



Building Capacity for Community Disaster Preparedness: A Call for Collaboration Between Public Environmental Health and Emergency Preparedness and Response Programs

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Abstract Partnerships among local public environmental health (EH), emergency preparedness and response (EPR) programs, and the communities they serve have great potential to build community environmental health emergency preparedness (EHEP) capacity. In the study described in this article, the beliefs and organizational practices pertaining to community EHEP outreach and capacity were explored through key informant (KI) interviews ($N = 14$) with a sample of governmental EH and EPR administrators and top-level managers from Riverside and San Bernardino counties in Southern California. The results indicate that KIs were highly confident in their workforces' efficacy, ability, willingness, and motivation to directly engage local communities in EHEP. Best practices to combat organizational and systematic barriers to community EHEP outreach were identified. Based on the authors' results, training in participatory methods is needed to bridge technical knowledge in emergency management to daily practice. The lessons learned will form the basis of future interventions aimed to prepare EH and EPR professions to implement community-focused emergency preparedness strategies.

Introduction

Disasters have the potential for negative long-lasting repercussions on the environment and environmental health services (e.g., food, water, shelter, sanitation and hygiene, and vector control) of affected areas (Miller, 2006; World Health Organization, 2011). Partnerships among local public en-

vironmental health (EH), emergency preparedness and response (EPR) programs, and the communities they serve have great potential to build community environmental health emergency preparedness (EHEP) capacity because of the expertise of the first two groups in protecting the public's health from harmful elements in the environment

(Berg, 2004; Elderidge & Tenkate, 2006; Forsting, 2004; Miller, 2006) and their ability to coordinate efforts with first responders during response activities (Dyjack, Case, Marlow, Soret, & Montgomery, 2007; Miller, 2006). Our study goal was to explore the capacity of EH and EPR programs to facilitate participatory relationships between themselves and with the community members they serve and to assess past levels of community emergency preparedness outreach (Abbot, 2002; Berg, 2004; Blessman et al., 2007; Elderidge & Tenkate, 2006; Miller, 2006). We posit that this is best done using community-based participatory research (CBPR) methodologies to foster the reciprocal transfer of knowledge and skills that may lead to system-wide disaster resilience (National Academy of Sciences, 2010).

Public Health Emergency Preparedness—It Is Everyone's Responsibility

Traditionally, public health departments and agencies are responsible for protecting the food supply, safeguarding against infectious diseases, and ensuring safe and healthful living conditions (American Public Health Association, National Center for Environmental Health, & Centers for Disease Control and Prevention [CDC], 2001; CDC Foundation, 2001; Goldman & Coussens, 2007).

In response to domestic incidents such as the 9/11 terrorist attacks and subsequent anthrax attacks, Congress enacted the 2002 Public Health Security and Bioterrorism Act, thereby clearly articulating the role of public health in emergency and disaster preparedness (Brand, Kerby, Elledge, Johnson, & Magas, 2006; Gebbie & Qureshi, 2002; Qureshi et al., 2004). The act authorized funding for the Public Health Emergency Preparedness (PHEP) cooperative agreement to support preparedness nationwide in state, local, tribal, and territorial public health departments. The intent was to build the capacity and capability of public health departments to effectively respond to the public health consequences of terrorist threats; infectious disease outbreaks; natural disasters; and biological, chemical, nuclear, and radiological emergencies (CDC, 2011a; Field Costich & Scutchfield, 2004).

More than a decade later our nation has recovered from the events of 2001, and public health systems are stronger, but as citizens we continue to experience sudden natural and human-made disasters. Lessons learned from notable domestic and international disaster situations emphasize the urgent need to be prepared to prevent, respond to, and rapidly recover from constant public health threats. While responsibility begins at the local level, public health preparedness requires a concerted effort, involving every level of government, the private sector, nongovernmental organizations, and individuals. Responsibility for the preparedness of the nation's communities lies not only with governmental agencies but also with active, engaged, and mobilized community residents, businesses, and nongovernmental organizations (Goldman & Coussens, 2007; Henestra, Kovacs, McBean, & Sweeting, 2004). Nelson and co-authors (2007) define public health preparedness as

[T]he capability of the public health and health-care systems, communities, and individuals to prevent, protect against, quickly respond to, and recover from health emergencies, particularly those whose scale, timing, or unpredictability threatens to overwhelm routine capabilities. Aside from coordination, preparedness involves continuous planning and implementation that relies on measuring performance and taking corrective action.

Partnerships for Environmental Health Emergency Preparedness— A Community-Based Participatory Approach

Environmental health lessons learned in the aftermath of major disasters, such as Hurricane Katrina, indicate that “professional-only” approaches were not effective in engaging the community (Goldman & Coussens, 2007). CBPR has been identified as an effective strategy to involve members of vulnerable communities in a collaborative approach to emergency preparedness, response, and recovery (Goldman & Coussens, 2007). A CBPR strategy emphasizes respectful co-learning and empowering partnerships among researchers, practitioners, and communities (Goldman & Coussens, 2007). Partnerships can be strengthened by joint development of research agreements regarding design, implementation, analysis, and dissemination of the results. It is therefore critical to develop effective training of the EH and EPR workforce on community-based participatory methodologies that would prepare them to engage communities by building partnerships for disaster resilience capacity (Gaddis, Miles, Morse, & Lewis, 2007; Goldman & Coussens, 2007; United Nations, 2004).

A community-focused approach to emergency preparedness is in line with the Environmental Public Health Performance Standards, which describe how to optimize performance and capacity of environmental public health systems and programs (CDC, 2011b). The standards assess how programs provide communities with the 10 Essential Environmental Health Services (CDC, 2011c).

Our study aims in particular to understand how EH and EPR programs can provide essential service #4, or how to “mobilize community partnerships and actions to identify and solve EH problems” by investigating what EH and EPR workforce members think about their role regarding emergency preparedness, community engagement, partnership building, and about the need to involve members of the community in preparedness efforts.

Methods

Study Location

Our study was conducted in partnership with the Riverside County Community Health Agency and the County of San Bernardino

Department of Public Health of Southern California. Home to over four million people, Riverside and San Bernardino counties have the greatest land mass in the nation but are two of the most resource poor (California Employee Development Department, 2010; U.S. Census Bureau, 2011). Almost half of the population is Latino, many of whom are low in English proficiency. Residents of this area are vulnerable to natural and human-made environmental hazards including earthquakes, train derailments, seasonal wildfires, floods, and landslides. Additionally, communities are directly impacted by extreme levels of air pollution and, in some areas, lack of access to safe drinking water (California Department of Transportation, 2010).

Study Design and Sample

In our qualitative study, in-depth semistructured interviews were conducted with top-level EH ($n = 8$) and EPR ($n = 6$) administrators and managers. Participants were selected by nonprobability purposive sampling methods.

Measures

The semistructured key informant guide created and used to guide the interviews was based on constructs of social cognitive theory (Bandura, 1982, 2000; Sampson, 2003; Sampson, Raudenbush, & Earls, 1997), social cohesion (Fone, Dunstan, Lloyd, Williams, & Watkins, 2007; Rosenstock, Strecher, & Becker, 1988), health belief model (Kreuter, 2002), social capital (Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008), and community resilience (Glaser, 2002). The interviews explored six main topics: 1) existing community EHEP outreach and activities; 2) readiness to engage communities in EHEP outreach; 3) benefits, barriers, and risks to engaging communities in EHEP outreach; 4) perceived community emergency and disaster resilience; 5) the role of social capital and social cohesion in disaster preparedness and response; and 6) personal emergency preparedness.

Data Collection

The key informant interviews were conducted by trained interviewers at EH or EPR administrative offices in June to August 2010. Prior to being interviewed, participants were asked to read and sign an informed consent approved by the Loma Linda University institutional review board. Each interviewer was

accompanied by one or two note takers and the interview was audiotaped. Confidentiality was protected by deidentifying transcripts, notes, and audio recordings. Each participant was assigned a code that was used as the sole identification of each participant. The files are stored in a locked file cabinet located in a locked room.

Content Analysis

Each interview was transcribed verbatim and analyzed with field notes using grounded theory methods of emerging line-by-line coding to first develop and apply a resulting codebook to all text using NVivo 8, a qualitative data analysis software, to categorize, query, and examine the data. The transcripts were analyzed for emergent themes and supported by critical quotes.

Results

Four central themes emerged from the key informant interviews. The themes along with corresponding quotations are presented below.

Theme 1: Community Outreach—Yes, We Do That!

The EH and EPR administrators were very confident in the community partnerships they foster. It must be noted, however, that the “community” stakeholders they identified include the American Red Cross, County Office of Emergency Services (OES), local and county fire departments, city emergency managers, other public health departments and programs, the transportation department, law enforcement, political decision makers, hospital systems, health care provider networks, county schools, businesses (especially restaurants), and universities, not community citizens themselves. Direct citizen engagement is generally only practiced in emergency response situations and not in preparedness efforts. Overall, the administrators firmly believe that preparing their partners to relay health messages to the general populace is the best method of information transmission to the community because these partners “know” their communities’ assets and needs best. They did note, though, that working with nontraditional community partners (e.g., schools, faith-based and community-based organizations, and homeless shelters) was key in spreading the word regarding H1N1 prevention and vaccination.

- “Unlike other programs in public health, I believe that this program has a different client than your typical HIV or WIC [Women, Infants, and Children]. Typically our clients are the cities and towns and their emergency managers. Emergency preparedness and planning uses [the cities and towns] to get to their larger client base which would be their citizens.”—EPR Professional
 - “Unfortunately, because of funding cuts, we haven’t been doing as much of that direct outreach. We’ve been going through other organizations at this point.”—EH Professional
- Despite their confidence in being connected to the community, respondents recognize that their direct engagement is limited. For the most part, the EH and EPR programs do not have a formal community outreach plan. Community outreach mainly consists of providing health education in the form of print and audiovisual media such as via their Web sites and mass e-mails and through public service announcements made on the radio or on television. Social media, such as blogs, was also described as a new form of reaching out to the general public.

Common environmental health education topics include 1) how to go potty without a potty, 2) what to do when a boil-water order is issued, 3) the truth about illegal food vendors, and 4) how to properly dispose of food after a long-term power outage. Common emergency preparedness and response topics include 1) generic preparedness tips including how to create a 72-hour survival kit, 2) bioterrorism preparedness, 3) pandemic flu prevention, 4) importance of getting the flu vaccine, and 5) proper hand-washing techniques. Direct community outreach is rarely initiated from within the department and occurs usually when requested by community organizations or other public health programs. Planning sessions, table top exercises, and trainings are typically reserved for the traditional “expert” community partners mentioned above.

- “We provide public education and printed materials . . . so during the H1N1 outbreak we provided a lot of information that was delivered through radio, movie theater advertisements that came before the movie, bus shelters, nonpharmaceutical interventions such as wash your hands.”—EPR Professional

Finally, both workforces feel competent to educate and engage the community in emer-

gency preparedness principles. Ambiguity exists, however, as to who the lead agency is or should be, thus leaving preparedness coordination largely fluid. EPR administrators identified EH departments, health education programs, or OES as the lead agencies. EH administrators identified EPR programs and the American Red Cross as the lead agencies. In general, EH administrators believe that their main role is to respond to communities’ needs *after* a disastrous event and to help communities “bounce back.” With respect to prevention, they feel that the extent of their function is to offer technical guidance in creating community emergency preparedness outreach materials.

- “Environmental health is the code enforcement section. They do the vector control, restaurant inspections, and wastewater inspections and treatment. So when we talk about environmental health emergency preparedness, I believe that means the type of work that environmental health services do and I describe. This program is the preparedness and response program. We do bioterrorism and pandemic flu preparedness.”—EPR Professional
- “We leave the preventive things to other groups, because in the environmental health department we’re the responders. We can take on that additional role, but we don’t have the resources to just go and do that kind of outreach.”—EH Professional

Theme 2: Barriers to Direct Community Engagement

The EH and EPR administrators and managers identified several barriers that impede direct community engagement about environmental health emergency preparedness.

Barrier #1: Limited Traditional Roles and Funding Streams

Traditionally, the EH workforce has been largely a fee-for-service, code-enforcing entity. Their primary responsibility is to monitor, inspect, and regulate food and water safety, air quality, sewage disposal, and vector management. In general, Riverside and San Bernardino county EH departments receive only a few county general funds to support activities such as direct community outreach. Thus, although EH administrators acknowledge the importance of this work, they feel that it is inappropriate to spend resources on an “unfunded” side project.

- “Our funding comes specifically from the regulated industry and it wouldn’t be right to use those monies for something that is not related to that facility that we are regulating. Actually, it is restricted by law in many cases.”—EH Professional

The EPR workforce is limited in its ability to directly engage community members in environmental health emergency preparedness because it is largely supported by categorical grant funding including funds to prepare for bioterrorism threats and pandemic flu (avian flu [H5N1] and swine flu [H1N1]). Categorical grants also limit the EPR scope of work by specifying what community or population must be targeted.

- “After 9/11, a funding stream was developed from Homeland Security and the CDC to provide monies and the efforts of planning more activities for each local health department to better prepare and respond to the threat of bioterrorism. Shortly thereafter, the CDC began placing emphasis on avian flu, H5N1, and wanted to provide a funding stream to local health departments in that effort as well. They realized that mechanism was already there for bioterrorism. So the program has these two primary goals in mind: bioterrorism and pandemic influenza planning.”—EPR Professional

Barrier #2: Lack of Interdepartmental Collaboration

Collaboration between the two departments generally occurs for disease surveillance and emergency response, not for emergency preparedness. Large governmental establishments were quoted as contributing to this barrier.

- “As far as working a lot with environmental health . . . I haven’t seen that happen too much yet in our program. I know we work a lot with various partners in the hospitals, with law enforcement.”—EPR Professional

Barrier #3: Communicating With Community Residents

EH and EPR administrators recognize diversity in ethnic, cultural, linguistic, and literacy levels of the residents of the “Inland Empire.” Language barriers and technical jargon make it difficult to communicate with many community residents. Different people have different ideas about the origin of disease, which can limit their understanding of disease outbreaks after an emergency. Thus, the need

exists to translate scientific principles into layman’s terms, while at the same time staying as true as possible to the original science. Having connections with key community opinion leaders, who are fluent in the local languages and comfortable with local culture, is vital for successful community entry.

- “When we are talking to the community about how to disinfect this water they might not have a clue what ‘parts per million’ is but they might understand caps of bleach.”—EH Professional
- “When you are talking about germ theory, or anything else that can go with that, it will be important to make it appropriate for the audience.”—EH Professional

Barrier #4: Perceived Lack of Community Trust for Government Entities

The administrators perceive that some communities in their service area do not trust governmental agencies due to past social injustices, persisting inequities, and fear of government control, or deportation. The programs overcome some of these barriers by training key community stakeholders and opinion leaders to transfer knowledge and skills using the best modality for their community.

- “Just giving the message in their language is one thing, but overcoming their fear or their resistance is also another barrier. They’re naturally suspicious sometimes of strangers trying to provide them help. A lot of them have felt at some points that they’ve been taken advantage of, or they feel mistreated and have frustration with the system.”—EH Professional
- “Regarding community mistrust: it has nothing to do with public health. This could be something that has happened in the last 20 or 30 years.”—EH Professional

Barrier #5: Perceived Community Message Fatigue (Risk Communication)

The administrators perceive that the general public is desensitized to emergency preparedness messages. These messages make the most impact after local or global emergencies or disasters and then lose their effect. They feel that many put off investing time, effort, and money in emergency preparedness and instead focus on more pressing issues like feeding the family or paying the bills.

- “With general disaster preparedness, I think it’s a real challenge because I think

you get things like message fatigue. We can’t get people in this field to buy disaster preparedness supplies, so how do you make that argument to somebody where they can’t touch it and see the reality of it?”—EPR Professional

Theme 3: Best Practices

The EH and EPR administrators recognize many barriers to direct community engagement in general. They are optimistic, however, and offered several solutions or best practice ideas. The art of listening was described as key to reaching a clear understanding of people’s challenges; programs, education, and outreach must be customized to the audience thereby eliminating the “one-size-fits-all” mentality. Simple and inexpensive preparedness techniques were emphasized because of their increased accessibility and greater likelihood for success. The use of community participatory strategies and partnering with local lay community health worker networks were also identified as ways to incorporate community members in planning, creating, and implementing outreach.

- “We have two ears and one mouth for a reason. And when you go and want to partner with someone about anything, the most important thing is to listen and really hear what the other is saying and really respond to that.”—EH Professional
- “Especially with environmental health, we’re so much in the regulatory mode. We can’t just go out there and spout orders and say it’s because the code says so. We try to educate and listen and rationalize and we would try the same approach in this arena [emergency preparedness] to gather information and analyze it.”—EH Professional

Theme 4: High Motivation for Community-Centered Outreach

EH and EPR administrators are cautiously optimistic about their workforces’ willingness to participate facilitating community emergency preparedness capacity. They believe their workforce is used to community engagement but would need some training in environmental health-focused emergency preparedness outreach. Regarding departmental readiness for this type of work, one manager said it best: “It comes from the top down.”

- “My commitment is to protect public health. And that happens through train-

ing, through what I've done, and through compassion, 'cause when somebody needs help, you help that person. Regardless of what your role is, so I'm committed and I'm ready."—EH Professional

Discussion

The EH and EPR workforces' professional knowledge, skill set, and partnership building capabilities and capacity suit them well as natural leaders in community disaster preparedness. While EH and EPR administrators and leaders identified significant organizational barriers to effectively engage communities in preparedness, they nevertheless were confident in their workforces' abilities, were motivated to practice a community-centered approach, and identified solutions to moving their workforce toward this through training and role clarification. Will this high collective efficacy translate to organizational readiness to change? Are they, collectively as an organization, ready to change the status quo and traditional functioning?

Our results corroborate and extend the published literature that describes the work of EH and EPR professionals in emergency preparedness efforts: EH professionals feel disconnected from preparedness planning and see themselves as too busy conducting fee-for-service activities (Dyjack et al., 2007); ambiguity exists about environmental health functions in disasters (Forsting, 2004); EH is not well represented in disaster planning; power and politics within agencies result in a narrow assignment of the environmental health role (Elderidge & Tenkate, 2006); and a top-down approach exists to disaster management (Perlino, 2006).

Given that EH professionals will likely play important emergency response roles in nearly all disasters impacting human health, it is surprising that so little attention has been paid to their training needs for responding to bioterrorism and other public health emergencies (Office of Workforce and Career Development, 2009). Public health program directors can combat organizational challenges such as those described in our study by seeking noncategorical, general fund, and grant money in order to provide more flexibility and the option to support applied research, community outreach, the provision of comprehensive services, and to provide support for the expanding scope of certain mandated programs (Dyjack et al., 2007).

Our study provided much needed in-depth insight into how the leadership of the EHEP programs of these two Southern California counties perceives the state of community partnership building and community emergency preparedness capacity. The results of our management-centered qualitative study informed a workforce-wide survey tool that was designed to evaluate the line staff workforce's perceptions on the effectiveness, accessibility, and quality of personal and population-based environmental emergency preparedness public health services, or essential service # 9 (CDC, 2011c).

The results have been instrumental in the development of a CBPR program to train EH and EPR professions in the fundamentals of community partnership building and capacity building. We envision that this training will provide the current preparedness workforce with tools to overcome organizational barriers

and strategies to engage in partnership-based EHEP education with their local communities and thus essential service #3, which is to "inform, educate, and empower people about environmental health issues (CDC, 2011c)."

Conclusion

As public health departments aim to model their programs in accordance with national standards such as the Environmental Public Health Performance Standards, it is crucial to understand how they fare in providing communities with the 10 Essential Public Health Services. We recommend using a CBPR approach to assess performance, build partnerships, evaluate performance, and build capacity for sustainability. 🌱

Acknowledgements: We are thankful to our partners at the Riverside County Community Health Agency and the County of San Bernardino Department of Public Health. We also appreciate the assistance of our team of collaborators and research assistants: Jesse Bliss, Walleska I. Bliss, Biblia Kim, Gricelda Gomez, David Busolo, Gigi Kwok, Alma Lopez, Angelica Mondragon, Nathan Dyjack, and Ramiro Lopez. This study is supported by CDC/PERRC#1P01TP000303-01. This research was also partially supported by 5P20MD160032.

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