

DO NO HARM: ETHICAL REPORTING OF HEALTH NEWS

By

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A Thesis Submitted in Partial Fulfillment of
the Requirements for the Degree of Master of Arts in Professional and Digital Media
Writing to the Office of Graduate and Extended Studies
of East Stroudsburg University of Pennsylvania

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ABSTRACT

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Abstract

This thesis examines the ethics of reporting health news out of context and how this practice has primed our country for the “fake news” era as well as the implications of this priming as they relate to information literacy and trust in science and the media. In order to do this, the researcher reviews the basics of scientific and health news communication, information literacy, audience behavior, and implications for the future of information literacy and public trust in the media. In addition to this literature review, the researcher conducted a survey to determine how people react to conflicting health news and how much trust they place in the media. This is followed by a brief case study of reporting during the COVID-19 pandemic in early 2020. Finally, implications for current media behavior and the necessary information literacy and health news communication steps to combat priming people to fall victim to the fake news era are discussed.

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CHAPTER 1

INTRODUCTION

The media and information landscape of the 21st century thus far has been riddled with cries of “fake news;” however, fake news is not a new phenomenon. It has existed since the days of yellow journalism (crude journalism based on sensationalizing information). The term is inherently problematic because news is, by definition, something that is factual and not fake, but the term has caught on. Society has quickly adopted the term “fake news” to apply to all information that is false, flawed, or contrary to personal beliefs. In fact, Putnam (2019) says this phrase has become a “catchall phrase that describes everything from honest mistakes to intentional deceptions.” In reality, this term describes different types of inaccurate information, and there is a distinction between misinformation (information that is inaccurate but not intended to harm others) and disinformation (information that is inaccurate and is intended to do harm) (p. 59). Wardlee and Derakhshan (2018) explain another type of information that we must be aware of that often falls under the “fake news” umbrella — mal-information, or inaccurate “information that is based on reality” and is “used to inflict harm on a person, organization, or country” (p. 20). Mal-information is dangerous because it blurs the lines between what is fake and what is real by presenting information that is flawed. Flawed

news, or mal-information, is particularly harmful because it can be difficult to distinguish where the fact ends and the fake begins. Another term is false news, which is a term Facebook has adopted in the fake news phenomenon. In this case, the term is used to describe “a specific notion of evidence-free or purposefully fabricated stories, disseminated for profit or political manipulation” (Sergeant & Tagg, 2018, p. 184).

Unfortunately, fake news has become a term used by anyone who wants to deny the veracity of unfavorable news coverage. Calling unflattering news “fake news” to pander to a political base is a tactic some politicians utilize frequently. People have also taken to commenting “fake news” on social media posts that do not align with their own political beliefs. Also, although not discussed in studies, the researcher’s conversations with friends, family, and acquaintances reveals fake news has also made it into peoples’ daily vocabulary as a way to jokingly downplay unflattering, friendly banter; while humor may seem like a harmless way of coping with this fake news epidemic, it also shows that this term has become so ubiquitous that we use it without even thinking about its implications and actual meaning. All of this confusion over what is true, what is fake, and what is flawed has led to what has become known as a “post-truth” era which Bluemle (2018) describes as “a situation in which facts lose relevance and emotions become primary” (p. 268).

Information literacy is an important tool to combat fake news and post-truth. Head et al. (2020) define information literacy as “an integrated set of skills, knowledge, practices, and dispositions that prepares students to discover, interpret, and create information ethically while gaining a critical understanding of how information systems interact to produce and circulate news, information, and knowledge” (p. 8). Part of

information literacy is a specific focus on media and news literacy, which seeks to provide people with the tools to critically evaluate news in a variety of media formats. But how do we engage in effective information literacy to ensure people can effectively navigate a digital news environment without gatekeepers? Evanson and Sponsell (2019) admit educators do not always understand how students interact with misinformation, nor do educators understand how to evaluate media and news literacy beyond the traditional evaluation checklists that are no longer adequate in today's media landscape (pp. 229-230). Of course before we can understand how to help people become information literate, we must first understand the information environment and help people understand the environment they are navigating. This involves knowing how algorithms work and shape what information is presented to users as well as the traits of mass media and electronic communication that impact how information is presented to users.

These skills are critical when it comes to health news as believing fake health news can have deadly consequences. Unfortunately, there are many barriers that exist to helping people navigate health news. Some of those barriers are put in place, often unintentionally, by credible media and scientific communication outlets. These barriers include how information is communicated between science and the media and then how that information is further distilled down into something understandable by the layperson, knowledge of journalists covering health news, media staff sizes, publication deadlines, and the need to cut through the media clutter. These barriers are magnified by filter bubbles, the need for confirmation bias, and the fragmented media environment that takes health news out of context. It is also necessary to acknowledge the vulnerable emotional state people may be in when searching for health news; this vulnerability can cloud

judgment and consequently impede someone's ability to thoroughly critique health news. Typically, when the impacts of fake news, or cries of fake news even when the news is legitimate, are examined in the research, it is in the context of politics and how fake news impacts elections. Fake news in the context of health news reporting is often neglected. Unfortunately, another aspect of health news reporting that is often neglected yet greatly impacts peoples' ability to understand and trust health news is the media itself and the practices it engages in to disseminate news, particularly the practice of reporting conflicting studies out of context. This erodes trust in the media and, ultimately, enables us to fall victim to the belief in fake news.

While there is clearly a gap in published research on the ethical reporting of health news and its various interconnected concepts, related research in this field is emerging. News and media literacy in general are evolving areas of information literacy, and the fake news era has prompted reflection on how people interact with this news and whether news and media literacy can be taught effectively or at all. Dyer (2017) examined whether news literacy could be taught at the K-12 and higher education levels and stressed the difficulties of retention of news literacy concepts. Head et al. (2018) published a report for Project Information Literacy (PIL) that examines how college students engage with the news. Although this broaches the subject of how students interact with news, it does not specifically examine health news. These authors are currently working on another report for PIL that examines media coverage of the first 100 days of the COVID-19 pandemic and how these media messages were received (Alison Head, executive director, PIL, personal communication, April 13, 2020). This upcoming report will help us further understand how students interact with news. It seems likely

that while this will be set in the context of the COVID-19 pandemic, it may not solely be focused on health news and the impact of the fake news era on media credibility. The Pew Research Group and other similar organizations have conducted surveys on the media and news literacy skills of adults as well as trust in the media, and research on how incoming college students interact with news are beginning to be published more, but again, this is in general and not specifically related to health news and fake news. There are also various reports that examine news reporting characteristics and their pitfalls, particularly Maksimainen's (2017) detailed report about improving the quality of health news. Finally, the convention MisInfoCon is attempting to help deal with the fallout from the spread of misinformation. MisinfoCon is a convention that began in 2017. It was created by a collaboration among The First Draft Coalition, The Nieman Foundation for Journalism at Harvard, and Hacks/Hackers. The summit brings together people in technology, librarians, academics, and others who are impacted by misinformation and discusses ways to fight misinformation (Zindren, 2020).

Clearly research exists on various parts of this topic, but what is missing is the bridging of these topics. This thesis seeks to be that bridge, and is the researcher's attempt to understand how people react to conflicting, contextless health news and how the health media landscape and the current fake news environment have impacted trust in the media. In order to understand these reactions and beliefs, the researcher has conducted a thorough literature review examining media, health journalism, and scientific communication characteristics; audience characteristics; areas for misunderstanding between academic and lay presses; the impact of the fake news era; and ways to combat its impact with an emphasis on the necessity of information literacy. This is followed by a

qualitative study that analyzes a small group of participants' health media consumption, news sharing behavior, and trust in the media. Finally, there is a brief case study on the current COVID-19 pandemic as an example of the negative media habits that impact accurate, complete health news reporting. Ultimately, the information gleaned from this thesis will be essential in helping media and information professionals understand how much damage the fake news era and media behaviors have caused to the health news landscape, what the chances are of recovering from this damage, and the implications this recovery, or lack thereof, could have for the future of health news.

CHAPTER 2

CHARACTERISTICS

In order to understand the current fake news/post-truth era, it is necessary to understand the characteristics of the media, health journalism, and scientific styles of communication and the characteristics of the audience consuming this information.

Media, Health Journalism, and Scientific Styles of Communication

The media landscape has changed dramatically since its inception. According to Daly (2012), there are five major periods in the history of U.S. journalism: the politicization of the news, the commercialization of the news, the professionalization of the news, the conglomeration of the news, and the digitization of the news. We have been in the digitization era since 1995 (p. 463). Since Daly's work in 2012, the news appears to be entering a new era, one in which journalism is interactive, fragmented, and free of gatekeepers (people who control the flow, accuracy, and quality of information through media outlets). The author of the present study refers to this as the social era because news is interactive, and it is easily created by anyone. While this era democratizes the news, it comes with consequences. Badke (2017) notes that most people are now more susceptible to falsehoods because they have not experienced a world without media gatekeepers. Before the internet, news sharing was limited to media sources that filtered

out “the worst excesses of falsehood and unreliability” (p. 58). But the problem is not just with the audience. Daly adds that in the digitization era, “news organizations appear more susceptible to error than ever” because news organizations are laying off veteran reporters and greatly reducing staff sizes, including making staffing reductions in fact-checking departments. There is also a rush to get information out first and make corrections later, and there seems to be a never-ending journalism weakness for “hype, ballyhoo, and hucksterism” (p. 459).

Cooke (2018) specifically describes the consequences of the fragmentation of the news: “Instead of the homogenous news world of the past, in which stories and reports essentially were the same, the fragmented news era boasts a heterogeneous news environment wherein accounts of one issue, topic, or event can differ significantly depending on the source.” There is “targeted exposure to specific audiences” (p. 13). Head et al. (2020) add this fragmentation, or disaggregation and redistribution, of news through search and social media platforms is troubling because it “makes evaluation of what used to be distinct sources” more difficult because “we do not see the same information when we search and with original context missing, it is not obvious where it came from” (p. 7). This fragmented news era is also iterative. According to Cooke (2018), in iterative journalism, media personalities report things they have heard rather than things they have actually investigated or experienced. The emphasis is getting the news out first; it can be made right later on through “updates,” not through “corrections.” Iterative journalism focuses more on commentary and opinion than on objective facts (p. 13). Cooke explains that the internet has created an environment that encourages this iterative behavior, an environment in which website traffic is more profitable and

important than accurate reporting (p. 12). In the battle for ratings, media are also quick to point out errors in reporting by outlets on the other side of the spectrum. While it's good to have errors unveiled, this combative behavior also helps to erode public trust in the media (Mason et al., 2018, p. 5). The combative behavior pits media outlets against each other in the battle for ratings, turning the act of correcting errors into a public shaming in which media outlets essentially claim their opponents cannot do their jobs correctly and should not be trusted.

O'Connor and Weatherall (2019) explain there is also a novelty bias in journalism. This means that by focusing on what they deem to be the most interesting piece of news to report to their viewers, the journalists can "bias what the public sees in ways to ultimately mislead, even if they only report real events" (p. 156). Basically, what journalists choose to emphasize can impact people's opinions about what is important or pressing in the world. Other items may be more important or more urgent, but they do not receive as much attention as items that are more novel. Health journalism appears to be particularly prone to novelty bias as evidenced by coverage of outbreaks of diseases common in Africa and Asian countries occurring in even the smallest of numbers in the United States and Europe. These events receive more coverage than major issues people in those countries have an immediate chance of suffering, like obesity or the flu, because those issues are old and common even though they are critically important. This novelty bias can lead to sensational headlines that do not accurately portray risk. This was the case with the Ebola outbreak in 2013 which reached a handful of people in the U.S. in 2014. Monson (2017) says the media riled Americans up "with round-the-clock coverage of the virus, fearmongering headlines, and frightening images of doctors in white

protective suits and quarantined patients. A discourse of crisis and panic ensued” (p. 4). In fact, Griffin (2015) claims if anyone was looking to become more informed about Ebola, “accurate, responsible reporting took a back seat to sensationalist headlines, menacing graphics and dissemination of erroneous information” (paras. 1-2). Zikmund-Fisher et al. (2017) explain adequate risk communication is difficult, and sensationalism may be fueled by the dilemma of what moves people to act on health information and take it seriously. It is often believed telling people the extreme possibilities of a health crisis may make them take notice and take things seriously because they want to avoid the extreme happening; however, providing the average impact could be more relatable and fuel more action and belief.

Zikmund-Fisher et al. (2017) conducted a study and determined people respond more to reports on the average situations that are likely to happen rather than to the extreme, sensationalized possibilities. Zindren (2020) emphasizes the need for science communication in general to be accurate even if it is a bit confusing because it helps stop people from being overconfident in their own understanding of science that comes from their filter bubbles; ideally, you must find a balance between information being engaging and informing. This is also applicable to risk communication.

Health journalism also has other issues that impact its accuracy and completeness. Belluz (2016) describes the following barriers to high quality health journalism: pay walls on scientific journal articles which prevent reporters from researching claims, scientific hype or spin in press releases from journal publishers, the amount of time it takes to sift through research (which is time most reporters do not have), the pressure to make stories interesting enough to generate website hits while also ensuring accuracy,

and the need to publish new and interesting articles daily. Science is slow, and there is no excitement in simply reporting on the accumulation of evidence ("There are hurdles..."). Belluz does not list current staffing models as a challenge, although this is a very real problem for all news staff, especially specialists like health journalists. Arora (2019) explains at the local level, health news staff are thin or nonexistent. This negatively impacts high quality health news. Schwitzer is quick to point out that while some organizations have attempted to fill this void with rigorous health/science/medical reporting, they are few and far between, and the gaps between the high quality, rigorous reporting and the less than rigorous reporting are becoming wider. These widening gaps could offset the good work done by the organizations with rigorous reporting (as cited in Green, 2017, "What are the consequences...?"). While we are losing staff at the local level, it is important to understand the national level news is trying to provide strong health news coverage via alternative sources. The high-quality alternative sources that have emerged include STAT News, Kaiser Health News, ProPublica, and the Center for Public Integrity (Arora, 2019, pp. 2159-2160).

Short staffs lacking health journalists means generalist reporters are often covering health news. Sometimes health journalists are not even consulted on articles. Goldacre (2010) describes why this lack of health journalist expertise can be problematic:

Journalists are used to listening with a critical ear to briefings from press offices, politicians, PR executives, salespeople, lobbyists, and gossipmongers, and they generally display a healthy natural skepticism, but in the case of science, they don't have the skills to critically appraise a piece of scientific evidence on its merits (p. 229).

Goldacre uses Andrew Wakefield's 1998 article in *The Lancet* about a link between autism and the measles-mumps-rubella (MMR) vaccine as an example of the differences in health and generalist journalist coverage. The paper, which Goldacre calls "one of the most misunderstood and misrepresented papers in the history of academia" was poorly written, the study was poorly designed, and Wakefield failed to disclose a conflict of interest to *The Lancet* prior to publication; the article was eventually retracted from the journal. After some initial buzz and a press conference, hype over Wakefield's article quickly died down even before its retraction. At that time, health journalists were covering the story and understood Wakefield's scientific weaknesses; thus, his claims did not get much coverage, and the coverage they got soon fizzled out. In 2001, Wakefield again published the same findings, this time in an obscure journal. Generalist journalists covered it, and they focused more on the emotions of the case than on the facts; this helped fuel the anti-vaccination (anti-vaxx) movement in England and the United States. After 2001, nearly 80% of MMR stories were written by generalist reporters (p. 228). Goldacre adds it was rare to find any discussion of the evidence since it was considered too complicated. Doctors were not given the time to explain it, or their explanations were watered down and made far too general. This lack of solid scientific information was pitted against emotional stories of distressed parents. Then, in 2002 media coverage included features on Dr. Wakefield (pp. 231-232). The articles did not critically evaluate the evidence, or lack of evidence, in Wakefield's claims.

Another major issue, and the issue that is the focus of the present study, is lack of contextualizing health news — not explaining how individual studies fit into the broader scientific conversation about a topic. In Maksimainen's (2017) interviews with

executives at eight major news outlets across the U.S. and U.K., the interviewees admitted this reporting on a single study out of context is a problem: “This habit focuses an undeserved amount of publicity on a study that lacks wider relevance and implies that sciences changes every time a new issue” of a publication is released (p. 19). These interviewees agreed that health journalists should contextualize news, and reports on research should evaluate the evidence's significance or lack of significance, compare and contrast it with other studies, and seek expert opinion. According to Maksimainen, “This requires a re-evaluation of several journalistic practices,” such as dramatizing stories, oversimplifying facts, and reporting impartially (in this case, impartiality refers to treating opposing viewpoints as equal when science clearly shows they are not equal). “Instead, good health journalism combines certain journalistic virtues, such as rigorous investigation and good story-telling, with the principles of evidence-based medicine” (p. 17).

Evidence-based medicine, or evidence-based practice, weighs research studies according to the strength of their evidence, and this means some research is seen as better because it is more rigorous and generalizable. For example, a case study that is only applicable to one or a very small set of people may be credible, but it is not given as much weight in the scientific community as a large-scale, randomized controlled trial that is generalizable to a large segment of the population. Unfortunately, this is not what journalists do. They report all research, regardless of study type, sample size, and even human or animal subjects, as if it all has equal weight, equal evidence quality, and equal rigor. This stems from the journalistic framework of fairness. O’Connor and Weatherall (2019) explain how this legal and ethical framework journalists abide by that seeks to

promote fairness and represent all side of an issue is actually problematic: Fairness is “extremely disruptive to the public communication of complex issues...We generally expect evidence favoring the true belief to appear more often. Sharing equal proportions of results going in both directions puts a strong finger on the scale in the wrong direction” (p. 158). An example O’Connor and Weatherall use to explain how this fairness principle is problematic is the debate over climate change. The Intergovernmental Panel on Climate Change (IPCC) and the Nongovernmental International Panel on Climate Change (NIPCC) both presented conflicting views on climate change. The IPCC won a Nobel Prize for its work on climate change and had global consensus while the NIPCC refuted the IPCC’s claims but did not have the backing of the majority of the scientific community. Both reports received equal time and were presented as having the same quality and the same credibility in the scientific community although this was not true. The scientific community clearly gave more credence to the claims of the IPCC (p. 134-135). This reporting has helped fuel and incorrectly inform the climate change debate for decades, and it is leading to detrimental environmental issues.

Audience

Various audience characteristics influence trust in media and the exposure to and ability to detect fake news. Head et al. (2020) tell us the group of college students “born before the constant connectivity of social media, has come of age aware, cautious, and curious about the implications of the current information landscape.” These students are “deeply skeptical,” and many of them are conditioned to do their own research rather than deferring to the traditional media outlets for information. Also, these students “understand that ‘free’ platforms are convenient but also recognize they harvest massive

amounts of personal data to target ads and influence what content they see” (p. 1). Head et al. conducted focus groups with students and faculty at eight colleges and universities across the United States and learned students understand algorithms exist to push information on them even if they don’t exactly understand how algorithms work. Also, students feel “resigned” to the existence of algorithms — if they want free applications, they just have to deal with algorithms. They are also frustrated with filter bubbles and echo chambers, but it often takes too much work to go outside these digital walls to learn the truth. Essentially, this leads them to believe no news source is automatically trustworthy. “As a whole, we found that the lack of trust in traditional authority figures meant trust was placed in Google as the arbiter of truth, sometimes to a ridiculous extent” (pp. 13-20). Fletcher and Park (2017) found that with some variation, people with low trust in the media tend to prefer non-mainstream outlets such as HuffPost, Google News, Twitter, and other “born digital” sites to mainstream outlets such as BBC and *The New York Times* (p. 1282). The authors also note that, surprisingly, people with low trust in the media are more likely to comment on news articles than those with moderate or high levels of trust (p. 1295). This commenting behavior is important to consider because individual factors (i.e. our own biases) as well as the people around us influence our perceptions of journalism and our trust in the media (Ognyanova, 2019, p. 540). Also, reading the comments of others can influence peoples’ perceptions and understanding of science, which is troublesome since the quality and content of comments varies widely (Flemming et al., 2017).

Understanding the influence comments play on perceptions of news is especially important in this social era of news because of the high frequency with which people

obtain their news from social media and news websites where you can immediately be exposed to thousands of comments. Mitchell et al. (2017) reported that the two most common pathways for people to obtain news are news websites (36% of the time) and social media (35% of the time). Unfortunately, when asked to name the news source, 10% of consumers who received their news from social media said Facebook was the outlet (pp. 5-6). According to Silverman and Singer-Vine (2016), “People who cite Facebook as a major source of news are more likely to view fake news headlines as accurate than those who rely less on the platform for news” (para. 2). Also, in 2017, two-thirds of Americans reported getting at least some of their news through social media (Mason et al., 2018, p. 4). A MindEdge (2019) survey found that 44% of respondents “rank online publications among their top news sources” and 48% “rank social media among their top three sources.” Less than half (43%) included physical newspapers in their top three sources (“Digital literacy and the mainstream media,” para. 3).

While social media shares and comments influence our perceptions of the news, the people making the comments and sharing items are not necessarily setting out to influence peoples’ opinions. According to Johnson (2017), we share news to “display our dedication to a community, feeling, or ideology,” as “a marker of identity,” rather than to inform or persuade (p. 14). In fact, “a human being’s very sense of self is intimately tied up with his or her identity group’s status and beliefs.” Because of this, people respond defensively to something that challenges those beliefs, and they attempt to rationalize their beliefs by giving credit to evidence that supports their beliefs and discounting evidence that disputes their beliefs. This practice is known as confirmation bias (Bardon, 2020, “Denial is Natural,” para. 2). When sharing information on social media to form a

community, people often only share what they agree with, creating their own echo chambers; this then encourages social media algorithms to continue to display similar information, thus forming filter bubbles. It is difficult for opposing viewpoints to penetrate the walls of these echo chambers and filter bubbles, and it is also difficult to stop the spread of fake or flawed news through them once it has begun. This is because filter bubbles surround us with ideas we are already familiar with and ideas we already agree with, making us overconfident in our knowledge (Pariser, 2011, p. 84). The filter bubble concept is particularly troubling because it is strong and there are no signs it is going away. In fact, Pariser says Facebook chief operating officer Sheryl Sandberg predicted that by 2016, the idea of a web not customized to its users would seem outdated (p. 85). Thus, our filter bubbles and echo chambers will become stronger.

Although we make it easy for fake news to spread, Americans do believe fake news is a problem. Approximately 64% of adults say, “Fabricated news stories cause a great deal of confusion about the basic facts of current issues and events” (Barthel et al., 2016, para. 2). Despite the belief that fake news is a problem, Americans overestimate their ability to recognize it. Approximately 39% say they are “very confident” they can recognize it, while approximately 45% say they are “somewhat confident” they can recognize it (Barthel et al., para. 2). But their confidence in their ability to spot fake news may not be well-founded. MindEdge’s (2019) survey determined 69% of college-educated Americans could not pass a basic digital literacy, fake news identification, and critical thinking skills test. Although baby boomers fared better than millennials (13% of boomers received an “A” while only 5% of millennials received an “A”), overall it is clear that the majority of Americans regardless of age are ill-equipped to navigate the

digital information environment (paras. 1-2). Wineburg and McGrew (2017) describe a study in which historians with Ph.Ds, fact-checkers, and first year college students evaluated various digital sources. Only two historians “adroitly evaluated digital information. Their colleagues were often indistinguishable from college students in their meandering searches and general befuddlement. Both groups often fell prey to the same digital ruses.” Fact-checkers did not fall prey to these ruses because of their lateral reading skills (p. 37). Also, Americans admit to sharing fake news: 23% say they have shared it, with 14% knowing it was fake when they shared it and 16% thinking it was true and later realizing it was fake. It is important to note that in some cases, people who knowingly shared fake news shared satire articles from sources like *The Onion* (Barthel et al., 2016, paras. 3-4). Sharing fake or flawed health news is especially problematic because in a Pew Research Study, Mitchell et al. (2017) discovered “community and health news spurred follow up action about two-thirds of the time” (p. 7). Acting on fake or flawed health news can have life-threatening consequences.

Evanson and Sponsell (2019) used a mini-course to learn how incoming first year students at Davidson College consume and evaluate news online. They discovered 82% of students used social media in the last week for government and political news. As part of the course, students also examined screenshots of news stories and explained whether they trusted the sources and how they evaluated them. Researchers also asked if students would share the items. Students correctly spotted a headline that was inconsistent with the article text, but they had trouble determining authorship of a syndicated article. In both cases, this lowered confidence in the sources and the desire to share the articles. A troubling finding of this study was that 24% of students would re-tweet a tweet with an

impostor URL despite only 16% of students having high confidence in the tweet's claim (p. 237). Sommariva et al. (2019) conducted a study to explore the spread of health news through social networking sites and the role of fake news in health communication and education. They specifically analyzed stories about the spread of Zika virus in 2016. The researchers discovered that, of the top 10 new stories shared about Zika, half could be classified as rumors. There was also a "positive relationship between the popularity of a topic and the appearance of fake news related to the same topic." Also, several fabricated stories downplayed the risk of Zika (p. 251). It is possible this willingness to share something on social media despite a lack of confidence in its claims points to the desire to share to be part of a community.

CHAPTER 3

COMMUNICATION DIFFERENCES AND AREAS FOR MISUNDERSTANDING

Differences in journalistic (lay press) and scientific (academic press) communication styles can cause problems when journalists are attempting to translate scientific literature into information that is understandable by the general public and is also interesting enough to cut through the clutter and capture audience attention. Accuracy is prized in both forms of communication, however journalism has other business needs, too. “Whereas scientists want to be exact, journalists want to be interesting, comprehensive, and entertaining” (Maksimainen, 2017, p. 11). According to Lois Rogers, a freelance health journalist, “The same rule applies to print and online news: the first five words must engage the reader. There is no space for empty expressions” (as cited in Maksimainen, 2017, p. 11). Although “science is incremental,” when journalists attempt to cut through the media landscape clutter, their messages “often convey scientific certainty when that certainty does not exist” (Arora, 2019, p. 2159). This can also lead to sensationalizing stories to drive traffic to sites. Pariser (2011) explains journalistic traffic chasing is not new, but it is magnified by the internet, and particularly social media, because website and social media analytics can allow you to

see what is trending in real time and boost the post accordingly. But this practice, along with peoples' social media filter bubbles, is dangerous because if traffic guides coverage, what happens to items that are important but are not interesting? It is possible news outlets could dismiss them in favor of ratings (pp. 70-74). Dismissing news items that will not bring in high ratings is not a practice that is unique to the digital news era, but it is magnified by the digital news era.

The need for audience engagement is not the only reason for health journalism's miscommunication of science. As noted earlier, newsroom staff are becoming thinner, and that may mean reporters covering health news do not have the requisite training and knowledge to understand how to read a scientific article. They also may not have the training to allow them to interpret medical jargon. One particularly difficult piece of medical jargon to understand is progression-free survival (PFS) and reporting of cancer treatment results. The term contains the word "survival," but it does not tell us anything about how long people will survive. Instead, PFS "is generally defined as the time that it takes for tumors to grow beyond an arbitrary amount, or for new ones to appear in a scan" (Jaklevic, 2019, para. 6). PFS rates can be impressive, and they can be incorrectly translated as a new drug's ability to increase cancer patient survival rates. PFS rates need to be thoroughly explained if they are to be used in reporting health news. Another aspect of scientific communication that is often miscommunicated is the concept of scientific tentativeness, which "refers to the issue that the reliability of empirical research is often uncertain and that conclusions drawn from empirical research are frequently subject to revision and therefore [are] tentative" (Flemming et al., 2017, p. 746). Scientists often avoid speaking in absolute terms even in the face of overwhelming evidence because they

understand science is not absolute and new evidence can cause things to change. An example of this is the distinction between probability and possibility. Scientists may admit there is always a possibility (even if it is a very slim possibility) something could happen, but that does not always mean it is probable something will happen. Killianski and Evans (2015) point out an example of confusion regarding this distinction with academic and lay press reporting on airborne transmission of the Ebola virus. The authors explain an *mBio* article was unclear regarding the ability of Ebola to be airborne on its own versus being transmitted via droplets of nuclei containing bodily fluid that spray through the air when someone coughs or sneezes. Not only was there confusion because it was difficult for journalists to discern the exact distinctions in the airborne transmission discussion, but there was also confusion because of the scientific tentativeness. While it was highly unlikely Ebola would be airborne on its own — it was not probable — scientists would not deny the fact there was always a possibility, no matter how remote, the virus could mutate and become airborne on its own. Also, Jamieson (2017) says a lack of clear science communication also contributed to the autism and MMR vaccine debate when the former director of the National Institutes of Health inadvertently “legitimized the false inference that there may be a link between autism” and the vaccine (p. 48).

While the discussion so far has focused on the faults of the lay press, it is important to understand that miscommunication is also the fault of the academic press. The academic press must provide complete, accurate information to the lay press; unfortunately, “completeness and accuracy are hard to define in the fast-moving world of scientific knowledge” (Kieh et al., 2017, p. 2). But it is not just the speed of science that

makes accuracy difficult to achieve. Authors of scientific papers sometimes add spin to abstracts, and this is further compounded by the spin present in promotional press releases about articles and research that are distributed by the journal publishers in order to attract attention to the research (Arora, 2019, p. 2159). In fact, Sumner et al. (2016) discovered “a strong association between exaggeration in press releases and news” (p. 6). This echoes an earlier study by Schwartz et al. (2012) which showed higher quality press releases issued by journal publishers were associated with higher quality reporting in the resulting newspaper coverage, and poor quality press releases were associated with poor quality coverage. Fundamental concepts like absolute risk, harms, and limitations were reported in news coverage when they appeared in the releases” (p. 4). Also, because of newsroom staffing and paywalls making the full text of articles inaccessible, journalists who are pressed for time and do not have scientific knowledge may rely solely on the press release for their articles and not actually look at the original research article. Taylor et al. (2015) examined articles from 2012 and 2013 included in a meta-analysis showing a modest link between pancreatic cancer and processed meat. Of the 312 news stories, approximately 113 were “derived largely or wholly” from press releases, and “only 14.4% went beyond a secondary source” (p. 8).

Clearly the differing communication styles of the presses make accurately conveying health information to the public complicated. This is further complicated by the desire of both presses to capture attention even at the risk of inaccurately representing information.

CHAPTER 4

IMPACT AND FUTURE

These characteristics and behaviors erode trust in the media and, consequently, lead to the media's loss of authority in the eyes of the general public. Putnam (2019) explains the current political climate and the application of the term "fake news" to legitimate but unflattering news undermines journalism and creates a slippery slope to journalists being viewed as the enemy of the people (p. 59). Sergeant and Tagg (2018) add that cries of fake news not only undermine journalism at home, but also on the world stage (p. 185). Unfortunately, the American public is experiencing cries of fake news as health news about the novel coronavirus (COVID-19) pandemic is being pulled into politics. As the pandemic was ramping up in the U.S., White House Press Secretary Mick Mulvaney was saying the Democrats were making a big fuss over the virus in order to bring down President Donald Trump (BBC News, 2020). At the time of this study, COVID-19 was impacting the world to varying degrees, and in numerous press briefings about the pandemic, President Trump was referring to the news outlets he did not like as "fake news media." According to Bluemle (2018), "loss of trust in traditional sources of authoritative information" has led us to the current post-truth or post-fact era. Both of

these terms refer to facts being less influential than emotions, beliefs, and biases in shaping opinions (p. 268).

“Many Americans do not see as legitimate cognitive authorities the sources of information — especially academics, the mainstream news media, and government organizations — that are most likely to be reliable, accurate, and credible” (Bluemle, 2018, p. 274). Brennan (2019) used Gallup Poll data to determine 41% of Americans have “a great deal” or “fair” amount of trust in newspapers and television to accurately and completely report the news. This is a four-percentage point decrease since 2018 and marks the end of consecutive improvements in trust after hitting an all-time low in 2016, when only 32% of Americans had this much trust in the media (paras. 1-2). Gallup began measuring trust in the media in 1972, and levels of trust have risen and fallen since then. “No more than 21% of Americans dating back to 1972 ever said they had the greatest level of trust in the media. Currently, 13% have a great deal of trust and 28% have a fair amount of trust” (Brennan, 2019, “Trust in Mass Media Remains Low,” paras. 2-3). Although many adults have lost trust in the media in recent years, 69% of people who lost trust in the media believe their trust can be restored by improving accuracy and minimizing bias in news (Knight Foundation, 2018).

The fake news and post-truth era as well as reporting health news out of context (which further fuels the thoughts of fake news and post-truth) is detrimental to health journalism and, in return, to peoples’ lives. According to Arora (2019), “The relationship that medicine and journalism have with the people they serve relies fundamentally on trust” (p. 2159). Schwitzer explains there are a number of ways people can be harmed by inaccurate, imbalanced, or incomplete health reporting, such as placing false hope in an

unproven treatment; scheduling unnecessary appointments to discuss irrelevant treatment options with physicians; wasting time and money on irrelevant courses of action when this time and money could be spent on legitimate, relevant, and evidence-based courses of action; and generally losing trust in medicine and science in addition to losing trust in journalism (as cited in Green, 2017, “What are the consequences of inaccurate or misreported...?”). Schwitzer’s discussion about wasting time and money on ineffective or irrelevant treatment options is important to note because people do take action on their health based on what is reported in the news; however, the type of reporting impacts the actions people take. According to Goldacre (2010), a 2005 *Medical Journal of Australia* article showed that mammogram appointments rose 40% during peak media coverage of singer Kyle Minogue’s breast cancer (p. 244). While this seems beneficial, it means the tendency to place positive spin on articles can negatively impact health; in fact, Boutron et al. (2019) conducted three internet-based randomized-controlled trials with 900 participants examining various articles about pharmacological treatments. The researchers discovered “spin in news stories can affect the interpretation of the benefit of treatment: participants were more likely to believe the treatment was beneficial when news stories were reported with spin” (p. 110). This can be harmful because not all treatments work as well as the spin leads people to believe, nor are all treatments applicable to everyone as news without context and nuance would have you believe; thus, people fall into the habits described by Schwitzer and mentioned above — wasting time and money on physician appointments and ineffective treatments.

But positive stories are not the only stories with impact. Goldacre (2010) tell us the Cochrane Collaboration “found five studies looking at the use of specific health

interventions before and after media coverage of specific stories, and each found that favorable publicity was associated with greater use, and unfavorable coverage with lower use” (p. 244). This unfavorable coverage does not just come from mainstream media; sometimes it is fake, and sometimes it is spurred by conflicting reports. Negative and inaccurate health information is a problem today, and social media has helped it spread faster and further. Recently, members of anti-vaccination health misinformation group “Stop Mandatory Vaccination” convinced a mother not to give her son Tamiflu medication prescribed by his doctor for flu treatment. The son died as a result of not taking the medication. Unfortunately, anti-vaccination pages are common places people turn to for information about a wide variety of medical information, including flu treatments (Zadrozny, 2020). Approximately one-third of parents are also delaying getting their children vaccinated and are not sticking to the Centers for Disease Control and Prevention (CDC) recommended vaccine schedules leaving children susceptible to deadly, preventable diseases; these practices are fueled by a general mistrust of the pharmaceutical industry as well as anti-vaccination misinformation (Safai, 2020).

There is no easy way to handle the impacts of the current fake news/post-truth era, however the literature is ripe with various health journalism and science communication strategies, technology strategies, and information literacy strategies to ease the effects.

Health Journalism and Science Communication

Health journalism must change some of its habits. O’Connor and Weatherall (2019) stress, “It is not, and should not be, journalists’ role to referee scientific disagreements; that is what peer review and the scientific process are for, precisely

because expert judgment is often essential.” They add journalists must avoid sensationalizing new findings, report consensus when there is consensus, controversy when there is controversy, and also to report the reasons for the controversy. “The mere *existence* of contrarian views or (apparent) controversy is not itself a story, nor does it justify equal time for all parties to a disagreement” (pp. 160-161). Clearly it is important to let go of this idea of fairness through representing all sides and to instead focus on accurate representation of the facts. Health journalists can also take advantage of the digital age of news to make their stories more complete and accurate. Belluz (2016) reminds readers the online environment provides more space than the print environment, thus stories can be updated as evidence evolves, and journalists can link back to the original sources of information or to their citations (“There are Real Hurdles...”). Maksimainen (2017) adds that headlines can even be longer online than in print (p. 31).

Arora (2019) encourages the medical community to support high quality journalism and trust in the media by working with journalists to highlight stories of interest to journalists’ local communities, sharing stories with journalists and being a resource, and actively correcting inaccuracies in stories (pp. 2159-2160). Leask et al. (2010) also suggest understanding workflow and contact journalists with news ideas during the peak times they are seeking out stories, providing pre-prepared resources such as fact sheets, and staying networked with journalists (p. 540).

The academic press can also make communication clearer for the lay press so there is less confusion translating information to news articles. Methods to achieve greater clarity include summarizing the approaches to the problem or issue so journalists do not need to sift through the article, using statistics to show the odds of possibility

versus probability, providing comparisons to other similar issues that are more familiar or better understood, and specifying if and what changes to policy or behaviors are necessary rather than leaving all of this information nebulous and open to interpretation (Kieh et al., pp. 22-23).

Technology

Technological solutions to combat fake news are being developed. In October 2019, Facebook launched a Facebook News section to select audiences in select cities. This feature includes human-curated pieces, algorithmically chosen pieces, and the ability for readers to subscribe to content they want to see (Baig, 2019). Cilella (2019) describes various media literacy technology tools, focusing specifically on NewsGuard, a browser extension backed by Microsoft. NewsGuard was launched in 2018 by a team of professional journalists. There are a set of nine journalistic standards used to evaluate website's credibility and transparency. The ratings then determine the website's "nutrition label" ("Flagging, not Censoring," para. 2). Other media literacy plug-ins and browser extensions include TrustedNews which rates items on a spectrum of looking harmful to looking good, FakerFact which evaluates news items based on six criteria, Media Bias Fact Check which finds bias in articles, and SurfSafe which evaluates the authenticity of images ("Flagging, not Censoring," para. 5). The University of Arizona is also working on a free browser extension to detect fake science and suggest reliable websites on the topic (Impey, 2020). While these tools sound like the solution to the problem, it is important to remember the people who created these tools use algorithms that may have biases. In addition to browser plug-in tools, there are fact-checking websites with humans doing the investigating. PolitiFact, FactCheck.org, and Snopes are

some examples of these sites. But as Cooke (2018) reminds us, even these sites may have biases in what the fact checkers decide to check (p. 17). Clearly, it is important for people to develop their own information literacy skills and, if using these tools or sites, to use more than one of them.

Information Literacy

Although there are technological solutions arising, it is important for people to be able to evaluate information on their own. This is because once we develop technology tools to combat fake news, people who want to spread fake news will work to develop more sophisticated algorithms to beat the tools (O'Connor and Weatherall, 2019, p. 1175). Rosenwald (2017) cites another example of why it is important for people to use their own critical thinking skills rather than depending on tools and algorithms to solve problems for you. The researcher uses an example from Jevin West's Info198 "Calling Bullshit in the Age of Big Data" course at the University of Washington. West gives his students a headline about vaccines causing shaken baby syndrome and asks them to investigate the claim. His students learn "the claim was so absurd that literally no content existed online to refute it." The only information students could find on this topic were other bogus websites that repeated the same invented data (para. 6).

Head et al. (2020) remind us that when information literacy and critical thinking were first adopted as educational outcomes, the algorithm-driven platforms many of us use daily did not exist. Although the "fake news" crisis has led to information literacy now including news and media literacy, there is little education about how the algorithms on sites like YouTube, Google, and Amazon influence us and the information we interact with (p. 1). Cooke (2018) explains librarians must help students develop greater critical

thinking skills. “We need to teach them [students] how to think about the production of information and the back-end workings of their favorite information source” (p. 14).

Head et al. (2020) echo this sentiment about teaching students how information is produced and how sources of information work: “Information literacy needs to incorporate an understanding of ways that news and information flows are shaped by algorithms” (p. 1). This means moving away from the CRAAP test, which is a tool librarians have traditionally used to teach online source evaluation.

CRAAP stands for currency, relevance, authority, accuracy, and purpose. Its emphasis is on vertical reading and staying within the website. This can be problematic because, as Fielding (2019) explains, the dissemination of misinformation and disinformation has become sophisticated and prolific, and staying within a website facilitates the spread of incorrect information because a user can easily be fooled. After all, “once a site is deemed ‘credible,’ all information on it is frequently trusted and taken at face value.” It is very difficult to get people to change their opinions on site credibility, even when they’re countered with facts (p. 620). This is why lateral reading is important. As evidenced by Wineburg and McGrew (2017), even highly educated historians fail to critically evaluate internet sources when they do not engage in lateral reading as fact checkers do. When reading laterally, you move from looking at what is within the site (vertical reading) to opening up various browser tabs and going outside of the site to check the claims made and to investigate the site’s authors and publishers. This lateral reading skills that fact checkers are adept at enables them to “take bearings,” or get familiar with the information surrounding the topic to better judge the quality of the site. In Wineburg and McGrew’s study, fact checkers understood websites were created and

financed with a purpose and specific interests, often partisan interest, in mind. Taking bearings helped fact checkers determine these interests (pp. 37-38).

While information literacy is important, Bluemle (2018) says our information literacy solutions must be “creative” and possibly include helping students understand the role of emotions in reasoning as well as exploring “the relationship between evidence and its interpretation” (p. 278). Sergeant and Tagg (2018) advocate for critical digital literacy which “combines an understanding of the affordances and implications of digital media with an awareness and sensitivity to the role media play in everyday social politics” (p. 179). Cooke (2018) believes metaliteracy can combat fake news issues in the future because metaliteracy combines elements of all of the literacies and encourages people to look at the bigger picture (p. 19).

Teaching students to check their biases is also important because, according to Bardon (2020), your identity impacts your willingness to accept evidence on politicized issues. This “process of deciding what evidence to accept based on the conclusion one prefers” is known as motivated reasoning (paras. 5-6).

Librarians are implementing new methods of information literacy to help students think more critically about the current information environment. Cooke (2018) offers the following suggestions to help people evaluate news: triangulate the information by checking multiple sources; check your own biases; read outside your comfort zone or filter bubble; understand the difference between satire, news, opinions, and infotainment; check fact checking sites; and investigate the source and its purpose (pp. 24-25). Glisson (2019) helps students engage in Cooke’s suggestions by having them compare and contrast articles on the same issue. Students examine headlines, content, sources, tone,

and visuals and how this impacts the media message. Glisson also uses fake Facebook profiles identified from Russian troll farms to show students how easy it is to create and spread false information and, consequently, the need to evaluate information. Fielding (2019) presents examples from Northern Essex Community College (NECC). Librarians in some of the English 101 and English 102 courses swapped out the CRAAP test for lateral reading where they compared sites on asthma from drug company Glaxo-SmithKline and the National Library of Medicine's MedlinePlus. Students in the lateral reading course went beyond looking at the site credibility to being very engaged in discussion about Glaxo-SmithKline's troubles and the ethics of a drug company offering health advice. Both sites were credible, but lateral reading allowed students to see how bias could impact information.

Silva et al. (2018) explain librarians need to know how students are searching online to determine how best to teach them about source evaluation. In their study of 84 first-year writing students at Brigham Young University, the researchers determined that, when evaluating articles, students most frequently looked at the sources cited in (or noted the lack of sources cited in) the article to determine source reliability. Students also frequently used previous experience with the source and their own bias judgment when evaluating reliability. The least exhibited behaviors were fact-checking the source, using the domain name, and checking the publication date. Based on these findings, the researchers suggest librarians must first teach novice students how to go beyond their initial inclination to only examine and trust surface features; students must learn how to go beyond the surface features and critically evaluate and corroborate the information found in the sources. Silva et al. also suggest librarians develop lesson plans that help

students “understand their own biases and think critically about how this helps or hinders their relationship to information sources...Getting students to think self-consciously earlier in the source evaluation process is perhaps the best way to open up other healthy research strategies” (p. 39).

CHAPTER 5

STUDY

The researcher conducted a survey using a grounded theory approach to determine how people react to conflicting health news, how they consume news, and generally whether they trust the media to report accurate information. Because this was a qualitative study, the researcher determined the appropriate number of participants once data saturation was reached; however, the researcher wanted to see at least 25 participants.

Methodology

Study Population

The researcher used a convenience sample and snowball sampling to recruit male and female adult participants, age 18 and older. Participants came from a variety of backgrounds and had a variety of educational experiences. The participants came from within and outside of the researcher's professional network as well as from the researcher's English department network at East Stroudsburg University of Pennsylvania (ESU). ESU is a university located in East Stroudsburg, a rural borough in northeastern Pennsylvania. The university offers bachelor's, master's, and doctoral degrees. It has approximately 5,400 undergraduate students and approximately 800 graduate students.

ESU is part of the Pennsylvania State System of Higher Education (East Stroudsburg University of Pennsylvania, n.d.).

The only demographic information sought was affiliation with ESU. Not collecting robust demographic information may be an unorthodox survey procedure, however research from this thesis's literature review shows that while it may be interesting to know additional information, it was not necessary for the purposes of this thesis. Regardless of age and educational background, adults mostly seem to have the same skill level and can fall prey to the same manipulation of information. Also, the focus of this study is on the mass media reporting of health news. The mass media does not narrowcast to reach a specific segment; instead, it reaches a broad population at the same time. Since additional demographic information was not necessary, the researcher decided against collecting it in order to make the survey shorter. Participants were encouraged to share the survey with their networks. The researcher invited people to participate by sharing the information on her social media accounts (Facebook, Twitter, and LinkedIn) and via email. Participants could then share the survey via their social media accounts or email. It is impossible to know how many people actually received the survey because people were encouraged to share it, however the researcher's personal and professional networks consist of more than 500 people.

The population allowed the researcher to recruit participants with a variety of backgrounds and media behavior, and it allowed the participant pool to be as diverse as possible considering the sample was a convenience sample.

Survey Design

Survey responses were collected via the researcher's password-protected SurveyPlanet account. All data collected were anonymous. The survey was deemed exempt by the ESU Institutional Review Board (Appendix A).

The survey (Appendix B) consisted of 16 questions. There was a mix of open-ended, select all that apply, and Likert scale questions. The only required question was the first question which indicated consent and affirmation that the participant read the invitation to participate and was at least 18 years old. All other questions were voluntary. Participations could skip any questions, and participants could also end the survey at any time with or without submitting questions they already answered.

Survey Distribution

The survey was only administered online and, as mentioned above, it was administered via SurveyPlanet. The researcher distributed the survey in two ways — email and social media. When the researcher directly emailed the invitation to participate, prospective participants could click on a link to the survey that was included in the invitation. When the researcher recruited via social media, a post was made directing people to read the invitation to participate which was posted on the researcher's professional website. The invitation posted on the website was the same invitation people received via email.

The survey was available February 24, 2020, through April 17, 2020. Initial invitations to participate and social media posts were distributed on February 24, and reminders were distributed on March 16. The researcher hoped to send another reminder, but with the COVID-19 pandemic occurring later in March and throughout April,

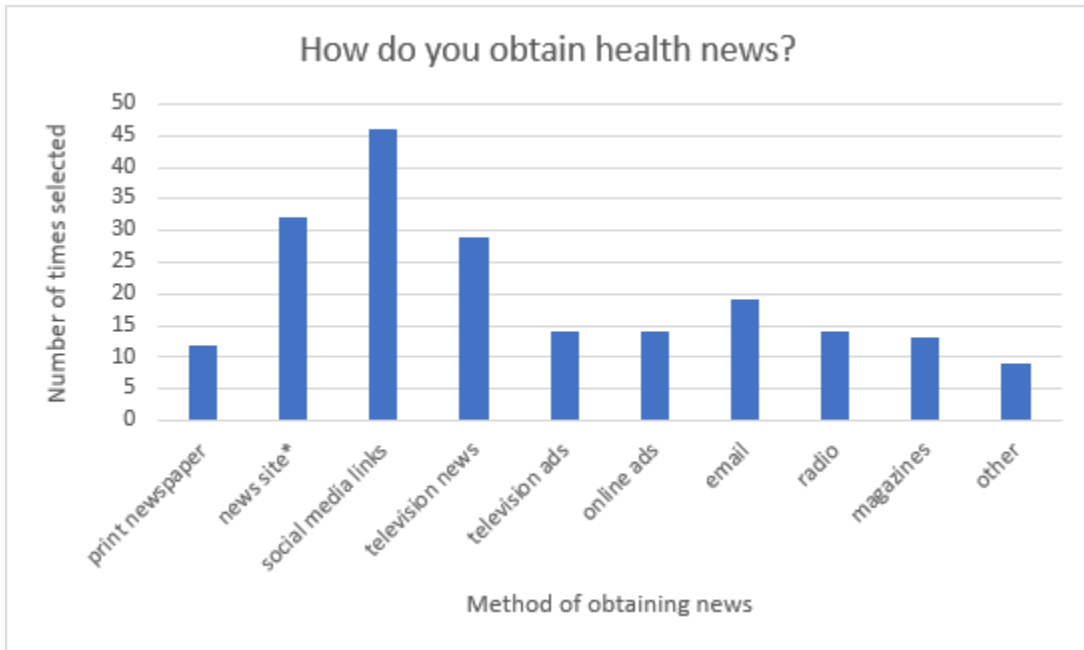
tempers were flaring around politics and the media, and the researcher felt these tempers and the extraordinary circumstances causing them could negatively influence survey results. Also, by the end of March the researcher had already exceeded the 25 responses desired. Because of these factors, the researcher decided against sending out another survey reminder.

Results

Fifty-four people responded to the survey; this is more than double the number of responses the researcher hoped to have. Thirty-six participants were not affiliated with ESU. The remaining participants were ESU undergraduate students (16) and graduate students (2).

Participants were asked how they consume health news, and they could select all methods of obtaining health news that were applicable (see Figure 1). The top two methods of obtaining health news were via social media links (46 selections) and newspaper or news network websites (32 selections). Television ranked third (29 selections). Print newspapers only garnered 12 selections, while radio received 14 selections. Participants selected “other” nine times, and they noted sources such as medical journal articles, TED talks, and medical professionals. One participant specifically mentioned searching Google for health topics but did not explain what sources they looked at in the list of Google search results. Only four participants obtained health news via one method. Most participants (12) obtained health news via four methods, while 10 participants obtained health news through three methods and 10 obtained health news through two methods.

Figure 1: Methods of obtaining health news.



*News site refers to the response “newspaper or news network site.”

When asked if they read the entire health news article before sharing it, 21 participants said they always read the article first. Twenty-two participants read it more than half the time, and seven read it less than half the time. No one said they never read it, and four participants said they do not share health news. Just as more participants do not always read the article before sharing it, more participants do not always research the health claims made in the article before sharing it. Only 11 participants said they “always” research the health claims before sharing an article. Fifteen people research claims first more than half the time, 15 participants research claims before sharing less than half the time, and 10 never research the claims before sharing. In this case, three participants said this was not applicable because they never share health news.

Regarding comments on health news articles (either comments on social media or comments on the news website pages), 13 participants always read them before sharing an article. Seventeen participants read the comments more than half the time, 14 read

them less than half the time, and six never read them before sharing health news. Again, four participants said they do not share health news.

Participants were asked what they think makes a health news article credible. They could list any characteristics they use to determine credibility. Responses were coded, and the themes and the number of times they appeared are displayed in Table 1. The three most common themes to emerge were the author, source, or author affiliation (appearing 34 times); reliable sources cited in the article (15 times); and evidence such as facts, research, statistics, and study design (11). The least common theme noted was the article’s purpose or motivation; this appeared in only one response. Two people described relevancy of the source to themselves or friends and family as something that helps them determine source credibility.

Table 1: What makes a health news article credible?

Theme	Number of times mentioned
Author/source/affiliation	34
Reliable sources cited	15
Facts/reliable research or study design	11
Relevancy/applicability to self and others	2
Date	2
Content organization	1
Includes statements from health professionals	1
Motivation/purpose of source	1

Next, participants were asked if they trust the media to provide accurate health news articles and if they trust the media to provide accurate non-health news articles. Both responses mirror each other — most participants were either neutral, somewhat disagreed, or disagreed with these statements (see Table 2). Participants were also asked whether they believe the headlines and images accompanying an article accurately portray the content of the article. In both cases, the majority of respondents were either

neutral, somewhat disagreed, or disagreed. In each case, less than seven people agreed with the statement. Responses are listed in Table 3.

Table 2: Trust in media to accurately report news

	Health news articles	Non-health news articles
Agree	5	4
Somewhat agree	17	19
Neutral – neither agree nor disagree	13	17
Somewhat disagree	14	11
Disagree	5	3

Rate agreement with the statements: I trust the media to provide accurate health news articles. I trust the media to provide accurate non-health news articles.

Table 3: Headline and images accurately portray content

	Headline	Image(s)
Agree	5	6
Somewhat agree	14	13
Neutral – neither agree nor disagree	14	20
Somewhat disagree	14	10
Disagree	7	5

Rate agreement with the statements: The headline of an article accurately portrays the content of the article. The image(s) accompanying the article accurately portray the content of the article.

The next two questions focused on sharing behavior in relation to article accuracy. Participants rated their agreement with the statement, “I share articles even when I doubt their accuracy.” This question did not refer to fake articles written explicitly for satire or entertainment value. The majority of participants were not in agreement with this statement (neutral = 6, somewhat disagree = 10, disagree = 28). Six participants somewhat agreed with this statement, and four people agreed.

The next question asked participants to think about whether they shared news that they thought was true but later turned out to be false and how they reacted. Forty-nine participants answered this question, and their responses were coded for themes. The top

three themes that emerged from this question were the participants did not discover news they shared was fake, the participants removed the post, and the participants explained their error either in an edit to the original post or in a follow up post. Table 4 has the complete list of themes. Of particular interest is one response indicating that the perceived importance of the post dictates follow-up action: “If shared and untrue but important, I have let the person know that it turned out to be untrue. If it is a very minor subject with little importance or opportunity to follow through, I’ll just let it go.”

Table 4: Sharing fake news

Theme	Number of times mentioned
Did not discover news they shared was fake	17
Removed post	11
Explained the error	7
Thoughts about what they would do if they discovered something they shared was fake	6
Yes, they have discovered something they shared was fake. Didn’t provide other details.	3
Shared the correct information	2
Now understands information must be evaluated	2
I don’t share health news	1
Let it go/do nothing	1

Have you shared a news item you thought was true or factual only to find out later it wasn’t? If you did, what did you do after you discovered all or part of the story wasn’t true or factual?

The remainder of the survey questions focused on reactions to conflicting health news. Participants were asked how they react to conflicting health news claims, and they were given the option to check all reactions that applied to them. The choices that were selected most often were “I research the claims, then decide what to do” (39), “I ask a health professional and then make a decision,” (28), and “I ask for input and form my

own decision” (21). Responses indicating people changed behavior without doing research or ignored conflicting health news each were chosen less than 10 times. See Table 5 for a complete list of responses. It is worth noting that 21 participants chose just one reaction to conflicting health news while 14 participants chose two reactions to conflicting health news, and 12 chose three reactions.

Table 5: How do you react to conflicting health news?

Theme	Number of times mentioned
I research claims, then decide what to do.	39
I ask a health professional and then make a decision.	28
I ask for input and form my own decision.	21
I maintain my current behavior without researching the claims.	9
I do what my friends and family recommend.	7
I change my behavior when I hear new claims without researching them.	6
I ignore conflicting health news claims.	6

In the next question, participants were asked to examine two conflicting headlines about sunscreen and then provide their immediate reactions; one headline stated sunscreen could lead to vitamin d deficiency (Drayer, 2019), and one headline stated it may not lead to vitamin d deficiency (Wiley, 2019). Participants were instructed to explain what they think about the use of sunscreen and if these headlines impact that, and they were also instructed not to do any research. The reactions were coded to reveal themes (Table 6). Fifty-one participants responded to this question. The two biggest themes to emerge were a focus on the language used in the headlines (17 occurrences) and confusion about the safety and potential harms of sunscreen after reading the headlines (12 occurrences). Language comments mentioned characteristics like the first

headline being more straightforward than the second, the tentativeness of the second headline, the use of qualifiers in the second headline, and the alarmist tone of the first headline. People also pointed out the first headline grabbed your attention more than the second headline.

Some comments about the language stood out because they showed a lack of trust in scientific tentativeness. For example, one participant said, “After reading both headlines, I would most likely want to read more into the first headline because it sounds more straightforward and to the point. The second headline doesn’t look very reliable and could be a red flag for possible fake news. So out of the two I would definitely choose the first headline to read.” Another participant said, “The first headline sounds more knowledgeable because it sounds like a straightforward news headline rather than a web-based headline.” What is interesting about this comment is that both headlines were from web-based news sources. The same participant goes on to say about the first headline, “Even though it has the word ‘could’ it still sounds more sure of itself than headline two. I’d be less likely to read this article fully because the headline seems so sure of itself I wouldn’t necessarily think the article adds much more information. The second headline is a little confusing in wording and is less firm in its apparent belief as well due to the ‘maybe.’ I would be more likely to read the article because I’d want to make sense of the headline. I would be more compelled to check the sources on this one.”

There was one other notable comment that touched on the discrepancy between trust and interest in reading an article: “Headline 1 is alarmist compared to headline 2. One is more likely for me to read, but 2 I am more likely to trust.” This comment

indicates that trustworthiness is secondary to an attention-grabbing headline and a desire to read the article.

Table 6: Reactions to conflicting headlines about sunscreen and vitamin d deficiency.

Theme	Number of times mentioned
Language comments	17
Confusion due to discrepancies and new knowledge conflicting with prior knowledge	12
Won't change behavior	10
Desire to learn more about the headlines	9
Must weigh risks/benefits of sunscreen	5
Typical of media habits/forcing a choice	2
Interest because of applicability to self	1
Yes, opinions changed	1

Finally, participants were asked to provide their reactions after reading a headline to an article about artificial intelligence's (AI) ability to diagnose diseases (Guy, 2019) and that same article's lead paragraph. The headline and the article somewhat conflicted each other. Fifty participants responded to this question. Responses were coded, and the themes found in the responses appear in Table 7. Nineteen participants noted conflicting information between the headline and the lead paragraph, in some cases specifically stating the headline is misleading. According to one participant, "The headline skips out on a key part of the information and those who do not read the content may get the wrong impression."

Three people who stated the information was conflicting also stated they changed their opinions about AI's abilities once they read the lead paragraph. They also stated that this conflicting information would make them stop reading the article.

While most participants mentioned the conflicting nature of the headline and lead paragraph, three respondents said the information was not conflicting because there was

hedging language used in the headline. These participants were not wrong. The headline does say AI “may be as effective as medical specialists” when it comes to diagnosing diseases, and it is an astute observation that the language itself does not conflict. What is conflicting is that the headline, although hedging, is still misleading because it still sounds more emphatic than the language used in the lead paragraph, particularly to people who are not paying enough attention to the nuances of the wording.

Participants also mentioned the type of language used in the headline and the lead paragraph nine times, stating things like the headline grabbed their attention, the language was engaging, or that the language was unclear or made the author seem unsure. In fact, just like with the previous question, we see the idea of scientific tentativeness working against credibility in one response: “After reading the headline and paragraph, I wonder how credible the source is since the intentions of the article and research seem unclear and indecisive in the results.” Another participant strongly reacted, “My reaction would be that it’s not 100% true since they are stating it ‘may be.’”

The desire to learn more about the topic or read the entire article was mentioned nine times. Some participants pointed to a lack of evidence in the information, however they were only provided with the lead paragraph and not the entire article; evidence comes later in the article. Still, it is not uncommon for studies to be cited in the lead paragraph, so these respondents raise a valid point. Although the question did state these two pieces of information were a headline and the accompanying first paragraph of the article, some respondents were confused and treated both items as headlines. This muddied some of the responses.

Table 7: Reactions to a health news article’s headline and lead paragraph.

Theme	Number of times mentioned
Conflicting information	19
Comments about language used in headline and article (other than comments about it being conflicting or not conflicting)	9
Desire to learn more or read the entire article	9
Unsure of credibility	5
Not conflicting information	3
No evidence cited	3
Confusion over concept	2
Lack of interest –not applicable to self	1
Not helpful to average reader	1
Not enough information to react to headline and paragraph	1

Limitations

Although the researcher’s personal, educational, and professional networks include a diverse group of people from across the United States, this study was conducted based on a convenience sample and snowball sampling. It would be better to conduct a survey with a sample that you can be assured is random and representative of all groups. A larger sample size would also be ideal to draw greater conclusions. Although the literature showed that users have the same search characteristics regardless of demographics, collecting additional demographic data from a larger, intentionally random sample would be beneficial to draw broader conclusions. The survey also relies on self-reported data rather than on watching people interact with the information. It is possible the participants were answering questions based on what they thought the researcher was looking for or that they overestimated their awareness of whether items they shared ended up being false. Finally, the survey would have benefitted by having the

questions about what makes a health news article credible, the conflicting headlines about sunscreen, and the AI article take place in a focus group rather than via a survey. A focus group would allow for richer discussion and understanding of the participants' thoughts. A focus group would also allow for participants to read the entire articles rather than just headlines and lead paragraphs. The researcher could have linked to the entire articles for the participants, however, as in the spirit of Evanson and Sponsell's (2019) study, the researcher thought it best to ensure all participants had the same experiences and would not need to navigate between pages. The researcher plans to address these limitations and revise the study appropriately prior to any professional publication of study results.

Discussion

The results of this study were generally consistent with other studies when examining how people obtain their news. Most of the participants obtain their news from online sources (social media and news websites) rather than from print newspapers. These results are consistent with Mitchell et al.'s (2017) findings that the two most common methods of obtaining news are news websites and social media. Results were also consistent with the MindEdge (2019) survey which showed online publications were among the top news sources. That same survey also discovered almost 50% of respondents ranked social media in the top three sources for news. In this thesis study, most participants used multiple methods of obtaining news. In fact, Head et al. (2018) explain today's young news consumers are "multi-modal" and obtain their news from a variety of sources (p. 2).

This study revealed a general distrust of the media both in reporting health news and reporting non-health news. Most participants rated themselves as neutral or

disagreeing that they trust the media to provide accurate news in either category. Also, participants were either neutral or disagreed that the headline and images accurately portray the content of the article. This general distrust of the media was reflected in Brennan (2019)'s findings from the Gallup poll information that only 41% of Americans have a "great deal" or "fair" amount of trust in the media.

Participants in this study seemed to have based article credibility on the vertical reading skills that come from the CRAAP test, specifically authority. Most participants said the author or source/affiliation as well as citing sources within the article and a reliable study design made a health article credible. No one mentioned the article claims being backed up by other researchers and in other sources or anything else that indicated engaging in lateral reading. Also, the least common theme to determine credibility was motivation; only one participant chose this. That is troubling as that means understanding the reason for the content creation (such as to persuade or inform) was not taken into account. Again, these results seem to match what other studies have shown. Wineburg and McGrew (2017) tell us that even highly educated historians fail to engage in lateral reading. Also, Silva et al. (2018) discovered with first-year writing students that past experience with a source is important; in the case of this study, if participants had past experience that led them to believe a source is credible or not credible, they were likely applying that to their evaluation of the source. Silva et al. also determined students frequently look at whether articles had or lacked citations to determine article credibility.

It was refreshing to see that in this study, most of the participants said they do not share articles when they doubt the accuracy of their content. This is reminiscent of Evan and Sponsell's (2019) discovery during their mini-course at Davidson College in which

24% of students would retweet an item despite only 16% of those same students having confidence in its accuracy as well as Barthell et al.'s (2016) findings that 23% of Americans have shared fake news and 14% knew it was fake when sharing it. The present study did not ask participants why they share, however other studies have pointed to sharing to form a sense of community.

Despite understanding there are factors that make an article credible and despite the low trust in the media's accurate reporting, slightly less than half of the participants said they always read the entire article before sharing. Even fewer people always research health claims made in articles before sharing articles; you cannot evaluate an article's credibility without actually reading it. Conducting a focus group in the future to determine why participants share articles they do not read would be helpful; however, it could be that if the article comes from a trusted source, it is automatically assumed the information will always be accurate. If this assumption is correct, it echoes Fielding's (2019) explanation that once a source is deemed credible, all information from the source is typically deemed credible.

The study started to get at how participants react to conflicting health news and whether it makes people change their habits. Results show most participants conduct research first, then decide what to do. What should be done in future studies via a focus group is determine what type of research participants are doing. Are they going to health resources? Are they searching Google and just choosing something that is in the top 10 search results? And if they are searching Google, how are they evaluating the credibility of the sources they are using to confirm the health news article? In addition to doing research, participants in this study noted they ask health professionals and others for

input. Most of the people in the study do not simply ignore health news claims, nor do they simply change their behavior based on new claims.

It is no surprise that participants explained they felt confused when reading conflicting headlines and also when reading content that is not exactly in sync with the article's headline. In the case of the participants in the study, this confusion led some of them to want to learn more about the claims rather than automatically disregard the new articles.

It was also interesting that the idea of scientific tentativeness, which is often more accurate than absolute language because of the changing nature of science, actually seemed to work against a headline's or article's credibility. Participants in this study noted that articles with tentative or hedging language common in science (i.e. "may be" rather than "is") appeared to be less credible. This would indicate that a headline with strong language and a lack of caveats, which is more misleading and less true, is actually seen as more credible. This is another aspect of audience interaction with health news that could be examined via focus group in the future.

CHAPTER 6

COVID-19 CASE STUDY

At the time of writing this thesis, the world learned of COVID-19, a novel coronavirus; coronaviruses are common viruses causing respiratory infections. Previous coronaviruses that have made the news are severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS). After initially downplaying the severity of COVID-19, the US and the world succumbed to this pandemic. At the time of submission of the thesis draft, the pandemic is still unfolding. This section presents a brief case study on media coverage of the pandemic.

Infodemic

The World Health Organization (WHO) says the COVID-19 pandemic has sparked an “infodemic;” there is an overwhelming amount of information circulating and, while some of it is true, some of it is also “downright untrue.” This false information includes conspiracy theories about the virus origin, incorrect treatment information, and even incorrect statistics about death rate. In fact, on March 9, 2020, the virus’s death toll was 3,800 worldwide, but false information online was putting the number at over 100,000 people worldwide (Gharib, 2020, paras. 1-2). Charlton (2020) tells readers a report from the U.S. Global Engagement Center found around two million tweets

containing conspiracy theories about the virus during a three-week period in January and February. Garlic was also offered up as one of numerous bogus solutions to guard against COVID-19 (“Are you stocking up on hand soap and garlic?”). Impey (2020) looked at tweets sent from December 2019 through February 2020 and discovered “people liked, shared, and commented on posts from sites containing false or misleading information about COVID-19 142 times more than they did information from the Centers for Disease Control and the World Health Organization” (“Americans’ predilection for fake science,” para. 4). In yet another tweet analysis, researchers at Carnegie Mellon University reviewed more than 200 million tweets about COVID-19 in January and February of 2020 and discovered 82% of the top 50 influential retweeters were bots and 62% of the top 1,000 retweeters were bots (Young, 2020, para. 2). Researchers also determined there were over 100 types of false stories circulating about COVID-19 between January and May 2020 (Young, 2020, para. 8). This mirrors the spread of rumors and false information Sommariva et al. (2019) found with Zika virus in 2016.

One of the most popular pieces of false information to spread via social media during the pandemic is the video *Plandemic*. In this video, virologist Dr. Judy Mikovits makes false claims about COVID-19. These false claims lend credence to the conspiracy theories about the virus’s origin, its use by government to manipulate people, and the ineffectiveness and danger of masks. She also casts doubt on Dr. Anthony Fauci’s credibility and his ability to handle the virus; Dr. Fauci is head of the National Institute for Allergy and Infectious Disease, and he has was a key member of President Trump’s COVID task force before he began to publicly contradict the president. Speaking out against the president not only led to Dr. Fauci falling out of favor with the president, but

it also led to his falling out of favor with many of the president's staunch supporters. Dr. Mikovits claims Dr. Fauci engaged in unethical actions during the HIV/AIDS epidemic and essentially says that Dr. Fauci is still engaging in unethical behavior at the expense of the American public's health. The claims in *Plandemic* have been checked and debunked by variety of outlets (Enserik and Cohen, 2020; Varshavski, 2020; Pappas, 2020).

Although the claims have been debunked, *Plandemic* went viral very quickly. In just over a week, it had over eight million views on various social media outlets (Frenkel et al., 2020).

This infodemic has also led to viral hoaxes. An example of a viral hoax spreading across the globe is the story that people were knocking on doors claiming to have at-home coronavirus testing kits as a guise to break into homes. The story was localized to numerous parts of the world, and it was shared by legitimate media outlets. NBC News investigated the claim and found no evidence of this happening anywhere the claims said it was happening. This "viral urban legend" was shared millions of times on Facebook (Collins and Solon, 2020).

Unfortunately, it is possible this infodemic will be worsened by foreign disinformation campaigns. A report from the European Union (EU) claims "Russian media have deployed a 'significant disinformation campaign' against the West" which "uses contradictory, confusing and malicious reports to make it harder for the EU to communicate its response to the pandemic" (Emmott, 2020, pars. 1, 3). Although the alleged disinformation campaign targets the EU, this information can easily spread to the U.S. via social media and harm our efforts to fight the virus, too

Media Coverage

While no conclusions can yet be drawn about the appropriate level of reaction to this pandemic on the part of the media, many of the patterns and practices discussed in the literature review are present in coverage thus far (through August 2020).

Contextless News

Because of the severity of COVID-19, many academic scientific publishers removed the paywalls to COVID-19 articles, providing unprecedented access to information to fellow scientists and to the lay press. Research is developing rapidly, and there hasn't yet been time to replicate studies or to place studies in a larger context. This means the media report on individual studies, again providing contextless news; this time, however, the reason for lack of context is because the research is so new, and scientists are still trying to figure out the context. One example of reporting single studies out of context is a study that discussed the possibility that blood type impacted risk for infection. The preprint was published, so it had not yet undergone peer review (Jaklevic, 2020). Although it is difficult to place such rapidly evolving science in any kind of context, media reporting on single studies is still problematic, especially now because, as noted by Maksimainen (2017), a large focus on single studies makes it seem like science is changing every time a new article is released. With unprecedented, free access to research, attempts can be made to place research in a broader context of the evidence evolution. Of course, a better practice would be to not focus on individual studies and to wait until there is scientific consensus on a guideline, treatment, risk factor, etc. to report on the topic.

Misleading or Contradictory Headlines

There is no shortage of misleading or contradictory headlines sparking fear, panic, and incorrect beliefs during this pandemic. Monson (2017) tells us that sensational and sometimes incorrect or misleading coverage of epidemics is nothing new, and she sites “germ panic” in the U.S. relating to tuberculosis and AIDS, the H5N1 avian influenza virus that triggered worldwide panic once it hit Europe, and the H1N1 influenza strain which was incorrectly associated with a pig farm thus leading to unnecessary slaughter of pigs in Egypt (paras. 6-7). One example misleading or contradictory headlines during the current pandemic comes from Bruillard’s (2020) *Washington Post* article. The headline reads, “A dog has ‘low-level’ coronavirus infection.” The subhead reads, “Don’t panic about coronavirus in pets, experts say.” Immediately we see a headline that strikes fear and a subhead that tells readers not to fear. The article discusses a variety of scientific evidence that talks about coronavirus in pets and humans, making it difficult to know whether you actually do need to worry about human to pet and pet to human transmission of the virus. Buried deep in the article, well beyond the point at which people may stop reading, is where you learn you should not abandon your pets or fear catching the virus from them because it is likely you are spreading the virus to your pets. While the article’s headline was not sensational — it stressed the infection was “low level” — the fact that it was written at the height of the pandemic means it may strike fear in people. There is also no discussion about what a low-level infection is in animals or even why there was a need to test this animal.

Another example of misleading headlines and contradictory information comes from LeMotte’s (2020) article on CNN.com. The headline reads, “Do you wear contact

lenses? You should switch to glasses to stop spreading coronavirus.” The article content contradicts the headline. LeMotte consulted Dr. Thomas Steinemann, a physician with the American Academy of Ophthalmology, who explained handling contact lenses comes with risks if you do not practice proper hand hygiene before lens insertion and removal. Also, he adds glasses could provide an extra barrier to block particles from entering the eyes. Ultimately, when asked if you can contract COVID-19 through your eye, Dr. Steinemann is quoted as saying, “Theoretically, it’s possible, but we have no proof of that” (para. 7). LeMotte then quotes another source, Dr. William Schaffner, a professor of preventive medicine and infectious disease at Vanderbilt University. When asked for his professional opinion about viruses, including COVID-19, entering through the eyes, Dr. Schaffner says, “It’s possible, I guess, but I always thought that was a bit of a stretch” (para. 8). Thus, if you only read this article’s headline, as so many people do, you will likely think contact lenses may cause the spread of coronavirus. When you read further, you see the journalist is conveying certainty in the headline when there really is none, which is a tactic Arora (2019) noted as a way for journalists to cut through the media landscape clutter (p. 2159).

Misinterpretation of Science

As previously discussed, the lay press must convey difficult scientific facts from the academic press to the general public in language that is understandable to them and in a manner that fits within the space and attention-grabbing constraints of the news medium. Also, the people who do this are increasingly generalist journalists rather than science or health writers. This may mean the journalist relaying the message lacks adequate background knowledge to understand the subtleties of scientific

communication. Coverage of COVID-19 is no stranger to the misinterpretation of science that these conditions may cause.

Cohen's (2020) article on CNN.com is entitled "Experts Tell White House coronavirus can spread through talking or just breathing." The lead paragraphs tells readers "a prestigious scientific panel" informed the White House of this finding. The article frequently quotes Dr. Harvey Fineberg of the National Academy of Sciences explaining the limited research on this topic is consistent with "aerosolization" of the virus from breathing (para. 2). He later says there is a "possibility" that COVID-19 could be spread through "bioaerosols generated directly by patients' exhalation" (para. 7). The article never explains what aerosolization (releasing particles into the air as happens with saliva from coughing, sneezing, or emphatic speaking) is or that it is not the same as the virus being airborne, which is the implication of the article's headline. The article further discusses how the virus can linger in the air (again, due to aerosolization which is not clearly explained). Finally, at the end of the article, Dr. Fineberg explains, "If you generate an aerosol of the virus with no circulation in the room, it's conceivable that if you walk through the room later, you could inhale the virus" (para. 15). The important word to note in this quote is "conceivable." It is "conceivable" this could happen, not "likely." The article concludes with another quote from Fineberg regarding aerosols and the likelihood they will linger and spread COVID-19: "But if you're outside, the breeze will likely disperse it" (para. 15). The article headline makes it sound like the virus could be airborne in any condition, including outside, and it waits until the end, which some people may never read, to add these important caveats about the findings. This confusion over airborne transmission versus transmission via aerosolized droplets is reminiscent of

Killianski and Evans's (2015) aforementioned description of the confusion about Ebola's transmission — airborne or via aerosolization — as well as the distinction between the probability versus possibility of something happening and the use of those terms in the academic press.

Another example of misinterpretation and miscommunication of science was a report that trace evidence of viral RNA of COVID-19 was found on the Princess Cruise Ship, a ship which was quarantined due to COVID-19, seventeen days after people finally disembarked the ship. According to Putterman (2020), when CNBC originally reported on this information on March 23, 2020, the headline said the virus “survived” in the cruise ship's cabin for up to 17 days, and that is how it was reported in the article. Politifact fact checked this story after it had spread via social media and determined the story was not true. Trace evidence was found, but that does not indicate the virus survived because the trace evidence was not live. Politifact quoted Dr. Akiko Iwaski, professor of immunobiology and molecular, cellular, and developmental biology at Yale University: “A piece of viral RNA is not the same as a living virus. In order for a virus to be infectious, it has to have an intact membrane, spike protein and the whole genome intact” (para. 10). On March 28, 2020, CNBC updated its headline to more accurately reflect the findings: “CDC says coronavirus RNA found in Princess Cruise Ship cabins up to 17 days after passengers left.” The article also noted its contents had been updated (Feurer, 2020). Fox News also ran a story about the results. The article content is an accurate reflection of the science, but the headline is still misleading: “Coronavirus survived for 17 days in empty cruise ship cabins, CDC says” (Bartirolo, 2020). This

confusion over trace evidence versus a live virus is reminiscent of Jaklevic's (2019) previously mentioned discussion about confusion over the term progression-free survival.

Technology

Because of the false news being spread in this infodemic, technological solutions have become available. Google has an SOS Alert on COVID-19 cures (Charlton, 2020). Gharib (2020) tells readers that Facebook is also deploying fact checkers to remove the false claims and conspiracy theories posted on the social media platform, and Twitter is actively bumping credible sources to the top of search results for coronavirus.

Researchers from Carnegie Mellon University are also using a “bot-hunter tool” to flag accounts that appear to be bots because they “tweet more than is humanly possible or claim to be in multiple countries within a few hours’ period” (Allyn, 2020a, para. 7). Twitter points out that bot behavior is not always in violation of its rules, however it has removed thousands of misleading COVID-19 tweets, challenged 1.5 million suspicious accounts, and has now added labels to denote misleading, disputed, or unverified tweets (Allyn, 2020a, paras. 9-12).

Browser extensions such as NewsGuard are also helping to identify false or misleading health information. This tool applies color-coded labels to websites to indicate which sites are generally reliable (green) or generally unreliable (red). NewsGuard also launched a coronavirus Misinformation Tracking Center at the end of March 2020. As of April 23, 2020, the tracker had identified 187 sites, 80% of which have been coded red. NewsGuard also introduced a list of 15 Facebook pages it considers “super-spreaders” of COVID-19 misinformation. These pages have more than 100,000 page “likes” (Schwitzer, 2020c).

While these technology solutions are helpful, they are not a solution to the problem, and they do not remove the need to evaluate sources on your own. According to Bhaskar Chakravorti, dean of global business at the Fletcher School at Tufts University, it is very difficult to fight false information because it can “jump” platforms; for example, Facebook may take it down, but it can still show up on Twitter and other platforms (as cited in Gharib, 2020, paras. 29-30). Also, as NewsGuard CEO Steven Brill points out, fact checking is, by definition, after the fact. The information has been published. By the time the social media site flags the misinformation, tens or hundreds of thousands of people may have seen it (as cited in Schwitzer, 2020c). Kathleen Carly, a professor at Carnegie Mellon’s School of Computer Science, adds that when it comes to Twitter bots, “not enough is known to develop a counter measure. Blocked accounts can resurface, and the nature of the network [Twitter] is such that you can’t just attack at individual points” (as cited in Young, 2020, para. 15). Finally, it is important to remember these technology solutions are not without flaws. Peters (2020) notes that in mid-March 2020, Facebook experienced a problem with its anti-spam algorithm leading the platform to mark legitimate news about many topics including the virus as spam.

Social media attempts to flag news without verified claims could be curtailed in the future, though. In May 2020, after Twitter flagged two of his tweets about mail-in ballots and voter fraud, President Trump signed an executive order to limit the protections social media companies are granted by the Communications Decency Act. This act allows social media platforms to regulate the content posted on their platforms. Trump’s executive order would impair the platforms’ ability to do this, and he signed the order because he claimed Twitter was silencing conservative voices with these labels

(Allyn, 2020b). While it may seem to be a noble cause to ensure Twitter is not engaging in censorship, at the time of this writing, there is no evidence Twitter is engaging in censorship of a particular group. It is also unethical to allow false information to spread rampantly, regardless of who it comes from. This is especially true when the information comes from a highly influential world leader with approximately 80 million Twitter followers.

Impact of Treatment/Medication Coverage

It has already been established that people take actions on their health based on media coverage (Kylie Minogue's breast cancer impacted mammogram rates, and coverage of Andrew Wakefield's bogus MMR and autism connection helped fuel the anti-vaccination movement), however it is also important to note that media coverage impacts policies and attention devoted to drugs and treatments. When politicians such as the president of the United States tout a particular treatment, that treatment could receive even more attention. This appears to be the case with potential COVID-19 treatment hydroxychloroquine, as described by Wong (2020). A deeply flawed study in France claimed hydroxychloroquine, a drug originally developed for malaria and used to treat lupus, had a 100% cure rate for COVID-19. Prior to the publication of this report, a lawyer appeared on Fox News falsely claiming to be affiliated with Stanford University. This man praised the effectiveness of the drug against the novel coronavirus. From there, President Trump began touting its effectiveness and Elon Musk even tweeted about it. Eventually, there were shortages of the drug, overdoses due to people trying to self-medicate, and other issues. The journal that published the results of the French study eventually said the study did not meet its quality standards, however by then the damage

had already been done and people were focusing on this as a cure and largely ignoring other options. But Wong reminds readers that initially, hydroxychloroquine had not stolen the show. Instead, Gilead's remdesivir was initially drawing more interest as evidenced by Google trend data that shows people were searching more for remdesivir than hydroxychloroquine throughout most of February. Remdesivir fell behind because it did not have a group of people publicizing the treatment and then the media jumping on the publicity bandwagon. It is likely that this increased media and presidential attention on hydroxychloroquine sparked the surge of interest in the drug.

A search of ClinicalTrials.gov's trials related to COVID-19 shows that, at the time of this writing, 54 trials involve hydroxychloroquine and only nine involve remdesivir (U.S. National Library of Medicine, 2020). While media attention certainly helped spark and sustain interest in the drug, the case of hydroxychloroquine exemplifies other problems in scientific communication, not just media coverage, such as launching a publicity campaign and adding spin to make a treatment appear successful, lack of proper peer review prior to publication, and presidential support for research that did not actually show what it claimed to show; in fact, as of August 2020, President Trump still claims hydroxychloroquine is effective, and he has made claims that he has taken the drug for prophylactic treatment against COVID-19. Hydroxychloroquine is thus a dangerous example of adding spin to promotional information and having that public relations spin trickle down to the media. This situation echoes Boutron et al.'s (2019) discovery that spin in news stories impacts the interpretation of the treatment benefit (p. 110) and exemplifies Schwitzer's (as cited in Green, 2017) warnings about the harmful impacts of false hope in treatments.

Tracing Movement

During the 2014 Ebola outbreak in the United States, the media traced the steps of anyone who was diagnosed with the disease. *The New York Times* immediately traced the steps of Dr. Kent Brantly, an American physician who contracted Ebola while on a mission trip to Liberia, when he returned to the United States for treatment. An article retraced his steps from the time he touched down at Dobbins Air Reserve Base to his police-escorted ambulance ride to Emory University Hospital (Blinder and Grady, 2014). The media also traced the steps of Amber Vinson, a nurse who treated an Ebola patient once the patient returned to the U.S. Vinson later contracted Ebola, and the media described her activities during the time she was asymptomatic including a commercial flight and shopping at a small bridal store while on vacation (Smith, 2015). While tracing these steps seems harmless for the patient and beneficial for society, it helps spur panic about the disease. In fact, in Vinson's case, the media coverage fueled such panic over the uncertainty and fear of Ebola that people no longer visited the bridal store in which she shopped. It earned the reputation as "the Ebola store" and customers were afraid merchandise purchased there would be contaminated with the disease. Eventually, the stigma caused this 30-year-old, profitable small business to close (Smith, 2015).

Although in the case of COVID-19 the media has not been identifying people specifically by name and the national media has not traced steps to the same extent as it did with Ebola, local media are tracing steps in their own ways. For example, the researcher of this thesis lives in Pennsylvania, and her local and regional media has noted the specific locations where those who test positive for COVID-19 work as well as the number of people who are infected. This type of coverage appears daily on television,

internet, and in print news. Here is a sampling of headlines tracing locations of confirmed cases and deaths in the researcher's county and surrounding areas:

- Enola Giant employee tests positive for COVID-19 (CBS21 News, 2020)
- Redner's Quick Shoppe worker tests positive for COVID-19 (69 News, 2020a)
- Hershey Medical Center's confirmed coronavirus cases up to 15, with 5 more under investigation (Press & Journal, 2020)
- Berks County coroner reports 2 more coronavirus deaths of Berks residents (Mayer, 2020)
- East Penn advises employees of co-workers with virus (69 News, 2020c)
- Employee at Wawa in Fountain Hill (Bethlehem) tests positive for COVID-19, store reopens after deep cleaning (69 News, 2020b)
- Two employees of Berks Heim test positive for COVID-19 (Lynch, 2020)

Numerous local news outlets across the country are also reporting daily on their own local and state case and death counts.

Although national media did not go to the extreme level of detail to trace individual movements as they did with Ebola patients in the U.S. (the sheer number of COVID patients in the U.S. soon made this an impossible task), national media reported almost daily on case counts in various states, especially states with high infection rates like New York, New Jersey, Florida, Texas, and California. The Centers for Disease Control and Prevention (2020) set up a reporting dashboard as did individual states. Pennsylvania Department of Health's (2020) dashboard includes totals as well as hospital bed and ventilator capacity. The Center for Systems Science and Engineering at Johns

Hopkins University (2020) also set up a major interactive COVID dashboard that allows you to drill down to individual states and counties in the U.S. as well as look at cases across the world.

In addition to dashboards to view local, state, national, and international data updated daily, governors in many states (i.e. New York’s Governor Andrew Cuomo, New Jersey’s Governor Phil Murphy, California’s Governor Gavin Newsom, and Pennsylvania’s Governor Tom Wolf and Secretary of Health Dr. Rachel Levine) have held daily press briefings to update citizens on the status of COVID, hospital bed and ventilator capacity, and COVID mitigation efforts in their states. Many of these press briefings were picked up by local, state, and national news outlets.

ABC News also tracked flights at the beginning of the pandemic. This tracking didn’t trace the movements of individual people, but it showed how groups of people flying into the U.S. from China, Italy, and Spain (virus outbreak hot spots at the time) helped increase the spread of the virus in the outbreak hot spots in the U.S. (Kelly and Thomas, 2020).

Use of Preprints

Because of the severity and quick spread of COVID-19, scientific publishers have removed paywalls on all published research related to the virus. Scientists are also setting aside their academic secrecy. According to Harvard Medical Professor Dr. Ryan Carroll, “Big, exclusive research can lead to grants, promotions, and tenure, so scientists often work in secret, suspiciously hoarding data from potential competitors” (as cited in Apuzzo and Kirkpatrick, 2020, para. 20). Now, scientists are widely sharing data with each other, and they are making preprints of their research quickly and widely available

for free via various digital repositories. This is an unprecedented move for scientific collaboration across the globe, but it also provides the public, including the media, with unprecedented access to all scientific studies, even those that have not yet undergone peer review to test the validity of their claims. Depositing preprints in open access repositories is not new; however, journalists' desire to utilize preprints is new.

There is nothing inherently wrong with using a preprint for an article, but journalists need to explain the benefits and limitations of a preprint and not simply use them to satisfy the novelty bias inherent in journalism. According to Jaklevic (2020), these “strong caveats” are often missing from articles based on preprints. News stories cite the preprints with little or no explanation about the quality of the work and without the caveat that preprints have not yet been peer reviewed to check for errors and weaknesses in the evidence (para. 10).

Schwitzer (2020b) pointed out *The New York Times* used a pre-print for an article in its Well column in which it is suggested runners need 15 feet of social distancing space rather than the commonly recommended six feet. The article does include some caveats, but this only serves to contradict its headlines and confuse audiences. Schwitzer explains the article admits the study used for the column was not published in a peer-reviewed journal nor did the study specifically examine coronaviruses. Schwitzer interviewed Dr. Adam Cifu of the University of Chicago about the *NYT's* decision to even publish this information. Cifu calls the reporting “truly irresponsible” and says there is nothing in the research that makes this claim plausible (as cited in Schwitzer, 2020b). Thus, even when an article contains caveats, it could still cause unnecessary confusion and panic in this time of uncertainty.

Iterative Journalism

The media have engaged in iterative journalism, described earlier by Cooke (2018) as reporting on topics affiliates or other news outlets have reported on rather than doing their own investigation. A prime example of this is a STAT News article about a remdesivir clinical trial in Chicago: “Early peek at data on Gilead coronavirus drug suggests patients are responding to treatment.” The article’s headline and lead paragraph point to early success of the trial; Feuerstein and Herper (2020) explain a clinical trial of the drug “is seeing rapid recoveries in fever and respiratory symptoms, with nearly all patients discharged in less than a week” (para. 1). The article goes on to give an overview of the trial, eventually offering a caveat that this single clinical trial’s outcomes “offer only a snapshot of remdesivir’s effectiveness,” noting the same trials are happening concurrently at institutions across the country, and telling readers, “It’s impossible to determine the full study results with any certainty.” Eventually, the authors remind readers that Gilead, the remdesivir manufacturer, has not released other trial data (Feurestein and Herper, 2020, para. 6). The rest of the article describes the clinical trial. Finally, in paragraph 17, the authors explain there is no control group in the study. More discussion of the trial ensues, and the article concludes with quotes from patients in the trial who recovered from COVID-19 and praise remdesivir’s effectiveness.

CNN reported on this article the next day with a headline that sounds more certain: “COVID-19 patients recovering quickly after getting experimental drug remdesivir” (Fox, 2020). The lead paragraph states the information comes from the STAT News article. After 10 paragraphs, the CNN article includes the same caveats as the STAT News article. Schwitzer (2020a) tells us that other news outlets also engaged in

iterative journalism based on the STAT News article, and some added their own caveats. For example, Schwitzer explains Fox News reached out to the University of Chicago School of Medicine for its caveat that this partial data is incomplete and cannot be used to draw conclusions about the drug's effectiveness ("Other news organizations...", para. 1). Schwitzer also tells us Reuters and CNBC picked up the article, but added information to position it from an investment standpoint. CNBC's caveat was that the study results are "largely anecdotal" and "should be interpreted with caution" (as cited in Schwitzer, "Other news organizations...", para. 6).

Continuing the Case Study of COVID-19

The pandemic is unfolding as this thesis is being written, and there are no definitive scientific answers as to when the pandemic will cease being a major health crisis and will be just another health issue to manage. While additional media study is beyond the scope and timeline of this thesis, the researcher intends to engage in ongoing media analysis and, at some point when the media coverage dies down and the pandemic slows, conduct a more thorough analysis of coverage and peoples' reactions to the coverage. The researcher plans to examine periods of media coverage in the progression of the pandemic — before it hit the United States, the early stages of virus progression in the United States, the height of the pandemic, once the country passed the peak of the pandemic, and finally re-opening of the country (at the time of this writing, all states have re-opened in some capacity although there is yet no timeline for returning to pre-COVID operations). Media coverage will be examined in two ways. The first way will consist of an examination of coverage of themes and risk messages similar to Basch et al.'s (2014) examination of Ebola coverage themes and risk messages, and the second will be an

examination of peoples' reactions to coverage based on social media article comments. Samples of articles will be examined from each period of media coverage, and the articles will come from traditional print news publications, alternative and digital news publications, radio news, television broadcast news, and television cable news. Through this analysis, the researcher hopes to learn how the media covered the pandemic from beginning to end, how people reacted to coverage throughout the pandemic, and if there are any themes that arise that can help us better understand how to communicate health news and how we should report when the next pandemic hits.

CHAPTER 7

CONCLUSION

The fake news era can have detrimental impacts for health news and, consequently, for people seeking out health news. Now more than ever, it is critical to examine the standards of scientific communication, both in the media and in the academic press, and to provide a strong foundation in information literacy in order to restore trust in the fourth estate.

Custodians of Knowledge

The media is what Jamieson (2017) calls a “custodian of knowledge.” She impresses upon us the ethical communication standards of these custodians of knowledge:

Custodians of knowledge tell us what science knows and how it knows it. Their language can enhance or cloud public understanding of the underlying science. Because language plays these roles, we need to be aware of the ways in which audiences hear the language that is used to conceptualize scientific concepts. When, advertently or inadvertently, linguistic choices miscommunicate the underlying science, the policy debate becomes muddied and the credibility of the science is more susceptible to the polarizing challenge (47).

The media is not the only custodian of scientific knowledge, but it is the main custodian of knowledge that directly interacts with the general public to relay important health and non-health information for the safety and wellbeing of citizens. The fourth estate thus occupies a very important place in society that requires it be held to high ethical communication standards. These ethical standards can easily be manipulated by the social era of news and the new methods of operating that the era brings with it.

How did we get here?

Unfortunately, media history is rooted in this ethical reporting conflict, a conflict that pits the values of good journalism against the values of business profits. Since the birth of newspapers, writers were taking sides on issues and peddling gossip. Ben Franklin even championed an early version of the fairness doctrine and a world free from gatekeepers. According to Daly (2012), Franklin referred to journalism as a business, and he believed truth and error should have “fair play” and “the power of the truth would win out in the end” (p. 24). The market was saturated with different media voices for most of its history. While those voices had gatekeepers unlike today’s social media, they were not always of equal quality and caliber of reporting, and they sensationalized news.

Media had been owned by individuals or families. Eventually, though, family-owned media companies became publicly traded entities. While this meant a singularly controlled media outlet had to answer to shareholders and thus this could mitigate biased points of view, this also meant opposing voices and unpopular but important and less-than-profitable issues and voices were silenced. Eventually, in the United States in the 1980s, media consolidated resulting in conglomerations which placed a premium on profits. Daly (2012) tells us that in this environment of consolidation and

conglomerations, the basic values of American journalism — independence, truthfulness, and diversity — were under pressure due to the “tensions inherent in trying to house a critical professional institution like journalism inside the big modern corporation...There was a ‘cultural contradiction’ in the news business between news values and business values” (p. 396). This meant fewer and fewer people controlled the media messages on various outlets, and it was a step toward creating filter bubbles outside of social media.

The 1980s also saw the birth of 24/7 cable news with Ted Turner’s CNN. MSNBC and Fox News would later follow. While the concept behind CNN seemed like a good way to keep people informed — providing constant access to news as it became available — it fundamentally changed the nature of news. According to Daly (2012), CNN changed news from being presented as a finished, polished product to being a process with incomplete information. That incomplete, or even incorrect, information can be updated in the next segment. Daly adds in this news process, “More of the material that reaches the public is partial, fragmentary, often speculative, and sometimes hearsay” and is often highly emotional (p. 408).

The 1990s then saw the rise of internet news outlets and the subsequent loss of print ad revenue, and this led to staff cuts, both of which had major impacts on the quality and delivery of news. Since the 1990s, news staffs have continued to be trimmed, placing a burden on those who are left to cover the news adequately and in a way that garners the ratings desired of conglomerates. The internet also allowed us to be inundated with news, and this compounded the 24-hour cable news sites. But also, the digitization of news upended all traditional ideals of journalism and news. Gatekeepers were removed, free news outlets meant people turned away from paid news outlets, and anyone could be a

“citizen journalist” presenting their own news. This democratization of the news did not guarantee the quality and accuracy of news.

The internet allowed an explosion of unchecked voices to be back on the news scene; this harkens back to the early days of journalism and Franklin’s belief that truth and error deserve equal time, and the truth will prevail. As we see today, though, the truth does not always prevail.

Although people could always create their own versions of filter bubbles by choosing where to obtain their news, they still had to seek out news outlets, and what they saw was not customized to their likes and internet activity. This changed with the advent of social media.

In the late 1990s and early 2000s, various forms of social media entered our lives. These platforms allowed people to interact with others who shared their views from all over the world, but the social media filter bubble did not truly come to fruition until Facebook was created. Facebook was created by psychology major Mark Zuckerberg while he was a student at Harvard University in 2004. At that time, it was originally only available to Harvard students. By 2006, it was available to anyone over 13 years old, including businesses (Boyd, 2019). Since then, Facebook and the social media platforms that followed have allowed people to personalize their news coverage, connect with like-minded individuals, and be served up news and information based on algorithms customized according to their internet activity and interests. Until recently, the quality of information on these platforms was completely unchecked, allowing people to be inundated with information of varying degrees of quality that continued to affirm rather than challenge their points of view, thus making it increasingly difficult to evaluate the

veracity of information that can easily be created by anyone with an internet connection and an internet-enabled device.

Clearly our history has led us to this point, and while we may never be able to reverse the damage done to reporting, particularly health reporting, we are ethically obligated to try to mitigate the damage.

Where do we go from here?

The media must address its contributions to the impacts of the fake news environment. The 24/7, fragmented news cycle is likely not going away. It is beneficial to provide new information when possible, however it is also necessary to ensure updates are clearly marked and outdated information — including social media links — are removed because, with any quickly developing issue, facts reported may be incorrect within the hour; information that is removed should be archived for historical news reference. This rapidly changing news makes contextualizing information even more important so the audience can understand the changes.

Lean staffs that lack science or health journalists or even fact checkers is a problem that impacts all types of reporting, not just health news reporting. Inaccurate science and health reporting can be eased with evidence-based journalism; these skills can be taught to generalist journalists if dedicated science and health journalists are not on staff. This mirrors the concept of evidence-based practice and ignores the fairness doctrine of journalism in favor of the evidence pyramid framework which gives more weight, and consequently more coverage, to studies with stronger evidence. In the pyramid, evidence is arranged as a hierarchy with items at the top of the pyramid, such as systematic reviews, having stronger evidence than items closer to the bottom of the

pyramid, like individual case studies. In science, all evidence is not treated equally, and journalists should convey this to their audience. When an item with weaker evidence that is lower on the pyramid is the only option to report, it should be presented with strong caveats that explain the study's shortcomings.

The use of preprints became a forceful trend in journalism as a result of COVID-19, and should this trend continue, it must be continued with caution. Preprints are not peer-reviewed or published, so while the pre-print may have a study that is at a higher level of evidence on the evidence pyramid, the study has yet to undergo peer review to ensure the study findings are accurate and the science is as rigorous as it should be. If preprints are the only option available to use, they should also only be used with strong caveats.

Adequate risk communication with health information is another issue to address. The fairness doctrine may give people the wrong impression about the actual possibility of certain risks (i.e. the results of treatments, reliability of testing, and possibility of disease spread). Risks cannot be sensationalized for ratings; however, we also cannot oversimplify and inadvertently downplay risks. The desire for simple and clear communication must be weighed against the need for detailed, accurate communication, especially since studies have shown that people act on their health based on what they read or hear in the news.

Ethical reporting also requires the media to take into account audience characteristics, particularly the characteristic of reading headlines and not reading the article at all or only reading part of it. This means the concept of the inverted pyramid in journalism — the style of writing where the most important details appear in the first one

to two paragraphs — is even more critical. But it is no longer just the first one to two paragraphs that are critical. Accurate information in the headline rather than a headline meant to shock readers and draw them in is necessary. In fact, Zindren (2020) addresses this when she says you must debunk myths in the headlines, not in the body of the article (“Top 10 Takeaways,” para. 7). The reality is our audience has ever-decreasing attention spans, and the audience cannot always be counted on to even click on the headline to read the first two paragraphs. While the onus for consuming all of the information presented to obtain a thorough understanding of the topic should remain on the readers, it is not entirely ethical for the media to continue to operate as if we still function in a society where the headline leads people to read the article before judging its veracity and sharing the claims with others. A headline may cut through the media clutter, but it needs to also be explicitly accurate, and evidence that supports your headline must be immediately present in the article body.

Another area to address is the news business model. The current for-profit news model that depends on advertising revenue is not sustainable for many local news outlets, and it continues to be a burden for larger outlets that see dwindling ad revenues. New business models must be investigated and refined. An alternative business model that is already in place for some outlets is the nonprofit model which relies on philanthropy and foundation endowments. According to Schmidt (2019), these outlets are attempting to fill the news gaps left by the for-profit model, namely investigative journalism and local news. Schmidt explains, “The nonprofit approach develops a closer relationship with foundations, folks with money, and readers/people who may be inclined to give a range of small-dollar donations to their work, rather than the corporate donors, advertisers, and

one-size-fits-all subscribers” (para. 3). This model appears to be growing in popularity. As Shi (2018) tells us, *The New York Times* reported that a month after the 2016 presidential election, “donations jumped at several nonprofit news outlets” such as ProPublica and The Marshall Project (para. 3). While this model should continue to be investigated and refined, it is important to understand this model comes with its own set of obstacles to accurate and fair reporting. These news outlets must be careful not to cater their coverage to specific interests and biases of foundations or large donors. If they cater to donor interests, their quality of coverage will be no better than the current outlets in for-profit models that cater to advertising dollars; the difference in business models will not guarantee a difference in news quality if this is allowed to happen. Also, relying too much on charitable funding is a dangerous business practice. What happens if the donations dry up? Relying on the charitable donations of others is not exactly a sustainable business model, and news outlets that rely on this type of funding could find themselves in the same dire financial straits that news outlets relying on advertising dollars find themselves now. This could also encourage coverage to be biased in favor of donors so the money keeps flowing. Finally, Shi (2018) also notes there is a lack of transparency related to funding with these nonprofit outlets. Although a lack of transparency does not automatically equate to an attempt to hide inappropriate business practices, it can lead to that situation. Because financial interests can shape coverage, it is important to understand who is funding the news outlet and how this could impact coverage. This is especially important with health news since financial transparency and disclosure of any kind of conflict of interest is an ethical pillar of scientific publishing.

Clearly a lack of transparency can create an environment ripe for biased reporting that is ultimately no different than what we sometimes see in the for-profit models.

But the media is not the only one that needs to change its habits. The academic press needs to reexamine its practices of adding spin to press releases to attract attention. Academic publishing should also reconsider its paywalls that lock people out of verifying scientific information presented in press releases. While the academic press should be focused on providing complete and accurate information, there also must be better communication about what constitutes completeness and how this is relayed to the lay press. This may not be much of an issue when science is relatively stable, but the COVID-19 pandemic has made it obvious that science does change and, when the worldwide scientific community is in the midst of rapidly uncovering information about a new virus, it can change quickly, conflict itself, and cause confusion. Scheufele et al. (2020) tell us that in this fast-moving environment, “Today’s high-profile expert assertion can be disproven by tomorrow’s events” (para. 1). The authors further explain that in this environment, a focus on accuracy and facts is an incorrect and misleading measure of good scientific communication. “The seductively simple directive to be ‘accurate,’ which lies at the heart of science communication, obscures the reality that accuracy is a tenuous notion during a crisis such as this [COVID-19 pandemic], in which uncertainty reigns.” As we gain new knowledge, science that was considered “correct” at the beginning of the crisis will be determined to be “incorrect” or at least “incomplete,” making it difficult to clearly determining what is misinformation and what is part of the legitimate scientific process. This means, “It is difficult to even define ‘misinformation,’ much less to ‘correct’ it” (paras. 5-6). Confusion over changing scientific information and what is

accurate and what is inaccurate has contributed to the confusion over various aspects of COVID-19, including whether masks are necessary to help prevent its spread. During the initial months of the pandemic in the US (February and March 2020), citizens were told masks were ineffective. By April 2020, there was research to show any kind of face covering could be helpful in preventing the spread of COVID-19; however, people are still unsure of mask effectiveness and the need to wear them because of conflicting information from earlier months. This uncertainty over the effectiveness of masks has been further exacerbated by politicians who second guess health experts in order to pander to their political voting bases. The confusion over masks is also an example of the academic press and the lay press not placing the information in the correct context of evolving research. Scheufele et al. emphasize that for accurate scientific communication in the future, there must be information about how complete scientific knowledge is — separate what science actually knows from what it does not yet know (“Implications...,” para. 2). Doing so and relaying updates that place new information within the correct context of how and why the information is changing should help ease confusion over what appears to be conflicting scientific information.

It is also remiss to ignore the fact that health information’s credibility is impacted by forces outside of journalist and scientist control. One of these factors is lack of trust in the pharmaceutical industry (big pharma). Another factor accompanying the distrust in big pharma is the anti-vaccination movement. Also, Impey (2020) explains that Americans have a penchant to believe fake science: “Americans are prone to superstition and paranormal beliefs. An annual survey done by sociologists at Chapman University finds...over 75% hold multiple paranormal beliefs. The survey shows that these numbers

have increased in recent years” (“Americans’ predilection for fake science,” para. 1). Americans may also have a penchant for conspiracy theories. According to Vittert (2019), “At least 50% of Americans believe in at least one conspiracy theory” (“Current beliefs,” para. 4). Fortunately, this number has not increased since 2010 (“Historical data,” para. 5). Although this number has not increased, bots spreading false COVID-19 information on Twitter are spreading conspiracy theories. These conspiracy theories lead to “more extreme opinions, which can in turn lead to less rational thinking” (Young, 2020, para. 13). Belief in conspiracy theories and their rapid spread via social media was evidenced in the earlier discussion of the video *Plandemic*. Also, politicians may influence thoughts about the media in general. President Trump is fond of calling certain news outlets “fake news,” and he refers to the press as “the enemy of the people.” It is believed Trump’s media sentiments are contributing to increased violence against journalists in the U.S. In fact, in 2019, the Reporters Without Borders (RWB) annual World Freedom Press began classifying the U.S. as a “problematic” country for journalists, ranking the U.S. below Romania, Chile, and Botswana. RWB’s ranking “follows inflammatory comments from the president and a broader hatred of the media which resulted in the shooting of five newspaper staff at the Capital Gazette in Maryland” (Waterson, 2019, paras. 2-3). Tension between science and politics also impacts health information’s credibility. This tension has been evident during the COVID-19 pandemic as President Trump has attempted to downplay the severity of the pandemic and the measures needed to fight it while members of his task force, including Dr. Fauci as well as Dr. Deborah Birx, the U.S. global AIDS coordinator and the COVID-19 pandemic task force’s coordinator, have provided evidence that contradicts the president. Dr. Fauci has

contradicted the president so much that he has stopped appearing with the rest of the task force, and both he and his family have received death threats. Recently, President Trump added a new physician to his pandemic task force. This physician, Dr. Scott Atlas, has no prior experience in infectious diseases or pandemics, but he agrees with President Trump's desired actions to get the country back to "normal," including no longer wearing masks (Thomas, 2020).

Finally, information literacy is necessary. The WHO uses the term "infodemic" to describe the current environment of information, particularly false information, during the COVID-19 pandemic; however, we live in a constant infodemic, particularly an infodemic of health news. Understanding how to navigate the information waters of this constant infodemic is a hurdle, and it exemplifies the importance of integrating information literacy throughout a person's academic career, particularly throughout the K-12 environment when students are learning how to navigate the world. A broad base of information literacy should encourage students to understand how their own biases, social media use, and internet searching habits impact algorithms and the information they see. This information literacy should also include an emphasis on how easy it is to create and disseminate false information and the need to understand the purpose of a piece of information. Also, as the idea of deepfake becomes more popular and people with a computer and internet access can digitally swap faces and even voices to create fake videos, the ability to critically evaluate resources is imperative. In fact, Toews (2020) explains "several deepfake videos have gone viral recently," including videos of President Obama describing President Trump with an expletive and videos of Mark Zuckerberg saying Facebook aims to manipulate its users (para. 5). There was also a

deepfake video from Belgium saying COVID-19 was the result of environmental destruction (“When seeing is not believing,” para. 11). But in addition to deepfake videos proliferating rapidly and becoming increasingly sophisticated, Toews also tells us their existence means people can claim real videos are deepfake videos to cast doubt on their credibility (“When seeing is not believing,” para. 18). This is similar to how society has adopted the habit of calling any unflattering news “fake news.” Perhaps emphasizing critical evaluation and information literacy skills throughout a person’s educational career could help quell the spread of misinformation.

While an overall base of information literacy is important, emphasis should be placed on news and media literacy. According to Dyer (2017), attempts to integrate news and media literacy into the K-12 environment have been met with mixed results, and some studies show the effects of individual news literacy courses diminish over time. Dyer adds there is also debate over whether news literacy can actually be taught: “Educators have demonstrated that, on a limited scale, they can make students a little savvier about the media. But whether those same educators can train large audiences to unmask fake news in the Internet age is an open question” (para. 14). It should come as no surprise that sporadic news literacy courses have a diminishing effect. Students do not master a concept after one course, and the ability to understand information and critically interact with it are skills that must be developed; thus, it is necessary to emphasize this ability throughout someone’s educational career just as you emphasize other basic skills like reading and writing. Also, because students are likely to interact with a substantial amount of health information throughout their lives, it is essential to include teaching about the concept of scientific tentativeness. The literature review revealed that

understanding scientific tentativeness is something journalists struggle with, and the study in this thesis revealed that accurate yet tentative language can actually lead people to have less trust in a health news article.

Do No Harm

In order for the media to fulfill its duties of informing the public, it must be trusted. Research has shown that trust in the media is low, and this is especially harmful to the public in the fake news era. Lack of trust in the media means we lack trust in an institution that should be a basic pillar of democracy that serves the best interests of the public; this includes keeping their safety and wellbeing in mind when reporting health news. When this anchor of credibility is gone, how are we to determine what else is credible? The media must acknowledge its own contributions to the fake news era and the infodemic, and it must also ensure ethical reporting that places information in the correct context, does not politicize information, and does not prioritize ratings over accuracy. Essentially, the media must abide by the guiding principle of the healthcare community — do no harm.

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Appendix 1: IRB Approval

East Stroudsburg University Institutional Review Board
Human Research Review
Protocol # **ESU-IRB-024-1920**

Date: **December 12, 2019**

To: **Sandra Eckard**

From: **Shala E. Davis, Ph.D., IRB Chair**

Proposal Title: **“Do no Harm: Ethical Reporting of Health News”**

Review Requested: Exempted **X** Expedited Full Review

Review Approved: Exempted Expedited Full Review

FULL RESEARCH

_____ Your full review research proposal has been approved by the University IRB (12 months). Please provide the University IRB a copy of your Final Report at the completion of your research.

_____ Your full review research proposal has been approved with recommendations by the University IRB. Please review recommendations provided by the reviewers and **submit necessary documentation for full approval.**

_____ Your full review research proposal has not been approved by the University IRB. Please review recommendations provided by the reviewers and resubmit.

EXEMPTED RESEARCH

X Your exempted review research proposal has been approved by the University IRB (12 months). Please provide the University IRB a copy of your Final Report at the completion of your research.

_____ Your exempted review research proposal has been approved with recommendations by the University IRB. Please review recommendations provided by the reviewers and **submit necessary documentation for full approval.**

_____ Your exempted review research proposal has not been approved by the University IRB. Please review recommendations provided by the reviewers and resubmit, if appropriate.

EXPEDITED RESEARCH

_____ Your expedited review research proposal has been approved by the University IRB (12 months). Please provide the University IRB a copy of your Final Report at the completion of your research.

_____ Your expedited review research proposal has been approved with recommendations by the University IRB. Please review recommendations provided by the reviewers and **submit necessary documentation for full approval.**

_____ Your expedited review research proposal has not been approved by the University IRB. Please review recommendations provided by the reviewers and resubmit, if appropriate.

Please revise or submit the following:

PLACE IRB CONTACT IN CONSENT SECTION OF SURVEY

Appendix 2: Survey Questions

1. I have read the accompanying invitation to participate, and, as an adult of at least 18 years old, I willingly consent to participating in the survey. I understand I may skip questions and stop the survey at any time with or without submitting my responses.

Yes, I consent to participating in this survey.

No, I do not consent to participating in this survey.

2. Please identify your affiliation with East Stroudsburg University of Pennsylvania (ESU). Choose all that apply.

No affiliation.

ESU faculty

ESU undergraduate student

ESU graduate student

ESU staff

ESU alumni

3. How do you obtain health news? Select all the apply.

Print newspaper

Newspaper or news network website.

Social media links.

Television news

Television ads

Online ads

Email

Radio

Magazines

Other:

4. I read the entire health news article before I share it.

Always

More than half the time

Less than half the time

Never

Not applicable – I don't share health news

5. I research the health claims made in the article before I share it

Always

More than half the time

Less than half the time

Never

Not applicable – I don't share health new

6. I read comments on the health news articles online (either the social media comments or comments on the article website) before I share it.

Always

More than half the time

Less than half the time

Never

Not applicable – I don't share health new

7. In your opinion, what makes a health news article credible?

8. I trust the media to provide accurate health news articles.

Agree

Somewhat agree

Neutral – neither agree nor disagree

Somewhat disagree

Disagree

9. I trust the media to provide accurate, non-health news articles.

Agree

Somewhat agree

Neutral – neither agree nor disagree

Somewhat disagree

Disagree

10. The headline of an article accurately portrays the content of the article.

Agree

Somewhat agree

Neutral – neither agree nor disagree

Somewhat disagree

Disagree

11. The image(s) accompanying an article accurately portray the content of the article.

Agree

Somewhat agree

Neutral – neither agree nor disagree

Somewhat disagree

Disagree

12. I share articles even when I doubt their accuracy. *Please note, this question refers to articles from sources that are not explicitly fake news written strictly for entertainment.*

Agree
Somewhat agree
Neutral – neither agree nor disagree
Somewhat disagree
Disagree

13. Have you shared a news item you thought was true or factual only to find out later it wasn't? If you did, what did you do after you discovered either all or part of the story wasn't true or factual?

14. How do you react to conflicting health news claims? Select all that apply.

I research the claims, then decide what to do.
I change my behavior when I hear new claims without research them.
I maintain my current behavior without researching the claims.
I ask for input and form my own decision.
I do what my friend and family recommend.
I ask a health professional and then make a decision.
I ignore conflicting health news claims.

15. After reading these two headlines, what do you think about the use of sunscreen and your health? Is it different from your previous thoughts on using sunscreen?

Headline 1: "Sunscreen could cause vitamin d deficiency."
Headline 2: "Does sunscreen compromise vitamin d levels? Maybe not."

Please provide your initial, immediate reaction after reading both headlines. Do not do any research on this topic to inform your opinion.

16. Below is the headline and first paragraph of a news article. After reading these two pieces of the article provided below, what is your reaction to the reporting and to the content?

Headline: "AI may be as effective as medical specialists at diagnosing disease."

Paragraph: "A new scientific review has concluded that artificial intelligence (AI) may be able to diagnose disease as successfully as human healthcare professionals, but a lack of quality studies means the real potential of the technology is unclear."