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COMMENTARY

The Novel Coronavirus (COVID-2019) Outbreak: Amplification of Public Health Consequences by Media Exposure

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The 2019 novel coronavirus (COVID-2019) has led to a serious outbreak of often severe respiratory disease, which originated in China and has quickly become a global pandemic, with far-reaching consequences that are unprecedented in the modern era. As public health officials seek to contain the virus and mitigate the deleterious effects on worldwide population health, a related threat has emerged: global media exposure to the crisis. We review research suggesting that repeated media exposure to community crisis can lead to increased anxiety, heightened stress responses that can lead to downstream effects on health, and misplaced health-protective and help-seeking behaviors that can overburden health care facilities and tax available resources. We draw from work on previous public health crises (i.e., Ebola and H1N1 outbreaks) and other collective trauma (e.g., terrorist attacks) where media coverage of events had unintended consequences for those at relatively low risk for direct exposure, leading to potentially severe public health repercussions. We conclude with recommendations for individuals, researchers, and public health officials with respect to receiving and providing effective communications during a public health crisis.

Keywords: infectious disease, media, coronavirus

In December 2019, scientists identified a novel coronavirus (COVID-2019) that was associated with an outbreak of pneumonia in Wuhan, China, and that was suspected of being zoonotic in origin. In a matter of weeks, over 100,000 of cases and thousands of deaths were confirmed globally, with numbers rapidly increasing daily. In less than a month, COVID-2019 surpassed SARS-Cov in terms of total number of reported cases, even though the SARS-Cov outbreak occurred over a 9-month period. On January 30, 2020, the World Health Organization (WHO, 2020) designated the COVID-2019 outbreak a "public health emergency of international concern." Scientists rapidly started working to elucidate the characteristics of the virus, including transmissibility, death rate, and origin (Perlman, 2020). In tandem, public health officials started working to communicate critical information to the public so that individuals could take necessary and appropriate precautions and governments could plan and respond accordingly.

Paradoxically, while journalists and public health officials worked to communicate critical information globally regarding risk assessments and recommendations, a related threat emerged: psychological distress resulting from repeated media exposure to the outbreak. This has implications not only for immediate suffering in a population already grappling with unprecedented social and economic fallout, but also for downstream effects on physical and mental health over time. Prospective, longitudinal studies have demonstrated that heightened stress responses during and in the immediate aftermath of a threatening event are associated with adverse physical and mental health outcomes over time (Garfin, Thompson, & Holman, 2018). Moreover, these stress responses can increase help-seeking behaviors that may be disproportionate or not recommended in response to the actual threat, overburdening health care facilities and diverting critical resources. For example, panic buying of essential consumer items like toilet paper, first aid kits, bottled water, and hand sanitizer in response to COVID-19 has led to global shortages and price gouging of important necessities.

During a health crisis, the public depends on the media to convey accurate and up-to-date information in order to make informed decisions regarding health protective behaviors. During times of uncertainty and crisis, the public may increase their reliance on the media (Ball-Rokeach & DeFleur, 1976), and it is imperative that trusted sources are available to provide risk assessments and recommendations (Lachlan, Spence, Lin, Najarian, & Del Greco, 2016). Decision science has revealed that people tend to form accurate perceptions of risk when facts are known and communicated to the public effectively via the media (Fischhoff,

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Wong-Parodi, Garfin, Holman, & Silver, 2018). In the absence of information—whether because the information is unknown to officials or because it is ineffectively communicated—ambiguity can lead to heightened appraisals of threat. This occurred in the context of the H1N1 crisis when increased uncertainty and feelings of uncontrollability increased anxiety (Taha, Matheson, & Anisman, 2014). Similarly, data collected during a school shooting found that during the crisis, when official updates were not provided, rumors proliferated, along with psychological distress (Jones, Thompson, Dunkel Schetter, & Silver, 2017). When this ambiguity is combined with an invisible threat, such as a virus, fear and worry may be exacerbated, and contribute to the spread of misinformation.

These phenomena are particularly relevant to the COVID-2019 outbreak, as people tend to perceive novel viral threats as higher in risk compared to more common threats such as influenza (Hong & Collins, 2006). During an ongoing threat from a novel disease outbreak, timely updates from trusted sources about the relative risk of contracting the novel disease versus a more common one are critical. Without them, public fears may escalate, fuel rumors, and provoke stress responses.

Emergency management agencies tend to underuse social media as a source of risk communication. Strategic social media use (e.g., hashtags) may be an effective way for agencies to communicate accurate information to the public during times of crisis (Lachlan et al., 2016). Residents may be advised to connect with and follow local health agencies and service providers for the most geographically relevant information. Researchers may use publicly available "big data" (e.g., localized tweets) to gauge the risk communication efforts of local agencies (see Lachlan et al., 2016, for an example).

In our interconnected society, public health threats can extend far beyond their point of origin. However, ubiquitous media exposure during the global 24/7 news cycle can lead viewers to inaccurately estimate the threat to their own communities. For example, the incidence of Ebola in the United States was quite low during the 2014 outbreak, but a nationally representative sample of U.S. residents (N = 3,447) showed that heightened media exposure to Ebola-related stories was associated with increased distress, worry, and impaired functioning (Thompson, Garfin, Holman, & Silver, 2017).

These heightened distress responses to media exposure to collective crises may have long-term repercussions for physical health. In an early study of American's responses to the September 11th terrorist attacks (9/11), increased hours of TV exposure in the days after 9/11 were associated with increased posttraumatic stress and new-onset physical health ailments 2 to 3 years later (Silver et al., 2013). High acute stress post-9/11 also predicted reports of new onset physician-diagnosed cardiovascular disorders over the 3 years following the attacks, especially among people who were worried about future terrorism (Holman et al., 2008). Such findings highlight the relationship between the stress responses and physical health outcomes, even for people who live far away from stress-provoking events or developments.

In the past decade, several studies have demonstrated that both the type and amount of media exposure affect psychological and physical responses to a community-wide traumatic event. Following the Boston Marathon bombings, for example, we found a strong positive association between the amount of exposure to bombing-related media coverage and acute stress symptoms. People who reported the highest media exposure reported higher acute stress than did people who were directly exposed to the bombings (Holman, Garfin, & Silver, 2014). These associations also appear to accumulate over time; as threats continue to emerge, repeated high levels of media exposure to these kinds of events may create a cycle of distress (Garfin, Holman, & Silver, 2015; Thompson, Jones, Holman, & Silver, 2019). People with the greatest concerns may seek out more media coverage of the event, further increasing their stress response.

In addition to the amount of media exposure, the content of the exposure matters as well. Exposure to graphic images that included blood was associated with heightened posttraumatic stress and fear of the future 6 months after the Boston Marathon bombings, both of which were positively associated with poor functioning (Holman, Garfin, Lubens, & Silver, 2020). These findings remained statistically significant after accounting for the overall amount of media exposure, highlighting the importance of considering both amount and type of media exposure.

Beyond effects on physical health from the increased stress response, media-fueled distress may overtax health care facilities as they deal with an influx of concerned patients. This occurred during previous epidemics, where high levels of media exposure resulted in a surge of emergency department visits, even in communities that were not experiencing an increase in the incidence of the disease (McDonnell, Nelson, & Schunk, 2012). We are seeing the repercussions of this with respect to the COVID-2019 outbreak: Consumer hoarding of facemasks has led to a global shortage of facemasks and respirators ("Coronavirus: Demand for Face Masks," 2020), which are critical to protecting those at high risk – particularly health care professionals performing routine and specialized care. This shortage imperils communities most at risk by impeding public health efforts to contain the virus. Visits to emergency departments from those with relatively mild symptoms are leading to further taxing of an already overburdened healthcare system.

Although it is critical for the media to convey information to the public to promote appropriate health protective behaviors and effective institutional responses, it is imperative that information be conveyed without sensationalism or disturbing images. The public, in turn, should be advised to avoid speculative stories and limit repetitious exposure to media stories that provide little new information, while staying abreast of critical updates. We recommend that the public rely on authoritative sources such as the Centers for Disease Control and Prevention or WHO for the most up-to-date information regarding transmission, protecting one's health, and community-level threats. Given that new media such as Apple updates, Twitter, and Instagram may be less likely to expose individuals to graphic images (Jones, Garfin, Holman, & Silver, 2016), they may be among the best ways to provide ongoing information without sensationalism or distributing graphic imagery. However, misinformation can also spread on social media and can heighten perceived risk and fear about health-related topics (Ng, Yang, & Vishwanath, 2018; Wang, McKee, Torbica, & Stuckler, 2019), which makes the responsible use of social media imperative. Both the Centers for Disease Control and Prevention and WHO provide regular communications via social media and website updates.

During a public health crisis, it is essential to convey urgent information to the populace in real time, while simultaneously tempering untoward media exposure that can lead to traumatic stress responses and associated maladies. Health care providers, as trusted community agents, also play an important role in communicating essential information to patients and other community members. Practical advice that individuals can implement to protect from contagious viruses (e.g., washing hands, using and immediately disposing of tissues for coughs and sneezes, sanitizing surfaces, social distancing) may be particularly beneficial, while simultaneously working to prevent other common contagions (e.g., influenza). Capitalizing on the high-risk perception of a novel virus could help to "market" health protective behaviors that might increase protection from other pathogens like influenza (Hong & Collins, 2006) and serve as a critical inflection point to communicate often disregarded public health messages such as the importance of preparing an emergency supply kit (Beatty, Shimshack, & Volpe, 2019). Health care providers can provide critical information and make concrete suggestions while seeking to temper hysteria that may thwart overall public health efforts to effectively combat the COVID-2019 outbreak.

Finally, many questions regarding effective risk communication during a public health crisis, particularly with respect to the use of social media, need further research. We hope that health scientists begin to design and conduct such research during the current COVID-2019 outbreak to provide information that public health officials can use now and in the future.

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