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Lessons Learned: Community Engagement in Emergencies in Puerto Rico

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Abstract

Objective: To describe the importance of community engagement from research projects and research centers in times of disasters or emergencies, using the case of Puerto Rico in recent years (2017 - 2022) as an example.

Methods: First, research participants and stakeholders from local community and health organizations were contacted via email and phone calls after each emergency to assess their immediate needs. Second, needs were classified in categories (materials, educational resources, service referrals, and collaborations). Finally, delivery of support was coordinated in a timely manner whether in person or online.

Results: Activities were conducted such as handing out materials, providing educational resources, contacting participants, and stakeholders, as well as coordinating collaboration with community and organizations.

Conclusion: Several lessons were learned from our experiences related to Puerto Rico's recent emergencies as well as some relevant recommendations for future disasters. The efforts presented illustrate the importance of community engagement from academic institutions in disasters. Research centers and research projects, particularly those with community engagement components, should consider providing support in the preparedness phase as well as the recovery phase if necessary. Community engagement in emergencies is crucial to recovery efforts as well as fostering empowerment and making an impact on individual and societal levels.

Introduction

Academic-community partnerships are fundamental not only to translational research but also in promoting community engaged research that improves the well-being of people. During the last several years, Puerto Rico has experienced a series of natural disasters with devastating social and economic consequences. There was the Zika epidemic in 2016, hurricanes Irma and María in 2017, earthquakes in the southern region in January, 2020, and the COVID-19 pandemic beginning in March 2020. In this article, the community outreach efforts from a research center (Center for Collaborative Research in Health Disparities - RCMI Program) and a research project (Puerto Rico Team for Exploring Contamination Threats - PROTECT), both part of the University of Puerto Rico-Medical Sciences Campus, will be presented and described. These efforts are an example of the importance of community engagement from academic institutions in disaster situations. Sharing scientific knowledge and providing necessary materials are important actions that can contribute to the recovery efforts and empowerment of communities, as well as support the reinstatement of research recruitment activities.

Community engagement

This concept refers to the process of working collaboratively with communities or groups of people affiliated by geographic proximity, special interest, or similar situations to address issues that affect the well-being of these people.[1] Morgan and Lifshay consider community engagement as involving dynamic relationships and dialogue between community members and institutions, with varying degrees of involvement, decision-making and control.[2] Community engagement can take many forms, and partners can include organized groups, agencies, institutions, or individuals. Mostly, collaborators may be engaged in health promotion, research, or policy making.[1] In general, the goals of community engagement are to build trust, enlist new resources and allies, create better communication, and improve overall health outcomes as successful projects evolve into lasting collaborations.[1]

When addressing community issues from a historical context, the social systems in which people live as well as potential and existing resources, and social networks must be considered. This process also implies establishing relationships and building trust, identifying existing networks, and resources, developing cultural competencies, ensuring bidirectional communication and community ownership and involvement throughout the process, and considering vulnerable groups within the community.[1] For Ramsbottom, O'Brien, Ciotti, and Takacs, considering vulnerable groups within the community implies recognizing that there are many groups within a community, some of whom may be exposed to more vulnerable conditions during emergencies for a variety of reasons.[3]

In community engagement there are several social actors that can be involved: (1) government agencies or institutions, (2) health professionals, (3) community leaders, and (4) research and academic partners. Ramsbottom, O'Brien, Ciotti and Takacs consider the synergy between institutions and communities highlighting the importance of a supportive/ collaborative relationship that is culturally sensitive, thereby bringing a wide range of organizations and people together for generating a more efficient response to disasters.[3] While more notably, community engagement may be achieved during a time-limited project, it frequently involves long-term partnerships that move from the traditional focus on a single health issue to address a range of social, economic, political, and environmental factors that impact health.[1] The success of emergency plans depends on communities and institutions working together to ensure a successful management of the preparedness, response, and recovery phases of the cycle. It implies understanding the context, existing relationships between institutions and communities, community organizations, practices, priorities, and expectations. It is also important to consider the infrastructure, resources, and funds, as well as capabilities and requirements of community ownership and a process for communicating with the community, timeline of linkages and engaging vulnerable communities.[3]

Disasters

Berroeta and Pinto de Carvalho define a 'natural' disaster as the negative consequences of a 'natural' event.[4] For them, considering the phenomenon as a 'natural' disaster, naturalizes a deterministic approach, minimizing the role of people in the causes, consequences, and restoration of a disaster. Seeking to denature the phenomenon, the social sciences have insisted that disasters are not natural.[5] Therefore, this approach uses the notion of socio-natural disasters as a discursive intention, since natural hazards must interact with conditions of social vulnerability in order for a disaster to occur. In this sense, settlement decisions and social, political, cultural, and economic conditions are decisive factors.[5] Understanding and intervention in socio-natural disasters implies the participation of other disciplines, in collaboration with the natural and physical sciences.

Community engagement in disasters

This concept is defined as a structured dialogue, joint problem solving, and collaborative action between formal authorities, citizens and local leaders around a pressing public matter and can augment officials' abilities to govern in a crisis, improving the application of communally held resources and mitigating community wide losses. It is important to understand that communities have capacities and that therefore they can access resources and design better solutions according to situations or social realities.[1] This also implies recognition that the communities can help overcome loss and trauma by accessing their individual and community strengths.[6] In relation to community engagement in disasters, some authors mention 3 phases: (1) preparedness, (2) response, and (3) recovery. The different phases of the crisis or disaster show how the presence of social, economic, psychological, cultural, and political dimensions increase their complexity. Therefore, their management requires the participation of different professionals, technicians, volunteers and affected persons in a team effort, which depending on the circumstances should apply multi-inter or transdisciplinary models.[6]

Emergencies in Puerto Rico

The Puerto Rican archipelago has been dealing with several disasters of a political, social, and natural nature during the past decade. These disasters include a debt crisis that led to a federally imposed oversight management board that essentially controls the government's spending on the Zika epidemic, Hurricanes Irma and María, a seismic sequence in the southwest region of the main island, and now the COVID-19 pandemic. The oversight management board was created by the Puerto Rico Oversight, Management, and Economic Stability Act (PROMESA), Public Law No: 114-87 in 2016, and its main focus is to provide a method for Puerto Rico to achieve fiscal responsibility and access to capital markets.[7] 'Puerto Rico is suffering the compound effects of multiple disasters over the last few years.'[7]

In 2019 the Global Climate Risk Index listed Puerto Rico as the most affected country by climate related events given its recent experiences with hurricanes and earthquakes.[7] As a tropical archipelago, people in Puerto Rico are highly exposed to weather-related hazards such as coastal erosion, hurricanes, floods, and droughts. Puerto Rico is also positioned among several fault lines which makes the territory vulnerable to earthquakes and tsunamis.[7] On the other hand, people within the archipelago have been experiencing an economic recession since 2008 along with severe austerity measures, that have a debilitated infrastructure - roads, electric grids, water systems, public buildings, homes, schools - and also a significant emigration from young and educated individuals.

Zika epidemic

On December 31, 2015, the first case of Zika was reported in Puerto Rico. More than 35400 Zika cases were documented in Puerto Rico 16 months later. This number represents 85% of all cases reported in the United States of America and its territories. The Zika epidemic exposed the poor quality of sex education, limited access to contraception and lack of resources to develop effective prevention strategies.[8] It must be taken into consideration that previously, the archipelago had been dealing with a Chikungunya epidemic, as well as endemic Dengue virus. The Dengue virus was first reported in Puerto Rico in 1899 and has 4 different types; throughout the 20th century several outbreaks have been reported.[9] The Chikungunya epidemic started in May 2014 with the first reported case, and in that same year 4465 confirmed and 30247 suspected cases were reported.[8]

Hurricanes Irma and María

Hurricanes Irma and María devastated the Puerto Rican archipelago in September 2017, Hurricane Irma on September 6, and Hurricane María on September 20. Hurricane Irma passed the North-eastern part of the Puerto Rican archipelago as a category

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5 hurricane and caused a nation-wide blackout and some structural damages.[10] Hurricane María encompassed the entire archipelago as a high-end category 4 hurricane only 2 weeks later.[11] The slow and inefficient recovery efforts by local and federal authorities resulted in over 4000 deaths.[12] The passing of 2 consecutive hurricanes over an archipelago with a profound economic and political crisis caused the collapse of the electrical grid system and communications system, limited access to water, disruption of healthcare and other social services, and the destruction of private and public property. All of this damage to infrastructure is estimated to cost $90 billion to repair.[12] 'The aftermath of María highlighted the need for resilient and sustainable infrastructure on the island. With the intensity of weather-related events expected to rise due to the climate crisis, the level of exposure and danger that events like María pose is even greater.'[12]

Earthquakes

On January 7 2020 there was a 6.4 - magnitude earthquake in the southern part of the Puerto Rican mainland which was felt around the island. It caused a total power blackout for several days.[13] The aftershock continued for several months. As a consequence, there were damages to properties including people's homes, public schools, and other public and private structures. However, this time (when compared with the hurricanes) the destruction was more localized, specifically in the towns of the Southwest and also in the central mountainous region.[13] As a result, people and communities set up improvised camping sites but this time around, 'many communities and groups were already organized due to their experience with Hurricane María. This enabled them to immediately carry out disaster-relief work with the framework of mutual aid.'[13] There were various aftershocks during the following months, according to García Canto and collaborators, Puerto Rico began experiencing an earthquake swarm in December 2019 and by July 2020 had experienced 92 earthquakes with a magnitude greater than 4.[12]

Covid-19 pandemic

The first confirmed cases of COVID-19 in Puerto Rico have been linked to a couple of Italian tourists who arrived at Old San Juan on March 10, 2020 from a cruise, and a Panamanian tourist who attended the Salsa Music Festival concert on March 13, 2020. On March 16, 2020 the government declared a lockdown in order to control the spread of the disease and avoid a collapse of the healthcare system. However, since May 2020 they have been lifting restrictions little by little but are responding more to economic concerns than public health recommendations. Recent data indicates a total of 442,931 confirmed cases, with 5,762 deaths, 4,855,315 PCR tests administered and a 15.8% positivity rate.[14] On the other hand, the rate of vaccination indicates a total of 1,077,480 people have completed the cycle of vaccionation.[14]

Community engagement initiatives

During the past few years, the RCMI Program and the PROTECT Project respective Community Engagement Cores (CEC) have frequently collaborated in community outreach initiatives to aid local communities in Puerto Rico during and after natural disasters. It should be noted that measures of effectiveness were not considered, and data was not systematically collected due to the immediacy of the disasters. However, the initiatives from the RCMI Program were key to the development and establishment of academic-community partnerships and the initiatives from the PROTECT Project were important to foster rapport between the research team and study participants.

Zika epidemic

When the Zika epidemic began, the RCMI Program funded a pilot project 'Using Risk Communication Strategies for Zika Virus Prevention and Control Driven by Community-Based Participatory Research,' and on the other hand the PROTECT Project began to take part in an international study (Zika in Pregnancy-ZIP) to explore the effects of the virus on pregnancy and birth outcomes among their cohort. The RCMI Pilot Project included community members in planning, developing, and implementing a risk communication initiative. This initiative focused on 4 risk communication strategies: Zika awareness, health fair, health education through theater, and community forums and workshops.[15] Findings from baseline and follow-up data demonstrated significant positive changes in respondents' recognition of personal and community responsibility for the prevention of Zika infection, increased knowledge of prevention strategies, and enhanced engagement in preventive behaviors for mosquito control. PROTECT participated in an international effort to evaluate the association between Zika and pregnancy, neonatal, and infant outcomes. With the emergence of the virus on the American continent and its association with adverse pregnancy outcomes, this study was important to provide a better understanding of clinical outcomes and develop best practices in the future. Both initiatives mentioned were based on research projects whose focus was data collection and thus measures of effectiveness (MoEs) were obtained, particularly in the project regarding risk communication strategies.

Hurricanes Irma and Maria

The RCMI Community Engagement Core in collaboration with the Puerto Rico Team to Explore Contamination Threats (PROTECT) along with the RCMI pilot project 'Risk Communication and Community Engagement Strategies to Enhance Behavior Change for Zika Virus Prevention and Control,' coordinated several community outreach educational activities after the hurricanes. Community leaders and residents from Manuel A Pérez housing project in San Juan and Villa Calma Sector in Toa Baja received visits from the RCMI pilot project and the PROTECT project after Hurricane Maria. The visits included training sessions and sharing of knowledge related to the prevention of mosquito transmitted diseases. The training consisted of the use of mosquito traps, community water filters and included a distribution of mosquito nets and repellents. The scientific knowledge shared was related to the Zika virus infection, strategies to protect homes from mosquitoes, the risks of contaminated water and proper water consumption. On the other hand, the PROTECT Community Engagement Core contacted their study participants to identify needs within their communities and provide aid. The most relevant were access to safe drinking water and mosquito repellents, nets to prevent diseases like Dengue and Zika, and baby supplies like diapers, food, and baby wipes. The research team established collaborations with several organizations in order to provide these materials and hand them out to the participants and their communities.[16]

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Earthquakes

After the earthquakes and subsequent tremors, the RCMI Community Engagement Core collaborated with the UPR-MSC Public Health School as well as the Puerto Rico Public Health Trust to on one hand, distribute materials such as flashlights, whistles, first aid kits, water filters, cots and mattresses, socks, and mosquito repellents. These materials were selected based on recommendations by the RCMI Community Coalition Team as well as previous experience with the hurricanes. On the other hand, with the PROTECT Community Engagement Core the RCMI CEC participated in a needs assessment to gather a demographic profile, housing conditions and basic needs from communities living in encampments after the earthquake.

Covid-19 pandemic

Shortly after this the COVID-19 pandemic began and in March the Puerto Rican government declared a lockdown. However, while working from home and virtually, the RCMI Community Engagement Core has done a series of activities in collaboration with health and community organizations. For example, the distribution of materials like face masks, hand sanitizers, digital thermometers and coloring books for adults. Also, developing and disseminating educational materials about basic definitions, prevention strategies, taking care of an infected person, and the vaccination process. A comprehensive community guide on COVID-19 was developed, and conversations about the impact of COVID-19 on vulnerable populations on Facebook Live in collaboration with the Puerto Rico Public Health Trust were coordinated. The PROTECT Project has also completed a series of engagement efforts. First, the research staff contacted active participants through the call center and asked them how they wanted to receive information about prevention strategies related to COVID-19 and environmental exposures. The participants expressed interest in receiving materials through digital platforms with visual representations. As a result, the Community Engagement Core (CEC) team designed strategies in order to adapt the information to our new reality. The CEC team generated and disseminated numerous diverse virtual educational efforts like webinars, Facebook lives, digital infographics, and social media posts, as well as short, animated videos. The infographics and videos focused on how to take care of their pregnancy stage during the COVID-19 pandemic and minimize exposures to harmful substances such as Phthalates, Bisphenols, Triclosan, and Triclocarban, as well as Parabens and other chemicals of concern. As a third strategy, the PROTECT CEC disseminated all educational materials through text-messages and social media, which gave the opportunity to amplify capacity building.[17]

Discussion

Here, 2 examples of community - academic relationships are presented, the first, a research center, and another a research project and their responses to general emergencies that have recently affected the Puerto Rican population. The research center focused on providing aid to community and/ or health organizations, while the research project focused mainly on providing support to their research participants. However, in spite of their differences both provided significant and meaningful support to individuals and communities during the response phase on several occasions during the last few years. Some lessons learned from these experiences are: (1) the importance of collaborating with other entities in order to not duplicate efforts, (2) the importance of identifying the actual needs that should be met, preferably by consulting the communities or organizations themselves, (3) the need to involve the community or organizations during the different stages of the process, working together and considering their knowledge, experience and skills, and (4) the relevance of developing or having established relationships with the individuals and/or communities that you want to impact since this will facilitate trust, communication and implementation.

Considering the efforts made in the research center focused on providing aid to community and/or health organizations and the research project focused mainly on providing support to research participants discussed above, it is recommended to identify a theoretical model that guarantees all the phases of the cycle, preparedness, response, and recovery are taken in consideration for future emergencies. Both examples of community-academic relationships illustrate an active role during the response phase. In order to guarantee that researchers and CEC staff can support all phases during a crisis, or disaster, they must understand that communities are dynamic and complex systems. This allows them to apply flexible approaches that are adaptable to a diversity of communities and environments particularly in their practices with different populations such as pregnant and postpartum women, people with chronic diseases like cancer, patients of sexual and reproductive health clinics and geographic communities (i.e., Caño Martín Peña and Río Piedras). In general, successful synergies can be enabled by ensuring the information is coherent and consistent, so that information is perceived as reliable and as a result, communities trust this information.

Also, the communication process should be bidirectional and be made during all phases to enable feedback from all groups within the community so that all relevant local knowledge can be shared. Particularly during the preparedness phase, background information about communities in terms of how well they work with institutions for an emergency might determine how successful the efforts are later on in the response and recovery phases of the emergency. A lack of communication may result in chaos when an emergency occurs, as community members are most likely first responders to an emergency. It is recommended that during the response phase, communication should be the government's responsibility, and their failure to live up to that, may lead to community members being uninformed and potentially result in a state of panic.[3]

During the preparedness phase, it is important to improve and strengthen the infrastructure, so communities are able to take ownership, particularly at times when institutions are not able to provide support during response and recovery. This includes the resources and funding granted to and within a community. An accurate evaluation about resources and funding to determine the extent to which community members can own community emergency response initiatives or would benefit from some assistance.[3] In relation to RCMI and PROTECT, they can contribute on one hand, by providing educational information to community members and study participants, evaluating existing resources and ensuring access to training opportunities, or connecting them to existing organizations that provide infrastructure support. Another lesson learned is that members of research projects or centers should have emergency preparedness training (i.e., USAID DART FOG manual and course, and UN OCHA materials) in order to be better prepared to respond to future emergencies and provide support to participants and communities. In addition, developing measures of effectiveness instruments to better evaluate the impact of community engagement during and after emergencies would guarantee continued assessment to adjust future interventions.

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During the response phase, pre-positioned disaster volunteer networks such as the Citizen Corps and the Red Cross can support professional responders. Similarly, voluntary associations without an explicit disaster mission (faith communities, trade groups, neighborhood associations, and fraternal organizations, as well as student groups) can marshal their organizational structures and material assets to meet emergent needs.[18] During this phase, communication should be the government's responsibility, and their failure to live up to that may lead to community members being uninformed and potentially result in a state of panic.[3] Trust is crucial for community engagement and if community leaders lack trust in emergency management staff, they may decide to disengage with its representatives. As previously mentioned, researchers and CEC staff have provided emergency relief mainly during this phase by identifying needs and providing material and educational support to organizations and individuals.

During the recovery phase, residents of a community affected by a disaster have a personal investment in their recovery over the short and long terms. In addition, local civic networks could provide community and comfort in ways that the government cannot. After sources of external aid have finished, local community networks and support systems remain to secure residents' well-being. Anticipating the termination of the 9/11 FEMA-funded crisis counseling programs, disaster mental health experts called for resources in locals affected by terrorism to equip existing community networks and support systems to provide solace over time.[18] RCMI and PROTECT could follow up with the communities impacted to ensure medium and long- term support if necessary. However, it must be recognized that as a research center and a research project, their priorities are not emergency preparedness and recovery. But since they interact with organizations and individuals it is their responsibility to provide support and respond to local emergencies that affect Puerto Rico.

In conclusion, there were several lessons learned from experiences related to Puerto Rico's recent emergencies as well as some relevant recommendations for future disasters. The efforts presented illustrate the importance of community engagement from academic institutions in disaster situations. Sharing scientific knowledge and providing necessary materials are important actions that can contribute to the recovery efforts and empowerment of communities and the people that inhabit them. However, before providing any kind of assistance it is necessary to first contact the community to assess their needs and expectations and also collaborate with them in the response process. On the other hand, it is recommended that research centers and research projects, particularly those with community engagement components should consider providing support in the preparedness phase as well as the recovery phase if necessary. In order to accomplish this, trust and foster a long-term partnership based on mutual respect and communication should be established. They must also look out for existing partnerships and other available resources which could help them manage issues related to infrastructure. Community engagement in emergencies is crucial to recovery efforts as well as fostering empowerment and making an impact on individual and societal levels.

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Abbreviations. CCRHD, Center for Collaborative Research in Health Disparities; CDC, Centers for Disease Control and Prevention; CEC, Community Engagement Core; COVID-19, Coronavirus; FEMA, Federal Emergency Management Agency; NOAA, National Oceanic and Atmospheric Administration; PCR, Polymerase Chain Reaction; PROTECT, Puerto Rico Test site for Exploring Contamination Threats; RCMI, Research Centers at Minority Institutions; WHO, World Health Organization.

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