

DISASTER RESEARCH CENTER
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OBSERVATIONS ON COMMUNITY COORDINATION
DURING THE MAY 27, 1973 JONESBORO, ARKANSAS TORNADO

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Early in the morning of May 27, 1973 a series of three tornadoes struck Jonesboro, Arkansas causing three deaths and extensive property damage. A two-person field team from the Disaster Research Center (DRC) arrived in the community the next afternoon and began observing community attempts at coordination and recovery. Relevant organizational officials were both formally and informally interviewed and numerous meetings were affected. On Wednesday, May 30, an additional field team from DRC came to Jonesboro. The combined teams interviewed most of the local and non-local officials involved in the community's disaster response as well as talked with a number of private citizens and tornado victims. The following report is a preliminary assessment of the community's reaction to this disaster, and observations may be later modified after a more systematic and intensive examination of the data.

Characteristics of the Community

Jonesboro, with a population of approximately 30,000 persons and an area of 11 square miles, is the seventh largest city in the state of Arkansas. It is the county seat of Craighead County and the home of Arkansas State University, the second largest public institution of higher education in the state. Situated high on a plateau known as Crowley's Ridge, and surrounded by some of the most fertile lands in Arkansas, and with the closest major cities being Memphis, Tennessee (68 miles away) and Little Rock (133 miles away), Jonesboro has established itself both as the hub of Northeast Arkansas' agricultural production and farm-related industry, as well as the retail and business center for the 70,000 occupants of Northeast Arkansas. Moreover, the pattern of growing industry in the city is reflected in the creation of industrial parks in which national manufacturers began locating plants where cotton, rice, and soybeans had once grown, as well as in an annual industrial payroll increase from 3 million to 24 million dollars in the past twenty years. Moreover, average annual per household income in Jonesboro is the highest in Arkansas at \$11,274.

Government in Jonesboro is headed by a mayor and a city council, the latter composed of two elected members from each of six wards. There is a county civil defense director who is a full-time paid county employee.

The city's police department employs twenty-four full-time police officers, and is equipped with five radio patrol cars, one motorcycle, and three unmarked cars. The Arkansas State Highway Patrol District Headquarters is located in Jonesboro, and there is also a fifteen-man auxiliary police force.

Jonesboro's fire department consists of 28 firemen, operating from 3 stations, and equipped with a rescue unit and 6 pumpers having a total capacity of 4,450 gallons per minute. The director of public works is officially in charge of the street and sanitation departments. The city water and light plant, although a municipal corporation separate from the city, functions more like a city department than a private utility. Having been created by the state, the corporation enjoys the same tax benefits as other government organizations.

At present, St. Bernard's Hospital, a 215-bed acute care, fully accredited, private facility, serves the city and surrounding area. Owned and operated by the

Benedictine Sisters, the services of the hospital include six operating suites, a four-bed coronary care unit, and a 24-hour emergency room with a full-time directing physician and staffed by residents from Memphis, Tennessee. The hospitals' staff includes 47 physicians and surgeons, 13 dentists and 478 other employees. St. Bernard's also has access to a packaged disaster hospital through the county civil defense which provides for its storage.

Other health facilities include both a 140-bed community mental health institution and the Children's Colony, a 500-bed institution for the mentally retarded. Taxpayers have recently given their approval to the proposed Craighead Memorial Hospital, a full service general hospital, in which, incidentally, the city/county government emergency operating center during a time of disaster is proposed to be located.

The Disaster Context

At approximately 12:45, Sunday, May 27 (Memorial Day week-end), a tornado struck the city of Otwell, southeast of Jonesboro, and an approximately one-half mile-wide path along Highway 39 in to Jonesboro. It caused considerable damage through residential sections and continued northeastward damaging or destroying the major shopping centers and business district before ending somewhere in the community of Nettleton, east of the airport. Then, a second tornado formed near the U.S. 63 bypass and Cotton Belt Railroad, de-railing a train and traveling eastward for about a mile into other residential sections. Finally, a third tornado formed near the Cotton Belt Railroad and Arkansas 1 by-pass, running northeasterly causing damage to homes and farms and ending 7 miles northeast of Jonesboro in Poinsett County near Paragould, Arkansas. In addition, the following rainstorm dumped an estimated 5.5 inches of water in less than 3 hours, resulting in minor flash-flooding of the area.

Two persons were killed in Otwell and one in Jonesboro, bringing the death count to an amazingly low three; 253 persons were treated for injuries at St. Bernard's Hospital with 22 being admitted. The American Red Cross reported the number of homes and mobile homes totally destroyed to be 1,308 and 23 respectively, with 1,267 homes suffering major structural damage, and 1,725 showing some minor damage. While most of the homes affected were in the \$30,000 to \$60,000 range, 90 percent were reported to have insurance covering 60 percent of their loss. Moreover, 90 small businesses were either damaged or destroyed, many of which were in the newest shopping malls in the area. In all, damage, both public and private, in Jonesboro alone was initially estimated by insurance adjusters to have exceeded \$41.5 million, with the total figure including Otwell and the immediate surrounding areas being estimated at \$60 million.

The Jonesboro School Board initially estimated losses on the 4 damaged schools of the 9-school district to exceed \$2.5 million. The one high school in Jonesboro and an elementary school in the adjacent community of Nettleton (not included in the above district estimate) were virtually demolished; and, in Jonesboro, two elementary schools and one junior high school suffered rather major damage.

According to the city water and light manager, the power system south of Nettleton Avenue in the southern part of town was virtually destroyed, leaving about one-half of the city without power. While the water system almost failed when sprinkler systems went off in the disaster areas, pressure was maintained so that most areas of the city had water service. Southwestern Bell Telephone reported a total of 75 telephone poles and 125,000 feet of phone cables lost, resulting in the loss of service to approximately 6,000 telephones. While Southwestern Bell proceeded with expanded crews and work hours, full restoration was anticipated to be rather slow due to the extensive damage.

Warning

On Saturday afternoon, May 26, the weather in Jonesboro was hot and muggy and various thunderstorms occurred in the area. In the early evening the barometer began to drop quickly. By 10:00 that evening, both thunderstorm watches and thunderstorm warnings had been issued for the general area. At 11:00 p.m. a severe thunderstorm warning was issued for Craighead County from the Memphis weather office. At 11:50 p.m., the Memphis Weather office spotted a tornado 5 miles west of Waldenburg, Arkansas (approximately 25 miles south of Jonesboro) and at that time it was moving towards Jonesboro at about 45 m.p.h. No warning was given to Craighead County at this time; instead the Memphis office of the weather service asked the State Reporting Center in Conway, Arkansas for a report on the area where the funnel cloud had been seen on radar. All reports were negative and no further warnings were issued since the funnel echo had disappeared from the radar screen.

At 12:30 a.m. Sunday, May 27, the Little Rock, Arkansas weather service placed Craighead County under severe thunderstorm warning. At 12:40 a.m. it placed all the counties around Craighead County under either tornado watches or tornado warnings. Craighead County, itself, though, was not mentioned on these weather advisories. At 12:45 a.m., a Jonesboro reserve city police officer reported a tornado on the ground in Jonesboro. At 12:50 a.m. the local civil defense director called the State civil defense office in Conway to report the tornado. At 12:55 a.m. the Memphis weather office put Craighead County under a tornado warning as twin funnels were sighted over Jonesboro on radar.

From this information it is seen that Jonesboro was hit by three tornadoes without any formal warning from either the Memphis or the Little Rock office of the weather service. As a result, neither organizations nor individual citizens were informed of the approach of the tornadoes by the weather service.

Disaster Subculture

Arkansas, one of the states in "Tornado Alley," ranks third in number of tornadoes per unit area since 1916. On May 15, 1968, just five years ago, a tornado struck the southern residential sections of Jonesboro and adjacent areas of Craighead County killing 34 and injuring between 250 and 300 persons. While this tornado was the state's worst in number of deaths since 1952, the highest estimate of damage to the Jonesboro area was \$8 million. Moreover, while one hundred and

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sixty-four homes were reported destroyed, most areas not directly hit by the tornado did have both electricity and telephone service and were otherwise unaffected. In terms of more widespread overall community disruption, this recent tornado appears (as was generally agreed by local and federal officials) to have far exceeded the 1968 tornado.

At the time of this earlier tornado there existed no extensive disaster subculture, that is, traditional expectations and planning for individual and group behavior before, during, or after the impact of a major community emergency. However, as a result of this previous disaster experience in 1968, a community level disaster plan was developed by the local city/county organizations. Nevertheless, the effectiveness of the overall coordinated community response in this instance (i.e., in 1973) appeared to be related more to this prior disaster experience (as well as informal social relationships) than to the implementation of a formal interorganizational plan. Two observations tend to support this conclusion. First, almost every government official and departmental head in Jonesboro in 1973 held the same position during the 1968 tornado, thereby facilitating reliance on prior role learning with respect to such an emergency. Second, while a written community disaster plan is currently in existence and was rather autonomously implemented by the relevant organizations, officials referred less to its contents and implementation than they did to what specifically they had learned from their own earlier personal experiences during the tornado five years ago. (As a matter of fact, copies of the overall civil defense disaster plan were not readily available from most of the relevant organizations interviewed.)

Finally, with the noted absence of many deaths and severe injuries with so many homes literally destroyed, it should be noted that many individuals in the community reported that, upon hearing, or seeing the first tornado (of the three to hit Jonesboro), they responded by taking shelter in areas of their homes which had been recommended to them and of which they had taken note as a result of the 1968 tornado. Therefore, considering that there was virtually no warning and even if there was, that there is no siren warning system per se, at least some of the effectiveness of individuals' responses in limiting deaths and severe injuries would appear to be a result of prior learning in the 1968 tornado.

Community Response

While the community was not formally alerted for a tornado, several officials in Jonesboro had activated their offices to keep a close eye on the weather. Also, many private individuals in the community were very concerned and were watching the weather closely. As a result of the 1968 tornado, a reserve section was created in the police department to go out into Jonesboro and the surrounding area to act as spotters along with the regular police staff, whenever a severe thunderstorm watch was issued. About 10:30 on Saturday, the county civil defense director activated the Emergency Operations Center (EOC) in the Craighead County Court Building. At 12:45 a.m. on Sunday, he picked up the report of the tornado on the reserve city police radio and contacted the state civil defense office at Conway. With this report the police and fire departments were activated.

Since telephone service was disrupted, the county civil defense director sent runners to each of the funeral homes and ambulance services to ensure that

they were activated. While it is yet unclear how this was accomplished, ambulances also were alerted and responded from Walnut Ridge, Truman, Paragould, and Blytheville, Arkansas. A runner was also sent out to the head of the Public Works Department by the county civil defense director to ensure that road clearance would begin quickly.

A number of problems developed just after impact which tended to hamper search-and-rescue operations. The tornado had knocked down power lines and filled the streets with building debris and a great number of fallen trees. The severe thunderstorms which followed the tornado created flash flooding, poor visibility, and extensive interference which almost destroyed effective radio communication. The state police radio system had been knocked out and the local radio and TV stations had already signed off and were now without power. It was over an hour before the local Emergency Broadcasting System (E.B.S.) radio station was able to set up and begin broadcasting from its transmitter site. Thus the community was without early information as to the extent of the impact and officials were unable to establish the location of evacuation centers and to designate assembly locations for search-and-rescue operations. The pre-designated site for rescue operations (the high school grounds) was in the impacted area and a new location was eventually set up behind the hospital. The base radio station for the ambulance service was also knocked out. For nearly two hours the mayor and the county judge were unable to get into the county court building where the EOC was located.

Community Coordination

At approximately 4:00 a.m. Sunday, the county judge, city mayor, chiefs of police and fire, and the civil defense director had a short meeting at city hall which was described as a "quick regrouping" to reassess what had been accomplished and what remained to be done. Prior to this time all decisions had been transmitted via the reserve police frequency. Except for a few meetings later on in the week, nearly all coordinating activities were done via radio contact and key personnel did not establish or man a central coordinating center as such. The following arrangement was used instead. In the county civil defense office there were facilities for the police radio frequency, reserve police radio frequency, city works radio frequency, and state civil defense radio frequency (which was used by state police since their radio communications were knocked out). The civil defense director manned this equipment and channeled information, calls, and requests for decisions to the relevant officials. This was facilitated due to the fact that he was familiar with the various task areas and responsibility domains of the key officials and could accurately direct the calls to the relevant officials. All key officials were thus able to keep abreast of developments and decisions by other officials by listening to transactions over the radio net. This system worked adequately since all department heads and city officials had radio contact. Also, early in the operation a county official was given the task of cataloging all offers of equipment and their location so that they could be contacted as needed. This helped to consolidate available resources which would be helpful to debris clearance teams later on.

On Sunday, at 3:00 p.m. a meeting was held with the mayor, judge, chief of police, civil defense director and a representative of the National Guard to make plans for security operations and a curfew was decided upon for the entire city of Jonesboro.

On Monday through Thursday a public meeting was held each morning to brief the media and other officials of changes in plans made by the top officials. There were no other major meetings except for city council and county court meetings where a resolution was made to enforce local laws which stipulated that all contractors and trades personnel coming into Jonesboro register and be certified to protect the victims who were rebuilding. In general, however, the decentralized type of coordination continued and decisions were made without any formal meeting with all key officials present. This type of arrangement seems to have worked partly because responsibilities have been compartmentalized by task area under the charge of a particular individual, and partly because the mayor and county judge carried great formal and informal control and did not have to seek permission for their decisions too often. Thus the nature of the coordination was at once decentralized and effectively structured.

On Wednesday afternoon, the city council met in emergency session to request that the Corps of Engineers take care of the debris clearance in the city and that the city provide dumping sites for debris and also to obtain permission statements from private property owners for the Corps to remove storm-generated debris free of liability. From this point on, the emergency phase of response ended and business operations returned to more normal channels of decision making.

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Selected Organizations

All indications at this point show that task areas were assigned and many different centers were established which coordinated activities for each task area. As a result, a sub-set of decentralized centers emerged rather than one central location where coordination took place. In light of this fact, the community response can best be captured by looking at the activities of some of the various groups that were most significant.

Ambulance Service

About a month before the tornado, all but one of the funeral homes had discontinued its ambulance service. Saturday night, the director of the remaining ambulance service became concerned when he noticed the barometer dropping quickly and he activated his ambulances to help people in nearby Waldenburg if they were requested. In the meantime the tornado hit Jonesboro and knocked out the ambulance base station and also their grouping site at the high school. Eventually they set up at the hospital and the ambulance director took charge of coordinating the search and rescue for the hardest hit section of the city, the area west of Main Street. Coordination was achieved by contact between ambulances and since one ambulance was also in the police net, it picked up calls from the police department that was also involved in search and rescue. Search and rescue east of Main Street was handled by police and volunteers with trucks and campers and also out-of-town ambulances. State police and city police units were also established in the hospital parking lot to pick up the location of victims and inform the ambulances of their location. As a result, all search and rescue was coordinated behind the hospital. At about 4:00 a.m. on Sunday, when few critical or serious cases arrived and the decision was made that previous expectations of high death and casualty rates in Jonesboro were probably inaccurate, the focus of search and rescue began to shift to the more rural areas. Victims coming for treatment were asked for information as to the whereabouts of impacted areas and other possible locations of injured. By 6:00 a.m. most of the injured were already cared for. The search and rescue eventually was completed at approximately 10:00 a.m. on Sunday.

Police, Sheriff, and State Police Departments

As already mentioned, the police department and the reserve police acted as spotters during the pre-impact stage. Initial knowledge of the tornado was obtained by the city police department which had one of its cars hit by the tornado while on patrol. The disaster plan called for the police to coordinate the rescue and search efforts, but with the police chief out of town, search and rescue was coordinated by the assistant chief and the county sheriff.

After a very short period of time, the city police force was augmented by 35 to 40 state police officers, 5 deputy sheriffs, and 25 to 30 reserve deputies. Within two hours of impact search-and-rescue teams were operational. Search-and-rescue efforts were limited somewhat by traffic and debris in the streets and by the fact that most of the injured found their own way to the hospital. The bodies of the three victims were located by sheriff's deputies. By 10:00 a.m., search and rescue ended.

Before daylight, efforts were directed toward setting up road blocks to restrict movement into the city. Road blocks were completed by 8:00 a.m. Also, during this time the state police were compiling a list of all the injured using information obtained from the hospital. This list, in alphabetical order, was then distributed to all agencies likely to receive questions about injured persons.

On Sunday afternoon the focus of the law enforcement agencies began to shift to traffic control and security operations. Steps were taken to prepare to enforce the curfew which the mayor had invoked on Sunday afternoon. In general, coordination of security, traffic control, and related activities with other law enforcement agencies was the responsibility of the chief of police.

Northeastern Arkansas Mobilized Citizen's Band Radio Club

This group arrived in equipped vehicles approximately 100 strong sometime early Sunday on their own initiative and were utilized to better existing communications and extend them where needed. The full extent of their use, however, is not clearly understood at this time.

City Public Works Department

The head of city public works was contacted shortly after impact and by dawn both city and county work crews were clearing main arteries, cutting down loose electrical lines and removing debris. This task continued, aided by the work of the electric company and telephone company who sent in linemen from around the area to help restore services. The National Guard was also used to help in the clean-up as well as numerous volunteers from Jonesboro and the surrounding area.

Red Cross, Salvation Army, and Seventh Day Adventists

Local units as well as units from Little Rock and Memphis responded early Sunday morning and set up both shelter and feeding operations. The services offered received relatively little use, however, particularly the shelter operation. There are a few possible explanations, but perhaps the most important point is that the impacted area was largely middle class. The victims who did not have friends or relatives to stay with, had the financial means to go to motels and hotels in the area. Thus, between the strong extended family systems and the financial means of the victims, very few utilized the shelters or the clothing that was donated. The feeding operations were used by victims in the impacted area while they worked on their property as well as by the non-local volunteer organizations, telephone and electric linemen, National Guard, and so forth.

National Guard

Although the members of the local National Guard reported in somewhat irregularly (due to poor communications and the need to care for their families first), by morning nearly 250 guardsmen were helping in search and rescue, operating heavy equipment in debris removal or guarding shopping centers. Their role continued to be generally security, traffic control, and debris removal throughout the emergency phase of community response.

The Hospital

While it was necessary during the 1968 tornado to transfer a large number of seriously injured victims to Memphis, Tennessee, the nature of most of the injuries in this instance was such that only two or three serious cases were sent there.

St. Bernard's Hospital has a disaster plan which was implemented as soon as ample hospital staff arrived to put it into effect. Since telephone communication was not available and only a limited number of the staff have purchased (at their own expense) "beepers," some of the personnel came in on their own, while others were notified by the police as prescribed by the plan. Both the chief of medical staff and the physician in charge of the emergency room were delayed in arriving at the hospital due to damage to their own homes and clogged streets, resulting in a 45-minute to 1 hour delay in reaction time, but the administrators arrived soon after the tornado. Only approximately 15 to 20 percent of the staff was in the hospital during the emergency treatment period (which lasted until roughly 6:00 a.m. by which time most victims were treated) which was attributable in part to many being out of town for the Memorial Day weekend. While 256 persons were treated, only 22 were admitted. Some consideration was given to discharging some current patients in the hospital, but this was unnecessary since there were 28 beds already available in the hospital.

A triage area was set up in the emergency room with predominantly nurses carrying out this function relying on physicians' supervision. While most of the medical specializations needed were represented, many doctors were performing treatments typically carried out by general practitioners. For example, one dermatologist was giving first aid care, rather than treating patients in accord with his specialty. This, as well as the presence of about 50 volunteers (some of whom usually work in the hospital as well as other who came in with relatives or who were medical personnel visiting from out of town) helped to compensate for the low percentage of regular staff present in the hospital. While often volunteers tend to create confusion due perhaps to their inexperience or the sheer overcrowding of the hospital, this doesn't appear to be the case in this disaster.

Two policemen, as provided in the disaster plan, were stationed outside the emergency room to assist in traffic flow, radio communications, and the dispatching of ambulances which arrived at the hospital from the nearby communities (usually without being requested). There was some indication, however, that the city/county plan provided for ambulances to be located and dispatched from the city police station in city hall via their radio communication network, since the hospital does not have one.

The hospital lost city power for only three hours and, during that time, utilized emergency generators. However, they unfortunately found too few outlets in crucial areas hooked into the power system. While the question of water contamination remained unanswered for a period, it was finally ascertained to be in good condition.

Three somewhat typical problems did emerge in the hospital during the emergency period. First, the influx of relatives and friends, and, although of lesser importance (due to the hospital's request after the 1968 tornado) members of the press caused overcrowding of the small emergency room area. This resulted

in the establishment of an information booth just outside the emergency room entrance, whereas the plan had called for its location upstairs which did not seem suited to the situation at hand. Second, the need for such typical emergency drugs as tetanus toxoid was evident, but this was handled by hospitals in the surrounding area who, for the most part, volunteered their assistance via police communications rather than having been called on by St. Bernard's. Thirdly, the hospital was somewhat hampered in its operations by lack of communication with civil defense, particularly since it did not have direct radio communications with the relevant organizations. While a representative of CD did stop in periodically, the hospital received no reports as to the extent of injuries in the community. Therefore, they were unable to make realistic appraisals as to whether or not to expect a heavy load of patients by daylight in order to adjust early treatment procedures and/or to release existing patients to provide adequate space for this apparently anticipated influx. Likewise, since the hospital was unaware of its potential demands, a request was made to civil defense for the packaged hospital which they store, to provide extra cots, blankets, etc.; by the time any action was taken, the building in which it was stored was flooded. Therefore, the hospital requested and received a packaged disaster hospital from the nearby Paragould CD, which turned out to not be needed crucially, although it was utilized for first aid for some victims of a bus accident caught in flash flooding on a nearby highway.

In conclusion, although the somewhat small emergency room facility was able to handle the atypical number of cases it received in a limited time period, again there was evidence that the prior experience of the 1968 tornado served as the primary guide. For example, after having learned that many of the wounds sutured at that time later became infected due to the nature of the materials inflicting wounds, physicians chose typically not to use this technique, even in borderline cases. But, on the other hand, their memory of the prior influx of patients in the 1968 tornado during early daylight hours and the number of deaths in that tornado as well as the noted absence of information to the hospital as to what to expect in terms of casualties, probably served to encourage treatment at a more rapid pace than might have been necessary.

Conclusion

In this disaster, compared with most others studied by DRC, there never was only one centralized coordinating center. Much of the organized community response was decentralized, being carried out at different locations by different organizational units. As seen in the discussion of the selected organizations, these units were autonomous according to specific task and functional areas. Coordination between these decentralized groups was facilitated through a multi-level communications network that provided the structuring and the necessary framework to achieve effective response.