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Community-Based Participatory Research During the COVID-19 Crisis: Lessons for Partnership Resiliency

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Abstract

This reflective essay explores how the strengths and even presumed limitations of community-based participatory and action research are critical assets to building and sustaining resilient research partnerships before, during, and after particularly difficult times. After highlighting key concepts from the boundary-spanning and resiliency literatures, we outline how four deep-seated principles of community-based participatory research (CBPR) contribute to building partnership and community resiliency. We draw upon our decades of experience across a wide range of both rural and urban partnerships to share examples of how these concepts were applied in actual research situations during the COVID-19 pandemic to understand how they sustain and strengthen partnerships and community impact.

Keywords: community-based participatory research, action research, boundary spanning, partnership resilience, COVID-19

As academic institutions work to strengthen their community impact and meet society's needs as knowledge-creating organizations, research partnerships have become a central tool for achieving these goals. Going by various names such as community participatory and action research, these community-engaged approaches to knowledge generation have directly confronted the long-standing problem of universities doing research in isolation from what partners might need, want, or can even use (Boyer, 1990; Chaffee, 1998; Hart & Silka, 2020; Sandmann, 1996; Lubchenco, 2017; Newman et al., 2004).

Today, this collaborative approach to co-create knowledge is gaining further recognition and acceptance at exactly the time when physical and social isolation is a central response to the ubiquitous COVID-19 health crisis. An orientation that involves working closely together might seem especially vulnerable to the limitations imposed by COVID-19. Could these kinds of constraints have the potential to undermine the very core of this approach? Some researchers are reverting to less collaborative approaches or putting research on hold as institutions around the country, including our own, have issued moratoriums on in-person community-engaged work, closed campuses, and moved meetings and classes online at different points throughout the pandemic. Examples include announcements indicating that "students who are engaged in community work will not be continuing in-person community placements" and policies that universities conduct and continue "remote operations for employees—and continue to cancel or postpone any on-campus events" (samples of institutional communications from University of Massachusetts Lowell and Tufts University during spring 2020).

As university partners, we emphasize how important it is that higher education rethink community–university approaches to knowledge creation under these kinds of constraints. We consider that while a crisis

like the COVID-19 pandemic may require changes, community participatory and action research (e.g., CBPR, PAR) feature resilience and boundary-spanning attributes that make these approaches well-suited and particularly useful when responding to and withstanding shocks to the system (Valdez & Gubrium, 2020). We examine these ideas in light of boundary-spanning and resiliency literatures, then draw on lessons from both urban and rural research settings that are faced with the pandemic, to better understand these ideas in practice.

Community-based participatory research (CBPR) and participatory action research (PAR) are collaborative approaches in which universities and partners cocreate knowledge (Israel, Eng, et al., 2005; McIntyre, 2008). These draw from decades of increased understanding that through active and equitable collaboration, those closest to or most impacted by a social problem are essential thought leaders on research that informs potential solutions (Israel, Schulz, et al., 1998; Lewin, 1946; Plummer et al., 2017; Wallerstein & Duran, 2010). The exact forms of participatory and action approaches can vary, but all involve partners and researchers working together on some or all of the steps in research (Clark et al., 2003; Hutchins et al., 2013; Israel, Schulz, et al., 1998; Mercer et al., 2008; Shirk et al., 2012; Silka & Renault-Caragianes, 2006), including sharing decisions on what to study, how it should be studied, and how the findings should be shared and implemented. For this article, we recognize that community-engaged research exists as a continuum, as well as divergent streams of CBPR and PAR, but we generally use the term *CBPR* as shorthand for all of these approaches, understanding that significant conceptual overlap ties various participatory and action research approaches together.

CBPR prioritizes many attributes that are useful during crises, such as flexibility, building trust, combining knowledge, and long-term relationships. In this article we outline and illustrate key CBPR principles as they could and do relate to conducting research during the COVID-19 pandemic: (1) multiple sources of knowledge and bidirectional capacity building to understand problems and find new solutions (Collins et al., 2018; Greenbaum et al., 2019; Hacker, 2013; Israel, Eng, et al., 2013), (2) a grounding in equitable partnerships that inform targeted social action (Bieluch et al., 2016; Geigis et al., 2007; van de Sande & Schwartz, 2017), (3) community relevance of research questions and findings (Hart & Silka, 2020; Israel, Schulz, et al., 2008), and (4) flexibility embedded throughout partnership development and across research phases (Bieluch et al., 2016; D'Alonzo, 2010; Israel, Schulz, et al., 2008). These principles apply across different contexts, both urban and rural, and especially during times of extreme stress and crisis.

In addition to combining applied, theoretical, and other kinds of knowledge, CBPR also supports interdisciplinary work (Holland et al., 2010). Although frequently seen in public and community health research (Israel, Eng, et al., 2005), CBPR approaches are useful across academic disciplines, including environmental, humanities, engineering, and social and "hard" sciences. Wherever research focuses on a community-centered question, whether the community is geographical, cultural, or defined by other characteristics, a CBPR approach integrates academic and local knowledge perspectives (Andersson, 2018; Hacker, 2013) to better understand the problem itself. Community participatory and action research broadens the range of available knowledge and methods to identify and tackle community problems in new ways (Jason et al., 2004; McIntyre, 2008).

How might this work? Consider an illustrative example in Maine described by Ranco et al. (2012). The emerald ash borer, an invasive pest, is migrating into this rural state and has the potential to dramatically reduce populations of ash trees. Entomological and forestry researchers in Maine were not studying this invasive species that decimates brown ash; ash trees were not a primary concern to researchers. It turns out, however, that the brown ash was the most important tree species for indigenous Indian basket makers, a major group maintaining Wabanaki culture. Researchers did not know this, did not know the conditions under which the brown ash prospered, and knew little about the ecology of these trees. The researchers were familiar, however, with how to study invasive pests. Codeveloped research bringing together indigenous knowledge and Western science was undertaken, with results that met community needs and moved science forward. In addition, the partnership resulted in University of Maine (UMaine) forestry students adding CBPR research approaches to their research

"tool kits" (Ranco et al., 2012).

Today, community and university partners must navigate such research collaborations even as overlapping crises compound barriers to full economic and civic participation. The COVID-19 pandemic makes the value of CBPR approaches clear and necessary. The inherent resiliency-building opportunities of CBPR in concert with its boundary-spanning function provide important lessons that prepare us for the next crisis by building critical infrastructure and skills today. These attributes enable researchers to operate effectively and build value during a crisis, fortifying research under stressful conditions. Furthermore, informed by the boundary-spanning literature so that we understand how to leverage these attributes, participatory and action research help us construct seismic-resistant research partnerships *before* a metaphorical earthquake, such as the COVID-19 pandemic, strikes.

Let's first take a look at boundary spanning and resiliency to understand how engaged research partnerships can identify and leverage these features. With these in mind, we can then explore four key principles of CBPR, using concrete examples and in light of the COVID-19 crisis.

What Is Meant by Boundary Spanning?

For 50 years, researchers have explored the concept and practice of *boundary spanning* to understand how crisscrossing organizational and community borders can facilitate innovation and growth. Although boundaries help define organizations, active boundary spanning prevents partnerships "from becoming ossified and disconnected from changes in environment" (Aldrich & Herker, 1977, p. 219). Boundary spanning enables better adaptation to changing contexts (Goldring, 1996) by accessing external information and acting as bridges to facilitate knowledge exchange (Aldrich & Herker, 1977) and enabling innovation through this exchange (Tushman, 1977). This occurs across all kinds of organizations, including community groups, universities, nonprofits, and government agencies. Cash et al. (2006) noted that spanners can transfer vital scientific information to communities in a manner that is socially embedded and therefore more salient, credible, legitimate, and useful. They described the alternative as the "loading dock" approach to linking research to its users. This is the notion that when research is conducted, it is then placed on the metaphorical loading dock ready to be picked up and distributed like the latest tech gadget. However, the latest gadget being manufactured likely went through some rigorous market testing to be sure it would sell. Without a similar process to determine whether what is being researched is actually useful to the end stakeholders, the research might just pile up and never be used. In community–university partnerships, the role of boundary spanning intertwines the research into applicable uses and makes it more easily accessible.

These partnerships provide not only a wider range of available resources, but also new channels for knowledge distribution. Information about rapidly changing environmental conditions can aid in resiliency development by helping partners adapt more quickly, and because boundary spanners can bring together untraditional collaborators (Miller, 2008), the pool of resources and capital (human, financial, social) available to community–university partnerships deepens. The information that boundary spanners collect and distribute is important at all points of the innovation process (Tushman, 1977), applicable to research stages from early idea formation to problem solving to implementation and evaluation.

Academic institutions, seeing the value of these relationships across organizations and communities, are in some cases intentionally incorporating community–university boundary spanning. For example, Maine is a state of major rivers, many of which were dammed decades ago when the ecological impacts were not fully understood (Lichter & Ames, 2012). Outcomes included a great reduction in fish that supplied the food chain for other species, whose numbers precipitously dropped. The rivers serve many groups who have competing goals, and research from many different disciplines is needed to understand the problems and proposed viable solutions. Boundary spanners are crucial to many research contexts such as these. Subsequently, University of Maine students are deliberately being taught boundary spanner skills: how to bring together the information from diverse groups and disciplines, and how to coalesce the information to create decision-support tools that assist communities using diverse

data from multiple perspectives and disciplines (Meyer et al., 2016).

Additionally, successful boundary-spanning leadership enables more effective and efficient collaboration over shared goals (Miller, 2008) that is especially important during times of crisis to bring together very different expertise and experience for complex problems. We often assume this must be a face-to-face activity (i.e., facilitating discussions and shared decision making), but it actually does not require in-person contact. A recent Partnerships for Environmental Public Health online panel discussion (Havlicek et al., 2020) highlighted this point when researchers who facilitated a rural Michigan-based community forum, which had been occurring annually for decades, started drawing unanticipated numbers of new participants. Rather than preventing participation, moving the community meeting online had made it *more* accessible for many.

The COVID-19 pandemic has amplified the value of the boundary-spanning capacity of participatory and action research, which can advance resiliency during a crisis and promote recovery. The relationships and cultural capital that boundary spanners develop over time enable them to share information quickly and efficiently in an emergency. Likewise, the ability to understand a crisis outside one's community or academic silo can facilitate the design of more effective preventive measures to avoid or mitigate future crisis situations. All of these possibilities are wrapped up in the concept of resiliency, which will be discussed next.

What Is Meant by Resiliency?

Resiliency refers to the capacity to adapt and thrive through change, setbacks, distress, or trauma (Bonanno, 2004; Magis, 2010), whether in personal or community contexts. The resiliency literature within psychology and biophysical sciences (Adger, 2000; Allen, 2006; Berkes & Folke, 1998; Chapman et al., 2018; Folke et al., 2003; Young, 2010) highlights the importance of pretrauma or predisaster factors—such as strengths and resources that can be drawn on during crisis—for subsequent recovery and adaptation. The presence of different factors can help or hinder individual and community responses.

Resiliency in action can mean all kinds of things. For instance, it might mean reconsidering how community members, businesses, scientists, municipal agencies, and others can improve multidirectional communications in the face of unanticipated disasters. Or it could involve a combination of targeted investment, neighborhood agriculture, and home-grown social networks in areas with ongoing food insecurity. Another community might identify changes in their local environment and explore ways to make coastlines greener and more permeable, and thus more resilient to rising water levels during storms. In yet another community, building resiliency can mean developing crisis plans such as standard operating procedures for conducting outreach to vulnerable communities safely so that disruptions to necessary services do not occur. Zoning, education, and financial policies, for example, might all contribute to community resiliency across a wide range of threats and challenges, including natural disaster, economic stagnation, chronic social problems, and public health crises.

An example from Maine's coastal communities illustrates how resiliency, bolstered through the boundary-spanning work of community–university research partnerships, enables a wide range of stakeholders to sustain the fragile clamming industry. Clam flats are changing along the seaboard, requiring diverse groups to work together. An invasive species of green crab is disrupting the clam flats, while changes in seaside community development lead to unpredictable sewage outflows that restrict clamming opportunities as well as raise dangerous health issues. Many unaligned levels of government (town, state, and federal) have jurisdiction over different aspects of the clam flats, resulting in uncoordinated activities. UMaine researcher Bridie McGreavy, through her "working the tides" efforts (McGreavy et al., 2018), has made serving as a boundary spanner a central way to bring groups together to solve problems and build the economic resiliency of Maine's clamming communities using tools such as CBPR. With her partners and her students, McGreavy has facilitated knowledge sharing between clammers, policymakers, and scientists, for example, about contamination and strategies for assessing contamination-related risks to economic opportunities (current efforts are described at https://themudflat.org/). McGreavy's students are learning boundary spanning as a central part of research–action approaches and learning what can be achieved by working

together despite the instability in contexts and problems.

In times of crisis, such as the COVID-19 pandemic, resilient communities and individuals prepared for disaster have a leg up in withstanding the first phase of bewildering change, as well as whatever follows. Communities and individuals that have trained their resiliency muscles can more readily lift themselves out of disaster and find stable ground.

How Do Aspects of CBPR Contribute to Building Partnership, Community, and Research Resiliency?

We can similarly identify CBPR features that foster resiliency and leverage the benefits of boundary spanning in research partnerships. Drawing from the literature and our own experiences in both rural and urban settings during the COVID-19 pandemic in 2020, we outline four community participatory and action principles that illustrate critical resiliency-building and boundary-spanning roles during crisis: Equitable partnerships, multiple sources of knowledge, community relevance of findings, and flexibility all enhance CBPR effectiveness and make this approach uniquely positioned to address pandemic-related challenges. We explore these elements of CBPR, illustrate each in practice through research examples, offer questions for community-engaged researchers to consider, and conclude with ideas for further consideration and exploration.

Principle 1: Equitable Partnerships Form the Basis for Participatory Research

CBPR diverges from traditional research approaches due to the primacy of deeply collaborative and equitable partner relationships across the research process. CBPR acknowledges community as a unit of identity (Hacker, 2013; Israel, Schulz, et al., 2008) and values coleadership research models. These partnerships upend the typical paradigm where a university researcher leads a process that culminates in an academic paper. Instead, as much as possible, CBPR aims for equal ownership of the research process, including development of key questions to be explored.

CBPR relies on developing a power-sharing structure for joint decision-making (van de Sande & Schwartz, 2017). Traditional research models are inherently unequal (Muhammad et al., 2015), with greater resources typically accumulated among university and institutional partners. CBPR relationships are intentionally constructed to be nonexploitive, and partners work to mitigate this inequality through greater transparency, communication, shared decision making, resource distribution, and relevant research findings (Hacker, 2013; Israel, Schulz, et al., 2008), so that all partners experience benefits from participation.

Participatory and action research relationships depend on trust and shared respect (Collins et al., 2018; Hacker, 2013; Israel, Schulz, et al., 2008), which facilitate connections between community, academia, government, and other actors. Because boundary spanners are bridge builders, they make these kinds of relationships across organizations and groups possible. Community–university researchers fill an important role, creating familiarity and honing a sensitivity to partners that forms the foundation of mutual trust and mutual respect. Mutual trust increases credibility among partners and enables them to work together despite vulnerabilities, and to share information and resources that would otherwise be inaccessible.

An example unfolded in a Massachusetts city that has been grappling with an opioid crisis with continuing increases in opioid-related illnesses and fatalities (Mayor's Opioid Task Force Data Subcommittee, 2020). The city created a multidisciplinary team of constituents from the Police, Fire, and Health Departments, emergency medical services, and a treatment agency, to outreach to overdose survivors and those most vulnerable to potential overdose, such as individuals with substance use disorder living in homeless encampments. Although the power dynamics among these members typically would not be balanced, team members rely heavily on one another for key components and expertise. Whether conducting daily check-ins, referrals to community meal centers, or rides to detox facilities, each team member brings not only their individual skills, motivations, and personality, but also their organizational culture to the job. Conflict sometimes arises on topics such as whether to distribute harm reduction materials, use of team equipment, or how the team is supervised. Recognizing that communicating challenges takes time and can disrupt the critical work

in which they are engaged, the University of Massachusetts (UMass) Lowell partners act as boundary spanners to hear and help guarantee equitable voice to the larger team's very diverse experiences in a way that facilitates problem-solving on multiple levels. For example, during the COVID-19 pandemic when the governor shut down the state except for essential workers and businesses, the team members conducting outreach faced an almost complete stop of their work. The group discovered quickly that these colleagues and their important work seemed not to be valued nor designated as essential, despite the important service to people they had gotten to know and care about. The entire team wanted the university partners to convey data to their supervisors, including losing track of clients and disrupted paths to recovery. By sharing information across groups, the larger team could both better understand their collective value and determine ways to continue their work uninterrupted if another shutdown of that magnitude occurs.

These evolving relationships buoy both partnerships and community resiliency through magnifying the knowledge located within the community, which has the best "up close" understanding of the issue to inform preparation, interventions, and recovery. To quote Congresswoman Ayanna Pressley, "Those closest to the pain should be closest to the power." In terms of CBPR, this means that community members and on-the-ground organizations leverage a deep understanding of the people, history, struggles, and triumphs of the community to inform both a more beneficial research agenda and a pathway to greater resiliency.

Finally, truly equitable partnerships are not instantaneous or easy. Effective boundary-spanning relationships through CBPR require long time horizons to establish and ongoing attention to maintain. These are time-intensive endeavors but have greater sustainability than more transactional relationships. And as with any relationship, partners learn continuously, make mistakes, and grow in their mutual understanding. This continuous improvement cycle contributes to the ongoing regeneration of preparation and resiliency.

For example, UMass Lowell's long-term relationships with the opioid outreach team's organizations provided access to honest data that was at times difficult for participants to express. The team and program participants trusted the university partners' skills in protecting identities and framing difficult conversations in a way that would make their voices heard. The entire team also felt comfortable being critical about data collection and other processes. It was important that all partners not only help identify appropriate data fields and methodology, but also continue to improve the process so that it ultimately documented the work accurately.

These equitable and trusting partnerships are essential (Soleri et al., 2016) and have grown more so during the COVID-19 and economic shutdowns. This project and others have relied on existing foundational partnerships with established mutual trust, enabling partners to move quickly and emergency work to be prioritized as needed. For example, none of the university researchers live in the city where another project was occurring; they were safely working from home. It was almost easy to forget that a few miles away, the city was called to action at a high level. Realizing that a data collection plan is far from the minds of people passing out boxes of food or finding safe emergency housing, the researchers needed to be aware of what they could and could not do. The university team's existing long-term relationship with the lead agency helped partners process and share what they and the people they serve were doing at the start of the pandemic. Many employers (including city departments, schools, and human service agencies) required people to work from home, a new and often unsettling experience for many. The lead agency program director called upon the university research partners, for example, to facilitate the first Zoom meeting of all the youth-serving organizations in the city. It was a new skill for the youth-serving agencies; however, the university not only already had the technology but had already been using these skills to teach online.

Principle 2: Multiple Sources of Knowledge, Skills, and Resources Are Essential

The collaborative partnerships highlighted above provide CBPR with a wide pool of knowledge, skills, and resources through their boundary-spanning roles across groups and organizations. Community partners, for instance, bring different and indispensable skills and information than do academic partners, including the neces-

sary understanding of community realities to recognize key questions to ask, issues to probe, and potential interventions and solutions to design (Hacker, 2013; Minkler, 2005). The skills of collaborators can complement each other and build on the strengths and resources of the community. For example, some partners may have language fluency, understand local history, possess a cultural understanding and relationships in individual immigrant communities (Hacker, 2013), have networks in specialized industry or in political offices, or be able to access resources that can translate findings into localized action.

The importance of not assuming that researchers have all of the needed knowledge to "help" community partners is especially brought home when the differences between partners are great (Silka, 2001), as many earlier CBPR projects illustrate. For example, throughout the 1980s and 1990s new immigrants and refugees moved into eastern Massachusetts cities like Lowell and Lawrence, an early industrialized region with chemical contamination such as lead remaining in houses, buildings, yards, and water sources. A group concerned with pediatric lead exposure decided to donate mattress covers to immigrant families for children's beds. The group went to great effort to do this and the refugee community appreciated the effort, but gently pointed out that their children did not sleep on mattresses and so the covers would not be helpful. Subsequent partnerships built around sharing knowledge and developing appropriate research and interventions have become central to changing this dynamic. Partnerships become critically important where the gaps and differences in knowledge are greatest between the community and the university. The critical gaps can include researchers not understanding the tools, levers, and decision-making processes that influence how research will be used and what research will be helpful (Silka, 2002).

During the COVID-19 pandemic, new examples of this same issue continued to emerge. For instance, some university researchers assumed that a lack of internet access in Boston area neighborhoods posed an insurmountable challenge for remote education, when a bigger problem for some neighborhoods has been finding adequately supervised space for schoolwork. Other local knowledge, available through CBPR-type boundary-spanning partnerships, must be amalgamated for effective and relevant research, so researchers can be aware of disruptions to public transportation or grasp the ever-shifting priorities of Greater Boston's community organizations regarding emergency housing and food insecurity. Research on other issues can continue only if the existing partnership can move and respond as needed. In another example related to technology and building on community knowledge and resources during the pandemic, researchers interviewing people with opioid use disorder who are homeless had intended to visit local encampments. They were faced with COVID-related in-person research restrictions, but the data was still needed for immediate improvements to services for this vulnerable population. Through the research partnership, which spanned relationships with other city organizations, the university partners connected with a local church that hosted telemedical appointments for residents with limited access to technology. The community–university partnership researchers were able to combine these church-hosted telemedical services with additional data collection and outreach.

These deep partnerships also facilitate non-research supports during a crisis. For example, during the first month of the COVID pandemic shutdown in the Boston area, members of the Tisch College Community Research Center steering committee met online, including local community organization leaders who have been working with Tufts University for years, to reconnect and communicate across community–university boundaries. Community partners shared news of disrupted programs, immediate needs related to resident unemployment and illness, and concerns regarding lost revenue. University partners in turn reported disrupted coursework, immediate student and staff health worries, and potential financial uncertainties. Although the discussion did not focus on research per se, the discussion itself was only possible because of the community and university partners' previous engagement in participatory and action research undertakings. With existing relationships, during a crisis partners can learn from each other and consider how to combine resources and make connections.

Further, not only does CBPR connect a wide range of community partners, but by drawing from a multidisciplinary back-

ground, partners pull knowledge from a wide range of academic literatures, including theories, examples, and new ways of looking at a problem. In academia, it is sometimes assumed that CBPR only serves problems addressed by the social sciences. Other concerns relate to capacity to generalize findings (Hacker, 2013) or potential conflicts of interest between scientists and community partners (Resnik & Kennedy, 2010). Consequently, some research projects are viewed as inappropriate candidates for involving partners and employing CBPR even though the opportunity for interdisciplinary work to enrich this research is clear (Holland et al., 2010).

Consider the example of waste management. Throughout the country and worldwide, COVID has exacerbated waste production problems (Kulkarni & Anantharama, 2020). At UMaine, faculty performing waste-related research from their own disciplinary silos and perspectives (engineering, food systems, economics, psychology, anthropology, chemistry, health, and nursing) have come together with partners to address the multifaceted problem of waste, especially during the pandemic. This problem has so many components that the only way to address it has been by working across disciplines and with partners as varied as policymakers, users of recycled materials, farmers who use compost, and administrators of facilities such as hospitals that create enormous amounts of contaminated waste (Isenhour et al., 2016; Saber & Silka, 2020). Equitable partnerships and boundary spanning have been essential and have led to new legislation and research-based changes in practice.

Aligned with multiple sources of knowledge, CBPR facilitates bidirectional learning among all partners that enables ongoing innovation (Israel, Schulz, et al., 2008). Knowledge exchange is a basic function of boundary spanners acting as bridges across organizations and between systems. The practice of mutual discovery also incorporates an iterative process for ongoing learning and revision, especially when embedded with intentional opportunities for reflection. These actions support organizational and community resilience by supplying novel information that can inform both proactive and recovery practices. This includes distribution of results and lessons in ways that are relevant for all partners. During crises, these kinds of immediate information exchange can prove critical, especially in unstable and rapidly unfolding crisis circumstances (Valdez & Gubrium, 2020).

Principle 3: Research Must Be Relevant to the Community

Community participatory and action research is social justice oriented in nature and is meaningful to community needs (Balazs & Morello-Frosch, 2013; Devia et al., 2017). With a community-driven focus, these research partnerships can be engaged in both theoretical and applied work simultaneously, addressing community-identified problems. Often, CBPR uses ecological perspectives that can take into account a wide range of factors that impact a community, such as social determinants of health (Israel, Schulz, et al., 2008). Boundary spanners provide a practical service in this regard and can help tailor research to the needs of stakeholders. Local relevance is further bolstered by connecting previously unaffiliated groups and linking their expertise in new ways.

The relevance of the research focus is of consequence for greater community resiliency. For example, CBPR can deliberately build on existing community or individual assets to aid resilience development. Crisis preparation and recovery must be grounded in local contexts and be locally meaningful. In order for findings to be effective, they must not be limited to high level and detached insight, but should instead bring together a broad coalition of perspectives to inform local action. This is especially critical during an emergency like the COVID public health crisis where knowledge must be shared and applied without delay.

An illustration of local relevance points us to a small Massachusetts city that received multiyear federal funds to help transform a high-crime, depressed downtown district into a vibrant hub of cultural, culinary, and family-friendly activity. UMass Lowell and community partner researchers collaborated throughout the planning process, getting to know the key players and building relationships while assisting the stakeholders with developing a strong plan to measure the impacts of the project. With detailed plans in hand and a scatter of partners poised to take them into action, the pandemic barreled in. A city filled with essential workers—relying on public transportation and initially scant information in multiple languages—created a perfect storm resulting in

a persistently high citywide virus rate. Some partners faced a complete stoppage of the project as planned and instead were forced to attend to basic needs such as distributing food and cleaning supplies, securing safe emergency housing, and creating and disseminating health and safety information in Spanish. Community and university partners recognized that the work being performed in the city was monumental and perhaps a model for future crises for other cities. Research partners collected data on the challenges and how they were met, what new partners were engaged, and how they sought to do the same or act differently in a second wave outbreak. Because of the trust the community and university stakeholders had developed in person at the table over the long planning process, coupled with the deep relevance of the partnership and its research to the community, the partners felt at ease navigating this change. They also recognized the importance of documenting this process with additional interviews to provide another view of the elements of a resilient city.

Principle 4: Flexibility Is Key

Flexibility is a theme that runs throughout the literature on participatory and action research. The previous three principles touch on flexibility and the examples illustrate it, yet this concept is so critical that we demarcate it as its own section here. Flexibility enables community-engaged research to respond to emerging needs, to incorporate new partners, and to "keep a finger on the pulse" of what is most important. Resilient partnerships and resilient communities require flexibility and the ability to "swerve" as circumstances change with the capacity to bend rather than break. The ability to quickly assess and shift gears is also a critical function of emergency operations during crises. For example, during the COVID-19 pandemic, all partners have found themselves overloaded with emergency issues that could not be delayed. Both nonprofit programs and university classes were canceled or moved online. Both community organizations and universities were constrained financially, and many stakeholders, including staff and students, were suddenly physically absent from these communities.

As a result, partners have relied on creative flexibility to continue their work. For example, UMass Lowell faculty and their Peruvian community and medical partners were engaged in a long-term CBPR project aimed at strengthening tuberculosis treatment in low-income communities struggling with limited health resources (Brunette & Curioso, 2017). The Peruvian–UMass partnership focuses on understanding community needs, goals, and resources, and working to codevelop new forms of TB testing that could be used in the community and could help serve the community's goals of rapidly identifying TB cases. In the midst of this partnership, COVID-19 emerged and immediately constrained the possibility of highly important face-to-face contact between these international partners. Despite this obstacle, they continued to build on past experiences to codesign ways that computer models could be made to work in the local contexts. In essence, they were able to pivot while still maintaining their original goals.

What can we learn from the four principles of CBPR that enable research to progress, and even flourish, during a crisis like the pandemic? As the examples in this section suggest, CBPR's underlying orientation along these concepts illustrates sample pathways in which research can move forward even when preplanned steps cannot be exactly followed. These basic underpinnings of participatory and action research can help us consider how to reinforce equitable partnerships, combined knowledge sources, local relevance, and flexibility in different research scenarios. This can help strengthen and prepare both research and partnerships for external shocks. In the conclusion, we reflect and consider what this means for continuing to strengthen CBPR approaches.

Conclusion

As noted throughout this essay, CBPR and related approaches help universities move beyond self-contained classrooms and laboratories and into the arena of working with community partners to attend to immediate problems. Through participatory and action research, knowledge discovery is linked to problem solving and, on many campuses, students, community partners, and faculty members participate in research training that does not separate research from the community context in which the problem analysis is generated and the findings will be applied (Bieluch et al., 2019). Potential users are deeply involved in the design of the research to ensure that its usefulness is maximized. To succeed at this complex

form of research, boundary spanning is key to increase the rigor and quality of research, to adapt to pressing needs, and to build a more resilient partnership and community. As things change in this complex CBPR network of people and activities, resilient research partnerships mean that despite pivots and adaptations, goals can be maintained and achieved without harming the partnership. And with each CBPR principle outlined here, there are strategic questions—on issues of equity, multiple sources of knowledge, relevance, and flexibility—that we can consider in collaboration with our research partners. These can help us be more intentional about constructing more crisis-resilient partnerships and communities: How can our boundary-spanning collaborations advance equity in terms of decision making, resources, and impact during a crisis, as witnessed during the COVID-19 pandemic? Who else could or should be at the table, what knowledge or perspective might be missing, and how can research be sensitive and responsive to changing community concerns during a crisis? How do we create and maintain a collaborative research environment? How and why are our particular research questions being asked and to whom? How can we pivot and bend effectively—such as during COVID-19—while still remaining true to our community-centered research goals?

The examples here have been intended to show these principles in the diversity of topics across rural and urban contexts, as well as in a wide range of disciplines involved in CBPR during the COVID-19 pandemic. In the past, we frequently heard researchers say this approach is all well and good, but "my research area can't be carried out in this way." Community participatory and action research approaches, however, have demonstrated that many problems could be examined this way, and could benefit from CBPR qualities. This has been particularly true for complex and multifaceted social issues in our communities, sometimes labeled "wicked problems" (Rittel & Webber, 1973). These challenges defy a monodisciplinary or unilateral approach, and instead draw on an array of invested stakeholders—including prioritizing knowledge located within a community—and methodologies to bring diversity of perspectives, information, and ideas to move the needle on potential solutions (Waring, 2012).

Now, as we have seen during the pandemic, concerns emerge that the constraints of social distancing, shifting priorities, and related challenges may weaken our ability to perform CBPR. Instead, we show evidence that these arguments do not fully account for what community-based research can do. Because of CBPR's attributes, this approach provides a useful framework for community research during this crisis.

In addition to drawing on CBPR's strengths, CBPR's suspected or hypothetical limitations may act as advantages during a crisis. For example, some criticisms of CBPR are directed toward a perceived lack of standardization that can hinder cross comparisons and generalizability (Hacker, 2013; Israel, Eng, et al., 2013; Wallenstein & Duran, 2010). This criticism stems from CBPR's emphasis on the unique quality of each community and each partnership. Nevertheless, robust methodologies enable findings to be shared and applied to new contexts and help highlight how lessons can be relevant across multiple settings. CBPR's attention to the contours of each individual partnership make this orientation particularly insightful when research partners must pivot creatively under changing circumstances, such as during the COVID-19 pandemic. A second criticism leveled at CBPR, particularly for partners with limited resources, focuses on the time-intensive nature of the research relationships (Hacker, 2013; Israel, Krieger, et al., 2006). These are long-term endeavors, not transactional arrangements. Although this aspect of CBPR can be problematic—for instance, when untenured faculty are applying for promotion (Sandmann et al., 2016) or funding is time constrained—the methodology surfaces as a real asset during events such as COVID, where enduring relationships help research to continue and to grow and to shift under changing circumstances. Finally, the flexibility of CBPR, which we described as an attribute, is sometimes reproached as a flaw that in some way makes CBPR less rigorous. However, blind, rigid adherence to methodological design is arguably not itself a virtue, and a certain amount of elasticity that enables a robust research project to weather external shocks is of critical importance in most circumstances, and certainly during a pandemic.

These issues play out across all kinds of contexts, as our examples demonstrate. Urban, suburban, and rural communities

have all been impacted by the COVID-19 pandemic and concurrent crises in various ways. Every single community is touched, and subsequently, so is the research embedded in these communities. We advocate that qualities of community-based participatory and action approaches are instrumental for a wider range of community-engaged research because of the resiliency they promote for both the community at the center of the work and for the research partnerships themselves.

So how might CBPR-related assets support and be nurtured across community–university research partnerships? Further, how might CBPR-related work be sustained over time and across multiple partnerships and research agendas without seemingly restarting from scratch when plans are disrupted by external events? Our examples have been suggestive in this respect, but new steps are being taken to ensure the persistence of this approach and grow new "generations" of research partners in both community and university spaces. For example, the National Science Foundation is funding NSF Research Traineeship (NRT) and Smart and Connected Communities (S&CC) grants designed to bring academic disciplines together to work with community partners on research and train graduate students from multiple disciplines to develop these skills. Community-engaged researchers are being called upon more and more to assist other researchers in creating successful community partnerships where the broader impacts of their research can be realized through collaboration. UMaine has three such multiyear grants focusing on natural resources, health across different species, and climate change in Northern and Arctic areas. One project is engaging graduate students in facilitating research efforts focused on building climate change preparation capacity in Maine communities that rely on natural resources for tourism. Utilizing local climate data, students will work with the community on forecasting potential conditions that will require action. This and other programs are dramatically changing the ways students are learning research: across disciplines, with partners, and aiming to create usable knowledge. Learning across projects has involved looking for similarities and differences and providing ways to compare and contrast. Leaders in these programs at UMaine have published on the use of spidergrams to compare, contrast, and learn across diverse contexts and problems (see Jansujwicz et al., 2021).

Similarly, Tufts University is working to strengthen community participatory research and support the "next generation" of community-engaged research, including through a Tisch College research center dedicated to supporting CBPR-related approaches, interdisciplinary faculty fellowship cohorts, community–faculty copartner seed grants, and a growing network of student–community research opportunities. UMass Lowell likewise hosts interdisciplinary communities of practice for faculty researchers in community-engaged scholarship as well as a community research center focused on supporting this work throughout the university. NSF's S&CC and other programs have inspired the College of Engineering faculty and students to actively engage social scientists and community groups in identifying critical research questions that connect new technology (e.g., water quality sensors, road hazard detectors) to solving real problems of interest to community stakeholders. Local residents are involved throughout the research cycle.

The COVID-19 pandemic outwardly appears as an example of external circumstances that might undercut effective community participatory and action research. Conversely, however, the COVID context highlights how drawing on principles of CBPR and related approaches can enable research to withstand external shocks more effectively. Many universities and community stakeholders are investing in ways to expand this work among faculty, community partners, and students, such as through grantmaking, fellowships, trainings, and symposiums. Our reflections here suggest how and why CBPR-related approaches can continue to make research partnerships and communities more resilient during crises and enable universities to better meet the needs of society.

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