



Article

Considering COVID-19 through the Lens of Hazard and Disaster Research

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Abstract: Decades of social science research have taught us much about how individuals, groups, and communities respond to disasters. The findings of this research have helped inform emergency management practices, including disaster preparedness, response, recovery, and mitigation. In the context of the COVID-19 pandemic, most of us—researchers or not—have attempted or are attempting to make sense of what is going on around us. In this article, we assert that we need not examine the pandemic in a vacuum; rather, we can draw upon scholarly and practical sources to inform our thinking about this 21st century catastrophe. The pandemic has provided an “unfortunate opportunity” to revisit what we know about disaster phenomena, including catastrophes, and to reconsider the findings of research from over the years. Drawing upon academic research, media sources, and our own observations, we focus on the U.S. and employ disaster characteristics framework of (1) etiology or origins; (2) physical damage characteristics; (3) disaster phases or cycles; (4) vulnerability; (5) community impacts; and (6) individual impacts to examine perspectives about the ways in which the ongoing pandemic is both similar and dissimilar to conceptualizations about the social dimensions of hazards and disasters. We find that the COVID-19 pandemic is not merely a disaster; rather, it is a catastrophe.



Citation: Ritchie, Liesel, and Duane Gill. 2021. Considering COVID-19 through the Lens of Hazard and Disaster Research. *Social Sciences* 10: 248. <https://doi.org/10.3390/socsci10070248>

Academic Editor: Francis O. Adeola

Received: 28 May 2021

Accepted: 23 June 2021

Published: 30 June 2021

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Keywords: COVID-19 pandemic; natural hazards and disasters; technological hazards and disasters; recreancy; catastrophes

1. Introduction

As sociologists who specialize in disaster research, we have often been asked over the past year whether the pandemic is a disaster. On occasion, we have thought about replying by referring to Barton who, in 1969, suggested that “arguing over what to call a disaster” is useless (p. 37). Instead, in response to this question, we assert that findings from the rich, longstanding body of scholarly work on societal dimensions of hazards and disasters offers a lens through which to consider the COVID-19 pandemic.

For our part, we have been relying heavily on our sociological backgrounds seeking to disentangle what is happening to us, to our family members, to friends and colleagues, to various groups around the country, and to the public at large. As many have personally experienced, there are times when this can be incredibly overwhelming. Yet, the pandemic provides what we refer to as an “unfortunate opportunity” to revisit and recontextualize the findings of decades of work in this arena.

In this article, we share our perspectives about how aspects of the ongoing pandemic are related to conceptualizations about the social dimensions of hazards and disasters. Focusing on the U.S., we discuss ways in which findings of extant research can help us to better understand the ways in which the pandemic continues to unfold. As will be discussed later, the pandemic has taken on characteristics of a catastrophe, which has been exacerbated by pre-existing political polarizations. The goal of this article is not to provide remedies, policy recommendations, or to be the final word about the pandemic in the

context of hazard and disaster research. Rather, our purpose is to stimulate thinking by grounding it in empirical research.

2. A Comparison of Natural and Technological Disasters in the Context of COVID-19 Pandemic

Gill and Ritchie (2018) offer a framework for comparing natural and technological hazards and disasters by considering six different dimensions: (1) etiology or origins; (2) physical damage characteristics; (3) disaster phases or cycles; (4) vulnerability; (5) community impacts; and (6) individual impacts.¹ As with much research in the hazard and disaster field, perspectives on these dimensions and comparisons have evolved over the past forty years and continue to do so. In short, this framework is not intended to reify distinctions between natural and technological disasters. Rather, it suggests that natural and technological disasters have overlapping qualities, characteristics, and outcomes that should be considered on a continuum. We apply this framework to examine the COVID-19 pandemic in the U.S.

Since Hurricane Katrina, in particular, there is widespread consensus among scholars that there is no such thing as a “natural” disaster—that disasters of most kinds are fundamentally a consequence of systemic social inequality. Let us think for a moment about Susan Cutter’s (1993) definition of hazards. She emphasizes that hazard is a broad concept “that incorporates the probability of the event happening, but also includes the impact or magnitude of the event on society and the environment, as well as the sociopolitical contexts within which these take place. Hazards are the threats to people and the things they value . . . ” (Cutter 1993, p. 2). What, then, is a disaster? As Tierney (2019) puts it: “. . . disasters involve the juxtaposition of physical forces . . . and vulnerable human communities. The severity of a disaster is measured not by the magnitude of the physical forces involved but rather by the magnitude of its societal impacts” (p. 4). While we do not dispute that disasters primarily have social roots, we maintain that there are differences between natural hazards and technological hazards.

2.1. Etiology or Origins

Natural hazards originate in meteorological, geological, hydrological, and astronomical processes, while technological hazards originate in anthropogenic systems and processes. This distinction is important because research dating back to the early 1970s, such as Kai Erikson’s study of the Buffalo Creek flood (Erikson 1976), has shown that the origin of disasters influences the ways in which people respond to them. The origins of natural hazard events situate them in relatively predictable geographic locations, seasons, and likely physical damages. For example, Atlantic hurricanes in the coastal regions of the U.S. usually occur between June 1 and November 30 and cause physical damages to the built environment resulting from strong winds, storm surges, heavy rain, and flooding. The public often see these events as “Acts of God” that are unpreventable and beyond control by them or any other human agency. Baum et al. (1992) observed how these views strongly influenced how individual survivors and their community react to a natural hazard event.

In contrast, there is arguably a loss of control of sociotechnical processes in technological hazard events, which means they should have been preventable; thus, some entity is to blame. A “primary responsible party” is a hallmark of technological hazard events. Technological disasters are associated with what Bill Freudenburg (2000) refers to as recreancy—“the failure of experts or specialized organizations to execute properly responsibilities to the broader collectivity with which they have been implicitly or explicitly entrusted” (p. 116). Recreancy can also take the form of inaction on the part of such experts or organizations (Freudenburg 1993). This concept illuminates the significance of trust and confidence in sociotechnical systems by focusing on consequences of breaking that trust and confidence.

The etiology of COVID-19 is a contested matter. Most credible scientists and medical officials believe the virus to be a consequence of human/animal interactions (Andersen et al.

2020; Weise and Weintraub 2021). Others argue that it was anthropogenically derived in a laboratory, either intentionally or accidentally (Guterl et al. 2020; Latham and Wilson 2020; Schmidt 2021; Wade 2021). As of this writing, the latter proposition has grown with a focus on China's Wuhan Institute of Virology where three researchers required hospitalization in November 2019 (Gordon et al. 2021). Beliefs about the origin of COVID-19 have influenced the ways in which individuals and groups have reacted and responded (e.g., see Weise and Weintraub 2021).

The predictability of the pandemic is also a contested issue. The world has experienced viral outbreaks in recent years (e.g., AIDS, H1N1, SARS, Ebola); thus, a pandemic has some characteristics similar to a natural hazard. For example, beginning with the George W. Bush administration, U.S. intelligence agencies have consistently warned about the need for pandemic preparedness (Lankford et al. 2020; Wirtz 2021). Although virologists were studying various strains of COVID years before the outbreak, they were unsure as to when and where the virus might emerge. In this sense, COVID-19 was somewhat unpredictable, similar to a technological disaster.

Issues of controllability come into play as a viral outbreak emerges and evolves into a pandemic. Although the "when and where" aspects of a pandemic outbreak may be unpredictable, there are expectations that action will be taken to control its spread and impacts. Efforts to gain control over the pandemic have been numerous, ranging from testing and contact tracing to social/physical distancing, mask-wearing, and lockdown mandates. Most recently, control attempts have focused on vaccination efforts and achieving "herd immunity"—the logistics, social issues, and politics of which are complicated (Thompson 2021).

Protection of the public in times of crises such as pandemics is a responsibility of public leaders. Crisis decision making involving the recognition of severity of the risk, effective communication, and national and international coordination are integral to controlling the threat and protecting the public (Comfort 2007). "In reference to COVID-19, control means achieving a reasonable balance between mitigating the spread of the infection, building healthcare capacity, and managing a safe level of economic and social activity" (Comfort et al. 2020, p. 617). As documented by Comfort et al. (2020), compared to South Korea and Italy, the U.S. response was slow due to factors such as the Trump administration's toning down the severity of the threat, a prior reduction in capacity to identify and respond to global pandemics, and the lack of testing capacity to provide data essential for containing viral spread.

Assertions of poor leadership and an inability to control a threat the magnitude of COVID-19 contribute to perceptions of recreancy. Arguably, any administration would have faced numerous challenges in responding to the COVID-19 pandemic. However, Trump's style of leadership exacerbated the situation. Analysis by Camacho and Glicksman (2021) suggests unclear and contradictory lines of centralized and decentralized authority worsened initial "careless and delayed" (p. 1) responses by the Trump administration. Drawing on crisis response research, Kapucu and Moynihan (2021) evaluate presidential leadership on the pandemic with respect to decision making; communication; collaboration and coordination; and control (see also Watkins and Clevenger 2021). Weaknesses in each of these key crisis management areas resulted in perceptions of recreancy.

2.2. Physical Damage Characteristics

Turning next to physical damage characteristics in Gill and Ritchie's (2018) framework, most definitions of natural disasters include some aspect of loss of life, casualties, and damages to the built environment that are directly attributable to a specific hazard event. Some disaster definitions focus primarily on these types of physical losses, rather than considering societal impacts as does Tierney's definition referenced earlier. Definitions of technological disasters usually focus on human error or technological malfunctions that result in physical damages to the natural environment and human physiology (Freudenburg 1997).

Assessing and quantifying physical damages attributed to natural disasters is straightforward relative to technological disasters. Deaths and physical injuries resulting from disasters can be counted, but there are typically fewer of these associated with technological disaster events. Physical damages to the built environment can be observed and revealed using standard assessment practices that translate damages into monetary terms. Technological disasters typically involve physical damages to biological organisms (including humans), ecosystems, and the broader natural environment. In cases of toxic contamination and exposure, physical damages are often undetectable without specialized instruments (e.g., radiation), can cause latent health and ecological effects, and result in ambiguity of harm and invisible trauma. The lack of clear scientific protocols and standardized assessment techniques contribute to contested definitions of the event and make damages difficult to translate into monetary terms.

Similar to technological disasters, COVID-19 is a form of invisible trauma that has presented its own challenges with respect to assessing damages and putting these into financial terms (which will be discussed in the next section). Although there are no physical damages to the country's built infrastructure associated with the pandemic, there is obvious loss of life and threats to human well-being, creating an ambiguity of harm. This contributes to pervasive uncertainty that leads to harmful community and individual impacts. There continue to be disputes throughout the country—many of them politically driven—over the calculation of numbers of cases of the virus, as well as how COVID-related deaths are reported (Kornfield and Jacobs 2021). For example, while naysayers and conspiracy theorists contend that figures are inflated (Kornfield and Jacobs 2021), leading experts advise that the number of cases and deaths in the U.S. and around the world are drastically underreported (Branswell 2021; Institute for Health Metrics and Evaluation 2021).

2.3. Disaster Phases or Cycles

Let us now discuss disaster phases or cycles and how they might relate to the pandemic. Social science disaster research traditions have relied heavily on conceptual frameworks to define and make sense of various characteristics and dimensions of hazards and disasters as well as societal implications. Some of the earliest work was that of Fritz (1961), based upon findings from research conducted in the 1950s. He discussed definitions of disasters, misconceptions regarding disaster behavior, temporal elements of disasters—disaster warning, threat, impact, immediate post-impact—as well as social adaptations to disaster.

In 1969, Barton framed disasters as situations of “collective stress” focused on a system's response to a stressor. Barton's paradigm consisted of both spatial and temporal elements: scope of impact, such as geographical scope and numbers of people; speed of onset, ranging from sudden to gradual, to chronic, as well as warning time; duration of the impact itself, whether the stressor is short- or long-lasting; and whether social preparedness is low or high. He also distinguished five disaster phases or periods: pre-disaster; detection and communication of warning; immediate, relatively unorganized response; organized response; and the longer-term post-disaster period or reconstruction.

Perhaps the most well-known and influential disaster framework is Drabek's (1986) linear model based on sudden-onset natural disasters that have a clearly defined beginning, middle, and end. He described four disaster phases: preparedness, response, recovery, and mitigation. Within each phase, he described individual, group, organizational, community, society, and international dynamics. Drabek's groundbreaking work provided a foundation for emergency planning and management protocols and has played a key role in framing future disaster research.

Based on studies of communities that have experienced technological disasters, research findings have demonstrated that they often follow a non-linear pattern. Some technological disasters have a definable starting point—for example, the Exxon Valdez and BP Deepwater Horizon oil spills, and the Flint, Michigan water crisis—yet their end point is uncertain. Contaminated communities such as Love Canal in New York are not

sudden-onset events; they have no clear beginning. Closure is elusive for many survivors as they grow increasingly uncertain of what constitutes recovery and how to determine when the disaster is over. Bureaucratized claims processes, litigation, and relocation associated with technological disasters can result in secondary traumas in the form of persistent negative psychosocial and sociocultural impacts (Gill 2007; Ritchie et al. 2018a; Ritchie and Long 2021).

In the U.S., public health has its own version of phases applied to pandemics, which is a model designed to guide as well as provide ways to inform and conduct risk assessment, decision making, and action. The Pandemic Intervals Framework (Centers for Disease Control and Prevention 2016) describes the progression of a pandemic using six intervals: investigation, recognition, initiation, acceleration, declaration, and preparation. According to the Centers for Disease Control (CDC), the duration of each of these intervals might vary depending on the characteristics of a given virus and the public health response.

Despite some contested uncertainty about the exact origin of COVID-19 at a global level, the CDC confirmed the first coronavirus case in the U.S. in Washington State on 21 January 2020 (American Journal of Managed Care 2021). By late February, the CDC confirmed that the COVID-19 outbreak was approaching pandemic status. The initial New York coronavirus hotspot offered a preview of the potential impacts if strict precautionary measures—mask wearing, social distancing, and lockdowns—were not taken. Unfortunately, many people did not or were not in positions to heed the warnings.

From a psychosocial perspective, we have been experiencing something similar to a technological disaster cycle—caught in a loop of warning, threat, impact, and blame. Between the beginning of the pandemic and as of June 2021, various geographic locations in the U.S. have experienced different rates of cases, hospitalizations, and deaths associated with the virus at different points in time. As of this writing, most locations around the U.S. remain in the Pandemic Intervals Framework's deceleration phase, with consistently decreasing numbers of new cases (Centers for Disease Control and Prevention 2016, 2021a). The number of reported new cases peaked at 249,389 on 11 January 2021, and as the pandemic evolved, fewer cases emerged, and the proportion of new cases requiring hospitalization and intensive care decreased. This decrease began prior to the impacts of mass vaccination efforts and offers encouraging signs of an "end" to the pandemic. Yet, there remain concerns about the potential for new hot spots resulting from newly emerging strains of the virus (Soucheray 2021). There is also discussion regarding the possibility of needing booster COVID vaccinations similar to the annual flu shot, which suggests that COVID-19 may have a more constant presence. Thus, an alternative takeaway from the current pandemic is that there is no "end" in the sense of a natural disaster cycle (Clarke and Phillips 2020).

2.4. Vulnerability

As defined by Bolin and Stanford (1998), "Vulnerability concerns the complex of social, economic, and political considerations in which peoples' everyday lives are embedded and that structure the choices and options they have in the face of environmental hazards. The most vulnerable are typically those with the fewest choices, those whose lives are constrained, for example, by discrimination, political powerlessness, physical disability, lack of education and employment, illness, the absence of legal rights, and other historically grounded practices of domination and marginalization" (pp. 9–10).

When we think about vulnerability in the context of research on natural disasters, several forms come to mind. First, we typically consider sociodemographic characteristics such as age, gender, race and ethnicity, income, class, and special needs populations. Vulnerability might also include place-based conditions where people are exposed to natural hazards. Individuals and groups considered vulnerable are also less likely to have substantial political power, social services, social and cultural capital, and overall resilience (Cutter 2016; Cutter et al. 2014).

Many of the same sociodemographic characteristics that lead to vulnerability in natural disasters also apply to technological disasters. However, technological disasters reveal other forms of vulnerability based on geographic proximity to hazardous industrial plants, waste facilities, and transportation corridors. These forms of vulnerability often involve environmental justice issues. Vulnerability based on exposure takes on a different meaning in technological disasters, especially when toxic substances are involved—amount, concentration, duration, type of substance, and combinations of types. Uncertainty regarding exposure and potential health effects contributes to increased levels of psychosocial stress.

Adverse impacts to the natural environment from technological disasters reveal new forms of vulnerability stemming from sociocultural and psychosocial connections to damaged and threatened resources. For example, acute and long-term damages to commercial and subsistence fisheries and losses of other marine resources after the Exxon Valdez oil spill gave rise to the concept of the “renewable resource community” to frame this vulnerability (Picou and Gill 1997). Furthermore, research comparing community responses to the Exxon disaster and the 2010 BP Deepwater Horizon oil spill reveals that vulnerabilities related to ties to renewable resources are more significant in predicting high levels of psychosocial stress than vulnerabilities associated with sociodemographic characteristics (Cope et al. 2016; Gill et al. 2012, 2014).

Technological disasters such as the 1986 Chernobyl nuclear accident reveal vulnerabilities and risks that transcend traditional perspectives. Accordingly, Beck (1986) theorizes the risk society in which risks from breakdowns in sociotechnical systems transcend temporal, spatial, and social confines. As a result, impacts from technological disasters become incalculable and non-compensable. The global nature of the pandemic demonstrates Beck’s ideas and encourages us to re-examine issues of vulnerability.

Similar to natural and technological disasters, COVID-19 has shed light on populations who are highly vulnerable to the pandemic for a variety of reasons. With respect to health vulnerability, the Centers for Disease Control and Prevention (2021c) list numerous groups as being disproportionately affected by the virus. Among these are older adults, children, individuals with underlying pre-existing conditions, and racial and ethnic minorities (Wilder 2021). Critical front-line healthcare workers, police officers, and others working in public settings are exposed, putting them at higher risk. Additional vulnerable populations include those living in rural areas, homeless people, as well as those living in institutional facilities such as nursing homes, group homes, prisons, and others working in them. Not surprisingly, coupled with the latter forms of vulnerability are economic threats among people living in poverty. Many who work in jobs that are considered “essential”, such as in grocery stores, transportation, and so forth, are disproportionately black and brown, and their communities have been devastated by the virus (Gould et al. 2020; Gould and Wilson 2020; Hawkins 2020; Wilder 2021).

“As an exemplar of the lethal combination of these kinds of vulnerability, Native American communities are being disproportionately ravaged by the pandemic (Lakhani 2021; Mineo 2020). One-third of the members of these populations live in poverty and have chronic health conditions that exacerbate the risk of dying from COVID-19. Additionally, multi-generational households increase the likelihood of the virus spreading to the elderly. One Native American elder expressed her concerns this way: “I fear the long-term impacts on mental health, our children, community resilience, and cohesiveness”. (Lakhani 2021)

2.5. Community Impacts

The disaster literature documents patterns in the ways that communities respond to natural disasters. The obvious physical damages associated with natural hazard events, as well as the ensuing media coverage, facilitate a shared definition of the situation among community members and outsiders. This often leads to an emergence of “therapeutic” or “altruistic” community patterns in which survivors receive communal support within a “community of sufferers” and experience a “post-disaster utopia”. These patterns continue in the recovery phase of disasters through “consensual adaptation”, guidance, planning,

and decision making. As communities rebuild, they often experience an “amplified rebound”, which is characterized by a more resilient infrastructure and stronger economy compared to pre-disaster conditions.

The contested nature of physical damages resulting from technological disasters yields different patterns of community impacts than those described above. Patterns of a “corrosive community” emerge (Freudenburg 1997) as social support networks and relationships break down, interpersonal and group conflicts increase, people self-isolate, and social capital erodes. Collective trauma—described by Kai Erikson (1976, p. 154) as “a blow to the basic tissues of social life that damages the bonds attaching people together and impairs the prevailing sense of communality”—is common in the aftermath of technological disasters. Ecological and physiological damages are more difficult to assess and restore, compared to damaged infrastructure. These damages contribute to chronic resource losses and prolonged uncertainty, which exacerbate corrosive community patterns. These patterns often occur within a “pressure cooker effect” of collective trauma and stress where interactions exaggerate existing social fissures, including political divisions (Hobfoll 1991; Ritchie 2012). Rather than an amplified rebound, economic and corrosive social conditions lead to deflation as impacted communities struggle to recover.

Community impacts of COVID-19 offer some of the richest points of comparison with natural and technological disaster outcomes. In some cases, the effects of the virus have mirrored responses to natural disasters. In others, they have been more akin to those resulting from technological disasters. Perhaps most accurately, they are a mix of responses we would expect to see from both natural and technological disasters. Reactions have continued to evolve and, in many cases, intensify as the pandemic goes on. Social isolation by way of individual choice; mandated closures of business, schools, and places of worship; and other circumstances have detrimentally affected individuals, groups, and communities. We are witnessing immeasurable social disruption and what Barton (1969) described as “collective stress”—“when many members of a social system fail to receive expected conditions of life from the system . . . to carry on normal activities” (p. 38). Among the conditions necessary to do so are safety of the physical environment as well as guidance and information from government officials and other authorities.

Along these lines, recent literature has illuminated the importance of community capitals—natural, built, financial, human, cultural, and social—to community resilience (National Academies of Sciences, Engineering, and Medicine 2019). Some scholars posit that social capital is the most essential asset for community resilience to a range of shocks and stressors (Aldrich 2012; Aldrich and Meyer 2015). Although it is far too soon to determine the long-term social impacts of COVID-19, researchers are already examining relationships between the pandemic and social capital (e.g., see Makridis and Wu 2021; Pitas and Ehmer 2020; Wu 2021). In some situations, we have seen adverse impacts of the pandemic on social capital. For example, Pitas and Ehmer (2020) propose that social capital is being disrupted by physical distancing.

In other cases, effects of the pandemic have served to bring people together. A study by Makridis and Wu (2021) suggests that social capital serves as a positive mediating factor in the spread of the virus, with people expressing more concern for others as evidenced by adhering to public health guidelines. This claim is supported by Wu (2021), who found that the pandemic is being addressed more effectively in places where social capital is high and people can mobilize resources.

Along these lines, there are some memorable instances of the emergence of therapeutic or altruistic communities in the context of the pandemic, such as the outpouring of support for healthcare workers and the formation of organizations to support survivors of the virus. For example, take “SurvivorCorps”, a group whose motto is to empathize, organize, and mobilize (Survivor Corps 2021). This organization of more than 155,000 people certainly constitutes a “community of sufferers” as described in the aftermath of natural disasters.

Issues of blame and responsibility associated with the onset and spread of the virus have shed light on and cultivated patterns of antagonistic interactions among groups

and individuals across the nation. The pandemic has intensified political polarization and spurred corrosive community patterns at local, state, and national levels. This is epitomized by harshly contested definitions of the pandemic and appropriate response measures, as well as the politicization of science (e.g., see [Hart et al. 2020](#); [Kerr et al. 2021](#)). Divisive rhetoric has fueled destructive social unrest such as that observed in 2020 at Michigan's state capitol where gun-carrying protestors challenged the governor's stay-at-home order ([Beckett 2020](#)). Likewise, in December 2020 at the Oregon state capitol, State Representative Mike Nearman allegedly assisted a crowd protesting COVID-related restrictions in gaining access to the closed building, which resulted in clashes with police and damage to property ([Baker 2021](#)).

The emergence of a phenomenon referred to as "minimalists" versus "maximalists", which was first used referencing the Love Canal toxic contamination crisis, is also apparent with the pandemic ([Levine 1982](#)). These terms describe different perspectives and patterns of social interactions that arise in the context of environmental contamination events. Minimalists tend to be more dismissive of threats, risks, and damages than maximalists, who have much more significant concerns.

In the context of the pandemic, those who oppose mask mandates, social/physical distancing, and other measures to stop the spread of COVID, such as business and school closures, would be considered minimalists. They would maintain that these steps are unnecessary, overboard, and problematic. They might also be disinclined to be vaccinated. Among these individuals are those who believe that the actions being recommended and taken to protect physical health are more disruptive and damaging to society than the virus itself—that the "cure is worse than the disease" ([Dorling 2020](#)).

Those who frame the virus as rampant and unavoidable unless one is in complete isolation would be considered maximalists—individuals in persistent fear for their very lives and those of others. They would also very likely be in favor of nation-wide mask and social distancing mandates and widespread lockdowns. Of course, this dichotomy between minimalists and maximalists is socially constructed and heightened by various forms of media coverage. Broadly speaking, the pandemic is perhaps revealing a more middle-of-the-road perspective that is not being discussed, with most individuals taking basic, reasonable precautions such as mask wearing, social distancing, limiting time out in public settings, and so forth being in this category.

It is important to consider how various forms of media contribute to corrosive patterns of political polarization through the spread of misinformation. Indeed, the World Health Organization labeled the phenomenon as an "infodemic" with life and death implications ([United Nations 2020](#)). Analysis by [Motta et al. \(2020\)](#) reveal that conservative media sources tended to report misinformation about the virus and pandemic, particularly in its early stages. [Jiang et al. \(2021\)](#) show that "echo chambers" prevalent in social media reflected political partisanship and contributed to misinformation (see also [Hart et al. 2020](#)). Notably, widespread misinformation contributed to an increased lack of trust in COVID-19-related information sources ([Latkin et al. 2020](#)). Moreover, misinformation about and politicization of COVID-19 influenced individual and collective protective measures ([de Bruin et al. 2020](#)) and initial acceptance of vaccinations ([Malik et al. 2020](#)).

2.6. Individual Impacts

Of course, individual impacts of disasters are associated with the community impacts described above. Among individual impacts include changes in behaviors, attitudes, perceptions, beliefs, mental health, and physical health. In the immediate aftermath of a natural disaster, research has demonstrated that most survivors do not engage in panic behavior and other antisocial behaviors, and they rarely show signs of disaster shock, lethargy, and psychological dependency. Instead, most survivor behaviors are goal-directed and prosocial—safeguarding personal and family security and providing assistance and comfort to others. Indeed, disaster survivors are usually the first persons on the scene, and some initiate search and rescue activities before official response teams

arrive. Survivors engage in some lifestyle changes during recovery and reconstruction, but lifestyles generally return to pre-event patterns by the end of these disaster phases. Depending on vulnerability characteristics, intensity of event experience, exposure to death and injuries, resource losses, and pre-event mental health status, survivors experience various types and levels of psychosocial stress and psychological trauma. However, stress and trauma from natural disasters tend to be acute and short-term.

The uncertainty associated with technological disasters has different impacts on individual behaviors, thought patterns, mental health, and physical health. Lacking a collective definition of the situation, individuals change their patterns of interaction—often to avoid those who have competing definitions—which diminishes social capital at both the individual and community level. Survivors of technological disasters may experience “reluctant resignation”—characterized by a realization and acknowledgement that one has little to no power or control over their situation—as secondary traumas from contested compensation processes, and other ongoing responses drag on and exhaust individual energy and other resources (Ritchie 2004, 2012; Ritchie et al. 2018b). Survivors may also contend with chronic adverse health outcomes as well as the potential for latent health effects.

Given the aforementioned individual responses to technological disasters, survivors experience heightened levels of psychosocial stress and psychological trauma, which tend to become chronic. Analysis of 160 separate samples of natural and technological disaster survivors from research conducted over a two-decade period concludes that people involved in technological disasters have a higher risk of adverse mental health impacts (Norris Fran et al. 2002). Technological disasters tend to generate anger, frustration, outrage, and feelings of betrayal among survivors, and strong beliefs about recreancy—institutional failures—are common. They also cause people to alter their lifestyles and, in the most serious cases, threaten lifescapes and ontological security. In this context, individuals believe that “outsiders just don’t understand” what they are going through (Edelstein [1988] 2004, 2000).

Among the most obvious disaster-like impacts associated with the pandemic have been lifestyle changes to avoid or minimize exposure to the virus. Many individuals have also experienced lifescape changes as the pandemic upsets their sense of ontological security; these changes are similar to those that tend to accompany technological disasters. Empirical evidence from studies of previous large-scale, disruptive events such as protests, riots, mass uprisings, terrorist attacks, natural and technological disasters, and catastrophes illuminates potential long-term harm from the virus in what some have referred to as a “spillover effect” (Galea et al. 2020; Ni et al. 2020). As one example, research on the 2003 SARS outbreak indicates that we should be concerned about mental health impacts such as quarantine-related depression and post-traumatic stress disorder, both in the immediate and the long term of the COVID-19 pandemic (Galea et al. 2020). These outcomes further mirror those found in studies of technological disasters. Again, the concept of invisible trauma is relevant to how we interpret the impacts of the pandemic. For example, uncertainty surrounding the variable health effects of COVID-19 is pervasive, negatively influencing the mental health of those who have had the virus, those who have lost loved ones to the virus, and others whose daily lives have been upended by the pandemic.

During the past year, studies of mental health have identified alarming trends tied to the pandemic. A recent report released by the American Psychological Association (2021) refers to “collective trauma” driven by the pandemic—much like Erikson’s (1976) conceptualization. Data show that “prolonged stress persists at elevated levels for many Americans” (American Psychological Association 2021). Among the most common feelings were anxiety, sadness, anger, and feeling overwhelmed by the number of issues in America (American Psychological Association 2021; de Nobel 2021; Edwards 2021). In April 2020, Galea et al. warned about just these types of mental health consequences of COVID-19. Specifically, they cited concerns about the need for prevention and early inter-

vention related to the potential for pandemic-related anxiety and depression, substance use, loneliness, domestic violence, and child abuse (Galea et al. 2020).

With respect to children, a 2020 CDC study indicates that “the proportion of emergency room visits related to children’s mental health rose dramatically for school-aged children and adolescents compared to the previous year.” The report goes on to say that “the ‘enduring uncertainty’ of the pandemic represents a particular challenge for teenagers during a crucial stage in their development, “losing milestones and rites of passage like graduations, birthday parties, and athletic seasons . . . ” Moreover, the authors write that “Children’s mental health during public health emergencies can have both short- and long-term consequences to their overall health and well-being” (Arkin 2020; Leeb et al. 2020).

An article in Nature declared “Pandemic Burnout is Rampant in Academia” (Gewin 2021). According to a 2021 study, almost 70% of U.S. faculty surveyed “said they felt stressed in 2020, more than double the number in 2019.” Levels of fatigue and anger were also significantly elevated. In addition, there were differential effects for men and women, with women reporting higher levels of various forms of pandemic-related stress and anxiety than men.

General burnout, sometimes referred to as “pandemic fatigue” or “COVID-19 fatigue” has taken hold (Berg 2021). According to the American Medical Association:

“At this point in the pandemic, people are tired of being cooped up due to restrictions on indoor gatherings outside the home. They are also tired of wearing masks, physical distancing, being away from family and friends, and increasingly fed up with the “new normal” routines. People are experiencing a type of burnout that experts are calling COVID-19 fatigue, which can lead to careless behaviors and a sharp rise in cases”. (Berg 2021)

From another perspective, what some are experiencing falls short of either burnout or depression; this is being referred to as “languishing”, which is characterized by a sense of stagnation and emptiness—an absence of well-being (Grant 2021).

Some literature suggests links between media coverage and public health communication and mental health consequences (e.g., see Anwar et al. 2020; Malik et al. 2020; Su et al. 2021). These studies have found that outcomes can be both adverse and positive. For example, Anwar et al. (2020) argue on the one hand that media coverage “during geographical lockdowns, extended quarantines, and financial and social hardships induced fear and caused psychological stress” (p. 1). On the other hand, they point out that “The media allowed for timely interventions by the Center For Disease Control And Prevention (CDC) and the World Health Organization (WHO), enabling a rapid and widespread reach of public health communications” (p. 1). These researchers also highlight the value of the media in educating the public about COVID-related protective guidelines, such as the use of proper hygiene, mask wearing, and social distancing. Broadly speaking, it is fair to say that accurate and consistent public health communication, including that of mass media, are essential components of pandemic response.

Whatever the causes, adverse mental health impacts occur at an individual level, and anxiety, stress, burnout, depression, and languishing become collective phenomena. These outcomes intensify the pressure cooker effect found in the aftermath of both natural and technological disasters. In the pandemic, we maintain that this phenomenon exists at both individual and community levels.

Last, but certainly not least, many survivors of the virus are suffering from physical health impacts—what is being referred to as long COVID syndrome. This involves “permanent damage to their lungs, heart, kidneys, or brain that may affect their ability to function; others are [experiencing] debilitating symptoms despite no detectable damage to these organs” (Komaroff 2020). Those experiencing these symptoms are being referred to as “long haulers”. This phenomenon reflects uncertainty following disasters—particularly technological disasters. Some individuals who have had the virus report feeling stigmatized and discriminated against; this is similar to the technological disaster-related notion described earlier, that outsiders cannot fully empathize with what those who have had the virus went through or are going through (Centers for Disease Control and Prevention

2020; Edelstein [1988] 2004, 2000; Murray 2021; Sotgiu and Dobler 2020). Survivors might also feel guilty—that they are somehow responsible for contracting the virus. In some cases, survivors have been blamed for engaging in what might be considered risky behaviors, such as not wearing masks or socially distancing. Some who have not had the virus live in fear of contracting it.

2.7. Summary

In this section, we have compared characteristics of natural and technological disasters with characteristics of the COVID-19 pandemic. Clearly, there are similarities across the six dimensions in Gill and Ritchie's (2018) framework. Yet, given the scope and magnitude of the pandemic, there are critical points of departure that deserve additional attention. These are discussed in the remainder of this article.

3. The COVID-19 Pandemic: A Catastrophe

In her 2019 book, *Disasters: A Sociological Approach*, Kathleen Tierney highlights ways in which emergencies, disasters, and catastrophes differ. Building on the work of Enrico Quarantelli (1996), as well as that of her own, she points out that catastrophes are not just big disasters. Catastrophes have “massive repercussions”, exceeding the capacity of systems to respond. According to Tierney (2019, pp. 5–6), catastrophes typically have the following attributes: there are devastating physical and societal impacts; response efforts are initiated by central government; response challenges far exceed those envisioned in disaster plans; response systems are paralyzed at local and regional levels; the public is the only source of initial response; and there are enormous recovery challenges and slow recovery processes.

Hurricane Katrina is an example of a catastrophe in recent U.S. memory. With more than 1800 fatalities, it overwhelmed central government response systems and caused major social disruption that some would argue continues to this today. Katrina exposed systemic inequality, racism, disenfranchisement, and government corruption. As Bill Freudenburg and colleagues assert, Katrina was a catastrophe in the making (Freudenburg et al. 2009). We maintain that COVID-19 can also be framed as a catastrophe in the making for many of the same reasons as Katrina.

As of this writing, the CDC reports that there have been more than 33 million confirmed COVID-19 cases in the U.S. and a staggering 600,086 deaths (Centers for Disease Control and Prevention 2021b). Despite promising results from vaccination efforts—more than 60% of adults have had at least one vaccination (Centers for Disease Control and Prevention 2021b)—newly emerging variants of the virus pose further threats. Although figures vary, some recent polls indicate that as many as 25% of Americans are reluctant to receive the vaccine (Brumfiel 2021). Economic losses are astounding; some say they are countless (Dorn et al. 2020a; Udalova 2021). Beyond our physical health, the pandemic has presented challenges to our mental health and well-being, with adults and children reporting elevated levels of stress and anxiety (American Psychological Association 2021; Centers for Disease Control and Prevention 2020). Our healthcare workers and systems continue to be overworked, strained, and in many locations over capacity (Hall 2020). Particularly during the 2020–2021 academic year, teachers have been overloaded and challenged to adapt to new learning environments (Bassok et al. 2021; Dorn et al. 2020b; Hiday 2020). Disruption has come in many forms, including changes in daily routines, social isolation, complex dynamics of social unrest, and extreme pandemic-related polarization on a variety of issues. Important social rituals such as funerals, weddings, birthday gatherings, bat mitzvahs, and graduations, among others, have been halted, further imposing negative outcomes on individuals, groups, and communities.

4. Catastrophic Impacts of COVID-19

Based on Tierney's characterization of a catastrophe, the pandemic is beyond a disaster. Indeed, the outbreak has brought with it broad, sweeping, and overwhelming impacts we

would expect to see in a catastrophe. In terms of catastrophic impacts at a macro level, there have been a wide range of effects of the pandemic across social institutions around the U.S., most notably to the economy, public health systems, and education systems. As stated in a March 2021 “America Counts” piece by the U.S. Census Bureau, “The COVID-19 pandemic has caused a devastating loss of life but it has also devastated the nation’s economy” (Udalova 2021). Indeed, the pandemic has given rise to differential economic impacts for individuals, businesses, and industries based on sociodemographic determinants, sectors, and geographic locations around the country. According to a report by the Brookings Institute, economists have determined that we are in an unprecedented economic crisis, with the pandemic “creating a demand shock, a supply shock, and a financial shock all at once” (Bauer et al. 2020, p. 1; see also Triggs and Kharas 2020). A study by the Pew Research Center focusing on the economic fallout from COVID-19 highlights job losses, with people having difficulty making rent or mortgage payments, paying for medical care and other bills, as well as experiencing other forms of financial hardship leading to economic trauma (Parker et al. 2020). Fiscal impacts of the pandemic also extend to towns, cities, and states due to reduced tax revenues (Sheiner and Campbell 2020).

Some sectors of the economy have been particularly hard hit by COVID-19-related restrictions. Within transportation industries, the nation’s airlines have been severely affected, with profits falling more than 95% in April 2020 (Chokshi 2021). The restaurant industry experienced major disruptions as public health policies restricted inside dining and lockdowns kept many people at home (National Restaurant Association 2021; Newton 2021). Likewise, the recreation, tourism, and entertainment sectors of the economic experienced a substantial reduction in business activities (U.S. Travel Association 2021). Adverse impacts in these sectors have resulted in lost sales, lost jobs, business closures, and disruption throughout these supply chains.

Pandemic relief legislation led by the Trump and Biden administrations has attempted to ameliorate some of these economic impacts. The 2020 \$2.2 trillion CARES Act (Coronavirus Aid, Relief, and Economic Security) provided financial assistance to individual households, extended unemployment benefits, and provided loans to small businesses, corporations, and state and local governments (Snell 2020). A COVID relief bill passed in December 2020 provided additional direct payments to individuals and funds for small businesses, as well as extending unemployment benefits (Pilkington and Strauss 2020). The \$1.9 trillion American Rescue Plan Act, passed by the Biden administration in March 2021, sent additional direct payments to individuals and further bolstered unemployment benefits (National Association of Counties 2021). Funds were also allocated to state, local, and tribal governments, as well as to the restaurant industry and K-12 schools.

COVID-19 has exposed and exacerbated weaknesses in the U.S. healthcare system (Bauer et al. 2020). The COVID-19 pandemic has shown macro-level vulnerabilities. As part of broader systemic inequalities, it reveals healthcare system disparities along racial and ethnic lines, as well as rural, inner-city, and other impoverished areas. As Blumenthal and colleagues (2020) note, the pandemic undermined an already weak health insurance program. The sharp increase in pandemic-induced unemployment has caused many individuals to lose health insurance for themselves and their family members. The unpopularity of the Affordable Care Act in many conservative states meant that this alternative safety-net insurance program was blocked or unavailable.

The pandemic has caused short- and long-term financial losses for providers as they contended with increased demands in treating those with the virus while simultaneously experiencing a decline in healthcare services (Blumenthal et al. 2020). Many providers were ill-prepared to more fully embrace telemedicine and other technological innovations. The public health system failed in its pandemic response by not effectively controlling the viral spread through testing and contact tracing, and by not implementing consistent physical-distancing and mask guidelines. As Blumenthal and colleagues (2020) state, “inadequate leadership and excessive partisanship have played a role in these shortcomings” (p. 1484).

Mixed messages from politicians and the CDC have created an environment of lack of trust regarding guidelines to implement and follow. Again, the definition of the situation is contested at the highest levels and influences responses among the general populations. Moreover, recreancy, demonstrated by a lack of trust and confidence in public health, inhibits the development of a “functioning national system for responding to pandemics” (Blumenthal et al. 2020, p. 1484).

At the micro level, the pandemic has adversely affected healthcare workers. According to a 2020 article in the Journal of the American Academy of Physician Assistants:

“The rapid spread of the disease [has] created challenges for healthcare systems and forced healthcare workers to grapple with clinical and nonclinical stressors, including shortages of personal protective equipment, mortality and morbidity associated with COVID-19, fear of bringing the virus home to family members, and the reality of losing colleagues to the disease. Evidence from previous outbreaks, along with early evidence from the COVID-19 pandemic, suggests that these events have significant short- and long-term effects on the mental health of healthcare workers”. (Hall 2020)

As in other social institutions, systemic inequalities in the broader society have been magnified in the education system at both K-12 and in higher education. At the K-12 level, as schools shut down classrooms and switched to online and hybrid forms of instruction, disparities in education across the country became more apparent (Adams 2021; Dorn et al. 2020a). A digital divide based on economic status and geographic location (e.g., inner cities and rural areas) meant that many students would be further disadvantaged in their educational pursuits. Impacts of the pandemic on education systems at every level have been drastic and will have repercussions for entire generations (Bassok et al. 2021; Dorn et al. 2020b; Hiday 2020). Dorn et al. (2020b) maintain that disruptions in education will have long-term impacts on the Gross Domestic Product and the economy. The essential roles that K-12 schools provide in terms of childcare and well-being—including addressing food insecurity through the School Breakfast Program and National School Lunch Program—was also highlighted (Bassok et al. 2021; Gibson 2020). This became part of the driving force behind the push to reopen schools to in-class instruction to allow working parents to return to the workforce as the economy reopens.

5. Other Effects of the Pandemic

Thus far, we have primarily discussed the negative impacts of the pandemic. This is reasonable, given that they far outweigh anything positive that might have emerged from it. With that said, are there any positive aspects that have come out of this tragedy?

One of the first things to note is the rapidity of the development of the COVID-19 vaccine (Cormier 2021). Operation Warp Speed, a Trump administration initiative, reflects what can be accomplished in the world of medicine given the dedication of enough resources and political will. We could also focus here on certain business sectors that are thriving because of the pandemic. Among these are grocery stores, liquor stores, and essential retailers; delivery services; cleaning services; information technology services and online support technology; medical and healthcare businesses; and warehouse and shipping businesses (Ludwig 2021). Exercise equipment has been at a premium and difficult to find. That sector of business is booming. As one example, stock prices for Peloton, the stationary bicycle company, rose 440% in 2020 (Garcia 2021).

On a more serious note, some research has shown that the pandemic has had some positive impacts on the environment (Khan et al. 2021; Kumari and Toshniwal 2020; Rume and Islam 2020; Tollefson 2021). For example, as Rume and Didar-UI Rume and Islam (2020) point out, in some cities and regions, ecological systems are being restored as air quality improves and as greenhouse gas emissions are reduced. There is also evidence of decreased water pollution and noise pollution, particularly in tourist destinations (Rume and Islam 2020).

Finally, we could also suggest that the pandemic’s further exposure of systemic social inequalities in the economy, healthcare, education, and other social institutions might have

constructive policy implications. This is yet another lesson in vulnerability, assuming we as a nation actually choose to learn and opt to do something about it. Maybe there is potential for an amplified rebound in our healthcare system—an opportunity to focus on reducing vulnerability rather than engaging in reactive, event-specific responses. The real question is whether the elevation of these COVID-19-related issues will stick? Moving forward, will we simply be “recovering inequality” as Steve Kroll-Smith suggested following Hurricane Katrina (Kroll-Smith 2018)? Again, it is too soon to tell. To be sure, there is and will continue to be an ambiguity of recovery with respect to the pandemic.

6. Conclusions

In this article, we have employed a disaster characteristics paradigm to the COVID-19 pandemic in the U.S. Among these characteristics are etiology, disaster phases or cycles, physical damage characteristics, vulnerability, community impacts, and individual impacts. We have also commented about the many ways in which the pandemic is a catastrophe that has overwhelmed the nation’s central government and response systems, as well as caused widespread social disruption and shed further light on vulnerable groups and systemic inequalities. There is no doubt that there is a great deal to discuss with respect to hazard and disaster research beyond what we have shared here and that others—particularly in the public health arena—also have much to contribute to this dialogue.

Revisiting the Gill and Ritchie (2018) framework in the context of the pandemic has reinforced its validity and salience in studying disasters and has demonstrated the ways in which COVID-19 is a catastrophe. However, it has also revealed an important missing component of our prior work: the prominent role of communication in both natural and technological hazards and disasters—as well as in the pandemic. Although there is a substantial body of literature on risk and crisis communication, including the role of the media (e.g., see Lindell 2018; Monahan and Ettinger 2018; Palen and Hughes 2018), our exploration of the pandemic through the lens of hazard and disaster research has illuminated this shortcoming in conceptualizing dimensions of comparisons of natural and technological disasters. Our future work—and hopefully that of others—will make efforts to incorporate this dimension and build upon extant research as well as examine communication approaches and missteps during the COVID-19 pandemic (e.g., see Bekalu et al. 2021; Gollust et al. 2020).

The new normal is proving to be uncertain as societies grapple with a number of recovery and mitigation measures. Given the reluctance and refusal by a substantial portion of the U.S. population to be vaccinated, will vaccine passports be required to enter into certain spaces? Will failure to contain virus mutations and achieve herd immunity result in a need for annual COVID shots, similar to the current annual flu shot? Will responses to COVID mitigation measures, particularly those that address systemic inequalities, continue to be dominated by polarizing political discourse?

It is difficult to offer conclusions to a discussion of an ongoing catastrophe. Just as many individuals who have survived the virus have become long haulers, the country’s recovery remains a long, uncertain path. The challenge and paradox of emerging pandemic-related research is that we are all living this event as we attempt to study it. In addition, the issues we are researching are moving targets, sometimes changing from day to day as medical experts learn more about how the virus operates and as government officials attempt to respond to emerging knowledge about how best to achieve herd immunity amidst the rise of new strains of the virus.

COVID-19 has provided a very unfortunate opportunity to observe social dynamics associated with pandemics. As Fritz put it in 1961, “[Disasters] are the sociological equivalent of engineering experiments that test the capacity of machines to withstand extreme physical stresses” (p. 654). In essence, they test resilience. He also advised that the practical advantage of studying disasters is “to provide foreknowledge of the social and psychological conditions brought about by disaster” (p. 653). By logical extension, it is of

paramount importance that we continue to examine the current situation to learn more about how to prevent and assuage the effects of future pandemics.

Although our article has focused on the U.S., what we learn from research about this pandemic holds the potential to reveal how the world might respond to future global catastrophes, including other pandemics, the effects of climate change, political unrest, and other forms of global collective stress. Policy- and decision-makers around the world can benefit from continuing to reflect on what is known from hazard and disaster research and, more importantly, to apply it to whatever recovery might look like moving forward. At the same time, beyond the field of hazard and disaster research, it is critical that we bring to bear as many perspectives as possible on this national and global catastrophe. To this end, we hope that the ideas presented in this article have served to promote your own thinking and to encourage more research in this arena.

Author Contributions: L.R. and D.G. shared equal responsibility for conceptualization; investigation; and writing—original draft preparation. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

Notes

- ¹ The Gill and Ritchie (2018) framework includes a dimension on post-disaster recovery processes. Given that the pandemic is ongoing we will not discuss these here.

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