

# Education and Training of Hospital Workers: Who Are Essential Personnel during a Disaster?

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## Abbreviations:

EMS = emergency medical services  
EMT = emergency medical technician  
FEMA = Federal Emergency Management Agency  
HICS = hospital incident command system  
HRSA = Health Resources and Services Administration  
ICS = incident command system  
NIMS = [US] National Incident Management System  
OSHA = [US] Occupational Safety and Health Administration  
PPE = personal protective equipment

## Abstract

Hospital plans often vary when it comes to the specific functional roles that are included in emergency and incident management positions. Bioterrorism coordinators and emergency managers for 31 hospitals in a seven-county region outside of a major metropolitan area, with urban, suburban, and rural demographics were surveyed to determine which specific functional roles were considered “essential” to their hospital’s emergency operations plans. Furthermore, they were asked to estimate the percentage of their “essential” staff trained to perform the functional roles delineated in the hospital’s plan. Responses were entered into a database and descriptive statistical computations were performed. Only three categories of hospital personnel were reported to be “essential” by all hospitals to their emergency preparedness plans: emergency department physicians, nurse, and support staff. Training for overall “essential” staff ranged by hospital 73.6–83.3%. Some hospitals reported that these staff members have received no training in their anticipated role based on the hospital emergency response plan. Allied health professionals and emergency medical technicians/paramedics (that are employed by hospitals) had the least amount of training on their role in the hospital preparedness and response plan, 33.3% and 22.2% respectively. Without improved guidance on benchmarks for preparedness from regulators and professional organizations, hospitals will continue to lack the capacity to effectively respond to disasters and public health emergencies.

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## Introduction

Acute care hospitals and medical centers are a vital component of healthcare infrastructure. Each day these facilities are relied upon to provide acute, routine, and primary health care to millions of Americans. In times of public health crisis, the acute care hospital will be expected to render a prompt and competent response to assist in minimizing morbidity and mortality.

In spite of the obvious roles and responsibilities of acute care hospitals during a major health or medical crisis in the United States, numerous deficiencies have been described concerning the lack of preparedness among the nation’s hospitals and trauma centers.<sup>1–7</sup> In response to these deficiencies, several governmental agencies and professional organizations have required and/or recommended standards for hospitals that are related to education, training, and preparedness for disasters and public health emergencies.<sup>8–11</sup>

Although some guidelines exist, there is no universal standard that describes which roles or job functions within a hospital are essential to the hospital’s ability to respond to and recover from a disaster or public health emergency. The current federal guidance, including that from the National Incident Management System (NIMS) Integration Center as well as the Occupational

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1. Of the following staff roles in your facility, what percentage have been trained in each of the following categories?

<p><u>Staff Roles</u>                  ED Director                  ED Support Staff                  ED Physician                  ED Nurse                  Staff Nurse                  Staff Physician                  Allied Health (PT, OT, etc.)                  Nursing Assistants/Aides                  Hospital Administrators                  Security                  Facilities/Janitorial                  Housekeeping                  EMTs/Paramedics                  Clerical/Admissions</p>	<p><u>Training Categories</u>                  ICS/HEICS                  NIMS                  PPE (for contaminated and highly infectious patients)                  Decontamination                  Medical Management of CBRNE Patients                  Functional Role in Emergency/Disaster</p>
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2. Of the following staff roles in your facility, which would you consider essential to your hospital preparedness plan in an emergency or disaster? Of these essential staff, what percentage have received training related to their intended role during a disaster or emergency?

Staff Roles  
 ED Director  
 ED Support Staff  
 ED Physician  
 ED Nurse  
 Staff Nurse  
 Staff Physician  
 Allied Health (PT, OT, etc.)  
 Nursing Assistants/Aides  
 Hospital Administrators  
 Security  
 Facilities/Janitorial  
 Housekeeping  
 EMTs/Paramedics  
 Clerical/Admissions

3. Of the following staff roles outside, but affiliated with your facility, what percentage have received training to be a part of your facility's surge plan?

Outpatient Nurse  
 Outpatient Physician  
 Outpatient Allied Health  
 Outpatient Nursing Aide  
 Outpatient Clerical  
 Outpatient Administrators  
 Community Nurse  
 Community Physician  
 Community Medical Assistant  
 Community Allied Health  
 Visiting/Home Health Nurse  
 Visiting/Home Health Aide  
 Visiting/Home Allied Health

4. List the specific preparedness-related training programs offered to your hospital staff in the past 36 months.

5. Please explain how appropriate courses are identified to train your hospital staff? What steps are taken to assure that course content is reliable and credible?

6. Have you identified any specific areas where training is needed but not currently available? If so, what type of training and in what area(s)?

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**Figure 1**—Survey instrument (CBRNE = chemical, biological, radiological, nuclear, or explosive; ED = emergency department; EMT = emergency medical technician; HEICS = Hospital Emergency Incident Command System; ICS = incident command system; NIMS = National Incident Management System; OT = occupational therapy; PPE = personal protective equipment; PT = physical therapy)

Safety and Health Administration (OSHA), has been unclear regarding, specifically, who should be educated and trained to perform key functional roles at a hospital during disasters or public health emergencies. This extends from the boardroom, in simply staffing the hospital's emergency operations center (EOC), to the workers performing emergency patient decontamination in the emergency department. As such, there is considerable institutional variability among

hospital preparedness plans as to the specific functional roles that are expected to be called upon or utilized in times of disasters or major incidents.

The purpose of this study was to determine the compliance of hospitals with recommended hospital staff training and to determine which hospital workers are viewed by healthcare emergency planners as "essential" to their hospital's emergency operations plans.

	ICS/HEICS %	NIMS %	PPE (for contaminated and highly infectious patients) %	Decontamination %	Medical Management of CBRNE Patients %
ED Director	80	45	85	70	78
ED Support Staff	35	2	66	55	42
ED Physician	37	10	67	53	60
ED Nurse	46	12	70	63	55
Staff Nurse	33	3	58	27	30
Staff Physician	23	5	60	22	34
Allied Health (PT, OT, etc.)	25	6	55	22	20
Nursing Assistants/Aides	30	6	62	28	23
Hospital Administrators	69	28	54	26	34
Security	61	26	67	51	38
Facilities/Janitorial	37	9	60	39	29
Housekeeping	29	5	48	27	20
EMTs/Paramedics	29	18	70	41	51
Clerical/Admissions	29	3	39	17	16
	40.3	12.7	61.5	38.7	37.8

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**Table 1**—Percentages of hospital staff trained in specific knowledge areas (CBRNE = chemical, biological, radiological, nuclear, explosive; ED = emergency department; EMT = emergency medical technician; ICS/HEICS = incident command system/Hospital Emergency Incident Command System; NIMS = National Incident Management System; OT = occupational therapist; PPE = personal protective equipment; PT = physical therapist)

## Methods

Bioterrorism coordinators and emergency managers for 31 hospitals in a seven-county region immediately north of a major metropolitan area, with urban, suburban, and rural demographics were surveyed to determine which specific job functions were “essential” to their hospital’s emergency and disaster plan, and what percentage of the personnel in these roles had received training in their anticipated emergency duties according to the hospital’s emergency operations plan.

Standardized, six-item telephone surveys were designed by the investigators with input from the regional hospital preparedness coordinating body, as assigned by the State Public Health Department. The survey initially was assessed by members of this group to determine its usability. The goals of the State Public Health Department were used to assess a component of the hospitals systems’ emergency preparedness planning. Fourteen common, regionally accepted, hospital job functions were selected for analysis in this survey. Survey items 1 and 2 focused on these specific functional roles. Item 3 assessed 14 hospital-affiliated, outpatient or community job areas that have a clear counterpart within the hospital. Items 4–6 were qualitative items designed to indicate the education and training needs of each specific hospital for regional planning purposes (Figure 1).

Interviewers were trained by the authors and provided with contact information (e-mail, telephone numbers, addresses) for each hospital’s Bioterrorism Coordinator/Emergency Manager. Interviewers contacted each hospital representative

by telephone to complete the survey. Non-respondents subsequently were contacted via telephone, e-mail, and standard mail to complete the survey. Responses were recorded by the interviewers and entered into a database. All responses were pooled and basic summary statistical processing was performed on the aggregate data to assist in depicting regional trends. Microsoft Excel Standard Edition 2003 (Microsoft, Inc., Redmond, WA) was utilized to perform basic descriptive statistical calculations.

Initially, the project was conducted under the authority of the Public Health Department to assess the ability of hospitals to respond to disasters as part of their oversight of the hospital system. Following this, a database of the results with all hospital and other identifying data removed was created for further analysis. As an existing database with no identifying data was evaluated, this project was considered exempt research.

Summary statistics were calculated using pooled, aggregate response data to generalize the survey results throughout the region. Individual hospital’s responses are not reported.

## Results

Surveys were completed during a five-week period. The response rate of the hospitals in the region was 24/31 (77.4%) at the completion of the survey.

Table 1 is a list of a topic-specific types of training by job function. The training topics included are common by required or suggested training programs by regulatory

	Essential %	Training in Role %
ED Director	95.0	89.3
ED Support Staff	100.0	73.8
ED Physician	100.0	81.0
ED Nurse	100.0	83.3
Staff Nurse	79.2	66.5
Staff Physician	70.8	54.8
Allied Health (PT, OT, etc)	33.3	26.1
Nursing Assistants/Aides	54.2	46.7
Hospital Administrators	83.3	75.8
Security	79.2	69.7
Facilities/Janitorial	62.5	52.4
Housekeeping	50.0	48.8
EMTs/Paramedics	22.2	23.2
Clerical/Admissions	62.5	55.2

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**Table 2**—Percentage of hospitals who indicated each function was “essential” to their disaster plan and the amount of functional role training that has been provided to these personnel. (ED = emergency department; EMT = emergency medical technician; OT = occupational therapist; PT = physical therapist)

agencies, professional associations, or scientific bodies. These topics include incident command system/National Incident Management System (ICS/NIMS); personal protective equipment (PPE); decontamination; medical management of patients exposed to chemical, biological, radiological, nuclear, or explosive (CBRNE) materials; and functional roles during emergencies or disasters.

The emergency department directors had the highest percentages of training in all of the content areas including training related to their role in the hospital response plan (89.25%). Emergency medical technicians (EMTs) and paramedics employed by hospitals had the least amount of training in functional roles (23.2%), and clerical and administrative staff had the overall lowest percentages of training in all categories (Tables 1 and 2).

Staff physicians received the least amount of training in ICS/HICS (23%) and ED support staff received the least amount of training in NIMS (2%). In all other categories, emergency department directors had the highest percentages of training and clerical and administrative personnel had the lowest percentages (Table 1).

The percentage of hospitals that indicated that specific staff were “essential” to their disaster plan, and the amount of training they have received to perform their functional roles are listed in Table 2. Overall, about 60.5% of hospital staff had received some training on their individual functional roles as described in the hospital Emergency Operations Plan (EOP).

Only three categories of hospital personnel were reported to be “essential” to all hospitals’ internal emergency preparedness plans: emergency department physicians, emergency department support staff, and emergency department nurses. Allied health professionals (physical therapy, occupational therapy, etc.), emergency medical technicians and paramedics were most infrequently described as “essential” to the hospital preparedness/disaster response plan, 33.3% and 22.2% respectively (Table 2).

Training for the staff described by hospitals as “essential” ranged from (73.6–83.3%). Furthermore, as these are aggregate data, it is noted that some of the hospitals reported that these “essential” staff members have received no training in their anticipated functional role described in the hospital’s emergency and disaster response plan.

Hospital staff also responded regarding the inclusion of non-inpatient and hospital-affiliated providers in disaster and emergency-related training. These include physicians on staff at the hospital and their office staff, outpatient departments, and community-based healthcare providers. The highest percentage of affiliated staff who received training to provide emergency surge capacity to the hospital in a disaster or emergency were outpatient nurses (34.7%). In contrast, community-based and visiting/home care allied health professionals received the least amount of training (7.8–8.4%). Overall, only about 19.2% of non-hospital based staff had been trained to provide any surge capacity to the hospital in times of public health emergencies or disasters (Table 3).

In the qualitative items, responses varied widely in the perceived needs of each hospital. Thirteen (54.2%) hospitals reported that the most frequent training program they offer to hospital staff is ICS training. Interestingly, 20/24 (83.3%) of hospitals surveyed reported that they use no formal process or procedure to identify appropriate training courses for hospital staff to assure that course content is reliable and credible. Despite the apparent deficiencies in training among “essential” staff, 11/24 (45.8%) of hospitals reported that there are no content areas for which training is needed but currently is not available to them (Figure 2). This was confirmed by investigators through the State Health Department and the regional hospital resource centers that confirmed that training is available to each of the hospitals, in each content area, free of charge, at their location, at any time they request it.

## Discussion

There are no clear definitions on who are considered essential hospital staff during a disaster or public health emergency. Although there have been attempts at creating common roles and responsibilities through systems like HICS, OSHA’s Hospital First Receiver Program, and Federal Emergency Management Agency’s (FEMA) Hospital Emergency Response Training program, the lack of adherence to these models shows that frequently the hospital administration decide who it thinks is important or “essential” to their internal hospital operations during an emergency.

Overall the respondents reported that the emergency department staff was the most “essential” to their hospital emergency response plans, although, out of all personnel in

	%
Outpatient Nurse	34.7
Outpatient Physician	27.0
Outpatient Allied Health	11.6
Outpatient Nursing Aide	27.0
Outpatient Clerical	27.0
Outpatient Administrators	27.0
Community Nurse	18.3
Community Physician	15.5
Community Medical Assist.	15.5
Community Allied Health	7.8
Community Clerical	15.5
Visiting/Home Health Nurse	16.8
Visiting/Home Health Aide	16.8
Visiting/Home Allied Health	8.4
	19.2

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**Table 3**—Percentages of affiliated hospital staff who are trained to provide surge staffing by job role

the hospital, emergency department support staff had the lowest training compliance with current NIMS guidelines. Furthermore, emergency department directors had the highest percentage of training in all areas; however, the emergency department directors only represent a single individual in the hospital.

Although emergency department staff have a clear role in disasters, it is important for hospital emergency planners not to undervalue staff in other functional areas. For example, not all patients entering or exiting a hospital during a disaster or emergency will be admitted through the emergency department. A small fire or a need to evacuate a single patient floor may not affect or involve emergency department personnel. Also, patients who are the victims of a disaster in a nearby jurisdiction and who are being transferred to a hospital in outlying areas due to bed shortages may be admitted directly to a patient floor and bypass the emergency department. These scenarios also would require non-emergency department staff to have an understanding and practical knowledge of their role during a disaster or public health emergency. Furthermore, all hospital staff should have the knowledge, skills, and abilities to assist in other capacities during a disaster or public health emergency in order for the hospital to have a greater surge capacity. Hospital emergency planners could achieve this through building disaster education and training upon more traditional and commonly practiced emergency procedures such as fire drills, which may assist staff in becoming more comfortable with evacuation procedures.

Emergency medical technicians/paramedics and allied health personnel (physical therapists, occupational therapists, etc.) were considered least essential by hospitals, but may be invaluable during certain emergencies or disasters since they have the capacity to augment the in-hospital

Preparedness-related training programs offered to hospital staff in the past 36 months

ICS	13
Decontamination	11
NIMS	4
HAZMAT	4
Evacuation	3
POD Training	4
Emergency Management	3
CBRNE Management	3
PPE	1
Mental Health in Disasters	1
General disaster training	1
Staff functional roles	1

Process or procedure for identification of reliable, credible, and appropriate courses to train hospital staff

Formal Process	3
Informal Process	1
No Process	20

Specifically identified areas where training is needed but not currently available

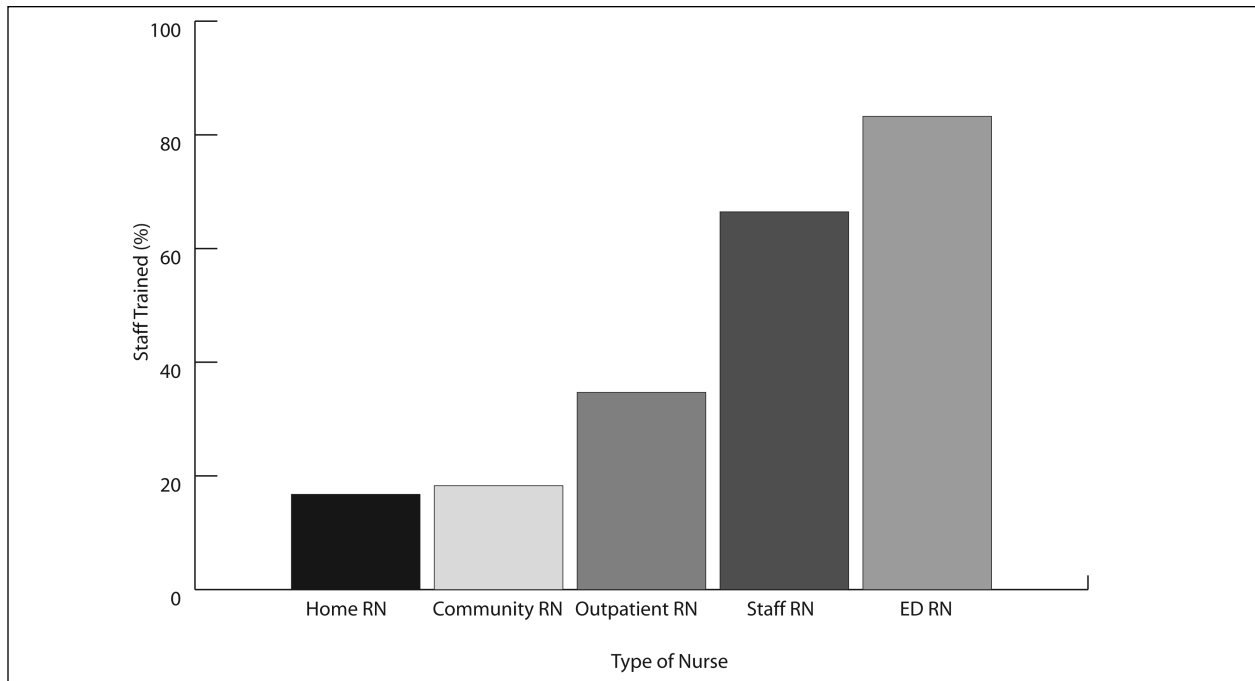
None	11
ICS/NIMS/HEICS	6
Functional Role Training	3
Decontamination/HAZMAT	5
Communications	1

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**Figure 2**—Summary of qualitative responses (CBRNE = chemical, biological, radiological, nuclear, or explosive; HAZMAT = hazardous materials; HEICS = Hospital Emergency Incident Command System; ICS = incident command system; NIMS = National Incident Management System; PPE = personal protective equipment)

clinical workforce and increase available staffing levels during/after an event. It is important to note that not all hospitals surveyed employ emergency medical technicians or paramedics. However, all hospitals reported relying on emergency medical services (EMS) personnel and equipment in their disaster plans for the purposes of mass patient transfers, evacuation, and surge decompression of hospital beds. Including the prehospital personnel in this survey is important to show that hospitals, who rely upon these personnel to perform essential functions during disasters and emergencies, do not often provide them with the education and training to perform these roles according to their hospital's emergency operations plans.

Hospitals that employ EMTs and paramedics also may be overlooking a valuable asset that can assist in creating surge capacity during a disaster or public health emergency.



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**Figure 3**—Percentage of nurses trained by nursing specialty (RN = registered nurse)

Not all public health emergencies require increased 9-1-1 responses. Waves of patients presenting with minor medical syndromes or flu-like symptoms may not require EMS personnel to be over-utilized. However, these presentations may fill emergency departments and hospital beds, and EMTs and paramedics as hospital employees may have an added role. Paramedics specifically have the education and training, clinical experience, and scope of practice (under medical direction) to perform critical patient care functions, including but not limited to triage, clinical examination, advanced airway management, intravenous access, advanced cardiac life support, medication administration, phlebotomy, and electrocardiography. Medical directors at these hospitals should explore with emergency planners how using prehospital personnel in this manner may assist the hospital during a major incident or staff shortage.

Emergency department nurses were described by all hospitals to be essential in their facility's emergency plans. However nurses in general had varying levels of training, which decreased as nurses began practicing outside of the hospital (Figure 3). Although specific procedures and technical aspects of nursing care may vary from unit to unit, principles of disaster nursing and nurses' roles and responsibilities according to the hospital plan should be taught to every nurse employed by the hospital or health system. This practice will make it easier for nurses to "float" to different clinical areas during disasters and assist with increasing the surge capacity of the hospital.

Hospitals require guidance on how to evaluate available training programs and determine if they meet the specific content or competency requirements in a particular topic area. Additionally, hospital administrators lack the ability to easily determine which agency or organization's standardized course fulfills the regulatory requirements or guidelines.

Development of a standardized and validated evaluation tool, metric, or set of guidelines that could assist hospital emergency planners in identifying appropriate training programs to fulfill the educational/training requirements could assist in increasing hospital preparedness. Future efforts should develop such a tool.

The few areas that influenced hospital administrators when deciding what training programs to offer were the NIMS Compliance Guidelines published through Department of Homeland Security/FEMA, the HRSA Hospital Preparedness Grant Program deliverables administered through the State Department of Health, and guidelines from accreditation bodies; however, it was largely up to the hospital administrators to ultimately prioritize their training needs. Although some training mandates have been given to the hospitals, they reported low percentages of training compliance in certain areas of training such as ICS, NIMS, and decontamination. Furthermore, any preparedness-related education/training that was required or recommended to hospitals (in this survey) was made available to each of the hospitals in each topic, free-of-charge, at their location, at any time they requested it through statewide, funded, regional resource centers. This makes the findings more significant since it truly was up to each hospital administration to determine who was trained and what training they received based on how they were deemed "essential" by the hospital administrators.

In spite of training in all required content areas being available through a State Health Department Regional Resource Center, which was designed to provide hospitals with planning and training resources for emergency preparedness topics, the Regional Resource Center reported that there had been a "very low" utilization rate. They further informed the study authors that this suggested that the

overall cost and availability of training may not be the limiting factor in low compliance, but it was necessary to explore other contributing factors to low compliance with hospital staff preparedness training mandates.

When asked by interviewers about barriers to preparedness training, virtually all of the hospital administrators voiced difficulty in coordinating and conducting a comprehensive preparedness education and training program for all hospital workers. Specifically, hospital representatives reported that either they lacked the internal expertise or credentials necessary to conduct education and training in areas such as ICS, decontamination, PPE, or CBRNE management and were forced to contract with outside vendors to provide these courses. Additionally, hospitals stated that even with internal subject matter expertise to conduct the required or necessary programs, often it was difficult to get staff to attend trainings due to the time required away from their daily job duties, collective bargaining agreements, which specified overtime pay or other types of compensation for educational activities, inadequate staffing to allow staff to attend the courses, or lack of institutional support or internal mandate requiring compliance with the requirements.

Regulatory agencies and professional bodies should develop compliance benchmarks for preparedness education/training, including criteria for acceptable courses and model curricula that clinical and professional educators can utilize to design adequate and effective programs for hospital workers. Additionally, workgroups comprised of hospital emergency managers and preparedness professionals should be created within these professional organizations and work with hospitals and medical centers to identify solutions to barriers in hospital preparedness in order to enable a better and more prepared hospital workforce.

#### Limitations

There were several potential limitations in this survey that may have impacted the study outcomes and the ability to extrapolate the results to other areas. First, this was a regional survey with a relatively small number of hospitals in a specific area of the country. In spite of the high response rate (77.4%), the sampling frame was limited.

This may impact the external validity of results outside of the study area and may simply describe a local phenomena. Second, the survey originally was designed as a training needs assessment and was not pilot tested partly due to our limited sample size. Nevertheless, the instrument was designed and validated with input of the regional hospital preparedness group as well as representatives of the public health entity on readability, clarity, focus, and scope. Third, although interviewers were trained by the study investigators, they were not blinded to the study hypothesis, and if they did not strictly adhere to the script or interview methodology, may have been in a position to influence survey responses. Fourth, hospital representatives may have reported estimates rather than exact data despite being asked for actual numbers. Fifth, since pre-defined job titles were used by the investigators to simplify data collection, it is possible that other job areas that were considered by hospital administration to be "essential" or who had received training were not included in this analysis if not explicitly mentioned by the administrators.

#### Conclusions

Despite millions of dollars in public health preparedness funds distributed to hospitals in the US each year, hospital personnel still lack appropriate training for staff in critical knowledge areas. The perception of which personnel within a hospital are "essential" during a disaster or public health emergency may be flawed. This misperception may contribute to an overall lack of preparedness in hospitals. Regulatory agencies and professional accrediting bodies must take a more active role in providing hospitals with the tools necessary to comply with mandatory and recommended preparedness standards, and to increase the quality and availability of preparedness-related education and training for hospital workers. Without specific and tangible guidance from national organizations, hospitals will continue to lack the capacity to effectively respond to disasters and public health emergencies.

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