

Introduction

Strategic science communication is crucial during a public health crisis (Barry, 2009). In the midst of a crisis, such as the COVID-19 pandemic, news media framing plays a vital role in public perception of a message (An & Gower, 2009; Barr et al., 2012). For example, messages about food safety crisis issues varied during the 2008 and 2009 *Salmonella* outbreaks, with news sources negatively framing governmental institutions and their food safety policies during this agricultural issue (Barr et al., 2012). Additionally, government figureheads and news outlets did not present consistent, reliable messages to the United States (U.S.) public during the 2014 Ebola outbreaks (Ratzan & Moritsugu, 2014). The inconsistencies in science communication during the Ebola outbreaks highlighted a need to increase health literacy in the U.S. through messaging from a single, credible source (Ratzan & Moritsugu, 2014) and has only been exacerbated during the COVID-19 pandemic.

In 2020, the World Health Organization (WHO) coined the term *infodemic* as “an overabundance of information – some accurate and some not – that makes it hard for people to find trustworthy sources and reliable guidance when they need it” (WHO, 2020a, p. 2). The *infodemic* was first declared during the early stages of the COVID-19 outbreak following the first reported COVID-19 death in the Philippines, the first to occur outside of China. It was at this time an Information Network for Epidemics was created by the WHO to combat misinformation circulating during the global pandemic to provide targeted messages to a variety of public and private sectors (WHO, n.d.). The creation of the Information Network for Epidemics punctuated the necessity for targeted information to reach the “general public”, the “health sector”, “travel and tourism”, “faith-based organizations”, “employers and workers”, “large event organizers”, and “food and agriculture” (WHO, 2020b, p. 147).

In June 2020, Australia, Chile, France, Georgia, India, Latvia, Lebanon, Mauritius, Mexico, Norway, Senegal, and South Africa issued a cross-regional statement asking United Nations member states to partner with them to stop the spread of the *infodemic* that emerged as a result of COVID-19 and its global impact. The release stated, “. . .the spread of the ‘infodemic’ can be as dangerous to human health and security as the pandemic itself,” citing secondary results of misinformation included violent reactions and torn communities (United Nations, 2020, p. 1). As a result of the *infodemic*, Islam et al. (2020) conducted a global social media analysis. They identified that “rumors, stigma, and conspiracy theories” sparked panic in the early stages of the pandemic that negatively affected individuals and their resulting societal actions as well as the healthcare system (Islam et al., 2020, p. 1627). While work has been done on a global scale, little is known about how U.S. news access patterns impacted the distribution of misinformation in the midst of the global COVID-19 *infodemic*. News access and specific audiences in the different regions across the U.S. vary and a deeper identification of differences may inform future agricultural and food safety communication efforts when it comes to the *infodemic* and spread of misinformation during critical moments in time for public health and safety.

News audiences are dynamic and segmented. Tewksbury and Rittenberg (2012) explained:

The audience for any given type of content, or even any single program, is really a collection of smaller audiences and individuals who have banded together through a

common interest. Audiences coalesce because of some combination of content, motivation, actors, hype, or social pressure. (p. 18)

There are thousands of news audiences with diverse interests thanks to the rise of internet news access. Individuals can access a variety of news sources according to their needs and preferences for particular content which plays a role in how the media presents their messages to specific audiences (Tewksbury & Rittenberg, 2012).

Audiences may evaluate risk messages differently according to their proximity to a health crisis. Researchers (van Lent et al., 2017) analyzed Twitter activity, expressing concern about the 2014 Ebola outbreak confirming that both “spatial and social distance” to a worldwide crisis affects the level of public attention a health crisis receives (p. 7). The study also found a positive relationship between fear for personal safety and tweets from countries near reported Ebola outbreaks (van Lent et al., 2017). For example, in the Netherlands and surrounding countries, the number of fearful tweets about Ebola increased as there were reports of the virus crossing the Mediterranean Sea into Europe. The public fear-based conversation increased as spatial distance from reports of infected individuals decreased. The research from van Lent et al. (2017) additionally revealed that fear about Ebola did not necessarily increase with a rise in cases in other parts of the world, or follow the epidemic curve. The response in level of concern for one’s self was positively related to the social and spatial distance from new cases emerging.

Given this, location must be considered when examining news access patterns of national news sources, specifically within the U.S. during times of crisis (Tewksbury, 2005). Some national news sites (such as Cable News Network or Fox News) perform better in certain regions of the U.S. than others (Tewksbury, 2005). When information about public health concerns, such as the Ebola virus, is being spread, network affiliations may influence the level of sensationalism news stories contain (Ihekweazu, 2017). Media location may also contribute to the amount of sensationalism stories contain about a public health crisis, leading to disparities in information processed by those consuming the information (Ihekweazu, 2017). White and Rutherford (2012) found in news coverage of an agricultural outbreak crisis, the location of a news source significantly impacted the number of stories a newspaper published, the length of stories, and the number of sources cited. Specifically, almost half of U.S. newspaper coverage of a bovine spongiform encephalopathy (BSE) from 2003 to 2004 was from the Pacific West region, close to where the first U.S. outbreak of BSE occurred in Washington state, indicating that proximity to an agricultural outbreak event affects newspaper coverage (White & Rutherford, 2012).

Additionally, media framing impacts public perception of a crisis (An & Gower, 2009). Media outlets possess the power to construct reality through covering particular aspects of an issue more prominently than other aspects, therefore influencing how an audience perceives an issue and their opinion on it (Kim et al., 2002). The media focusing on one aspect of an event, and its presentation to the audience, can create a reference point for audience members that impact judgment of all future information (Carter, 2013). Content analyses of media coverage in past agricultural food crises have revealed that coverage of animal disease outbreak issues influence the way a health risk is reported in the future and shape public perception, while disproportionately emphasizing potential human health risks (Cannon & Irani, 2011; Ruth et al., 2005). Ruth et al. (2005) found a significant difference in the way in which Canadian newspapers and U.S. newspapers framed reports surrounding a confirmed Canadian case of BSE, also known as mad cow disease, indicating a significant difference in geographical news reporting. Similarly, Cannon and Irani (2011) reviewed coverage of the 2001 and 2007 foot and

mouth disease (FMD) outbreaks in a major U.S. newspaper and an equally influential U.K. newspaper. Both newspapers framed their coverage largely from a perspective of fear. BSE can be transferred to humans, while FMD is only communicable between cloven-hoofed animals, but Cannon & Irani (2011) found that, similar to Ruth et al. (2005), the U.S. newspaper focused more on the human health aspects of the disease than the U.K. newspaper. Both studies found significant differences in reporting between news sources in each country (Cannon & Irani, 2011; Ruth et al., 2005), indicating news coverage can vary by geographic proximity to an issue.

While media use and framing varies geographically, individual patterns of news access and the effect thereof may differ during times of health crisis. During the time when public fear was peaking surrounding the Zika international health emergency in 2016, Park et al. (2019) explored the relationship between information channels, news processing, and the behaviors that followed in the U.S. Park et al. (2019) found a significant difference in the types of information channels used on a regular basis and those used during crisis. Television news ranked as the most important information channel, closely followed by health department websites and medical professionals. Park et al. (2019) also found that those who intended to follow health directives and those who did not selected television news and health department websites as their media of choice for information about Zika. With the intent of identifying the importance of social media in gathering crisis information, Liu et al. (2011) found that during the first stages of crisis development, traditional media and word-of-mouth communication from friends and family are the most important communication sources. However, they also found social media communication becomes more relevant later in the crisis communication process.

These information-seeking behaviors during times of crisis are particularly salient because risk analysis literature posits that “perceptions of risk are unevenly distributed across societies” (Whaley & Tucker, 2004, p. 4). Previous studies have revealed that people from underrepresented groups, those with less education, and higher gross incomes were more likely to depend on media to fulfill their informational needs (Whaley & Tucker, 2004). The news can shape the information provided to these individuals with a variety of sources that are not always experts, which can be particularly dangerous in a food safety crisis. For example, in an examination of a foodborne illness crises, Barr et al. (2012) compared transcripts of television newscasts on national news sources ABC News, CBS News, NBC News, and CNN News concerning two high-profile food safety stories - the 2008 outbreak of *Salmonella* in jalapeños and the 2009 *Salmonella* outbreak in peanut products. Barr et al. (2012) concluded stories about food safety issues surrounding outbreaks can be handled differently, even if they are about the same type of bacteria. The jalapeño outbreak stories featured the FDA as the most common information source, while the peanut product outbreak focused on *Salmonella* victims or family members of victims. Neither focused heavily on gleaning information from food safety experts (Barr et al., 2012), thus affecting the type of information available to the public during a crisis. The public health crisis and *infodemic* surrounding the COVID-19 pandemic present a unique opportunity to explore news source access and its potential influence on individuals within a specific geographic area during times of crisis.

Theoretical Framework

Sense-making theory (Klein et al., 2006) was used as the theoretical foundation for the current line of inquiry. Klein et al. (2006) indicated individuals process information about their world by constantly drawing conclusions from their experiences and relationships to inform their

behaviors. Sense-making is not simply about comprehension but interpretation of complex topics, particularly events in time. Sense-making is considered a constant, active process that happens within the human mind to interpret connections “(which can be among people, places, and events) in order to anticipate their trajectories and act effectively” (Klein et al., 2006, p. 71).

So et al. (2016) studied sense-making theory in the context of health risk communication by exposing participants to news of a health risk and monitoring the actions they took online to seek further information. The study found an increased level of information-seeking behavior in an individual led to greater self-efficacy and response efficacy. Information-seeking behaviors around health risks could also explain individual rejection of a health risk messages, while seeking additional information about the threat of the health risk and how to cope with it could help mitigate rejection of a risk message (So et al., 2016).

Additional studies examining sense-making have explored information-seeking behaviors of segmented groups, resulting in developed scales (Timmers & Glas, 2010). For example, Liu et al. (2020) conducted a study of mainland China residents in an attempt to understand mass and social media’s influence on creating subjective norms for the public around COVID-19. The study was specifically interested in subjective norms that influenced preventive behaviors toward the pandemic (Liu et al., 2020). When responses from a group in the Wuhan area (where COVID-19 originated) were compared to a group from other regions, the results did not reveal a significant difference between the groups and the effect of social media on their public psychology toward the pandemic. This was possibly due to coronavirus already spreading throughout China when the study was conducted (Liu et al., 2020).

In the risk information seeking and processing (RISP) Model, Griffin et al. (1999) identified four possible categories related to creating preventive health behaviors based on individual use of media sources and whether or not they passively or critically consume risk information. RISP model literature suggests that demographic characteristics such as gender, age, and education level can influence the attitudes and behaviors of message recipients as related to health and safety (Burke et al., 2020; Yang et al., 2020), and Harrison et al. (2004) found geography can play a role in risk perceptions associated with GM food purchases. However, little research has been conducted examining information-seeking and sense-making patterns when segmenting the U.S. public by demographic characteristic of geographic location, especially during times of crisis. Given the large size of the country, and the decision-making power given to state governors when the U.S. was striving to control the spread of the coronavirus, a study examining information-seeking patterns of U.S. residents segmented by geographic region during the COVID-19 pandemic is warranted and needed to further inform the theoretical underpinnings alongside future agricultural and health crisis communication efforts.

Purpose and Objectives

The purpose of this study was to identify the media outlets U.S. residents used during the COVID-19 pandemic when most of the U.S. was under shelter in place orders. Additionally, the purpose of the study was to determine if media outlet use during that time varied by geographic region. The study was guided by the following research objectives:

1. Identify the media outlets used by U.S. residents to obtain COVID-19 information; and
2. Determine if media outlets used differed based on geographic locations.

Methods

A quantitative survey research design was used to address the objectives of the study. The research described here was part of a larger effort exploring how the U.S. public seeks and processes information during times of crisis. Two parts of the survey instrument were used for the study: media outlets used during the COVID-19 pandemic when most of the U.S. was under shelter in place orders and geographic location of respondents.

Instrumentation

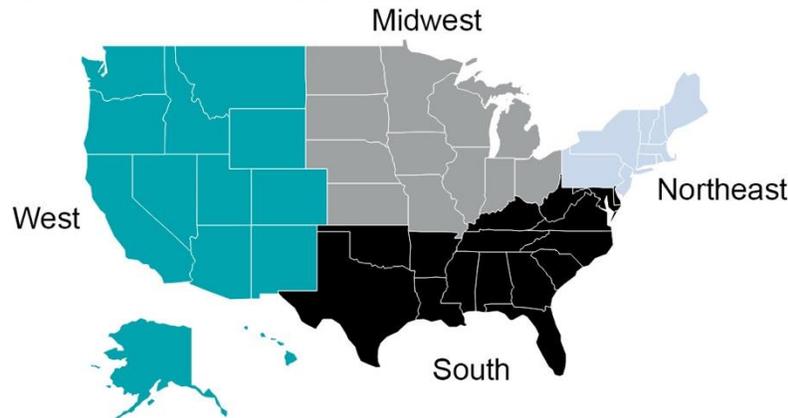
A web-based survey instrument was researcher developed using Qualtrics to address the objectives of the study. The researchers recognized that one limitation of using a web-based survey was participation may have been limited to respondents with access to the internet, impacting the generalizability of the results (Ary et al., 2010). In addition, the coronavirus pandemic may have exacerbated this effect since many public spaces, such as libraries and public schools, were closed, restricting access to the internet.

The instrument included demographic and Likert-type questions. Seventeen questions were used to determine media outlets (accessible via the television or online) respondents used while most U.S. states were under COVID-19 shelter in place orders. The initial list included 17 sources and a fill-in-the-blank option. Respondents were asked to indicate how often they accessed each of the 17 media outlets on a seven-point Likert-type scale (1 = *Never*; 2 = *Less than once a week*; 3 = *Once a week*; 4 = *Several times a week*; 5 = *About once a day*; 6 = *Several times a day*; 7 = *Almost constantly*). The media outlets included the WHO, Centers for Disease Control (CDC), Cable News Network (CNN) News, Fox News, American Broadcasting Company (ABC) News, Columbia Broadcasting System (CBS) News, National Broadcasting Company (NBC) News, their state governor press briefing, White House press briefings, National Public Radio (NPR) News, Reuters, nationally distributed newspaper (e.g., New York Times, Los Angeles Times, USA Today, Huffington Post, Wall Street Journal, etc.), Politico, Yahoo! News, Apple News, BuzzFeed, and Other (Please Describe). There was no differentiation between online, print, or television news sources. Media sources that were used by more than 70% of respondents were considered in this study's list of media as they were used more frequently by respondents than other media sources.

One multiple choice question was used to determine the state where a respondent lived when most of the U.S. was under shelter in place orders. The multiple choice question was subsequently recoded to group respondents into geographic regions based on the 2010 U.S. Census (U.S. Census Bureau, 2010a). Regions included the Northeast (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont, New Jersey, New York, and Pennsylvania), Midwest (Indiana, Illinois, Michigan, Ohio, Wisconsin, Iowa, Nebraska, Kansas, North Dakota, Minnesota, South Dakota, and Missouri), South (Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia, Alabama, Kentucky, Mississippi, Tennessee, Arkansas, Louisiana, Oklahoma, and Texas), and West (Arizona, Colorado, Idaho, New Mexico, Montana, Utah, Nevada, Wyoming, Alaska, California, Hawaii, Oregon, and Washington; Figure 1).

Figure 1

Map of the U.S. depicting geographic regions



A team of experts in survey design and communications reviewed the instrument for content validity. The study was approved by the University of Georgia Institutional Review Board (IRB # 00006482). The instrument was then pilot tested with 50 individuals representative of the population of interest to further ensure face validity. No modifications were made to the instrument based on accurate responses to the pilot.

Population and Sample

The population of interest for the study was U.S. residents aged 18 or older who were representative of the population based on gender, age, race, ethnicity, and geographic location. Data were collected in May 2020 when most states were under shelter in place orders due to COVID-19. Respondents were acquired using non-probability opt-in sampling, a commonly used data collection method in public opinion research (Baker et al., 2013). One limitation of non-probability opt-in sampling is participants must sign up to be contacted to participate in the study; therefore, non-probability opt-in sampling is not random and may cause selection bias (Baker et al., 2013; Lamm & Lamm, 2019). Weighting of the data was used in order to mitigate non-probability opt-in sampling limitations (Lamm & Lamm, 2019).

Data Collection and Analysis

Responses from 1,048 individuals were obtained. Data were weighted based on 2010 Census demographics ensuring accurate portrayal by geographic location, gender, age, and race/ethnicity. Weighting was done to ensure respondents were representative of the population of interest (U.S. Census Bureau, 2010b). Detailed demographics of the respondents can be seen in Table 1. It should be noted that respondents were more educated than the general U.S. public they were intended to represent; therefore, despite best efforts to weight data appropriately, the results may have been influenced by level of education. Data were analyzed via SPSS 26 using descriptive statistics and Chi-square analysis.

Table 1
Demographics of Respondents (N = 1,048)

	<i>F</i>	<i>%</i>
Sex		
Male	502	47.9
Female	546	52.1
Age		
18-34 years	227	21.7
35-54 years	438	41.8
55+ years	383	36.5
Race*		
White	896	85.5
Black	83	7.9
Asian	41	3.9
American Indian or Alaska Native	34	3.2
Other	20	1.9
Ethnicity		
Hispanic	73	7.0
Non-Hispanic	975	93.0
Education		
Less than 12 th grade	18	1.7
High school diploma	140	13.4
Some college	190	18.1
2-year college degree	104	9.9
4-year college degree	268	25.6
Graduate or Professional degree	328	31.3
U.S. Region		
Midwest	220	21.0
Northeast	190	18.1
South	392	37.4
West	246	23.5
Family Income		
Less than \$24,999	156	14.9
\$25,000 - \$49,999	195	18.6
\$50,000 - \$74,999	148	14.1
\$75,000 - \$149,999	295	28.1
\$150,000 - \$249,999	181	17.3

\$250,000 or more	73	7.0
Political Affiliation		
Republican	383	36.5
Democrat	405	38.6
Independent	186	17.7
Non-affiliated	65	6.2
Other	9	.90
Political Ideology		
Very liberal	112	10.7
Liberal	200	19.1
Moderate	393	37.5
Conservative	218	20.8
Very conservative	125	11.9

Note: *Respondents were allowed to select more than one race.

Results

Survey respondents indicated how often they used media outlets to obtain COVID-19 information while most of the U.S. was under shelter in place orders (Table 2). Over half of the respondents used the CDC, their state governor press briefing, and the White House press briefing as sources of COVID-19 information once a day or more.

Table 2

Media Outlets Used During COVID-19 Shelter in Place Orders (N = 1,048)

	Never %	Less than once a week %	Once a week %	Several times a week %	About once a day %	Several times a day %	Almost constantly %
WHO	19.8	12.5	9.3	11.6	11.7	13.2	21.9
CDC	12.0	11.3	11.9	13.6	15.2	14.4	21.6
CNN News	27.8	9.2	7.8	7.7	11.1	15.2	21.3
State governor press briefing	6.3	8.5	12.1	19.0	22.7	15.5	15.9
White House press briefing	10.7	10.0	11.0	17.8	22.2	13.4	14.9
Fox News	29.5	7.7	7.9	9.4	13.5	17.2	14.9
ABC News	24.0	10.1	10.6	11.5	17.7	15.9	10.0
CBS News	25.0	10.9	10.3	12.5	17.4	14.8	9.2
NBC News	24.9	7.1	11.5	15.5	19.1	12.8	9.3

Frequency of media outlet use was then examined based on geographic region (Table 3). More than half of respondents from the Northeast used their state governor press briefing (66.8%), the CDC (63.2%), White House press briefings (62.6%), CNN (61.1%), Fox News (59.5%), the WHO (58.9%), ABC News (57.9%), CBS News (55.8%), and NBC News (55.3%)

once a day or more. Moreover, more than half of the respondents from the West used the CDC (60.2%), the WHO (58.5%), CNN News (58.1%), their state governor press briefing (57.7%), Fox News (54.9%), and the White House press briefings (52.8%) once a day or more. Slightly less than half of the respondents from the West used ABC News (48.8%), CBS News (48.0%), or NBC News (46.3%) once a day or more.

Respondents from the South used media outlets less than their Northeastern or Western counterparts overall. More than half of respondents from the South used their state governor press briefing (51.0%) once a day or more. Slightly less than half of respondents from the South used the White House press briefings (49.5%) and the CDC (46.2%) once a day or more. Moreover, respondents from the Midwest did not use any media outlets once a day or more indicating they used media outlets the least. More than half of respondents from the Midwest used Fox News (59.6%), CBS News (57.3%), CNN News (56.8%), ABC News (56.8%), the WHO (55.5%), and NBC News (53.2%) once a week or less.

Table 3

Media Outlets Used During COVID-19 Shelter in Place Orders Based on Geographic Region (N = 1,048)

	Never %	Less than once a week %	Once a week %	Several times a week %	About Once a day %	Several times a day %	Almost constantly %
Northeast (n = 190)							
WHO	13.68	8.42	6.32	12.63	10.00	21.05	27.89
CDC	8.95	9.47	5.79	12.63	15.2x6	17.89	30.00
CNN News	21.58	7.89	4.21	5.26	11.58	18.95	30.53
Fox News	19.47	5.79	5.79	9.47	10.00	24.21	25.26
ABC News	20.00	5.79	6.32	10.00	21.05	17.89	18.95
CBS News	18.42	5.26	7.89	12.63	22.11	18.42	15.26
NBC News	20.53	4.74	7.89	11.58	24.21	17.89	13.16
State governor press briefing	5.79	2.63	5.26	19.47	22.63	18.42	25.79
White House press briefing	8.42	3.68	8.95	16.32	20.53	14.74	27.37
West (n = 246)							
WHO	12.60	12.60	5.69	10.57	14.23	14.63	29.67
CDC	8.94	12.20	8.94	9.76	13.82	17.89	28.46
CNN News	19.11	8.94	6.91	6.91	14.63	20.33	23.17
Fox News	26.02	7.32	5.69	6.10	16.26	23.17	15.45
ABC News	19.51	11.79	6.91	13.01	21.14	17.07	10.57
CBS News	19.92	12.20	8.94	10.98	19.92	18.29	9.76
NBC News	20.73	6.50	8.54	17.89	21.54	13.82	10.98
State governor press briefing	6.50	7.72	13.41	14.63	20.33	21.54	15.85
White House press briefing	14.63	10.16	7.72	14.63	20.73	18.29	13.82
South (n = 392)							
WHO	23.47	11.73	11.73	12.76	9.18	10.46	20.66

CDC	14.54	9.18	15.05	15.05	13.27	12.76	20.15
CNN News	32.91	7.65	8.93	7.40	9.95	11.22	21.94
Fox News	32.91	7.14	7.65	11.22	13.78	13.78	13.52
ABC News	24.74	10.46	13.01	11.22	17.60	15.05	7.91
CBS News	28.32	11.99	9.95	13.01	15.82	14.03	6.89
NBC News	27.04	7.40	13.27	15.31	18.37	10.97	7.65
State governor press briefing	6.63	9.44	12.50	20.41	21.68	14.54	14.80
White House press briefing	8.16	10.46	10.97	20.92	22.45	13.27	13.78
Midwest (n = 220)							
WHO	26.82	17.27	11.36	10.00	15.00	9.55	10.00
CDC	13.64	15.45	15.00	16.36	20.00	10.45	9.09
CNN News	33.64	13.18	10.00	11.36	8.64	13.18	10.00
Fox News	35.91	10.91	12.73	9.55	12.73	10.45	7.73
ABC News	31.36	11.36	14.09	11.82	11.36	14.55	5.45
CBS News	30.45	12.27	14.55	13.18	13.18	9.09	7.27
NBC News	29.55	9.09	14.55	16.36	13.18	10.45	6.82
State governor press briefing	5.91	12.73	15.91	20.91	27.27	7.73	9.55
White House press briefing	12.73	14.55	16.36	17.27	25.00	6.82	7.27

Chi-square tests were then used to determine if there were significant differences in media outlet use based on geographic region (Table 4). Respondents from the Northeast and West were more likely to frequently use media outlets (regardless of the source) than respondents from the Midwest and South.

Table 4
Chi-square Analysis of Media Outlets Used During COVID-19 Shelter in Place Orders Based on Geographic Region

Media Outlets	χ^2
WHO	79.16***
CDC	68.40***
CNN News	68.29***
Fox News	73.64***
ABC News	55.44***
CBS News	48.68***
NBC News	38.47**
State governor press briefing	62.87***

Note. ** $p < .01$, *** $p < .001$.

Conclusion and Discussion

A public health communication plan is critical during times of crisis (Irlbeck et al., 2013) whether it is associated with a food safety issue or a global pandemic to ensure all audiences are receiving sufficient information in the manner that fits them best. Since smaller audiences with diverse interests and preferences for information access make up the large public audience (Tewksbury & Rittenberg, 2012), communicators must create strategic plans to appropriately reach each segmented audience. This study added to the crisis communication literature base by identifying media outlets used by U.S. residents when most states were under COVID-19 shelter in place orders and determining if geographic region influenced the use of media outlets as sources of information to make sense of the COVID-19 pandemic. The results indicated there were significant differences in information-seeking behaviors by geographic region and, therefore, where someone lives in the country is relevant when developing communication plans.

There were a few limitations to this study that must be addressed before the findings are further interpreted. First, because the present research captured a snapshot of news-seeking behaviors, the study was limited to a specific moment in time during a unique global event. Response to another global health pandemic may be different if experienced by the U.S. public and media again. The present findings can advance our understanding of information-seeking during crisis.

Second, different states experienced sporadic shelter in place orders based on state and local government leadership decisions (Dave et al., 2020). It must be noted the survey for the current study was conducted while most states were under shelter in place orders. Future studies should examine the information-seeking behaviors of U.S. residents based on the length of time state residents experienced shelter in place orders in their state.

Acknowledging the limitations, the study successfully met the first research objective to identify which media outlets U.S. residents utilized to obtain COVID-19 information during the early stages of the COVID-19 pandemic. Overall, state governor press briefings, the CDC, and White House press briefings were media outlets with the largest percentage of frequent users. The top three sources garnering engagement were all direct sources from the government and located within the U.S. Agricultural crises that are national in scope should be communicated about through direct sources from the government considering they received the most engagement during the pandemic crisis. The media outlets used the least were NBC News, CBS News, and ABC News. Each of these news organizations have local affiliate stations and were used less often in comparison to cable news networks like Fox News and CNN News. The higher use of domestic sources of media direct from the government, such as the White House or their state governors' offices, could be a result of U.S. residents seeking a single, unified message about the pandemic from government figureheads. This finding aligns with a need identified by Ratzan and Moritsugu (2014) in their study regarding the spread of misinformation and health literacy during the 2014 Ebola outbreaks. Having a unified message prepared for agricultural crises, such as *Salmonella* outbreaks, that can be disseminated through governmental sources may help mitigate the spread of misinformation in the future. Moreover, previous studies have found differences in how the media frames agricultural issues in the U.S. and abroad (Cannon & Irani, 2011; Ruth et al., 2005). Future studies may benefit from exploring the frames used by the

frequented media outlets around the U.S. in times of crisis, such as the COVID-19 pandemic and/or a food safety crisis, to prepare agricultural communicators for future crisis situations that may arise quickly.

For the second research objective, the study determined media outlet use varied by geographic location. Residents in the Northeastern and Western regions exhibited larger frequency of use for all of the media outlets as compared to residents in the South and Midwest. The higher use of news sources among Northeastern and Western regions in this study revealed inconsistencies in information-seeking behavior when respondents were segmented by region. The finding implies it may be more difficult to reach residents in the South and Midwest because they are not seeking information as frequently as residents of the Northeast and West during times of crisis. Agricultural communicators must be aware of these regional differences in order to provide targeted communication to members of the public who are less likely to seek information about a health risk. Since increased information seeking about health risks and coping strategies can lead to acceptance rather than rejection of a health risk message (So et al., 2016), region-specific communication plans may be critical to the health and well-being of those living in the Southern and Midwest regions of the U.S. Often, agricultural crises, such as *Salmonella* outbreaks, impact the broader U.S. and therefore a unified message must be presented to all regions based on their associated communication preferences. The development of the WHO Information Network for Epidemics created resources for specific industries and worked with trusted sources within those industries to create targeted education materials (WHO, 2020b). Perhaps the response to the *infodemic* should be strengthened and further enhanced through a strategic, audience-segmented approach with wording and information-seeking preferences appropriate for each geographic region.

The results of this study, however, are preliminary and future studies should explore why audiences in the South and Midwest did not view media as often. Barriers may exist, such as broadband access, that prevent residents in the South and Midwest from engaging in crisis communication. Conducting focus groups or interviews with residents in the South and Midwest may provide insight into potential barriers. When preparing for the future of food and health crisis communication, information needs to be disseminated effectively in an easily accessible manner that builds public trust and employs clear, consistent scientific messaging (Ratzan & Moritsugu, 2014).

Future research is also needed to identify why residents of the Northeast and West were more likely to access media outlets during this time of the COVID-19 pandemic. Perhaps demographics such as political affiliation or education level led to the regional differences in information-seeking behavior. In previous risk information-seeking research, findings have revealed that gender, age, and education level influence attitudes and behaviors about health risks (Burke et al., 2020; Yang et al., 2020). Poindexter and McCombs (2001) found that, under non-crisis circumstances, the civic duty to be informed had a positive relationship with education levels; therefore, a higher level of education indicated higher use of news media. The lower use of news sources in the South and Midwest could also be due to the different shelter in place orders implemented in each state. Because audiences respond differently to health risk messages depending on their physical and spatial distance from outbreaks (van Lent et al., 2017), residents of the Northeast and West may have been more frequent users of media outlets due to the number of COVID-19 outbreaks in their proximity and the social emphasis placed on COVID-19 in each region. The first case of COVID-19 in the U.S. was reported in Snohomish County, Washington, in the West (Holshue et al., 2020). Additionally, New York City, New York, in the

Northeast was an “epicenter” of the U.S. COVID-19 outbreak from March 2020 to May 2020 (Thompson et al., 2020, p. 1725). Therefore, proximity to the crisis may have played a role in information-seeking behaviors. Given the severity of the COVID-19 outbreak events in Northeast and West, there may have been more news coverage available from media sources in the Northeast and West because of their proximity to the developing crisis, as exhibited by White and Rutherford (2012) in the case of BSE outbreaks. The study did not examine the number of cases in each state at the time the survey was completed. Future studies should examine how proximity to an outbreak crisis specifically in the U.S. impacts media use to provide additional information for communicators when developing strategic crisis communication plans.

Future research to explore the information-seeking behaviors of regional residents beyond the scope of traditional media outlets would also be helpful. Both traditional media and word-of-mouth communication are prominent information-seeking methods at crisis inception (Liu et al., 2011); therefore, Midwesterners and Southerners could more frequently seek information through their friends and family than the outlets identified in this study. Considering the large-scale agricultural production in the Midwest (e.g., Iowa, Nebraska, and Illinois) and the south (e.g., Texas), agricultural communicators may benefit from determining their specific information-seeking behaviors during times of crisis. Additionally, Midwesterners and Southerners may have been influenced by the message framing exhibited by the media sources through which they were receiving information since covering specific aspects of a news story shapes public opinion about the matter (Kim et al., 2002) and framing of crisis information can significantly vary according to the geographic location of the news source (Cannon & Irani, 2011; Ruth et al., 2005).

Overall, the findings indicated a need for targeted communication based on the U.S. regions when striving to amplify public health messages in the midst of a crisis. Moving forward, the regional differences in information-seeking behaviors should be woven into crisis communication plans as agricultural communicators craft messages that ensure trustworthy sources are correctly amplified to specific audiences that will increase the likelihood the information will be obtained and used. Additionally, government media sources should be mindful of their targeted messages to residents in their geographic areas of influence because residents tend to rely heavily on governmental information sources in times of crisis. The findings imply governmental agencies and news media working together in their specific parts of the country would result in the most effective spread of health and food safety crisis messages to targeted audiences resulting in increasing a health-literate society in the face of current and future crises.

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