & Cauberghhe, V. (2019). The role of empathy in crisis communication: Providing a deeper understanding of how organizational crises and crisis communication affect reputation. *Public Relations Review*, 45(5), 101851.

Seeger, M. W. (2006). Best practices in crisis communication: An expert panel process. *Journal of Applied Communication Research*, 34(3), 232–244.

Seeger, M. W., & Reynolds, B. (2008). Crisis communication and the public health: Integrated approaches and new imperatives. In M. W. Seeger, & T. L. Sellnow (Eds.), *Crisis communication and the public health* (pp. 3–22). Hampton Press Inc.

Semetko, H. A., & Valkenburg, P. M. (2000). Framing European politics: A content analysis of press and television news. *Journal of Communication*, 50(2), 93–109.

Sergent, K., & Stajkovic, A. D. (2020). Female’s leadership is associated with fewer deaths during the COVID-19 crisis: Quantitative and qualitative analyses of United States governors. *Journal of Applied Psychology*, 105(8), 771–804.

Shah, D. V., McLeod, D. M., Gottlieb, M. R., & Lee, N. J. (2009). Framing and agenda setting. In R. L. Nabi, & M. B. Oliver (Eds.), *The Sage handbook of media processes and effects* (pp. 83–98). Sage.

Snow, D. A., & Benford, R. D. (1992). Master frames and cycles of protest. In M. Aldon, & C. McChurg Mueller (Eds.), *Frontiers in social movement theory* (pp. 133–198). Sage.

Snow, D. A., & Behrman, D. R. (1986). Frame alignment processes, micromobilization, and movement participation. *American Sociological Review*, 51, 464–481.

Society of Risk Analysis. (2015). Glossary society for risk analysis.*www.sra.org/resources*

Sweet-Cushman, J. (2016). Gender, risk assessment, and political ambition. *Politics and the Life Sciences*, 35, 1–17.

Thompson, F. J., Gusmano, M. K., & Shinoharu, S. (2018). Trump and the Affordable Care Act: Congressional repeal efforts, executive
federalism, and program durability. *Publius: The Journal of Federalism*, 48(3), 396–424.

Tyson, A. (2020, July 22). Pew Research Center. https://www.pewresearch.org/fact-tank/2020/07/22/republicans-remain-far-less-likely-than-democrats-to-view-covid-19-as-a-major-threat-to-public-health/

Van Asselt, M. B., & Renn, O. (2011). Risk governance. *Journal of Risk Research*, 14(4), 431–449.

Veil, S., Reynolds, B., Sellnow, T. L., & Seeger, M. W. (2008). CERC as a theoretical framework for research and practice. *Health promotion practice*, 9(suppl), 265–345.

Wang, B., & Zhuang, J. (2017). Crisis information distribution on Twitter: A content analysis of tweets during Hurricane Sandy. *Natural Hazards*, 89(1), 161–181.

Wang, G., Devine, R. A., & Molina-Sieiro, G. (2021). Democratic governors quicker to issue stay-at-home orders in response to COVID-19. *The Leadership Quarterly*, 101542.

Watson, K. (2020, April 3). A timeline of what Trump has said on coronavirus. CBS News. https://www.cbsnews.com/news/president-donald-trump-changing-statements-on-coronavirus/

Wlezien, C. (2005). On the salience of political issues: The problem with 'most important problem. *Electoral Studies*, 24(4), 555–579.

---

How to cite this article: Zahry, N. R., McCluskey, M., & Ling, J. (2022). Risk Governance during the COVID-19 pandemic: A quantitative content analysis of governors’ narratives on Twitter. *Journal of Contingencies and Crisis Management*, 1–15. https://doi.org/10.1111/jccm.12412