

## A BACKGROUND NOTE ON THE PRELIMINARY FINDINGS AND IMPRESSIONS OF THE DRC STUDIES\*

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Late in 1974, the Disaster Research Center (DRC) proposed a study of the delivery of emergency medical services (EMS) in large scale disasters in the United States. The objective of the research was to establish the nature and parameters of the characteristics of, conditions for, and consequences from the efforts to provide EMS in catastrophes and major stress situations. This study was seen as involving intensive and extensive field work on community health care systems. The empirically based findings were perceived as having important implications for general EMS training and education and as suggesting guidelines for the planning of the organization and delivery of disaster-related EMS.

In May, 1975, funds were awarded by the Health Resources Administration of the United States Health, Education and Welfare Department to initiate a two-year study beginning on June 1, 1975. At the time of the publication of this article, this research will be terminating a four-month extension of the work having been granted. What follows is a general discussion of the overall study, indicating something of the theoretical, methodological and substantive backgrounds of the DRC research.

Since the study was the first of its kind ever undertaken, there were few guidelines to follow in developing a research design. For example, even what theoretical frameworks ought to be brought to bear was initially unclear. The attempt to test any explanatory theory about the conditions affecting the delivery of EMS services in disasters was considerably handicapped by the almost total absence in mid-1975 of any factual knowledge about the sheer characteristics of the phenomena. Who participated in the delivery of disaster-related EMS, when and how they got involved, what they did and similar kinds of questions, lacked any kinds of answers. Thus, it was necessary to obtain the simplest kind of information to even begin to be able to characterize typical and atypical features of EMS in disaster situations.

From a methodological point of view, it was possible at first to conjure up all kinds of data which ideally ought to be collected. But realism quickly imposed itself on the DRC research when very early it was discovered, for example, that few hospitals had adequate enough record keeping procedures to provide very accurate or detailed information about their intake of patients in normal everyday EMS operations, let alone during the stress of a disaster when, frequently, all pretense of patient intake record keeping is generally abandoned. This eventually led DRC to design,

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reproduce and provide a standardized emergency patient intake record form for one major American city so that all the hospitals in the community could collect this most elementary data for their own internal everyday use, as well as for DRC research objectives.

Substantively, too, decisions had to be made about whether certain assumptions about EMS were warranted and what should be emphasized in the data observations and gathering. For example, DRC initially assumed that some kind of local EMS *system* existed in the communities studied, but it quickly became clear that the existence of any kind of social arrangement constituting something that could be called a *system* had to be treated as problematic and had to be established in each instance, rather than be taken as a given in all situations. It was also soon obvious, to cite another example, that our initial objective to establish the consequences or outcomes of the delivery of disaster-related EMS services had to take second place to the depiction and clarification of the actual system processes involved in attempting to provide EMS in disasters. For the most part, EMS research has so far failed to contribute even good systematic descriptions of the social processes which take place within the EMS system operating under day-to-day conditions, let alone how these may alter in time of disasters.

None of the indicated theoretical, methodological or substantive problems were easy to solve in the real world context of disaster responses in which the DRC research was undertaken. Some of the problems were never totally satisfactorily solved; for instance, what to use as a good indicator for the quality of the EMS care provided. Such advocated measures as response time seemed dubious in light of the field discovery that in mass casualty situations, the less seriously injured typically received treatment before more seriously injured victims. On the other hand, acceptable, if not perfect, solutions were evolved for other problems. For instance, instead of attempting any kind of systematic sampling, it

was found a “snowball” technique of tracing down informants frequently allowed DRC to locate all the major groups and agencies involved in the transport of most victims to hospitals.

It is not the purpose of this paper to present research findings, since this is done in the five papers which follow. Rather, it is to discuss in more detail some of the steps taken and decisions made during the course of the DRC research which might be useful as a background context for understanding the empirical observations set forth. What follows is a description of some of the more salient aspects from the start of the DRC study to its current phasing out.

After an extensive review of prior DRC work in the health-medical area and the existing literature on everyday EMS, an early decision was made in the course of the DRC research effort to use an open system theoretical perspective. This required the obtaining of information from multiple sources within and outside a variety of local EMS “systems”; in all, about four dozen different community systems were studied. In almost all events studied by DRC, it was standard to interview personnel from all hospitals, ambulance services, fire and police departments, and whatever other agencies might be involved in the finding, transport and initial treatment of actual or potential mass casualty victims. More than 1,000 interviews were obtained, most with operational personnel, such as the particular ambulance drivers and emergency room nurses involved in the crisis situation, although pre-designated key decision makers, such as hospital administrators and disaster committee chairpersons were also automatically contacted. The refusal rate was less than 5 percent in the total study.

Similar, open-ended but semi-structured, interview guides which tapped system and behavioral dimensions were used in almost all the events examined. A consequence of this was that in practically all the disaster events covered, it was possible to reconstruct how the

vast majority of casualties who reached hospitals were found, transported and generally treated in the process of being given EMS. Concurrently, standard information was routinely obtained about such matters as overall community disaster plans, interorganizational linkages, agency experiences with mass emergencies and other factors which might affect the effectiveness and efficiency of EMS responses in mass emergencies. Overall, then, the quantity and quality of the data DRC obtained was such as to allow, in the final phase of the research, a significant testing of the applicability of the open systems model to the delivery of EMS in disasters.

Of course, what is important about the open system perspective is that it implies that there is some sort of whole whose components have to adjust to one another, to the whole and to the environment of both. But, as it is currently used in the social sciences, open or general systems theory is not as much a theory as it is an analytical perspective or dynamic model, providing general concepts and processes by which to depict and analyze social behavior. To apply the perspective, and for this theory to have explanatory power, substantive theories and concepts must be derived which are relevant to the phenomena being analyzed. The derivation of these substantive elements and the specification of relationships between them was, in fact, a major objective of our research.

The following five research articles indicate some of the specific dimensions or substantive concepts of the open system model which was applied in our research. However, these papers are substantive pieces which deal with specific questions and problems in disaster EMS delivery rather than with the overall problem of the response of open systems to stressful environments. Therefore, they only implicitly convey the overall theoretical model of service delivery on which the DRC research was based. An explicit formulation and depiction of the open systems model used by DRC is set forth in an upcoming DRC publication. Thus, while each of these five research articles is written to be

able to be read of its own, each will undoubtedly be more understandable when its basic theoretical underpinnings are made more explicit.

At present, systematic and quantitative analyses of the data gathered are being undertaken. For example, 16–20 major disasters studied are being systematically compared with respect to a series of practical and theoretical system variables on which DRC has standardized data. A coding scheme is being used to quantify and analyze such general dimensions as hospital response, transportation response, transportation modes, disaster site data, non-hospital medical response, previous disaster experience, general community EMS information, history of EMS in the community, centralization and specialization of EMS response, and relevant inter-organizational communications and other linkages. With each general category, other more specific information is being quantified and analyzed. As only one example, key variables influencing hospital responses are being coded and quantified. Among these categories are: *disaster plan* (e.g., existence, activation, termination, etc.); *casualties* (e.g., total, nature of injuries, admitted, transfers, DOA's, etc.); *patient flow* (e.g., duration, modes, first arrivals, most serious arrivals, mode of arrivals, numbers arriving by different means, etc.); *hospital notification* (e.g., how, content of message, information from disaster site, etc.); *disaster impact on hospital* (e.g., loss of different utilities, damage to hospital, necessity of evacuation, etc.); *adequacy of resources* (e.g., personnel, equipment, supplies, etc.); *change in hospital activities* (e.g., record keeping, surgery, X-rays, counseling, security, communications, medical diagnoses, etc.); *hospital characteristics* (e.g., relationship to disaster site, location, occupancy rate, categorization, funding source, etc.); and *emergency room characteristics* (e.g., staffing, communications, shifts, etc.).

Because of the importance of certain of the findings and their implications for EMS planning, a decision was made not to await the

final quantitative data analyses before reporting some of the results. Many of the observations reported in the following five articles are therefore based, for the most part, on initial qualitative impressions and limited quantitative analyses. Nevertheless, it is not anticipated that the final reports of the research will differ substantially from what is reported in the five articles in this journal. The only difference will be that the later observations will be rooted in much more systematically analyzed and quantified data.

The importance of publishing preliminary findings also means that only part of the data gathered in the DRC 29-month study could be used for the five research articles in this issue. The final reports on the work will include analyses of the full body and range of the data obtained. Again, it is not anticipated that the initial substantive impressions reported in this journal issue will be materially altered in the final reports, but a broader range of topics and questions regarding EMS in disasters will be addressed than it was possible to examine in just five articles.

As already noted, the basic open system theoretical model used in the research will be fully set forth. In addition, in an attempt to convey the flavor of EMS in stress situations, several detailed case studies are being prepared. One, for example, is of a single hospital in a massive disaster, and another compares EMS preparations in two events with very high potential for disasters. Still other papers will address such topics as "A methodology for evaluating disaster-related EMS" and "Factors affecting the distribution of victims in mass casualty situations."

Other studies will have to be undertaken before it will be possible to arrive at a conclusive judgment as to both the scientific merits and policy implications of the overall worth of the DRC work on EMS in disasters. However, the DRC research, whatever the ultimate judgment, would seem already to have three important accomplishments. First, the work shows that it is possible to go beyond the pure-

ly descriptive case study approach, which was almost the only disaster-related kind of EMS research undertaken up to a few years ago. By using a theoretical framework and systematic data gathering procedures to study a variety of mass casualty situations, general findings and observations applicable to the generic problem of EMS in disasters were obtained. Second, the DRC work was a pioneering effort of its kind. Future studies, therefore, instead of starting at ground zero, will be able to build upon its substantive findings and observations and to learn from its successful and unsuccessful methodological procedures and theoretical ideas. Third, and perhaps more crucial, the DRC work raises some fundamental questions about basic assumptions which underlie planning and thinking about disasters in most of the EMS sector of the health community in American society. If any of the major substantive themes of the DRC studies reported in this journal issue are valid, serious thought will have to be given to a major policy reassessment of the whole question of providing EMS services in disasters and other kinds of mass casualty situations.