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SOME OBSERVATIONS ON THE EFFECT
OF THE EMS LAW ON DISASTER RELATED
DELIVERY SYSTEMS

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delivery have been addressed and

## Introduction

Natural disasters and mass casualty situations present extraordinary contexts for delivery of emergency medical services (EMS). Not only is there an increased demand for services in terms of caseload at the point of entry into the emergency medical system, often at the same time and place; but the capabilities of the system are tested in terms of the degree of effectiveness and efficiency with which components are able to coordinate and mobilize their resources to meet that demand. (Taylor, 1974). These capabilities are tested at a time when various agencies are often pursuing their own primary tasks, which may be peripheral in terms of usual conceptualizations of EMS, such as the provision of shelter, fire protection and traffic control. Agencies involved in these tasks, as well as private citizens and other organizations, may exacerbate coordination with day-to-day EMS providers (Quarantelli, 1970). A breakdown in one or several components of that system--agencies or organizations designated to deliver a particular service--may result, at worst, in the ineffective operation of the system (Stallings, 1970).

The purpose of this paper is to examine the hospital-medical area of EMS care in mass casualty events in localities prior to the establishment of federally-funded EMS systems and after funding became available. We will explore the extent to which issues and problems involved in EMS delivery have been addressed and describe how EMS operates in disasters. Concluding comments will suggest changes in operations which might make for more efficient patient care and will focus on the distinctiveness of EMS delivery in disasters and other high-demand settings.

## Methodology

Levels of analysis for each mass casualty event include the disposition of individual cases from hospital records, pre-hospital phases of EMS organizational involvement, hospital EMS, and the community context.

Data are both documentary and interviews. The pre-EMS law data are from nine cities: five struck by tornadoes; two by explosion-fires; one by flood; and one disaster-prone from the years 1963-1974. More than 650 interviews with professional and administrative staff from 35 hospitals and numerous public safety agencies were utilized.

The latter data span 11 mass casualty events in six states from 1975 and 1976. In this area, three were the result of tornadoes, three of explosion-fires, three transportation disasters, one flood and one fire. Two hundred twenty-five interviews were conducted at 43 hospitals and numerous public safety agencies. Hundreds of documents were used as supporting material. Data were gathered by field workers from the Disaster Research Center (DRC) at The Ohio State University.

These sources of comparative case studies at Time One, pre-EMS Federal guidelines and Time Two, post-EMS Federal guidelines, were compared along selected aspects of the 15 EMS Components. Our focus is on the EMS linkages between agencies involved in communication, transportation, treatment and identification of victims, and coordina-

tion existing among them. Relational characteristics include such factors as the amount of communication between organizations, the frequency of cooperation or conflict, and coordination.

Data in the following sections will describe the processes as they occurred in various communities prior to EMS guidelines and again in other communities after federal guidelines were disseminated and funding became available.

## COMMUNICATIONS

From the standpoint of hospitals, the communication process is both internal and external, involving not only discovery of and notification about a mass casualty emergency, but the continued transmission of information on the status of the situation among and within organizations such as other hospitals, police and fire departments, the Red Cross and Civil Defense. How do hospitals then learn they are in a mass casualty emergency situation and how do the hospitals inform their staffs? How is information communicated regarding the emergency room (ER) capacity, diversion or transfer of patients, needs for personnel and supplies?

Modes of notification vary depending upon the resources available and the nature of the disaster agent. Our data indicate that, in the flood and tornadoes, hospitals were generally notified by public safety agencies. Other means of notification were first arrival of casualties, public radio and sightings. In the explosion-fires there was no formal warning before the first casualties arrived, but telephone notification occurred shortly thereafter. It should be noted that tornadoes and floods generally have a longer warning period.

Although individual hospital disaster plans designate who is to report for duty and where, many hospitals reported convergence of staff and volunteers who were not requested, or inability to locate key personnel. Contacting staff by telephone was often complicated by jammed switchboards. Within the hospital some paging systems were not on emergency power and were ineffective when power failures occurred. In one instance, local television was used to request staff. In one city, National Guardsmen performing security tasks did not recognize nor honor staff identification and prevented personnel from entering the hospital area.

In no case was there an effective, direct communication linkage from the disaster site to the hospital. In a few cases either ambulance-hospital or hospital-ambulance linkages existed, but rarely was there any two-way communication. Contact with public safety agencies was available in a few cases through Civil Defense or citizen's band radios, but more often was nonexistent. In some cases, hospital-hospital communication existed via radio, and in a few others by telephone. Nearly all hospitals reported that telephone lines were jammed or disrupted. In one city, hospital A phoned hospitals B and C to send extra personnel to hospital D whose phones were jammed. Had direct communication with hospital D been possible, hospital A would have learned the extra staff were not needed.

In all but one city, there was a lack of a central communication system. In the city where such a system existed, the linkages between the hospitals and other emergency organizations were weak and unspecific. In effect, the existence of equipment did not guarantee its effective use, in cases where it was unfamiliar, manpower to operate it was lacking or power failed.

In the post-EMS communities we still find instances of hospitals informed of a mass casualty situation by the first arriving casualties. Here again, this was generally the case where there was little or no warning that a disaster had occurred. In one city, despite the existence of six radio networks for EMS, there was no direct hospital-hospital or ambulance-hospital communication, and the fire department which owns the ambulances notified other EMS components by phone. In another city, despite the existence of three communications centers designed to notify EMS components, one center failed to communicate at all. In another case, a city with an emergency radio network was able to effect two-way communication with hospitals and ambulances and to call in specialists, but one of the hospitals was notified after the first casualty arrived, and one receiving hospital was not included on the radio net.

One state experienced four mass casualty situations, but its state-wide communications system, not geared to disaster conditions, was utilized inconsistently. In city A, the ambulance association was not notified of the disaster. In city B no site-hospital communication could be effected, and separate police and fire radio networks and dispatchers caused coordination difficulties. In city C the ambulances are equipped with two-way radios to police and hospitals. Although one receiving hospital was on the state network, no trained operator was available at the time. In addition, no one was listening to the police emergency radio, and the hospital switchboard lost its power. On the other hand, in City D four radio networks are available, and the state patrol provides the key link to all EMS components. One hospital monitoring the weather radio was prepared for receipt of casualties, communicated with the state network and with volunteer ambulances, and did not experience an overload of patients.

While communications capabilities are improving in many cities, lack of experience with a mass casualty situation, lack of consistency within network linkages, and the failure to initiate communication at the crucial moment still cause breakdowns in the process.

## TRANSPORTATION

The transportation process is involved with two separate but related functions: dispatching aid in the form of vehicles and personnel to the site, and transporting the victim from the site to a facility where care is given. In the transportation area, some important questions are: is there central dispatch? who is notified of the need for help? who transports the victims and how is it decided where they will go? who transfers patients?

There was no evidence of a central dispatch to link the transportation and communication processes in the pre-EMS law data. For the most part, fire and police ambulances were either called for or arrived voluntarily at the scene and transported patients to the nearest hospital. In many situations, ambulance drivers were asked to divert less critical casualties to other hospitals. In one city, nearly twice the number of casualties were taken to the nearest hospital, a private facility, than were taken to the general hospital with the best ER facilities.

A major problem in this phase of care is the transporting of patients by private vehicles which are not tied into an EMS communications or transportation network, frequently resulting in maldistribution of casualties. Here individuals take on the responsibility for transportation to treatment facilities because they are ready and available to transport, often before ambulances arrive or because they want to carry family or friends themselves. Many victims walk to the nearest facility. In one city taxis and chartered buses already at the scene of a disaster commenced transport of casualties to hospitals.

Due to lack of data, we cannot generalize about transportation life support capabilities. Although some personnel had first aid training, it seems the majority of casualties in all cities were not transported by vehicles with equipment and personnel meeting current EMS expectations. In addition, it should be emphasized that not all vehicles dispatched for aid are capable of transportation, such as some fire rescue units.

In the case of transfers, data lean toward transport by ambulances and private vehicles. Transfers either require intensive care units elsewhere or require treatment for minor injuries, in which case transfer both relieves convergence and is relatively safe for the patient.

The transportation process in the post-EMS cities was facilitated by central dispatch in only two communities, and hospital overload was prevented in both. Those communities without central dispatch experienced problems such as convergence of ambulances to the site--however, Emergency Medical Technicians (EMTs) did search and rescue--autonomous response by city and county vehicles with separate dispatch centers, shortages of vehicles and squabbling over EMS transportation responsibility. In one case, 50 casualties were transported by bus to one hospital, and in another case many victims walked to the nearest hospital which ultimately received 125 of the 140 casualties in the disaster. While the existence of central dispatch can ameliorate convergence because whereabouts of the vehicles is known, the participation of groups and individuals not normally associated with EMS delivery may alter the complexion of the transportation process unless these are made subject to coordination. For example the 50 casualties transported by bus could have been dispatched in coordination with the ambulance services to avoid hospital overload.

## TREATMENT

Treatment may be trichotomized into on site care, initial emergency room care and definitive care. Pertinent questions include: who takes care of the casualties at each stage? are they trained personnel? are the casualties triaged?

The need for on site treatment was met in a few cases with a professional response. In one disaster, three treatment sites, staffed by six doctors and 15 nurses, were set up. In other cases, help arrived too late. Triage at the site was not evident; emphasis seemed to be on moving the patient to the nearest hospital. This was accomplished for the most part by untrained individuals.

Professional ER staffs existed in some hospitals and materialized in others without regular ER coverage. In many cases, the disaster's occurrence at shift change allowed for all those in the hospital to aid in the EMS response. In others, the occurrence of the disaster during a slack shift necessitated the request for additional staff. Convergence of both volunteers and staff to the ER area generally was encountered. Poor traffic control and lack of security outside hospitals sometimes were problems in that they either inhibited staff accessibility or eased outsider accessibility to the ER.

Teaching hospitals which received casualties were often at an advantage in utilizing their student nurses or medical students to augment patient care. However, one problem encountered in using those not normally on the staff was their unfamiliarity with the facilities.

Since the majority of hospitals had little prior knowledge of how many or what categories of casualties to expect although many have agreements with organizations to receive such information, numbers and specialties of professional personnel were contacted as the emergency progressed. Available physicians were not able to treat solely according to specialty. Fractures, lacerations, contusions and some head injuries were the major injury types. These require the abilities of orthopedic surgeons and neurologists whose services were available in some cases but were seriously lacking in others. Casualties may arrive in a steady flow, or in clusters. X-ray departments were frequently used to full capacity and sometimes understaffed, and one hospital reported "sloppy" X-rays. Of 120 casualties received in one hospital, 110 were processed directly through the X-ray department with no prior ER care. Another hospital received 53 casualties, nearly all of whom required treatment for smoke inhalation. In most cases the sudden convergence of casualties at a hospital requires that non-critical patients be selectively discharged. Data indicate that many times it is nurses who make the initial decisions toward this end.

At least five of nine cases reported performing triage in the ER, directed by medical staff. In one hospital, separate entrances were set up for ambulatory and more critical cases according to disaster plan.

Another hospital waited 45 minutes for a trained person to initiate triage. After triage, patients were sent from the ER to the proper care area or transferred to another facility. In two cases, outpatient clinics were used to handle those less seriously injured. The criteria for transferral to another facility were seriousness and type of injury and age of the casualty.

On-site treatment was handled in various ways in the post-EMS law cities. In those having central dispatch with EMT response, one experienced no site triage or tagging while another administered treatment on site, lessening the hospital load. In the latter city, EMTs stabilized the injured and transported them to a single hospital where the decision to transfer patients could be made. In one of the explosions some on-site treatment was reported but not triage for hospitals. The Red Cross treated on-site in one community. When a medical team was denied entry to one site, emphasis was shifted to removal and transportation. Another city reported triage where there was no site-hospital communication.

In a flood community there were 1,000 recovery-work casualties, and four first aid stations were established. EMT-staffed ambulances were available in addition to Navy and National Guard medical teams. However, minor injuries were usually treated at homes due to a special nursing program that provided widespread first aid instruction.

In terms of distribution, several hospitals reported convergence problems. Two said they were overloaded initially but were large enough to absorb the quantity; one complained of poor distribution of non-serious injuries; another received the first 24 casualties simultaneously, which included all the critically injured; and one triaged out the less serious to an adjacent clinic. Casualties still were generally taken to the nearest hospital. Several hospitals set aside routine procedures, stressing patient care as the primary goal.

## IDENTIFICATION

The identification process in a mass casualty situation generally serves four purposes: naming of the patient; recording the injury sustained and other relevant medical information; facilitating the billing procedure; and fulfilling the demand for public information.

Some of the problems encountered with identification of patients were, a shortage of tags (one hospital resorted to use of paper towels), unfamiliarity with the color coding, lack of carbons, and the small size of tags. In the hospital morgue tags sometimes were attached to clothing rather than the body of the victim and personal effects were mislaid. Some tags were not designed to include other medical information such as drugs administered, allergies, etc., and sometimes victims were too seriously injured to supply data. Frequently non-medical personnel were assigned the task of tagging, and in cases where medical records personnel were involved, normal billing activities were suspended. Where there

were insufficient data on the tags, billing and insurance collection were nearly impossible. It was reported that non-critical cases occasionally left the hospital after initial care still wearing their tags. One hospital, however, evidenced non-interrupted standardized record-keeping and tagging simultaneously.

Scant data on identification, on definitive care and on convergence of volunteers, staff and media to the hospitals precludes generalizations in these areas for post-EMS cities. This is also the case in the area of facilities; thus the following section considers pre-EMS cities only.

## FACILITIES AND SUPPLIES

Generally there was no formal categorization of hospitals in the nine cities, but in some cases informal categorization was implicit. Several hospitals had plans, in the event of a disaster, to expand the ER area into the orthopedic clinic, labor rooms, surgical recovery unit or physical medicine department. One hospital called for moving the entire ER to a larger area of the hospital. Convergence problems were particularly acute at one facility which has four separate ER entrances.

Several hospitals needed extra blood during the emergency, but all seemed to obtain ample supplies. Occasionally shortages were noted in the areas of dry clothing, stretchers and suture sets. At one hospital at least, requisition of drugs was informal as routine paperwork was suspended; in others, "cold" sterilizations were necessary.

In the cities struck by tornadoes, loss of water pressure and electrical power occurred, disrupting some hospital service. In a few cases, emergency power was not tied in to the paging system, X-ray developers and elevators. These unforeseen circumstances also precipitated coordination problems. Telephone service was inconsistent because switchboards were jammed.

We have little data on definitive care given those already hospitalized at the time of the disaster, and to those admitted as a result of the disaster. In the flood case, the only instance of serious damage to a facility, two hospitals had to evacuate entirely. According to prior plan, a satellite hospital was set up for relocation of these patients. The resulting transfer resulted in a loss of continuity in physician-patient relations, but it is difficult to assess the consequences to patients. In another city, 37 in-patients, one of whom died later, were evacuated by tunnel to an adjacent dormitory.

## COORDINATION

Although coordination certainly includes linkages involving transportation and communication most importantly, it may be conceptualized as a complex of cooperative, harmonious action among the various processes

we have described. Good coordination should take the victim through the
EMS system efficiently and effectively. As we see, there are many possible
pitfalls, ranging from competition across geographical boundaries to the
absence of a hospital triage officer during a mass casualty situation.
Problems of coordination are magnified during a disaster but not solely
because of the greater number of casualties. While the same tasks need
to be performed, it is the emergence of different organizational linkages
that makes disaster EMS delivery different from day-to-day operations.

In the communications process, unusual modes may be sought when normal
channels fail. When telephones are no longer functional because of power
loss or jamming, runners or radios may have to be utilized. Not only is
there difficulty in receiving reports from various agencies, but the added
problem exists of communicating with hospital staff, both externally and
internally.

Demands by police or fire department, the Red Cross or hospital public
relations, whoever is responsible for information dissemination, make stan-
dardized record keeping qualitatively different from day-to-day activities.
Numbers of cases and the immediacy of the demand for a center to inform
media and families about casualties were problems in many hospitals where
there was no planning for this contingency.

In transportation, a lack of central dispatch hampers coordination.
Blockages of regular hospital routes due to damage, damage to vehicles,
and the intrusion of the private sector into EMS delivery may also compli-
cate matters. Coordination with public safety agencies is imperative,
since they tend to suspend normal activities in disasters. In one city,
a fire department near the site made immediate arrangements with depart-
ments in four surrounding communities to assume fire protection duties for
the duration of its commitment to EMS delivery.

In the area of treatment there are a number of variations from day-
to-day activities: triage may be called for; tagging procedures may alter
normal record keeping procedures; ER facilities may need to be expanded
or moved; supplies may be overtaxed; power and water failures may necessi-
tate improvisation; in-patients may need to be discharged early to make
room for more admissions; internal and external security becomes proble-
matic; and convergence of casualties, the media, families, staff and volun-
teers can create confusion in the ER.

Administrative coordination frequently is more of a problem than
is professional coordination. As one administrator noted, "I'm sure that
the professional service is much more integrated informally than admini-
stration." In another city, it was noted that nurses trained in patient
care but not in command and coordination of duties showed initiative in
these areas when the situation demanded. One administrator saw individual
initiative as both the answer to and cause of coordination problems within
the hospital.

One hospital respondent articulated the frustration involved in co-ordination this way:

> "I had all this personnel and all these volunteers who are just
> as good as Red Cross people...and there was no way that I could
> get that talent into the system. I sent them over to the Red
> Cross...and they had no need for them...so they came back and
> asked me if they could go out on the ambulances because they
> could at least start the IVs. I sent one to go with each ambu-
> lance crew which is composed of two people, but I don't think
> anybody got to go because the ambulance crews were coming and
> going...maybe on a one-time run and weren't coming back this
> way. The hospital operator would say a helicopter is dropping
> off a patient and how can I get an ambulance there, so when
> they would bring some patients in, I would commandeer the ambu-
> lance and tell them to go pick up a victim at so-and-so and they
> wouldn't know where it was. I had to send a med student with
> them for directions...The police and fire networks had their
> own problems but we didn't have an emergency net between ambu-
> lance and hospital, hospital and hospital, aside from phones
> which were knocked out in some areas. It was a total waste
> of personnel.
>
> It saddened me there was no communications...they couldn't
> get physicians or patients in or out of there except by heli-
> copter. They needed personnel, supplies, and I had all the
> stuff that I could have given him. We had nothing to do after
> a while. There was just no way to be sure that if you went
> somewhere you wouldn't be told to turn around and go back home."

In cities where a more structured EMS system existed during the last two years, we may ask whether the same problems have been adequately addressed or whether new problems have emerged. And we may also ask, does the day-to-day EMS emphasis adequately address the delivery of EMS in disasters?

Despite greater sophistication in equipment and training, all EMS delivery processes cannot function smoothly without coordination. Some individual or organization must be in charge, particularly at the site, and the linkages between processes must be explicit both in theory and practice. Data indicate the lack of a coordinator or coordinating body still is a problem. In one city which seeks central coordination, all EMS providers are not represented and the various components seem to be unfamiliar with each other. In another, the regional trauma coordinator was not involved in the disaster, leaving Civil Defense and the fire department the task of coordination, which was complicated by overlapping jurisdictional boundaries.

In other instances, the abundance of resources, rather than their paucity contributed to coordination problems. This may be seen as an

old problem wrapped in new technological ribbons. The combination of several radio networks in a community and the response of greater numbers of people and vehicles, in addition to an autonomous response by groups in different jurisdictional boundaries, put enormous strains on coordination efforts. In some cities, however, coordination, at least between the communication and transportation processes, has improved with the addition of radio networks and central dispatch. Coordination between transportation and treatment has likewise improved with the addition of EMTs. The hospital phase of the response obviously depends strongly on the degree of efficiency with which the preliminary, or pre-hospital processes of EMS are delivered.

A disaster situation in one city resulted in a shift from placing demands solely on EMTs to the inclusion of other nursing and supervisory personnel. In another situation, role conflict occurred, and the position of regional EMS director was temporarily filled by another person so the director could assume his post in a National Guard medical unit. The latter post seems to have taken precedence over the EMS function for that individual.

## THE DISASTER LINKAGE

For most hospitals, the only formal acknowledgement of the possibility of a mass casualty situation is the hospital disaster plan. While nearly all hospitals have a disaster plan, and while these plans are supposed to subsume disasters both internal and external to the hospital, most are written as if the hospital existed in a social vacuum. Few plans mention coordination or practice it with other hospitals, public safety agencies, other than security or traffic control, and other organizations that are apt to be involved in communication or transportation. Many administrators, while pointing out that disaster plans are necessary for accreditation concede that they are relatively unworkable in practice.

One administrator commented: "We do what needs to be done. We don't have to look at the plan." Another said, "I opened up our plan immediately after we got the note and it said that wards 4A and B would be the shock and resusitation area for all victims. That's four floors up. I've got two old elevators that take forever to move up and I said, 'We're forgetting the disaster plan completely, this is the way we're going to run it', and we ran it from that point on our own...The tornado hit the affluent part of town. Had it hit the poor section, I doubt if those hospitals would have activated their disaster plans. The general hospital would have had to handle the entire load. That's just the way society is."

Many plans seem to be tied to hospital "personalities", in whose absence coordination falters. Besides lack of recognition that different linkages will be involved in disasters from those operative in normal EMS situations, plans are generally written that disregard convergence. Seldom is it mentioned that families, staff and media will congregate or attempt to communicate with the hospital during the course of the emergency, nor are procedures designed to cope with it.

Disaster drills generally were internal, but community-wide drills which point up coordination difficulties are becoming more frequent. Seldom are non-day-to-day EMS deliverers or volunteers designated as "media" or "families" included to fully test convergence potential and the linkages that are non-routine for most hospitals. Disaster critiques of internal drills are often more congratulatory than critical in nature, although one disaster critique said that major errors, weaknesses and problems existed in ill-defined lines of command, communications and co-ordination. But community-wide drills, while having the potential to elicit response from more segments of the community, sometimes have the added burden of attempting to correct weaknesses without causing permanent ruptures in working relationships. Mass casualty experiences often result in disaster plan revision, however.

The EMS Systems components' disaster linkage addressed the whole complex of mass casualty care by calling for an EMS System plan which will link to local, regional and state disaster plans and participate in exercises to test disaster plans ( EMSS Guidelines, 1975). Early data on post-EMS cities indicate this has not yet been accomplished.

## COMMENTS

Since the EMS law is in its infancy, few communities have had sufficient time to develop comprehensive plans. Additionally, few communities have seen their efforts seriously tested in a mass casualty situation. But for those in our sample, many of the same problems still exist in the disaster context and must be planned for.

For example, during a disaster communication linkages need to include organizations other than those directly involved in EMS delivery such as Civil Defense, sheriff, National Guard and weather bureau. While it is not economically feasible for communities to plan for all possible contingencies, telephones should not be relied upon as the sole means of communication. The use of a radio network with two-way capacity to all components and trained, available personnel to use such equipment is imperative. But failure to respond to pre-arranged procedures or to notify some component is courting reduced efficiency. In practical terms, notification of a disaster by arriving casualties hardly affords a hospital the lead time required to make preparations. Hospitals still are plagued with inadequate estimates of arriving casualties and unequitable distribution of patients.

Contingencies for face-to-face communication also must be anticipated both inside and outside the hospital. Access to the hospital must be facilitated at the same time security is being maintained and it must be done quickly. Under disaster conditions, this process may well be the province of a non-EMS provider.

On-site mobile communication and coordination with the transportation process can reduce hospital convergence. It must be emphasized that the response of private citizens, which is not a feature of day-to-day EMS delivery, is omnipresent in the disaster setting and is an illusive feature to coordinate. If not controlled on-site, this segment of response is likely to escape coordination altogether.

The pattern of transportation to the nearest treatment facility, while a seemingly logical one, highlights the need for formal categorization. Awareness by EMS deliverers and the public of a facility's potential may lessen both convergence and the necessity to transfer patients to other intensive care units (ICUs). This may have less relevance in the rural disaster context where there are fewer options in treatment facilities. In this case, hospital-hospital linkages may need to be stronger than in the urban setting.

In terms of treatment, the nature of most injuries in disasters would seem to indicate on-site care. But the reality is a convergence of minor injuries to ERs. With increasing numbers of non-emergency patients already clogging emergency facilities, it would be reasonable to strengthen the capability of on-site care, not as a pre-hospital treatment but as an extra-hospital service. Some hospitals have attempted to initiate triage team services on site, with varying degrees of success. In addition to stabilizing the more serious injuries on site, the expansion of paramedic programs may have a positive effect on the elimination of minor injuries from the ER. Legal and financial guidelines should be conducive to such care.

In conclusion, the distinction between everyday EMS care and EMS in disasters needs to be emphasized. Definition of EMS as a system which provides for the arrangement of personnel, facilities and equipment for the effective and coordinated delivery of health care services in an appropriate geographical area (Findeiss, 1974), under emergency conditions has been geared to the notion that if a community response is not adequate for the sick or injured individual, it cannot cope with a disaster. "Individual Care" and Mass-Casualty Care" are seen as opposite ends of the same continuum. The rationale is that since every contingency cannot be provided for, a flexible system to cope with both extremes is the answer. Disasters are often regarded as an extension of day-to-day EMS, as a "more of everything" situation. But, as the foregoing discussion indicates, disasters present circumstances which are different in more complex ways than sheer numbers of casualties.

Sophistication of equipment and personnel has been sought following EMS guidelines, including telemetry transmitting physiologic information, for example. In most disaster situations, however, such equipment is more sophisticated than required. The day-to-day operations have different demands compared with the lax definition of emergency injuries in a mass

casualty context. For many of those "involved" in a disaster, their injuries, however minor, make them a part of the event and therefore subject to treatment. In a non-disaster context, the same injuries might be treated at home, if not subject to insurance claims. As we have previously noted, equipment and personnel may not be utilized to full advantage; a broader range of potential EMS deliverers and organizational links than exists under normal conditions may emerge during a disaster; and coordination of personnel, equipment and facilities is more seriously tested and seemingly more illusive on site.

Coordination in its simplist form may be a matter of eliminating confusion among people and groups who have never worked together before, but this potential must be anticipated by planning groups. Interaction is not limited to the same number or types of organizations or individuals in a disaster. The "Good Samaritans", specialty surgeons, social services, National Guard, clergy and media may all interface with EMS in an emergent way. While there is no way to plan the location where a disaster will strike and to cover all possible situations, planning organizations should broaden the definitional parameters of potential EMS deliverers to effect better coordination and cooperation.

Few communities have developed an EMS system to a high level of efficiency, and until this is accomplished, the philosophy that disasters are an extension of day-to-day EMS cannot be fairly evaluated. A full development of the concept of systemness with its goal of an effective and efficient delivery of EMS may go far in coping with disasters but may not eliminate the typical "snafus" we have described unless these differences are not only recognized, but also incorporated into planning.

# References

1975

*Emergency Medical Services Systems*:
Program Guidelines, Division of
Emergency Medical Services, Health
Services Administration, DHEW,
Rockville, MD.

J. Clifford Findeiss, M. D.
editor
1974

*Emergency Medical Care*, Intercontinental Medical Book Corp., New
York, Chapter IV.

E. L. Quarantelli
1970

"The Community General Hospital:
Its Immediate Problems in Disasters",
*American Behavioral Scientist*;
13, No. 3 (Jan.-Feb. 1970):380-391.

Robert A. Stallings
1970

"Hospital Adaptations to Disaster:
Flow Models of Intensive Technologies", *Human Organization*; 29,
No. 4 (Winter 1970): 294-302.

Verta Taylor
1974

"Hospital Emergency Facilities in
a Disaster: An Analysis of Organizational Adaptation to Stress",
Disaster Research Center Preliminary Paper 11, Feb. 1974, rev.
April, 1974.