

Current Emergency Preparedness Resources and Capabilities Among Academic Health Systems in the United States

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ABSTRACT

Objective: Although hospital emergency preparedness efforts have been recognized as important, there has been growing pressure on cost containment, as well as consolidation within the US health care system. There is little data looking at what health care emergency preparedness functions have been, could be, or should be centrally coordinated at a system level.

Methods: We developed a questionnaire for academic health systems and asked about program funding, resources provided, governance, and activities. The questionnaire also queried managers' opinions regarding the appropriate role for the system-level resources in emergency response, as well as about what is most helpful at the system-level supporting preparedness.

Results: Fifty-two of 97 systems (54%) responded. The most frequently occurring system-wide activities included: creating trainings or exercise templates (75%), promoting preparedness for employees in the system (75%), providing access to specific subject matter experts (73%), and developing specific plans for individual member entities within their system (73%). The top resources provided included a common mass notification system (71%), arranging for centralized contracts for goods and services (71%), and providing subject matter expertise (69%).

Conclusions: Currently, there is wide variation in the resources, capabilities, and programs used to support and coordinate system-level emergency preparedness among academic health systems. (*Disaster Med Public Health Preparedness*. 2018;12:574-577)

Key Words: disaster planning, health care economics and organizations, academic medical centers, health care facilities, manpower, and services

Although hospital emergency preparedness efforts have long been recognized as important, over the past 15 years most hospitals across the United States have utilized significant and new resources to substantially improve their individual programs for emergency preparedness.^{1,2} Over the same period, however, there has also been a growing pressure on cost containment at all levels, as well as an overall consolidation within the US health care system. The number of community hospitals owned by large health systems in the United States rose by 26% between 1999 and 2014, and the trend is continuing, with 112 hospitals involved in mergers, acquisitions, and joint ventures in 2015 alone.^{3,4} In the face of these changes, hospitals and other health care organizations across the United States are under continued pressure to be ready for disasters, but are also under increasing pressure to minimize and/or centralize costs and maximize efficient use of resources.

Despite the broad trends toward cost containment and consolidation of functions within health care, there is a dearth of data looking at what specific health care emergency preparedness functions have been, could be, or should be centrally supported or coordinated at the corporate level among hospitals affiliated within a health system. Further, there is no governmental directive describing the potential appropriate roles of corporate leadership within a central health system with respect to the functions that they should or could support in emergency planning and response for the hospitals in their systems. In this study, we have endeavored to describe the current landscape in the United States of centralized emergency preparedness resources and functions within one type of health system, the academic health system, in order to better understand the system-level emergency preparedness programs and resources that support many of our nation's hospitals, clinical research programs, and other health

care services. In addition, we have attempted to identify practitioners' opinions regarding the most important functions that should be filled by a system-wide emergency preparedness resource.

METHODS

We developed a questionnaire for academic health system emergency preparedness managers, and asked about the amount and sources of funding for their program, the resources they provided to system members, as well as specific details about their program governance and activities. The questionnaire also queried opinions regarding the appropriate role for system-level resources in an emergency response, as well as about what managers perceive to be most helpful at the system-level supporting emergency preparedness. The questionnaire was primarily comprised of multiple choice and numerical response questions. No protected health information was collected. To avoid overburdening survey respondents, general descriptive data about the health systems surveyed was gathered from publicly available sources such as company websites and annual reports, and only limited descriptive data about the health system not consistently available in public domain (eg, number of hospitals, regions in which the system operates) was asked of respondents.

For the purposes of this study, we defined an "academic health system" as one which contains: (1) at least one academic medical center as defined by Joint Commission International (<http://www.jointcommissioninternational.org/improve/get-accredited-academic-medical-center-hospitals/>), (2) at least one other acute care hospital, and (3) at least one other non-hospital health organization (eg, home health, long-term care, mental health, or medical school). Using these criteria, we identified a total of 97 academic health systems by running a query of health systems in the American Hospital Association database and cross-matching these results with the list of academic medical centers from the Association of American Medical Colleges. We then attempted to identify the appropriate administrator or emergency manager who has responsibility for system-level emergency preparedness at each academic health system using publicly available information, and sent that person a survey, along with a cover letter of introduction and an explanation of IRB approval. We attempted to follow-up with non-responders individually to try to increase the overall response rate. All responses were collected using SurveyMonkey software (SurveyMonkey, Palo Alto, CA). The study was determined to be exempt by the Partners HealthCare Institutional Review Board. Data were transcribed into Microsoft Excel 2007 (Microsoft Corporation, Redmond, Washington, USA). Descriptive statistics and logistic regression were utilized to analyze the data. Continuous variables were summarized using mean with SD while categorical variables were summarized using frequency and percentage.

RESULTS

Fifty-two of 97 health systems (54%) responded to our survey. Of the respondents, 90% were non-profit health systems. Median revenues of the respondents were ~\$2.6B USD. Respondents had a median of 22,561 employees, and 10 member entities (mean of 45 with a range of 3-500). All 10 US Department of Health and Human Services (HHS) Regions⁵ were represented in the survey, with a minimum of 3 systems responding from each HHS Region.

In total, 73% of respondents reported that they have dedicated staff employed at the system level for emergency preparedness. Of those systems with dedicated staffing, the median number of full-time equivalent personnel dedicated to emergency preparedness among academic health systems was 2 (however, the mean was 3.5 with a range of 0.2-19). Operating budgets for emergency preparedness ranged from less than \$50,000 annually to more than \$5 million annually. Thirty-two percent of programs reported annual operating budgets of <\$50,000, while nearly another third (28%) reported annual budgets between \$50,000 and 500,000. It was not clear from the survey responses if budgets, particularly the larger reported budget values of greater than \$2 million, included pass-through funding for individual health care entities as well as system-level resources. Twenty-three of 50 programs (46%) stated that none of their emergency preparedness budget came from federal or other grants, and 36 of 50 systems (72%) stated that grant funding comprised 25% or less of their annual budget. Conversely, grant funding accounted for 75-100% of annual budget allocations for 10 of 50 (20%) respondents. Twenty-five of 46 (56%) programs were accountable to a health system executive sponsor for their activities with 70% reporting to a vice president or chief officer. The remainder of respondents described a wide variety of reporting arrangements from a multidisciplinary committee to the system CEO. There was not a statistically significant relationship ($P > 0.05$) between the EP program budget and total system annual revenue or the total number of system employees. There were statistically significant positive relationships ($P < 0.001$) between the total number of EP FTEs (Emergency Preparedness Full-time Equivalent) and total system annual revenue as well as the total number of system employees.

Respondents were asked about their specific program activities at the system level in the past 5 years. The most frequently occurring activities included: creating trainings or exercise templates (75%), promoting preparedness for employees in the system (75%), providing access to specific subject matter experts (73%), and developing specific plans for individual member entities within their system (73%). Additional significant activities supported at the health system level in the past 5 years included conducting system-level exercises and trainings and serving as the primary point of contact for governmental officials in emergency response (69% each). The top 3 resources provided by the system to its member hospitals included provision of a common mass notification system for the enterprise (71%), arranging for

TABLE 1

Comparison of Resources Provided by System-Level Preparedness Programs with Emergency Managers' Beliefs on Resources that Should Be Provided

Rank	Resources Health System Does Provide (% Responding)	Rank	Resources Health System Should Provide (% Responding)
1	Mass notification system (71%)	1	Operating a system-level command/coordination center (73%)
1	System-level contracts or memoranda of agreement for emergency supplies and services (71%)	2	Mass notification system (71%)
3	Subject matter experts available to assist with emergency plan development (69%)	2	Training and exercise facilitation and or evaluation (71%)
4	Training and exercise facilitation and or evaluation (65%)	4	Deploying services or personnel to support entity response (65%)
5	Cache of emergency supplies and equipment (62%)	5	Cache of emergency supplies and equipment (63%)
6	Patient transfer services/coordination (60%)	5	System-level contracts or memoranda of agreement for emergency supplies and services (63%)
7	Physician expert/leader in emergency preparedness (58%)	5	Physician expert/leader in emergency preparedness (63%)
8	Emergency radio network (44%)	7	Subject matter experts available to assist with emergency plan development (62%)
9	Computer/web-based incident management software (35%)	7	Dedicated funding for emergency preparedness (62%)
10	Dedicated funding for emergency preparedness (23%)	10	Computer/web-based incident management software (56%)
11	Other (21%)	11	Patient transfer services/coordination (52%)
		12	Emergency Radio Network (35%)

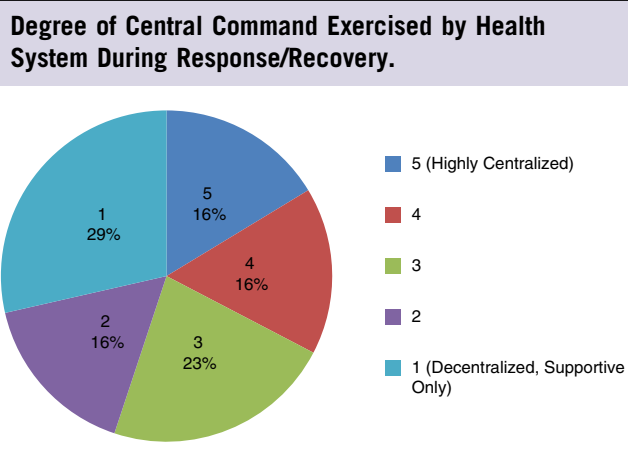
centralized contracts for goods and services to support emergency response (71%), and providing subject matter expertise for individual hospital emergency plan development (69%).

When asked what preparedness and response resources the respondents thought *should* be provided by their systems, however, we identified discrepancies between respondents' descriptions of the resources that their system provides for member entities compared with resources they felt should be provided (see Table 1). The top resources that respondents thought should be provided included operating a system-level emergency operations or emergency coordination center (73%), training and exercise facilitation and evaluation (71%), and supporting a mass notification system (71%). Eighty-one percent of respondents reported that their health system facilitates information sharing and situational awareness for the enterprise during emergencies. Sixty-two percent of respondents stated that they can activate a physical emergency operations center during major incidents, while 50% of respondents can do so virtually. Twenty-four of 47 systems (51%) reported using metrics or benchmarking to measure their program performance though these metrics varied; some metrics included internally developed objectives, NIMS compliance, Joint Commission standards, and response times for emergency notifications.

Respondents were asked to rate their perception of the degree of centralization of emergency response in their system on a 5-point Likert scale (1 = highly decentralized to 5 = highly centralized). Figure 1 demonstrates a wide range of responses, though nearly half of the responses were highly or mostly decentralized.

Finally, respondents were asked about the biggest gaps they faced in enhancing their systems' preparedness. The 4 top

FIGURE 1



responses were integration of the clinical research enterprise into emergency planning, response, and recovery (54%), creating improved tools for management of resources and assets in the system (52%), tools and guidance for coordination of medical surge (46%), and developing tools and guidance to support improved situational awareness (44%).

DISCUSSION

To our knowledge, this study represents the first national effort to quantitatively describe the resources and programs supporting academic hospital emergency preparedness at the system level in the United States. We have found substantial variation in the size and budgets of the programs that support emergency preparedness at the system level for academic health systems; however, it is worth noting that the majority of programs surveyed appear to employ at least one full-time staff member

dedicated to planning and response. In addition, while federal and other grants are a minimal contributor to program funding for most systems, it is interesting to note that nearly one quarter of programs appear to be significantly reliant upon such grants.

The most common program activities reported in our survey centered on providing central support for limited resources, such as expertise in planning, exercising, or content (biological, chemical, and other expertise), contracting or caches. Regarding what activities respondents believed would be most important for systems to provide to member entities, the development and delivery of quality emergency response training and conduct of exercises ranked highest on the respondents' questionnaires. These findings have special relevance in light of the new CMS emergency preparedness rule which imposes new requirements on hospital emergency management programs as of November, 2017.⁶

LIMITATIONS

This study has some potential limitations. In describing emergency preparedness programs' relationships with other corporate departments, it is unknown whether the survey responses we received indicating that no relationship currently exists are due to such a relationship not existing anywhere within the system, or to the specified department not existing at the system level. Also, as stated previously, it is unclear from some of the responses whether reported system-level emergency preparedness budgets include pass-through money to member entities. Additionally, the data we received on the total number of employees is reported differently by health systems, with some reporting total individuals employed, while others report full-time equivalent personnel. Further survey questions to delve deeper into these intricacies were not included in order to minimize the data collection burden for survey respondents.

CONCLUSIONS

Currently, there is wide variation in the resources, capabilities, and programs used to support and coordinate system-level emergency preparedness among academic health systems. Most responding academic health systems do, however, employ at least one individual dedicated to system-level preparedness and have an annual operating budget of at least \$50,000. The most common functions performed at the system level include supporting a common mass notification system, providing subject matter expertise during both

planning and response, centralizing emergency supply contracts, and providing support for training and exercises. It is unknown which of these functions and resources may be most needed and/or most effective, and which others may be needed, as no associated response outcomes data have yet been collected or analyzed.

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