Preparedness and Community Resilience in Disaster-Prone Areas: Cross-Sectoral Collaborations in South Louisiana, 2018

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Objectives. To determine how community-based organizations (CBOs) define priorities for bolstering community resilience, challenges in addressing these priorities, and strategies to address challenges.

Methods. The Community Resilience Learning Collaborative and Research Network (C-LEARN) is a multiphase study examining opportunities to improve community resilience to the threats of disaster and climate change in South Louisiana. Phase I of C-LEARN involved using the National Health Security Strategy and Implementation Plan for directed content analysis of key informant interviews with CBO representatives from 47 agencies within South Louisiana between February and May 2018.

Results. CBO interviewees highlighted the importance of forging relationships and building trust through diverse cross-sector collaborations and partnerships before disasters. Such collaborations and partnerships were shown to tailor disaster response to the needs of particular communities and populations as well as address key challenges such as gaps in information, services, and resources.

Conclusions. Our results encourage a culture of community resilience and community preparedness through partnerships and community-engaged strategies. C-LEARN will utilize the results of our interviews in the design of phase II of our agency-level coalition-building intervention. (*Am J Public Health.* 2019;109:S309–S315. doi:10.2105/AJPH.2019.305152)

Environmental and technological disasters cause significant harm to human physical and mental health through exposure to toxins, exacerbation of chronic conditions, and injury.[1,2] They may destabilize or damage physical and social determinants of health such as housing, transportation, and education systems.[1,2] Geographically isolated populations, people with low incomes, children, older adults, and people with disabilities face elevated risk for experiencing ongoing consequences of disasters.[1,3–5]

Promoting community resilience to disasters has recently become a national public health priority[6] and is defined by the US Department of Health and Human Services (DHHS) as "the sustained ability of communities to withstand, adapt, and recover from adversity."[6] The DHHS's Assistant Secretary for Preparedness and Response collaborated with a range of stakeholders to create the National Health Security Strategy and Implementation Plan 2015–2018 (NHSS/IP), which includes 5 strategic objectives and activities to promote community health and wellness in the face of threats.[7] Although many of the recommendations are directed at local and state governments, those that focus on building social capital, developing community-tailored resources, and conducting multistakeholder-partnered translational research are particularly relevant to assets such as community-based organizations (CBOs).

CBOs include secular and faith-based organizations (FBOs), are trusted sources of information and material support in both pre- and postdisaster situations, and often fill vital roles when local, state, or federal government agency responses are delayed or inadequate.[8] Coalitions involving CBOs have developed novel approaches to supporting community resilience in disaster planning,[9,10] and have improved long-term health and social outcomes for vulnerable populations in intervention studies.[11–15] However, CBOs perceive that local health authorities do not adequately engage them in disaster preparedness planning efforts.[16] Little is known about how CBOs in disaster-prone communities may be operating independently or informally to implement community resilience–building strategies in the absence of formal, externally coordinated efforts.

The Community Resilience Learning Collaborative and Research Network (C-LEARN)[17] is a multilevel randomized comparative effectiveness trial that aims to

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build community resilience among disaster-affected communities in South Louisiana. Health and social-community service programs are randomized to community engagement and planning for multisector coalition support or technical assistance for individual program support. Within each arm, the study will randomize individual adult clients to 1 of 2 mobile applications that provide resources on depression, social risk factors, and disaster response, or also provide psychoeducation on cognitive behavioral therapy to enhance coping with stress and mood. C-LEARN employs a community-partnered participatory research (CPPR) approach that promotes equal power, 2-way knowledge sharing, and community involvement in all aspects of the research process.[18]

Phase I of C-LEARN involved a community–co-led assessment of the strengths, needs, current activities, and challenges that CBOs face in promoting disaster preparedness and community resilience. We highlight themes from in-depth interviews with CBO representatives that illustrate how agencies' current activities align with NHSS/IP recommendations. These results may inform how CBOs in other disaster-prone areas can enhance preparedness and community resilience.

METHODS

We conducted key informant interviews with CBO representatives in South Louisiana between February and May 2018. The C-LEARN Leadership Council, an active and engaged group of community and academic leaders who are experienced in mental health, disaster exposure, and community resilience, nominated and recruited interview participants. The Leadership Council codeveloped and refined a semistructured interview guide (Appendix A, available as a supplement to the online version of this article at http://www.ajph.org) that included questions on the following: interviewee, agency, and client demographics; services offered; partnership or network involvement; agency and individual disaster-related experiences; and agency use of technology.

Eligibility criteria for participation included being aged at least 18 years and being a current employee or volunteer at a CBO focused on health, social services, or community development. We contacted nominees by e-mail and requested to schedule an interview by phone or in person. Nonresponders were contacted by phone and e-mail approximately 1 week later, and a final e-mail was sent 3 weeks after initial contact. Participants were not compensated for their participation in this phase of the study. Interviewers included an academic physician with experience in CPPR, 2 masters-level study coordinators, and 3 public health graduate students. All interviews lasted approximately 1 hour. Interviews were audio-recorded and transcribed. When 2 people represented 1 CBO, demographics for each individual were recorded separately but interview content was analyzed collectively.

We analyzed transcripts by using a directed content analysis approach,[19] which uses existing theory or previous research to identify and define key concepts as initial coding categories.[20] We used this approach with the NHSS/IP Strategic Objective 1 (Build and Sustain Healthy, Resilient Communities) as our guide to focus analysis because of its shared scope with our research.

Members of the research team (M. J. P., J. B., L. R., N. O., B. S., A. W., and G. T.) independently read a diverse set of roughly 10% of transcripts and met to create preliminary codes. We applied this codebook to a larger set of 24% of transcripts, which were coded by a primary and secondary coder, to calculate and discuss percentage agreement. We then revised the codebook accordingly until it was considered comprehensive and accurate. The entire data set was then coded by 3 primary coders (M. J. P., J. B., and L. R.) by using ATLAS.ti Version 8 (ATLAS.ti Scientific Software Development GmbH, Berlin, Germany). Analytical memos were written while coding each interview. Using the memos and coding output, we identified key themes present in these interviews and direct quotes to highlight these themes. In the next section, we report on themes from these interviews as related to NHSS/IP Strategic Objective 1 priorities, challenges to addressing these priorities, and recommendations to address these challenges.

RESULTS

We invited 67 people to participate; 53 responded, and 48 were interviewed. Participants represented 47 agencies that provided the following services:

- Primary care,
- Housing and homelessness services,
- Social services and advocacy,
- Faith-based services (those that aim to meet the spiritual, social, and cultural needs of FBO members),
- Consulting,
- Funding, and
- Education.

Agency representatives that did not respond or declined to participate were not widely different from those who did. There was representation from 12 Louisiana parishes (counties), with almost half (46%) from Orleans Parish and roughly one quarter (26%) from the Baton Rouge area. See Table 1 for interviewee demographics.

Respondents described current activities and priorities related to building community resilience in disaster-prone areas of South Louisiana. Key themes related to bolstering resilience included (1) maintaining continuous, effective communication and year-round network building with other agencies; (2) forging predisaster strategic partnerships with individuals and organizations that recognize and value the need for planning for a community's unique needs; (3) providing appropriate education and training; and (4) building an integrated system that enables rapid disaster response. The relationship between key themes and the NHSS/IP is described in the next paragraphs, with participant-reported challenges to addressing these priorities and recommendations to address challenges.

The first key theme, maintaining continuous, effective communication and year-round network building, aligns with NHSS/IP Priority to Build and Sustain Healthy, Resilient Communities 1.1 (Encourage social connectedness through multiple mechanisms to promote community health resilience, emergency response, and recovery). Interview participants described the importance of having reliable connections in place to enable communication during disaster

TABLE 1—Demographics of South Louisiana Community-Based Organization Interviewees, February–May 2018

	No. (% of Total)
Gender	
Female	32 (67)
Male	16 (33)
Race/ethnicity	
White	27 (56)
African American	12 (25)
Asian	4 (8)
Hispanic/Latino	2 (4)
Two or more races	2 (4)
American Indian or Alaska Native	1 (2)
Age categories, y	
21–30	6 (13)
31–40	4 (8)
41–50	16 (33)
51–60	11 (23)
61–70	10 (21)
71–80	1 (2)
Did not specify	4 (8)
Job levels	
Agency leadership	28 (58)
Agency managers	9 (19)
Frontline service providers	7 (15)
Did not specify	4 (8)

response among and between agencies and the community members they serve. They also emphasized that agency staff and community members be in communication with their networks year round, or create new networks to be aware of available resources during a disaster. One participant elaborated,

> I don't think we have recognized how important it is to have year-round connections, but it's something that we have actually started to develop. We're working on a calendar to bring the organizations together at least quarterly and to be very intentional about meeting about disasters.

Additional strategies identified by respondents included

- Communicating with and making action plans with city officials and state and local government,
- Helping clients formulate disaster preparation plans that account for many types of disasters (e.g., tornado, hurricane, flood, active shooter),
- Sharing information through multiple channels,
- Tailoring messages to each person's needs (e.g., using newsletters, social media, neighborhood Web sites, apps, phone calls, text messages, and word of mouth), and
- Having trained social workers and physicians available to actively listen to people's experiences and needs before, during, and after a disaster.

One participant commented on the efficacy of appropriately trained professionals by saying,

> Having access to teams of social workers has got to be the root for disaster stuff. A specialty in social work for disaster work would be ideal, because you would probably be a lot more effective long-term in understanding . . . .

Challenges to maintaining seamless communication during a disaster included a lack of financial resources, personnel, or time to respond to clients' specific needs. Another challenge was the difficulty of ensuring that all community members have received important disaster-related messages. One interviewee stated that agencies should

> . . . be really picky about issues of equity when looking at communications to make sure that things are communicated well, and that they speak to everybody in a community if it's a very diverse neighborhood . . . .

To address communication challenges, interviewees encouraged coalition building before disaster strikes. One participant commented,

> Even though people have a general sense of preparing for a disaster, when they [disasters] actually come, things happen unexpectedly that we're not really prepared for. . . . Creating these coalitions on the ground, first hand, before disasters happen, is a great way to make sure things are organized.

The second key theme, forging predisaster strategic partnerships with individuals and organizations that recognize and value the need for planning for communities' unique needs, aligns with NHSS/IP Priority to Build and Sustain Healthy, Resilient Communities 1.2 (Enhance coordination of health and human services through partnerships and other sustained relationships). Interviewees identified that establishing relationships with organizational partners can help in long-term recovery and resilience planning and that bringing partners together who have reliably filled specific roles in the past can fill gaps in resource generation and distribution during a disaster. One participant highlighted their CBO's ability to serve their community's unique needs by saying,

> They [community members] know that we can be relied on or have been relied on oftentimes as the provider of last resort in the past for many people who have had either problems with affordability or transportation or something like that . . . [they] could always rely on receiving services from us.

Another participant explained their approach to forging partnerships:

> We approach any potential community partners with a framework of support and with the framework of working together. We're not competing. We share resources. We invite them to our events and we show up at theirs, and we show them that we're here to collaborate and not duplicate or replicate or replace.

Some challenges around forging partnerships were lack of knowledge about how to prioritize needs and which agencies provide specific resources (e.g., safe spaces, locations for relief specialists to work, bilingual staff) and lack of volunteer management and sufficient cultural humility training among volunteers. One participant described the importance of ensuring volunteer sensitivity by saying,

> One thing that was important for us was . . . explaining to volunteers that this event is not about you. You may not take pictures of the families with their pile of rubble in front of their house; that's not what we are here to do. We are here to go in, help them, and be really cognizant of their needs and their state of mind.

To combat some of these challenges, interviewees recommended upkeep of referral lists, prioritizing monetary (rather than material) aid distribution, storing electronic medical records on multiple servers and in other states, and partnering with a wide variety of agencies including FBOs, nonprofits, academic institutions, hospitals, police, public health services, neighborhood associations, and government agencies. One participant

described utilization of unique partnerships by saying,

> We kind of work with the churches and work with different groups that are designed to help not only people come back in their homes, but help them stay in their homes.

The third and fourth key themes align with NHSS/IP Priority to Build and Sustain Healthy, Resilient Communities 1.3 (Build a culture of resilience by promoting physical, behavioral, and social health, leveraging health and community systems to support health resilience, and increasing access to information and training to empower individuals to assist their communities following incidents).

Within the third key theme, providing appropriate education and training, participants described a need for community education on the following topics: preparing for and recovering from disasters, the functionality and importance of levees and drain cleaning, and policy-level change and advocacy. One CBO participant elaborated:

> . . . helping the community to understand . . . some of the salient issues of disasters and flooding and hurricanes and tropical storms. Like why we need to have the levees. . . . Why are these things important? Why do we need to advocate to make sure that we find ways to keep the flooding off our streets as best we can?

Within the fourth key theme, building an integrated system that enables rapid disaster response, participants expressed that a disaster-resilient culture is determined in part by how quickly government agencies, volunteers, and workers in construction, mental health, and legal sectors are able to respond to disasters.

Many challenges were named to providing education and building a culture of resilience, including

- A lack of disaster preparation messaging to community members, organizations, and FBOs;
- A lack of ability to train local, trusted community members and leaders (as opposed to outsiders);
- A lack of knowledge of services available in disaster scenarios (e.g., mental health, social services, partnerships, resources for people who are incarcerated or differently abled);
- Cost of hurricane-proofing homes;
- The effects of disaster on their agency (e.g., loss of office space, staff displacement);
- The effects of civil maintenance systems (e.g., zoning, permitting, building codes) on disaster-prone individuals and communities;
- Disappearing infrastructure and economic opportunity in low-lying areas;
- Displacement because of climate change–mitigation efforts.

One participant described how disasters and disappearing infrastructure are related to community resilience:

> Then you've got 2015, when it's post-BP oil spill, and a large percentage of our tribal members work in either the oil and gas fields or in fisheries, and both of those industries plummeted. . . . We had calls from tribal elders that are living on fixed incomes and they're going, "I supplemented my income by fishing," or "I supplemented my food stamps by fishing and shrimping, to put food on the table for my family, and couldn't do that." So, we've had a large number of stressors. . . . That's a lot for people to go through. We can all talk about how resilient people are, but at some point, it does get to you.

Challenges surrounding creating a disaster-resilient culture were especially well described by one participant:

> Our house, we've spent a lot of money making it hurricane-proof. We've got shutters, we've got solar, gas generator, natural gas generator. . . . But also, poor folks can't afford that kind of thing. So, there are no really easy answers to [climate change] mitigation. One of the facts of life in South Louisiana is that it's going to be underwater. And we're spending most of our efforts helping people prepare for the fact that the place they love is going to be underwater.

Although many challenges exist to creating a disaster-resilient culture, interviewees provided several strategies to address these complex challenges. One recommendation was to detect deficits apparent from past disasters, then offer trainings in those areas. Some recommended trainings and resources were the Coastal Protection and Restoration Authority online Flood Risk and Resilience Viewer,[21] mental health first aid, and exercises in response, trauma, and disaster management. One participant described implementation of such trainings by saying,

> When there's not an event happening, we're planning for one. We take a look at what the highest risks are for our state, and then develop workshops and trainings and meetings to try and address and better respond to, and recover from whatever those are that we identify.

Participants repeatedly cited community-engaged strategies to address the aforementioned structural challenges. Examples of such community engagement were gathering neighborhood teams to clean street catch basins to reduce flooding, posting in church bulletins, using multilanguage materials, and collaborating with Indigenous communities. One agency described their work with Indigenous communities by explaining,

> We're working with a number of tribal communities, tribal nations, along the coast of Louisiana . . . on how they are going to respond and adapt to what's happening to their communities because of sea level rise and weather change. And so, we're working to help them keep what is important about their community and build a system so that they could do self-care. . . . We're building local capacity for capability.

Further strategies were ensuring that city and statewide disaster plans are compiled and readily available to the public, funding home elevation in areas facing recurrent flood risks, and bolstering preparedness among staff at their agencies. One participant shared,

> For us, it's making sure we are prepped, that all of our staff know what to do. . . . We're prepping from A to B, not only with community members, but with our staff.

Theme alignment with NHSS/IP is further described in the box on pages S313–S314 and Appendix B (available as a supplement to the online version of this article at http://www.ajph.org).

DISCUSSION

In this article, we highlight how community perceptions of the activities and priorities of CBOs in a disaster-prone area serve as lenses through which to consider strategies endorsed by NHSS/IP. Many of the CBO interviewees do not specialize in disaster management, yet they have first-hand experience in disaster response after Hurricanes Katrina and Rita, the BP Oil Disaster, and the

SOUTH LOUISIANA COMMUNITY-BASED ORGANIZATIONS' KEY THEMES TO BOLSTERING RESILIENCE AND ALIGNMENT OF ACTIVITIES WITH THE NATIONAL HEALTH SECURITY STRATEGY AND IMPLEMENTATION PLAN, FEBRUARY–MAY 2018

Current Activities and Priorities	Challenges to Accomplishing Priorities	Strategies to Address Challenges
NHSS/IP Priority to Build and Sustain Healthy, Resilient Communities 1.1		
Encourage social connectedness through multiple mechanisms to promote community health resilience, emergency response, and recovery.		
Theme 1: Maintaining continuous, effective communication and year-round network building		
Reliable connections in place year-round to enable communication for disaster response between agencies	Agencies not having the financial resources, personnel, or time during a disaster to respond to clients' specific needs	Create coalitions between agencies on disaster management before disaster strikes Communicate with and make action plans with city officials, and state and local government
Reliable connections in place year-round to enable communication between agencies and the community members they serve	Difficulty ensuring that all members of communities have received important disaster-related messages	Share information through multiple channels, and tailor those communication channels to each person's needs
	Difficulty retaining mental health professionals	Help clients formulate a disaster preparation plan that accounts for many types of disasters Have trained social workers and physicians available to actively listen to people's stories and needs
NHSS/IP Priority to Build and Sustain Healthy, Resilient Communities 1.2		
Enhance coordination of health and human services through partnerships and other sustained relationships.		
Theme 2: Forging strategic partnerships before a disaster strikes with individuals and organizations that recognize and value the need for planning for a community's unique needs		
Agencies establishing relationships with organizational partners can help in long-term recovery and resilience planning	Lack of knowledge of who can provide specific resources	Partner with FBOs, nonprofits, academic institutions, hospitals, police, public health services, other community-based services, neighborhood associations, and government agencies before a disaster strikes
	Lack of volunteer management Lack of sufficient cultural humility training among volunteers	Maintain updated referral lists
Bringing historical partners together who have reliably played specific roles in the past can fill gaps in resource generation and distribution during a disaster	Lack of knowledge of how to prioritize needs	Prioritize monetary aid distribution (contrary to material aid) Store electronic medical records on multiple servers and in other states
NHSS/IP Priority to Build and Sustain Healthy, Resilient Communities 1.3		
Build a culture of resilience by promoting physical, behavioral, and social health; leveraging health and community systems to support health resilience; and increasing access to information and training to empower individuals to assist their communities following incidents.		
Theme 3: Providing appropriate education and training		
It is necessary to educate the community on general preparing for and recovering from disasters, the functionality and importance of levees and drain cleaning, and policy-level change and advocacy.	Lack of disaster preparation messaging to community members, organizations, and FBOs Ability to train local, trusted community members and leaders (as opposed to outsiders) Cost of hurricane-proofing homes The effects of civil maintenance systems (e.g., zoning, permitting, building codes) on disaster-prone individuals and communities	Detect deficits apparent in past disaster scenarios, then offer trainings on those deficits Utilize community engagement in education efforts

Continued

Continued

Current Activities and Priorities	Challenges to Accomplishing Priorities	Strategies to Address Challenges
Theme 4: Building an integrated system that enables rapid disaster response		
A resilient culture is determined in part by how quickly government agencies and volunteers in construction, mental health, and legal sectors are able to respond to disasters	Lack of knowledge of services available in disaster scenarios (e.g., mental health, social services, partnerships, resources for people who are incarcerated or disabled)	Compile city or statewide disaster plans and make them readily available to the public
	The effects of disaster on agencies (e.g., loss of office space, staff displacement)	Bolster disaster preparedness among staff at agencies
	Disappearing infrastructure and economic opportunity in low-lying areas	Collaborate with Indigenous communities in low-lying areas facing seawater encroachment to fund relocation efforts, divert water, and elevate homes
	Displacement because of climate change mitigation efforts in Coastal Louisiana	Fund home elevation in areas facing recurrent flood risks

Note. FBO = faith-based organization; NHSS/IP = National Health Security Strategy and Implementation Plan.

2016 Great Flood in Baton Rouge, thus offering particularly valuable insights.

Interviewees reported the following key themes related to bolstering resilience: (1) maintaining continuous, effective communication and year-round network building with other agencies; (2) forging predisaster strategic partnerships with individuals and organizations that recognize and value the need for planning for a community's unique needs; (3) providing appropriate education and training; and (4) building an integrated system that enables rapid disaster response. These themes closely align with NHSS/IP Strategic Objective 1 (Build and Sustain Healthy, Resilient Communities).

We were not surprised that interviewees repeatedly called attention to the importance of cross-sector collaboration, planning, and preparation. Diverse coalition approaches to addressing disasters represent leading opportunities to bolster community resilience.[9] Although the importance of forging partnerships before a disaster strikes has been previously reported,[22] our interviewees provide new insight on partnership and trust building with community members, FBOs, nonprofits, academic institutions, hospitals, police, public health services, neighborhood associations, and government agencies. CBO interviewees reported that preventive coordination across such sectors contributes to planning and response systems that react to disasters quickly, equitably, and effectively, thus contributing to greater overall community resilience. Such efforts have been vital to disaster recovery after Hurricanes Katrina in Louisiana and Rita in Houston, Texas.[23] CBO respondents also noted that successful, strategic, prevention-focused partnerships often do not form organically because of limited financial resources, personnel, and competing immediate priorities.

Community engagement was identified by respondents as essential to advancing community resilience and public health security goals, but few operational models exist, especially within public health departments.[24] Community-engaged strategies are emphasized by the NHSS/IP and previously published literature[22,24–28] and may merit ongoing attention and further research to determine how best to replicate elements that are successful in disaster-at-risk areas of the United States and the world.

In this South Louisiana study where communities face frequent threats from climate change, rising sea level, and structural inadequacies to mitigate risk, interviewees highlighted the importance of educating the community on disaster-related topics and advocating preparedness before disasters.

The CPPR-approach we undertake in this study may potentially be considered a mechanism for community self-study and capacity building to better identify and address community risks. We further build on the potential of CPPR and our emerging understanding of community resilience by integrating the interview results in the design of an agency-level coalition-building intervention and randomized controlled trial.[17] By strengthening interagency relationships between sectors, we hope to test in phase II of C-LEARN (in progress) whether agencies are better equipped to support each other and address their communities' diverse needs.

Limitations

This study is limited in several areas. First, a directed content analysis approach was the chosen methodology for data analysis because NHSS/IP Objective 1 aligns closely with our research; however, in this approach, data analysts may be more likely to find evidence that is supportive of NHSS/IP than nonsupportive. Second, 47 agencies are represented in this article. CBOs in South Louisiana who were not interviewed, including the 19 contacted to participate, may have offered unique or competing views that may differ from the perspectives in this article. Third, we used NHSS/IP 2015–2018 as an analysis guide. NHSS/IP 2019–2022 was released after this article was initially submitted for review.

Public Health Implications

Disasters such as hurricanes, floods, and oil spills are a significant public health concern, especially to underresourced communities. Our interviewees in at-risk communities identified that before, during, and after disasters, CBOs may fill vital roles in fostering community resilience through cross-sector

collaboration, planning, and preparation, akin to some NHSS/IP Priorities. Results of this study indicate that to most effectively bolster community resilience in disaster-prone areas, CBOs and public health agencies must maintain continuous, effective communication and year-round network building, participate in partnerships before a disaster strikes, provide appropriate education and training, and contribute to building an integrated system that enables rapid disaster response. AJPH

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CONFLICTS OF INTEREST

The authors do not have any conflicts of interest to disclose.

HUMAN PARTICIPANT PROTECTION

All study procedures were approved by the Louisiana State University Health Sciences Center–New Orleans institutional review board.

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