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Commentary

Boston Strong: The Role of Community Resilience

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April marked the 1-year anniversary of the Boston Marathon Bombings, which brought our city to a standstill as we endured a terrorist attack, manhunt, and subsequent lockdown of the metropolitan area. Twin explosions near the marathon finish line, occurring just minutes apart, left 3 people dead and hundreds injured. In the hour that followed the bombing, the city of Boston and privately run ambulance crews, with the aid of first responders, bystanders, and trained volunteers, triaged and transported 118 patients to 9 different hospitals, including the city's 7 major trauma centers, preventing what could have been a much higher death toll. In the ensuing disorder, families were separated, belongings misplaced, and hundreds of runners stopped before they could finish the race.

As we have done every year since the 9/11 terror attacks, the Boston Public Health Commission, the city's health department, had been working with other city agencies, the Boston Athletic Association, and state public safety officials for 12 months to plan for the annual marathon event. Our typical role during the marathon is to coordinate medical care for runners and spectators, ensure adequate numbers of emergency medical services crews and trained medical volunteers, and monitor the event for any unusual risks to the health of runners, which most often is inclement weather.

On April 15, 2013, our role quickly shifted. Within 1 minute of the first explosion, crews in the medical tent at the finish line began treating those injured in the blast and radioed information about the bombings to the Medical Intelligence Center, the commission's command center during a serious medical emergency. Within 3 minutes, the Medical Intelligence Center had notified all hospital emergency departments of the attack and warned them to prepare for an influx of badly injured patients. In the immediate hours after the bombing, we set up a family reunification center to enable runners and spectators to be reunited with their families, with injured patients who had been transported to area hospitals, and with their belongings. We then began the difficult job of making sure that all bombing survivors, including those with injuries that were not so visible, were connected to care and support. In the days and weeks that followed, we established and staffed a family services center, organized drop-in counseling services, responded to requests for psychological first aid at community meetings, and funneled offers of help, which came from all corners of the country, to the bombing survivors. This task continued through the anniversary of the attack and continues even now as we provide ongoing support to survivors with special health care needs.

At the same time that we were actively involved in the response and recovery, we were also beginning the iterative process of mitigating and planning for the next possible threat. What worked well on April 15? What could we have done better? What will we do differently and how will we train for the next emergency?

Public Health Preparedness

Public health preparedness, like many areas of public health, is invisible when it is functioning well. In a typical year, the Office of Public Health Preparedness in the Boston Public Health Commission trains 2500 to 3000 professionals in preparedness, maintains a regional Medical Reserve Corps (MRC) of more than 800 credentialed volunteers, and provides grants to community-based organizations to help identify and

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reach vulnerable populations. The office runs drills with public safety agencies, health care providers, businesses, and community organizations at the city and state levels as a way of testing our capacity to respond to all types of hazards, from pandemics to power outages, chemical spills, and winter storms.

But most of these drills focus on the immediate impacts of the disaster—where to shelter displaced individuals, how to treat all of the injured patients, and how to safely clean up the mess in the aftermath of such an event. Often, we will spend a weekend doing these drills and then hashing out how well we responded in the first 90 minutes of each hypothetical disaster. As we learned during the Boston Marathon Bombings, this type of planning is critical to our ability to save lives of those who are critically injured during a disaster. It was this planning that made it possible for our hospital emergency departments to meet the demands of the day and for our public and private ambulances to get the patients there as fast as they did.

What we have missed in our devotion to planning for the immediate response, however, has been the capacity that will be required in the days, weeks, and even years that follow a disaster to help all those affected heal and return to some degree of normalcy. In the wake of the Boston Marathon Bombings, we learned that planning for this ongoing need, which taxes all of the city's social welfare systems; building the infrastructure necessary to recover—community resilience—is just as important as planning for the initial catastrophic event.

Building Community Resilience

Resilience is the quality of being able to recover, or "bounce back," from a stressful event or episode. As Allmark et al[1] discuss, the term implies either that the individual is able to return to "normal," as in the case of a well-adjusted adult recovering from an incident such as a mugging, or the ability to be better off than one should be, as in the case of a child who is subject to repeated incidents of abuse. The difference between the 2 scenarios is important as it suggests not only a different endpoint but also a different starting point. Individuals who have a starting point that is healthy and well-resourced will be better equipped to recover than those who begin with significant challenges. It also implies that repeated assaults make the possibility of recovery more remote, because resources have been sapped during previous recovery efforts.[2]

Community resilience, then, is the ability of a group of people, collectively, to anticipate, prepare for, respond to, and recover in the wake of a stressful event. Chandra et al[3] describe the 5 components of community resilience as the well-being of the population, social and economic resources, effective risk communication, involvement of organizations (governmental and nongovernmental) in recovery, and the ability to engage social networks within the community. As with individuals, communities come with different baseline levels of health, economic resources, and social connections. Public health strives not only to promote conditions that foster health and well-being but also to invest in providing better risk communication, integrating organizations, and building social networks that make for more resilient communities. Resilient communities not only ensure an appropriate response to stressful events but also create and sustain conditions necessary for optimal health and well-being. As Plough et al explain, the commitment of public health to "building community resilience implies that individual members of a community should not be viewed as unavoidably reactive, helpless, and panicked in the face of disaster; instead, they can be informed, trained, and empowered survivors."[4] For public health practitioners, building resilience is at the core of our work to support community leadership and engagement, to exchange information and foster shared decision making.

By its nature, building community resilience is a local activity. It requires in-depth knowledge of local populations, relationships with residents and nonprofit and faith-based organizations, and an understanding of neighborhood conditions. This type of community-level knowledge already informs many local public health efforts aimed at addressing the social determinants of health. By working locally, it is possible to link emergency preparedness and community response activities to efforts already underway that strengthen opportunities for optimal health and well-being. This allows us to both leverage needed resources across multiple funding streams and provide organized responses to other traumatic neighborhood events, such as gun violence, that contribute to pervasive health inequities.

One example of an effort to integrate emergency preparedness and community building in Boston is the development of a system of neighborhood-based trauma response teams utilizing the MRC framework. In 5 Boston neighborhoods with high rates of community violence, residents who are clergy, social workers, educators, public safety responders, and service providers are recruited to join the MRC as trauma response team members. Volunteers are trained, certified in psychological first aid, and assigned to a neighborhood team that is linked to a community-based organization. By using the MRC infrastructure for certification validation, deployments, and coordination of follow-up activities, responses to traumatic local events, such as shootings and weather-related emergencies, are timely and reliable. Team members are well prepared to play an instrumental role providing leadership and direction during an emergency in their own neighborhoods, and community-based organizations are part

of a system that can be held accountable for ensuring that response and recovery activities are effective.

Another example, described by Plough et al,[4] is the community resilience work of the Los Angeles County Health Department, a large urban county health department that covers 4000 miles and has a population of 10 million people. Los Angeles County has transitioned from an emergency preparedness framework focused on individual preparation for disasters to one that emphasizes social connectedness and neighborhood-level disaster planning. This shift has been accompanied by an investment in training for emergency preparedness staff that focuses on community engagement and building effective partnerships across sectors. This is coupled with the development of a curriculum for community partners, community-level disaster planning, and the engagement of existing community coalitions in the county's emergency preparedness efforts.

Challenges and Opportunities to Building Community Resilience in Boston

While Boston has a thriving economy, strong housing market, and a comparatively high median income for a city of its size, roughly 50% of our residents are considered socially vulnerable by virtue of age, socioeconomic status, or social, cultural, and linguistic isolation. Boston remains highly segregated by race and socioeconomic status. Black and Latino residents, who make up just over 40% of the city's population, live in just 5 of the city's neighborhoods: Dorchester, Roxbury, Mattapan, and, to a lesser degree, East Boston and Hyde Park. Many of the residents in these neighborhoods have less access to reliable public transportation, healthy food, safe recreational spaces, and viable employment opportunities than residents in other Boston neighborhoods. These residents also bear the brunt of the city's violent crime—although violent crime in Boston has dropped to a 10-year low,[5] it remains stubbornly high in Dorchester, Roxbury, and Mattapan.[6*] The chronic and cumulative stress associated with poverty, racism, and crime undermines social cohesion and frays a community's ability to respond to additional shocks, especially when those shocks occur at a large scale.

In addition to our black and Latino residents, Boston has a number of population groups that are socially, culturally, or linguistically isolated. Boston is a city of immigrants, with large pockets of Haitian, Chinese, Dominican, and Vietnamese communities throughout the city. Fully 35% of Boston residents report speaking a language other than English at home and 17% report speaking English less than "very well." Ten percent of our population is made up of elderly residents and almost 15% are children.

At the same time, Boston has a number of assets that aid in our efforts to build resilience. The city has a robust set of nonprofit and faith-based partners in every neighborhood who bring deep knowledge of their neighborhoods and trust among residents. We are a city with a strong innovation economy that invests in technology both to improve city operations and to bridge the digital divide. And we have long had leaders who are committed to the principles of achieving health equity and racial justice.

As we work toward the ideal of resilient communities, it is easy to see how this increased capacity at the local level could benefit residents and government agencies in the event of a serious disaster. In the future, resilient individuals and families will be prepared, organizations will have strategies to check in on vulnerable members, and a communications infrastructure will be in place that both reaches all residents with accurate information and allows residents to provide each other and city officials with real-time data about response challenges.

Building this infrastructure, however, will take time, capacity, and resources.

Chronic Underfunding

The bulk of funding for public health preparedness comes from 2 federal sources. One is the Public Health Emergency Preparedness Cooperative Agreements (PHEP) from the Centers for Disease Control and Prevention. PHEP provides funding support to state, local, tribal, and territorial health departments for preparedness activities. This funding enables government at all levels to prepare for a variety of natural and man-made disasters including infectious disease outbreaks, biological, chemical, and nuclear threats, and severe weather events. The other source of funding is the Hospital Preparedness Program, which is housed in the Office of the Assistant Secretary for Preparedness and Response. Hospital Preparedness Program funding supports planning, integration, and infrastructure improvement across local health care systems to ensure that health care providers are able to respond effectively in the event of an emergency.

In the last several years, the federal government, under President Obama, has pulled back on support for public health preparedness, citing a need to increase efficiencies across all preparedness planning. PHEP grants to states and cities have been cut more than 30% since fiscal year 2007. In the same way,

*See pages 341-351 for discussion of neighborhood violence trends.

Hospital Preparedness Program funds have been cut by 35% since fiscal year 2006. This has resulted in an erosion of preparedness capacity at the state and local levels to address emergencies at a time when demand for preparedness planning—with terrorist threats, climate change impacts, and increasing infectious disease outbreaks—is at an all-time high.

Unlike some large cities, such as Los Angeles, New York City, Chicago, and Washington, DC, Boston receives all of its public health preparedness funding as pass-through funding from the state department of public health. In a state such as Massachusetts, where we lack a strong county system, Boston must compete with 350 other cities and towns for this funding. Although Boston is more than 3 times the size of the second largest city in Massachusetts, and doubles in size to 1.2 million people when you consider the daily commuting population, the city received only 12% ($1 460 000) of the $12.5 million in PHEP funding awarded to Massachusetts in fiscal year 2014.

Given the scarce resources currently allotted to local public health preparedness, it is a challenge for local health departments to build community resilience in addition to the other more traditional preparedness activities that are underway. However, as others have noted, community resilience work offers an opportunity to link efforts to address chronic stressors of poverty, violence, and racism with the efforts to address episodic stressors such as disasters. If government agencies embrace a model that acknowledges the central role of community resilience in promoting positive health outcomes and sustained and effective responses to disasters, perhaps integrated funding streams are possible. We can certainly envision how focused investments in building community resilience from the Department of Justice, Homeland Security, and Centers for Disease Control and Prevention could strengthen crime prevention efforts, reduce the burden of chronic disease, and improve community readiness and security.

Lessons Learned

If there is a lesson to be learned from Boston's experience, it is that it is never too early to begin building community resilience and that we should begin this work even if outside funding is not immediately available. While we have always had strong relationships with community- and faith-based organizations, before the bombings, we had not invested in the intentional community building needed for effective recovery from a terrorist attack. As we learned in April 2013, all large cities are susceptible to foreseeable and unforeseeable disasters, and long-term recovery should be given the same consideration as planning for the immediate aftermath of a disaster. We also know that even if we do not experience another large-scale emergency in the near future, Boston residents will benefit from resilience-building activities in subtler but critically important ways.

Conclusion

In the wake of the Boston Marathon Bombings, the city health department was pressed into a role that involved long-term follow-up of patients who experienced physical and emotional injuries. Like September 11 and Hurricane Katrina, the Boston Marathon Bombings had an immediate and profound effect on the physical and emotional health of survivors, which required the mobilization of medical care and mental health resources in the short and long term.[7] This experience shined a light on the value of investing in community resilience as a means of helping communities to bounce back from unanticipated disasters as well as from everyday stressors such as community violence, poverty, and racism. While a promising strategy, community resilience will require an infusion of preparedness resources, which can come from various public agencies charged with ensuring health, well-being, and safety, as well as private entities that have an interest in promoting healthy, thriving cities.

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