Incorporating Lessons Learned during COVID-19 into Future Planning for Emergencies and Disasters

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<u>Abstract</u>

The COVID-19 pandemic prompted the largest emergency response activation in the nation's history, creating unfamiliar challenges for public health, emergency management, and an array of organizations not typically involved in such operations. In some areas, compound disasters exacerbated the strain on resources and required additional adjustments. The far-reaching impacts of these crises have been particularly devastating for marginalized communities, with disproportionate rates of illness of death amplified by secondary stressors such as housing instability and financial losses. Reflecting on lessons from since the start of the COVID-19 pandemic, this publication identifies measures needed to improve preparedness for complex and compound emergencies. Additionally, it provides strategies to promote equity and justice in disaster-related programing and practice.

INTRODUCTION

The COVID-19 pandemic has introduced a range of challenges, both anticipated and unanticipated, to the field of disaster management. The response to this public health emergency in the United States has required coordination among personnel from across a wide spectrum of disaster responders, including groups and agencies that typically operate in silos. The scale of nationwide mobilization has been unparalleled, presenting novel challenges and innovations. Moreover, as the pandemic has evolved, other hazards and disasters, such as hurricanes, floods, wildfires, and industrial accidents, have continued to occur. The convergence of these events has presented complex challenges for disaster planning and management as the agencies responsible for these tasks have had to juggle competing priorities and directives in unfamiliar circumstances.

Particularly in disaster-affected communities, the crush of compound emergencies has left little time for reflection and documentation. Local and state emergency managers have modified plans and procedures in response to emerging conditions but have not necessarily been able to incorporate lessons from these early modifications into emergency plans. As the pandemic continues to evolve through new disaster seasons and threats, reviews[1] are needed to assess past adjustments and apply lessons learned.

The impacts of the pandemic have not been felt equally. Black, indigenous, and people of color; low-income populations; people with disabilities; older adults; women; and other historically marginalized groups have been affected in diverse ways that extend beyond disparate rates of illness and death—which have themselves been devastating. The crisis has magnified disaster vulnerability among these groups, highlighting the need for strategies to enhance equity and pursue more just approaches for disaster management. As the virus continues to evolve, disaster planning and response must evolve in tandem.

STRATEGIES TO INCREASE PREPAREDNESS FOR CONCURRENT THREATS

Emergency preparedness and response efforts in these first two years of the pandemic have called attention to the importance of planning for complex and concurrent threats. Less than weeks following the World Health Organization's characterization of the COVID-19 crisis as a pandemic, a spate of tornadoes touched down in Alabama, Florida, and Georgia, damaging homes and highlighting the complexities of compound threats and conditions of uncertainty. There is much to be learned from the disaster response during this time, particularly in an era of intensifying disasters due to climate change. It is important for disaster planners to begin documenting and reflecting on these experiences.

Incorporate pandemics and public health emergencies into disaster plans.
The need to integrate public health emergencies into state and local disaster plans stands

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[1] See Appendix A for guidance on conducting such reviews.

out as one of the most important lessons from the first year of the COVID-19 pandemic. The nature of the initial response to the virus, though variable across geographies and levels of government, largely suffered from poor coordination and inadequate integration of public health into traditional emergency response structures. Efforts to address these shortcomings are needed not only to improve current and future pandemic response efforts but also to increase preparedness for multiple intersecting hazards, such as when wildfires, hazardous air quality events, hurricanes, and heat waves have occurred—sometimes simultaneously—during the pandemic. Emergency planners need to be prepared for the multiplier effects that such incidents create that can impact disaster response and require more comprehensive planning.

For instance, in working with emergency management agencies for evacuation and disaster shelter planning during the pandemic, public health and extreme weather response became a compounding response. Shelter plans have had to be revised to allow for social distancing, reducing the capacity of the shelters, as well as the transportation assets to help evacuate those who could not evacuate themselves (National Academies of Sciences, Engineering, and Medicine 2021). This quickly expanded the number of sites, vehicles and staff needed in an environment where there were potentially fewer resources and volunteers available due to travel restrictions and general pandemic concerns. To help reduce pressure on shelters, evacuation strategies called for more targeted evacuations and encouraged shelter-in-place where feasible (FEMA 2020).

Fortunately, these sheltering plans have not had to be employed at the levels that would have likely overwhelmed the shelters, in part because non congregate sheltering alternatives were utilized following Hurricane Laura. Hurricane Ida will provide a stronger test of these sheltering plans as the prolonged power outages in the impacted areas require a continued influx of impacted residents into congregate shelters, as well as a long-term dispersal of families across the broader region while in the midst of a COVID-19 spike. Case numbers are not currently available, but there are widespread concerns of another increase in COVID-19 cases as a result—particularly as increases in virus transmission were associated with hurricane evacuations during the 2020 hurricane season (Pei et al. 2020). Regardless, it illuminates the impacts of compounding disasters, and the unique challenges when one of them is a long-duration pandemic.

Due to the prolonged nature of pandemics like COVID-19, along with an increasing trend of major disaster occurrences, planning frameworks and hazard specific annexes may need to be updated and even new frameworks created to plan for compounding events. Specific to pandemics, it may be necessary to build out base plans with traditional planning assumptions, then to establish more robust planning under different assumptions. For example, shelter plans in a stand-alone hurricane event will be different during a pandemic. This also extends beyond a pandemic as a compounding event, and could include compounding events like major storms in rapid succession, and other combinations of compounding events. Lessons learned from ad hoc planning can greatly contribute to establishing more formal methods for compound disaster planning.

Expand training and exercises.
Training and exercising plans in more complex and variable scenarios would also help to

build capacities and processes for managing a confluence of disasters. These activities can complement disaster plans by providing opportunities to identify and work through unanticipated issues with input from those who would be involved in response and recovery efforts.

As an example, a COVID-19 After Action Report for the City of Kirkland, Washington noted that for years the City's small emergency management program had involved City departments and elected officials in planning efforts related to its Continuity of Operations, Continuity of Government, and Comprehensive Emergency Management Plans. The involvement of these stakeholders and emergency operations center staff in planning, training, and exercises was credited with helping to prepare Kirkland's leadership and employees to respond to the challenges associated with the pandemic (Murphy et al. 2020). In particular, involving elected officials throughout the planning process and in training and exercises brings awareness and creates opportunities for them to provide input throughout plan formulation.

Research suggests that such activities have been broadly underutilized. In a 2019 study of U.S. municipal and county chief administrative officials, more than 60 percent of respondents stated that their local government had not implemented any disaster training exercises that included recovery and restoration scenarios (Dzigbede, Gehl, and Willoughby 2020). As the pandemic has required coordination between traditional disaster responders and other entities that are not routinely engaged in emergency planning or response, however, the momentum gained through interagency and multi-sectoral coordination represents an opportunity to use training and exercises to continue building upon these relationships as well as the tools and processes that have been developed. Complex and compound events are likely to produce challenges similar to those that have emerged during the pandemic, underscoring the potential benefits of expanding the range of stakeholders engaged in these efforts. Expanding training and exercises can also improve preparedness for a wider range of risks, such as that of biothreats (Townsend-Drake, Harvin, and Sellwood 2021).

Improve systems to coordinate multi-agency response.
The National Response Framework (NRF) and National Incident Management System (NIMS) serve as a foundation for all-hazards emergency management. However, adherence to these planning frameworks is not universal, and during the COVID-19 pandemic has been inconsistent with a deluge of non-traditional response partners as well as increased political involvement beyond many planning assumptions. Integration of a broader array of community partners and elected officials in planning, training and exercise processes will help to solidify understanding of these frameworks and roles within them. Additionally, integrating greater uncertainty into planning and response efforts may add flexibility to planning efforts to operate in socio-political environments that deviate from planning assumptions.
This may include integrating uncertainty into performance metrics (Schlegelmilch, Stripling, et al. 2021), and utilizing approaches from other fields such as emergent strategy, which are designed to accommodate unanticipated patterns of organizational behavior, and has been observed in other disaster situations (Chandler et al. 2016).

Decision support tools can also be better designed to define informational inputs based on analytical information as well as socio-political dynamics that impact response. This has been posited for the use of epidemiological models (Akselrod et al. 2012) in decision support, as well

as utilized for mitigating workforce absenteeism for a major utility during COVID-19 (Schlegelmilch, Paaso, et al. 2021). Mechanisms for real-time integration of emergent partners into NRF/NIMS may also support greater operational cohesion.[2] As evolving frameworks that are regularly updated, the foundational tenets of the NRF and NIMS may also benefit from a thorough review of the performance and suitability of these frameworks during COVID-19, and for these lessons to inform future revisions of these and other all-hazards frameworks.

Invest in multi-sector partnerships and regional collaborations.

      Increasing preparedness for concurrent threats requires engaging with a wide array of partners, at multiple scales. Community based networks, as well as community members, are most aware of emerging needs and unique circumstances that may not be visible at the city or county level. These local networks hold traditional knowledge, relationships, and capacity that are critical for the necessary adaptation and improvisation that preparedness requires in a shifting landscape. For example, the coastal indigenous and fishing communities along the Gulf Coast have an in-depth understanding of local waterways and are key partners to local levee boards looking to estimate the specific impacts of projected surge. Recent interviews with local decision-makers along the Louisiana coast, including emergency managers and elected officials, revealed that these decision-makers relied heavily on local knowledge to ground truth official forecasts and estimates of water height (Jerolleman, Laska, and Torres 2021). As another example, food banks hold valuable knowledge about social vulnerability and community needs due to their extensive networks of emergency food providers (e.g., food pantries), connections to government agencies, and insights into risk factors such as food insecurity (Hake et al. 2020; Ottesen 2020). They also often step up during times of crisis to provide services well beyond food provision due to high levels of trust and visibility within their service areas, which positions them as important partners for a range of disaster preparedness and management efforts (Slider-Whichard, Caslin, and Humbert 2020).

      However, local networks and partners can be overwhelmed in the immediate aftermath of an event, or may lack sufficient resources to support increased preparedness among their networks. This is particularly true when local partners are facing extreme and constant stressors that limit adaptive capacity and pull attention and resources away from longer term preparedness and resilience efforts.[3] Regional collaboration, and multi-sectoral partnerships, can provide critical bridges to resources and capacity, while also facilitating peer networking.

      Successfully engaging with partners, at all scales, requires a substantial investment of time in order to build strong relationships and trust. It also requires ensuring that all participants are heard and benefit from the collaboration. Emergency managers can work to share emergency plans, making them more readily accessible to partners, while also creating opportunities for feedback and evaluation of such plans by community partners. Relying on partners solely when

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[2] Furthermore, prolonged use of the Incident Command System may not be sustainable for longer-term public health emergencies, like pandemics, especially in smaller agencies without staff reserves. High rates of burnout among the emergency management and public health workforce indicate needs to reconsider approaches to staffing events with long durations.

[3] Moreover, capacity among some partners may have been diminished by the response to COVID-19 (Hutton et al. 2021). Investments to shore up nonprofit sector resilience could be an important way to ensure they have the capacity to support response and recovery.

there is information to disseminate, or an ongoing event, misses the opportunity to improve emergency management processes and plans based upon the perceptions and experiences of partners.

Pre-event investments in coalition building can help to build social networks among agencies and community human service organizations during response. The work of the Resilient Children / Resilient Communities Initiative[4] is an example of establishing child-focused community resilience coalitions among local organizations. Activities of the coalitions include developing plans, training and exercising with child-serving institutions within a community (e.g., schools, childcare, after-school programs, etc.). They also work to engage parents and caregivers through community events and in sharing resources through normal operations, such as discussing preparedness and providing resources for family preparedness planning. While not explicitly pandemic focused, these coalitions pivoted to integrate COVID-19 response of the child serving sector with the public health and emergency management sector in communities across the country. The coalition members also became a hub of information sharing through webinars, as well as updating and sharing resources with other communities through an online toolbox[5] that was amended to highlight pandemic relevant resources for children. The communities also supported a series of issue briefs[6] connecting national policy issues with local, community specific impacts and relevance (Ratner et al. 2021).

Utilizing Dynes Typology of emergent organizational behavior in disaster response (Dynes 1970) philanthropy can also be guided to identify organizations that are providing impact to communities. The typology identifies different types of organizations that range from established response organizations to emergent ones that may not have even existed prior to the response but are created to meet unmet needs. The more emergent organizations may not be ideally situated to receive resources through federal contract vehicles or other fundraising that more established organizations utilize for disaster events, but provide vital services to meet unmet needs (Schlegelmilch et al. 2020). The typology also identifies extending organizations, or those that begin to expand their services to include work outside of their mission space as a result of a disaster. The pandemic led many social service organizations to exhibit this behavior.

Plan for an extended disaster workforce.
The disaster workforce is diverse and multi-sectoral in general, but the continuing state of emergency caused by COVID-19 required officials to reassess the boundaries of which services and personnel were essential to the response effort. Emergency managers need to review the services that were pulled into these expanded parameters and consult with other department leaders to consider what other functions may be needed in other kinds of complex or compound emergencies. Additionally, it is advisable to update continuity of operations plans to account for these situations and the potential modifications to working conditions (e.g., alternate sites, equipment, safety protocols) that may be required.

In the first few months of the pandemic, governments reassigned personnel to entirely

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[4] For more information about this program, visit: https://ncdp.columbia.edu/rcrc

[5] See: https://rcrctoolbox.org/

[6] Interactive versions of these briefs are available at: https://rcrctoolbox.org/rcrc-issue-briefs/

new roles outside of their normal duties to support different emergency initiatives. For example, the City of San Diego reassigned personnel voluntarily to staff the city's convention center, which had been converted into a shelter for people experiencing homelessness (Adan 2020). The City of Lexington, Kentucky reassigned social services and parks employees to assist a nonprofit organization and food bank with packaging food boxes for distribution at its shuttered community centers (Straub 2020). These kinds of arrangements can lead to unanticipated challenges due to uncertainty over issues such as personnel management, human resources complaints, implications for collective bargaining agreements, and other unanticipated issues (Klibanoff 2020). The process of updating continuity plans may need to include decision-makers who can develop the policies and procedures needed to provide better flexibility and clarity about personnel issues in future emergencies.

Develop communication plans for concurrent/multiple threats.
Communicating effectively about risk requires advance planning and clear goals; an understanding of both the needs of the target audience and the information sources and channels that are most appropriate; and credibility with entities who are trusted by the target audience and willing to help to amplify risk messages. Information is most effective when it is provided in ways that people understand, through pathways they already use, and with recommendations that are actionable (World Health Organization 2017). These basic principles of risk communication, developed through decades of research and practice (Mileti et al. 2006), remain relevant in the context of COVID-19 (Bostrom et al. 2020). This means that disaster planners do not need to learn entirely new rules for risk communication, but rather can focus on designing messages and dissemination strategies that account for changing conditions and appropriate actions, such as the possibility of guarding against multiple threats.

For example, in its 2020 public guidance on emergency planning for hurricanes and tropical weather, the City of New Orleans introduced high visibility information boxes under each category of guidance where additional or different measures needed to be taken to account for the impacts of COVID-19. These boxes highlighted issues such as changes in evacuation timelines, supplies needed to minimize the risk of virus transmission, and how to prioritize hurricane risks relative to virus transmission risks, with information separated into concise sections (see Figure 1). In this instance, clear language directly addressed what could be seen as competing messages (e.g., guidance to stay at home to minimize virus transmission and the possibility of evacuation due to hurricane hazards) to account for multiple hazards.

Risk communication strategies need to take contextual factors into consideration in addition to message content (Paton 2013). Issues such as political polarization and its influence on the extent to which official information is considered to be credible have become more complex during the pandemic and need to be taken into account to improve the chances that important information is received and acted upon by people at risk. Earlier guidance (National Academies of Sciences, Engineering, and Medicine 2021; National Academies of Sciences and Medicine 2020) has addressed such issues in different contexts and thus will not be discussed in significant detail here.

Figure 1: New Orleans COVID-19 Evacuation Guidance

Institutionalize practices that support rapid deployment of resources and programs during emergencies.

There are many lessons to be learned at each level of government from the rapid mobilization of the nation's disaster response system and other sectors in response to COVID-19. The innovative approaches used to quickly expand the capacities of systems and agencies to provide financial assistance, human services, food and supply distribution, and other supports highlight opportunities to minimize burdensome bureaucratic delays that disadvantage those in greatest need of assistance.
Reflecting on such efforts may be key to creating protocols for practices that proved valuable during the pandemic response to future emergencies, as the ability to quickly reorganize, repurpose, and re-budget on the fly is a critical skill for government officials during emergencies (Dzigbede et al. 2020).

One of the strategies that localities employed involved pre-developing plans to work around slow-moving bureaucratic decision-making processes. Well before FEMA issued pandemic operations guidance or information regarding reimbursement rates, for example, emergency managers and other agencies responsible for disaster response in some hurricane-prone areas began arranging for alternate forms of evacuation transportation and noncongregate sheltering (Dunn et al. 2020). Such actions were taken proactively with the understanding that there was a need to have plans, agreements, and contracts in place so that they could be executed quickly if needed once there was greater clarity from the federal government.

Another strategy involved restructuring existing programs and activities. For instance, following the nation's first significant outbreak of COVID-19 in February 2020, King County, Washington launched an unprecedented effort to modify its homeless shelter system to minimize the spread of the virus among people experiencing homelessness. This effort involved expanding shelters' hours of operation; reducing capacity in congregate shelter settings; and opening new sites, including both individual hotel rooms and group hotels with enhanced services (Colburn et al. 2020). This initiative enabled a rapid response to mitigate the compound effects of the region's homelessness crisis and the looming COVID-19 crisis.

While many of the efficiencies and innovations introduced during the pandemic may serve as models for future emergencies, these approaches were not uniformly positive. Some modifications introduced new problems and had unintended consequences. For example, the use of hotels as non-congregate disaster shelters used during Hurricane Laura in September 2020 limited the ability of shelter operators to identify needs and share information and resources; created logistical problems for connecting shelter residents with resource centers; created barriers to communication; and increased geographical spread among residents, thereby limiting their access to recovery resources (Darwish 2021).[7] Examples such as this one illustrate the importance of after action reviews and program evaluations to understand the benefits and pitfalls of changes that were made.

Before integrating pandemic-related practices into future disaster plans, it is important to understand what kinds of changes must be made and ensure protections for those served by them. Key considerations for institutionalizing pandemic-driven practices into disaster plans include:
- Feasibility of replication (e.g., what mechanisms are needed to replace pandemic funding allocations)
- Technologies and tools required for service delivery
- Staff training needs
- Decision support and policy needs
- Participant support needs (e.g., with regard to accessibility, barriers to action)
- Opportunities to simplify requirements and streamline processes
- Internal (e.g., within and among organizations) and external (e.g., with clients and the public) communication needs and capabilities
- Data collection and analysis needs
- Protocols to ensure documentation and accountability

STRATEGIES TO ENHANCE EQUITY AND JUSTICE

Disasters are known to amplify existing inequalities, and the COVID-19 pandemic has been no exception. The direct and indirect impacts of this crisis have been felt most acutely among socially marginalized populations, reflecting pre-existing lines of stratification by race and ethnicity, disability status, gender, class, and age. To address systems that reproduce

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[7] Additional reflections and recommendations related to these events are available at: https://recoverydiva.com/2021/05/

inequality and fail to meet the needs of those most vulnerable to disasters and public health emergencies, changes are needed in both programs and policies intended to support these communities and the implementation of those policies in emergency management and public health practices.

Introducing an Equity and Justice Focus into Programs

Just as disaster impacts are often felt unequally, programs and services that are ostensibly intended to support those affected by disasters and disruptions are often inaccessible to or otherwise biased against those who stand to benefit most from them (Elliott, Brown, and Loughran 2020; Fothergill and Peek 2004). Similar patterns have been observed in relation COVID-19 relief programs. To illustrate, loans from the Small Business Administration (SBA) —a key source of disaster recovery assistance from the federal government for households and businesses alike—are awarded based upon criteria that reflect deep legacies of racial discrimination and that hinder the ability of minority applicants to access these resources (Tierney 2019). Likewise, Black and Latinx households encountered difficulties accessing loans through the SBA's Paycheck Protection Program, which was launched in 2020 to keep small businesses afloat through the devastating financial impacts of the pandemic (Liu and Parilla 2020; Ong et al. 2021).

Requirements and assessment criteria that utilize measures that are discriminatory in their impacts[8] due to legacies of systemic racism, gender discrimination, and other structures of social stratification contribute to such disparities (Howell 2021; Morrow and Enarson 1996). The results reinforce existing inequities, leaving vulnerable households and communities at even greater risk of ongoing and future adverse events. Policymakers and administrators need to develop targeted efforts that prioritize disadvantaged communities, eliminate biases built into assistance programs, and address deeply entrenched inequities.

Build equity into disaster assistance programs and policies.
State and local governments can integrate equity into the design of the emergency assistance programs they manage and administer externally funded programs in ways that are consistent with equity goals. A clear definition or equity framework is needed to establish goals and guide program development and to identify priority populations so that resources can be channeled toward areas of greatest need. Considerations may include factors such as historical discrimination and ongoing disparities, the extent of losses incurred, income and access to resources, eligibility for other forms of assistance, racial and social justice, or other factors as guided by core principles of equity. Before executing emergency assistance programs, it is also important to develop a clear plan and measures of accountability by establishing clear goals, benchmarks, and plans for data collection to track progress and outcomes.

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[8] See, for example, the use of credit scores, which are used to determine creditworthiness for disaster assistance loans despite the fact that they reflect the ongoing impacts of racist practices such as redlining and continue to perpetuate racial inequities (Ludwig 2015; Singletary 2020).

Several waves of relief initiatives developed in response to the pandemic have generated useful insights about strategies to build equity into emergency assistance programs. The strategies below are drawn from assessments of programs developed to assist small businesses and renters (Aspen Institute Financial Security Program et al. 2020; Bramhall, Fedorowicz, and Randall 2021; Yae et al. 2021):

- Targeted outreach: Extensive outreach may be necessary to reach marginalized and historically underserved groups and support them in applying for available assistance. Partnering with existing networks, such as community groups and local organizations, may improve effectiveness by utilizing established and trusted communication channels.
- Application and intake processes: There is a fine balance to be struck between narrowing eligibility to ensure that resources are available to those most in need and creating obstacles that hinder accessibility to those same groups. Efforts need to be made to minimize complexity and documentation requirements while providing support and technical assistance to help applicants through the process. As this level of support requires a significant time investment, budgetary allocations are needed to cover staff and partner resources.
- Resource distribution: Selection processes need to include equity-based criteria. Reserving funds for general and priority populations can help to ensure sufficient funds and minimize obstacles for disadvantaged applicants. Strategies may need to be modified to accommodate funder restrictions while still prioritizing equity.

Minimize delays between appropriations and spending.

Delays in distributing available resources to people who desperately need them have emerged as a critical challenge during the pandemic. The need to eliminate barriers and improve access to support is increasingly pressing, as many disadvantaged households become continuously more vulnerable with each day that passes. To illustrate, as of late August 2021, only 11 percent of the money allocated by Congress to the Emergency Rental Assistance Program had been released to tenants and landlords (Thrush and Rappeport 2021). State and local governments have struggled to create entirely new programs and systems to process applications, with additional delays resulting from factors including lack of prioritization; lengthy deliberations about how to prioritize aid recipients; development of outreach initiatives to target the neediest households; and an overwhelming volume of applications (DeParle 2021).

An assessment (Aiken et al. 2021) of similar programs created in the early stages of the pandemic using CARES Act funds noted common challenges and identified a range of measures that could be taken at the programmatic and government decision-maker levels to introduce efficiencies. Among the most important takeaways was the need to allow for flexibility in both funding requirements and in the programs themselves. Other recommendations focused on how to engage and minimize burdens on applicants, target underserved populations and track outcomes, engage landlords, boost efficiency, and partner with nonprofits (Aiken et al. 2021). A pilot program in Colorado (the COVID-19 Eviction Defense Project Rental Assistance pilot) is testing some of these practices: for instance, it provides a simple application process, with targeted marketing via multiple channels to speed up the disbursement of rental assistance and works closely with community groups to improve access (Aspen Institute Financial Security Program et al., 2021). In another example, the Illinois Housing Development Authority,

distributed $200 million in rental assistance and undertook an extensive marketing and outreach campaign to educate landlords and tenants about the program. While these examples relate specifically to rental assistance, these strategies may be effective for many other kinds of programs.

Building Equity and Justice into Emergency Management and Public Health Practice

Efforts to promote equity and justice in disaster-related programming can only be successful to the extent that the institutions implementing those programs also operate in a manner that is consistent with these goals. The need for a shift toward justice-focused disaster planning and management has become even more pressing in the context of COVID-19. Specific actions that decision-makers and organizational leadership can take to bring emergency management and public health practice into closer alignment with goals for equity and justice are detailed below.

Meaningfully engage the whole community and operationalize equity in all dimensions of disaster planning.

Working toward equity requires meaningful engagement with diverse experiences, capacities, and needs, particularly with historically marginalized groups. The Whole Community approach to emergency management promotes the kinds of inclusion required of equity-focused work. To effectively serve the whole community, emergency managers and other disaster planners need to identify groups that face disproportionate disaster risk and include them in the planning process. While the need for this approach was well established before the pandemic (FEMA 2011), the disparate and ongoing impacts of COVID-19 have made the need to foster equity and justice in disaster planning even more acute.

In addition to inclusively engaging the whole community, leaders within agencies responsible for disaster planning need to address systemic injustices by examining their internal practices to eliminate bias. For example, this can involve identifying how policies they enforce or protocols they follow distribute resources unfairly, fail to meet basic needs, or otherwise contribute to unjust outcomes (Jerolleman 2019). Organizational leaders also need to thoroughly integrate a focus on equity throughout their operations. Guidance developed in response to COVID-19 (Institute for Diversity and Inclusion in Emergency Management 2020) breaks down the process for operationalizing equity into key steps including:
- committing to equity (e.g., embedding equity in decision-making);
- focusing on the people (e.g., identify most vulnerable in the community; supporting community-serving organizations);
- ensuring equity in transactions (e.g., equitably distributing resources; designating funds to support resilience among small, women, and minority owned businesses);
- guaranteeing equity in public messaging (e.g., providing information in all of the community's languages); and

- providing transparency of data and decisions (e.g., measuring impacts on equity in after action reports).

Provide ongoing equity-focused training across all levels of the organization.

Agency staff are likely to need guidance and instruction to successfully implement the above strategies. It is important that these competencies be developed throughout the entire organization, and especially at the leadership level. Equity-focused training and capacity-building activities need to be offered as part of a comprehensive strategy rather than as one-off events to ensure that staff maintain required competencies. Training content may vary depending on a unit's specific needs or duties. Recommendations identified for local health departments responding to COVID-19 that hold promise for future disaster planning include: "utilizing an equity audit tool for emergency response, building community partnerships (including community partnership agreements), and utilizing disaggregated data to design an equitable response" (Bay Area Regional Health Inequities Initiative and Public Health Alliance of Southern California 2020:10).

Demonstrating what such measures can look like in practice, Seattle-King County has integrated an equity focus throughout its command and response system and introduced additional mechanisms for involving community partners in planning and decision-making in response to COVID-19. Its Incident Command Structure includes an equity team with an equity officer responsible for providing briefings in daily command meetings, dedicating positions to equity-focused responsibilities and providing equity-focused training for all emergency operations center staff (Jacobson 2020). The Pandemic Advisory Group, comprising representatives from various community, business, and government sectors, advises the county's Public Health department regarding what members are hearing from their constituencies with regard to challenges and opportunities and relays information within their individual spheres of influence (Seattle & King County Public Health n.d.).

Build a disaster workforce that is representative of the communities it serves.

Workforce diversity is a critical component of efforts to address disparities and improve equity in disaster outcomes. Varied perspectives and backgrounds are needed for teams to effectively serve the nation's increasingly diverse communities (Jackson and Gracia 2014; Laine and Stanley 2013). However, the fields most directly involved in disaster planning and management are significantly lacking in diversity, especially with regard to those holding positions of leadership (Coronado et al. 2020; Frank 2020). Emergency managers, for example, are overwhelmingly white males, with racial and ethnic minorities and women significantly underrepresented within this field of practice (116 Cong. 2021). Challenges such as vaccine access barriers among communities of color and people with disabilities during the pandemic (Feldman 2021; Fernandez 2021; Johnson 2021) highlight the importance of having a diverse and inclusive workforce that is equipped to provide culturally competent services and develop innovative solutions to address disparities (Coronado et al. 2020; Jackson and Gracia 2014).

There are various steps that organizational leadership within emergency management, public health, and other agencies engaged in disaster planning can take to enhance diversity within their workforce, including:
- formally committing to increase the representation of people of color, women, and other

historically marginalized populations throughout the organization and particularly in leadership roles;
- building diversity goals into succession planning;
- developing plans and performance metrics for diversity in recruitment, retention, and promotion;
- creating recruitment pathways such as internships and pipeline programs in target communities;
- encouraging dialogue about diversity within agencies; and
- tracking and evaluating progress toward diversity and inclusion goals.

Institutionalize data collection and reporting practices that promote data equity.
Coordination is needed at the federal level to ensure uniformity and accuracy in public health data collection that can be critical to making key policy decisions related to openings and public health measures (e.g., physical distancing, capacity limits). Without such coordination during the initial months of the COVID-19 pandemic, states varied in how they defined and reported key metrics, such as testing data, cases, hospitalizations, and deaths (Sapat, Lofaro, and Trautman 2021). For instance, during the first wave of the pandemic, a third of states were not reporting hospital admission data, which was key to understanding the surge in the spread of the virus (Tahir and Cancryn 2020). In some states, health departments were initially including antibody tests along with diagnostic tests (Karimi, Almasy, and Hanna 2020), inflating overall testing counts and reducing positivity rates.

Data disaggregation by race and ethnicity is also needed to fully understand the impact of a pandemic (Sapat, Lofaro, and Trautman 2021). The number of states reporting race and ethnicity data for testing, case rates, hospitalizations, and deaths were fairly low in March and April 2020 (Madrigal and Meyer 2020). Even as more states began reporting race and ethnicity data for certain groups, data for other minoritized groups, including Latinx, Asian American/Pacific Islander, and Native American communities, were systematically missing or not accurately captured in data collection efforts. The lack of accuracy stemmed from many sources, ranging from the paucity of testing sites particularly in hard-hit minority communities during the early months of the pandemic, to the lack of reporting of cases in which the race and/or ethnicity was known (Madrigal and Meyer 2020). It is imperative that this type of missing data be captured. Key data are needed to make critical decisions related to the allocation of resources and to combat health disparities and effectively fight COVID-19 and other disasters. The following actions (Sapat, Lofaro, and Trautman 2021) could be taken to ensure data practices that prioritize equity:
- State and local governments and organizations such as schools and universities, need to be transparent about health data and maintain and disseminate easily accessible public health data via mechanisms such as public health dashboards and through other avenues.
- Data dissemination of public health data during pandemics and other disasters needs to be high-quality, trustworthy, reliable, timely, frequent, and accurately reflect changing statistics.
- Data needs to be disaggregated by various factors such as ethnicity, race, age, geographic area, and other socioeconomic variables to understand the impacts of the pandemics and disasters and appropriate interventions for vulnerable populations.

Develop outreach and engagement strategies that target frequently overlooked populations.

The pandemic has created a host of challenges among groups that already tend to be disproportionately affected by extreme events, from the risk of infection to the knock-on effects of financial instability and mental health issues. These impacts have played out differently across social groups, highlighting the need for targeted outreach and support that are tailored to the specific challenges faced by diverse community segments. Public outreach efforts and networks created during the pandemic to respond to these challenges may serve as a useful foundation for more inclusive disaster planning.

As an example, the Massachusetts Department of Public Health developed an initiative to work with 20 cities and towns on vaccine outreach. Using the CDC Social Vulnerability Index to identify at-risk populations in communities with the highest COVID-19 burden, the agency then worked with key stakeholders including local boards of health, local community and faith-based organizations, community health centers, and community health workers to identify local needs and conduct grassroots outreach. Additionally, the effort hired local residents to engage with neighborhoods and local businesses (Massachusetts Department of Public Health 2021). These kinds of approaches are consistent with best practices for establishing partnerships and communication pathways that support disaster resilience.[9]

Expand efforts to reduce housing insecurity.

The recent U.S. Supreme Court decision to end the CDC eviction moratorium, combined with variability across state lines and ongoing financial disruption to economically disadvantaged households, underscores the need to channel rental assistance quickly to households that need it most. Approximately 15 million people live in households that are currently behind on their rental payments and these households collectively owe more than $20 billion to their landlords according to the Aspen Institute (Gilman et al. 2021).

Delays providing assistance can harm small landlords and vulnerable renters. Renters, particularly lower-income households, those living with multiple members and extended family, and those in precarious housing conditions[10], may be disproportionately affected by disasters and slower to recover. Combined with the housing affordability crisis that predated the pandemic, the dismantling of housing protections for renters affected by COVID-19 or disasters during the pandemic may be devastating. Studies have found that rental prices often increase in the aftermath of a disaster, leaving these households even further behind. Those who have been displaced, either due to evictions or disaster, risk being priced out of the market. Those with the fewest resources may not be able to afford the cost of relocating elsewhere, further increasing the risk of homelessness and leaving housing insecure populations increasingly vulnerable to displacement. Disproportionate harm is likely to track along lines of class and race.

Several measures can be taken to reduce housing insecurity, avoid mass evictions and improve rental assistance processes (Aspen Institute Financial Security Program et al. 2020):
- Simpler, more accessible application processes with extensive marketing to vulnerable communities can reduce administrative burdens, speed up assistance, and reach under-

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[9] For resources on engaging and leveraging the capacities of specific frequently overlooked populations, see Appendix A.

[10] Sapat, A., D. Mitsova, A-M. Esnard, M. Escaleras, and K. Sweeting. 2021. "COVID-19, Subjective Resilience, Adaptive and Coping Capacities in Hurricane-Prone Regions." Under review.

served populations.
- Rental assistance payment terms need to promote long-term housing stability; for instance, rental assistance funds could be used for both existing and new housing so that tenants can pay for re-housing.
- Since a majority of tenants facing eviction cannot afford lawyers, strong legal and policy frameworks should be created, such as right to counsel programs and legal representation, along with other support services.
- Compliance after rental assistance is provided should be monitored to ensure effective implementation of program payment terms.
- Follow-up assistance such as tracking landlords and tenants after payments are issued, providing tenant complaint lines, and providing additional support if possible to help those with ongoing payment issues can improve compliance with payment terms and provide long-term housing stability.

LONG-TERM STRATEGIES TO IMPROVE DISASTER PREPAREDNESS

Expand and sustain investments in hazard mitigation.

Although it has created new and unfamiliar challenges for disaster management, the COVID-19 pandemic has exploited longstanding vulnerabilities that still require attention. The overwhelming human toll that this crisis and other recent disasters have taken signals the need for further action to minimize the potential impacts of future emergencies. Yet there is a risk that the costs that states and local communities are already enduring due to the pandemic will create a form of tunnel vision for decision-makers regarding how funds should be prioritized, with longer-term investments failing to make the cut. Hazard mitigation often does not receive the level of investment that is needed until there is a disaster, if at all, as competing funding priorities often take precedence.

States play a particularly important role in building local capacity to develop hazard mitigation plans and policies. The level of effort dedicated to these and other state-led hazard mitigation functions varies significantly, however, as funding for pre-disaster mitigation planning initiatives is inconsistent and often inadequate (Smith, Lyles, and Berke 2013). State decision-makers need to increase support to state hazard mitigation offices to bolster their capacity and ability to provide technical assistance and other services to local mitigation planners. Investing state funds in mitigation measures can also make states more competitive for federal mitigation grant funding through opportunities such as the Federal Emergency Management Agency's new Building Resilient Infrastructure and Communities (BRIC) program (Bragg, Shea, and Bates 2021).[11] State and local policymakers also need to introduce policies that strengthen building codes and standards and advance a land use planning agenda that supports hazard mitigation (Smith et al. 2013). But while needed now perhaps more than ever, calls for such actions were well-established prior to the appearance of the novel coronavirus.

COVID-19 has revealed the need to think more expansively about hazard mitigation.

[11] First implemented in 2020, BRIC represents a timely and unprecedented increase in federal support for mitigation projects.

Investments in more traditional mitigation measures such as floodplain restoration are important; however, policy- and decision-makers also need to place a stronger emphasis on often overlooked critical social infrastructure, such as public health systems and human services (O'Sullivan et al. 2013). For instance, the size of the public health workforce nationally had been in decline for years by the time the pandemic struck due to shrinking federal and state funding allocations (Alford et al. 2021; Carlin et al. 2021). As is the case with hazard mitigation dollars (Smith et al. 2013), prioritization of public health preparedness funding tends to wane in the absence of an emergency (Murthy et al. 2017). The nation's public health and healthcare infrastructure was insufficiently equipped to respond to the pandemic, and was not well integrated into other disaster management. State level decision-makers can play a role in helping to sustain the critical social infrastructure systems needed for holistic community preparedness.

Comprehensive investments in hazard mitigation are also a critical element in the pursuit of social equity and justice. The communities that have suffered the greatest impacts from COVID-19 are often located in marginal and physically vulnerable places. For instance, minority neighborhoods tend to have poorer quality physical infrastructure than white neighborhoods, leaving them more exposed to disaster losses and disruption from other hazard conditions (Hendricks 2017) in addition to their struggles with poor quality healthcare and public health infrastructure. These inequities need to be addressed when planning hazard mitigation[12] and infrastructure development measures. For instance, states can provide funds to assist marginalized communities with match requirements. Local agencies and decision makers can engage marginalized communities using participatory and community science-based approaches to identify opportunities for improving the built environment and critical social infrastructure and ensure an equitable distribution of resources (Hendricks 2020). As state and local governments prioritize resources for public safety, thinking more holistically about hazard mitigation can produce more equitable outcomes for the whole community. In addition to creating more just outcomes, enhancing equity in critical social infrastructure is an important investment in the nation's security (Townsend-Drake et al. 2021).

Consider the potential impacts of political influence on emergency preparedness.
Since 9/11 there has been more than $100 billion spent on biodefense (Abelson et al. 2020), including pandemic readiness, in the United States. This includes grant funding for state and local planning efforts through the US Center for Disease Control and Prevention's Public Health Emergency Preparedness Cooperative Agreement, as well as the Hospital Preparedness Program, administered through the US Department of Health and Human Service Assistant Secretary for Preparedness and response. Under these and other resources, plans after plans were drafted, evaluated, exercised, and revised based on extensive guidance (CDC 2017) from the federal government. This planning was ranked number 1 out of 195 countries analyzed under the Global Health Security Index, and helped propel the United States to the top spot of countries prepared for epidemics and pandemics (Cameron, Nuzzo, and Bell 2019). However, the utilization of these plans in response efforts has been mixed at best. In some cases plans were

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[12] The BRIC program will double its funding for hazard mitigation projects in Fiscal Year 2021 over the previous year, to $1 billion. The program's 2020 grant allocations raised concerns that funds were being distributed inequitably, as the majority of funds were awarded to wealthy and higher-capacity jurisdictions (Frank 2021). However, changes introduced for the second round of funding are intended to emphasize equity, increase support to tribal, disadvantaged, and rural communities, and reduce their cost share requirements (FEMA 2021).

utilized, while others were rejected or replaced by other strategies by elected officials. The role of partisan politics is beyond the remit of this paper, but intersection of public health and political science is something that clearly requires additional insight. The cause of this requires a more fundamental understanding; but even in the absence of it, it suggests that current planning paradigms and investments are sub-optimal and do not take into account these socio-political dynamics.

CONCLUSION

At the time of this writing, the COVID-19 pandemic has taken the lives of more than 656,000 people in the United States, according to official counts. The true toll is surely much higher and may never be known. The pain and trauma that have resulted are similarly immeasurable. This crisis, which scholars have argued may be more appropriately defined as a catastrophe rather than a disaster (Ritchie and Gill 2021), serves as a tragic but valuable opportunity to learn how to more effectively plan for similar events and avoid further escalation of current conditions. Decision makers, organizational leaders, and other disaster planners can take advantage of these insights to enable greater resilience and more just, equitable outcomes in the future.

APPENDIX A
EXAMPLES AND RESOURCES

Conducting Interim/Post-Event Analysis

- *Facilitated Look-Backs: A New Quality Improvement Tool for Management of Routine Annual and Pandemic Influenza*: https://www.rand.org/pubs/technical_reports/TR320.html
- *Homeland Security Exercise and Evaluation Program Preparedness Toolkit*: https://preptoolkit.fema.gov/web/hseep-resources

Fostering Equity and Inclusion in Disaster Management

- *Building Alliances for Equitable Resilience*: https://www.fema.gov/sites/default/files/documents/fema_rnpn_building-alliances-for-equitable-resilience.pdf
- *Embedding Equity into Emergency* Operations: https://www.barhii.org/latest-resources/embedding-equity-into-emergency-operations
- *Equity and Policy Preparedness During Public Health Emergencies Webinar Series:* https://www.nga.org/webinars/equity-and-policy-preparedness-during-public-health-emergencies/
- *Establishing and Maintaining Inclusive Emergency Management with Immigrant and Refugee Populations*: https://welcomingamerica.org/wp-content/uploads/2021/04/Inclusive-Emergency-Management-Checklist.pdf
- *Strategies for Inclusive Planning in Emergency Response*: http://publichealth.lacounty.gov/eprp/documents/Strategies%20for%20Inclusive%20Planning%20in%20Emergency%20Response_FINAL.pdf
- *Washington County, Oregon Emergency Operations Center Checklist to Embed Equity in Decision Making*: https://www.co.washington.or.us/HHS/CommunicableDiseases/COVID-19/upload/Equity-Tool_.pdf

Engaging Frequently Overlooked Populations

- *Addressing Disaster Vulnerability among Homeless Populations during COVID-19: https://www.nap.edu/catalog/26220/addressing-disaster-vulnerability-among-homeless-populations-during-covid-19*
- *Older Persons in Emergencies: An Active Ageing Perspective*: https://www.who.int/ageing/publications/EmergenciesEnglish13August.pdf
- *Research Counts Children and Disasters Special Collection:* https://hazards.colorado.edu/news/research-counts/special-collection/children-and-disasters

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