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A Study of the Characteristics Affecting Organizational Behavior of Nursing Homes and Related Home Care Facilities During Emergency Evacuations

Barbara Muller Vogt
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To the Graduate Council:

I am submitting herewith a dissertation written by Barbara Muller Vogt entitled "A Study of the Characteristics Affecting Organizational Behavior of Nursing Homes and Related Home Care Facilities During Emergency Evacuations." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Sociology.

Donald R. Ploch, Major Professor

We have read this dissertation and recommend its acceptance:

Donald Hastings, Suzanne Kurth, Charles Cleland

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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A STUDY OF THE CHARACTERISTICS AFFECTING ORGANIZATIONAL BEHAVIOR OF NURSING HOMES AND RELATED HOME CARE FACILITIES DURING EMERGENCY EVACUATIONS

A Dissertation

Presented for the

Doctor of Philosophy

Degree

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Barbara Muller Vogt

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This work is dedicated to J.S.

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ABSTRACT

Both emergency planners and disaster researchers cite the lack of empirical data on the problems and needs of special populations during emergency evacuations. Although most evacuations of nursing homes and related care facilities are carried out successfully, the effectiveness of an evacuation (as measured by time to evacuate) appears limited by certain constraints. Among the factors affecting such evacuations are resources (such as the number of staff available at the time of the evacuation), type and number of clients, and community characteristics such as population density. This study describes selected organizational characteristics of nursing homes and related care facilities which have recently experienced either a partial or complete evacuation of their facilities. After discussing the theoretical aspects of organizations in evacuations and the methodology used for the study, the study discusses both the quantitative and qualitative factors affecting organizational behavior during evacuation.

It is evident from the findings that the continuity of responsible care for clients is of critical concern to both management and staff during an evacuation. The findings suggest that individuals within specialized populations are unlike other disaster victims and may require different management strategies on the part of agencies assisting in the evacuation.

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CHAPTER I

INTRODUCTION

Background of the Study

Sociologists have researched crisis situations, including emergency evacuations, as a means of understanding how changes in social behavior come about. Merton (1970:xxv) notes that whereas chronic stress situations, such as the plight of the homeless, are largely ignored by the public because of the social form's invisibility, disasters are events that are highly visible and can thus provide impetus for discerning social processes that might otherwise remain hidden. By examining the adaptive behavior of social groups and organizations coping with an emergency, we can determine how group performances are maintained or altered to cope with the evacuation. An examination of organizational behavior during emergencies also extends our knowledge of the unrecognized or hidden dimensions of organizational structures that influence change.

Disasters and crisis events that instigate evacuations will continue to occur in the future but our response to them can be made more effective with an improved and extended base (Drabek, 1986:319). Once the effects that result from the consequences of an emergency are known, it becomes possible to plan meaningfully for disastrous events (Quarantelli, 1985).

Reviews of evacuation studies cite the need for more detailed and systematic investigations of evacuation behavior of institutionalized populations (Quarantelli, 1980; Drabek, 1986). Aside from a few specific studies (Stallings, 1975; Blanshaw, 1975) and anecdotal observations (Marks and Fritz, 1954; Rosow, 1955; Taylor, Zurcher, and Key, 1970) social scientists have generally overlooked the behaviors and problems of organizations that result when either a partial or total evacuation occurs at a specialized facility (Drabek, 1986; Vogt and Sorensen, 1985). This omission follows from a concentration on individual, not organizational, behavior patterns observed in hazardous situations. These patterns are reflected in the concentration on individual case studies.

Research Objectives

Since few studies have examined the behavior of organizations in the health care field during an evacuation (Drabek, 1986), this study adds to the general body of knowledge on evacuations by examining those social processes that occur when nursing homes and related home care facilities (housing clients needing chronic or supervisory care) evacuate because of a threat.

The goal of this research is to identify the social factors, including the constraints and facilitators, that influence organizational responses to emergencies which result in evacuations of facilities housing special populations. Included in the social factors are those elements of emergency management techniques and strategies which influence the effectiveness of organizational coping behavior.

By examining the behavioral factors influencing the performance of organizations during evacuation, the study provides a baseline for future work on specialized or institutionalized populations and a framework that may be used to make sound policy decisions both by emergency managers and organizations about evacuations.

Conceptual Framework

Figure 1 presents a conceptual framework identifying the relationships between the organizations and factors affecting the evacuation experience in this study. Characteristics of the community and the organization as well as the threat itself play interlocking roles when a hazardous event forces an evacuation. The conceptual framework is adapted from Quarantelli's macro-level model of evacuation behavior for a community threat (1980). The model states that the threatened community (in this case, the immediate environment of the specialized facility) provides a context for the disaster threat and subsequent impact, the context includes capabilities and resources, social linkages, and the prevailing social climate both within and external to the organization (Quarantelli, 1980:24). Thus, five factors are significant predictors of response to threat (Quarantelli, 1980):

1. resources
2. social climate
3. social linkages
4. extracommunity setting
5. threat.

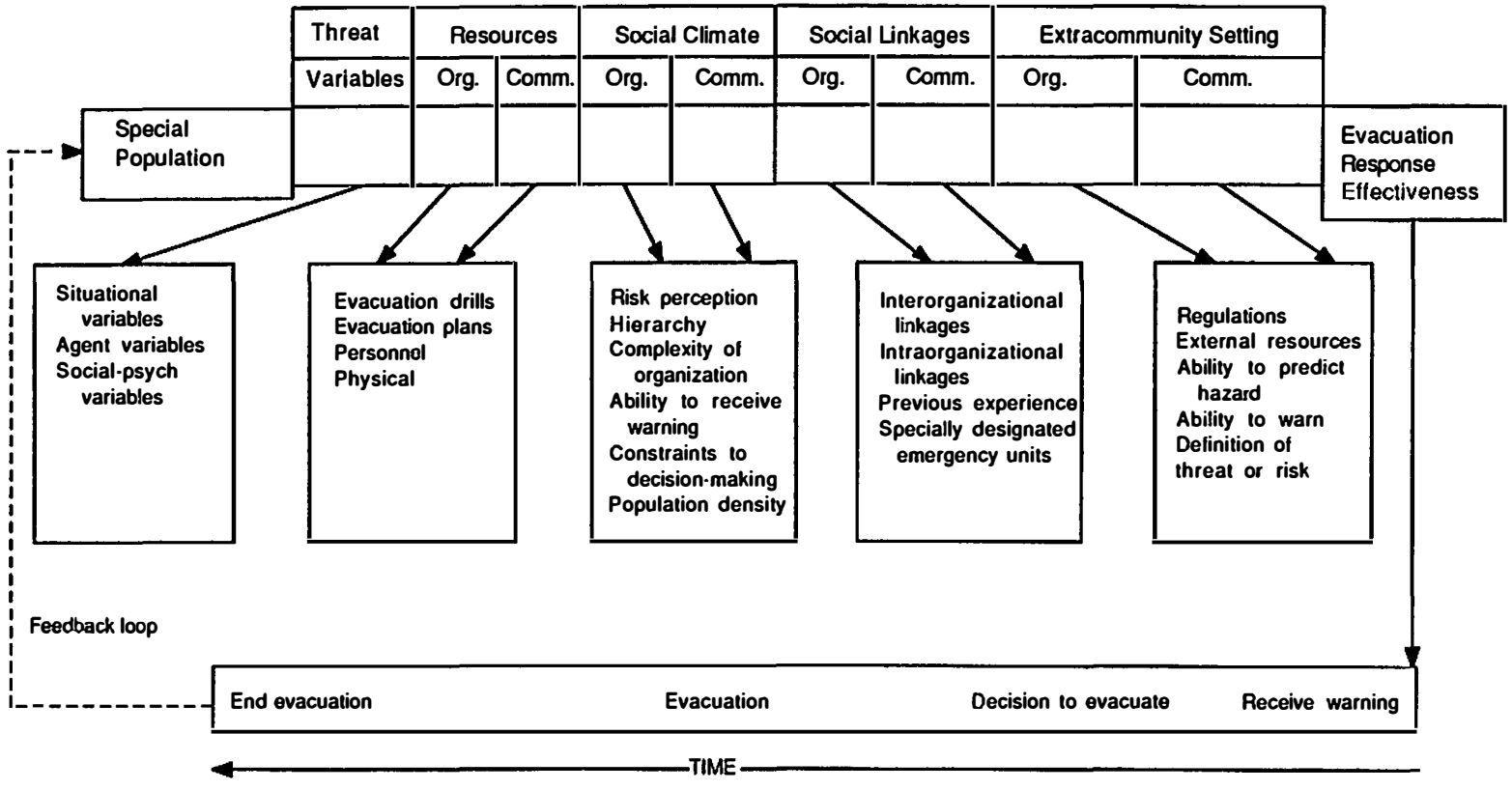

Figure 1. Analytic Framework

These factors influence performances of personnel within the organization and predict both the time to evacuate and the evacuation rate per person. The post-impact, or recovery phase, of an evacuation is noted as a feedback loop of the framework but is not critical to this study. During the recovery period, the overriding concern for most health care facilities is returning to "the old routine" (Blanshaw, 1978:178).

The study will concentrate on organizations rather than the community, because organizations, for example nursing homes, are directly responsible for evacuating special populations. The effects of the larger community on evacuation will be seen only through the eyes of the organization's managers.

Several aspects make the study of organizations caring for specialized populations significant for sociological study. The first aspect has to do with organizational performance in an emergency. Organizations must perform adequately to maintain legitimacy and survive as a social unit. Performance is especially critical when the health and safety of client population is involved.

The effectiveness of organizational behavior in an emergency is the degree to which an organization performs the desired outcomes, depending on the preferences of the constituencies or other interested parties (Zammuto, 1982). Within that framework, the performance of individual organizations can be examined and patterns among organizations can be analyzed for similarities and discrepancies.

Resources include both labor and material supplies an organization can use quickly in emergencies. Compared to individual evacuees, members of specialized groups require more resources to cope with an emergency because of their particular needs and constraints. The number of persons available to assist in an emergency may be as important as the level of preparedness in responding to an emergency. Determining the resources used during an emergency aids the understanding of evacuation needs.

The social climate, or environment in which the event occurs, influences the performance of the organization in meeting the demands of the threat. The context in which the threat occurs has certain situational factors specific to the event such as the time of day, the season of the year, and the number of people at the site at the time of the threat. For example, seasonality is critical to an evacuation study when the population of a community changes dramatically because of the influx of tourists and emergency plans are based on normal population size. Likewise, the number and type of clients at a facility at the time of the threat influence the demands on staff during the evacuation.

Social linkages, or the relationships between the organization and external agencies, form social networks which bind individuals and organizations to the collectivity, or community at large. Even for highly controlled facilities such as prisons or health care facilities with mentally incompetent or resistive individuals, the necessary backup and specially trained emergency workers, such as

fire or police personnel, generally come from outside the facility to aid the organization. By determining these linkages we can better understand adaptive behavior of organizations in coping with their environments during stressful events.

The capabilities of the local community and the specialized facility organization are further influenced by the "extracommunity" (or larger society) in the definition and response to the threat. For example, the ability to detect unusual or hazardous weather patterns is generally the responsibility of the National Weather Service (NWS), a federal agency, but the reception and transmission of that information to the directly affected populations is generally a state or community function involving a variety of social linkages. How an organization learns of the threat and acts (or does not act) on that information is determined within the organization. Since this study is limited to evacuations of specialized populations and not to entire communities, discussion of the extracommunity will include only factors pertaining directly to those facilities, such as experiences with quasi-public agencies such as the Red Cross.

Critical characteristics of the threat creating the stress on the organizational structure include (1) the specific type of agent creating the threat, and (2) the situational factors at the time of the crisis. Together with the organizational context, these characteristics generate certain social processes which emerge as the emergency occurs over time. The type of agent affects organizational processes by the magnitude of the threat, by degree of impact

of threat and by the intensity of the threat. For example, the degree of certainty that a threat will place the clients at risk affects preparedness actions, especially in the time it takes to make the decision to evacuate the facility.

Practical Considerations

A clear indicator of the need for research on nursing home populations is the "aging" of the American population. An aging population refers to the increase in the ratio of elderly persons--generally 65 and older--to the number of younger persons. The trend has been documented by the U.S. Bureau of the Census.

> In the U.S., the numbers of persons aged 65 and over rose from 16.6 million in the 1960 census to 25.5 million in 1980. The most dramatic increase in the population is variously termed "oldest old" or "extreme aged," arbitrarily defined as aged 85 and above. Whereas there were 0.9 million persons 85 years or older in 1960, by 1980 there were fully 2.2 million. Moreover in each decade since 1940, the population aged 85 years and older has increased by more than 50%, a rate of growth far in excess of that of the total population 65 years or above for a similar period. [It is] also significant to observe that [the] proportion of the elderly who were over 85 remained at 40% between 1900-1940. The percentage has increased at each census since 1940, reaching 8.8% in 1980 (Suzman and Riley, 1985:179).

The trend appears likely to continue at least until the year 2020. The middle series projected by the U.S. Census Bureau shows the population aged 85 and above doubling between 1980 and 2000 and reaching 14.1% of the total aged at a later date (Manton and Soldo, 1985; Suzman and Riley, 1985; Rosenwaike and Dolinsky, 1987). This increase means that a growing setment of the American population will

likely require the services of nursing homes and/or related home care facilities.

Within nursing homes and related care facilities the population will have a larger proportion of the very old. This "graying" of nursing home populations was reported by the National Center for Health Statistics (NCHS) (1987). In 1977, 40% of the residents were over 85; by 1985 that proportion had risen to 45%. This increase in the number of older persons (the "old old") raises two relevant issues for nursing home organizations and emergency personnel. The first issue involves resources. Management of nursing homes and related health care facilities will require more physical services during evacuations because of diminished physical capacities of even more elderly clients. Secondly, nursing home and responding emergency personnel can expect a greater percentage of "resistive" clients due to impaired cognitive functions among the very old.

Overview of Dissertation

The dissertation is divided into five chapters followed by the appendices. Chapter II presents the relevant theoretical and empirical problems in the research literature about evacuations, particularly those that have involved chronic and acute health care facilities.

Chapter III describes the methods of data collection, the population available for study, the operationalization of concepts and how the interview schedule examined those concepts.

Chapter IV describes the characteristics of the non-response group, provides a univariate analysis of selected variables and

discusses the findings as related to the hypotheses.

Chapter V discusses implications for emergency management policies and the need for future research.

The appendices include a list of abbreviations used in the text, the interview schedule, the letter sent to administrators introducing the study, a sample coding form used to analyze the evacuation articles, and the evacuation model results.

CHAPTER II

THEORETICAL PERSPECTIVES ON EVACUATION

The literature relevant to the sociological study of evacuations of specialized populations can be divided into three general categories: (1) the sociological literature which deals with evacuation as a social process, (2) the literature which deals with evacuations of threatened institutions such as nursing homes and other health care institutions (including the sociological literature about evacuation behavior and findings); (3) the organizational literature that describes organizational behavior and strategies in crisis situations including the literature dealing with evacuation strategies of health and related care facilities. Work consisting of attitudes and behavioral intent case studies is not relevant to the dissertation and is not discussed.

Investigating Emergency Responses

Over the past several decades researchers have investigated behavioral response to emergencies that arise from either natural or human-induced threats. In 1920, Samuel Prince was the first sociologist to study individual behavior in a disaster. The subject of his study was the 1917 explosion of a ship carrying munitions in Halifax (Canada) harbor. Prince wanted to know how normative patterns of social interaction were adapted to fit crisis situations and bring about social change. Included in his descriptions of group behavior

following the explosion was the process of recovery in the disaster stricken community. As a result of his observations, the concept of therapeutic community was developed. This concept of a community response would be repeated as a central theme in almost every early study of disasters (Barton, 1970:207; Cornell, 1976:257; Drabek, 1986).

Two decades later, Sorokin (1942) examined the major consequences of societal disasters such as war, famine, disease and pestilence. Sorokin advocated the study of disasters for insight into general or everyday social processes (Dynes and Pelanda, 1987).

In Communities in Disaster, Allen Barton (1969) attempted to integrate the diverse findings of sociological research about community disasters. With the use of a collective behavior perspective, Barton organized his findings as responses to "collective stress situations" which occur "when many members of a social system fail to receive expected conditions of life from the system (Barton, 1969:38). Examining the factors which influenced both individual and community organizational behavior, Barton argued that an emergency social system, like any other social system, has the problem of organizing human behavior. When a system is stressed basic social processes are accelerated. Characteristics which emerge under stress are hidden or latent until the emergency occurs. By studying the patterns of response to stress situations, sociologists can better understand overall social behavior.

Disasters are stressful events which draw on extraordinary resources from individuals or communities to cope with the disruption

to social life. Disasters constitute a major category of "collective stress situations" (Barton, 1969:38). The collective stress may be limited to only small systems or may occur only to a small unit within the system as a result of stress to a larger system. The effect of stress on a smaller system or unit may be entirely different from stress on the larger system, depending on the isolation or linkages to the larger system (Barton, 1969). How stress from a threat is handled by the system will vary according to the scope of impact of the threat, the speed of onset of the threat, the duration of impact of the threat and the preparedness of the social unit (Barton, 1969). Although not all disasters result in evacuations, most disasters in the United States force some or all of the populations at risk to evacuate for a period of time.

The proposition that normative behavior continues to operate in a disaster remains strong in the literature (Drabek, 1986:158). A principle of continuity pervades a disaster with little or no change in norms or behavior. Quarantelli and Dynes state, "[A] disaster does not initiate major changes" (1977:34). If officials are effective prior to an event, then they are likely to be perceived as effective during a crisis--or similarly, as ineffective. Post-disaster behavioral change likely involves pre-disaster trends that were already in place in community (Quarantelli and Dynes, 1977:35). Yet many of the disaster myths about panic and immobility of victims remain strong in public perceptions of disasters (Wenger, James, and Faupel, 1980).

The collective behavior model required shifting from stimulus-response reactive models in which evacuees were viewed as passive respondents to the event to pro-active models which recognized evacuees as active participants in the evacuation process. Officials and observers with field experience questioned the stimulus-response model because moving persons out of danger was more than a matter of issuing correct warnings and making sure people received the correct information. Most scholars in evacuation research now acknowledge that people follow general norms of behavior--such as accounting for kin before evacuating, confirming the threat, or waiting for more information before making a decision as to the appropriate action (Perry, 1979b; Drabek, 1987).

Turner and Killian (1972) suggested that crowd behavior was not homogeneous initially but became more similar as norms emerged through group interaction. They held that behavior followed general normative patterns that may have been latent prior to the event. Behavioral norms emerge as the event unfolds (Quarantelli and Dynes, 1977). On different occasions, crowds will respond very differently to a similar event. Gillipsie (1986) has suggested that emergent norm theory may help explain why crowds with similar resources in similar emergency situations behave very differently from one another. The argument is that a number of norms are dormant and behavior that becomes evident is specific to the event in both time and place.

One source of variation in the pool of dormant norms in disaster behavior is differences in cultural background and ethnicity of

individuals involved (Turner and Nigg, 1979; Perry and Mushkatel, 1987). For example, prescribed behavior on Caribbean islands during hurricanes involves sheltering in concrete buildings and not evacuating. When islanders immigrate to the southern United States, assumptions about seeking shelter may travel with them (Nigg, 1985).

Finally, disasters are events with both functional and dysfunctional consequences. The strengthening of family ties has been reported in individual case studies. More effective planning activities between emergency agencies and organizations also result from the disaster experience. On the other hand, some major disasters have significantly disrupted community life to the point of dissolution (Erickson, 1976).

Definition of Evacuation

Evacuation of any population for any reason implies disruption of social life and normal routines. Evacuations are instituted for a variety of reasons during various times of the day or night and may be of short or long duration. Timing affects response because routines are more easily disturbed when minimum staff are available or when clients are otherwise occupied, for example, sleeping or eating. Following Quarantelli (1980:10) evacuation is defined as "the mass movement of people, of a temporary nature, that collectively emerges in coping with community threats, damages or disruptions." Using this collective perspective, Quarantelli notes that evacuation is "primarily a community level phenomena generally organized around a locally integrated social entity such as town or city." Quarantelli argues that conceptually an evacuation includes a return trip as well

as initial withdrawal and an evacuation should be considered as a "round-trip" event. However, Aquirre (1983) argues that theoretically the return is unnecessary because in some instances (e.g., severe and prolonged droughts), people evacuate until the hazard is gone, which may mean permanent relocation or withdrawal from the area. Evacuation (Aquirre, 1983) is a continuum with temporary shelter at one end and permanent withdrawal at the other. For this study, and for most emergency practitioners and researchers, the concept of a round-trip event appears more useful and better reflects the actual situation.

Several prominent features of evacuations can be underscored. First, evacuations may be required for either existing or potential threats. For example, evacuations are regularly carried out for bomb threats even if the bomb source (the threat) cannot be identified. Some evacuations are carried out for precautionary reasons before a situation turns hazardous. In some evacuations the threat never materializes, as in the case of hurricanes when a sudden change in wind direction changes the areas at risk by hundreds of miles.

A threat or hazard implies risk and risk has many dimensions. Of primary concern to this research is the sequence in which a threat is defined as a risk for the nursing home organizational management. This includes the timing of the event and the consequent decision-making about the protective actions regarding that risk. This dynamic feature of risk involves various interested parties at different times within the organizational decision-making structure. Such parties may have varying degrees of power and responsibilities

as well as conflicting preferences about what actions to take (Allison, 1971; Kunreuther and Ley, 1982:3). Decision-makers for evacuations of chronic care facilities include administrators or directors, first responders such as staff or maintenance personnel, or external responders such as fire or civil defense personnel.

Evacuations may be initiated through recommendations or orders of a local or state civil authority. Such recommendations often make an evacuation mandatory, at least for the clients of such organizations, whether the threat is perceived by the organizational management as necessitating an evacuation. Furthermore, emergency managers of both public and private organizations are charged with protecting the general public from dangers whether they stem from human-induced or natural hazards. Thus precautionary evacuations may be instituted for specialized populations even when a threat does not actually exist to present a risk to the population at large.

Recognition of Threat and Response

To initiate emergency response, an event must be defined as threatening to an individual or group. Of foremost concern to this research is the sequential nature of defining an event as a threat to the organization. The definition of a threat involves various interested parties within the organizational decision-making structure. Such parties may have varying degrees of power and responsibilities as well as conflicting preferences about what actions to take (Allison, 1971; Kunreuther and Ley, 1982:3). Decision-makers for evacuations for chronic care facilities include administrators

or directors, first responders such as staff or maintenance personnel, or external responders such as fire or civil defense personnel.

The elements of the response process consist of the interactions between the communicator, the communication mode and the warning content with the receiver (Drabek, 1986). Frequently the initial response is disbelief (Fritz and Mathewson, 1957; Moore et al., 1963; Drabek, 1969, 1986; Quarantelli, 1980; Perry et al., 1981). The determinant of an individual's first action after receiving a warning message has been found to be a function of the extent the message is believed and the associated first assessment of risk (Perry et al., 1981; Perry and Mushkatel, 1986). The warning response process may be conceptualized as a series of six independent but related steps:

1. Receive first message
2. Arrive at initial assessment of warning belief and personal risk
3. Undertake first action
4. Gather further information regarding threat
5. Arrive at final assessment of warning belief and risk including decision about protective action
6. Make final decision to ignore warning, comply with message contents if given, or adopt innovative alternate action.

(Adapted from Perry and Mushkatel, 1986:50-51.) Multiple warnings are frequently given and received by individuals about a hazardous situation (Perry and Mushkatel, 1986), with some messages providing inadequate or conflicting information.

When confronted with the unexpected, organizational systems initial responses--like individual processing--reflect long-standing normative guidelines to the threatening situation (Drabek, 1986:158). Thus the warning of a threat must be received by organizational personnel before decision-making can begin about the appropriate protective action.

Organizational Aspects

Three problems arose for researchers when groups, rather than individuals, were studied during crisis situations (Haas and Drabek, 1973). The first problem was how to examine emergency agencies whose organizational boundaries did not have the classic structure of organizations and institutions as identified in sociological theory since Max Weber. Such agencies included the Red Cross as well as the altruistic organizations like the Quakers who provide help in disasters. These groups did not have the typical constraint structures and other characteristics which define the limits of formal organizations (Haas and Drabek, 1973).

Secondly, the structure of the emergency organizations did not fit within organizational theory. Many of the organizations were very loosely structured without clear hierarchy. And thirdly, emergency situations tended to have a number of emergent groups whose members organized to perform specific tasks during the event but who dispersed afterwards once the demands were met. General organizational theory did not address such issues. Since the early 1980's, however, there has been a better meshing of collective behavior theories with

organizational theories from the study of emergent group activity during crisis events (Drabek, 1985).

Definition of Organization

Organizations are social units predominantly oriented toward the attainment of specific goals (Parsons, 1956; Etzioni and Lehman, 1980). An organization as a social unit is different from other social groups because as a group it exhibits certain bureaucratic characteristics in the attainment of goals (Parsons, 1956; Etzioni and Lehman, 1980:iii). Organizations vary as to the degree of formalization (Hall, 1987). Formalization represents the use of rules by the organization (Hage and Aiken, 1967:79) and influences the control an organization holds over the individual within the organization. In highly formalized organizations, there is strict adherence to procedures. With minimal formalization, members may be expected to use their own discretion in deciding what to do (Hall, 1987).

The degree of formalization also indicates how organizational decision-makers view the behavior of their members. Organizations dealing with human problems such as in mental health clinics are presented with unique situations in which precedents do not always exist. Although much work is routinized, new situations are frequently encountered which require ad hoc measures. Such situations exist for teachers, social workers, police officers, judges, lawyers and prison guards who need a great deal of discretion in carrying out their work in "street-level bureaucracies" (Lipsky, 1980:79, as found in Hall,

1987:74). The degree of variation that is tolerated within roles determines the degree or formalization within the organization (Hall, 1987).

To accomplish objectives, managers of organizations rely on rules rather than orders (Kahn, 1964) but not all rules are specifically articulated or written. For example, rules that govern actions of various professionals are seldom enunciated; this leads to necessary and continual negotiation among members of an organization (Strauss et al., 1963). Generally organizational rules function to reduce conflict rather than to remove the inherent tensions created within a bureaucratic environment (Gouldner, 1954). Thus, rules tend to ease communication among organizational members, provide leeway in gaining cooperation, and set general standards that can be applied to a number of situations. Rules can also provide justification for punishment or dismissal when specific procedures are not followed (Gouldner, 1954).

Organizations' Systems During Emergency Response

Drabek (1986) gives five general principles of response patterns of organizations that reflect both the quality and structure of the organization. First, routine emergency planning differs qualitatively for management of organizations planning for emergencies depending on whether or not plans for rare events such as disasters are included. Dynes and Aquirre (1979) noted that the structural conditions of the emergency make for uncertainty, diversity, decreased formalization and decentralization among organizations. Taken together these factors

increase communication and coordination among organizational personnel and sometimes between organizational systems during an emergency (Drabek, 1986:29). The lack of understanding of the particular demands an emergency imposes on personnel is reflected in organizational plans. In a comprehensive study of chemical emergencies, Quarantelli (1979) reported that chemical company executives generally viewed routine safety planning in the same vein as planning for disasters.

Second, role conflict among organizational personnel does not result in role abandonment, but in an increased tendency for persons to remain at work during the emergency. Third, the larger organizations are more likely to have disaster plans. Smaller organizations do not view themselves as subject to threat and thus are less interested in disaster planning either for themselves or with the community at large (Quarantelli, 1982). Resources for planning may be more available, or the consequences for not planning greater, given the larger size of an organization. Fourth, emergency agency officials can increase response of citizens by proposing adaptive actions rather than by emphasizing only the dangers of the risk or threat. Fifth, organizational officials have more insight into human responses to disasters than the general public does. Wenger et al. (1980) showed more officials (43 percent) were able to give correct answers on a general disaster knowledge scale than did the general public (29.5 percent) (Drabek, 1986:31).

Organizations as Total Institutions

Most organizations caring for specialized populations are regarded as total institutions, i.e., an institution whose rules encompass all the behavior of its members. Although every institution has encompassing tendencies, total institutions have almost total control over their clients (Goffman, 1957, 1961). This power is often symbolized by barriers to the outside that are built into the physical plant--locked doors, barbed wire--or through the less obvious use of increased geographical distance from other social life.

In a total institution there is a basic split between the large managed group of clients and the small supervisory staff. Each group tends to conceive of the other in terms of stereotypes which inhibit communication between the groups and which distances the staff from the clients. The labeling is important in examining emergency responses of the organizational staff and clients. Distancing provides staff members with a certain degree of power over the clients. Dependence of the clients through conditions resulting from infirmity, age, gender, or legal status augment this power.

The staff-client relationship has further implications in an emergency. In responding to an emergency, perceptions of threat are defined by the management and staff personnel, not by an individual client. Thus the responsibility for determining the threat rests with a small, elite group. The consequences of this aspect on emergency response have not been addressed in the literature.

Organizational Effectiveness

Organizational effectiveness is the extent to which an organization is able to attain its goals without jeopardizing its future material or organizational resources or long-range interests (Theodorson and Theodorson, 1969). Effectiveness as related to emergency procedures means that the primary goals or functions of the organization are not reduced or placed in danger during the response to a threat and that the organization survives the emergency.

Interorganizational effectiveness in responding to an event can be enhanced through preparedness (Mileti and Sorensen, 1987; Kartez and Lindell, 1987). The key determinant to maximal effectiveness is the specification of work roles during an emergency. The definition of roles facilitates participation of actors in the event without sacrificing personal and organizational costs. Moreover, in planning for low probability events, flexibility must be maintained to maximize coordination and enhance effectiveness (Mileti and Sorensen, 1987).

Deployment of resources by an organization in an emergency depends on whether there was an evacuation plan for the community prior to the crisis and whether the organization has its own evacuation plan (or plans). The question also arises about interorganizational coordination as a constraint to organizational effectiveness during a crisis situation (Drabek et al., 1981). For example, how does the facility, generally self-contained most of the time, coordinate with other organizations that may have to be used in an emergency? Emergency needs may encompass the help of fire personnel, Swat teams to control

terrorists within the facility, contact with the Red Cross to set up and staff temporary shelters, contact with other hospitals or institutions out of the threatened area to which patients may be taken until the threat is over, or managing volunteers or other "helpers" either from the community or beyond who arrive to assist in the evacuation effort. Furthermore, the problem is not just one of coordination, but involves consideration of liability and other legal issues of responsibility.

The issue of planning has been of concern not only to researchers but to political actors (Drabek et al., 1981). Whether the type of evacuation plan is a generic one designed to accommodate a number of emergencies or whether specialized plans exist for various categories of emergencies are both political and environmental issues. A general or integrated plan for emergencies with specific areas outlined for these events could reasonably be expected for communities with ongoing hazards or a history of frequent events requiring emergency response, i.e., hurricanes or tornadoes. More specific plans may be made for warning certain segments of the community in different ways. For example, commercial interests may require additional time to move inventory out of danger during an anticipated flood or tsunami. Health organizations require additional time to call in additional staff to aid in an evacuation or to contact transport services.

One planning concern is how the organization defines emergencies. Does the organization treat a fire threat in the same manner as preparing for evacuation from flooding of their premises? The definition may

be part of regulatory procedures. The organization or facility may be required to have a prepared emergency plan to be regulated or licensed by state or federal agencies. Other agencies influencing planning include insurance agencies and those quasi-public agencies from which organizations get their plans approved for certification or accreditation.

Organizational effectiveness also depends on a clear chain of command. Who assumes, or can assume, responsibility for decision-making during an emergency influences effectiveness. Questions arise about roles adopted during an emergency. Are the roles of staff maintained in the normal operating manner, or are there specific personnel who assume responsibility for the evacuation procedures? For example, maintenance personnel, ward supervisors, or other staff are sometimes especially trained for emergency tasks. Following through with the concept of continuity, one would expect roles and tasks to be performed with greater efficiency if those tasks were similar to work tasks assumed during normal operating behavior.

Other organizational mechanisms facilitate continuity during crises by providing "standby resources" such as volunteer support groups (Stallings, as found in Dynes and Pelanda, 1987:247). Some evacuation plans recognize that "the elements of opportunity" (such as volunteer or other helper groups) are as important in effective evacuation activity as the pre-planning for emergencies. Yet as Drabek (1986) has noted, despite the importance of how organizations mobilize for evacuations, little theoretical or empirical work exists on the topic. Systematic investigation of the characteristics of

coping strategies organizations employ in the evacuation process has not been part of research agenda. Although such information is available in trade journals and association memoranda, the discussions lack the preciseness and clarity for discerning organizational behavioral patterns in evacuations. Thus both organizational leadership in evacuations as well as organizational structure and evacuation effectiveness should be studied systematically for such populations (Drabek, 1986). It is through systematic studies our knowledge is gained about the entire evacuation experience.

Organization Models

A number of models have been developed to explain organizational decision-making strategies. As this study focuses on the organizational processes involved in making a decision to evacuate when the safety of the institutionalized population is threatened, we will examine only those models that directly affect decision-making strategies. Of three models--the resource-dependence model, the natural-selection model and the rational-contingency model, the most useful model is the perspective which focuses on resources and dependence of the organization on environmental externalities.

The model's basic premise is that decisions dealing with the external environmental conditions are made internally within organizations. The process involves active participation of the organization in dealing with the environment that includes attempts to manipulate that environment. Internal power arrangements, including managerial strategies, and the demands of external groups are central

to the decision-making process. Aldrich and Pfeffer (1976) argue that the resource-dependent perspective suggests that administrators' management of their environments may be more critical than the management of their organizations. Consequently, the effective management of threats from external sources is crucial to the ongoing structure of the organization.

Communication of Threat

A basic issue in emergency response to threats concerns how information about the threat is communicated to affected populations either individually or in groups. The evacuation literature on individual response to emergencies describes four modes of warning: (1) direct confrontation with the threat, as in a fire, explosion, or bomb threat; (2) televised or radio broadcast warning messages of potential risks, as in hurricanes, floods, or tornadoes; (3) organizational linkages or networks initiated by warning calls from the police or other community officials such as by sirens or official warnings; and (4) through social networks (Perry, 1979; Quarantelli, 1980; Perry et al., 1981; Drabek, 1986). People at risk are frequently contacted by friends, peers, relatives, who heard of the threat and felt motivated to call about the warning, often with offers of shelter (Drabek, 1986). Whether these communication modes are applicable to organizations is problematical.

Psychological Aspects

A related issue concerns the psychological dimensions of response patterns to threats. Janis and Mann (1977) theorize that effective

emergency decisions are more likely made when a vigilant coping pattern, as opposed to a hypervigilant pattern, is dominant. A vigilant coping pattern requires that four mediating conditions be present. The first is the awareness of serious risks if no protective actions are taken. The second requires an effective appraisal of expected effectiveness regarding a protective action if that action is taken. The third condition states that there must be a moderate or high degree of hope that a better means of escape is realistically possible. And finally, there must be sufficient time available to select and evaluate information and advice. This theoretical model of decision-making has not been tested extensively. For organizations which are committed to the care or protection of specific personnel, the cognitive aspect of decision-making may mean that the concern for safety of clients enhances the saliency for making plans for emergencies.

Role of Experience

If regular fire drills are required for regulatory reasons, decisions to expand the drills to include evacuation strategies due to other less salient or infrequent threats may not be deemed necessary. The reliance on fire drills for non-fire related emergency evacuations has been noted by some researchers. Arnold et al. (1982) studied evacuee behavior following an earthquake in southern California. The study found that evacuees followed normal procedures of emergency evacuation in exiting the six-story office structure, even if it meant choosing a less safe or more complicated route to leave the building.

Queried later about why such routes were taken, evacuees reported following "drill procedures."

Burton (1981) notes that the Mississauga train derailment, which resulted in the evacuation of over 250,000 people over a five-day period without loss of life and without injuries, was effective because of previous experiences the agencies involved had in working together. Thus organizational linkages were strengthened by prior experiences even though the threats were very different (the former threat had been an airplane disaster) (Burton, 1981).

Role Abandonment During an Emergency

Another aspect of emergency response concerns the issue of role conflict and the abandonment of work-related roles during emergencies. The issue of role abandonment has been raised mostly by intervenors in litigation over nuclear power plant licensing. The issue is important to this study because of the need for continuing care for clients during evacuations.

White's (1952) early studies suggested that role conflict exists among emergency workers during an emergency and could hamper response when emergency roles were unclear. Mileti (1985) argues that when emergency roles have been made clear prior to an event, role conflict elicited by the emergency does not result in abandonment of the emergency role by workers. Mileti concluded that prior emergency plans and worker training for emergency roles alleviated the stress of uncertainty caused during the unexpected event and thus was beneficial in establishing effective response patterns to emergencies. Moreover,

if the emergency response is perceived as good, then prior experience will help in the next emergency.

Various issues about evacuations in health facilities are distinctive. One issue that surfaces in the medical literature is the problem of maintaining accurate records on patients' whereabouts and conditions during evacuations (Fisher, 1986). Another unique concern is the removal of non-ambulatory patients, especially if litters are required to carry clients (Hargest, 1981). The problem with nonambulatory clients is that several persons are needed at once to transport clients compared to situations where several clients at one time can be guided to safety.

Hargest (1981) also mentions the problem of high-rise structures in evacuating patients when elevators cannot be used to transport patients between floors. Of greater concern to emergency personnel such as firefighters is the removal of resistive patients from an imminent threat (Klien, 1987). Patients suffering from senility and autism may not be able to comprehend danger. Likewise, attending to patients who do not speak English or have a deep fear of authorities impairs rescuers' attempts to aid patients and may place emergency personnel in danger themselves, especially when time is of the essence (Klien, 1987).

By far the most common threats mentioned in the medical literature are those about fires. Drabek (1986:36) notes that testing and fire drills are commonplace in hospitals of various types because of the formal certification required by the American Hospital Association.

However, he notes that little is known on the behavioral responses during actual disasters. Drabek further notes that researchers offer little guidance about emergencies in hospitals. A Canadian study by Allred et al. (1982:vii) states:

> . . . A hospital fire is treated somewhat differently from one in other types of buildings. Given a fire in a normal high rise, the first decision would be to evacuate. Given a fire in a hospital, the first decision is to attempt to avoid an evacuation if at all possible. . . . It is our conclusion--based on what we saw at St. Joseph's--that this approach to fighting fires in hospitals in hospitals may not be entirely justified (Quoted in Drabek, 1986:36).

Although many regulations have been developed to prepare staff of chronic and acute care institutions for fires, the regulations are based on the premise that a fire would be easily contained (Hargest, 1981). Agreeing, Dynes (1979:57) states:

> . . . The EMS (Emergency Medical Services) literature is almost useless for planning purposes in connection with mass casualty situations . . . is generally limited and selective in coverage, with an administrative focus or bias, ignores many real and operational problems and . . . [is] derived from anecdotal accounts (Quoted in Drabek, 1986:43).

An issue of particular concern to health managers is the increased risk to clients because of an evacuation move (Fischer, 1986; Roberts and Mills, 1982). Thus discussion focuses on the comparison of morbidity rates before and after the emergency evacuations. The fear of increased morbidity rates also constrains decision-making unless the actual presence of the threat is evident. Morbidity rates do not necessarily increase after an evacuation (Fischer, 1986).

Disaster Planning for Health Facilities

Most disaster plans for health facilities differ from other organizational plans in one vital way: they are written to prepare the facility to respond to the demands of an uncontrollable event and not to control events (Seliger and Simoneau, 1986). For a health care facility a disaster is defined as:

> . . . any patient-generating incident which overloads existing personnel; or existing personnel, supplies, and equipment; or, which occurs in such magnitude that resources such as personnel, supplies, and equipment are not readily available for stabilization and treatment of casualties (Simoneau, 1985:58).

Most hospitals have disaster plans that provide for people coming into the hospital during a crisis, i.e., external disasters, but plans for crises that may lead to evacuation are often unavailable except for threats from fires.

Unresolved Issues

Studies of evacuations have been criticized because evacuation behavior is poorly defined. An evacuation is often subsumed under the more broad canopy of hazard response. Response to threat does not necessarily imply evacuation. Response can also mean seeking shelter, confirming where family members are located before deciding on what to do, or waiting for further instructions from an authority.

Frequently evacuation is viewed only as withdrawal from an area without reference to the overall behavior. Few studies ask about specific or final destination points of evacuees. Did the evacuees

travel to the friend's home four blocks away, four miles away, or leave early and go 400 miles to visit a family member? Questions are seldom asked about how far the evacuees traveled, with whom the journey was made (pets, neighbors, kin) or if stops were made on the way to buy food or obtain money from a bank. How long it actually took to make the journey to a safe place is also unclear.

Some behaviors, such as waiting to account for kin, may impede safety of the evacuating population by prolonging exit time. This problem has surfaced for emergency planners in issuing warnings about hurricanes and flooding. Storm surge can often inundate low-lying coastal highways within hours of an evacuation order. Some events such as a slow moving flood or volcano flow may allow people to take more time to organize or to prepare to move out (Perry and Green, 1983).

Detailed information is lacking from the evacuation literature on destination points of families and individuals and is virtually unknown in the material on organizations when involved in evacuations of special populations. In instances when the evacuation of a special facility has been mentioned, as in the Mississauga train derailment incident, there are frequent references to the difficulties involved when the need arises for a second withdrawal (Burton, 1981). Problems of sequential sheltering may stem from a lack of preparedness, planning, or prior experience with a threat either within the community or at the organizational level of specialized facility.

There are few studies on the return to the evacuated site by evacuees. When an evacuee returned or attempted to make the first return trip remains uncertain. How people find out when it is safe to return or if, when they returned, how they found out they had to leave again is unclear in most of the evacuation studies. When people are forced to leave a second time, researchers have tended to treat the ensuing behavior as part of a single evacuation experience rather than distinguishing between the two behaviors. There may be distinct dissimilarity between the two evacuation experiences, including the decision of where to go and what to take along.

Other issues relate to problems authorities have in keeping people from returning to homes before a threat is resolved. During the five-day Mississauga evacuation in Canada, emergency officials requested the Humane Society to enter the evacuated areas and feed the pets on a regular basis so people would stay away until the threat was over (Burton, 1981). People want to get on with their regular business as quickly as possible after a disruption and to take up where they left off before they were so "rudely" interrupted.

Anecdotal observations suggest that most evacuations of chronic health care and related types of facilities are carried out in a disorganized or ad hoc manner (Quarantelli, 1970; Blanshan, 1978). Yet most health care organizations must have some sort of emergency plan to be accredited within a state or to carry insurance. Whereas centralized planning has become a common feature in today's health care facilities, most disaster planning in health care facilities

receives only superficial attention (Seliger and Simoneau, 1986). This study examines the prior planning and preparedness of organizational personnel before the actual evacuation occurred.

Assessing Evacuations of Chronic Care Organizations

Zammuto (1982) notes that evaluating the behavioral performance of an organization is often based on the informant's subjective experience with that organization. This study used replicable measures to determine the characteristics affecting response to the emergency evacuation. The results can then be compared across studies.

Various aspects of time are used to measure effectiveness of organizational activity. Elapsed time measures how quickly people are moved to safety or arrive at a shelter. For health care and related home care facilities this involves a number of conditions which must be satisfied, such as distance to safety, percentage of ambulatory to non-ambulatory clients, overall size and characteristics of client population, and the number of staff or other personnel available to assist in evacuation efforts.

Time available between the detection of the threat and the onset of event varies by threat type. Response time is more critical in a fast-moving or crisis situation or when the threat is ambiguous with a high probability of risk or damage. An explosion or fire often precipitates immediate action without the advantage of preparation or dissemination of knowledge about the threat among initial staff responders.

Response time is further affected by extracommunity or community resources that provide warnings allowing advance preparation for health care managers. When a facility is warned by officials or through the media that severe weather may cause temporary evacuation of an entire area, preparations generally include procuring more equipment and supplies. When an event such as a riverine flood happens yearly, preparations for disseminating information about possible evacuation may be systematically applied to organizational operations as a matter of resource accommodation. Thus during hurricane seasons in the Southeast or tornado weather in the Midwest, adoption of strategies to respond immediately to events that require evacuation may be more on the minds of organizational personnel. Saliency would induce an emotional state of preparedness which significantly improves effective response to a threat (Janis and Mann, 1977).

Thompson (1973:21) argues:

> . . . Organizations pointed toward emergencies such as fire departments, attempt to level the need for their services by activities designed to prevent emergencies and by the emphasis on early detection so that the demand is not allowed to grow to the point that would overtax the capacity of the organization (Quoted in Haas and Drabek, 1975:253).

As Haas and Drabek (1978:254) state, "The greater the organizational stress, the greater the change in organizational performance structure," or, as Broulette and Quarantelli (1971:40-41) have noted, the more stress to an organization, the more of a 'debureaucritization process' occurs within the organization during a crisis." Linn and Kreps'

(1987) research indicates that organizational stress incurred by a disaster may lead to restructuring of the organization that can be calibrated temporally and spatially.

Organizational systems, like the individuals in organizations, reflect initial responses that are rooted within normative guidelines (Drabek, 1986:158). The theme of normative continuity, as Drabek (1986) notes, permits understanding of the organizational member's behavior during times of stress. Thus organizations, such as utility companies, are often more prepared and effective during an emergency than those that do not deal with crisis events on a regular basis. In Drabek's review of organizational initial responses (1986:159), he found case studies suggesting both planning and the degree of event predictability were related to response continuity. Thus response to a stressful event is more continuous and more articulated and timely when preparation for a threatening event has been accomplished prior to an event.

> . . . Organizational decision-making in crises has several distinguishing characteristics. The rate of decision-making increases, as does the number of decisions made, particularly at the lower levels of the organization. There seems to be less consultation among organizational members, and such individual autonomy means that organizational personnel and resources are committed quickly, often outside the organization's previous domain of competence. Organizations usually lose autonomy when coming under the control of new "coordination" arrangements; within organizations, sectors with high crisis relevance gain decision making autonomy (Dynes and Quarantelli, 1977:24; Drabek, 1986:162). (See also Quarantelli, 1970a:389; Drabek and Haas, 1969; Haas and Drabek, 1973:250-256; Yamamoto, 1981:66; Mileti and Sorensen, 1987).

Adaptation to disaster by an organization will be influenced by three factors: (1) the preexisting bureaucratic structure, (2) the emergency capability, and (3) the perceived effectiveness and efficiency of the emergency response (Broullette and Quarantelli, 1971, as summarized in Mileti et al., 1975:79; Drabek, 1986:162). Thus the contextual aspect of prior organizational arrangements is critical in response effectiveness. The effectiveness of organizational capacity in coping with extreme but low probability events is dramatically increased when planning includes anticipation of such events with corresponding organizational networks and linkages defined and clarified across and among organizations.

The literature review and analytic framework suggest a number of hypotheses relevant to nursing homes and related health care facilities. Appendix F presents the hypotheses and the relevant findings.

CHAPTER III

METHODOLOGY

Choosing the Universe

Part of the problem in examining evacuations of specialized populations was identifying facilities that had experienced an evacuation of some or all of their premises. Hazards and threats to people are considered newsworthy items (Kreps, 1980; Rossi et al., 1981); therefore, we used the Nexis/Lexis computerized data based system to locate reported incidences of evacuations in syndicated newspaper articles by United Press International (UPI), the Associated Press (AP), and Reuters between November 1, 1983, and December 31, 1987. We found 35 articles reporting actual evacuations of nursing homes and two other articles reporting preparations for evacuations of such facilities in the United States.

Incompleteness of articles dealing with the evacuations required a further search to determine the name and location of the facility. On occasion we contacted local police or other emergency agencies in the area of the evacuation for information on the evacuated facility. In further pursuit of the media reports of evacuations during Hurricane Elena, we were referred to a public document prepared for Pinellas County that listed 19 nursing homes among the number of medical facilities which were evacuated. During the course of this research two evacuations of nursing homes took place in Tennessee. These institutions were visited and personal interviews conducted with staff members.

These were used to test the survey instrument and as case studies to provide an in-depth analysis.

Analysis of Documents

The articles generally reported the date of evacuation, the number of persons evacuated, the number of injuries and deaths, first responders, type of threat, and if others in the vicinity also were evacuated. Some articles also reported where evacuees were taken and how long the evacuation lasted. Addresses of the facilities were determined from library files, telephone books and operators, police files, or from newspaper editors or personnel. (Appendix C has a copy of the content analysis form.) To gain knowledge about community resources, secondary material was used to determine characteristics of the county where the facility was located. The data included the size and density of the population.

The newspaper articles provided a base of information for all members of the universe. This information was used to compare interview respondents and non-respondents. Given the small number of evacuations, we decided to gather information from each facility in the universe rather than select a sample.

Initial Contact

Once the facility had been located, a cover letter describing the study and enlisting the organization's help was sent to the administrator of the organization. The letter discussed the study's purpose and requested a copy of any internal report of the evacuation

that would provide background for the interview. (See Appendix B for a copy of the letter.) The letter indicated that a research worker would call the administrator with requests for specific information about the evacuation. We also outlined the procedures to protect those interviewed. It was made clear in the letter that all information would be treated in a confidential manner in keeping with The University of Tennessee research policies on human subjects . Besides maintaining strict confidentiality, this included respecting a respondent's refusal to answer questions.

Data Collection

An interview schedule was developed to investigate the evacuations at the facilities. The schedule was reviewed and pretested at a nursing home in Knoxville, Tennessee. Although the nursing home itself had not undergone an evacuation in the last four years, the administrator's comments were helpful in recasting the questions. A retirement home adjacent to the facility chosen for pretesting had evacuated approximately five years previously and that experience was used as a focus for questions pertaining to evacuation procedures. (See Appendix E for the interview schedule.)

The interview form focused on the evacuation as experienced by the organization (not the clients). Beginning with the initial information about the threat, the administrator was asked to describe the evacuation to the point when all clients were returned to the facility. Most questions did not have fixed choice responses. Instead, the interview used directed questions in conversational style. A few

questions were directed to gaining basic information about the organization (i.e., number of clients and staff, services provided, types of clients, contacts with other agencies, evacuation plans, and associations). Specific information was gathered on the time taken to evacuate. The interview concluded by asking the administrator's opinion on the effectiveness of the evacuation and what changes would be made by the organization in future evacuations. The interviews were conducted between January 6, 1988, and May 30, 1988.

A retired nurse was recruited to handle most of the telephone interviewing. Hiring her was extremely advantageous because her medical background and ability to "talk shop" gave us credibility with administrators. She also provided a background to help understand the problems of staff during emergencies.

Codes were developed for analysis of the data from the interview. Data were recorded directly onto schedules during the telephone interview. Immediately following the interview, data were transcribed to coding sheets and entered into a data base for later analysis. Because of the nature of the interviews, we did not systematically check for errors. Data thought to be in error were recorded as missing. The code book is available upon request and may be used with permission of the author.

Measurement

Quarantelli's (1980) typology of factors influencing the ability of organizations to cope with evacuations notes five categories: (1) threat, (2) resources, (3) social climate, (4) social linkages,

and (5) extracommunity. In addition we gathered data on response characteristics. Within each category the specific variables on which data were gathered included:

1. Threat
    A. Situational variables
        1. Time of day of evacuation
        2. Month and day of evacuations
    B. Agent variables
        1. Frequency
        2. Predictability
        3. Duration
    C. Social-psychological variables
        1. Definition of risk
2. Resources (for both specialized facility and community)
    A. Evacuation drills
        1. Number of hours of staff time involved in actual drills
        2. Number of hours of staff time given to procedures
    B. Evacuation planning
        1. Number of full-time hours per person devoted to evacuation planning
        2. Level of drills: paper and pencil, fire drills, mock simulations
        3. Level of preparedness for actual evacuation
        4. Personnel involved in evacuation planning

C. Physical

1. Specialized or built-in safety structures or units (i.e., tornado shelter, fire doors, etc.)

3. Social climate (for both specialized facility and community)

A. Risk perception

1. Number of previous experiences with similar threat(s)

2. Number of evacuations completed

B. Hierarchy

1. Number of levels

2. Number of personnel involved in decision about evacuation

C. Complexity of organization

1. Number of clients

2. Part of a larger organization

3. Services provided

D. Ability to receive warning

1. Method(s) warnings received/transmitted

2. Responsible agency for issuing evacuations

3. Special procedures for notification about threats

E. Constraints to decision-making about evacuation

1. Previous false alarms

2. Other constraints: security, inability to move clients or inexperience with moving clients, no destination site available

3. Density of population of community

4. Social linkages (for both specialized facilities and community)
   A. Interorganizational linkages
      1. Number of organizations involved in evacuation
   B. Intraorganizational linkages
      1. Clarity of evacuation procedures within organization
      2. Social-psychological views about evacuations
   C. Previous experience
      1. Number of organizations worked with in past evacuations
      2. Individual experience with prior evacuations
   D. Specially designated emergency units
      1. Types of specially trained personnel during evacuations
      2. Number of past occasions requiring use of specially trained units.
5. Extracommunity setting (for both specialized facility and organization)
   A. Regulations
      1. Number of regulations affecting decision-making about evacuations
      2. Number of agencies affecting decision-making about evacuations
      3. Number of internal guidelines affecting decision-making about evacuations
      4. Penalties
   B. External resources
      1. Extent of assistance available from state or federal agencies
      2. Extent of subsidies available for planning/drills

6. Evacuation response of specialized facility
   A. Time
      1. Time to make decision to evacuate
      2. Time to complete evacuation of facility (per capita involved)
      3. Time to return (round-trip) (per capita involved)
   B. Other factors
      1. Number of persons evacuated
      2. Deaths or injuries due to evacuation
      3. Shelters
      4. Problems.

Threat Characteristics

Several characteristics of the threat were known from analyzing the articles: the type of threat, the month, the day, and the year. To determine how the threat had been perceived, the respondent was asked when and how the organization had learned of the problem. We also asked whether the news article contained correct information about the evacuation.

These questions were designed to determine how the threat was detected, whether detection was internal or external, and, if external, was it from a local or extracommunity source. Secondly, the question determined if the warning was received from an authority or if an official notification was made to the facility. We also confirmed whether the reason for the evacuation was a threat stated in the news article.

To determine the frequency of evacuation experiences within an organization, a question asked whether this was the first evacuation at the facility. A follow-up question ascertained whether the organization had prepared to evacuate in the past but not had to leave.

Resources

To measure organizational resources which could be used in an emergency, information was sought as to how staff learned of emergency procedures, what types of training staff had, if drills were conducted and if those drills actually included mock simulations of evacuations. We inquired about the number of staff and if the staff lived within a 10-mile radius (for availability for use in emergency). We also asked about external help from volunteers or emergency agencies during the evacuation.

Social Climate

To determine level of preparedness, we asked about how information on emergency behavior was disseminated to employees within the facility. The level of measurement was hierarchical with (1) no drills, simply reading manuals as one category; (2) inservice training with occasional fire drills at least once a month with inservice training on evacuations; (4) fire drills at least monthly with mock simulations or actual evacuations carried out yearly with or without community support as the fourth level.

We also asked why organizations had such drills. Answer categories were (1) for regulatory or certification requirements; (2) because

of being located in an area threatened by a seasonal hazard (hurricane, tornado, flooding, etc.); or (3) other, such as "being a good idea," "you never know," etc. If the preparedness training included simulated or mock evacuation exercises, similar questions were asked.

Other aspects of the organizational resources were originally intended for analysis. We asked about the yearly operating budget of the facility as well as the percentage of that amount spent on emergency preparedness. Almost all administrators balked at these inquiries, and the questions were consequently dropped from the schedule.

Another question listed nine difficulties reported in the literature as constraints to evacuation. The list was not arranged hierarchically but was simply used to elicit a response on each issue. Replies to these categories included ranking how difficult the problem was for the organization, measuring whether it was (1) of major concern during the evacuation, (2) of minor concern during the evacuation, or (3) of no concern during the evacuation. If the item was not applicable it was placed in the "no-concern" category. The list ended with an open-ended question asking if there were any further difficulties that came to mind. The open-ended question did not yield any further categories and was subsequently dropped from the analyses.

An issue raised in the list of difficulties of providing medication for clients during the evacuation elicited an unanticipated response about how patients were identified during the evacuation from their home facility. Most organizations reported taking all

clients' charts with the clients, with some facilities reporting having duplicate charts available for use during emergencies. Two informants reported having a picture of each client on the first page of the client's chart for easy identification of the client. Some informants mentioned having wrist bands to identify clients.

Another related issue concerned medication for clients. Most informants indicated that maintaining proper medication levels for clients during evacuations was considered critical for the well-being of their clients. Almost all the organizations reported taking all client medications with them when leaving their facility, even when clients were placed in a hospital for the duration of the evacuation. Some respondents reported wheeling medication carts into the vans or buses that carried the clients to shelter sites. Concern for patients' well-being was of primary concern, with no one wanting to upset clients any more than was necessary, particularly as some clients were reported experiencing confusion because of the move from their home base.

We also asked how staff handled "resistive" patients. No one reported any problems in actually removing clients during the evacuation. "We talked to them," "we assured them," or "we put their mind at rest" were among the responses given. One respondent mentioned that one client had to be "helped," apparently with two "able-bodied" staff members to leave the premises. Probing into the matter was unsuccessful and we eventually dropped the item from the analyses.

Social Linkages

To ascertain how linkages to external emergency organizations were handled, two questions were included asking what agencies had been contacted (either federal, state, county, or local) by the organization in planning for emergencies. We also asked the reverse question--how many official agencies (such as FEMA) had contacted the facility about evacuation planning. Since only one facility reported any contact that question was also dropped from the analysis.

To determine other linkages to the community, we also asked who assisted the organization in evacuation efforts. Overwhelming replies were received about most of the staff personnel coming in before being called or "all staff" reporting when called to assist. Only one facility reported a night shift refusing to continue working in case of a possible evacuation. In this case the threat was uncertain and the staff had already worked an eight-hour shift. Frequent reports were made that family and friends of staff members arrived with the staff to help also. Operators of ambulances and hearses as well as other volunteers "off the street" also assisted in the evacuation efforts. The few instances in which no volunteers were reported as helpers were in evacuations in which the entire community was involved in the evacuation from a major threat.

Social linkages as independent variables were also operationalized by determining the organizational use of external sources of aid and the types of external help (such as official help and/or the use of volunteers). Also used as independent variables were the sources

of notification about threats and level of preparedness within the organization for emergencies, including evacuations. The size and density of the population of the county in which the facility was located also were determined and used as independent variables. The size of the facility was also used as an independent variable.

Response Characteristics

Three variables have been associated with assessment of risk and the development of warning belief--warning source, warning content, and past experience with disasters or other threats (Perry and Mushkatel, 1986). Before issuing an evacuation order, someone within the organization must determine that the situation is hazardous and proceed to issue an evacuation order. Quarantelli (1980) argues that evacuation as a collective concept is primarily a community-level phenomenon generally organized around a locally integrated social entity such as a town or city. However, in this study, community is referenced as a social unit within a specialized facility which shares certain characteristics and is perceived as distinct from the larger society within which it exists.

An easily measured variable to determine warning characteristics is time. Five questions yielding a measurement of time were used: (1) the time the threat was discovered; (2) at what time decision-managers learned of the threat; (3) the time it took to evacuate clients from the facility (even if not all staff left with the clients); (4) at what time the decision was made to return to the facility; and (5) the time when all clients were returned safely to their

quarters. We omitted the return times of the few clients who had been sent to hospitals as precautionary measures during the evacuation and who were returned at a later time to the facility than the majority of clients.

The measures provided a method of (1) discerning length of time to evacuate per client (measure included clients only); (2) determining the length of time spent in the initial evacuation effort; and (3) determining the time away from the facility. Length of time to return clients was sometimes reported as longer than the initial withdrawal experience because of the lack of buses for transporting clients as well as other inconveniences that hampered return efforts.

Throughout the study, effectiveness of the evacuation (as measured in the time spent evacuating) was used as the dependent variable. Effectiveness was also measured subjectively by our respondents on a five-point scale using one as "very ineffective" to five being "very effective." Effectiveness was further measured by the number of problems encountered while evacuating. Several questions addressed this issue: difficulties organizations had in evacuating their clients to safety, difficulties at the shelter sites, difficulties in returning clients to the facility, and difficulties when clients were all back in their quarters.

Data Analysis

First, the univariate statistics were compiled to provide a quantitative description of the characteristics of organizations that evacuated and of the evacuation process. These also provided a means

of analyzing the non-respondents to see if systematic bias was being introduced into the analysis from non-response. Second, bivariate analysis was used to examine relationships suggested in Chapter II and from the analytic framework presented in Chapter I. Contingency tables analyzed measured levels of association when variables were nominal. T-tests were used to determine differences in means between dichotomous and continuous variables. Pearson's correlation was used when both variables were continuous. (Results are presented in Appendices under Data.)

Third, a regression model examined the analytical framework as specified. Variables chosen represent elements of the theoretical model. The selection of variables was based on the univariate and bivariate analysis and on having reasonably complete data on each variable. Finally, descriptive data collected in the telephone survey were used to provide a qualitative description of the evacuation experience. The effect of the response to the future emergencies by the organization was examined by analyzing changes that the organizations have made or intend to make in the future evacuations because of problems encountered during the evacuation.

Because we used the universe of all evacuations in a four-year period, significant tests are not strictly appropriate. For the most part, they are not reported. Where they are reported, they are illustrative. Differences between categories of data are differences in the universe. The magnitude of difference is the only important measure.

CHAPTER IV

FINDINGS

Introduction

This chapter provides a descriptive analysis of the findings from the study. Section One describes the census of cases and analyzes available characteristics of non-respondents to determine if non-response introduces systematic bias. The section also describes the threat characteristics for variations in regional distribution, the types of threats causing evacuations, the seasonal distribution of the threat occurrences. Section Two gives the distribution of responses on the variables studied. Section Three describes the problems experienced during the evacuation by respondents. Section Four summarizes the findings with respect to the hypotheses tested.

Section One: Census and Non-respondents

Census of cases. Sixty-two nursing homes and related home care facilities were identified from the media articles as having evacuated some or all of their premises between October 1, 1983, and December 31, 1987. Coincidentally, one facility within this population evacuated twice on separate occasions approximately one year apart but for two different types of threats. These two evacuations were treated as separate cases, bringing the number of cases to 63. Included in the 63 cases of reported evacuations were 19 nursing homes

in Pinellas County located in the Tampa Bay region on the Gulf coast of Florida. All these facilities had been evacuated during Hurricane Elena in 1985. During the period of interviewing, two evacuations of nursing homes occurred that were used as case studies. Our census is 65 cases of evacuations.

Three types of facilities caring for special populations were identified: nursing homes providing some type of continuous medical supervision or custodial services (N=61); retirement type facilities providing security and other basic services such as housekeeping but with minimal supervision (N=2); and mental health facilities providing rehabilitation and supervisory care (N=2). The nursing homes and related care facilities provided intermediate and/or skilled health care as well as custodial services to clients. The retirement type homes were associated with a chronic health care facility. The mental health facility provided rehabilitative as well as custodial care to clients with impaired mental capacities. For the rest of the dissertation all cases are referred to as nursing homes and related care facilities.

Non-responders. Non-response always has the potential to bias the results. Since we had usable data from 46 nursing homes and related care facilities, we examined non-respondents and responders on available characteristics to see if non-responders were biasing the results.

Reasons for non-response were divided into four categories: (1) change in administration or management of the organization (N=7); (2) no evacuation took place at the facility (N=6); (3) organization

refused to be interviewed when contacted (N=3); and (4) facility could not be located (N=3). In all seven cases where there had been a change in administration or management, no one who had participated in the evacuation was employed at the time of the interview. Six organizations stated that no evacuation had taken place. Three of these organizations had prepared to evacuate but did not actually leave their buildings. One of these three organizations reported that their clients refused to leave the facility because the local civil defense unit was using the facility as headquarters and the clients considered the facility a safe place to stay. One organization stated that they had prepared to evacuate but never left after all. Another organization reported that only one client had left the home voluntarily and that no evacuation of the overall facility occurred. Two organizations refused to be interviewed, stating they wanted to forget the incident. Another organization refused stating that company policy forbade outside interviews. We were unable to locate three of the facilities. Of the 49 facilities located with verified evacuations, three (or 6 percent) refused to respond--a very low refusal rate.

Non-responders and responders. Mortality differences between responders and non-responders were quite small. No deaths had occurred among clients during the 46 evacuations for which we had full data. There was one case of possible increase in morbidity rates among clients in the months following one evacuation but the administrator could not verify the observation. There was one death reported in the media accounts of a fireman who assisted in evacuating a small facility.

We did not include this death (although verified) because the person killed was not connected directly with the organization.

In the non-response group there were three cases in which at least one death was reported by the media. All reports indicated that deaths had occurred as a result of fires which investigators felt were deliberately set (arson). Of the organizations in which deaths had occurred, we were able to contact only one facility by telephone. After confirming that an evacuation had occurred and that one person had died during the event, the administrator refused to participate, stating she wanted to forget the whole incident. The other two facilities did not have listed telephones and could not be located through police records, local civil defense agencies nor through regional and local newspaper libraries.

Table 1 shows the distribution of mortality among responders and non-responders.

Table 1. Mortality Among Responders and Non-responders

	No Deaths	One or More Deaths	Total Cases
Responders	46	0	46
Non-responders	16	3	19

We cannot argue that mortality in the evacuations causes non-response. The number of instances is very small and in two of the instances the

reason for non-response was failure to contact the facility. It appears that non-response is unrelated to mortality from evacuation.

Nursing home and related home care facilities are distributed unevenly across the United States. Twenty percent of all nursing home and related care facilities in the United States are located in the Northeast, about 29 percent in the North Central, and approximately 29 percent in the South, with the remainder (23 percent) located in the West (Statistical Abstract of the United States, 1987:102; regional groupings of states follows use by the United States National Center for Health Statistics, 1986).

Regional variation of nursing homes in the United States and in the census of evacuations is given in Table 2. The census contains 19 evacuations of facilities in Pinellas County (near Tampa Bay, Florida). All these facilities were evacuated during Hurricane Elena in August of 1985.

Whether the Pinellas County group is included or not, the South shows a disproportionate number of evacuations. Of the total group of 65 cases, more than half (57 percent) of reported evacuations occurred at facilities located in the southern United States. Without the Pinellas group, the South still accounts for almost 40 percent of all reported evacuations. The distribution of facilities shows that evacuations are more likely in the South and less likely in the West. It also shows that regional variations are the same for responders and non-responders.

Table 2. Nursing Homes and Evacuations by Region

All Nursing Homes* (Region)		Including Pinellas		Excluding Pinellas	
		All	Responders	All	Responders
Northeast	20	12	9	17	25
North Central	29	25	24	35	50
South	29	57	61	39	12
West	23	6	6	9	12
Total	25,646	65	46	46	32

*Census reporting of nursing and related care facilities excludes hospital-based nursing homes.

Source: Adapted from the Statistical Abstract of the United States, 1987:102. U.S. National Center for Health Statistics, unpublished data.

(Regional distribution of states is by Census definition and available in the code book on request from the author.)

Table 3 shows the seasonal variation of evacuations for responders and non-responders. The distributions are different, with non responders more heavily concentrated in the winter and responders in spring and fall.

In the census 12 of the reported evacuations occurred during the winter months (January 1 through March 31), 8 during spring (April 1 through June 30), 32 during the summer (July 1 through September 30), and 13 during the fall (October 1 through December 31). All 14 of the Pinellas County evacuations occurred either late at night on August 30, 1985, or during the early morning hours of August 31, 1985. The large number of evacuations in the South in late summer

Table 3. Seasonal Variation of Evacuations

Season	Including Pinellas			Excluding Pinellas		
	Responders	Non-responders	Total	Responders	Non-responders	Total
	----------Percent----------			----------Percent----------		
Winter	13	31	18	19	44	26
Spring	13	11	12	19	14	18
Summer	52	42	49	31	21	28
Fall	22	16	21	31	21	28
No. facilities	46	19	65	32	14	46

are not surprising. Florida is a region particularly susceptible to hurricanes and August the season for hurricanes, which affect a much greater area and more of a population than other, more localized threats, such as floods or fires.

Threats, which caused evacuations, were placed in four categories: (1) weather (N=37), (2) human (N=7), (3) external mechanical failure (N=19), and (4) internal mechanical failure (N=2). Fifty-seven percent of the evacuations occurred because of weather-related threats. Twenty-three evacuations (including the 19 in Pinellas County) were caused by hurricanes, 9 were related to floods, 3 to external fires (such as forest fires), and 2 to other types of weather problems. The Pinellas County group of evacuations substantially alters the analysis. When the Pinellas County group was omitted from the analyses, the evacuations due to weather were reduced to 32 percent of the census and 39 percent of the sample. Still the largest single cause of evacuations is hurricanes--23 cases including 19 from Pinellas County. The large number of evacuations from hurricanes collaborates Wright and Rossi's conclusion that individual victimization by hurricanes is the most common form of disaster experience (Wright and Rossi, 1981). Thus the skewing toward weather-related causes is almost entirely due to the group of Pinellas County evacuations. However, the threat of hurricanes is such a frequent occurrence in the South that some other locality could replace Pinellas County if a different four-year period is studied.

A third of all evacuations were caused by mechanical failure. If Pinellas County cases are omitted, 32 percent of the census and 42 percent of the evacuations in the sample were due to external mechanical failures. Among the 19 evacuations related to external mechanical failures were eight caused by train derailments, seven caused by explosions or fires near the facility, three caused by on-site chemical spills, and one caused by an accident of a truck carrying explosives. Mechanical failures internal to the facility accounted for two evacuations.

Threats were regrouped into two categories: (1) weather and (2) non-weather. The "weather" group (N=37) included all weather-related evacuations. The remaining threats (N=28) were grouped together under "non-weather." The threats were regrouped because the human and internal mechanical categories had few cases and to match the common typology of "natural" versus "technological" hazards. In this classification, natural hazards or threats are those related to weather or geophysical disturbances. Technological hazards or threats refer to mechanical or human-induced events, i.e., non-weather related threats.

Table 4 shows types of threats among respondents and nonrespondents. Excluding Pinellas County reduces the number of weather-related threats. It is clear that the distribution of non-responders and responders is the same with respect to types of threats.

The number of clients evacuated from 46 facilities interviewed ranged from 4 to 274, with a mean of 80 clients. For non-responders

Table 4. Types of Threats

Threat	Including Pinellas			Excluding Pinellas		
	Responders	Non-responders	Total	Responders	Non-responders	Total
	Percent			Percent		
Weather	57	58	57	38	43	39
Non-weather	43	42	43	62	57	61
No. facilities	46	19	65	32	14	46

the number of beds per facility was used as a surrogate measure for the number of beds per facility was used as a surrogate measure for the number of clients and ranged from 11 to 104 beds with a mean of 44. Non-responders are from a group of smaller organizations than those interviewed.

Table 5 provides a comparison between the mean number of clients per facility between responders and non-responders.

We conclude from the analyses of the several characteristics on which we have information about the non-response group--mortality rates, regional distribution, seasonal variation, types of threats, and mean number of clients--that systematic bias is not being introduced into the study from the non-responders. Minor variations in season of threat and size of facility are not large enough to conclude that non-response introduces systematic bias.

Section Two: Univariate Distributions

This section provides a quantitative description of the variables used in the analyses of the evacuation experience. First, general characteristics of the 46 responding organizations are examined for variations in threat, resources, social climate, social linkages, extracommunity setting. Second, we examine the evacuation experience and effectiveness. The evacuation experience is described by destination sites, shelter selection, distance travelled, assistance during evacuation, and the number of clients picked up by kin or others are first examined. Evacuation effectiveness is examined by the time it took to evacuate and the rate of evacuation. Finally we examine

Table 5. Mean Number of Clients

	Including Pinellas			Excluding Pinellas		
	Responders	Non-responders	Total	Responders	Non-responders	Total
Mean number of clients	80	44	73	70	42	57
Total cases	46	14	62	32	9	44

the changes the organizations intend to make in future evacuations.

Threat. The types of threat that caused the evacuations and the time of year they occurred were discussed in the previous section and will not be repeated here. The threats were found to be distributed across all time periods. Sixteen (37 percent) of the 43 evacuations, for which we have data, occurred between 12:01 and 6:00 a.m., 14 (33 percent) between 6:01 a.m. and 6:00 p.m., and 13 (30 percent) between 6:01 p.m. and midnight.

The times the organizations learned of the threat were categorized for periods when most patients were sleeping (approximately 9:00 p.m. to 7:00 a.m.) and awake. The findings do not suggest that time of day places additional constraints on staff personnel for moving clients to safety or that additional time must be taken to waken and alert clients. The results from the data indicated random occurrences of time of evacuations. Twenty evacuations occurred during normal waking hours, with 23 evacuations occurring during the 9:00 p.m. to 7:00 a.m. time span. All the Pinellas County evacuations of nursing homes occurred during the late evening and early morning hours.

Resources. To analyze the level of preparedness, four questions were included in the interview schedule about emergency planning. Organizational personnel were asked if they had (1) an emergency plan prior to the actual evacuation and (2) if yes, whether that plan included specific procedures for evacuation. Then we asked (3) how employees learned about emergency procedures, including evacuation,

and (4) what level of training was included in teaching staff members about those procedures.

Personnel in most organizations considered themselves prepared for emergencies because of the use of fire drills. Only one organization, a very small home health care unit, reported not having disseminated any information to staff about emergency procedures prior to the evacuation. Three organizations reported giving new employees manuals with emergency guidelines outlined. Ten reported having monthly fire drills along with inservice training on emergency preparedness. Over half, 24 of the 43 reporting (or 56 percent) reported conducting monthly fire drills on each shift with inservice training and at least mock simulations of evacuations of the facility yearly.

On-premise drills were conducted with or without an external emergency agency's attendance. Approximately 80 percent of the facilities reported using fire drills on premises as means to inform staff about emergency measures. Some facilities reported that personnel from the fire department visited the facility at least once a month and conducted fire drills which had to meet the fire department's standards. Yet of all the evacuations, only four in the group of 46 respondents were due to fires. Two of these fires were attributed to client negligence, the other two blamed on electrical problems. The incongruity of preparedness for threat from fire becomes even more dramatic when the number of evacuations related to weather is noted--36 evacuations were related to weather.

To determine if preparedness for evacuations was associated with concern for threats, administrators were asked why they had plans to evacuate. Of those responding, seven reported having plans as a company "policy." Ten mentioned planning as being "a good idea." Six reported living in a hazardous area and thus needing to be prepared for an emergency. Three reported that emergency plans were needed for licensing or for other regulations, including insurance coverage. Several informants were unable to answer the question for the organization, with "being unsure" as the major response.

The potential number of staff available to assist in an evacuation ranged from one person at a small home facility to 182 staff members at a facility caring for 274 clients. The measure is suspect, however, because some administrators would include only patient staff without other personnel such as maintenance staff, dieticians, social workers or activity directors who may have helped out during the actual evacuation.

Organizations used a variety of sources to help in evacuating. Generally, off-duty staff were called in to help with the evacuation. Thirty-four facilities in our sample called in the entire staff, with all patient care and all management personnel responding. Two other facilities called only management staff while one organization called only patient care personnel for assistance. Three facilities reported that all staff arrived voluntarily at the facility without being summoned by the organization. Four facilities did not call extra

staff because they were not needed or there was not time before the evacuation started.

Other sources of assistance included: (1) local external emergency organizational help, (2) non-local external emergency organizational help, (3) help from volunteers with ties to clients or staff within the facility, and (4) help from other volunteers or assistants without ties to facility. In the local external emergency help category, aid was received from police, fire departments, sheriffs and local emergency organizations, including emergency teams, paramedics, or county civil defense agencies. In the non-local external emergency aid category, help was received from the National Guard, state agencies or civil defense, or from sources outside the county in which the evacuation occurred.

Subsequently the category of volunteer help was divided to test the hypothesis that aid received from volunteers with ties to residents or staff of the facility may be more accessible and/or more available in times of threat with short forewarning. One category of volunteers included families, friends, in-house volunteers, and other helpers with ties to clients in the facility. In-house volunteers included helpers who reportedly assisted on a regular basis at the facility but were not related to any clients or members of the staff. One facility reported having a group of retired persons who regularly provided organized activities and helped in emergencies. The help received from volunteers who assisted in the evacuations was credited

frequently by administrators across all threats with their subjective evaluation of the overall effectiveness of the evacuation.

The second category of volunteers consisted of all others such as the Red Cross, medical personnel, or staff of ambulances or buses who assisted in evacuating clients to shelters when called by the facility. Administrators readily acknowledged external sources of aid as extremely helpful. One organizational administrator commented on the valuable assistance rendered by bus drivers in helping clients to enter and exit buses when evacuating. During one community-wide evacuation caused by a chemical spill, an administrator noted that ambulances were voluntarily sent by area funeral homes both within and outside the county to help transport clients.

Of the 27 organizations reporting help from external sources, 12 reported that volunteers with ties to clients or staff personnel were the only source of assistance. Thirteen organizations reported receiving help from local emergency agencies as well as volunteers. Thirteen facilities were only assisted by emergency personnel, no volunteers. Two facilities reported receiving aid from four sources--volunteers, other non-official helpers, local emergency personnel, and non-local emergency personnel. Six facilities reported not receiving any aid from outside sources--volunteers or emergency personnel. Table 6 describes assistance with evacuation.

Social climate. To examine perceptions of risk two questions were asked about past evacuations. The organizations were first asked whether they had ever evacuated or had prepared to evacuate in the

Table 6. Assistance with Evacuation

Type of Assistance	No.
Only volunteers	12
Volunteers and external helpers	13
All sources	2
No outside source	6
Total respondents	46

past. Thirty-five of 43 respondents (or 78 percent) reported no evacuation in the past at their facility. Some of the respondents noted they had been at the facility in some capacity for nine years, with no crisis precipitating preparations to evacuate.

The range of past evacuations within the rest of the group varied from one to four. Five respondents reported having evacuated the facility once in the past, two reported having evacuated twice, one director reported evacuating three times, and two directors reported four evacuations of the facility sometime in the past. We did not ascertain exactly when those past evacuations took place. Of 45 organizations responding to our question on having to prepare to evacuate in the past, 40 (89 percent) reported no preparations. Only two organizations reported one past preparation with no evacuation. Three organizations reported preparing to evacuate twice in the past but never leaving their facility.

We used the number of staff members called in to assist in the evacuation as a surrogate figure for the number of staff available at the time of the evacuation. We computed the ratio of clients evacuated to staff personnel. The average ratio of clients to staff ranged from between five clients to one patient care staff to ten clients to one patient care staff with a mean of 3.8 clients to one staff member. In retrospect, asking for the number of registered nurses, licensed practical nurses and aides employed by the organization may have provided a more accurate measure. Physicians did not appear to participate actively in most evacuations. It is unclear whether physicians were involved in transfers of clients to hospitals during evacuations or in discharging clients from the hospitals once the evacuation was over. We did not learn of any instances in which assistance in evacuating was rendered by physicians or other specialists such as podiatrists or dentists. Housekeeping and maintenance people were mentioned most frequently as being on the premises at the evacuation sites.

We also determined who made the decision to evacuate. The overwhelming majority (64 percent) of decision-makers for the organization were administrators and/or directors of nursing of the nursing homes. These persons were normally in charge of all operations at the facility except for direct medical services provided by physicians or dentists. Only four facilities were evacuated through decisions made by another staff member such as a safety director or maintenance person.

Twelve nursing homes (22 percent) reported that the decision to evacuate was made externally through an authoritative source. Orders to evacuate were received from police, fire personnel, local or state government officials, or civil defense personnel. "We didn't make the decision--it was made for us" was a frequent comment. "When they tell you to leave, you leave," said a director.

A question was asked as to how organizations learned of the threat that forced the evacuation for three reasons. The first reason was to determine whether the source was internal or external. The second was to identify linkages between nursing home facilities and the community. The third was to determine how organizations confirmed the threat.

Of 46 respondents, 12 organizations (26 percent) learned of the threat from an internal source such as a staff member, or from an emergency alert system such as a fire alarm. Almost three times as many, or 34 organizations, reported learning of the threat from an external source. Thirteen of those 34 organizations were alerted by local emergency units such as the police, fire, or sheriff's office. Fourteen facilities reported being notified by personnel from civil defense units, rescue squads or emergency management teams, or acted on information to evacuate from other official sources, such as the mayor or governor's office. Two organizations reported hearing of the threat initially through the media but waited for further notification from authorities before making the decision to evacuate. Seven organizations were unsure about how the threat was determined.

How the organization learned about threat is summarized in Table 7. Internal threats such as fires were usually determined internally by staff personnel. Information about slow-moving threats such as hurricanes, or mechanically induced threats like chemical spills or vehicular accidents, were learned about from external sources.

Table 7. Threat and Source of Initial Information on Threat (45 Cases)

Threat Type	External Source	Internal Source	Total
Weather	21	4	25
Non-weather	13	7	20

The number reported evacuated included only clients and not the number of staff who may or may not have evacuated with clients. In some instances some staff stayed with the vehicles transporting clients to shelters, while other staff drove personal vehicles or rented U-haul trucks to the sites to assist with setting up supplies for clients at the shelter. Some organizations reported staff assisted in the evacuation efforts and then returned to the facility to call clients' families or provide other assistance such as cooking or cleaning. In other cases, all staff left with the clients along with volunteers and other helpers.

Table 8 provides a description of the number of clients evacuated (grouped by quartiles) by type of threat.

Table 8. Threat by Number of People Evacuated Using Quartiles

Threat Type	Under 53	54-78	79-100	101+	Total of 46 Evacuations
Weather	7	5	5	9	26 (57%)
Non-weather	5	6	6	3	20 (43%)
Total	12	11	11	12	46 (100%)

Three measures were used as indicators of organizational constraints--average age of clients, percent of non-ambulatory clients, number of staff, and the number of floors. The average age of clients ranged from 44 to 93, with a mean of 74.86 years. The number of non-ambulatory clients ranged from none to 100 percent with a mean of 41.1 percent non-ambulatory clients. As expected, most facilities were one floor--37 facilities; five had two floors, three had three floors, and one had six floors.

Social linkages. Sixty-one percent of the facilities in the sample were associated with a larger organization. Seventeen of the reporting 44 facilities were independent, 27 were connected to larger corporations. Thirty-seven of the 42 organizations reported that staff commuted less than ten miles to work. Five reported that some staff lived beyond a ten-mile radius. Forty-two of the 45 responding organizations provided long-term care--over six months--to clients. Only one provided short-term care and two provided custodial care

during the day. Twelve organizations provided skilled care with eight providing intermediate care. Fifteen provided both skilled and intermediate care.

Linkages between clients and the community were examined. Twenty-one facilities reported that no clients were picked up by friends, kin, or guardians. Only at one facility, a retirement home associated with a nursing home, were half the residents picked up by friends or relatives and taken to safety. In this case 75 persons were taken to homes of families and friends with the other clients going to official Red Cross shelters or to the homes of staff from the facility. Three other facilities reported having 20 to 22 clients picked up at the time of the evacuation.

In 21 facilities evacuating, the number of clients picked up by outside persons ranged from one to twelve. Three facilities had between ten and twelve persons picked up. Eighteen of the twenty-one facilities had five or fewer clients picked up from the facility.

Extracommunity. From secondary sources we determined the population of the county for each facility and calculated the county's population density. The most densely populated area was Pinellas County with 2,889 persons per square mile. The population density of places ranged from 22.3 persons per square mile to 2,889 persons per square mile, the mean being 1173.7 persons per square mile.

Organizations generally used a number of shelters either consecutively or simultaneously. The general evacuation pattern was for clients to be divided up and transported to two locations. Skilled

care facilities generally used a hospital for at least one evacuation site for some of their clients.

Of the 46 reporting destinations, about one third (16 facilities) used only one site. Another third (15 facilities) used two places as evacuation sites. Seven organizations used three sites, with another seven organizations going to four sites. Only one organization chose more than four sites, with clients being divided up among 10 hospitals and several nursing homes.

Of the 15 organizations that reported going to two places, 10 made simultaneous moves to two sites and remained at those two locations throughout the evacuation. Five organizations made consecutive moves. They moved all clients to one shelter, then moved clients to another location. In a few instances the second move was necessitated by the host facility being unable to accommodate the evacuees for the length of time required for the entire evacuation. In other cases clients had been moved to safety outside the facility and were then transported to a more permanent shelter when a site was located.

A variety of places were used as shelters: schools, hospitals, other nursing homes, hotels, parks, churches, and individual homes. Some of the sites were designated official shelters which were shared with other evacuees from the community. This presented problems for some organizations who had mentally impaired individuals in their group. Not all shelters were one-story structures which meant that equipment, such as wheelchairs, had to be hauled upstairs.

Of 45 organizations reporting shelter sites, two only used hospitals as shelters for their clients, eight used one or more other nursing homes and at least one hospital as shelters, four used a hospital and a designated shelter, one used a hospital plus another nursing home and another type of shelter and one used a hospital plus a church. Seven only used other nursing homes as shelters. One used a nursing home plus the homes of staff. Of those using schools for shelters, eight used schools only, three used schools and a hospital, and two used schools and other nursing homes. Four used other types of shelters such as churches, motels, hotels, or recreational buildings. Four organizations were able to use part of their own facility as an evacuation site.

Evacuation effectiveness. In this study evacuation effectiveness is the time to evacuate to safety. The times taken to evacuate ranged from ten minutes to seven hours, with a mean of 2.5 hours. To standardize for different size institutions the time was divided by the number of clients yielding a ratio of time (in minutes) expended per client. The evacuation rate ranged from .08 minutes per person to 6.20 minutes per person with a mean of 2.19 minutes per person. One finding is that time to evacuate is not related to number of persons evacuated (see Appendix F).

Section Three: Evacuation Problems

This section provides a qualitative description of the variables used in the analysis of the evacuation experience. We examine possible

problem areas including convergence, the decision to evacuate, the identification of the threat, the return of evacuees, media interference, client welfare, and the provision of medications.

Convergence. Anecdotal observations suggest that convergence of helpers and sightseers at the site of a disaster can hamper emergency efforts. However, when asked if convergence was a problem for the organization in evacuating, only one administrator agreed. In that case the administrator mentioned that returning to the nursing home was a problem, not leaving, because "everybody seemed to be going back at the same time and it took us much longer than when we left the home originally."

Selection of shelters. The selection of destination sites depended on a number of factors. As would be expected, the availability of space for clients was cited as the major reason for site selection. Existing plans, or other prior arrangements among facilities for use of other health care facilities, were also important considerations for site selection. For those with prior evacuation plans, decisions about where to take clients were frequently made internally by management of the nursing home facility.

External decisions made by officials or other authorities were also cited as reasons why certain sites were chosen as shelters. For example, the Red Cross has designated shelters which are activated in a community-wide emergency or by a specific request by authorities. In some community-wide evacuations, shelters were needed beyond a

certain distance for safety reasons, thereby eliminating nearby accommodations for clients that were in existing organizational plans.

The client's physical condition frequently affected the decision about the evacuation site. If the client was perceived as needing additional medical attention or as being "under the weather," the client was placed in a hospital. Those persons were the first to leave the facility, generally in ambulances. Moreover, these clients were often retained at the hospitals until all the other clients were returned to the facility. Since persons who were sent to hospitals were not representative of the general nursing home population, we did not take their final return times into account when reporting the endtime of the evacuation.

Several administrators mentioned the accommodations for the elderly provided by the Red Cross did not meet the elderly's particular needs. Because the cots and food provided were inadequate for their clients, additional transportation had to be used for carrying supplies, such as mattresses, to evacuation sites. One director commented that clients found the cots provided by the Red Cross difficult for resting "old bones and frail skin" and that mattresses would definitely be taken next time an evacuation occurred. On the other hand, one administrator indicated that placing mattresses on the floor was hard on staff who "did most of their work on their knees--and that can be tiring." For staff working 12-hour shifts--which occurred in many of the evacuations--this aspect might have been among the worst experiences of the evacuation.

Some elementary schools used as shelters had teachers' bathrooms locked, forcing elderly clients to use "kid-sized" toilets. One director commented that facilities at the elementary school were adequate, but the height of toilet facilities "wore them out bending over all the time." A few of the official shelters such as schools were not air-conditioned and were used temporarily until management could find better accommodations for their clients.

Concern for clients. Another issue that arose from unsolicited comments made by administrators was the need to keep clients in contact with staff familiar to them. It was apparently important for organizations to provide staff personnel that remained with clients throughout the evacuation. "We worked 12-hour shifts" said one administrator. Another said, "Our staff stayed with all our clients, even at the hospital."

Several times we heard that staff remained with clients to calm and reassure them during the entire evacuation. "Some [clients] are confused anyway, and we didn't want to add to their confusion" noted several administrators. As many of the clients were in their eighties and nineties, this concern was voiced as normal organizational procedure. We did not have any reports of families assisting with client care at the evacuation sites. Administrators also made considerable efforts to maintain schedules (such as snacks and meals) familiar to clients, to alleviate as much stress as possible to clients during the evacuation.

It was also important to administrators to insure that all medication be administered on a regular schedule to all clients throughout the entire evacuation. Administrators noted several ways that medication schedules were maintained. All medications were generally taken with the clients to the evacuation site, even when clients went to a hospital. Several directors mentioned wheeling medication carts onto the vehicles evacuating the clients. At one facility where an evacuation occurred because of a propane leak, both clients and medication carts were wheeled out the door of the facility into the adjacent parking lot.

A frequent deterrent to evacuating for health care facilities is said to be the fear for increased rate of mortality and/or morbidity in moving such a sensitive population from their normal environment. Management did not express fear about moving their clients from the facility but were careful to return their clients as soon as possible.

Overall, very few difficulties were reported after clients were returned to their quarters. Two organizations reported that some of their clients suffered skin abrasions during the evacuation, noting also the fragility of some elderly persons' skin. Some administrators mentioned the extra caution staff had taken during the evacuation in making sure the clients were moved every two hours. In normal nursing home procedures, clients, especially bedridden ones, are turned every two hours to prevent bedsores from developing.

Some organizations reported leaving clients in hospitals where they had been taken as a precaution during the evacuation to be sure

clients were satisfactory before returning them to the facility. Such clients were reported as having "breathing problems" or "having heart problems." One organization reported placing clients in the hospital because of breathing difficulties after the clients were returned following the evacuation. In this instance, the evacuation was caused by a forest fire nearby and smoke was still in the vicinity.

Only one organization indicated that a staff member was upset with the evacuation and tried to get medical compensation for "stress" from the evacuation experience. The facility refused the request and reported, "She left [the organization] soon afterwards."

The only other instance of stress reported may have been experienced by a family. One director mentioned that a woman taken home by her family during the evacuation was so disoriented by the change in surroundings that she kept calling the facility to find out when she could get her personal items "since she was sure she wasn't ever going back. It didn't bother the family or us--we just reassured her everything was taken care of--but she sure called a lot of times," said the director. The director also mentioned that both the woman and her family were "very glad" when she was returned to the home.

Decision making. It was not always considered necessary for all staff to leave with clients. A few directors mentioned that staff members went with clients but returned to the facility to call families of clients and/or prepare for the return of clients. Some staff remained at the facility throughout the evacuation. Thus some

evacuations were for prevention or protection of clients, not for the benefit of the overall organization.

How long the evacuation lasted generally depended on the circumstances of the threat's impact. Frequently an outside source--usually official--decreed when the organization could return their clients to the facility. The one facility that reported having evacuated for an entire week--the longest period of evacuation in the study--had been inundated with floodwaters and required considerable clean-up. The director reported that the repairs included "many new appliances before the insurance and health people would let us return."

An earlier version of the interview schedule attempted to determine the time spent in making the decision to evacuate. Most managers were unable to respond to the question citing external constraints on the decision process. Another constraint was ambiguity about whether the evacuation would actually take place. One administrator phrased the problem well. "We were put on alert until notified officially to leave," he said. He also noted that the two and a half hours spent "on alert" were distressing for staff, who were not sure what was expected of them during that time. He noted he spent a lot of time reassuring the staff, but not any time making the decision to leave. "They waited until they [the local emergency personnel] were sure we had to leave and then they got us out," he said.

Threat identification by organizational personnel. Health care facilities appear to rely more on official notification when evacuation is necessary than do individuals during a similar circumstance. In

most evacuations where individuals are involved, friends, neighbors, kin, and media sources provide information about threat. However, no managers in this study reported being notified of a threat by a personal friend. A few administrators and some staff personnel reported that on hearing about the threat from a staff member, they immediately turned on the radio or television to learn more about the emergency. One administrator noted that confusion was created among his staff because they listened to the radio while waiting for official notices.

Extensive community preparations for evacuations were evident in the Pinellas County group. Six facilities from Pinellas County reported being informed of the need for evacuation through a call-down system instituted by the local civil defense unit. The call-down system had been initiated by local emergency managers to inform health care and related facilities when evacuation was required for hurricanes, a frequent threat in the southern states. Although this was the first time the call-down system had been operative, managers in Pinellas County thought it an efficient notification method.

Communication problems between emergency agencies and organizations were also noted by management. During one evacuation alert, two nursing homes were notified by officials that they were to evacuate, since they were located in an official evacuation zone. The facilities apparently attempted to call in staff and prepared to leave. Preparations were completed for evacuating for at least one nursing home. However, one of the administrators claimed they were "forgotten"

by officials in the evacuation process. The administrator continued to wait without receiving further communication about the threat or evacuation procedures from officials. Nursing home staff who attempted to get to the facilities during the crisis were turned away at official barricades. Neither organization ever evacuated from the danger zone.

The two organizations responded very differently to our questions. One facility was willing to discuss the problems encountered. The other organization refused to answer even basic questions about the number of beds in the facility or the types of services offered by the organization. Since the two facilities had only prepared to evacuate and never left their premises--although the threat was real--they were eliminated from the analysis.

Preparedness for evacuation. Two issues were involved in examining the level of preparedness of the organization for the evacuation. The first issue related to emergency plans existing prior to the evacuation. The second issue related to the prior experience--or lack of experience--among organizational members with either an actual evacuation or in preparing for an evacuation. The two issues differed, because a plan can exist prior to an emergency and not be tested, while an experience provides direct exposure.

Mock or simulation evacuation exercises were another matter. Sometimes the mock simulations of evacuations were carried out in a general community emergency exercise, while others were conducted with agencies such as local civil defense units. Most evacuation simulation exercises conducted by the organizations were carried out

internally, without external support units, but with patients actually being moved to the front lobby or loading dock or to an exterior area. Administrators were generally pleased with their emergency plans and indicated no reason to change them.

Return of evacuees. Return of evacuees posed few problems for management of the nursing home facilities. Only one facility that had been evacuated returned clients to the facility after 9:00 p.m. Some nursing home managers elected to retain their clients at the shelter sites (many sites were other nursing homes) for an additional night so as not to have to return clients during darkness. On the other hand, most administrators reported clients were happy to be in their own quarters. Comments such as "everybody was glad to get back" and "relieved but happy to be back" were frequently made about the return experience.

Another unsolicited comment heard frequently was how tired clients and staff were when they returned to the facility. One administrator noted, "We gave them a cold supper in bed--they were all so tired." Another director indicated that clients had not been able to rest because there were no beds, only chairs provided by officials at the shelter site, and most clients needed to lie down to rest.

Several administrators reported that the trip back to the facility was much longer than the initial withdrawal. Although we did not specifically ask about the mechanics of the return trip, directors mentioned that they "went the same way they left," meaning the same transportation was utilized by the organization to return to the

facility. One director reported her appreciation of the help of the local U-haul agency in arranging transport for the articles needed during the evacuation. A few managers reported that buses provided by emergency officials were slow to arrive for the return trip, which was very annoying because "everyone was anxious to get back." Several informants mentioned the heavy traffic encountered in returning. Return trip procedures did not seem to be a part of emergency plans, either among the organizations or among the officials orchestrating the evacuation.

Evacuation model. At the beginning of this dissertation, an analytic framework was given for analyzing the factors that affect evacuation (Quarantelli, 1980). The model states that the effectiveness of the evacuation depends on the type of threat plus the availability of resources, social climate of the organization, social linkages to the community and the extracommunity setting. To complete the analysis we tested the evacuation model.

Effectiveness of Evacuation = Type of Threat + Resources + Social Climate + Social Linkages + Extracommunity

Effectiveness of evacuation was operationalized as time taken to evacuate the facility. The total amount of time (in minutes) to evacuate was recorded. This produced a measurement (TIMEVAC) which could be compared across the entire census of facilities. TIMEVAC was used (rather than time per client) because rate was not related to the number of persons evacuated.

The type of threat was treated as a binomial variable. Either the variable was weather related or not related to weather. We called this variable THREATD.

Resources were measured by three variables: the number of sources of external help (NUMHELP), the ratio of staff to clients (RATIOSP), and the presence of an evacuation plan (EVAPLA).

Social climate was measured by the number of clients evacuated (PEREVAC), the average age of clients (AVEAGES) and the percentage of non-ambulatory clients (AMBULAT).

Social linkages were measured by association with a larger organization (DEPEND) and population density of the community (POPDEN).

(Note: Extracommunity was not used in analysis.)

Ordinary least squares estimate of the most parsimonious model are:

TIMEVAC = 1.103 + -1.151 THREATD + 1.156 NUMHELP + 0.001 POPDEN

The model needs further testing across other special populations before any conclusions can be drawn. However, the results are somewhat unusual. As expected, the equation supports the proposition that the response to non-weather threats us faster than to weather-related threats. The equation further suggests the greater number of sources of help, the longer the evacuation time. Further, the greater the density of population of the county, the longer the evacuation time. We can offer no explanation for these latter findings. Data to support the equation are in Appendix G under Evacuation Model Results.

CHAPTER V

CONCLUSIONS

Overall, the organizations caring for the specialized populations in nursing homes and related home care facilities coped well with emergency evacuations. The manner in which organizations handled emergency evacuations suggests that the continuity of responsible care for clients is of foremost concern to the organizational personnel, both management and staff. The lack of injuries and deaths of clients during the evacuations is a tribute to the managers and staff of the organizations caring for these specialized populations.

Unlike other victims of disaster, individual clients in nursing homes and related home care facilities are in a unique position when an evacuation is necessary. There are several reasons for this uniqueness. First, individual clients lack responsibility for their own welfare. By entering a nursing home or home care facility, individuals forfeit many of their constitutional rights about their obligations to themselves and their families. Among these forfeitures is the ability to decide when a risk is threatening.

Second, families and kin share little responsibility for the care of persons in such facilities. In a sense the health care organization functions as a surrogate family. It is the organization that receives the warning and alerts the clients. It is the organization that determines what the risk is to the clients. It is the organization that determines the site for sheltering, how to travel

and when to return. Clients are totally dependent on the decisions made by the organization about "safety" concerns.

But this safety is not without its limitations. Concern for individual property--and perhaps dignity--is forfeited in the endeavor to secure the safety of clients. We heard several comments on how difficult it was to transport clients' wheelchairs because of all the "baggage" clients stuffed in them on leaving. Clients should not be "allowed" to carry as many possessions with them. Other comments alluded to the problems of providing different mattresses for clients other than their "own." That evacuees want to take certain items--even pets--with them is understandable the way they do in evacuations as individuals, but not when these individuals become clients in a nursing home or related health care facility.

Goffman (1961) noted that institutionalized persons and the people who care for them behave toward each other with specific behaviors resulting from the "basic split" between the large managed group of clients and the small supervisory staff. This study of evacuations suggests that the mannerisms of two separate groups are continued throughout a crisis. The clients remained dependent on the care provided by the organization even when they were taken to official shelters with available Red Cross personnel or to hospitals with nursing staff.

Likewise, the organization did not relinquish the responsibility of caring for its clients throughout the evacuation experience. Routines--including the constant provision of medications and the

two-hour movement of bedridden clients--were continued as if clients were at the home facility. Frequently the care of clients was administered by staff personnel on an around-the-clock basis.

The situation of specialized populations of nursing homes and related care facilities is unusual. Although reports in the medical gerontology literature fear increased morbidity among clients, physicians were not directly involved in the decision to evacuate clients. Management of the facilities, or, in some instance, other staff members made the decision to evacuate. Medical decisions were ad hoc depending on how the client "appeared" to staff members.

Organizations appear to have interpreted official notifications as mandating the evacuation of clients, not of the entire facility nor the entire staff. Even in potentially tragic chemical spills where toxic fumes present threats to anyone in contact with the substance, not all staff in the facility were evacuated. Why this is so is unclear. We can only surmise that in evacuating only the clients, the organization is fulfilling its legal responsibility to provide safe conditions for clients. What the organizational responsibility is to staff needs further study.

Issues

A number of issues were raised by the findings. The findings suggest that the structure of the organization as an institution may have more to do with the effectiveness of the evacuation as measured in time evacuated per person than the use of volunteers or external help sources. External help was generally provided by trained

emergency personnel from fire or police departments.

Role Abandonment

There was no evidence of role abandonment or that workers left their jobs to attend to families during crisis situations. Conflict between family and organizational responsibilities did not affect performance of work tasks by nursing home managers and staff. On the contrary, when hearing of an emergency at their facility, staff members, along with their families, were reported as going to the facility voluntarily to assist in the emergency.

When additional staff were needed to assist in the evacuation, not one nursing home reported having difficulty reaching staff or in getting their immediate favorable response to help. Even if families were evacuating themselves, the staff generally responded by making sure family members were taken care of and then going to the facility to help with the clients.

Family members of staff, especially male spouses and older children, often aided in evacuation efforts by undertaking the physically heavier tasks such as lifting clients onto buses and carrying mattresses. One facility with an extensive evacuation plan specifically mentioned whose responsibility it was to care for young children of staff during evacuations.

The assistance in emergencies supports Dynes and Quarantelli's (1976) conclusion that a total role structure may be organized around a set of value priorities which provides direction during crisis situations. In this study, the role of care provider for incapacitated

clients appears to direct nursing home worker behavior. At the time of an emergency, other less salient or conflicting roles were eliminated.

The findings support the proposition that the family unit makes internal adjustments about appropriate roles in an emergency. The fact that so many family members engaged in roles appropriate to helping may indicate that descriptions of resources in the evacuation literature overlook an important aspect of organizational coping strategies.

Use of Other Volunteer Helpers

We need to construct better methods of discerning how organizations use volunteers in times of emergency. Several facilities mentioned help received from volunteers other than family members. Some administrators mentioned people "walking in off the streets" to help in evacuating the clients. Almost one-third of the facilities reported volunteers as their only source of aid other than staff.

The types of assistance provided by volunteers need further study. Besides helping move clients, volunteers frequently assisted in the care of clients at shelter sites. Whether these were the same or different volunteers is unclear. Several groups of volunteers continued their assistance throughout the period of evacuation until normal routines were resumed at the facility. One administrator noted that an older group of volunteers who regularly worked at the nursing home assisted in preparing the beds and performing other clean-up tasks before residents were returned from the evacuation site.

Dissension between staff and volunteers about appropriate domains during the emergency did not appear to be a problem. Volunteers and staff coordinated efforts to get the necessary tasks--even the difficult or less desirable--accomplished. Volunteers assisting with aspects of residents' care were welcomed by staff and management alike. Although we did not ask questions about volunteer helpers, many respondents spontaneously reported being grateful for the support of the community and the number of volunteers during the crisis situation. Several mentioned how difficult the evacuation would have been without volunteer help.

Overall, the evacuation rate did not increase or decrease with the use of volunteers. Size of organization was correlated to the use of volunteers as larger organizations used volunteers more frequently than smaller organizations. The correlation may be explained by the greater number of linkages to outside sources given the larger number of clients. The specific number of volunteers helping in an evacuation was unknown to administrators.

The number of volunteers assisting in the evacuations supports the proposition that individuals not involved in a crisis are willing to adopt appropriate helping behavior in an emergency. This performance of tasks appropriate to helping in an emergency again indicates that the use of latent resources is overlooked in organizational coping strategies. Yet organizations recognized the assistance provided. Whether this type of aid is treated as a resource in evacuation plans needs further study.

Care of Specialized Populations During Evacuations

The findings support the proposition (Kreps, 1978; Stallings, 1987; Drabek, 1986) that continuity and adaptation of structure characterize organizations during crisis situations. They support the proposition that the greater the continuity between disaster roles and normal responsibilities, the less problematic is disaster mobilization likely to be (Drabek, 1986).

Significant interest was expressed about how clients were cared for during the entire evacuation process of nursing home and related care facilities. Part of this approach to client care may be due to legal mandates or corporate policies. For example, a hypothesis could be made that differences in responses of organizations of nursing home and related care facilities were different from those of other organizations from a legal standpoint. Health care organizations must continue that care because they must answer to a variety of outside agents including local and state regulations, insurance providers, and federal statutes.

Other specialized populations may or may not receive similar treatment. Given a prison population, the concern for the physical well-being of clients might not be as critical. On the other hand, organizations caring for incarcerated clients may view their obligations as protecting society from their clients. The continuity of care would then be in keeping their populations away from the public at large. This is a question for further study.

The multidimensional aspects of caring for "undesirable" special populations during emergencies include both political and social constraints to making the decision to evacuate a special population. Important interaction effects such as community resistance in assisting a prison evacuation because of perceived problems with safety may intrude on organizational decision-making about an evacuation. Few evacuations involve incarcerated clients being moved from their facility to another facility. School populations, on the other hand, would likely receive the same concern from staff and administration as do nursing home residents.

Response Characteristics

The question remains whether significant differences in response to threat exist between nursing home and related home care organizations and that of individuals or family units. Given our information, the immediate response to a threat appears to be intent alertness, combined with genuine concern for client welfare. This supports the Janis-Mann conceptualization of increased awareness of individuals when faced with a crisis situation. An organization may act as a surrogate responder for the individual client.

Organizations relied to a greater extent on official sources than on other types of sources for information about the threat. Organizations did not want to move their clients unless clients were directly threatened. Decisions to evacuate usually occurred under orders from an external source if it was an external threat.

The lack of cognitive awareness places constraints on staff as well as emergency responders who must deal with resistive persons. When asked what steps were taken when clients refused to evacuate, administrators replied that clients were generally reassured by staff personnel with whom they were familiar or calmed down through conversation. One manager noted that the objector was "bodily removed from the premises." Not one administrator mentioned giving clients medication to relieve stress during the evacuation.

The lack of locomotion has been cited as an issue in moving clients to safety. In this study the number of non-ambulatory clients, however, was not correlated to the evacuation rate. Neither was the average age of the clients correlated with evacuation rates.

Moving a large number of clients presents direct logistical problems that must be dealt with in an efficient manner for the safety and health of clients. Instead of having detailed plans, organizations instituted ad hoc operating procedures with all staff members called to assist in moving clients. Although the addition of volunteers was frequently credited with the ease of movement, the total number of staff present and not the availability of volunteers, was correlated with lower evacuation rates.

Belief in Warning Message

Administrators and other managerial decision-makers placed greater reliance on warning messages from authorities than any other source of warning messages. This reliance is especially evident when the threat was external to the facility. The reliance on authority may

dispel any inherent ambiguity about the threat and the consequent need for evacuation for the organizational decision-maker. In one case, when a facility was threatened with fire, clients were initially evacuated to an internal destination--a lobby--but taken outside the facility when told to do so by personnel from the fire department.

Contrary to the disaster literature on the individual tendency to deny risk when confronted with a threat, in this study there was no evidence to suggest that the first reaction to the threat was denial. On the contrary, several administrators reported setting in motion immediate preparations for evacuation even when told by authorities that an evacuation was uncertain at the time of warning.

Apparently most emergency agencies and authorities are aware of the specialized populations within health care and related home care facilities in their jurisdictions. After issuing warnings to the organizations, authorities and emergency agencies frequently remained to help evacuate clients. In only one case did emergency officials order an area evacuated, warn the nursing home personnel, and then "forget" to evacuate the facility. The case is now under litigation.

Planning for Evacuations

The findings from the study indicate that organizations are not significantly influenced by policies (either legal or in-house) that require evacuation plans. The differences between those organizations reporting having evacuation plans because of policy or legal mandate and those reporting having plans for other reasons were insignificant.

There was no correlation between rate of evacuation per person and the expressed reasons why organizations had evacuation plans.

The lack of interaction between state and federal emergency organizations and the nursing homes and related care facilities may indicate that the sifting down of preparedness for emergencies is not reaching the target organizations. This suggests that such organizations have been overlooked in the past when planning for these low-probability events. How such organizations can be assisted in planning for evacuations needs further study.

The proposition that the most extensive evacuation planning will be in communities that are larger as measured by population density was supported by the data from Pinellas County. Besides having the highest population density (2,280 persons per square mile), it was the only area in which respondents reported having a call-down telephone system among nursing home organizations initiated by civil defense personnel.

That the more extensive planning for emergencies occurs in areas frequently victimized by disasters remains unclear. Although Pinellas County is in an area threatened annually by hurricanes, an actual storm with winds of hurricane force is an infrequent occurrence in the area. Nor did respondents in Pinellas County report any more past preparations for evacuations than respondents from other regions of the country.

Generally procedures followed during the emergency were those learned previously during fire drills. Thus this study generally supports research on earthquake related evacuations about learned

behavior for emergency evacuations (Arnold et al., 1982). For many organizations, fire drills may be the only source of information about evacuation procedures other than manuals. How the reliance on fire drills for training staff about evacuation procedures affects effectiveness of evacuation remains problematic. Some administrators mentioned learning from fire department personnel how to use emergency supplies such as hoses, while others mentioned only the arrival of fire personnel at their premises for safety inspections or monthly fire drills.

Very few organizations reported being in contact with or contacted by emergency agencies about evacuation planning. Those that reported being in contact with other than fire departments told us they were in contact with the local civil defense agency.

Length of Evacuations

The majority of the evacuations were for preventative or protective measures for short periods of time. Clients were gone from their premises a mean of 41.33 hours, or about a day and three quarters. Twenty-three were gone from their facility less than 24 hours. Only one organization reported being away from its facility for an entire week.

The relatively short length of evacuations raises a question on organizational effectiveness for long-term evacuations. Who assumes responsibility for finding continued shelter for the evacuees of special facilities if the building that houses the special population is destroyed or made unsafe, as occasionally happens during a tornado or flood, needs attention.

The effects of long-term evacuation on the health and well-being of clients of nursing homes and related care facilities needs further study. Elderly clients as well as caretakers would find it extremely difficult to remain in makeshift quarters and "make do" until repairs are completed at the facility. If the nursing home facility is made unusable and an organization cannot fulfill its stated objectives, the organization could lose legitimacy and cease to survive. If that occurs, clients would have to find other sources of care. The stress on families and clients would then escalate. Under such conditions both morbidity and mortality rates might escalate.

Planning or caring for specialized groups of the general population is apparently not defined as a responsibility of the quasi-public agencies charged with the protection of the general public. The Red Cross assumes most of the sheltering and feeding during community emergencies, but whether its duties include special accommodations for the elderly, children, or prisoners is not clear. Yet not one organization mentioned using other than a Red Cross shelter when an official shelter was used as a destination site. The interactions between organizations caring for the elderly populations and the Red Cross needs further study.

Destinations of Evacuees

Shelters were chosen for several reasons. The most important concern was adequate room for groups of clients. Clients were frequently divided and sent to one or more locations along with staff.

How organizations choose shelter sites in a community-wide emergency is unclear from this study. The Red Cross plans about sheltering special populations such as nursing homes or related health care facilities remain murky. The Red Cross is charged with providing shelter to public not private facilities in emergencies. The policy, however, is not universally applied across communities. Both private and public nursing homes and related health facilities located within the same community faced with the same threat relied on Red Cross shelters at some time or other. Still other facilities of similar size and structure did not utilize a plan for the use of official shelters. In smaller communities the reliance on official shelters provided by the Red Cross was often assumed, whether the facility was within the public domain or not.

Adequacy of accommodations provided by the Red Cross was not always at a level satisfactory for elderly clients. While the Red Cross generally shelters and feeds evacuees, the food provisions are not adequate for the needs of the elderly. Elderly clients frequently require special food preparation and additional dietary supplements for health conditions. Administrators were consistent in reporting about the organizational preparation of food at official shelters or the bringing of food to official shelters by staff personnel. Specialized populations have needs outside of those necessities provided in standard shelters.

The findings suggest that organizations may move just to the boundary of safety, It appears that both organizations and/or

authorities were aware of shelters at the minimal distance from the threat to diminish dislocation of clients. In the Pinellas group of health care facilities, organizations which were located on water-front property frequently reported having reciprocal agreements with other nursing homes at higher elevations in case of hurricanes, an annual threat in that region.

The overall number of moves as well as the number of consecutive moves made to shelters raises some questions about designation of official shelters. To avoid additional stress being placed on clients, the ideal movement in an evacuation is to one site for the period of risk and then returning to the facility for all clientele. Five of the organizations reported making subsequent trips after the initial withdrawal.

The number of moves as well as the use of several destination sites may not be unusual for health care facilities. Some Mississauga hospitals had to evacuate consecutively during the five-day evacuation. That an organization was taken to an official shelter (a church) and then told to leave by church members because a picnic was planned later in the day suggests that better coordination is needed between authorities and shelter providers.

Evacuation Costs

Who assumes payment for evacuation costs is a viable issue for further research. Organizations were either unable or disinclined to provide cost estimates about the evacuation or about drills associated with evacuation preparedness training. Costs can be

absorbed by the organization, passed on to insurance carriers or Medicaid, or, if a community-wide disaster, to state and federal agencies. Determining the amount of time spent each month on drills was unsuccessful.

The Future

There have been significant changes in the care of the elderly in America during the last four decades. This growing older segment of the population will need more chronic care facilities such as nursing homes, convalescent homes, and adult day care centers in the future. The proportion of the elderly receiving adequate health care has improved the overall survival chances of this group in addition to providing the elderly with an improved quality of life. Initial steps to curb the abuses and deficiencies of the past of those caring for the elderly have been taken. But the sheer growth of this segment of America's population suggests problems in the care of the elderly, especially during evacuations.

The federal initiative to reduce hospital costs by shortening length of hospital stays has several implications. The use of nursing homes for short-term clients will increase. The increase in short-term clients may decrease the number of ambulatory clients, suggesting a need for more personnel in times of emergencies.

No doubt regulations (through government authority or insurance or accreditation) requiring drills, especially for the rare events requiring evacuation, have been successful in alleviating some of the problems organizations of special populations faced in the past

in times of emergency. Even if the event is not one that falls under the organization's definition of an "emergency," the knowledge of essential tasks to perform for the safety of clients is available to the staff from drill rehearsals.

Few official policies are designed to alert government officials about the special needs of these populations. The burden of responsibility has fallen on nursing home operators to evacuate their clients successfully. Frequently that evacuation does not start until an "official" announcement is made or given to an administrator of the facility. Yet these administrators remain for the most part out of contact with government officials in the planning and execution of evacuation efforts. In some instances it takes twice as long for clients to be returned to the facility than to evacuate initially, creating major problems for both facility operators and elderly patients already exhausted by the physical exertion of the move. To the credit of nursing home operators and staff there have been few tragedies during evacuations.

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APPENDICES

APPENDIX A

LIST OF ACRONYMS USED IN STUDY

AP--Associated Press

DOE--Department of Energy

DRC--Disaster Research Center

EMS--Emergency Medical Systems

FEMA--Federal Emergency Management Agency

FTE--Full Time Equivalent

HUD--Housing and Urban Development

NAS--National Academy of Sciences

NCHS--National Center for Health Statistics

NOAA--National Oceanographic and Atmospheric Administration

NORC--National Opinion Research Center (University of Chicago)

NRC--National Regulatory Commission

NWS--National Weather Service

ORNL--Oak Ridge National Laboratory

SMSA--Standard Matropolitan Statistical Area

TMI--Three Mile Island

UPI--United Press International

USDOC--United States Department of Commerce

USFEMA--United States Federal Emergency Management Agency

USGAO--United States General Accounting Office

APPENDIX B

SAMPLE OF LETTER SENT TO ADMINISTRATORS

Dear Administrator:

The Sociology Department of the University of Tennessee in cooperation with the Oak Ridge National Laboratory and the Federal Emergency Management Agency is conducting a study about evacuations of facilities that service special populations such as hospitals and nursing homes. The study examines what organizations did when forced to evacuate some or all of their facilities. We are contacting you because your facility was identified as having experienced an evacuation in the last four years. Your assistance in this effort will help improve the way facilities such as yours manage emergency evacuations.

The data required for our study will be collected during December, 1987. It is important that we talk with the person in your organization who has the most information on the evacuation experience. We will call to arrange a convenient time to discuss the evacuation experience.

If you have prepared a summary report on your experiences during the evacuation, we would like to obtain a copy. By reading the report we can avoid asking unnecessary questions. Please forward any relevant reports to:

Ms. Barbara Muller Vogt
901 McClung Tower, Department of Sociology
The University of Tennessee
Knoxville, TN 37996-0490

All the information provided about the evacuation will be treated in a confidential manner. The collected data and any report we receive will be given an identification code when transcribed to tape. The data will only be available to the project managers. After the project is completed we will destroy all information linking your organization to the code number. Neither you nor your organization will be identified in the final document.

The results of the study will be published in a report available to all government officials and representatives and other interested parties. You may obtain a summary of the results by requesting a copy when you are contacted.

If there are any questions about the project, you can contact us at the above address. Our Knoxville telephone number is (615) 974-6021.

Thank you for your assistance. We look forward to talking with you.

Sincerely,

Barbara M. Vogt
Project Director

APPENDIX C

SAMPLE CODING FORM FOR ANALYSIS OF NEWSPAPER ARTICLES

SOURCE: SECTION: KEYWORD: DATE OF SOURCE:

LENGTH OF STORY: MAPS/PHOTOS INCLUDED:

DETAILS OF INCIDENT

TYPE OF FACILITY: _____ NAME OF FACILITY: _____

LOCATION: _____

DATE OF INCIDENT: _____ TIME OF INCIDENT: _____

CAUSE OF INCIDENT: _____

DESCRIPTION OF INCIDENT: _____

_____

_____

DESTINATION OF EVACUEES: _____

NUMBER OF EVACUEES FROM FACILITY: _____ NUMBER EVACUEES OVERALL: _____

DURATION OF EVACUATION: _____

INJURIES/DEATHS AT FACILITY: _____ OVERALL: _____

DAMAGES: _____

FIRST RESPONDERS: _____

NAMES OF PERSONNEL LISTED IN ARTICLE: _____

_____

EVAC. PROBLEMS IDENTIFIED BY NEWSPAPER ARTICLE: _____

_____

COMMENTS BY EVACUEES:_____

_____

_____

_____

COMMENTS BY CODER:

APPENDIX D

QUESTIONNAIRE FINDINGS

A. Accommodations

1. Trucks and vans were needed to transport mattresses to shelter sites.

2. The height of bathroom facilities in elementary schools used as shelters were inadequate or difficult to use by elderly--"with their weary bones." On occasion teachers' bathrooms were found locked up. Some administrators recommended bringing the facility's "potty chairs" instead of so many wheelchairs.

3. More than one story levels in shelters created problems in transporting patients, wheelchairs and mattresses. "All are heavy items--both up and downstairs."

4. Patients needed bedrest. When mattresses not available, just the cots provided by outside agencies were inadequate for resting. Older patients' fragile skin made it difficult to use cots and to be turned on the cots as required every two hours. Some skin abrasions resulted from using cots.

5. Frequently linens were lost or misplaced when moving to another facility. Not all linens were marked with the facility's name. Administrators thought disposable linens were better--as long as they took along enough plastic trash bags for disposal.

6. One official shelter--a church--told a group they would have to be out at noon because of official church function that afternoon--a picnic. Better coordination of expectations of shelter hosts would solve problem.

B. Patient Care

1. Identification of clients was a reported concern, especially for those clients lacking cognitive functions. The use of identification arm-bands was thought feasible for clients. Some managers had duplicated medical charts with patient's recent picture on top that travelled with client to an from the evacuation site.

2. Clients frequently were reported as being tired when returned to facility after evacuation but as having "enjoyed the change of scenery."

3. Only one facility reported clients refused to leave the facility when advised to evacuate, and for good reason. The county emergency unit had set up their official command post in their facility and patients felt "safe." This could be problem for both clients and officials if all had to leve at a later time.

C. Preparedness of staff for emergency

1. Fire drills were cited as means to inform staff about emergency procedures. Some in-service training accompanied drills and most managers mentioned simulated evacuations about once a year as part of training.

2. Some managers mentioned staff were notified a week prior to drill that a drill would be forthcoming. Management personnel felt the advance notice gave time for staff to make sure everyone knew what to do in emergency.

3. Mention was made that staff personnel didn't mind the drills but that patients objected to fire alarms going off--once every shift about once a month in some facilities.

4. Few managers mentioned being in contact with state or federal agencies about evacuation planning at their facility. However, most administrators mentioned fire personnel conducting monthly drills at their facilities.

D. Return

1. Sometimes clean-up at facility prevented clients from returning. Clean-up took longer than expected when there was any type of damage, especially if insurance companies or health officials were involved.

2. Actual flooding or damage in facility was generally not expected. Evacuation plans did not appear to account for extended stays from the facility.

3. Returning to facility took longer than expected because of convergence of people returning home.

APPENDIX E

SAMPLE QUESTIONNAIRE

Hello. I'm Barbara Vogt from the University of Tennessee. We have contacted you about an evacuation study sponsored by the Sociology Department of University of Tennessee and the Oak Ridge National Laboratory through a contract with the FEMA. Did you receive our letter?

IF NOT RECEIVED, USE THIS
(Your facility was identified from newspaper reports as having experienced an evacuation within the last four years. The study examines the strategies that organizations that care for special populations (like nursing homes and hospitals) use when they evacuate some or all of their facilities. Your assistance in this study will help improve the way in which facilities such as yours cope with an emergency in which an evacuation occurs.)

Do you have time to talk with me now--the interview will take about 30 minutes--or is there a time when I can call you back and talk with you?

We want you to know that all the information you provide about the evacuation will be treated in a confidential manner according to University of Tennessee research policies. Neither you nor your organization will be identified in the final report.

If you have no objections, we would like to tape the interview. This saves both time in recording answers and provides a check on the data we receive. We will notify you when the tape has been transcribed and destroyed. Also, if there is some question you can't answer or would prefer not to answer, tell me and we will skip that question. Do you have any questions?

Date _____ Time _____ Recorder _____
Organization _____ Tel. # _____
Contact _____ Title _____

On _____ the API (or UPI) news syndicate reported an evacuation occurred at your facility because _____

(1) Do you recall the incident?
    a. Yes
    b. No
IF NO ASK: Do you know of anyone in your organization who could help us find out about the evacuation? (Probe if necessary)
    Name of person
    Affiliation
Could you please connect me with that person? Thank you.
(Quit and go to start of questionnaire with new contact.)

(2) In your opinion, what were the reasons for the evacuation?

(3) When and how did your organization learn about the problem?

(4) Who in your organization made the decision to evacuate?

(5) Once the evacuation started, how long it took to get your clients to a safe place?

(6) How many people evacuated from your facility?

(7) Does that number include only your clients or does it include staff personnel who were at the facility at the time of the emergency?

(8) Did your organization have to call in extra staff to help with the emergency evacuation?

(9) Were there any others who aided your organization in evacuating your clients?

(10) What means did you use to get your clients to shelter?

(11) How did you handle clients who didn't want to leave?

(12) Sometimes when people hear about a problem, they may attempt to telephone for information. Would you say the number of incoming telephone calls were less than average, about average for a normal day, averaged twice as many as usual or much more than that?

(13) How did you handle telephone calls during the emergency?

(14) How did you handle attention from the media during the evacuation?

(15) About how many of your clients were picked up by friends, relatives or guardians and taken to safety?

(16) Where were your clients taken? (Get place names if possible).

(17) Approximately how many miles away are those places?

(18) About how many clients would you estimate went to each place?

(19) What kind of difficulties did your organization have at the places where you took your clients during the evacuation?

(20) When and how did your organization learn that it was safe to return your clients to their quarters?

(21) Who in your organization made the decision to return to your facility?

(22) What difficulties did your organization experience in getting your clients back to their quarters after the emergency was over?

(23) About what time did the evacuation end for your organization, that is, all clients were all returned to their quarters?

(24) Were there any further difficulties with your clients after the evacuation event was over?

(25) Now I'm going to read you a list of difficulties organizations have cited when they evacuate some or all of their facility. Please indicate whether the difficulties during the evacuation at your facility were major, minor or of no concern to you.
(a) Getting confirmation about the threat was difficult.
(b) Knowing what agencies to call for help in evacuating was difficult.
(c) Telephone lines were overwhelmed during the evacuation.
(d) Contacting or notifying relatives or guardians about the emergency was difficult.
(e) People arriving during the evacuation created traffic difficulties.
(f) Staff unprepared to move clients safely during the evacuation was a difficulty.
(g) Finding a safe place to take clients was difficult.
(h) Getting relatives or guardians to pick up clients was difficult.
(i) Getting medication to clients during the evacuation was difficult.
(j) Were there any other difficulties that come to mind?

(26) Were any of your clients injured or died as a result of the evacuation?

(27) Were any staff members injured or died as a result of the evacuation?

(28) What would you say this evacuation cost your organization?

Now I am going to ask you some questions about how your organization deals with emergencies in general.

(29) How many times has your organization actually evacuated in the past?

(30) Have you ever had to actually prepare for an evacuation but didn't have to leave after all?

(31) Has your organization asked any agencies to provide information to your organizational personnel about threats that might cause a possible evacuation prior to telling the general public about the threat. If so, who are they?

(32) How would staff members learn about emergency procedures that include evacuations?

(33) Did you have an emergency plan in place prior to the evacuation?

a. Yes
b. No
c. Don't know

IF NO GO TO Q. 37

(34) Did that emergency plan include procedures for evacuation?

(35) Why did you have plans to evacuate?

(36) Prior to the recent evacuation experience did your organization include drills as part of emergency planning?

(36a) If yes, ask: Were these pencil and paper drills, staff moving to predesignated positions or mock stimulations of emergencies that included evacuation?

(37) In the past have you ever been in contact with local or county agencies about evacuation planning for your facility? If so who were they?

(38) Have you ever been in contact with or been contacted by state or federal agencies about evacuation planning for your facility? If so who are they?

These next few questions concern your organization overall.

(39) What is the approximate annual operating budget for the facility?

(40) What are the major services provided by your organization?

(41) Is your organization independent or part of a larger organization? (Name the parent organization)

(42) How many clients do you usually care for on a daily basis at your facility?

(43) Is your facility one-story or multistory?
Number of floors _____

(44) Approximately what percentage of your clients are non-ambulatory? By non-ambulatory, I mean clients that are unable to get out of bed without help. People that are unable to get into a wheelchair from their bed by themselves would be in this category.

(45) Approximately what percentage of your clients are female?

(46) Do you care for most of your clients on a long-term or short-term basis? By long-term we mean more than 6 months. Short term care would be up to 6 months.

(47) What is the age range of your clientele?
(a) Under 35
(b) 26-50
(c) 51-65
(d) Over 66
(e) All ages

(48) What age range are most (at least 51%) of your clients?

(49) How many staff members are usually on duty at your facility?

(50) What would you say is the normal daily ratio of clients to patient care staff--2 clients to 1 staff member, 5 to 1 staff, 10 to 1 staff, 20 to 1 staff, 50 to 1 staff or more?

If MORE, ask: What do you mean by "More?"

(51) Do most of your staff live in the immediate area or do they have to commute more than 10 miles to work? By most, I mean at least sixty percent of your staff.

It's difficult to examine the effectiveness of an evacuation. One could measure the overall time to evacuate a certain number of people, the number or lack of deaths or injuries, or the lack of confusion on the part of staff in getting clients to safety. There are also subjective evaluations that express the organizational view of the evaluation.

(52) If I asked your organization to rate the effectiveness of an evacuation overall from a staff viewpoint, what in your opinion do you think the response of your organization would be?
The evacuation experience was:

1. Not at all efective
2. Somewhat effective
3. About everage
4. Moderately effective
5. Very effective

(53) What would your organization do differently the next time a threat forced an evacuation?

Is this your correct address?

One further question, is there a summary report about the evacuation that you could send us?

a. Yes
b. No
c. Other

Make sure address is correct:

901 McClung Tower
University of Tennessee
Knoxville, TN

That's all the information we need right now. We appreciate your cooperation. Is there anything else you want to tell me about the evacuation that you think would be helpful for our study? (Write on back of this page.) Thank you for the opportunity to talk with you.

APPENDIX F

HYPOTHESES

This appendix examines each of the hypotheses in light of the univariate data, qualitative findings, and multivariate analysis. Where appropriate, bivariate analysis is used when other information is incomplete. Data to support this analysis are available and may be used with permission of the author.

Social Linkages

H.1. The greater the size of the facility (as measured in number of clients), the higher the use of external help (as measured by number of outside sources.

The size of facility was not correlated with use of external helpers.

H.2. The greater the size of the facility (as measured in number of clients), the higher the use of volunteers (as measured in use of volunteers).

The size of facility was not related to the use of volunteers.

H.3. The greater the population density of the community, the greater the help available in evacuation (as measured in use of volunteers and external help).

The population density was not related to the use of volunteers, but population density was related to use of external helpers. The greater the population density of a community, the higher the use of external sources of help by the organization when threatened.

H.4. The greater the population density, the more linkages to official sources in preparedness planning (as measured in number of agency contacts with organization).

Population density was not related to contacts with agencies.

H.5. The greater the population density, the higher the level of preparedness training (as measured in type of drills at facility).

Population density was not related to level of preparedness as determined by drill type.

H.6. The greater the size of community, the greater the number of official shelters used.

The size of community was not related to the number of shelters used as evacuation sites.

H.7. The smaller the community, the greater the use of volunteers.

The size of community was not related to the greater use of volunteers in evacuations.

H.8. The smaller the community, the less dependence on official sources for notification about threat.

The size of community was not related to official sources of notification, but the population density was related to the use of official sources for notification about threat. Communities with lower population densities are less likely to use official sources of notification about threat than larger communities.

Threat

H.9. Evacuation rate is directly related to type of threat to organization.

Both evacuation rate and the time taken to evacuate the facility were related to the type of threat. Evacuations due to weather related threats were more likely to take longer--both in time taken to evacuate overall and in the rate of evacuation. Non-weather related evacuations were shorter in terms of times to evacuate and evacuation rate.

H.10. The greater the number of threats (as measured in past evacuations or past preparations for evacuation), the higher the level of preparedness (as measured by type of drills).

There was no relationship between the number of past evacuations or past preparations for evacuations and the type of drills.

H.11. The greater the number of past threats (as measured in past evacuations or past preparations for evacuation) the greater the level of contacts between official agencies and organizations.

There was no relationship between the number of past evacuations or past preparations for evacuations and the number of agency contacts.

Social Climate

H.12. The greater the size of client population, the slower the evacuation rate.

The size of client population was correlated with evacuation rate but was correlated to the time taken overall to evacuate the facility.

H.13. The greater the number of dependent clients (as measured by percentage of ambulatory clients and average age), the slower the evacuation rate.

The number of non-ambulatory clients was not correlated to the evacuation time but the average age was correlated to the time taken to evacuate. The higher the average age of clientele, the slower the time taken to evacuate the facility.

H.14. The higher the number of staff available, the faster the evacuation.

The number of staff available at time of evacuation was not correlated with the evacuation rate but was correlated to the overall evacuation time.

Resources

H.15. The greater the level of resources (as measured by number of external sources of help), the faster the evacuation rate.

The number of external sources of help was not correlated either with the evacuation rate or the evacuation time.

H.16. The greater the level of resources (as measured by use of volunteers), the faster the evacuation rate.

Organizations who had volunteers assisting with the evacuation effort evacuated more quickly than those without such help. The findings indicate use of volunteers lowers evacuation time.

H.17. The greater the number of staff available (as measured in staff available or ease of commute), the faster the evacuation rate.

The number of staff available to help clients was correlated to the overall time to evacuate but not to the evacuation rate. Those organizations who had more staff evacuated more quickly than those who had less staff available. Distance commuted was not related to either evacuation time or evacuation rate.

H.18. The greater the level of resources (as measured by planning), the faster the evacuation rate.

Planning as measured by type of drills was not related to the time taken to evacuate or to the evacuation rate.

H.19. The greater the level of resources (as measured as part of larger organization), the faster the evacuation rate.

The association of the organization with a larger corporation was related to the evacuation rate but not to the evacuation time. Independent organizations had a higher evacuation rate--the time per client to evacuate was higher than the time taken per person to evacuate for organizations associated with larger organizations.

APPENDIX G

EVACUATION MODEL RESULTS

FULL MODEL

TIMEVAC=CONSTANT+THREATD+NUMHELP+RATIOSP+EVACPLA+PEREVAC+
AMBULAT+AVEAGES+DEPEND+POPDEN

DEP VAR: TIMEVAC N: 40 MULTIPLE R: .802 SQUARED MULTIPLE R: .643
ADJUSTED SQUARED MULTIPLE R: .536 STANDARD ERROR OF ESTIMATE: 1.268

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	1.407	2.190	0.000	1.0000000	0.642	0.525
THREATD	-1.139	0.509	-0.306	.6345429	-2.237	0.033
NUMHELP	1.094	0.379	0.403	.6086132	2.887	0.007
RATIOSP	-0.083	0.044	-0.253	.6648510	-1.892	0.068
EVACPLA	0.505	0.762	0.091	.6322869	0.662	0.513
PEREVAC	-0.000	0.005	-0.010	.6644154	-0.073	0.943
AMBULAT	0.628	0.765	0.116	.5935501	0.821	0.418
AVEAGES	-0.014	0.029	-0.083	.4283226	-0.500	0.621
DEPEND	0.209	0.500	0.056	.6570645	0.417	0.680
POPDEN	0.001	0.000	0.735	.4544260	4.543	0.000

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	86.994	9	9.666	6.012	0.000
RESIDUAL	48.230	30	1.608		

REDUCED MODEL

TIMEVAC=CONSTANT+THREATD+NUMHELP+POPDEN

DEP VAR: TIMEVAC N: 40 MULTIPLE R: .768 SQUARED MULTIPLE R: .590
ADJUSTED SQUARED MULTIPLE R: .556 STANDARD ERROR OF ESTIMATE: 1.241

VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	1.103	0.802	0.000	1.0000000	1.375	0.178
THREATD	-1.151	0.457	-0.310	.7536615	-2.519	0.016
NUMHELP	1.156	0.340	0.426	.7256743	3.404	0.002
POPDEN	0.001	0.000	0.720	.7568519	5.873	0.000

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	79.807	3	26.602	17.282	0.000
RESIDUAL	55.416	36	1.539		

VITA

Barbara Muller Vogt graduated from the University of Hawaii (Honolulu, Hawaii) in 1978 with a degree in Pre-Landscape Architecture. In 1981 she received a Master's degree from the same university in Urban and Regional Planning, specializing in environmental resource planning. In 1982 she entered the graduate program in Sociology at The University of Tennessee, working both as a teaching assistant and as research assistant. She received the Doctor of Philosophy degree with a major in Sociology in December 1988.