

RESEARCH

Assessing the Integration of Health Center and Community Emergency Preparedness and Response Planning

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ABSTRACT

Background: To assess the state of health center integration into community preparedness, we undertook a national study of linkages between health centers and the emergency preparedness and response planning initiatives in their communities. The key objectives of this project were to gain a better understanding of existing linkages in a nationally representative sample of health centers, and identify health center demographic and experience factors that were associated with strong linkages.

Methods: The objectives of the study were to gain a baseline understanding of existing health center linkages to community emergency preparedness and response systems and to identify factors that were associated with strong linkages. A 60-item questionnaire was mailed to the population of health centers supported by the Health Resources and Services Administration's Bureau of Primary Health Care in February 2005. Results were aggregated and a chi square analysis identified factors associated with stronger linkages.

Results: Overall performance on study-defined indicators of strong linkages was low: 34% had completed a hazard vulnerability analysis in collaboration with the community emergency management agency, 30% had their role documented in the community plan, and 24% participated in community-wide exercises. Stronger linkages were associated with experience responding to a disaster and a perception of high risk for experiencing a disaster.

Conclusions: The potential for health centers to participate in an integrated response is not fully realized, and their absence from community-based planning leaves an already vulnerable population at greater risk. Community planners should be encouraged to include health centers in planning and response and centers should receive more targeted resources for community integration. (*Disaster Med Public Health Preparedness*. 2007;1:96–105)

Key Words: emergency preparedness; community preparedness; disaster response

Federally funded health centers provide medical services for more than 15 million medically underserved people in the United States and are a major component of the nation's health care safety net. Health centers provide comprehensive primary and preventive health care including chronic disease management and pharmacy, laboratory, and mental health services, as well as associated enabling services such as translation and transportation, regardless of insurance coverage or ability to pay.^{1,2} Health centers serve a unique population of patients who are often low income, ethnically diverse, and have limited proficiency in English. As such, these centers are an integral component of the US health care system and are likely to be a primary resource for patients from vulnerable populations affected by a public health emergency or disaster.³

An effective response requires collaborative planning

across all health care organizations in the community. To maximize a community's emergency response and recovery capacity, community planners should recognize health centers as valuable community medical assets. Some of the potential roles for health centers in emergency response include disease surveillance; medical and mental health surge capacity both at the health center and at the site of an emergency; points of distribution for pharmaceuticals and supplies, mass vaccination clinics, and alternate care sites; and provision of translation services and risk communication. Reports show that health centers have played important response roles in many of our country's manmade and natural disasters.^{4,5} Health centers provided primary care services in response to such disasters as Hurricane Andrew (1992), the 1994 Northridge (California) earthquake, the terror attacks on September 11, 2001, and the 2003 San

Diego area wildfires. Most recently, health centers responded to the devastation caused by Hurricane Katrina. Within 2 weeks of Katrina's landfall, health centers in areas hit and those in the areas accepting evacuees enrolled more than 40,000 people to receive services.⁶ Unfortunately, the lack of predisaster involvement in community planning made widespread, on-site health center response to Katrina difficult. In many cases, health centers did not have access to medical supplies and equipment to properly treat patients affected by the hurricane because they were not recognized as primary treatment assets by the local or state emergency response plans and resources were not being shared.⁷ Despite more than a decade of reports describing health centers' response to emergencies, this study and others have demonstrated that the importance of integrating health centers in emergency preparedness and response may be underestimated by emergency planners.⁸

To assess the state of health center integration into community preparedness, we undertook a national study of linkages between health centers and the emergency preparedness and response planning initiatives in their communities. The key objectives of this project were to gain a better understanding of existing linkages in a nationally representative sample of health centers, and identify health center demographic and experience factors that were associated with strong linkages. We hypothesized that those health centers with experience responding to a disaster or public health emergency, or that perceived themselves at high risk for hazards, would report stronger community linkages than those without disaster response experience or high perceived risk.

This project was the second phase of an Agency for Healthcare Research and Quality-funded project investigating health care organization and community linkages in emergency preparedness; phase 1 examined the integration between hospitals and their community emergency preparedness (Cooperative Agreement Number 1U18HS13728-01).⁹

METHODS

Data Collection

Data were collected from participating health centers using mailed, self-administered questionnaires and statistics from the Bureau of Primary Health Care 2003 Uniform Data System.² A technical expert panel was established, comprising 7 members with expertise in the areas of health center operations, clinical medicine, and emergency preparedness. With input from the technical expert panel, the hospital questionnaire used in phase 1 was modified for health centers and then pilot tested at 23 centers.

The final study questionnaire contained 60 items, both open-ended and close-ended, divided into 7 content areas: health center profile, experience with prior emergencies or disasters, community emergency preparedness planning, health center role in a community response, communication, surveillance, reporting and laboratory testing, and training and exercises.

The final section addressed barriers to community linkages and health center satisfaction with their current level of involvement.

The entire population of health centers supported by the Health Resources and Services Administration's (HRSA) Bureau of Primary Health Care ($n = 890$) was eligible for inclusion in the study. The questionnaire with accompanying cover letter was mailed to the executive director of each health center in February 2005. The letter outlined the project goals and benefits of participation, including the opportunity to contribute to national baseline data and to receive a report of the aggregate national results. The letter indicated that participation was entirely voluntary, confidential, and unrelated to accreditation by the Joint Commission for Accreditation of Healthcare Organizations (now The Joint Commission). To further encourage participation, the Bureau of Primary Health Care sent a letter of support to each health center in March 2005. Each returned questionnaire was examined carefully for omitted or inconsistent information. Follow-up requests for clarification were sent by e-mail to the person responsible for completing the questionnaire.

The reliability of questionnaire-item response was assessed in a sample of 45 randomly selected health centers from the cohort that responded to the initial questionnaire. They were asked via electronic mail to answer 4 questions that were identical to items found in the original questionnaire. The reliability assessment evaluated the correspondence of answers between the each of the 4 items: Does the community have an emergency preparedness planning group? Does the community have a separate health care coalition? Does the community have a crisis communication protocol? Have staff seen the local/county emergency operations plan (EOP)?

The study design and questionnaire were approved by the Joint Commission's external institutional review board. Participant confidentiality was preserved by reporting only aggregate results; no individual health center names or locations were used.

Data Analysis

Because no widely accepted, predefined model for health center integration into community preparedness existed at the time of study design, no metrics for measuring good linkages were available. To examine what factors were associated with strong linkages, the project team retrospectively selected 3 items to serve as representative indicators of strong linkages: health center completion of a collaborative hazard vulnerability analysis (HVA; the identification of potential emergencies and the direct and indirect effects these emergencies may have on the organization's operations and the demand for its services¹⁰) with community responders; documentation of the health center's role in the community emergency response plan, and health center participation in community-wide exercises. These metrics were chosen be-

cause each reflects substantial coordination with community planners and requires a high level of active collaboration between the health center and the community.

To assess the reliability of item response, the percentage of agreement between questionnaire items from the original response and the follow-up questionnaire was calculated. Accuracy of data entry for this study was assessed by double-entry comparison of 12 randomly selected questionnaires. Percent correspondence was calculated by dividing the total number of discrepancies by the total number of data points where discrepancies were possible.

Data from all of the questionnaires were entered into a Microsoft Access 2003 database. PC-SAS version 9.1 (SAS Institute, Cary, NC) was used for all of the analyses. Frequencies, means, and other descriptive statistics were generated for each questionnaire item. To examine the possibility of a response bias, we compared respondents to nonrespondents for location (urban or rural), center user volume, number of sites per center, and accreditation status.

Bivariate analysis was performed to examine relationships between 16 selected health center emergency preparedness linkage items in the questionnaire and dependent variables related to demographics, experience, and perceived risk. The demographic characteristics used as dependent variables included urban versus rural location, high user volume (defined as 21,072 or more patients across all delivery sites per year, which is at or above the 75th percentile of the total number of patients seen annually across centers); large number of service delivery sites (≥ 6); and Joint Commission accreditation. The dependent variables related to experience and risk were experience responding to an actual disaster or public health emergency in the community and high perceived risk for hazards or threats (defined by the respondent's recognition of ≥ 5 or more potential hazards or threats for their center, which is at or above the 75th percentile of the total number of perceived hazards among responding centers). An additional analysis was performed to examine associations between the presence of the selected indicators of strong linkages and demographics, experience, and perceived risk. The chi-square statistic was used to assess the significance of associations ($P < .05$).

RESULTS

Participation and Data Characteristics

Responses were obtained from 307 (34%) of the 890 health centers who received the questionnaire. Health center administrators were the personnel most likely to complete the questionnaire (54%), followed by medical and clinical staff

(15%) and quality improvement and compliance personnel (14%).

When comparing respondents' characteristics to the overall population of health centers, accredited health centers responded at a higher rate than centers that were not accredited (42% vs 31%; $P < .001$). Centers with high user volume were more likely to respond than those with low user volume (44% vs 32%; $P < .01$). Centers located in rural areas were more likely to respond than those located in urban areas (38% vs 31%; $P < .05$). No significant difference was found in response rates by the number of service delivery sites.

In the reliability assessment of the 4 questionnaire items, 32 of the 45 invited centers replied. Item correspondence was as follows: community planning group, 84%; health care coalition, 69%; crisis communication protocol, 75%; and local/county EOP, 67%. The answers provided in the original questionnaire were retained. In the analysis of overall data entry accuracy, 9 total discrepancies were found across 12 questionnaires. With 238 data points per questionnaire and a total of 2856 opportunities for data entry discrepancies, the analysis yielded a 99% data entry correspondence.

Demographic Characteristics

Table 1 presents overall prevalence and results from a bivariate analysis of relationships between health center demographic characteristics and 16 health center emergency preparedness linkage items. Six linkage items were associated with location. Health centers in rural areas were more likely to have an EOP that was developed with community responders and to have seen the community EOP ($P < .01$). Rural health centers were also more likely to have a designated staff member who could be contacted by the emergency management agency (EMA) around the clock ($P < .05$). Health centers in urban areas were more likely to be represented on a community health care coalition, to use 800-MHz radio to communicate with the community during an event, and to have received state or federal funding for emergency preparedness activities ($P < .05$).

High user volume was only associated with being represented on the community health care coalition ($P < .05$), and no items were associated with having a large number of sites. Accredited health centers were more likely to use 800-MHz radio to integrate with the community during a response ($P < .01$) and to have received funds for emergency preparedness activities ($P < .05$). They were more likely to have staff who were involved in community emergency preparedness and who had received training in proper laboratory techniques ($P < .05$). Accredited centers were also more likely to have health center staff involved in emergency management

The finding that only 39% of centers reported that staff had viewed the local/county EOP clearly underscores the lack of substantial integration.

who had seen the community EOP and to have a designated health center contact who the community emergency management agency could reach at any time ($P < .05$).

Experience and Perceived Risk

Table 2 presents overall prevalence and results from the bivariate analysis of relationships between health center experience with prior disasters and high perceived risk and health center emergency preparedness linkage items. Overall, about one third of health centers had experience responding to disasters or public health emergencies, both within and outside their service areas. Their response activities included providing medical care (50%), reassigning staff (27%), providing education and information (23%), and other functions.

Experience responding to an actual or potential disaster or public health emergency was associated with 10 linkage items. Centers with prior experience were more likely to have a designated health center contact who the community EMA could reach at any time, to be involved in community-wide training, and to have seen the community EOP ($P < .01$). Health centers with such experience were more likely represented on the community planning group and to be represented at the community emergency operations center during a response ($P < .05$). Having received funding or in-kind assistance for emergency preparedness activities was also associated with prior disaster or emergency experience ($P < .05$).

The most commonly reported natural hazard risks included winter storms/extreme cold (53%), tornadoes (41%), and floods (42%); the most commonly perceived manmade hazards included hazardous materials (42%) and terrorism (25%; Fig. 1). The median number of hazards perceived as significant risks by individual respondents was 4. Perceived high risk for hazards was associated with 11 items; health centers who perceived themselves to be at risk for a high number of hazards were more likely to have developed their center's EOP in collaboration with the county/local EMA, to be represented on the community planning group, and to have made arrangements for reimbursement of resources expended during an emergency ($P < .001$). Centers with high perceived risk were also more likely to be represented at the community emergency operations center during a response, to have viewed the community EOP, and to have made arrangements to obtain additional supplies and equipment during an emergency ($P < .01$). High perceived risk was also associated with having representation on the community health care coalition ($P < .05$).

Overlooking health centers as important medical assets risks future inadequate response by preventing the community from realizing its full capacity for medical care and preventive interventions.

Selected Indicators of Strong Linkages

Table 3 presents overall frequencies and associations between data from emergency preparedness linkage items and the 3 selected indicators of strong linkages. Overall performance on the linkage indicators was low. Only 27% of health centers had completed an HVA with community responders. Rural centers completed collaborative HVAs significantly more often (32%) than urban centers (21%; $P < .05$). Centers with experience responding to a previous disaster and those with high perceived risk were more likely to have completed a collaborative HVA ($P < .001$).

A total of 30% of health centers reported that their center's role during an emergency was documented in the community EOP. More than one third (34%) of rural centers but only 24% of urban centers reported such documentation (ns, $P = .06$).

Only 24% of health centers reported having participated in community-wide exercises. Centers with high user volume (33%) were more likely to have participated in community-wide exercises than those with low user volume (21%; $P < .05$). Again, rural centers more commonly (26%) reported exercise participation than urban centers (21%; ns, $P = .28$). Centers with experience responding to a prior event (35%) were more likely to have participated in exercises than those who did not have disaster or public health emergency experience ($P < .001$).

Overall, only 25 centers (8.1%) answered affirmatively to all 3 indicators. Centers with experience responding to a prior disaster or public health emergency had higher aggregate scores than those without such experience ($P < .001$). Similarly, those with high perceived risk had higher aggregate scores than those without perception of high risk ($P < .01$). Accredited centers were more likely to have higher aggregate linkage indicator scores than centers that were not accredited by The Joint Commission ($P < .01$).

Satisfaction With Involvement and Barriers to Community Linkages

Respondents reported on their overall level of satisfaction with their health center's degree of involvement in community emergency preparedness activities. Using a 5-point scale, with 1 being not at all satisfied, 3 being somewhat satisfied, and 5 being completely satisfied, the mean satisfaction score was 2.51 ($n = 286$, median = 3, SD = 1.12). The majority (74%) of respondents reported being only somewhat or less than somewhat satisfied.

TABLE 1

Associations Between Emergency Preparedness Linkage Items and Demographic Factors

Linkage Items	Health Centers Answering Affirmatively	Location			No. of Sites			User Volume			Joint Commission Accredited		
	Overall %, n = 307	Urban %, n = 135	Rural %, n = 172	P	Large %, n = 129	Small %, n = 176	P	High %, n = 77	Low %, n = 228	P	Yes %, n = 121	No %, n = 184	P
Health center involvement in community planning process													
Health center EOP developed in collaboration with county/local EMA	43.0	34.1	50.0	.005	44.2	42.1	.71	44.2	42.5	.80	49.6	38.6	.06
Health center staff are involved in community emergency preparedness and response planning	70.0	66.0	73.3	.16	72.1	68.5	.50	74.0	68.7	.38	76.9	65.6	.035
Health center is represented on the community planning group by a staff member or PCA	53.9	56.3	52.1	.46	55.5	52.8	.65	54.6	53.7	.9	56.7	52.2	.44
Health center or PCA is a member of the community health care coalition	23.5	32.6	16.3	<.001	26.4	21.4	.31	36.4	19.1	.002	27.3	21	.20
Health center staff involved in emergency management have seen community EOP	38.8	30.4	45.4	.008	36.4	40.5	.48	41.6	37.8	.56	47.1	33.3	.016
If health center provides laboratory services, staff have been trained in proper techniques for acquisition and transport of suspect specimens	40.3	35.1	44.2	.11	43.4	37.9	.33	49.4	37.1	.06	47.1	35.7	.046
Health center staff have been involved in community-wide training	31.2	30.1	32.0	.72	34.9	28.4	.23	39.0	28.5	.09	34.2	29.2	.36
Community inclusion of health center in event response													
Community plan addresses health center's need for additional supplies and equipment in an emergency	33.7	30.4	36.1	.30	32.6	34.3	.75	35.1	33.0	0.75	35.5	32.3	.55
Community plan has a mechanism for verifying licensure or credentialing volunteer clinical staff in an emergency	17.7	20.3	15.7	.30	17.2	18.1	.84	19.7	17.0	0.59	20.0	16.2	.40
Health center has arrangements for reimbursement of resources expended in response to an emergency	9.5	8.3	10.5	.52	10.2	9.0	.74	9.2	9.6	0.92	10.0	9.2	.81
Health center uses 800-MHz radio to integrate with community during a response	12.1	18.8	7.0	.002	13.2	11.4	.63	16.9	10.5	0.14	19.0	7.6	.003
Community EMA has ability to reach a designated health center contact 24/7	57.9	51.5	62.8	.048	58.9	57.1	.76	62.3	56.4	0.36	65.0	53.3	.043
Community plan addresses health center staff's traveling to the scene of an emergency to provide care	16.7	16.4	16.9	.92	14.8	18.0	.47	13.2	17.8	0.34	18.3	15.6	.53
Health center is represented by staff or PCA/network at emergency operations center during a response	26.5	20.2	30.0	.05	21.7	28.6	.18	23.4	26.4	0.60	28.1	24.0	.43
Resources													
Health center has received federal, state, or local funds to support emergency preparedness activities since 2001	33.9	35.6	23.3	.018	29.5	28.1	.79	31.2	27.8	0.57	22.3	32.8	.047
Health center has received in-kind assistance from community entities for emergency preparedness activities	30.0	32.6	28.0	.37	27.9	31.5	.50	27.3	30.9	0.55	33.9	27.4	.23

EOP indicates emergency operations plan; EMA, emergency management agency; PCA, primary care association.

The most commonly cited barriers to building linkages within the community (n = 305) were staff limitations and time restraints (70%), lack of funding for training and equipment (59%), potential role of the health center not

being understood by community emergency planners (57%), lack of strong leadership or poor coordination of efforts among stakeholders (22%), and lack of reimbursement for emergency services provided by the center

TABLE 2

Associations Between Emergency Preparedness Linkage Items and Experience and Risk Factors

Linkage Items	Health Centers Answering Affirmatively	Experience Responding to Potential/Suspected Disaster			Perceived Risk for Hazards and Threats		
	Overall %, n = 307	Yes %, n = 108	No %, n = 197	P	High %, n = 100	Low %, n = 205	P
Health center involvement in community planning process							
Health center EOP developed in collaboration with county/local EMA	43.0	52.8	37.6	.010	58.0	35.6	<.001
Health center staff are involved in community emergency preparedness and response planning	70.0	77.8	65.8	.029	80.0	65.2	.008
Health center is represented on community planning group by a staff member or PCA	53.9	66.4	47.2	.001	72.0	45.2	<.001
Health center or PCA is a member of the community health care coalition	23.5	26.9	21.6	.30	31.0	19.8	.03
Health center staff involved in emergency management have seen community EOP	38.8	49.1	33.2	.006	50.0	33.3	.005
If health center provides laboratory services, staff have been trained in proper techniques for acquisition and transport of suspect specimens	40.3	49.1	35.4	.020	42.0	39.3	.65
Health center staff have been involved in community-wide training	31.2	43.5	24.4	.001	42.4	25.7	.003
Community inclusion of health center in event response							
Community plan addresses health center's need for additional supplies and equipment in an emergency	33.7	39.8	30.2	.09	45.0	28.0	.003
Community plan has a mechanism for verifying licensure or credentialing volunteer clinical staff in an emergency	17.7	19.4	16.7	.56	20.2	16.5	.43
Health center has arrangements for reimbursement of resources expended in response to an emergency	9.5	10.2	9.1	.77	18.2	5.3	<.001
Health center uses 800-MHz radio to integrate with community during a response	12.1	15.0	10.6	.27	19.2	8.7	.009
Community EMA has ability to reach a designated health center contact 24/7	57.9	71.0	50.8	.001	71.4	51.5	.001
Community plan addresses health center staff traveling to the scene of an emergency to provide care	16.7	19.4	15.2	.34	18.2	15.9	.62
Health center is represented by staff or PCA/network at the emergency operations center during a response	26.5	32.7	21.8	.038	35.4	21.0	.007
Resources							
Health center has received federal, state, or local funds to support emergency preparedness activities since 2001	33.9	37.0	24.1	.017	32.0	27.0	.37
Health center has received in-kind assistance from community entities for emergency preparedness activities	30.0	38.9	25.1	.012	32.0	29.0	.60

EOP indicates emergency operations plan; EMA, emergency management agency; PCA, primary care association.

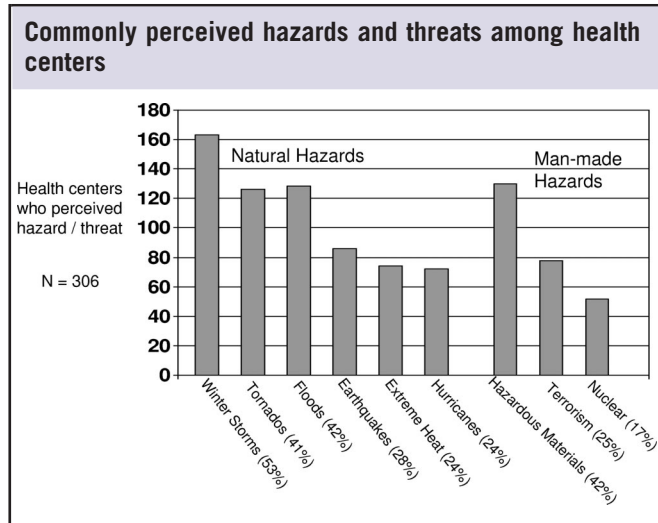
(20%). Only 8% of respondents reported that they encountered none of these barriers.

DISCUSSION

This study accomplished a cross-sectional baseline assessment of health center and community emergency preparedness linkages in the United States. Health center integration with the community was examined through the center's relationship to its community emergency pre-

paredness and response planning process, and the health center's role in a community response was investigated. In general, overall health center involvement in community planning and performance on linkage items was low. Higher performance on linkage items was related to having past experience responding to a disaster or public health emergency, having a perceived risk for many hazards or threats, being located in a rural area, and being accredited by The Joint Commission.

FIGURE 1



The finding that only 39% of centers reported that staff had viewed the local/county EOP clearly underscores the lack of substantial integration. That only 30% of health centers have their role in a response documented in the community plan suggests that involvement in the planning process does not always coincide with inclusion in the response plan, a finding that has been supported by previous studies.⁸ The finding that less than one third of responding health centers reported staff involvement in community-wide training and less than one fourth in exercises since 2001 supports the notion that their participation in community response is suboptimal. Low satisfaction with and the many barriers to community involvement suggests that even if health center staff are able and willing to participate, successful integration may be challenging.

One reason why health centers are not fully involved may be that community planners do not understand the potential role of health centers; this was cited by study respondents as a key barrier to integration. Nevertheless, response agencies such as local emergency management cannot be held solely responsible for health centers' lack of involvement; federal agencies should clarify the potential roles for health centers and their providers during community response. Collaboration among all health care stakeholders is likely to benefit responders and victims by allowing for coordination of mitigation, preparedness, and response and recovery activities, and ultimately increase capacity to save lives.

Resources for promoting health center emergency preparedness are clearly limited, as less than one third of responding health centers reported having received federal, state, or local government funds or in-kind assistance from other community entities to support emergency preparedness activities. Our data were collected in early 2005, however, and increased federal funding may have been distributed subsequently to health centers through the HRSA National Bio-terrorism Hospital Preparedness Program¹¹ and other

initiatives. Few health centers reported having made arrangements to be reimbursed for resources expended during emergency response; consequently, health center involvement could pose a risk to the financial stability of the organization and create a major disincentive for participation in community planning and response. Insufficient financial resources as well as constrained human capital were also cited by respondents as barriers to health center integration into community planning.

As hypothesized, experience responding to a disaster and a perception of high hazard risk were both associated with higher performance on many preparedness items. We did not expect to find that rural health centers responded affirmatively to indicators of integration into community planning more often than urban centers, given that urban centers reported more resources and funding than their rural counterparts. This finding was consistent with a previous study⁴ that found that rural centers more often coordinate with local community agencies than urban centers. Better community integration in rural areas may occur because health centers are often the only providers of health care in such communities; their importance in emergency response, therefore, may be better recognized by both community emergency planners and health center administrators.

This study has several limitations. First, it is important to note that the responses represent only the perspective of the health centers themselves. It is possible that the view of community linkages from the perspective of other stakeholders, including other health care organizations, may be different. As with all survey research, the results reflect self-reported information, and the study did not independently investigate the veracity of the health center reporting. Conclusions about the community, therefore, should be drawn with caution. It is also important to note that the overall response rate of 34% was low and that accredited health centers and those with large user volume were overrepresented among study respondents. Further research is needed to determine whether the selected indicators are appropriate metrics for measuring strong linkages and to determine the reliability of questionnaire items. It is also important to note that this questionnaire was administered only to federally supported health centers. We did not assess linkages in the many other nonprofit, licensed primary care clinics that serve vulnerable populations across the country, but we expect that the state of community linkages would be similar in this clinic cohort.

CONCLUSIONS

Because the effectiveness of community response to any type of disaster is greatly enhanced by collaborative planning among all community assets and stakeholders, health centers should be recognized and used as a valuable and necessary partner. Collaboration among all health care stakeholders is likely to benefit responders and victims by allowing for coordination of mitigation, preparedness, and response and

TABLE 3

Associations Between Emergency Preparedness Linkage Items and Indicators of Strong Linkages

	Health Centers Answering Affirmatively, n = 307		Location		No. of Sites		User Volume		Joint Commission Accredited		Experience Responding to Potential/Suspected Disaster		Perceived Risk for Hazards and Threats							
	Overall %		Urban %, n=135	Rural %, n=172	P	Large %, n=129	Small %, n=176	P	High %, n=77	Low %, n=228	P	Yes %, n=108	No %, n=197	P	High %, n=100	Low %, n=205	P			
Indicators of Strong Linkages																				
Health center has completed HVA of community in collaboration with community responders	27.3		20.7	32.0	.028	27.1	27.0	.97	31.2	25.7	.35	29.8	25.3	.39	39.8	20.1	<.001	41.0	20.3	<.001
Health center's role during an emergency is documented in community EOP	30.0		24.4	34.3	.06	25.6	33.2	.15	23.4	32.2	.15	33.9	27.4	.23	35.2	27.1	.14	36.0	27.1	.10
Health center has participated in community-wide emergency or disaster drills/exercises since 2001	23.9		20.9	26.2	.28	27.1	21.5	.25	32.5	21.0	.040	25.6	22.7	.56	35.2	17.7	<.001	29.0	21.4	.14
Summary score, indicators	51.1		57.8	45.9	.07	49.6	52.3	.34	42.9	53.9	.17	43.0	56.5	.002	37.0	58.8	<.001	37.0	58.0	.007
0 of 3	25.1		25.2	25.0		29.5	21.9		33.8	22.2		33.9	19.4		30.6	22.1		31.0	22.2	
2 of 3	15.6		10.4	19.8		12.4	18.0		16.9	15.2		14.1	16.7		17.6	14.6		21.0	13.0	
3 of 3	8.1		6.7	9.3		8.5	7.9		6.5	8.7		9.1	7.5		14.8	14.8		11.0	6.8	

EOP indicates emergency operations plan; HVA, hazard vulnerability analysis.

recovery activities, and ultimately increase capacity to save lives.¹² Health centers serve predominantly minority, low-income, and uninsured Americans, who are “precisely those most vulnerable to the direct impact of a natural disaster.”¹³

Reports from Hurricane Katrina and other major emergencies demonstrate the important role of health centers in providing essential health services after disasters. One lesson learned from the experience of Hurricane Katrina is that planning for medical and public health response must be coordinated from the local through federal levels well in advance of a disaster.^{14,15} One model that organizes community health care and medical response resources for this purpose is presented in the Medical Surge Capacity and Capability (MSCC)¹² management system. MSCC recommends collaborative preparedness and emergency response through a community-wide health care coalition. MSCC is a 6-tier systematic approach that organizes and coordinates all of the available health and medical resources so they may perform optimally under the stress of an emergency or disaster. Tier 2, the health care coalition, stresses organization of individual health care assets into a single functional unit. The coalition ensures that health and medical assets have the information and data they need at the level of detail that will allow them to optimally provide surge capacity and capability. Adopting such a community system could ensure that all of the relevant health care assets, including health centers, are used in response to an emergency. With full integration of health centers into community planning and response, the void in care for vulnerable populations during emergency response and recovery can be effectively addressed.

Fortunately, the movement toward adoption of the tiered response system as a national model is progressing. In July 2006 HRSA published their continuation guidelines for the National Bioterrorism Hospital Preparedness Program support.¹¹ The mission of this program is to “enhance the ability of hospitals and supporting health care systems to prepare for and respond to bioterrorism and other public health emergencies.”¹¹ Included in the guidelines to state applicants is the requirement that awardees describe how they intend to adhere to the tiered response system. Although this step toward integrating the tiered model nationwide should be lauded, this approach can only reach its fullest potential for collaborative planning and response when implementation is required not only of hospitals but also of public health, traditional first responders, and all community health care organizations. Recently, the Pandemic and All-Hazards Preparedness Act (PL 109-417)¹⁶ shifted oversight of the National Hospital Bioterrorism Preparedness Program from HRSA to the Department of Health and Human Services Office of the Assistant Secretary for Preparedness and Response¹⁷; the future direction of the program is unclear, but the opportunities to promote collaboration should remain.

This study demonstrates that insufficient financial and staff resources are obstacles to the involvement of health centers

in community preparedness and response planning. Without an increase in both preparedness funding and guidance resources, implementation of the tiered model to include health centers in community health care coalitions could be difficult. Although current federal policy has substantially increased general funding for the health center program, these resources are not specifically intended for emergency preparedness.¹³ More resources are needed to promote health center integration into community planning, and policymakers should work to provide both funding and clear, achievable, validated guidance for effectively accomplishing this community integration. Fortunately, the Bureau of Primary Health Care recognizes the importance of integrated response and is preparing to add several community integration requirements to their program expectations to be released later this year; the requirements are designed to ensure that health centers are adequately prepared to respond to emergencies and be fully integrated into local emergency planning and response.¹⁸

Strong linkages between community responders and health and medical assets is only one step toward the realization of a truly integrated, efficient response. Many obstacles block the path to successful response, including myriad legal concerns that must be addressed. Specifically, during Hurricane Katrina, medical liability insurance and licensure became major issues for health center staff who wanted to respond from neighboring states. Physicians who are employed by federally supported health centers receive liability coverage under the federal government, which does not allow for coverage across state lines.^{19,20} Similarly, licensure is granted on a state-by-state basis, and temporary licensure to practice in a different state during a disaster is not always easy to obtain.^{7,19}

Time is of the essence, before the memory of Katrina and the key role of health centers in that disaster fades. Overlooking health centers as important medical assets risks future inadequate response by preventing the community from realizing its full capacity for medical care and preventive interventions. Current preparedness levels may in fact put an already-vulnerable population at even greater risk, and thereby add to the challenging casualty load for a community. Together, providers, policymakers, and health care stakeholders should enable and encourage integrated planning and response to address this important issue.

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