

UNIVERSITY OF DELAWARE  
DISASTER RESEARCH CENTER

PRELIMINARY PAPER #32

EMS DELIVERY IN DISASTERS\*

Verta A. Taylor  
and  
Russell R. Dynes

\*This paper was presented at The Emergency Medical Services Bicentennial Meeting, Baltimore, Maryland, May 10-12, 1976.

The Disaster Research Center (DRC) at The Ohio State University is conducting a systematic and comparative study of the delivery of emergency medical services (EMS) in large-scale and relatively sudden mass casualty producing situations in the United States. The objective of the research is to establish the nature and parameters of the conditions for, characteristics of, and consequences from the efforts to provide EMS in turbulent social environments such as natural and technological disasters and other catastrophic crisis situations with many victims. The core of the study involves intensive and extensive field work on community health care delivery systems in localities involved in disasters and similar events, as well as on systems likely to have to handle or at least to have to prepare to handle high potential mass casualty events.

Thus, the field work involves an examination in given localities of all components in the EMS complex of hospitals, ambulance services, fire-police and other victim transporting organizations present in a disaster area. Data are primarily obtained (1) through in-depth, mostly open-ended interviews with key EMS officials as well as operational personnel at different levels of the EMS system or network, and (2) through the collecting of documentary and statistical information on the receivers and providers of EMS services. Pre-disaster as well as trans- and some post-disaster data are obtained to the extent possible.

Field studies are conducted not only in actual and threatened disaster situations (such as tornadoes, floods, explosions, transportation crashes, etc.) but also at events with mass casualty potentials (such as during the Mardi Gras in New Orleans, the Kentucky Derby, etc.) as well as in some of the known, more high disaster prone localities in the United States (such as Los Angeles, Omaha, etc.).

So far, the study in its first 11 months has gone through the initial two phases.

Phase I has involved (besides the training of a field team and preparation of field instruments) four subtasks:

1. An examination of the relatively recent disaster-relevant EMS planning literature, whether so designated or not;
2. A very detailed, in-depth case study using previously gathered data on the handling of hundreds of casualties in one major tornado disaster;
3. An intensive reanalysis of all previous hospital/medical area studies undertaken by DRC -- this reanalysis involves hundreds of primary interviews and dozens of documents; and
4. The development of an overall theoretical framework for purposes of guiding the research and to allow for the drawing of practical implications.

Overall, this work covering about a four month period suggests the following.

Exceptions can be found, but the current disaster-relevant EMS literature is almost useless for planning purposes in connection with

mass casualty situations; it is generally very limited and selective in coverage, has an administrative focus or bias, ignores many real operational problems, and rests in the main on impressions derived from single case anecdotal accounts.

The intensive case study does indicate that there are certain conditions that facilitate a fairly efficient and effective EMS handling of very large numbers of casualties. These conditions are not beyond a planning effort.

This point is supported by the DRC data reanalysis which further indicates that particular factors may contribute to a viable EMS disaster response, e.g., preplanned interhospital links, understood relationships between ambulance services and police-fire departments, pre-disaster professional ties between key EMS system personnel, and clear organizational division of labor in processing victims, to mention but a few factors that appear to be important.

Partly as a result of the work done on the three just mentioned subtasks, DRC has been able to develop a framework that not only utilizes an open-systems model for looking at EMS but relates it also to a network or unit linkage model.

What has been discussed so far involves the already concluded Phase I of the work. Phase II, which has been underway for seven months, however, comes closer to the basic thrust of the study; it involves the conducting of pilot, exploratory and some actual comparative field studies. So far field work has been undertaken or is underway in 21 situations; 13 disaster-like incidents, five pre-disaster settings, and three potential high casualty producing events.

The following are some preliminary field work impressions from the field work, but to which exceptions can sometimes be found in given cases.

1. Few localities and their health care systems have undertaken realistic and overall planning for handling large numbers of casualties; most assume the everyday EMS system can be extended to larger scale events even though there are qualitative as well as quantitative differences between disaster and everyday operations (e.g., Routine EMS operations are designed in the main to meet specialized problems such as cardiac cases, multiple trauma cases as in auto accidents, etc.) as well as the fact that daily EMS operations are seldom models of efficiency or effectiveness.

2. There is widespread lack of basic knowledge about the overall EMS system in almost all communities even within components of the EMS system itself; only a few officials even recognize this as a problem and even those are uncertain on how to go about diffusing greater knowledge.

3. Political considerations enter into all aspects of EMS planning and response even in disasters, with city/county and public/private

splits almost universal, with little understanding by anyone that such process variables may be more important than input resource variables in affecting the development of disaster planning or disaster responses.

4. Almost without exception, lack of coordination among those providing EMS in disasters prevails even in situations where there has been considerable planning; this may be related to the tendency to think of coordination primarily in communication and transportation terms.

5. Poor inter- and intraorganizational communication appears to be almost as serious a problem as coordination of EMS in disasters, although seldom because of a lack of communication facilities per se; in fact, there is a failure to understand that some technological solutions may actually compound organizational problems.

6. By most relevant criteria, the extrication and transportation of disaster victims is generally very poorly handled and appears at times to contribute to additional medical damage; in part this stems from the general tendency of initial victims to be found and moved by non-medically trained personnel.

7. Meaningful triage is seldom attempted in actual disaster situations although some on-site treatment in pre-planned situations indicate its value.

8. In certain situations, casualties are treated and admitted simply because they were persons involved in a disaster, and not because of the severity of injuries they have suffered; this lack of discrimination with respect to walking wounded is at the cost of attention to more critical care patients.

9. The frequent lack of implementation on an everyday basis of standardized patient record keeping, one of the 15 EMS components, makes it difficult for EMS personnel to observe the different EMS demands in a disaster situation.

10. In some instances, care being given to regular hospital patients falls below acceptable standards because of the attention given to providing EMS to disaster victims; few hospital disaster plans take this possibility into account.

11. Regular evaluation measures such as output measures, e.g., population mortality rates, do not lend themselves to disaster purposes; more relevant criteria need to be developed.

12. Few EMS systems have any institutionalized mechanisms for learning from disaster experiences, and at present there are also few ways for learning from the experiences of others.

Even the preliminary analysis and observations indicate that disaster related EMS planning is inadequate, that planners for these kinds of EMS activities have no body of systematic knowledge upon which to draw, and that EMS responses in disasters are only occasionally effective and seldom efficient. They also indicate that there are widespread misconceptions in the EMS area about human and organizational actions in disasters,

that EMS system disaster experiences infrequently lead to learning, and that the existence of an EMS system is often a myth rather than a reality.

On the other hand, there are some positive factors at play that should not be ignored. Here and there in different EMS systems, key officials and operational personnel both recognize the major problems and are attempting innovative solutions. Some of the crucial variables impeding improvements are now also becoming clearer, for example, that disaster planning and response should be recognized as a certain kind of specialized problem, that disaster planning--one of the 15 EMS components--might lead to greater interaction among cooperating units so as to balance the conflict and competition that hospital categorization tends otherwise to engender, etc. Finally, in the research so far conducted, the evidence is that most of the disaster related problems in the EMS area appear solvable by appropriate system and organizational planning, not requiring major financial expenditures, massive reorganization or the creation of a new technology.

Suggested Readings

Dynes, Russell. Organized Behavior in Disaster, 236 pp. Disaster Research Center, Columbus, Ohio, 1975.

Quarantelli, E. L. The Community General Hospital: Its Immediate Problems in Disasters, American Behavioral Scientist, 13: 300-391, 1970.

Stallings, Robert A. Hospital Adaptations to Disaster: Flow Models of Intensive Technologies, Human Organization, 29: 294-302, 1970.