

THE PROVISION OF PRIMARY CARE DURING A PERIOD OF NATURAL DISASTER OR LARGE SCALE EMERGENCY

Robert A. Smith, Clarence C. Traum and Lorna H. Poole

Health Care Management Corporation, 1011 Oak Street, Pittstown, Pennsylvania 18640

We live in a potentially disastrous age. The recent earthquake in Guatemala and the threats of earthquakes in California, the possibilities of flooding of major rivers in the United States, the incidence of hurricanes and tornadoes, the awesome threats of atomic disaster – all these are part of the hard facts of our times. A community that has suffered and lived through a disaster can become, when properly studied, a “disaster laboratory” from which much can be learned. The delivery of primary care under such conditions of extreme stress – when disaster paralyzes the providers of care – is of special interest. The results of a recent survey study and sample survey by Health Care Management Corporation, analyzing the impact of the 1972 flooding of the Wilkes-Barre/Wyoming Valley area of Pennsylvania as the result of Tropical Storm Agnes, point to some pertinent conclusions on these matters.

How did approximately 300 physicians in this area react in such a situation of stress? Not only had the flood eliminated their usual place of business (direct damages by flood waters included the offices of over 130 physicians), and seriously affected their personal lives (many had to evacuate their homes), but consumers of health care – the affected population – also had their personal and business lives affected in the same manner. The HCM study found that, under the most intense stress, even when faced

with incredible demands, physicians who are by profession trained in “the medical emergency” could be counted on for true leadership. In the Wilkes-Barre situation, they were able – despite the lack of a comprehensive delivery plan and under conditions of extreme confusion – to deal capably with a demand for service two or three times that of the normal population demand for medical care.

It was also observed that, although emergency planning might establish “new” centers for primary care treatment services – evacuation centers, packaged disaster centers, and so on – both patients and physicians tended to rely on the existing system as they knew it, for both the demand and supply of services. Patients gravitated to their usual sources of medical care (for example, 62.4% of those seeking a physician’s care went first to his “office”, even though most of those offices were flood hit), rather than seeking out new points for provision of service. As for the physicians, they identified strongly with the hospital as the point of delivery of medical services and, within that structure, they were able to increase the efficiency of their practices in the crisis situation so as to accommodate a major increase in the demand for their services. Let us have a look, then, at what actually happened in this unusual situation, in which the health care personnel and facilities, at the time they were needed most by the affected population, were

themselves disrupted and malfunctioning during the height of the flood emergency.

DISRUPTIONS

Nowhere else in the country did the damage from Tropical Storm Agnes, June 22, 1972, even approach the widespread devastation wrought on the Wyoming Valley in North-eastern Pennsylvania. Although the flood primarily affected Luzerne and Wyoming Counties, which have a combined population of 360,000, its impact was mainly centered in the Wyoming Valley section of these two counties along the Susquehanna River. Estimates showed that the raging flood waters had damaged over 80% (roughly 21,000) of the 25,000 housing units in the area, with over 15,000 of these sustaining major damage; caused a half-a-billion dollars worth of physical damage; and dislocated between 70,000 and 80,000 people. Almost all services came to a standstill; broken power lines and mass media offices under water crippled communications. Businesses and industrial services were closed, with a consequent sudden loss of many jobs.

The breakdown in normal commercial activity was complete, including the entire downtown business district in neighboring Kingston and five suburban shopping malls. Seventy-two thousand people had to be evacuated; 34 public schools, 14 private schools and 3 colleges sustained damages amounting to US \$ 52,700,000; damages to roads and bridges amounted to US \$ 50,000,000; 11,335 jobs were affected by the devastation. Direct damages to the health providers and facilities included the offices of more than 130 physicians (*American Medical News*, 1972), 55 dentists, 50 pharmacists, and public health structures.

The two hospitals and five nursing homes that were evacuated had neither sufficient warning of the impending flood nor a co-ordinated emergency plan to implement in case of such a disaster, even though the Valley had

sustained repeated flooding in past years. In 1784, 1786, 1842, 1846, 1850, 1865, 1893, 1901, 1902, 1936, and 1955, flooding occurred as a result of spring thaws or hurricanes and tropical storms. The Valley is directly in the path of water flowing from mountains in upstate New York (Luzerne County Historical Society). When these institutions were notified and advised to evacuate early in the morning, some few hours before the 37-foot river dikes were topped, they were as ill-prepared to relocate their patients as the other institutions were to receive these patient evacuees. In all, 40% of the hospital beds in the area were out of service during the flood crisis. The two evacuated hospitals listed their losses at approximately US \$ 10,000,000. Care for the elderly was at a premium because of the shortage of skilled staff and intermediate level facilities to substitute in supplying a continuing adequate level of care. Medical records were destroyed, pharmacies were inundated, and all lines of communication were non-functioning. Tragically, the emergency communications equipment, stored in the basement of the Civil Defense Building, was located on the river bank. It was one of the first systems to be flooded.

Loss of Physician Offices, Hospital Beds, Displacement of Population

Approximately 155 physicians in the Wyoming Valley – over 50% of all those in the area – were directly affected by the flood (that is, either their homes or offices, or both were seriously flooded). Up until the first week of July, the identification of these flood-affected physicians and a determination of their location was a major task. (The Luzerne County Medical Society later reported that of these 155 doctors, most suffered major damage to their offices; 37 had offices on upper levels of multi-storied buildings, but lack of telephone and electrical service prevented them from returning to their offices.) Thus, most had their offices flooded, records destroyed or water-

damaged, and equipment ruined. And all those affected faced important decisions, some of which were: (1) to restore their pre-flood offices, (2) to re-locate to undamaged facilities, (3) to leave the area, and (4) to retire. Despite these difficult personal dilemmas, a large number of Luzerne County physicians continued to deliver primary medical care under these extraordinary conditions.

Incidence of Illness Requiring Medical Attention

The flood did indeed act as a precipitating factor in help-seeking: 58.9% of those persons whose homes were flooded sought medical help (as opposed to 27.8% of those whose homes were not flooded). In terms of sheer numbers, this meant that approximately 50,000 persons needed to be served in some way by a crippled system. A further complication was an unusual demographic characteristic: those persons situated in the flood plain were disproportionately represented by age: more than 14% of those evacuees who were neither hospitalized nor in a nursing home were 65 years of age or older. Many had little warning of any kind about the flood, and many of those in the general population who were then under a physician's care left their prescription medications behind when they evacuated their homes. The stress of such a trauma acted to aggravate existing chronic conditions. Emotional upheavals were catalyzed by the upsets of friends and the loss of property to the flood waters. How then, did this health system, itself in crisis, provide adequate care to those thousands of persons whose lives were threatened and disrupted by a disaster of these proportions?

SURVEY OF FLOOD VICTIMS

Trained researchers conducted personal interviews with the head or the spouse of the head of each household in the survey. A stratified random sample (N = 267 families – 801 persons)

was drawn from the flood plain and surrounding areas of Wyoming Valley. The sample was stratified by urban-rural designates and probable economic status, and represented approximately 1% of the 72,000 persons affected by the flood. This survey was performed in partial fulfillment of Contract No. HSM 110-71-234 with the Department of Health, Education and Welfare.

The test instrument was designed to elicit responses concerning the barriers to health care over selected time periods: during the flood crisis, two months to one year after the flood, and two years after the flood, in order to assay any lingering after-effects directly attributable to the flood. The survey instrument also contained general health data, which was administered to a control group of 1,340 families. Some lived in the general Valley area, but the majority of control group respondents resided in surrounding counties in Northeastern Pennsylvania: Carbon, Lackawanna, Luzerne, Monroe, Pike, Sullivan, Wayne, and Wyoming. These statistics allowed an extensive and reliable comparison measure of the health status in similar regions, as well as in those areas geographically linked to the Wyoming Valley. In this way, those respondents who were not situated directly on the flood plain but who may have been affected by the flood in terms of continuing health care, consumption of goods and/or utility services were also included in the assessment.

The User: The Needs of the Disaster Victim

In the survey, 18% of those persons involved in the flood had some type of ongoing health problem for which they sought treatment; 24.7% had upper respiratory infections; and, 14.7% had hypertension problems. The rest of the respondents cited a variety of ills, many of which were chronic diseases for which they were receiving prescription medications. Despite the lack of medical records and the destruction of local pharmaceutical supply houses, a mere 3.1%

of these persons had difficulty in getting their prescriptions filled.

A substantial (67.9%) group of persons who claimed to have needed medical attention during the crisis period contracted their illness in the seven days that the area was under water. For 37.3% of these, the illness lasted for those seven days; however, 28% stated that they were still suffering from the same problem during the time the survey was conducted (1974). More than one half of these attributed their health problem directly or indirectly to the flood.

RESULTS

The overall conclusion of the survey was that both providers and patients relied on the traditional system rather than establishing new treatment points; population and physicians preferred to use existing centers within the existing medical systems.

Impact of Flood on the Population

1. From HCM's flood survey, of those who had a health problem one to three days during and after the flood, 24% suffered from upper respiratory infections and 13% suffered from high blood pressure, nervousness, or tension respectively.

2. Seventy percent of the health problems reported occurred one week or less after the flood.

3. Fifty-nine percent of those surveyed who acknowledged any health problems during the flood reported that these were caused by the flood.

4. Eight percent of those surveyed indicated that their families had received adequate medical care between June 23 and August 30 and after the flood.

5. Of those who tried to contact their doctors during the flood and evacuation period, i.e., June, July, and August of 1972, 75.6% indicated that they saw him in two days or less.

6. Statistics showed that the population preferred and utilized their usual source of care instead of such transient sources as evacuation centers, etc.

Response of the Hospitals

1. An emergency hospital was set up in Misericordia College and staffed with Emergency Room doctors from Nesbitt Hospital, which had previously been evacuated.

2. The Emergency Room at Wilkes-Barre General Hospital evidenced a 300 to 400% increase in the volume of visits. Pre-flood volume had averaged 60 encounters a day.

3. During the period from June 23 to July 4, 1972, 5,000 patients were seen at the Wyoming Valley Emergency Room. Pre-flood volume had been about 1,000 visits a year.

Response of the Physicians

It is apparent from a Luzerne County Medical Society survey that many of the flood-affected physicians, having no disaster plan to follow, and no office from which to treat patients, went to their usual place of work — the hospital. The Luzerne County Medical Society findings, released on July 8, 1972, showed that of 82 flood-affected physicians which they could locate, 10 were practicing out of Wyoming Valley Hospital; 29 were at Wilkes-Barre General Hospital; 19 were at College Misericordia; 6 were at a Family Practice Clinic (Wilkes-Barre); and, 18 were at other locations (not identified, possibly evacuation centers).

Effectiveness of the Physicians

The following statements are the results of a household survey administered to a sample of flood victims from Wyoming Valley. An analysis of these statements demonstrated that the physicians were available during and after the flood, and that the quality of care provided did not decrease, despite the physical and mental challenges of the situation.

1. Of those interviewed, 23.3% replied that they *did* try to contact their physician during the time of the flood crisis (less than two months after the flood).

2. Of that 23.3%, 83.4% contacted their regular physicians and 88% saw them.

3. Thirty-five percent of the respondents indicated that they did evacuate during the flood. Of these, approximately 80% were aware of sources providing emergency medical care.

4. Within a year after the flood, 62.4% of those who sought medical help went to a private physician. The most frequent reason why they chose that particular source of care was because it was their *regular* source of care. Even though the majority of persons were aware of the evacuation center as a source of care, most still chose to go to their own physician, even though he may have been caught in the flood himself. Twelve percent of the patients obtained help at hospitals, and a surprising 10.6% at nursing homes. Evacuation centers were used as a "last resort" for medical attention: only 1.4% went there for aid.

Later Response of Physicians

In the survey, respondents were asked if they had tried to contact their physicians during the time period of two months to one year after the flood and, if so, had they been successful in seeing them. Twenty-eight percent answered affirmatively; of those, 59.6% were seen by their physicians immediately, 21.1% within three days, and 19.3% in one week. This indicates that considerable back-up in scheduling may have been occurring, possibly due to the damages sustained by doctors and patients during the flood.

An illustration of this phenomenon is the fact that more than 75% of the Valley residents were definitely aware of their physician's status and location during and after the flood crisis. A

small percentage (8.6%) tried to contact another doctor when they were unable to reach their own physicians during this period. More than 80% of these respondents were able to see the alternate doctor, and nearly two-thirds of these persons were seen immediately. Even though offices were flooded, records destroyed, and communications still in a state of semi-repair, a satisfactory level of primary care was being maintained.

CONCLUSIONS

As a result of these studies, it may be concluded that the physicians involved in the Wyoming Valley disaster responded extremely well under conditions of extreme pressure. The response was chosen in terms of the existing system, following the usual and customary methods of operation. It may also be concluded that the patient's choice in a chaotic situation is to identify with stable, already existing sources of medical care. Therefore, we may assume that disaster planning should make maximal use of existing health care resources, since it is difficult to change patterns of behavior during periods of shock. Future plans should rely on existing health care systems as much as possible.

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