What Is Health Resilience and How Can We Build It?*

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Keywords

public health, disaster, resilience, preparedness, response, recovery

Abstract

Whether a community is in the path of a natural disaster, the target of an act of terror, or simply striving to meet the demands of increasingly dense urban populations, a community resilience paradigm can help communities and individuals not just to mitigate damage and heal, but to thrive. This article discusses experiences from recent, large-scale disasters to explore how community resilience might serve as a sustainable paradigm for organizing public health and medical preparedness, response, and recovery. By strengthening health systems, meeting the needs of vulnerable populations, and promoting organizational competence, social connectedness, and psychological health, community resilience encourages actions that build preparedness, promote strong day-to-day systems, and address the underlying social determinants of health. Thus, community resilience resonates with a wide array of stakeholders, particularly those whose work routinely addresses health, wellness, or societal well-being.

INTRODUCTION

The devastation wrought by two large-scale crises at the turn of the twenty-first century, the September 11, 2001, attack on the World Trade Center as well as Hurricane Katrina in 2005, fundamentally reshaped how America responds to both natural and man-made disasters. The mantra "prepare, respond, and recover" guided a cascade of investments to shore up critical infrastructure throughout the United States and reinvigorated a languishing capability to respond to public health emergencies. While the landscape of both naturally occurring and manmade threats is constantly evolving, too often the investments are seen as preparing for rare or extreme emergencies such as catastrophic natural disasters or devastating acts of terrorism rather than as everyday events. Indeed, the investments to date have been necessary, but not sufficient, to build communities that can withstand known and novel threats and that thrive every day. Now, a decade later, increasing momentum supports an approach to preparedness that connects our ability to withstand a disaster with efforts to strengthen day-to-day systems to improve the public's health and vitality: community resilience.

Experiences from recent major disasters anecdotally highlight the important role community resilience can play following major disruptions. Resilience can be seen in the stories of those who sheltered in place safely during Hurricane Sandy, when an estimated 2.2 million New Yorkers lost power. It is exemplified by a man with quadriplegia who was able to stay safe at home because a brigade of friends and neighbors spontaneously formed to help him keep his ventilator battery charged with the help of the local fire station for the entire two weeks the power was out.

Resilience can be seen in the systems that weather the disruption caused by disaster and continue to meet the community's needs. When the 2011 tornados flattened parts of the hospital in Joplin, Missouri, the newly installed electronic health records enabled safe and appropriate care to be seamlessly provided at the temporary tent-hospital and surrounding facilities to which patients were evacuated. Even patients receiving methadone at a local substance abuse clinic were able to receive their medication nearby.

Finally, resilience can be seen in disasters large and small, when communities bind together to clean up a chemical spill, heal from a shooting, or determine that they will not just recover, but also become stronger and healthier in the process. Actions taken before, during, and after events, be it a natural disaster or an act of terror, can clearly mitigate damage and help communities and individuals heal and even thrive.

In public health, we have become adept at "resilience spotting," recognizing examples of resilience. The challenge now is to move from identifying it to building it at scale. In this article, we briefly review the literature that describes resilience as a framework for better addressing the public health and medical needs of individuals and communities in disasters while also strengthening the underlying everyday systems and social connections that serve and sustain communities. Through discussing the science, practical implications of resilience policies and programs, and the gaps encountered along the way, we hope to stimulate ideas throughout the public health community about how government and stakeholders alike can promote resilience.

THE RESILIENCE PARADIGM

Resilience has become a popular theme across many disciplines and is a term widely used with varying symbolic meaning. The critique that the term has become imprecise—particularly since it left its origins in physics and mathematics—may have to do more with the existence of numerous, discipline-specific definitions and studies rather than with a lack of scholarly attention. The general acceptance of the term by the public may also add to numerous interpretations. However, it

is this very versatility and far-reaching resonance that offer the exciting potential to establish resilience as a shared, multisector framework for building flourishing communities. At its core, resilience embodies a vision of healthy individuals and thriving communities, and a resilience-centered framework provides concrete actions people, organizations, and institutions can take to promote the sustainable and long-term well-being of communities in the face of adversity and disaster.

This concept of resilience is gaining traction in tandem with the recognition that the complexity of human communities, and the challenges they face, is accelerating. The United Nations projects that by 2050, 75% of the global population will live in increasingly large, dense urban centers (39). This significant demographic shift is accompanied by changing demands on urban infrastructure, social structure, and ability of municipalities to meet the needs of their residents. As people increasingly aggregate, the consequences of failures in our systems affect more people and thus are more catastrophic.

At the same time, large, global forces are changing the kinds of challenges human communities face. The frequency, cost, and complexity of both human-caused and natural disasters are increasing. The National Climate Report released in 2014 declares that impacts of climate change are a current concern in addition to being a defining global challenge over the coming decades. Certain types of extreme weather events with links to climate change have become more frequent and/or intense, including prolonged periods of heat, heavy downpours, and, in some regions, floods, fires, and droughts. These trends will increase as climate change progresses over the coming decades, and new challenges will emerge because changes in climate interact with other environmental, economic, and societal factors (22) potentially involving threats to food production, population shifts, and recurrent physical and psychological exposure to natural disaster.

Researchers, including Norris, Pfefferbaum (27), Chandra (9), Cutter (14), and Plodinec (28), among others, have examined definitions of resilience and the implications of community resilience for emergencies and disasters. The National Academies of Science identified many of the sectorial risks and recommended actions in its seminal publication, *Disaster Resilience, A National Imperative* (26); however, the emphasis of that report was not on health. More specific to public health and national health security, Chandra (10) has posited a model based on interrelated levers of resilience (wellness, access, education, engagement, self-sufficiency, partnership, quality, efficiency), and Lurie and Morton have discussed the interplay of key domains of health resilience (9, 20).

Although different sectors define essential components of resilience slightly differently, it is clear that no single domain alone sufficiently reflects what is required to enable a community to withstand the stresses of a disaster or to improve the quality of life for its residents in the aftermath. Models suggest that community resilience is a function of not only economic development, information and communication, and community competence, but also the degree to which individuals experience strong social support and have robust social connections, the state of the physical and psychological health of the population, and the integration and collaboration of government and nongovernment entities (27).

The increase in risk to expanding communities, the complexity of new and old threats, and the demand for efficiency in our daily and emergency response systems point to the need for an approach that can leverage efforts across multiple sectors to achieve a common goal. Resilience can serve as a galvanizing concept for a more sustainable approach that builds the capabilities that foster day-to-day community vitality as well as adaptability in the face of large-scale disaster. The task now is to figure out how: How can utilizing a resilience paradigm augment traditional efforts to prepare communities to withstand anticipated disasters and emergent threats? Part of the answer to this question lies in understanding the centrality of human health and wellness to overall community resilience. As we examine how researchers, practitioners, planners, and communities

have approached resilience in the context of disaster and emergency, we highlight several projects currently under way that illustrate key points. The projects referenced are by no means intended to be a comprehensive list because many other exemplary efforts are being carried out at the regional, state, and local levels.

RESILIENCE AND HEALTH

Traditional resilience-building initiatives have focused on infrastructure and environmental sectors. Although the ultimate goal of these efforts is to protect human life, health, and economic vitality, too often a commensurate focus on the people served by this infrastructure is lacking in preparedness plans and frameworks. The centrality of health to both societal and individual wellness suggests that a commitment to building human resilience should be at the forefront of any workable model. Accepting the World Health Organization's definition of health as a state of physical, mental, and social well-being informs the understanding that true health resilience must derive from stronger health and health care systems, improved population health, and the capabilities to sustain physically, mentally, and socially healthy individuals and communities amid large-scale changes (38).

Certainly, some traditional preparedness activities remain essential, such as having sufficient supplies to enable survival for 72 hours unaided, having a plan for evacuation, and having a plan for family reunification. Although these actions foster prepared individuals and families, they are necessary but not sufficient to build individual or community resilience. In contrast, a community health resilience approach leverages efforts to improve population health and to connect individuals, systems, and communities with each other throughout the stages of a disaster or public health crisis. Doing so generates a virtuous cycle: A healthier population contributes to stronger communities, strong and closely connected communities are better able to adapt to withstand adversity or get out of harm's way in a disaster, which in turn contributes to the future well-being of individuals and communities. Thus, resilient communities design preparedness interventions to have a positive impact on daily community functioning and improve the public's health.

This link between community design and healthy people is well understood by public health practitioners and is part of a "health in all policies approach" (31). Such an approach is evident in areas such as community walkability and access to healthy food yet has been exploited less in investments in critical infrastructure or disaster mitigation. For example, flood risk reduction projects can be deliberately designed in a way that prevents floodwaters from damaging property while also maximizing community spaces in which people interact, thereby aiding individuals to expand their networks and enhancing social capital. Elevating housing above the flood line is important, but dense housing environments might also be designed with robust, fail-over power systems that enable people to charge their durable medical equipment. Design could also allow for satellite Internet connectivity to enable the rapid connection of survivors to friends, relatives, or needed services after a disaster. Following Hurricane Sandy, members of the Federal Emergency Management Agency (FEMA)/Health and Human Services (HHS) Field Innovation Team established local Wi-Fi in the hard-hit high-rise buildings in the Red Hook neighborhood of Brooklyn, enabled by the satellite connectivity on the roofs. Individuals could then connect to their online social networks to assure loved ones that they were safe and to discover others who needed help.

Researchers in academia and government have explored the relationship between preparedness and health resilience, which in turn has supported efforts by public health, behavioral health, and social services stakeholders to leverage preparedness initiatives within critical infrastructure, emergency management, housing and land management, and recovery to support public health and
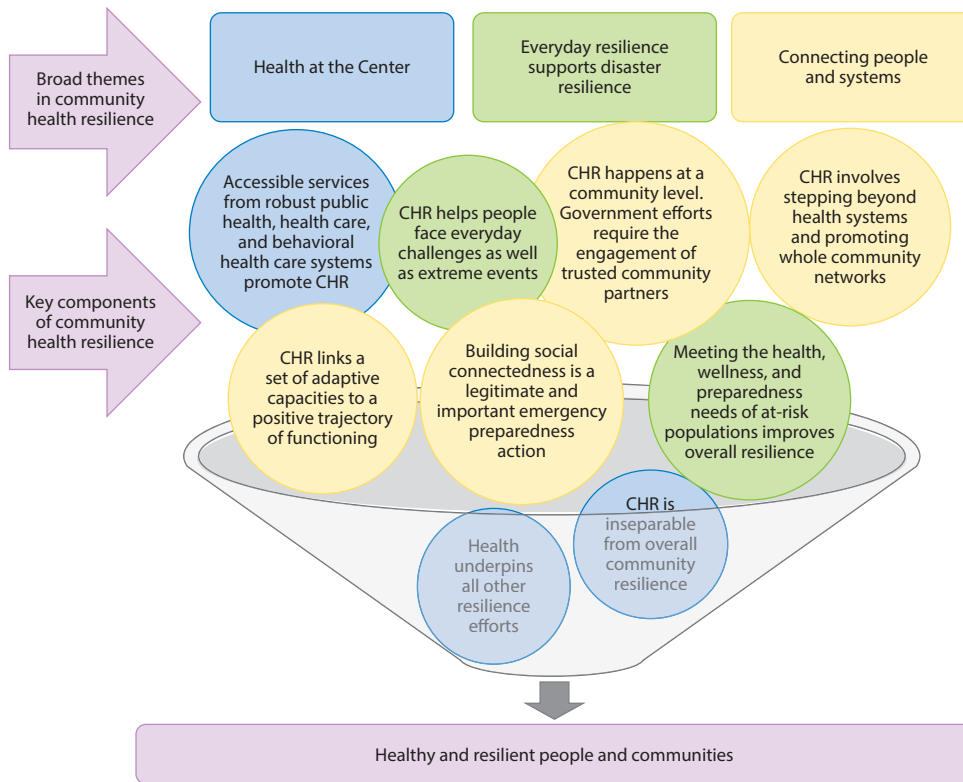
Figure 1

Themes and components of community health resilience (CHR). Information adapted from Reference 24.

well-being. The US federal government has promoted a health and wellness–centered approach to community resilience through the FEMA's Whole Community effort and HHS's National Health Security Strategy (NHSS) (36). Building on the foundation of community resilience described in the NHSS, the Centers for Disease Control and Prevention's (CDC) Public Health Preparedness Program and the Assistant Secretary for Preparedness and Response (ASPR)'s Hospital Preparedness Program grants have promoted community resilience as one of five cross-cutting domains (4, 37). Broad efforts such as these toward integrating resilience into preparedness are important to build acceptance of resilience as a useful preparedness approach. However, a deeper operational integration of resilience will require work specifically in the functional areas of preparedness, response, recovery, and mitigation.

More recently, the National Preparedness and Response Science Board (NPRSB) has issued recommendations regarding community health resilience and identified themes that encompass a human health and wellness–centered approach to resilience (24). See **Figure 1**.

As consensus around the centrality of health in resilience grows, and the necessity of an integrated approach that weaves together constituencies and capabilities is accepted, five areas suggest opportunities to leverage existing expertise and programming to promote positive outcomes. These areas are the strength of health systems, organizational resilience, social connectedness, psychological resilience, and the meeting of needs for at-risk individuals.

Health Systems

Efforts to strengthen our daily health care system build resilience (26). We know that a healthy population is necessary for communities to thrive as well as to better withstand and recover from disaster. If community health needs are not being met day to day, then it is unlikely they will be effectively met during a disaster, even with the potential influx of national, state, and regional resources.

The 2010 Patient Protection and Affordable Care Act (ACA) has made great strides in expanding access and affordability of health care services, including preventive care. In 2014, the reduction of the uninsured rate in the United States to approximately 12.9%, a historic low, and the requirement that mental health services be covered at parity with other medical services represent major milestones to increase access to care.

While access to health care is increasing, the health care system is challenged to meet higher demands for service. Many hospitals routinely operate at or near 100% capacity, negatively impacting the capability of facilities to surge to meet additional disaster and emergency needs (16). Here, a resilience framework can consider the health care system as a whole rather than focus just on the role hospitals play in an emergency. To support this community approach to the provision of care, health care coalitions—collaborative groups of local health care institutions and response agencies that work together to prepare for and respond to emergencies—have emerged throughout the United States as a result of the Hospital Preparedness Program (HPP) (13). HPP's emphasis on health care coalitions represents a shift from a traditional preparedness approach of investing in specific infrastructure for a given hospital (e.g., buying a generator) to a community-wide health system resilience approach, which urges all health care facilities in the community—hospitals, nursing homes, dialysis facilities, etc.—to work together to prepare for and respond to emergencies. Although these networks cannot replace the need for core institutions to remain open and rebound quickly, they can add valuable supplemental capacity. As witnessed in Hurricane Sandy, coalitions and partnerships enabled the whole system to surge and redistribute resources and patients efficiently. These networks also have peacetime dividends. For example, during the 2012 fungal meningitis cases in Michigan, the coalition was rapidly able to help a hospital to surge to handle an unprecedented number of patients needing surgical drainage of abscesses (17).

Social Connectedness

The importance of social capital as a health determinant is well understood by the public health community (34). Recent studies examining the effects of social connectedness or social capital on recovery from disaster and large-scale traumatic events suggest that community-level interventions aimed at building social capital are relevant to emergency preparedness. Aldrich's research on large-scale disasters has found that the reservoirs of social capital and the trust (or lack thereof) between people (bonding social capital) and between individuals and organizations (bridging social capital) in disaster-affected communities are related to whether some communities display resilience while others struggle with recovery. As such, social capital is both a prerequisite and a major predictor of recovery and may trump the degree of infrastructure damage, the underlying socioeconomic status of a community and the amount of aid received by an area (1, 2). In addition, indicators of bonding and bridging social capital, civic participation, heterogeneous socioeconomic relationships, and political efficacy and trust remain significantly associated with self-rated health (29).

If building social connectedness promotes health resilience, then social connectedness has value as a legitimate, and indeed essential, component of emergency preparedness. However, preparedness messaging to the public over the past decade has valued individual preparedness

over collective effort. It is as important to take actions to promote social connectedness as it is to build a 72-hour survival kit. These actions range from simple steps such as getting to know one's neighbors and taking an active part in the life of the community to more deliberate efforts to be of service to one's neighbors.

The most likely person to provide immediate assistance in an emergency will be a friend, coworker, family member, or passerby rather than a professional first responder. Close associates and community and affiliation groups are also often called on to provide the primary emotional, and in many cases physical, supports during the recovery process. As we saw in the 2013 Boston Marathon, when two bombs exploded near the finish line, spectators reacted quickly by using their clothing and napkins from the nearby restaurant to forge makeshift tourniquets. Others just stayed with victims, sitting and lying down with them, until help arrived. In contrast to the standard practice of protecting public safety by pushing the public back, the authorities let the bystanders rush to the aid of victims. Thus the immediate health and psychological needs of the victims were prioritized, and the role of bystanders was understood. This paved the way for friends and strangers to spontaneously start helping, ultimately saving lives. Although upwards of 260 people were injured, only 3 people were killed by the attack (33). If preparedness efforts embrace a more equitable balance between individual preparedness and empowering people to connect to and help their neighbors, then an underutilized set of community capabilities becomes available to support response and recovery.

Given that members of the immediate community are likely to be in a position to provide timely disaster assistance, interventions that increase bonding and bridge social capital—and educate neighbors to help neighbors—may increase population health (18). Linking social capital, developed by building trusting relationships between community stakeholders and entities that hold authority and power, can likewise allow for the governmental and nongovernmental collaboration necessary for community resilience (29). Government resources and information to support resilience need conduits into communities to be successful. Local health and human services providers make natural allies in this regard. Public health practice has long aimed to support healthy people in healthy communities; synergies among public health and community resilience goals point to a leadership role for public health in promoting disaster resilience (36). Health care systems and hospitals serve as nodes of social capital in their communities owing to their importance to the local economy, the life-sustaining nature of health care services, and the supplemental community benefit activities they provide. Likewise, behavioral health and social service providers in the community can also facilitate key linkages to at-risk individuals but often are not as closely connected to emergency management systems as are their public health and medical counterparts.

Organizational Resilience

Alongside strong interpersonal bonding, bridging social cohesion between individuals and organizations contributes to community resilience. Governmental, nongovernmental, and community-based organizations that provide needed social services and food assistance, for example, serve vital community needs each day and are often needed most after a crisis. Furthermore, institutions such as schools or community centers that are the go-to places for those who need help or assistance under normal circumstances can provide a valuable forum where community members can connect under extreme circumstances. Their ability to survive, stay open, and serve people in need is vital.

For example, although significant effort has been put into hospital preparedness, reports from shelter workers in both Hurricane Katrina and Superstorm Sandy point to the importance of continuity of operations planning for community and residential programs. Many shelters had to

address the needs of at-risk individuals—in particular, people with chronic mental illness, individuals experiencing homelessness, and elders with dementia—in significant proportion. These individuals required specialized support to meet their access and functional needs while in the shelter and were challenging to transition out of shelters as the programs that served other needs such as food access or social support were incapacitated. After the crisis, the disruption of continuity of these vital services can dramatically affect the recovery, for both individuals and the community.

One key element of organizational resilience is having a "plan for your people." The very people that organizations will rely on to continue operations in a crisis are also members of the community, potentially personally experiencing loss or trauma. When the 2011 tornado flattened a Joplin hospital, the CEO announced the next day that all of the jobs were guaranteed for the next year if employees kept showing up for work. This commitment provided continuity and economic stability for those individuals and kept the doors open for a community, even though employees had to operate from a temporary facility.

Psychological Resilience

Psychological resilience is a key building block of overall community resilience. Evidence going back decades helps frame the understanding of individual psychological resilience and the linkage between the physical and psychological impacts of trauma (7, 19, 23). Psychological resilience is expected to be the normative response to traumatic events. More specifically, Bonnano has demonstrated that the most common reaction among adults exposed to such events is a relatively stable pattern of healthy functioning coupled with the enduring capacity for positive emotion and generative experiences (6). Although resilience is prevalent, a still significant number of individuals will experience adverse and potentially serious behavioral health effects. The literature concerning posttraumatic growth, basic supportive interventions such as psychological first aid, and adaptations of treatment modalities such as cognitive behavioral therapy have also strengthened our knowledge concerning adaptive responses to disaster-related trauma—and positive adaptation is a key characteristic of resilience (32, 35). Furthermore, psychological resilience has linkages to social capital because efforts to increase social support and collective efficacy can buffer the effects of psychological distress (5).

Different types of disasters and emergencies will result in different medical needs, but all traumatic events will result in behavioral health casualties. Although different threats may entail different psychosocial risks (e.g., distinctions between terrorism or human-caused mass casualty, natural disasters, pandemic), behavioral health is most definitely an all-hazards concern. Disaster behavioral health often focuses on the more immediate needs of disaster survivors, support to grieving families, and actions to support the resilience of responders. The broader scope of community resilience allows us to bring health systems and public health approaches into behavioral health preparedness. This integration can be accomplished by leveraging behavioral health promotion efforts by increasing citizen preparedness through psychological first aid and similar training and by improving continuity of operations planning for behavioral health programs and facilities. Behavioral health and social service systems, and the people who use their services, are potential assets that can strengthen the day-to-day resilience of a community and play an active role in disaster preparedness, response, and recovery.

Needs of At-Risk Individuals

The concept of community resilience includes a focus on the needs of at-risk individuals, sometimes called vulnerable populations (3). In addition to the challenges faced by individuals with access and

functional needs, the social determinants of health influence how individuals will fare during and after a disaster or emergency. Individuals at higher risk of health, behavioral health, economic, and social disruption before a disaster are at increased risk when these issues are exacerbated by injury, trauma, or disruption of vital services (21). In an aging society, older people who have complicated medical needs and dementia or other cognitive impairments are also at higher risk during disasters (30). Furthermore, a range of medical and psychological risks affect children and youth—who account for 25% of the population—requiring specialized planning and intervention appropriate to the child's developmental stage (25).

The emergence of an individualized function-based approach for emergency management, replacing the traditional special needs population-level approach, is particularly resonant with community resilience ideas of empowerment and inclusion. In a function-based approach, planning for at-risk individuals during an emergency is based on an anticipated access or functional need in areas such as communication, maintenance of independence, medical needs, supervision, or transportation (15). The function-based approach encourages at-risk individuals to take an active part in their own personal preparedness and avoids assumptions that categorize all members of risk or disability groups as inherently vulnerable or ill-prepared (3).

BUILDING RESILIENCE BY DESIGN

The discussion of resilience is often inspired by examples of when resilience has emerged—sometimes by accident, sometimes in response to adversity, and sometimes through the intentional actions of determined individuals or organizations. Alongside these emergent examples, many creative thinkers have recognized the opportunities to develop resilience programming within preparedness investments and have spearheaded initiatives across the United States. For example, the joint initiative among HHS, RAND Corporation, and the Los Angeles County Department of Public Health helped put resilience on the map through its work building leadership across the city of Los Angeles in the face of disasters and pandemics. This model has been replicated in other places across the United States, such as the Resilient DC initiative, a citywide initiative to construct a framework with which stakeholders can map assets and connect to one another. America's PrepareAthon!, a joint partnership between the Rockefeller Foundation and FEMA takes preparedness to the public, focusing on how people and individuals can better prepare and build resilience. The figure below, from RAND Corporation, illustrates the easy-to-understand material used to convey resilience to partners and the public. See **Figure 2**.

Now, the challenge is to figure out how to use foundational efforts such as these to develop reliable and scalable ways to build resilience by design. At a minimum, how can we create the conditions that support the emergence of resilience and optimally be able to influence the development of resilience?

Fund Resilience

Reliable funding streams that incentivize the use of a resilience paradigm are critical. Ambitious initiatives such as the Rockefeller 100 Resilience Cities program set an important example about the necessity to fund resilience-building, and they have the potential to pilot new ideas and bring to scale programs that work, especially as they incorporate the health and human aspects of resilience in their work.

Funding resilience is important not only for programming that promotes resilience, but also for science studying it. Translating resilience from a conceptual notion to an operational framework requires the ability to both utilize science to promote resilience and to assess the impact of these
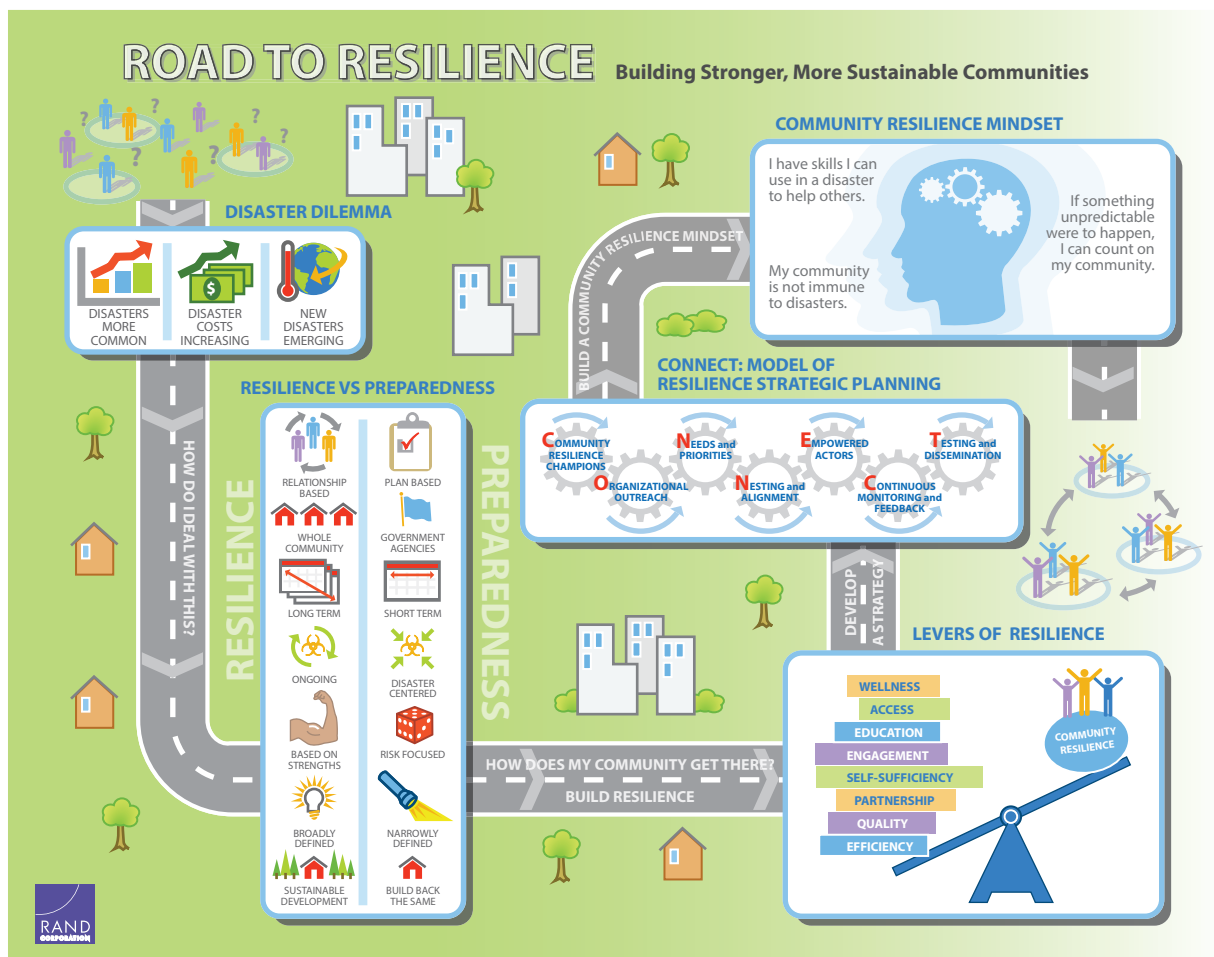
Figure 2

Road to Resilience. From Reference 8, with permission.

efforts. Emergency management identifies risks and then catalogs capabilities and assets to address anticipated threats. In the present environment, community resilience relies on proxy measures of capacities that can be expected to help promote resilience. This disparity makes it difficult to describe the value and reliability of a community resilience approach, particularly when trying to convince traditional partners or secure budgets.

Building resilience science starts by asking and answering knowable questions and requires a commitment to do the best science, even in the worst of times. ASPR invested more than $8 million in grants to systematically study recovery and resilience-building efforts in the wake of Hurricane Sandy—the first grants of their kind. A coordinated approach is needed to encourage funders to prioritize programs that promote resilience and make investments to examine the science behind resilience.

Pilot New Tools

Resilience is a galvanizing concept across multiple sectors, and thus, efforts that build resilience are inherently multisectorial. This complexity requires a creative and concerted commitment to pilot new initiatives and to recognize successes and failures.

For example, when workers from the National Disaster Medical System responded to the 2009 earthquake in American Samoa, they faced a paucity of information about the population that they were deployed to serve; the population displayed high obesity rates and a high prevalence of multidrug-resistant tuberculosis. This knowledge gap inspired an initiative to be able to circle a map and know everything we can about the people who live there, in addition to other things relevant in a response such as roads, airports, or hospitals. The necessity of the ability to layer response assets with key health or population indicators prompted the prototype of MedMap, a tool that layers geospatial information with demographic information, population statistics, infrastructure data, and any other data set that can be geotagged.

This pilot program has now become a standard tool in federal public health emergency response. For example, during the 2012 west Texas factory explosion, MedMap enabled ASPR to send language-matched first responders to aid local efforts. Contrary to the assumption made that Spanish-speaking first responders would be required, MedMap enabled the teams to ascertain that the explosion had occurred in a Czech-speaking enclave. Sending a language-appropriate team to respond in the aftermath of an explosion that killed or injured dozens may seem like a small gain; however, it acknowledges that the community itself is the core driver of recovery, and building resilience means supporting, not supplanting, community assets—if even to deploy responders who speak the native language of affected individuals.

This effort led to a cascade of other pilots, building on the need for population statistics to be incorporated into crisis management. ASPR has partnered with the Centers for Medicare and Medicaid (CMS) and the City of New Orleans to utilize health care claims data to map where individuals dependent on electricity-powered devices or dialysis lived, in a manner consistent with privacy and security protections, to better assess and respond to community needs. In June 2013, a joint exercise was conducted to query CMS claims data and validate the integrity of the data through a simulated hurricane and subsequent door-knocking exercise in New Orleans. The data was more than 92% accurate, and responders anecdotally reported the positive feedback of individuals who were comforted by the health department checking on them. For the first time ever, we were able to understand a community's underlying needs by querying claims data in a private, safe, and protected way. This pilot is scaling into a nationwide, regularly updated map that will contain deidentified population statistics by zip code to display the proportion of individuals in an area who require durable medical equipment.

This kind of work demonstrates the potential of a resilience framework with vast implications not just for public health, but also for other sectors (12). For example, these data could be used by power companies to better understand where in a community power restoration should be prioritized on the basis of population statistics about individuals who use life-sustaining durable medical equipment, or by civic leaders to understand the specific needs of different neighborhoods.

Promote Community-Based Participatory Policy

Public health practitioners have long recognized the importance of developing research agendas in partnership with the communities that researchers are investigating. The model of community-based participatory research should be extended to work to build resilience and to promote community-based participatory policy.

The United States can learn from an experience beyond our borders. Efforts in the aftermath of the 2010 earthquake in Christchurch, New Zealand, exemplify this model. Organizers launched a campaign called Share an Idea, by which any community member could articulate his or her vision for a rebuilt city (11). This approach exemplifies the shift brought by a resilience paradigm in which community members are not passive spectators, but featured actors writing the script, enabling a higher internal community resilience capacity than policy and funding could ever achieve alone.

The suggestions to increase funding for resilience initiatives, pilot new tools, and promote community-based participatory policy are the first steps in changing our preparedness paradigm to meet evolving threats. Future areas of inquiry could include better evaluation of existing resilience projects, identification of international approaches and assessment of their applicability for implementation in the United States, examination of the impact of recurrent collective experiences with disasters, and study of how issues of trust in authority or reliable public communication impact resilience. A key reason the concept of resilience is so powerful is that it is multifaceted. When appropriate funding, tools, and a science base are in place, applications are limited only by the limits of our creativity and curiosity.

CONCLUSION

The concept of resilience has matured to the point that it provides a viable framework to guide multisectorial activities seeking to strengthen communities in the face of known or novel threats. In simple terms, community resilience aims to make systems more robust, communities more connected, and people more physically and psychologically healthy day to day both as minor crises arise and as major disasters or emergencies occur. Thus, as compared with a traditional preparedness approach, community resilience is likely to have greater resonance with a wider array of stakeholders, particularly those whose work routinely addresses health, wellness, or societal well-being. The broader vantage point of community resilience—with its concern for health systems, social connectedness, psychological health, and vulnerable populations—encourages actions that build preparedness while also addressing the underlying social determinants of health.

DISCLOSURE STATEMENT

The authors are not aware of any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

ACKNOWLEDGMENTS

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