



2020 Utah Earthquake and COVID Response

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Introduction

A number of emergencies and disasters occurred around the world in 2020. Decades of institutional racism and the death of George Floyd prompted many social protests in the United States. Members of the Islamic State-West Africa Province attacked a police station, a United Nations office and citizens in Nganzai, Nigeria. Over 30 named storms in the Atlantic resulted in an extremely active and costly hurricane season, with Laura chief among them. The “derecho” windstorm struck Illinois, Indiana, Iowa, Nebraska, and Wisconsin. 2,750 tons of ammonium nitrate that was being stored in warehouse in Beirut exploded. And California experienced a major outbreak of wildfires across the state. Although these events are diverse in terms of cause and impact, a unique commonality among all of them is that they occurred during the global COVID-19 (corona virus Disease) pandemic.

Dealing with various civil, natural and technological events during a global pandemic raises an important question for those involved in emergency management: How did/does COVID-19 impact responses to emergencies and disasters? With this in mind, the following article will examine the response to the March 18th, 2020, 5.7 magnitude earthquake in Magna, Utah during the 2020 COVID-19 outbreak. The major conclusion of this study is that widespread public health emergencies complicate responses to natural disasters, and this fact deserves more attention from both scholars and practitioners.

The article will first provide a brief review of the general disaster literature and identify the methods employed for this study. Contextual information about COVID-19 and the Magna earthquake will be provided along with general issues that had to be addressed. The two following sections will identify how the pandemic both benefited and complicated the response operations. After a discussion about findings, the conclusion will review the major lessons of this research and provide recommendations for future study and practice.

Literature Review

The literature on disasters and emergency management is increasingly robust, and advances have been made in comprehension of the causes of catastrophic occurrences and what to do about them. However, there is a lack of knowledge about how organizations deal with multiple disasters simultaneously under dynamic conditions with limited information and insufficient resources.

Much of the early literature emanated from geography, engineering and sociology. Physical scientists sought to understand earthquakes, hurricanes, tornadoes, floods, tsunamis, landslides, subsidence, etc. Burton, Kates and White categorized the features of hazards based on magnitude, speed of onset, duration, areal extent, frequency, etc.¹ Engineers examined how hazards impacted structures and infrastructure, and provided recommendations to minimize damage, destruction and loss of life through improvements to building codes and construction practices.² Sociologists dispelled myths about disasters, shed light on human behavior in extreme events, and provided recommendations for improved responses.³ Others discussed how to warn, evacuate and shelter populations effectively.^{4, 5, 6}

Scholars also suggested that traditional management styles may not always be applicable in disasters. Dynes as well as Neal and Phillips asserted that rigid, top down approaches could be problematic due to the number of participants and need for improvisation.^{7, 8} Others like Perry and Drabek and McEntire explored emergency operations center (EOC) operations and coordination mechanisms respectively.^{9,10}

More recently, research has focused attention on terrorism and homeland security,¹¹ social media in disasters¹² and how to integrate cultural competency in emergency management education.¹³ There have also been important studies on humanitarian logistics,¹⁴ sustainability,¹⁵ and how to deal with epidemics like Ebola.¹⁶

In spite of visible progress, there is a dearth of knowledge on certain topics. It was argued decades ago that disasters are characterized by overwhelming demands and limited resources.¹⁷ There has been increasing concern about catastrophes,¹⁸ but with the exception of Cruz¹⁹ there has been insufficient research on the capacity to respond to multiple disasters simultaneously. In order to fill this gap in knowledge, the following article will examine how emergency management officials responded to an earthquake under the conditions of COVID-19.

Research Methods

The research for this article followed a case study methodology.²⁰ In order to understand the context of both COVID-19 and the Magna earthquake, the author initially referred to several local and national news reports. While reliance on media sources can be problematic, scholars such as Comfort²¹ and Alexander²² have demonstrated that the media can be a useful tool for academic exploration.

The author then worked with his connections in the FEMA Higher Education Program and FEMA Region VIII who provided contact information for local, state and federal officials that also responded to the Magna earthquake. The author subsequently interviewed several professionals involved in the response including Emergency Managers, City Managers, a Mayor-Pro-Tempore, an Integration Team Lead, FEMA Disaster Recover Specialists, a Director of Planning & Development Services, a Deputy Director of the Department of Community and Neighborhoods and others. These individuals represent local, county, state and federal government departments and agencies including Magna Metro Township, Salt Lake City, West Valley, Salt Lake County, a Municipal District, the State of Utah (Division of Emergency Management) and FEMA Region VIII. A Disaster Program Manager for the American Red Cross was also interviewed.

In order to minimize risk associated with COVID-19, the author talked to informants via Microsoft Teams, on Zoom or over the phone. Respondents were asked a series of questions that typically included, but was not limited to:

- What is the context of each disaster?
- What were the impacts of each disaster?
- How did the events complicate individual responses?
- How did the organizations respond to the disasters (and coordinate the responses)?
- What challenges were encountered?

- What successes were evidence?
- What lessons were learned?
- What are the implications for research and practice?

The author obtained additional informants through “snowball sampling” and many of these individuals were interviewed. All interviews were recorded digitally on a phone, transcribed, and then reviewed multiple times to look for unique issues, trends, lessons learned, etc.

The Context COVID-19 and the Magna Earthquake

The coronavirus disease (more commonly known as COVID-19 or COVID) is a severe acute respiratory syndrome that was first identified in Wuhan City in Hubei Province in China at the close of 2019. Although the original source is debated, the virus spread throughout the world. By February 2020, nearly 10,000 cases were reported along with 200 deaths which prompted a global health emergency. The disease soon spread to 114 countries with more than 120,000 cases and 4,300 deaths, which resulted in a global pandemic declaration by the World Health Organization on March 11, 2020.

The first reported case of COVID-19 in the United States occurred on January 21st with the first confirmed death in February. By March, there were 1,000 cases in the United States, and the infection and projected death rates began to alarm medical professionals and public health officials. President Trump declared a national emergency on March 11th and instituted a travel ban from China on March 13th.

At the beginning, the coastal areas of the United States had the most confirmed cases of COVID-19, but the disease was spreading to the interior portions of the country. Public officials in most states, including Utah, noted that “governments in general were looking pretty heavily at what was happening in New York [and California], and . . . bracing that . . . this sort of thing could happen in our state.” Meanwhile, a few Utah residents were on a cruise ship that was initially prohibited from docking in San Francisco on March 6th due to positive COVID-19 cases. Governor Gary Herbert wanted to assist them in their return and ensure they were quarantined. This was regarded to be “a ramp-up before really everything started going.”

Utah was in close communication with federal officials in the Centers for Disease Control and Prevention as well as FEMA Region VIII in Denver, Colorado. There were frequent meetings to discuss the number of cases, hospitalizations and fatalities in Utah. Policy makers were exploring emergency declarations, alternative care sites, and resource needs such as face masks, hand sanitizers, cleaning supplies/disinfectants, testing kits, medication and ventilators. The state appeared to be proactive in acquiring personal protective equipment according to a federal official who was interviewed. He said the emergency management and public health logistics folks put together a list of vendors and started making calls. They did a very good job at accessing and acquiring resources.

While Utah was dealing with COVID-19, it was probably the first state in the country to experience a minor or mid-sized disaster concurrently. Utah – particularly the northern portion of the state – is prone to the earthquake hazard. Many of the fault lines run along or near the Wasatch Front, which is an area that stretches 240 miles from Logan in the north to Provo the

south. The populated valleys parallel a sizable mountain range, which was formed by and prone to periodic seismic activity. Scientists agree that the area is long overdue for a major earthquake, but smaller events occur every 5-10 years (with the last major quake occurring 28 years ago).

At 7:09 am on March 18, 2020, a fault located to the West of the major Wasatch fault slipped, and the 5.7-magnitude quake was felt by an estimated 2.76 million people in Nevada, Idaho, Wyoming and Colorado.²³ Since the epicenter was located about 4 miles northeast of the Metro Township of Magna, the quake had stronger impacts on Magna, West Valley, Kearns, Taylorsville and Salt Lake City

People who felt the earthquake said it lasted between 10 to 30 seconds. One person described it as a “solid one.” Another resident said, “it felt like somebody picked up my house and dropped it.”²³ A third person said he was “sliding around on the floor” and commented that he could “only imagine what the larger ones do to you.”²⁴

The quake damaged hundreds of structures ranging from homes and schools to city halls and fire stations. Forty-nine mobile homes in a West Valley mobile home park were condemned temporarily because they were not anchored to the foundation. There was significant damage to the Brownstone and Panama buildings in Magna. Cyprus High School was damaged and West Lake Junior High School had to be demolished. Public buildings in Salt Lake, South Salt Lake and West Valley received damage to windows, suspended ceilings, walls, staircases and parking structures.

Some of the most significant damage occurred in older buildings such as the First United Methodist Church (constructed in 1906), the Crane Building (constructed in 1910), the Jackson Apartment building (constructed in 1915), and the Fuller Paint Building (constructed in 1922).²⁵ Other structures with unreinforced masonry, such as the Rio Grande Train Depot, the Salt Lake Rescue Mission and Colosimo’s Market, experienced cracked walls and facades that fell to the ground.

The earthquake also affected infrastructure. Some roads were damaged, and a few traffic lights were not functioning. Over 55,000 customers lost power.²⁴ The Salt Lake City International Airport was shut down due to broken water pipes and local train lines were taken out of service. It is estimated that the earthquake caused more than \$20 million in damage,²⁶ and damages are still being identified in fiber optic systems and storm drains.

In spite of the initial damage and over 2,500 aftershocks, the Salt Lake Valley was spared the grave potential. The quake was not the anticipated 7.0-magnitude event that is expected in this area. One interviewee commented “the truth is we didn’t have near the amount of damage that most forecasters predicted . . . and it could have been a whole lot worse.” Another City Manager stated that he was glad that liquefaction did not occur because his City Hall is located in this hazard prone area.

Regardless, Salt Lake City Mayor Erin Mendenhall stated, “the last thing we need right now is an earthquake.”²⁴ Ironically, FEMA was holding a meeting at the University of Utah about the Wasatch Fault days before the earthquake occurred. He commented “we were actually talking about it. What would you do during a pandemic if this happened? That Tuesday, it happened!”

Non-COVID-19 Related Challenges Encountered in the Response

The response to the Magna earthquake was fairly complex. Many entities were involved in the response including local jurisdictions, a municipal service district, three counties (Davis, Tooele and Salt Lake), the state, and FEMA. First responders from police and fire agencies, engineers and other damage assessors, emergency management and public health personnel, mayors and other elected officials, and federal Disaster Recovery Specialists participated. EOCs were running at every level of government. Other participants included debris removal companies, the Seismic Safety Commission, utilities, a historic preservation society, the media, voluntary/non-profit groups and the American Red Cross, among others.

The response demonstrated a wide range of success and preparedness levels. Some jurisdictions were fully capable of dealing with the earthquake while others struggled at times with challenges that became manifest and had nothing to do with COVID-19. Eight of these are particularly noteworthy and will each be discussed in turn.

1. There may have been inadequate continuity of operations planning (COOP) in one smaller jurisdiction. The Mayor of one city was visiting relatives in Arizona and at least some of the other leaders in the city were unaware of his travel schedule. When a city council member showed up at City Hall to see how things were going, her colleagues said, "Oh, by the way, you are the Mayor." Upon hearing this news, the Mayor Pro-Tempore decided to walk down Main Street to see the damage first-hand. She noted she was stopped by police since she didn't have anything official indicating that she should be in the area. She mentioned the need for "a vest or a hat or identification or something" so they knew it was ok for her to be there.
2. Some of those interviewed noted that the cellphone communication systems went down almost immediately. The Mayor Pro-Tempore mentioned above was trying to contact the City Manager and City Council members to initiate the jurisdiction's response. She "could not get through and they could not get through to me." Although the Mayor Pro-Tempore could text relatives in Boston, "she could not call outside to anywhere" immediately after the earthquake occurred.
3. Another challenge was a hazardous materials release that temporarily shut down one Emergency Operation Center. When the earthquake struck, an antique lantern that was used by firefighters decades ago fell out of a display case and broke when it hit the floor. Emergency Management personnel entered the hallway to survey the damage and one person wondered "what is that smell?" He realized it was carbon tetra chloride and said "we checked it out . . . [and] cordoned off that portion of the building. Luckily, we had our Haz Mat guys in the EOC, so they just called their buddies. They showed up in their suits and had it mitigated within 6 hours." The city had to respond to the earthquake during the initial hours without a functioning EOC.
4. An additional issue pertained to vulnerable populations that were severely impacted by the earthquake at the Western Estates Trailer Park in West Valley City. The majority of the 48-50 mobile homes were not properly anchored to their foundations. Structural damage resulted and approximately 32 of these mobile homes experienced breaks in their gas lines. No fires resulted, but Dominion Energy

shut down service to the entire neighborhood. The water was also turned off, and many of these trailers were condemned and deemed uninhabitable. Many of the homeowners or renters did not have earthquake insurance because “it was just too expensive,” and they lamented that the repairs “will cost too much” and didn’t “know what to do.”²⁷ Residents were asked to evacuate, which proved to be difficult in a variety of ways. A leader from the American Red Cross mentioned they dispatched representatives to the area. They discovered a language barrier and issued “a call . . . across the state to see what team members could help. The Red Cross leader stated that “we are very fortunate that the LDS [Church of Jesus Christ of Latter-Day Saints] community is very diverse in their language speaking,” so she was able to assemble “quite a few people that could . . . overcome that barrier.” The Red Cross leader mentioned that the “volunteers were on the ground going door to door trying to help people. She commented “they were successful in some cases, but in other cases no matter how hard we tried they still refused our help.” The Red Cross leader clarified that there may be “misconceptions about the Red Cross and government,” and stated “I would venture to guess that we hadn’t done a good enough job creating a comfortable and welcoming environment for all cultures and diverse backgrounds to feel like they can come to us and feel like their information is safe.” She accordingly affirmed that there is a greater need for “cultural representation in understanding - that I’m looking and talking to somebody that is a part of my community. And they are able to communicate not only in my language, but also be able to relate to and understand my culture.” She admitted that “we need to continue to establish those relationships . . . to be able to serve these communities . . . and help build that trust.”

5. Social media and public information issues were a further issue that confronted one jurisdiction. One of the individuals interviewed noted that “there was a lot of misinformation out there that had to be debunked quickly.” Someone had posted on social media that there was a likelihood of a 9.0-magnitude aftershock. Other people were suggesting that they had “insider information from the local congressional office” and that the federal government would handle it all. This caused some victims to tell local emergency personnel that “we are going to wait for the feds.” The interviewee said “we’ve got to have a press conference. We’ve got to lay it out what’s really going on” so we can educate our community and “manage expectations of the public.” A press conference was held, but the City Manager lamented that the media’s approach is if “it bleeds, it leads.”
6. An insufficient number of emergency managers or trained personnel was a barrier in some jurisdictions. One interviewee believed “the lack of full-time dedicated emergency managers in all our municipalities . . . is an ongoing issue in the valley.” In his opinion, this shortage complicated information sharing among the 16 cities in the area. Another person noted that she had taken FEMA national incident management system (NIMS) and disaster liaison trainings but admitted that there were “a lot of specific things we discovered we were weren’t doing, didn’t know ... or we needed to figure out.” In another case, a recently appointed Emergency

- Manager was a political appointee who really did not understand her role in disasters yet, which required her to rely on more experienced personnel.
7. One jurisdiction was “a brand-new municipality . . . [and] there were a lot of things that were never pre-pondered.” The City Manager stated that his jurisdiction was “a unique duck under the municipal code and state law” and surprisingly “had never been [fully] reported as a municipality.” As the city started to coordinate the response with the county, the state and FEMA, it was soon recognized that the municipality was not yet completely registered with the county or federal government. The jurisdiction therefore had to “work with Region VIII to get that recognition.” In addition, the City Manager mentioned “we had never adopted a flood ordinance that met FEMA standards” so we had to make “promises that we are going to do this after the fact.” He commented “how far behind the bureaucratic power curve our community was going into this quake” and stated that this “was a unique challenge that most cities or counties would have never experienced.”
 8. A final difficulty related to the disaster declaration process. One person noted that the earthquake “did not receive an immediate disaster declaration” and indicated that “it might have been different had it been a more significant earthquake.” Nevertheless, the entire Salt Lake Valley did hit the required threshold for Individual Assistance and that was declared by local governments, the county and FEMA. President Trump also approved Individual Assistance and Hazard Mitigation on July 9, 2020 (within 120 days of the incident). Nevertheless, one of those interviewed wondered if there were other priorities at the White House since Public Assistance was more problematic. He said the declarations were submitted, cleared FEMA and were given to the White House for review but none of them were getting declared. Eventually, the declaration was rejected, but a Public Assistance appeal was made and approved by the end of December.

The Positive Impact of COVID-19 on the Response

Normally, it would be assumed that COVID-19 would have only a negative impact on the response to the Magna earthquake. Interestingly, there were at least two areas where COVID-19 reduced detrimental consequences or facilitated an improved response to this disaster. These included the shut-down of many schools and businesses, and the activation of EOCs prior to the earthquake.

First, many individuals noted that “we were lucky” or had “dodged a significant bullet.” One respondent was relieved that “we did not have people injured. We did not have people trapped. And we were not going to need search and rescue.” The magnitude was not overwhelming, and it occurred before children had gone to school and others went to work or were running errands. COVID-19 also curtailed normal daily activities. Emergency orders relating to the pandemic were invoked between March 6th and March 13th in Utah. Salt Lake County had already shut down so many non-essential employees were working at home during this period. Universities and businesses had also closed or altered their hours and mode of

operations, which resulted in a situation where there were fewer people in vehicles, walking on the streets, making purchases at convenience stores, ordering breakfast in restaurants, etc.

Second, COVID-19 had required the activation of many EOCs and this early transition went smoothly in most instances. Some jurisdictions had already been doing “EOC training forever” before the pandemic occurred and this was of great benefit. One emergency manager noted that “he basically spent the last year revamping our operations room with new technology [and] new furniture lay out. He stated that his city “had spent the last couple of years finding the staff and training the staff as far as what it means to be an ESF [Emergency Support Function] person. I literally started on ESF 101.” He was relieved that “everybody knew what to expect” and commented that “it is a good thing it happened in March 2020 and not March of 2019 because we were in the midst of trying to get all that organized and fixed.” In his opinion, the earthquake “couldn’t have happened at a better time.”

Beyond this proactive planning, COVID-19 itself proved beneficial. Those interviewed commented that “we were already activated because of COVID,” or that our EOC was “leaning pretty far forward in anticipating some issues.” Various examples confirmed this:

- “It had actually been set up as the COVID EOC. So, we were already in place when the earthquake happened, which was good for us.”
- “The Salt Lake County EOC was already active. So, when the earthquake hit, they actually just shifted some of the assets and focused on the earthquake response.”
- “The day of the earthquake I was actually there at the EOC . . . getting everything dialed up . . . to deal with . . . COVID stuff when the building shook. So, I was able to notify everybody that we were going to level 1 activation. Because we already had the room up and going, everybody was well-acquainted and trained up it was pretty awesome to witness.
- “We were already functioning and operating as an EOC. The Commissioner was present in the EOC the day of the earthquake, and we had good support and daily contact with the Governor and Lieutenant Governor. So, we had all of the players here engaged in an operation and connecting. I think that was one of the biggest positives.”

Therefore, COVID-19 gave a head start to emergency operations and allowed essential relationships to be established or strengthened before the Magna earthquake occurred.

The Impact of COVID-19 on the Earthquake Response

Although COVID-19 may have minimized injuries and the loss of life and helped to strengthen emergency operations, its relationship to the earthquake was certainly more complex than this. The earthquake temporarily shut down the state’s COVID-19 hotline (Rice 2020), thereby causing a pause in information sharing or assistance given for the pandemic. COVID-19 also complicated evacuation, sheltering and damage assessment operations in various ways. It likewise created the need for a virtual response, added to financial/accounting challenges, and placed further burdens on very busy emergency management personnel. One of the City Managers interviewed said COVID-19 was definitely “running through our minds” as we were responding to the earthquake.

Evacuation and Sheltering

Some of the problems associated with evacuation had nothing to do with COVID-19. Many individuals and families on Main Street in Magna who were evacuated by the fire fighters did not always have proper shoes or coats for the cold weather at the time. Others did not bring necessary medications with them and some even left pets in their homes or apartments. While it is unclear if clothing and medicines were acquired, people did say their dog or bird was still in the apartment. So, the fire fighters worked with Animal Control to retrieve pets so they could be returned to their proper owners.

But, COVID-19 did have a significant impact on evacuation in other ways. A tank holding hazardous chemicals fell and was damaged at the Rio Tinto Kennecott smelter property. Due to the breach, 8,200 gallons of hydrochloric acid leaked in the facility, causing fear of it interacting with other chemicals in the room which could create a dangerous reaction and/or plume. Rio Tinto Kennecott evacuated the area, 9/11 was notified and the Unified Fire Authority Haz Mat Team was dispatched to the scene. One jurisdiction was made aware of the issue, but a City Manager lamented that his information was limited and unconfirmed. He stated, “we didn’t what type, how big, was there a plume or any of that,” but started “thinking about our evacuation plans” nevertheless.

Meanwhile, after sizing up the incident, another Fire Captain notified a Mayor Pro-Tempore that a chemical plume could pose a threat to Magna since the winds were shifting. The Captain noted that “we have a situation that is developing rather quickly, and we need to make a decision.” The jurisdiction realized that it would have to “formulate an evacuation plan in the middle of a pandemic,” but this was worrisome because they had to:

figure out how to create two different evacuation plans for the different groups of people. How do you determine if somebody is positive or not? How do we test them before they get on the bus? And, what do we do with the bus driver? We can’t mix people. We were still trying to figure out those answers. So, that’s where it got really, really crazy.

The city was about 5 minutes away from ordering an evacuation of 30,000 people when the HazMat crew reported that the situation was not significant threat. The specialized team was able to get a drone into the room and verify that the substance had stayed in the catch basin and had not interacted with other chemicals stored in the room. One person reiterated that his jurisdiction was relieved that the team had mitigated the issue, so an evacuation was not required.

Although Magna did not need to be evacuated, several evacuation centers and shelters were set up, contemplated or used on a temporary basis. Kearns and West Valley had been impacted by the earthquake, and perhaps as many as 150 people had been evacuated to a church and other locations for a short period. When people were asked to leave apartments on Main Street in Magna, they went to the nearby Webster Center (which is a public building where the city offices are located) that could accommodate the numbers. One respondent

mentioned they set up a warm evacuation center for the displaced who couldn't return to their homes. Her city worked "with the Health Department . . . to provide a safe screening which was also new for all of us. [It included] temperature checks, mask wearing and social distancing." None of these locations were equipped for a long-term sheltering operation, though, so alternate and more permanent locations had to be identified and established.

The major concern at this time was the pandemic. One official noted that "it was really at the beginning . . . of COVID. And we were really one of the first areas to pioneer what do we do during a pandemic in mass care." Another said, "the issue was making sure we were not speeding up the spread if we had to do evacuation." There was a high degree of caution since "we were still in the process of writing out policy as an organization." An additional person commented on the challenge: "How do you shelter people in the time of COVID? Shelters by nature are communal in every way - in the rooms where they sleep, in the bathroom facilities, eating facilities – everything is communal." A different person mentioned that masks and social distancing were concerns that were part of the conversation. It was acknowledged that "you couldn't just shove all people into a building" but "it was so early we didn't know very much."

Regardless, since "nothing was set up to function appropriately in a global pandemic situation," "the overall priority for sheltering was to separate people who may have had or been exposed to COVID." This was problematic because "at that very early time . . . we did not have any testing in Utah. We were just looking at temperature. [So, if] . . . there were people who were sick or who had a fever [they] were going to have to go to one place and then everyone else would go to a different place."

Several shelter locations were identified and debated including Taylorsville High School, the Sandy Mountain America Convention Center and the Maverick Center (a sports and events stadium in West Valley City). Emergency management personnel were also looking at the possibility of utilizing community recreation centers. One individual stated "those things were [already] shut down because of COVID which offered us the ability to use them for the earthquake if we needed to. They were just sitting in anticipation of a surge. So that was our primary plan along with schools and faith-based buildings that we would use if we needed to."

Although there was a lot of talk about different sheltering possibilities, these options became obsolete or less desirable. One interviewee noted that "we didn't need to shelter a lot of people because the damage was not as extensive as it could have been." Others stated that "most of the people that we had to relocate actually had somebody that they could go stay with or would come get them." In addition, some felt it didn't make sense to open locations such as the High School and try to maintain them to the necessary hygiene standard.

But, the overarching reason why mass sheltering was generally rejected was directly due to COVID. One official commented that "everyone agreed that the traditional congregate sheltering option was no longer a safe option. So, they . . . made a shift into . . . non-congregate sheltering which for us would be . . . hotels, motels, dormitories, [and] things like that." This idea was floated around initially when the Governor was trying to return Utahns home from the Cruise ship. At the time, there was preference for hotels with entire wings open or motels that did not have common hallways.

The topic of non-congregate sheltering was also being discussed seriously by FEMA right before the earthquake occurred. Since this federal agency realized that it was about to roll "into hurricane season . . . there was some initial policy discussions going on. If we have to

evacuate people during COVID, how do we allow that since our normal mode is to fund big Red Cross congregate shelters? Obviously, if you are worried about an airborne contagion and you're sticking a bunch of people in a high school gym is not really the right way to go." Recognizing this potential problem, "there already had been indications from FEMA National that there would be support for non-congregate sheltering if it had to be done."

Planning for and carrying out such sheltering operations involved close coordination between emergency management personnel, Public Health Departments and the American Red Cross. An American Red Cross representative stated that the Public Health Department personnel "have been tremendous. They really stepped up and have become just such a great partner and a great ally being able to ensure that everything is safe for not only us but for everybody in the community. We would never want . . . [to open up a center and] become a super-spreader event where everybody there got sick."

With this in mind, one local government official commented that this "is essentially what we did for those individuals that came to us that day." It was noted that "the county used its rapid response housing money to fund that." This benefited both those who had evacuated as well as the hospitality businesses who were struggling at the time. The Red Cross funded 187 overnight stays for those who were displaced or affected by the earthquake. It was also stated that their "42 volunteers and staff members had provided 943 meals, 202 snacks, and distributed 50 cleaning kits and 48 comfort kits."

Damage Assessment

There was not a lot of debris that resulted from the Magna earthquake, so one city simply contracted with Wasatch Waste and Recycle to bring a few large dumpsters to Main Street so broken bricks could be discarded. Since there were no other immediate issues, the priority turned to damage assessment for both individuals and families as well as for public facilities and infrastructure. This damage assessment was complex due to the nature of the task. The hidden damages slowed down the process since they did not always show themselves immediately due to the magnitude of the earthquake. One of the people interviewed said "it took a little longer for a lot of the folks to realize they had structural damage. It wasn't quite large enough to be apparent, but it was large enough to have some . . . hidden structural concerns."

Nevertheless, there was a noteworthy relationship between COVID-19 and damage assessment, which required some novel approaches so this task could be completed correctly and completely. A local government representative stated that it was "interesting being right in the middle of COVID [and] it definitely created some challenges for us." While much of the damage assessment was often undertaken in person, in other cases it was accomplished through virtual means. Due to COVID, "it wasn't the normal disaster where we could [always] get our damage assessment teams together in groups and go out and do onsite reviews of damage." FEMA was on travel restriction due to the pandemic and could not dispatch personnel, so they relied heavily upon the digital pictures that were submitted by the county and state. In addition, the local, county and state governments were extremely busy. Because of COVID, some wondered if they had "adequate staff with adequate with adequate protective measures to be able to do it first-hand." These governments were already "up against a wall

because of everything they were doing to support COVID.” This may have been one of the reasons why an extension was needed, requested and approved.

As the situation unfolded, most jurisdictions completed a rapid or windshield assessment. In some cases, this was done by individuals, the fire department, and the police department. For instance, one of the elected officials in Magna said she started “driving around my neighborhood just to see if there was damage and what was happening.” She also said, “I went down-town and I could see the damage on Main Street, which was quite extensive.” The Fire Department was already on scene inspecting the damages and beginning to evacuate residents when required to do so. However, because there were so many people on scene looking at the damages, “it actually got to a point it was inhibiting the damage assessment.” For this reason, the Police Department cordoned off Main Street so the Fire Department could focus on its responsibilities.

In Salt Lake City, the windshield assessment was impressively organized with geographic information system (GIS) maps. GIS personnel assigned each police officer a portion of the city to evaluate. Digital maps that were separated by ESFs were uploaded on the officers’ laptops in their cruisers. The police officers would assess their assigned area and then report back on their findings. This enabled the city to get a broad picture of what had happened in a relatively short period of time. There were a few small hiccups, however. Some officers could not find or access the maps on their computers. So, some additional communication and training had to occur so the assignment could be completed. Also, there was a small misunderstanding in the EOC. When a sizable aftershock occurred, the person who was coordinating the damage assessment wondered aloud if they had to start inspecting everything over again. Some individuals behind him heard what he had said and started notifying the police officers to check damages again. The leader had to retract the request “because he was just talking aloud” which caused some confusion. Nevertheless, it was felt that this damage assessment process with the police officers “worked very well.”

Upon completion of the windshield assessment, attention could be given to a more detailed assessment of residential and public damages. It was reported that the existing forms were locked up in schools and there hadn’t been sufficient training on them. Noting this fact and the ongoing threat of COVID-19, the Planning Director proposed the use of an online damage assessment tool. She had worked previously in southeast Georgia and had worked with a digital damage assessment application after a hurricane. A similar document was therefore created in English for the city (and then translated in Spanish by those working in Public Information/External Affairs). The form was uploaded by the information technology personnel after about an hour or so and the public was notified via social media or the news that they could access it at www.msd.utah.gov. The link was also placed on the city webpages so individuals could relay the condition of their homes and even upload pictures of damages. It was reported that this tool “allowed the public to click on the link to give a quick structural update of their property right on to the website so you didn’t have to send people out and about to look at every house.” It was also noted that the County adopted this approach and “it freed us up a ton” so the engineers could focus more on the public infrastructure. The digital damage assessment process was regarded to be “seamless” and respondents stated that “the damage assessment form worked really good.” However, it was acknowledged that there may be some individuals who are not comfortable with using this type of technology.

While this was occurring, the assessment of damages to public facilities and infrastructure was also taking place. It was vital to declare buildings habitable or uninhabitable, and also begin to tally financial losses. During this process, various challenges became evident. First, some buildings were not opened, so one respondent noted that his “real estate and asset management team . . . [had to get] people keys to buildings to do assessments.” Second, there were limited personnel to assess damages so additional resources had to be requested and deployed from the seismic safety group, the county and the state. Third, some of the existing personnel were not fully familiar with the damage assessment process. For this reason, “the state had two trainers they sent . . . here to work with the boots on the ground. That first afternoon our guys hit the ground to start doing assessments.” Fourth, there were some concerns about doing assessments in structures that had substantial damages. One person noted that “there were circumstances where we did not go inside buildings if it was structurally unsafe. That was both for their personal safety if the structure wasn’t sound, but also due to COVID.” This brings up a final issue. The pandemic created some uncertainty about in-person damage assessments because COVID-19 was so new. In the words of one person:

everybody was worried about COVID, but nobody really knew anything. We just knew it was a pandemic – an epidemic type spreader. We knew it was a problem. But, in our case, it wasn’t like we had PPE [personal protective equipment]. So, some of our guys did their best . . . to social distance from others.

This individual also mentioned that while those doing damage assessments were using the internet in the Webster’s Center to record their findings, they were trying to keep away from others as best they could. He said, “it’s not like they had face coverings – they flat didn’t exist [then].”

Meanwhile, FEMA was relying heavily on Salt Lake City and Salt Lake County to conduct the damage assessments and share pictures or videos electronically. As was noted, the goal was to have “someone who can look at a building and say it is moderately or significantly damaged [and] show us the assessed value of the property.” He mentioned FEMA could do the math and send a few people out to take pictures of buildings where the evidence was unclear. The FEMA representative also clarified the unique features of their involvement in the damage assessment/information gathering process:

on our end we supported them mostly virtually. We did some things we have not done before including some virtual town halls and some applicant meeting . . . we put together. It was definitely different, but . . . some of the things ended up . . . being best practices that we’ll probably continue to use in future disasters.

Although most things ran relatively smoothly, the damage assessment results did include some disagreements and discrepancies. It was noted by one jurisdiction that “we had some issues . . . between the two groups that were certifying the buildings and the engineers. Some would say it was habitable. Others would say it wasn’t. There didn’t seem to be a

common framework.” He acknowledged that “there were some complications there” and stated, “I think that is something we need to work out with the [unified fire authority] UFA team, [urban search and rescue] USAR team, and the county.” Also, the new process of relying more on county and state assessments created some confusion at times and lengthened the process. A FEMA official observed:

in a non-COVID environment, the advantage of sending in a big federal team of assessors is that you can just go out and everybody looks at the property one time and the federal folks think it’s this damage and the state folks think it’s this damage. If everybody agrees then you are through the process. But there was a lot more back and forth because it was virtual.

Another person agreed and said there were times “where we have had to go 4, 5 or 6 rounds of conversations and emails to work out an issue that in person would have been about 10 minutes.”

Virtual Response

The Magna earthquake was probably among the first operations (if not the first) to rely substantially on a virtual response, and it demonstrated the possibility of significant changes in how emergency management may be conducted in the future. Much of the virtual response was required due to COVID-19, but some of it also relates to advances in computer and internet capabilities. These changes were illustrated in the shift from in-person EOCs to remote work and in the use of a virtual townhall.

As mentioned earlier, most EOCs had opened and were activated due to the COVID-19 pandemic. When COVID-19 appeared and worsened after the Magna earthquake, different decisions were made about EOCs. For instance, one city decided to evacuate their EOC. The quake was substantial in this jurisdiction and city personnel did not feel safe in that building. Using their Incident Command Trailers, they set up a mobile EOC outside. Although efforts were taken to social distance people, there were concerns. One city manager reported that we were “all a little bit nervous about how transmittable it is.” He wondered, “how many are [of our people] going to be knocked out and how many are we going to be down?”

In another case, the EOC was open and actively managing the response to the earthquake. But, looking through the mirror of hindsight, those involved in the EOC may not have been as careful as they could or should have been. They did have their temperature taken, but people were not socially distancing and wearing masks. Much of this was due to the fact that “this was so early on that no one really knew.” Another person observed:

that was kind of interesting because the earthquake happened a little earlier on in the COVID response. At the time, we weren’t really into the full mask wearing and social distancing. That was still something that was being debated heavily as to whether or not it worked or didn’t work. And we were getting mixed

messages” from Anthony Fauci, the CDC and President Trump about wearing them or not wearing them.

However, when the earthquake struck the state EOC was open, and those managing it were also doing the best they could to be safe. A high-ranking state official commented:

Back at the time of the earthquake we had a fairly robust EOC going. We had people here onsite working in their groups and we were doing a lot . . . in person. I would say at that time there was probably easily 50 people at least. We were trying to spread out a little. Mask wearing was probably not happening on a regular basis, but . . . we were doing a temperature check and symptoms checking. Early on we started putting someone from the Health Department outside the EOC who was doing temperature checks. We were signing in and indicating whether or not we had any symptoms.

Even though EOCs were open, active and trying to keep people safe, there was a definite shift toward a virtual response. But the transitions did not happen all at once and different jurisdictions and agencies had distinctive experiences and results for a variety of reasons. Some of the American Red Cross employees had stopped going into the office a week or two before the earthquake. One of the respondents said he thought was that “initially . . . we are just going to do this for 2 weeks,” but she laughed that “we are still operating in a virtual environment” today. In another situation, city personnel were divided into a Team A and Team B and were anticipated to rotate in and out of the office each week. However, the employees never went back to the office after the earthquake and due to COVID. She stated that the primary, secondary and tertiary EOC locations identified in their COOP plan were either impacted by positive COVID cases or the earthquake. They were not available, which mandated a virtual response. In another jurisdiction, it was noted that “we pivoted digitally, and we were ready to pivot digitally.” The jurisdiction had updated their continuity of operations plans and was ensuring their personnel had laptops, software and phones to utilize at home.

FEMA was also moving toward a remote response for many of their employees. One Region VIII representative mentioned that there was a definite and active interest in reducing existing “FEMAisms” and that “there was an effort being made to find the way to provide the most assistance possible which was very nice to see.” Consequently, FEMA “got that technology across the board for those who needed it.” This was important because traveling was restricted, and people were managing the recovery efforts in Denver and even assisting from Florida.

The move to remote work was not without its challenges. One person who was interviewed provided a nice summary of the problems his city encountered:

it was not seamless because we had just barely started transitioning at home the week before the earthquake. I didn’t even have my workstation set up at home. It took some time to

make a transition to online working. We didn't have, for example, the ability to do electronic signatures prior to COVID. We had just started using Teams. So, it took some time to get people up and running on that. WebEx . . . would crash. I think people at home were not equipped for the bandwidth we needed and the whole world sort of went online at once. So, I think we were experiencing the same problems everybody else was.

Nevertheless, the remote work environment did function well in most cases and even had some advantages. A Region VIII employee stated that their FEMA Zoom accounts did not have major limitations for people or time. Therefore, they could have 300 people on a video conference call that could last a few hours. The move to remote operating environment "worked really well" for many of the individuals and agencies involved. A Red Cross also employee affirmed that:

We have been able to really adapt to these technological advances . . . which has really . . . improved our communication with our communities across our Chapter. We have continued to provide our service delivery as home fires occur, but we have adapted to doing that completely virtually. Before we would send our Disaster Action Team Members onto every scene of a home fire. Now we have them calling clients [with] video conferencing . . . to provide them with immediate service delivery [for their] unmet needs.

A FEMA employee likewise noted both the initial challenges and the resulting benefit. He said:

We didn't have Zoom. We didn't have Teams. We didn't have any of that. So, this helped solidify the technology that FEMA needs . . . to use in a virtual type setting let alone as a back-up or alternate. For us this was kind of a force multiplier. It helped us solidify what we . . . have been telling headquarters we've been needing this whole time.

Besides moving toward a virtual work environment, local and FEMA officials also experimented with virtual townhall meetings. It was noted that "in the past we have always tried to go and do community meetings and onsite public meetings." However, due to COVID, this was not advisable. Therefore, meetings to educate citizens or city leaders about FEMA processes were advertised and held online. Information was shared to disaster victims in a virtual setting and time was allotted for questions and answers. It was believed that the online meetings were "pretty well attended with those who had questions." A FEMA employee commented that "we have learned that we accomplished a lot of things virtually in this COVID environment and got some good participation - and maybe more so than we would have if it would have been a public in-person meeting." Therefore, the virtual town hall meetings

opened up new opportunities during the response to the earthquake and for the future of emergency management.

Although the virtual responses worked out fairly well, there were some drawbacks – particularly as they relate to the need for human connection. One leader for the American Red Cross described them well:

I think the thing that has been the hardest for our team is just that inability to provide the traditional comfort and care that people are looking for. You're consoling folks that have gone through something very traumatic. But, how do you do that at a safe distance? How do you console somebody from 6 feet who is sobbing . . . about what they have just gone through? So, it was very difficult to adapt our way of providing that comforting care and compassion to those that are suffering. It was also a bit nerve wracking for everybody to not know what we are going to be walking into, and what we knew about COVID at that time was still so new. But I think the hardest thing was not being able to hug and care for people like we do so naturally.

Challenge of Finances

Another concern that arose in dealing with the two disasters simultaneously was finances. A few complications were mentioned specifically – the deadlines for the use of Coronavirus Aid, Relief and Economic Security (CARES) Act funding, complex accounting issues associated with multiple disasters, and the need for redevelopment funding.

First, a high ranking official with the State Division of Emergency Management mentioned worries about the deadlines for spending huge sums of money from the CARES Act funding. This leader shared his gratitude for the financial assistance from the federal government but noted that it has been a challenge since the “states got all of this money with a deadline to spend it.” He then clarified “but, as we all know COVID is not going to end on December 31st.” He mentioned “we are spending a billion dollars in 7 or 8 months” in Utah and the state is keenly aware of its fiscal responsibilities to both the citizens and the federal government. Consequently, he said:

there have been some real difficulties in trying to budget the money that is available to us . . . but at the same time trying not to spend it on things we don't need. So, there has been a lot of challenges with the federal government just trying to get them to take action on extending the deadline for these dollars or making additional funding available.

Another concern about finances related to the tracking of funds spent on different emergencies and disasters at the same time. One respondent mentioned “the biggest thing . . . that came up was . . . needing to be very careful on the accounting side because there were

National Guard folks that were being used to support the clearance [of debris] in some places and making sure that was accounted for and separate from the National Guard folks that are supporting the COVID operations.” He acknowledged that “you can’t use the COVID-funded folks to do these other functions [for the earthquake] so [you have to] make sure you keep everything separate. So, it was a little more of a headache . . . to keep all those tracks separate.”

Also, and as noted earlier, Magna was the epicenter of the earthquake. Since many of their buildings were older, they received the brunt of the damage. This was troubling since the old commercial district on Main Street “had been forwarded by Preservation Utah Office to the federal government . . . [to be designated on the] National Registry of historic places.” There was a specific concern that the older buildings would be demolished and not rebuilt due to the lack of funding for retrofitting and rebuilding. Fortunately, it was reported that “the Salt Lake County Redevelopment Agency had an old Redevelopment Area [allocation] with a half a million dollars in it.” The city was able to acquire this funding²⁸ in less than 40 days, which a City Manager said, “was unheard of in government.” Preservation Utah (a non-profit organization) is now managing the funds to ensure the area is rebuilt to current building-code standards.

Workload and Burnout

A final and significant problem experienced pertained to the extensive demands that COVID and the earthquake were placing on emergency management personnel. Several comments drew out this issue at the local, state and federal levels. One respondent said “we were working super long hours. I was probably doing 18-hour days.” Another mentioned that Utah has “a relatively small staff, and most of their staff was already active in the COVID response.” A third person noted that the “state resources are about as exhausted as they can get now that we are in month 7 or 8 of ongoing [COVID] operations” and another person replied that “FEMA had activities 7 days a week.” One respondent noted “that folks are hitting the stress point and are not necessarily doing great. It feels like you get one thing cleared off the pile and five more things have arrived.” A final comment from a state official illustrated the load his team was carrying:

We started to get into COVID in February. It wasn’t getting too wound up yet until March. And then, obviously, we had the earthquake and we were on the finishing-end of legislature. We’re housed here on Capitol Hill so that is always a strain on our team anyway. We are also in the middle of moving and our office building here on the Capitol is eventually being torn down. So, between everything that was going on at the time, I definitely think there was a lot of stress happening. Burnout was starting to occur a little later on and then we started to run into the civil disturbance events when we had the protests - the riots downtown - and that became an almost an every night thing for a couple of weeks so that was adding an additional strain to the

staff. And, then, it was a matter of whether or not we had the right amount of people in person at the EOC versus working virtually. And we ended up we have our wildfire season [and then] a flash flood in St. George. We have the big windstorm that hits the Wasatch front. So, it was just non-stop, one thing right after another. It's definitely been a trying year for our staff.

In light of these demands placed on emergency management personnel, efforts were made to limit time at work, give time off or rotate schedules. One person said "we started to crack down and say 'look, we need to start rotating out. We can't have the same people showing up and doing 12/18-hour days every day of the week.' So, we got them on a rotation to take care of everybody." Another replied "we were actually splitting shifts. We had one person come in doing a 9- or 10-hour day early in the morning [and another] late at night so that we were not running anybody the full 12 hours at a time. My concern from the beginning is that if this goes as badly as it looks like it might and we . . . end up running 3 or 4 months, the last thing I wanted to do is having anyone burn out."

There was a silver lining due to COVID, though. One person commented that the remote work had helped to minimize burnout. He said with a full-on EOC activation we would really see burnout. "In some ways the ability for them to be working at home and having those comforts is probably been helpful this year. I think that it maybe was a saving grace that things kind of worked out that way."

Discussion

Overall, those involved in the response should be commended for their efforts to respond to two complex events simultaneously – especially since the earthquake happened only about a week after COVID-19 was declared a national emergency. Many of the respondents praised their organization and other personnel outside their agency/jurisdiction who assisted in dealing with COVID-19 and the earthquake. Those interviewed said "the fire and police both responded admirably" and appreciated these "well-trained individuals." Respondents praised the American Red Cross, the Health Department and FEMA. Others credited "the partnerships that had been previously been established [which] had allowed us to have trusted communication and collaboration between locals and the state." FEMA already had some locally embedded individuals in the state EOC, and this allowed immediate coordination between the state and federal government. Those interviewed also stated that there was "rapid collaboration among the various parties involved and innovation . . . to meet the needs of communities and disaster victims/survivors in a timely manner." In addition, some of the efforts – particularly in regard to the use of GIS for damage assessment, EOC training and the move to a virtual response – were noteworthy. One City Manager likewise noted the role of innovation he witnessed in addressing the demands they faced. He said "you try something. You figure if and how it works." He also said the best thing to do is ask questions:

what is your capability? What are the advantages and disadvantages? What else do I need? What else could we do? How else could we do this differently?

The City Manager then said, “we’ve made a lot of progress and [had] success in our remote work capacity capability.” He stated that by the time most individuals were getting back into their mobile homes in West Valley, building inspections could be conducted remotely (through a Zoom meeting where the building inspectors ask residents to show them what they needed to see). The City Manager was pleased that the jurisdiction’s EOC is operating virtually now. He even mentioned that he traveled in his motor home to an isolated location in Missouri and said in spite of some minor connectivity issues at times, he “was able to do everything that I was normally doing.”

Nevertheless, opportunities for improvement were noted. Several general lessons can be derived from the response to the Magna earthquake:

- Older, unreinforced masonry buildings must be retrofitted and brought up to code.
- Mobile homes must be anchored to their foundations in seismically active areas.
- Hazardous materials releases should be anticipated when earthquakes occur.
- Plans for alternate/redundant EOC locations should be identified.
- Preparations should be undertaken to minimize communication disruptions.
- Training is required on the damage assessment processes.
- Federal deadlines for declarations may need to be extended due to hidden damages.
- Evacuees should bring medications and pets with them (if the situation allows).
- Rumor control should be managed through intentional public information campaigns.
- Jurisdictions should ensure legal paperwork is up to date to streamline the application process for federal assistance.

There are also specific COVID-19 related lessons that can and should be derived from this study of the Magna earthquake. The state was very proactive in its response to COVID, and all jurisdictions did their best to adapt to the unique demands presented by the Magna earthquake at the same time. Leaders and personnel took additional measures to minimize the spread of COVID-19 during the response to the earthquake, and their hard work over an extended period of time is to be commended. The excessive demands on organizations coupled with the willingness to innovate, resulted in some positive lessons and outcomes. In the words of one FEMA official:

The biggest one for me is that we can do it this way. There is definitely a ‘this is the way we do business assumption,’ and I think . . . we demonstrated very conclusively . . . that there are other ways to do business and they might be better than what we have been doing. It worked pretty smoothly. It was definitely not problem-free, but it was a lot easier than I think almost anyone . . . was really expecting because everyone came to event with the

same goal of getting assistance out as clean as possible for the people who needed it. It showed in the meetings. It showed in the discussions. And there really was an assumption that we can make this work. It worked . . . really well.

The impact of COVID-19 on the response to the earthquake is extremely important to consider for the future success of emergency management. First and foremost, it is imperative that leaders are extremely clear about the use of masks and PPE in future epidemics and pandemics. In the case of COVID-19, Dr. Anthony Fauci mentioned on 60 Minutes and in various news interviews that masks would not be needed. And, even after he and others from the CDC or Department of Health and Human Services suggested that masks should be worn, President Trump did not unequivocally endorse the practice. He actively opposed the wearing of masks at times or at least was unclear about his support when talking to the media. These mixed messages undoubtedly had a negative impact on containing the virus and should be avoided at all costs going forward.

Second, there must be a recognition that it is not unusual to have complex and/or multiple disasters impact a jurisdiction, state or nation at the same time. Two quotes explained this nicely:

- It is never one thing when you have an emergency. We all like to think that. But, it's never one thing. In our case, it turned out to be what's now a full-blown pandemic in an earthquake. As much as we wished it was one event, it is never really one event. Everyone tends to forget that there are events within the event.
- When it comes to emergency management, we're always talking in the abstract – you know, 'something that is going to happen in the future.' And, we think in the back of our mind, that is not going to be us, so we don't need to worry about it. And, here we have several concrete examples from this year where it did happen. Having numerous things happen in the same year really elevates the importance of being prepared for the future.

Third, current and future planning efforts should give additional attention to evacuation and sheltering during epidemics and pandemics. If serious respiratory viruses are present, plans should be designed to test disaster victims for symptoms and then ensure those who have been exposed are separated from those who have not been exposed. This will obviously require the planning of alternative options for evacuation and sheltering functions that have heretofore been unnecessary.

Fourth, additional emphasis may need to be given to alternate EOC sites and the capability to implement virtual responses must be built. In the case of the Magna earthquake, one jurisdiction was unable to utilize its primary, secondary and even tertiary EOC sites due to exposure to COVID-19 or damages to public buildings. Also, local, state and federal emergency management agencies may need to consider further investments in communications, computer, and data-sharing infrastructure to facilitate remote operations – whether these be at home or at other off-site locations. Decisions may also have to be made about which

software platforms will be utilized (e.g., Microsoft Teams, Zoom, WebEOC, Webex, etc.) as well as if and how they will interface with each other. Innovative public information meetings that are held virtually could be increasingly applied going forward, provided that the pros and cons are fully understood and appreciated. Of course, it is important to recognize that larger disasters may make virtual responses more challenging if the power goes out and if internet systems are severely disrupted. One respondent stated, “if a major quake had happened around the same time as COVID,” it is doubtful that it could have been managed 100% remotely.

Fifth, because “lack of depth [of personnel] was a challenge,” it may be wise for local, state and federal governments to hire more personnel. These emergency management employees (and others) must also be trained to address the complications associated with simultaneous disasters. If these complex events extend over a period of time, personnel will also need to be rotated out periodically to reduce stress and avoid burnout.

Finally, those working in finance and administration must give additional attention to accounting issues when multiple disasters occur at the same time. A failure to carefully track distinct impacts, damages and expenses could delay federal assistance or result in a loss of revenue/reimbursements. Proper accounting should be practiced so disaster recovery can be sped up and more fully realized.

Conclusion

By way of summary, emergency management personnel at the local, state and federal levels were confronted with not only COVID-19, but also a notable earthquake that struck Magna and other nearby jurisdictions in March 2020. The responses to these simultaneous events were largely successful and should be commended, even if some general challenges were evident as they are in any disaster. However, the combination of COVID-19 and the earthquake illustrated the unique features of dealing with concurrent emergencies and disasters. In some ways, the early onset of COVID-19 limited the loss of life and actually enabled the response to the Magna earthquake. But, in other respects, COVID-19 complicated evacuation, sheltering and damage assessment functions. COVID-19 also altered EOC operations, created the need for a virtual response, and had adverse impact on financial accounting and the workload placed on personnel.

Ultimately, the response during the unusual interactions of COVID-19 and the Magna earthquake illustrates the need for more planning, communication and collaboration between emergency management and public health and medical personnel and organizations. This study reveals the need for further research on many topics: human behavior in pandemics, evacuation/sheltering/damage assessments during pandemics, the benefit of remote EOCs and virtual townhall meetings, how to track finances and rotate out personnel effectively, and the impact of modern technology on the future of emergency management.

It is hoped that this article will help in some small way to direct the unfolding research agenda and facilitate successful responses when multiple emergencies and disasters collide. In the words of one respondent, “we can never be too prepared.”

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