

BUILDING COMMUNITY-BASED SURGE CAPACITY THROUGH A PUBLIC HEALTH AND ACADEMIC COLLABORATION: THE ROLE OF COMMUNITY HEALTH CENTERS

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To improve national emergency preparedness, multiple levels of the public health system require strengthening. One major area is surge capacity,¹ defined by the Agency for Healthcare Research and Quality (AHRQ) as “a health care system’s ability to rapidly expand beyond normal services to meet the increased demand for qualified personnel, medical care, and public health in the event of bioterrorism or other large-scale public health emergencies or disasters.”² The aftermath of Hurricane Katrina and increasing concerns about a possible avian flu pandemic have focused more attention on this issue, especially regarding disadvantaged and special needs populations.³ While national agencies such as AHRQ, the Centers for Disease Control and Prevention (CDC), and Health Resources Services Administration (HRSA) have cited surge capacity as a priority “focus area,” current published literature is sparse. A MEDLINE search yielded few relevant resources, and those focus primarily on hospital settings.^{4,5} Non-hospital settings, such as community health centers (CHCs), also offer potential. In this article, we describe a collaboration among CHCs, government agencies, and academia that initiated the growth of community-based surge capacity in the Boston area.

DEFINING THE DIMENSIONS OF SURGE CAPACITY

The dimensions of surge capacity include *health care facility-based surge capacity*, *public health surge capacity*, and *community-based surge capacity*.¹ *Health care facility-based surge capacity* refers to the ability of health care facilities to treat increased numbers of sick and injured, especially when inpatient care is required. *Public health surge capacity* refers to the capacity to implement core public health activities such as mass prophylaxis and vaccination, risk communication and epidemiologic investigation. *Community-based surge capacity* encompasses the community’s ability to supplement both the public health response (by assisting with mass care initiatives such as vaccination or prophylaxis) and the health care facility response (by providing care at sites away from overloaded facilities). A United States General Accounting Office (GAO) report notes that much remains to be accomplished in these areas.⁶ Groups such as the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) have urged “. . . an agreed-upon set of units, or measures, of surge capacity at the federal level or, at the very least, at the state level . . .”⁷ for facility-based surge capacity; HRSA has established an ad hoc surge capacity target of 500 extra hospital patients per million population in urban areas.⁸ Similar targets, lacking for community-based surge capacity, are needed with respect to *space, staff, and supplies*.

Space considerations include temporary external shelters (e.g., the Louisiana Superdome in the case of Hurricane Katrina) and sites for patient triage (such as schools/public buildings/hotels or even partially decommissioned hospitals).⁹ Public health officials are trying to identify facilities that ideally could accommodate high traffic volume and have capacity for decontamination, showers, waste disposal, heating, plumbing, water, sewage systems, electricity, and parking. *Staff* includes not only medical personnel (e.g., physicians, nurses, and trained interpreters) but also those with key coordination functions (e.g., contacting service organizations, aiding in volunteer recruitment, and coordinating volunteers and off-duty personnel in

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the logistics of care), as well as those providing administrative support (e.g., patient tracking, clinical management, and triage). A local medical reserve corps (enhanced by just-in-time training) could help staff an off-site facility, particularly in the first several days of a crisis. *Supplies* include local stockpiles of equipment (e.g., medications, vaccinations, and personal protective equipment), the strategic national stockpile, and communication and information network supplies (e.g., radios and computers). Supply issues also include cooperative mutual aid agreements with other health care facilities and material management issues (ranging from refrigeration of pharmaceuticals to maintaining paper supplies, computers, and copiers in functioning order).

COMMUNITY HEALTH CENTERS AS A FOCUS FOR COMMUNITY-BASED SURGE CAPACITY

First established in 1965, community health centers have as a core mission the commitment to serve clients regardless of income, insurance coverage, or immigration status. Currently, the nation's network of over 1,000 federally qualified health centers (non-profit, consumer-directed health care corporations that provide comprehensive primary and preventive health care services) serves 15 million people.¹⁰ Moreover, CHCs have special commitments to underserved and immigrant populations. In 2002, two-thirds of all federally funded health center patients were members of racial and ethnic minority populations, 86% were low-income (i.e., family income \leq 200% of the federal poverty level), approximately 40% had no health insurance, and approximately one-third spoke a primary language other than English.¹¹

CHCs are organized under the umbrella of Primary Care Associations (PCAs), non-profit associations representing health centers and other primary care (safety net) providers on a state or multi-state regional basis. PCAs provide a variety of services in support of community-based primary care, including centralized clinician recruitment and technical assistance in areas of programs, management training, and governance. CHCs have close affiliations with hospitals and/or operate under hospital licensure.

CHCs represent a unique focus for community-based surge capacity because of their potential contributions to patient care and public health during emergencies. As a usual place of care, CHCs constitute sites where patients may present in the first stages of a disaster such as the anthrax and SARS episodes.¹²⁻¹⁴ CHCs are

usually accessible by foot or public transportation in the communities they serve. CHCs could also potentially serve as points of dispensing for mass vaccinations or prophylaxis. Multicultural/multilingual providers and support staff of CHCs can facilitate communication and rapid interventions where language barriers or mistrust of the health care establishment may be high.

Even before 9/11, the Department of Defense envisioned that Neighborhood Emergency Help Centers could provide "a network of high-volume temporary care facilities that can rapidly enhance a community's 'surge capacity' to more effectively manage immediate medical and human service needs. . . ." and ". . . serve as rapid neighborhood triage centers and dispensaries."^{13,15} Also, the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (H.R. 3448; PL 107-188) specifically authorized funding "for the purpose of enhancing the preparedness of hospitals, . . . clinics, health centers, and primary care facilities for bioterrorism and other public health emergencies."¹⁶

However, several national surveys by the National Association of Community Health Centers (NACHC) documented a need for better planning and preparation.¹² The October 2001 NACHC survey of PCAs and CHCs (including responses from 137 federally qualified health centers) found that "health centers were willing to participate in responses to these threats, but that they lacked adequate resources . . . including drugs, supplies, training, and information systems."¹⁰ Furthermore, a 2003 NACHC survey found that ". . . only a handful said that health centers also had representation on [advisory] committees."¹⁴

An October 2003 NACHC disaster preparedness survey of health center executives (193 responses; total response rate of 27%) underscored both the potential and challenge of building surge capacity through CHCs.¹³ The majority (76%) of respondent CHCs indicated that they had written emergency or disaster plans. However, only about half had contacted and/or coordinated with their local, county, or city health departments, and just 28% with state health departments. Only 30% had received training from the local health department, 28% from the state health department, and 18% from the local Emergency Medical Services (EMS). Only 9% of responding health centers felt adequately prepared for a community disaster; they identified training and improved equipment and supplies as high priorities.¹³

INITIAL PLANNING AND IMPLEMENTATION OF PREPAREDNESS TRAINING FOR BOSTON COMMUNITY HEALTH CENTERS

In Massachusetts, 53 CHCs at 185 sites serve one out of every ten state residents.¹⁷ HRSA's Bureau of Primary Health Care recognizes the Massachusetts League of Community Health Centers ("the League") as the state's PCA. These CHCs care for about 43% of the state's medically underserved (defined as Medicaid-eligible and low-income uninsured and underinsured).¹⁷

The impact of CHCs is particularly striking in Boston, a major metropolitan city with great diversity; 51% of its residents are non-white.¹⁸ Each of the city's 26 CHCs tailors services to meet the needs of populations that are traditionally underserved. These centers offer a wide range of services, including primary care, pediatrics, obstetrics and gynecology, immunizations, dental care, mental health, social services, community outreach, and public health programs.

In winter 2002–2003, the Boston Public Health Commission (BPHC) and the League launched a staged process of clarifying expectations and roles through planning meetings. (Personal communication, R. Serino, Boston Emergency Medical Services, May 9, 2005.) A League survey of 37 CHCs in Massachusetts found that about three-fourths had written emergency plans and about half had updated them since 9/11.¹⁸ About two-thirds had the resources to staff facilities beyond normal operating hours, but only about a third of clinical staff had received some training in disaster preparedness. Virtually all identified personnel training, obtaining personal protective equipment, and participating in the local communications network as their highest priorities.

Responding to these needs and initiating the process of building community-based surge capacity first required role clarification. Many CHC leaders and staff expressed initial concern that they would be expected to handle hospital overflow patients requiring acute care. CHC leaders and staff were subsequently reassured that they would be expected to continue to focus on providing primary care and ambulatory care. Discussions ultimately solidified the understanding that key CHC roles as part of emergency preparedness could include: (1) surveillance of unusual outbreaks and diseases; (2) education of community and patients; (3) internal staff education, as well as clarification and identification of staff roles; (4) vaccination and mass prophylaxis; (5) capacity to address post-event public demands/needs; (6) outpatient surge capacity and triaging systems; and (7) an integrated role in city-wide emergency response efforts.¹⁹

In March 2003, BPHC initiated the first of three rounds of pilot funding to tailor emergency preparedness plans according to each CHC's capabilities and responsibilities. BPHC provided CHCs with a self-administered assessment tool to document needs and refine their plans. Some critical elements included establishing policies for calling in staff, clarifying whether emergency response duties were voluntary or part of a job description, and creating communication phone trees.

In addition, BPHC, Boston Emergency Medical Services (Boston EMS) and the DeValle Institute for Emergency Preparedness (a BPHC and Boston EMS program funded by the CDC and the Massachusetts Department of Public Health) provided basic training regarding emergency operations planning and the incident command system (ICS). Several CHCs went further by initiating coordinated planning with other CHCs in proximity. At the end of this pilot period, each participating CHC submitted to the BPHC a final report of activities accomplished and resources needed to continue to grow this effort.²⁰

City-wide planning in 2003, highlighted by two day-long summits, brought together key decision-makers from hospitals, public health, CHCs, and emergency medical services. For many CHCs, these summits presented the first tangible opportunity to participate with other organizations as part of the surge capacity planning process. The summits reemphasized the role of CHCs in emergencies, as evidenced by their dedicated seat at the Boston Emergency Operations Center alongside public health, EMS, and hospital representatives.

In October 2003, the Harvard School of Public Health Center for Public Health Preparedness (HSPH-CPHP) joined with Boston EMS and the DeValle Institute for Emergency Preparedness to advance training. After formalizing a memorandum of understanding, the partners developed more detailed needs assessments, designed and developed curricula, provided educational programming, and organized outreach and promotion.

First, staff from BPHC, the DeValle Institute, and HSPH-CPHP further surveyed the 26 Boston CHCs to assess desired training topics and training formats (on-site training, train-the-trainer, and centrally located training with other centers). Written surveys were followed by telephone surveys with CHC CEOs, with 15 responses. The nature of the responses varied. CHCs without prior experience in emergency preparedness desired basic training (on topics such as Emergency Operations Planning and ICS) while others desired expert feedback on established plans. Respondents ranked Exercise and Drill Design and Evaluation as

their highest priority (mean score of 3.5 on a priority scale of 1 [highest priority] to 9 [lowest priority]). All respondents wanted to improve connections with other emergency preparedness partners (such as hospitals, EMS, fire, and police). On-site training was the preferred modality, while many also favored a train-the-trainer model with short (one hour) presentations and supporting materials for CHC staff.

Based on this information, the DeValle Institute, HSPH-CPHP, and outside experts created and implemented a basic curriculum of six training seminars (*Introduction to Disaster Planning, ICS for Health Centers, Emergency Operations Plan Evaluation Tool, Emergency Operations Plan Clinic, Designing and Evaluating Exercises and Drills, and Train the Trainer*). Most modules lasted from two to four hours. *ICS for Health Centers* specifically addressed the challenges of disaster response within the context of scarce resources and minimum staffing levels seen at many CHCs. Representatives of five CHCs also participated in the city-wide surge capacity tabletop exercises along with partner hospitals. Trainings brought together Boston CHCs with their partner hospitals as well as with first responder agencies such as police, fire, and EMS. Satisfaction with training was high; almost all CHC trainees responding to evaluation surveys agreed that they had “gained new skills and knowledge” (e.g., 17/20 for *Train the Trainer* and 17/18 for *Designing and Evaluating Exercises and Drills*).

In addition to these external trainings, CHC officials used these materials for internal training of their own staff on topics such as emergency operations plan, stress management, and infection control measures. Several CHCs offered educational programs to their patients. BPHC and Boston EMS provided each CHC an *Emergency Preparedness Toolkit* of resources, including reference handbooks, incident command charts, incident command vests, maps and demographic profiles of Boston neighborhoods, digital cameras to facilitate diagnoses and sharing of information, CD-ROMs, video tapes, and other training tools.

A second round of BPHC funding of emergency preparedness grants to the League and twenty-two Boston CHCs allowed staff to attend training seminars and purchase equipment. Some CHCs used grant funding to purchase supplies such as redundant communications devices, first-aid kits, and equipment for infection control and staff safety (e.g. masks and goggles). By November 2004, the third round of BPHC grants reflected a higher level of training sophistication to improve outpatient surge capacity with respect to triaging, mass prophylaxis, immunization, and com-

munication. The importance of CHCs and surge capacity increased that year when the CDC funded Boston as part of the Cities Readiness Initiative (CRI). This joint initiative (between the Department of Health and Human Services, the Centers for Disease Control and Prevention’s Strategic National Stockpile Program, and the Department of Homeland Security) has as its aim to increase capacity for the “timely delivery of medicines and medical supplies during a large-scale public health emergency.”²¹ BPHC and HSPH-CPHP have also embarked on developing a distance-learning training platform for the Boston Medical Reserve Corps which enrolls volunteers to assist in public health emergencies (www.bphc.org/volunteer).²²

Some concrete benefits have already emerged from this collaboration and training. First, CHCs have benefited from the better coordination resulting from a “staff sharing” agreement fashioned by the Boston Metropolitan Medical Response System (a program of the BPHC) and area hospitals. In this agreement, hospitals send staff (physicians, nurses, clerks, and translators) to work for the BPHC in the event of a public health emergency. Such staff, excused from regular duties, receive liability and worker’s compensation coverage. In turn, the agreement allows BPHC to guarantee a competent and appropriately licensed workforce. CHC staff have been incorporated into a more unified response for staff assistance in such instances. Second, CHC staff used preparedness training to increase protections surrounding the 2004 Democratic National Convention,²³ a national event which drew thousands of outsiders into the city of Boston. CHCs have also provided volunteer staffing for special outbreaks, e.g., when Hepatitis A clinics that were activated in response to the public’s exposure to an infected restaurant worker in downtown Boston (2004) and when a Boston Medical Center-based physician contracted active tuberculosis.²⁴ In the latter instance, CHC staff helped in an extensive process of identifying patients exposed over the preceding six-month period. (Personal communication, M. McMahon, Boston Medical Center, September 15, 2005.) Of the nearly 1,500 patients who were identified as possibly exposed, many received primary care from Boston CHCs. CHC staff assisted in a coordinated effort of screening patients, completing screening templates, and returning information to a confidential centralized electronic tracking system. The use of multiple community sites made the screening process less burdensome for the hospital, more convenient for the patients, and allowed better surveillance and investigation of the results.

LESSONS LEARNED AND FUTURE CONSIDERATIONS

Our experience has shown the potential for collaboration between government, academia, and CHCs to begin to build community-based surge capacity. The process involved needs assessments, curriculum development, training, and outreach. First, the collaboration clarified the role of CHCs in emergency preparedness, identifying at least seven specific functions. The process also reemphasized that CHCs should have a seat and a voice at the local Emergency Operations Center while also underscoring that each CHC needs to have a clear sense of its own facility's potential for surge capacity in terms of staff, space, and supplies. Trainings, which have evolved through several stages of sophistication, not only provided education but also networking opportunities with preparedness partners. CHCs in other cities, such as New York City, have also moved toward improving community-based surge capacity.²⁵

Despite this initial progress in planning and coordination, many challenges remain. While all partners are committed to perfecting and testing a citywide plan that best utilizes CHC resources, there are many ongoing issues with respect to staff, supplies, and space. Complicating factors include the varying sizes and resources of the different centers and the range of integration in disaster preparedness that individual CHCs enjoy with affiliated hospitals. Other staff challenges include limited time and resources available for training, limited or no full-time personnel devoted to emergency preparedness, and employee turnover (including an ongoing nursing shortage). Limited local stockpiles of medical supplies and the need for more backup communications systems also require future attention. More engagement of neighborhood resources (such as community group volunteers) is needed. Finally, regular tests of community-based surge capacity through exercises and drills should continue to assess capabilities and needs.

Ideally, CHCs can help provide a flexible, linked network of "reserve" health care capacity to supplement, support, and extend the efforts of acute care hospitals in their communities. Coordination through PCAs (such as the Massachusetts League of Community Health Centers) offers statewide and regional vehicles to advance these experiences throughout the country. The Boston experience offers some initial lessons learned to build stronger community-based surge capacity for the future.

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