

DIFFERENTIAL RESPONSE OF HOSPITAL PERSONNEL TO A DISASTER*

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In any major community disaster the most valuable resource a hospital possesses is its personnel. A major concern of hospital administrators therefore is the availability of personnel following the onset of an emergency. There are two dimensions to the availability of personnel as a resource for hospital organizations. Most obvious is the quantitative aspect: will there be sufficient numbers on hand to deal with the increased demands generated by the disaster? Less obvious, but possibly more important, is the qualitative aspect: will the right kinds of personnel be on hand? The "right kind" of personnel depends somewhat on the exact nature of the catastrophe and the injuries it creates (the crash of a 747 jetliner versus a tornado, for example).

In a previously published discussion of this topic Quarantelli (1970: 386) notes that, even though hospitals are staffed twenty-four hours a day, the availability of personnel is related to "the timing of the disaster in relation to the work rhythm of the organization." A disaster occurring on the weekend or late at night will find fewer and somewhat different personnel in the house than one occurring for example late in the afternoon just as one shift is preparing to go off duty while another is readying to go on

duty. Personnel not present at the hospital when disaster victims begin arriving are frequently alerted to the emergency by mobilization procedures built into disaster plans, and still others report for duty voluntarily when learning of the situation. Weller and Kreps' (1975) review of disaster studies reveals that such helping behavior is facilitated by emerging norms, but they point out that this does not explain why some people (including hospital personnel) engage in helping behavior while others do not. Stallings (1970b) suggests that hospital personnel whose occupations stress the ideal of service to the community such as physicians and nurses will report for duty voluntarily to a greater extent than other types of employees.

The present paper contains a discussion of data from a survey of all hospital employees (i.e., personnel paid directly by the organization, thus excluding the medical staff) from one short-term community hospital caught up in a major disaster. The questions to which the paper are addressed include who participated in the disaster response and who did not; who was requested to report for work and who volunteered to do so; the temporal pattern in the build-up of personnel; and the kinds of information participants had as they began to respond to the incoming victims. The paper concludes with some policy and planning implications suggested by the findings. Such data should prove valuable from both the practical

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standpoint of seeing what actually happened in one major disaster and from the standpoint of having systematic, quantitative data upon which to ground propositions for a theory of helping behavior in disaster. Before data are presented, however, some background information is provided on the disaster and on the hospital involved.

BACKGROUND

With little warning and devastating force a spring tornado ground its way through seven suburban communities surrounding a major metropolitan center in the Midwest. Hardest hit was a city of 55,000 population where 32 were killed and more than 400 others injured. Within a four-hour period the 400-bed general hospital located in this community received nearly 200 victims of this disaster. Although a tornado watch had been in effect all afternoon, first word that a tornado had actually struck came from the first victims to arrive at the hospital within two or three minutes after the storm touched down. Within fifteen minutes at least twenty-five tornado victims had been delivered, including some dead on arrival, and for the next five hours the emergency room was the scene of intense activity until the last of the injured were treated. Officially the hospital treated 187 tornado victims,¹ 58 of which were admitted and 84 others treated and released. Nine victims were dead on arrival and 37 with only minor injuries were transferred to other hospitals in the area after preliminary examination and treatment.

When it opened six years before the tornado disaster, this hospital became the second in the metropolitan area sponsored by the hospital as-

sociation of a major Protestant denomination. A twenty-four member board of directors, half of whom are ordained ministers, govern the two hospitals through an executive director who himself holds a doctorate of divinity. Each of the two hospitals has a separate administrator in charge of day-to-day activities, the administrator of the hospital considered here being also an ordained minister with a Masters of Business Administration specializing in hospital administration.

Offices of the major officials of the hospital association are housed in this newer, suburban hospital. These include offices for the executive director, the controller, the purchasing agent, the public relations director, and the chaplain. Their responsibility includes both hospitals with the chaplain dividing his time daily between them. Weekly meetings of the board of directors are held in this hospital's conference room. The school of nursing operated by the association is also housed in new quarters on its grounds, and a laundry facility serves both association hospitals with daily truck service between them. As can be seen, the relationship between this hospital and its sponsoring association provide it with special facilities that might not otherwise be expected due to its size and location.

The building itself is a six-story brick structure, but at the time of the disaster construction was under way on an additional three floors. To the rear of the building and connected by a 600-foot underground hallway is a service building housing the heating plant, laundry facility, engineering department, emergency electrical equipment, and so forth. An adjoining passageway leads to the school of nursing and to the student nurses' dormitory.

The hospital has a capacity of roughly 400 beds; when the tornado struck, 375 of the 400 beds were occupied. The 58 admissions from the disaster therefore necessitated some shifting of patients already in the house, and here the value of the additional facilities of this hospital was evident. Twelve ambulatory

¹ Unofficial estimates place the total number treated at more than two hundred, the difference being a score or more tornado victims who received treatment for minor injuries but left the premises before any record of their presence was obtained. This is a common occurrence in disasters where victims not seriously injured are anxious to return to their homes or neighborhoods damaged by the storm.

patients were moved from the sixth floor medical-surgical ward to the student nurses' dormitory. Other disaster victims were housed in one wing of the maternity floor which had been cleared by moving a few maternity patients into the other ward on that floor.

From all indications, then, it is apparent that this hospital bore the brunt of the medical response to a disaster of major proportion. It is also clear that the organization was successful in dealing with the demands created by this situation with no advance notice of the enormity of the task. What was the nature of its build-up for these increased demands, especially the build-up of personnel? How was this accomplished?

DESIGN AND METHODS

Within six weeks following this disaster two types of data were collected on the hospital's response to the emergency. The first were obtained through nearly forty indepth, semi-structured interviews conducted with the administrator and other officials, department heads, supervisors, physicians, nurses, and others whose position or participation in disaster activities provided them with insights into the organization's response. Much of these data have been considered elsewhere (see Stallings, 1970a) and were not utilized in this study. A second set of data were gathered through questionnaires distributed to all employees of the hospital.² Accompanied by a cover letter from the administrator of the hospital explaining the intent of the study and pledging the hospital's cooperation with it, a series of 23 structured and 7 open-ended questions on two legal-size pages were distributed to all personnel by the various department heads and area supervisors. Questions focused on communication patterns and on the movement of personnel over time during the five and one-

half hour emergency period (from 5.25 p.m. to 11.00 p.m.). Five hundred and thirty-four usable responses were obtained, representing a response rate of slightly more than 80 percent of the hospital's paid employees at the time of the study. Eliminating questionnaires from 19 respondents who became employees of the organization only after the tornado produced an n of 515. Since no sampling, random or otherwise, was involved the data will be treated as those from a universe and only descriptive statistics utilized. Of course, findings are thus subject to certain limits of generalizability since they pertain to the experience of one hospital in one city responding to injuries created by only one kind of disaster agent. Despite this, however, a systematic evaluation of data from a reasonably complete census of organizational members has not been attempted in studies of organizations in crises, and its results, if not definitive, should at least be suggestive.

DATA AND FINDINGS

Forty-four percent (224) of the personnel responding to the questionnaire were involved in disaster activities at the hospital between the time the first victims were brought to the emergency room and the last casualties had been either admitted or released. Only 37 percent normally work during the hours encompassing the emergency period; 42 percent of those participating were from the 7.00 a.m.—3.00 p.m. duty shift, 20 percent were 8.00 a.m.—5.00 p.m. daytime employees, and 14 percent were from the 11.00 p.m.—7.00 a.m. shift. Forty-two percent (95) of the participants in the disaster response were already at the hospital when the tornado struck. Another 18 percent (40) were contacted by switch-board operators and others at the hospital and requested to report for duty, while fully 40 percent (89) of those involved reported to the hospital voluntarily after learning of the disaster.

Those at the hospital when the tornado struck heard of the disaster much sooner than

²The medical staff and a large women's auxiliary volunteer group were excluded for both practical and theoretical reasons.

did personnel who were elsewhere, as would be expected; fully 80 percent learned of the tornado within 20 minutes and 97 percent within one hour compared to only 37 percent of those outside the hospital who had heard the news within 20 minutes and 69 percent within one hour. However, even though they learned of the disaster earlier, those at the hospital at the time actually knew less about the magnitude of the emergency in terms of deaths and injuries than those who were not present. Three-fourths of the former had no specific information on casualties and only 12 percent could cite specific numbers of dead and injured (which for the most part proved to be inaccurate) compared to 19 percent of those not at the hospital who had heard specific casualty figures (also mostly inflated) and 57 percent with only general information (such as “many killed” and “scores injured”). One quarter of those at the hospital first learned of the tornado from the victims themselves; another 24 percent first heard the news from a fellow hospital employee; and 21 percent actually saw the storm as it passed within four blocks of the hospital. In contrast, half of those not at the hospital at the time first learned from radio and television news reports while another 13 percent witnessed the storm. In short, personnel at the hospital at the time the disaster occurred knew of the emergency much sooner but had less specific information on the number of casualties than did those who were elsewhere at the time.

A majority of those at the hospital when the tornado struck were at or near their regular duty stations. Some (ten percent) were having their evening meal in the hospital cafeteria; eight were on duty in the emergency room. Surprisingly, given the rapid speed of onset of the tornado, almost three fourths of those in the house (73 percent) knew of the storm striking before victims began arriving, although fully one fourth first heard from the victims themselves, as indicated above. Most (57 percent) immediately passed word along to coworkers

either in person (69 percent) or by house phones (26 percent). None of the personnel on duty passed word of the disaster at this time to anyone outside the hospital.

Word of the tornado reached at least half of those on duty in the emergency room even before casualties were received; only four reported that their first information came from victims. Five of the eight immediately passed the word to others in the hospital that casualties were about to or had already started arriving.

More than half the nearly 200 victims handled by the hospital arrived during the first forty-five minutes after the tornado touched down, and the number tapered off gradually during the next three hours, after which time no additional casualties were delivered. However, since this disaster occurred at 5.25 on a Friday afternoon, most administrative and clerical personnel had left the building. Only the normal evening staff was on hand to deal with the first victims to arrive. Thus mobilization of a variety of off-duty personnel was necessitated. Figure 1 depicts the arrival of personnel who were not initially present at the hospital but subsequently participated in disaster-response activities. The shape of this curve is of particular interest. One of the images of hospital disaster activities pictures the build-up of personnel as a sudden process

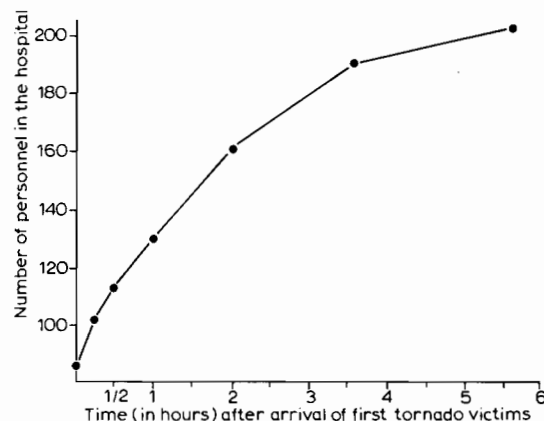


Fig. 1. The build-up of personnel in the disaster response.

with all those participating on the scene within a few minutes and few if any additional arrivals. The data clearly show, however, that this is not the case. Rather, the arrival of personnel who were a part of the hospital's response was a continuous process. A steady build-up took place throughout the entire five-and-a-half hour emergency period, although the pace tapered off slightly after about two hours. But employees were still coming in as late as 9.00 and 10.00 p.m.³

Of the more than 200 respondents who were involved in the organization's disaster response, 18 percent (40) had been contacted by others at the hospital, and of these 34 were requested to report for emergency duty. Slightly more than half (53 percent) of these participants were contacted within half an hour after the first arrival of victims. Forty-two percent already knew about the tornado, but a majority of those contacted (58 percent) learned of the disaster for the first time. Forty percent reported that they were notified by a person from the hospital with whom they were not normally in contact. Seventy-three percent reported that they in turn told other members of their family of the tornado; only six relayed this information to another hospital employee (in most instances by telephone). Actually, only 34 (85 percent) of those contacted by someone from the hospital were specifically asked to report for duty.⁴ Of these, the bulk (79 percent) were in other communities adjacent to the stricken city while only 21 percent were inside the community itself. Apparently due to delays in reaching the hospital caused by heavy traffic and debris-clogged streets, only

³This may be due in part to some members of the 11.00 p.m. to 7.00 a.m. duty shift reporting to work earlier than usual. Some 28 percent of the respondents on this shift reported to work sometime between 7.30 p.m. and 11.00 p.m.

⁴Apparently six of the forty who received calls were contacted by friends or other coworkers who merely relayed information about emergency activities. None of the six were requested to report to work. On the other hand, only 31 of the 34 who were so requested were actually able to reach the hospital.

9 percent of those requested to report had arrived within 20 minutes after the tornado touched down, only 21 percent within the first half hour, and still only 39 percent within the first hour. It was not until 7.30 p.m.—fully two hours after the tornado struck—that the majority (73 percent) of those employees whose services had specifically been requested were able to reach the hospital.

Those employees who came voluntarily to the hospital without having been requested to do so experienced the same sorts of hindrances. By 6.00 p.m. only 24 percent had arrived, within the first hour 35 percent, and by 7.30 p.m., two hours after the initial casualties were received, 60 percent were in the hospital. Figure 2 shows the build-up of these personnel who reported voluntarily. Their numbers increased steadily throughout the evening, tapering off only slightly after a few hours. It is important to recall that these volunteers represented 40 percent of all those hospital employees who participated in the disaster response during the emergency period. For this reason alone their involvement deserves closer examination.

Where were these voluntary participants when they learned that disaster had struck the community? Unlike employees requested to come to the hospital, half of those who came

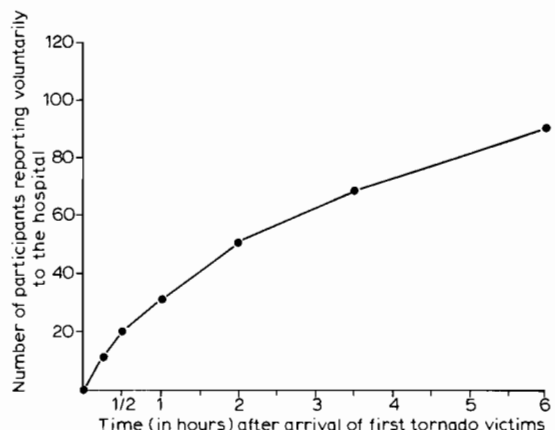


Fig. 2. The build-up of personnel who reported to the hospital on their own.

on their own (49 percent) were inside the stricken community itself while the other 51 percent reported learning of the disaster while in one of the surrounding cities. Thirty percent of this group actually witnessed the tornado strike while another 34 percent learned of the situation from radio broadcasts. It is not surprising to find therefore that one half of those who went to the hospital of their own accord were aware of the disaster within fifteen minutes after it occurred. In terms of the content of their first information about the disaster, however, the overwhelming majority (some 91 percent) had no specific information about the number of deaths and injuries before setting out for the hospital. All they knew was that many people must have been killed and many others injured.

Who, then, were these people who reported voluntarily to the hospital? A breakdown of the volunteers by occupation is shown in Table I. Remembering that physicians were excluded from the study, it is not surprising to note that registered nurses were the largest single category of voluntary participants, com-

prising more than one third of the total. Nurses, after all, are the largest single category of hospital employee, and their role in an emergency such as this is clearly an important one. Next were nurses' aides followed by members of the maintenance/engineering department. However, in terms of the proportion of each category participating voluntarily, a slightly different picture emerges. First come orderlies, 75 percent of those responding to the questionnaire having gone voluntarily to the hospital, followed by engineers (55 percent) and department heads (50 percent). Overall, about a fourth (23 percent) of all personnel not at the hospital when the tornado struck reported voluntarily for duty.

A brief comparison of the backgrounds of these voluntary participants and the remaining employees who were not involved in the disaster response discloses little accounting for differences in the rate of helping behavior. Average length of employment in hospitals (including the present one) was 7 years for the volunteers, 7.5 years for the nonparticipants, and both had identical longevity records on their particular job assignments at the time of the disaster. The only difference occurred on previous hospital disaster experience. Ten percent of those reporting voluntarily had previously worked at a hospital involved in a disaster response (although the nature of their involvement was not established) compared to 6.8 percent of those not participating. Since this difference is slight, it should not be over-interpreted.

CONCLUSIONS AND IMPLICATIONS

Although the point may seem obvious, it is worth repeating that, based on this survey of nearly 80 percent of the paid employees of a hospital involved in a major disaster, less than half (42 percent) of the personnel on the payroll actually became involved in the emergency response. In other words, without total mobilization this organization treated over 200 vic-

TABLE I

Composition of Personnel Reporting Voluntarily to the Hospital during the Emergency Period (by occupation)

Occupation	Percent of total voluntarily participating	Percent of each category participating voluntarily*
Registered nurses	36	26
Nurses' aides	18	28
Engineers	7	55
Lab technicians	6	33
Licensed practical nurses	4	31
Department heads	3	50
Switchboard operators	3	38
Ward secretaries	3	18
Orderlies	3	75
Clerks	3	15
All others	12	—
Total	100	23

*Excluding both those who were already in the hospital and those who were requested to report for disaster duty.

tims of a major tornado, many seriously injured, in five-and-a-half hours. Some hospital officials in fact felt that in certain areas more personnel was present than was actually needed.

Still, the magnitude of this disaster did necessitate mobilization of certain personnel beyond those on duty, although these latter were the largest segment of participants in disaster activities. About one fifth of the participants received calls requesting that they report for duty. Nearly three times that many came to the hospital voluntarily (69 percent of those who participated but who were not initially present at the hospital). A majority of these were nursing personnel. Few of the participants possessed specific information regarding the number of casualties to expect.

These findings suggest several implications for administrative policies and disaster planning. The most general point is that of the two dimensions of personnel as an organizational resource, the quantitative and the qualitative, potential problems in the emergency phase of disaster operations would seem more likely to revolve around the latter. That is, an ample number of personnel can be expected to be on hand, but certain types of personnel may not be available, at least in the immediate post-impact period. Problems of sheer numbers could come from those whose arrival is not expected, the volunteers, but these could be averted by insuring that such volunteers as well as other incoming personnel report to a specifically designated location rather than to their regular duty station (even if this should be the emergency room). The gradual, steady build-up of off-duty personnel indicated by Figures 1 and 2 should facilitate the check-in and assignment of incoming workers. One emergency assignment station such as this is also important for alleviating some of the qualitative problems of personnel mobilization, as will be indicated below.

The qualitative aspect of personnel availability refers to the specialized skills and expertise possessed by individual members of

an organization. There may be many such individuals with a certain skill or there may only be a few (perhaps only one as in the case of the hospital administrator) familiar with certain specialized tasks. And some tasks can be learned quickly by almost anyone (such as folding blankets or making sandwiches) while others require years of training and practice (surgery, for instance). The success of any organization's response to a disaster is affected not only by having sufficient numbers of personnel on hand but also by having sufficient numbers of the "right kinds" of personnel available, those who can perform tasks relevant to the nature of the situation.

Clearly the nature of the disaster agent and the type of injuries it creates affects the kinds of medical specialists required. Likewise, the time of day when a disaster occurs is related to the availability of staff in the hospital itself. Particularly in tornadoes where the speed of onset is rapid and where injuries are created with little chance for extensive preparation, qualitative problems seem most acute in the very early stages of the emergency period where the initial brunt of the response falls to those on duty.

Shortages of certain types of personnel can occur in one of two ways. A sudden influx of victims can create the need to fill out a great number of disaster tags or to transport unusually large numbers of patients at about the same time to the X-ray department or elsewhere. Here employees with greater expertise than necessary such as nurses can be reassigned to these tasks requiring fewer or easily learned skills. An altogether different problem develops when there is an initial absence of personnel with highly specialized skills, administrative or medical. Two partial solutions are possible. Some information from the site of the disaster as to the nature if not the number of injuries can allow some time for needed specialists to be alerted. Radio contact among the various hospital emergency rooms serving a given area would also make it possible to locate personnel

or resources which one hospital may not have immediately available and allow ambulances to be rerouted without undue delays. Secondly, hospital disaster simulations might include some deliberate but unannounced crossover of assignments. For example, the director of nursing services might be informed that she is the highest ranking administrative official in the house and instructed to take overall charge of disaster operations. A nursing supervisor might be instructed to make certain decisions normally handled by a physician such as those in triage. And nurses' aides might be assigned to work in medical records during the drills. Anticipation of such flexibility is probably more useful in coping with the qualitative aspects of disaster demands than building into disaster plans alternate assignments for specific individuals who may themselves be unavailable at the time of an emergency. In later stages of the emergency period when some areas are adequately staffed while others are understaffed, the same crossover of assignments can be practiced. In this particular disaster, for example, some late-arriving physicians and nurses helped prepare coffee and sandwiches for their colleagues working in the emergency room (the dietary department had finished the evening meal and closed down). In addition to the direct support such assignments provide, they also indirectly limit the number of personnel in other easily-

congested areas. One problem, though not an insoluble one, is that in putting members of the "helping professions" to work on what may appear to them trivial though necessary tasks they may feel their skills are being wasted.

Whether one's interests are practical or theoretical, these findings are clearly only a beginning based as they are on the experience of one hospital caught up in a single major medical emergency. What is needed is a systematic body of knowledge based upon similar data from other organizations in other types of crises. Replication will enhance the generalizability of the present findings, sharpen the focus of these policy implications, and reduce the dependency of scholars and administrators alike on case studies and personal accounts.

REFERENCES

- Quarantelli, E.L. (1970), "The community general hospital: its immediate problems in disasters." *American Behavioral Scientist* 13, 380-391.
- Stallings, R.A. (1970a), "Hospital adaptations to disaster: flow models of intensive technologies." *Human Organization* 29, 294-302.
- Stallings, R.A. (1970b), "A test of the professional service ideal." Paper presented at the annual meetings of the American Sociological Association, Washington, D.C.
- Weller, J.M. and G.A. Kreps (1975), "Helping behavior in disaster: an organizational perspective." Paper presented at the annual meeting of the North Central Sociological Association, Columbus, Ohio.