Disasters, Nursing, and Community Responses: A Historical Perspective

Barbra Mann Wall
University of Pennsylvania School of Nursing

Modern disaster planning has taken on increased importance and urgency in light of the recent dramatic increase in natural and man-made disasters that have resulted in enormous human and economic losses.[1] Such planning is aided by examining the historical role of nurses in disaster responses. Nurses occupy vital positions in disaster care because of their unique roles with patients and their experience in such areas as evacuation, triage, physical and psychological care, screening measures, case finding, vaccinations, monitoring, and disease surveillance and prevention.

What does history tell us about nurses' roles in disasters, particularly their provision of disaster relief during the initial response phase? Why is this important for disaster responses? And how can this knowledge enhance our understandings of the notion of "emergent phenomena"? For this discussion, disaster is defined as a social disruption resulting from natural causes such as earthquakes and hurricanes, technological causes such as explosions or nuclear accidents, and conflict situations such as wartime.[2] Research on the term "emergent behavior" has been a significant feature of disaster studies in sociology, but it has not been examined from the standpoint of the history of nursing. Sociologists Thomas Drabek and David McEntire argue that emergent phenomena include "the appearance of interorganizational networks after disaster which attempt to fulfill important societal functions made evident by an extreme event." These networks are composed of many organizations that work together to "resolve the demands placed on their community in times of disaster."[3] Drabek and McEntire argue that people

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become more "cohesive and unified during situations of collective stress, and they work together." Emergent groups often "have no previous knowledge of each other," and they may perform "nonregular tasks." Local communities are particularly important at this time; they are the "first to help themselves."[4] Often, these emergent groups are the most effective and quickest to respond after a disaster.[5]

A history of nursing can contribute to theoretical discussions of emergent behavior. By taking into account nurses' rich heritage in disaster responses, we can learn about which groups should be included in any organizational coordination during disasters.[6] This article features case studies of the work of nurses and some physicians situated within a local response and one involving international aid. The aim is to enhance understanding of the social and political forces that informed nurses' actions and the tensions and inconsistences that occurred at particular times in particular places.

Doing disaster research has its challenges because records can be lost or destroyed. Some sources are available, however, including newspapers, diaries, letters to family members and other personal correspondence, official histories from organizations, city records, photographs, and oral sources. Problems include memory loss if a letter was written or an oral history obtained some years later. Yet Joseph Scanlon, who wrote about the 1917 Halifax, Nova Scotia, ship explosion, found that "disasters are so dramatic that many vividly remember what happened even three-quarters of a century earlier."[7]

Another problem is "whose history is recorded? From whose perspective? A gaping hole includes the voices of the silenced, including minorities, the poor, and others excluded from power. This could be because they may have lacked the means to document personal experiences, or archivists and librarians simply did not seek their stories."[8] In my own research, I have had to doggedly piece together different sources and read between the lines of others to get at the silenced voice.

In 2010, Arlene Keeling and I edited a book on the history of nursing in disasters.[9] We concluded, based on 13 case studies, that nurses made crucial independent decisions in crisis situations where time was critical to a person's survival. Their senses sharpened as the events at hand took priority. They also often responded with makeshift activities as they helped restore order after extreme social disruption. We also affirmed that disasters unraveled stable geographical boundaries as nurses responded in collaboration with others. For example, nurses from Boston, Massachusetts, assisted in Halifax, Nova Scotia, after the 1917 ship explosion. Nurses from Boston were rewarded a year later when Canadian nurses went to Boston to help

during the flu pandemic. From Mississippi to Texas, Boston to Halifax, and New York to Turkey, nurses and others offered to help after disasters in any way they could.[10]

Historically, people have had a sense of obligation to care for strangers during periods of war and devastation. The founding of the International Red Cross in 1863 in Geneva was a milestone in the growth of humanitarian relief based on a position of neutrality. Eventually several national societies formed.[11]

Historians and sociologists have been saying for decades that health care workers and survivors are resilient in the face of disasters, and our conclusions validate this finding. As an example, after the 1906 earthquake and fire in San Francisco, Nurse Lucy Fisher and her companion immediately donned their uniforms and went to a makeshift hospital in a building called the Pavilion. It is interesting that they thought to put on their uniforms; indeed, this gave them legitimacy. The fact that they were nurses allowed them entrance when many others were turned away. In Fisher's first-hand account for the *American Journal of Nursing*, she noted that they faced a chaotic scene of mattresses strewn on the floor, nearly all occupied by patients. An improvised surgery was well equipped and already in operation, however, with operating room tables, dressings, instruments, and hot and cold sterilized water from the destroyed emergency hospital. Patients were constantly being admitted, and Fisher and her friend were told to "pitch in," which they quickly did. Because the surgery area was well staffed, Fisher was particularly concerned about critical cases that might be overlooked in the confusion, and she went around the room with extra blankets, hot water bags, and coffee for people in immediate danger. In the process, she put her assessment skills to work by observing for those "with feeble pulses and blue lips."[12] She and her friend pinned pillowcases to their waists to carry dressings, helped with dressing changes, and gave hypodermic injections for pain. Because of the confusion and the danger of duplication of drugs, the nurses pinned tags onto patients with the name and quantity of the drug and the time it was administered.[13]

Other nurses rode to disaster sites in that new contraption—the automobile. Rene Bine, a young San Francisco physician, also responded by commandeering an automobile with his father's pistol in hand. He and others broke into hardware and drug stores to get medical supplies and ransacked department stores for pillows and mattresses for the injured. They did not consider this looting—rather, they saw it as a necessity to get the needed supplies. He worked at several makeshift facilities. He later wrote to relatives, "I never felt better in my life. We sleep on the ground & it is better than the country and loads of fun. We have a good supply of rations & are in OK shape

all around."[14] Nellie May Brown nursed at a camp in Oakland and wrote her family that she was "working in the thick of the suffering—at last experiencing the horrors of the field hospital." She was in the first squad sent out to one of the nearby forts. She wrote that she was having the "experience of a lifetime."[15]

Several groups also emerged in 1947 in Texas City, Texas, after a ship loaded with fertilizer exploded in the harbor, killing more than 500 people. The entire local fire department responded, and all its members were killed. More than 3,000 injuries also occurred.[16] Individuals and organizations from the local community immediately responded. One Red Cross administrator noted, "Never in all my days have I seen such response from nurses, doctors, first aid crews, military personnel, law officers, and citizens."[17] One drug store owner opened a first aid station and, along with some volunteers, began bandaging the injured. Conscious of the racial norms of the day, it was important for him to point out, "We bandaged everyone, whites, Negroes, Mexicans."[18] He knew that doctors used whiskey for shock, and he started passing it out not only to survivors but also to morticians "to keep them going in their horrible job."[19] Search and rescue teams formed. A nurse from a local clinic remembered that men from one of the industrial plants came to help, and they worked "like Trojans."[20]

The city had not prepared for a disaster of this magnitude, and no disaster plan was in place. Without a local hospital, physicians and nurses set up a makeshift clearing station and triaged casualties. Texas City clinics were full, and volunteer physicians and nurses had to work with no water or electricity. Women opened their homes to care for the injured, and even workers at the local radio station got into the act. To maintain a record system for tracking survivors, someone started a file system.[21] Indeed, these residents were the "first to help themselves."[22]

Nurses, surgeons, medical residents, and medical and nursing students from Galveston's John Sealy Hospital across the bay from Texas City were among the responders. After giving emergency first aid to thousands, they sent casualties to 21 area hospitals in cities such as Houston and Galveston. Typical of emergent phenomena, as citizens and organizations took on new tasks, they stepped in and shared their resources.[23] The participants included nursing and medical students who worked both at the disaster site and in hospitals. One nursing student was recruited by her supervisor. At first she resisted, stating, "I don't have permission from the nursing office" to go. The supervisor cried, "It doesn't matter. I give you permission!" After arriving at the scene, the student administered first aid to severely burned patients, including giving morphine for pain. In fact, in this emergent situation, she had an "open order to

administer hypodermics of pain relievers as I saw the need . . . In a situation like this," she wrote,

> you are oblivious to anything except doing the job at hand. Somehow, everything you have ever learned in this area comes to the surface and you do the best you can. . . . I later realized there was no way that you could take a holistic view of a patient in a situation like this; it's only the immediate needs that are met." [24]

In her memoir, she commented on "what a confident twenty-year-old nurse I was."[25]

A sophomore medical student also responded and was dispatched to John Sealy Hospital's emergency room. In this situation, medical and nursing care blurred. He washed the oil off burned patients and those with severe contusions, set up oxygen tanks, took histories, monitored vital signs, and cleaned wounds. Hospital leaders also drafted medical students to help nurses who worked long shifts on the floors. Thus, for the next 2 days, he cared for patients with suspected gas gangrene until special nurses could take over the care.[26]

One nursing student recalled that she was amazed at how, when she was at the scene of the disaster, "everything began to fall into place and regardless of rank or race we were a team."[27] The medical student wrote,

> For the first time in my life, I didn't care whether a man was white or black. I worked with both equally at ease. It didn't make a bit of difference as both were sick, and all needed to be cared for.[28]

These examples illustrate that nursing and medical students' routine assignments changed, and they found alternative ways to respond as they shared tasks.

The students' stories should not be taken to mean that there were no challenges. Historical research can also add to debates over the impact of race on emergent behavior. Indeed, this study shows that responses were composed of "messy" race struggles. White respondents remembered people pulling together during the emergency period, yet they probably were working from a base of unacknowledged "white privilege": One of the benefits of being White was having the power to ignore race in the situation.[29] A different story was told when Black responders came forward. Black physicians and nurses also rendered aid at the disaster scene, as did morticians and embalmers. I was able to find their voices through a search of Black newspapers and photographs.

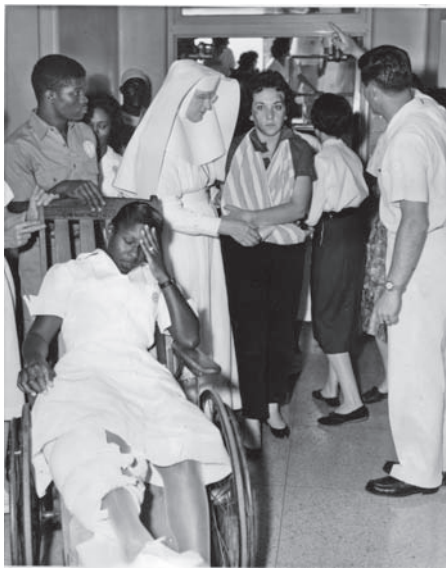
Two ministers from local Black churches carried the injured and dying in their cars to hospitals in Galveston.[30] But they reported that "when they began their rescue work, the Negro injured were being walked over while the Whites were being rescued."[31] Although these contrasting accounts were likely true—as they applied to specific situations—the African American newspaper took a different perspective and reported on the continued neglect of Black casualties.[32]

This brings me to a discussion of how photographs can enhance the historical record when few written sources exist on silenced voices. I have written elsewhere about a particular photograph of the emergency room at St. Joseph's Hospital in Houston, where some of the survivors of the Texas City disaster were taken.[33] It reveals a Catholic sister helping an injured woman while several people, both African Americans and Whites, look on. This nun in her white religious garb, being in the center of the picture, lent a settling presence to a chaotic situation. But the photograph can also suggest something about racial relations. One interpretation is that African Americans are working side by side with Whites. This is significant because in 1947, hospitals in Texas were segregated. In showing Blacks and Whites working together, the picture can validate sociologists' claims that disasters often blurred racial boundaries.

Yet sociologists' disciplinary focus on qualitative and quantitative studies does not include scholarly interpretations rooted in historical analysis.[34] My reading of this photo is that, although it gives the impression that Whites and Blacks worked together in accord without favoritism, when contextualized with Texas's history of racial discrimination, a different interpretation can be offered. The African Americans are on one side and the Whites on the other. Perhaps the photo is staged, as they often are, because no one appears to be actually working. Furthermore, the nun is assisting a White ambulatory woman while a Black woman waits in a wheelchair.[35] This photograph can support what the African American newspapers had reported—that Blacks were ignored, whereas Whites were tended first.

After the San Francisco earthquake and the Texas City ship explosion, it is also interesting to consider how nurses and physicians described their experiences. They saw themselves as performing meaningful work that was deeply rewarding to them. They turned the disaster into an opportunity (it was exciting for them, in a positive way), and they were proud of their work. What is often overlooked from most contemporary caring models is the personal satisfaction nurses and other health care workers find in actively using their knowledge and skills and being present for patients and their families in times of need.[36]

Yet what the texts did not reveal is also interesting. They did not mention fear or lack of control. And we also do not get the perspective of nurses



St. Joseph's Infirmary, Houston, Texas, April 16, 1947. Photograph courtesy of the Archives of the Sisters of Charity of the Incarnate Word, Villa de Matel, Houston, Texas. Used with permission.

who did *not* come to help. During the severe acute respiratory syndrome (SARS) epidemic in Toronto in 2003, for example, some nurses chose not to lend assistance because they were afraid of contagion and of infecting family and friends. Indeed, one study revealed that the attack rates among nurses who worked in emergency departments and intensive care units ranged from 10.3% to 60.0%.[37] This probably happened in earlier disasters as well.

After 1950, disaster teams expanded with formal state responses that differed from the earlier 20th-century voluntary responses of the Red Cross. At this time, growing world political tensions led to new conceptions of disaster relief. The United Nations had formed in 1945, and the Marshall Plan had succeeded in rebuilding war-torn Europe. This was the context for the growth of international humanitarian aid and, concomitantly, an international disaster relief network that included health care. Rather than private ad hoc initiatives, intergovernmental agencies became more prominent. Among others, these included the United Nations International Children's Emergency Fund (UNICEF) and the World Health Organization (WHO).[38]

National governments were also taking on greater roles in disaster relief. In the United States, President John Kennedy created the U.S. Agency for International Development (USAID), and in Canada, the Canadian International

Development Agency (CIDA) was formed. Also established were international nongovernmental organizations, or NGOs, such as Oxford Committee for Famine Relief (Oxfam, 1942) and Cooperative for Assistance and Relief Everywhere (CARE, 1945). Nurses and physicians worked in each of these agencies. The organizations expanded their work in developing countries as well, especially in those that had recently won independence from their colonial masters.[39] An Oxfam publication noted that these agencies "could move much more quickly than could governmental and intergovernmental organizations and could often go where governments could not."[40] One sociologist has argued, "The private relief and development organizations, by dressing in 'neutral' clothing, could venture into politically sensitive areas that were out of bounds to governmental agencies."[41]

This happened in the 1967–1970 Nigerian civil war. The war led to a public health emergency when a segment of the Nigerian population was displaced and food was cut off to them. Like other disasters, the war generated large-scale displacements of people and resources, and women nurses and physicians played key roles.[42] Yet little is known about emergence that occurs in conflict situations. Indeed, war complicates the notion of emergent behavior because new groups are constantly being formed.[43]

I analyze this question in my current research on mission physicians and nurses in Nigeria in the mid-20th century. Complex political and religious tensions occurred as Catholic women, working through international networks, attempted to provide medical and nursing care during this period of instability. One important document I found is a diary by Sister Pauline Dean, a pediatrician and a Medical Missionary of Mary who worked at St. Mary's Hospital in Urua Akpan. Sister Pauline wrote her diary from January to September 1968,[44] the period during which her hospital was in the midst of the conflict. At that time, two nurse midwives, Sisters Eugene McCullagh and Elizabeth Dooley; two physicians, Sisters Pauline Dean and Leonie McSweeney; and Administrator Sister Brigidine Murphy staffed the hospital. St. Mary's had begun in 1952; at the time of the civil war, it boasted 150 beds, a large surgical clinic, and a training school for midwifery.[45]

The Medical Missionaries of Mary had come to Nigeria from Ireland in 1937 to do both mission and medical work. During this period of violence and upheaval, however, they shifted their understanding of mission from conversion of souls toward humanitarian relief.[46] The Catholic Church was one of the private agencies that played a significant role in the civil war. Although they had made little impact in the northern part of Nigeria, which had a Muslim majority, Catholic missionaries were more successful in the southeastern region, particularly among the Ibo (Igbo). For the Irish missionaries, Nigeria was the

centerpiece of their "religious empire," with more Irish missionaries concentrated there than elsewhere in the entire world.[47] By 1965, the eastern area had more than 2 million conversions.[48] The Irish also made great inroads in education and health care, where the British colonial state had not played a large role.

Nigeria was formed in 1914, when Britain joined the two northern and southern protectorates, and it received full independence in 1960. The civil war that began in 1967 was between the eastern region of Nigeria (renamed Biafra) and the rest of the country. Biafra declared itself an independent state, which the Federal Military Government of Nigeria regarded as an act of illegal secession, and the Nigerian government fought the war to reunite the country. One million people had fled to the East, and by April 1968, Biafrans had flooded into a landlocked enclave entirely surrounded by federal forces who blockaded all the roads. Western nations were unwilling to violate Nigeria's national sovereignty and channel assistance across the border. The 30-month war ended in 1970 when the revolt collapsed.[49]

Cooperation occurred between many groups in Biafra: missionary nurses and physicians, priests, UNICEF volunteers, local people on the ground, and private international and church aid groups. Biafran women helped as nurses and midwives, social workers, caretakers of children, and distributors of relief. The Medical Missionaries of Mary worked out of their hospitals and clinics in the eastern area. Although most Protestant organizations fled, the sisters and many Irish priests made the crucial decision to stay in Biafra.

In her diary, Sister Pauline gave eyewitness accounts of aerial bombardments of her hospital, people being killed, roadblocks established by soldiers, and the disease situation in the refugee camps. The diary provides a vivid account of the most severe health and nutritional problems of war's effect. Her first entry, on January 23, was an acknowledgment of the food problem: "Food was scarce so we started to farm. Planted pumpkin, melon, and okra." On January 28, she noted the turmoil of the region: "Plane and two thuds in OPD [outpatient department]. I did not hear because of screaming children." Food issues continued to be a problem, and on February 14, she went to *Use Abat* to get yams.[50] On February 19, she wrote,

> Bad day trying to do Male Ward, Children's Ward, and 2 clinics. Head just doesn't work after 1:30 when working at such a pace. Continued rounds 4-7:20 and called down again at 7:30 pm. Up at night 1:20-4:45 am. [B]reech delivery and then another delivery by vacuum."

Another "bad day" was February 20; on the 21st, she was "up at night 2-5 am" and the next day faced 108 patients as the only doctor.[51]

The hospital was bombed on March 3, after which the sisters treated 21 wounded people. On March 5, Sister Pauline went to a hospital in Aba, where she "begged for some blood giving sets" and received them. The next day she went to Ikot Ekpene to get splints but had to leave quickly because of an air raid there. Throughout the month, in addition to caring for patients, the nuns tended their garden, helped at St. Vincent de Paul's bazaar to get clothes for refugees, and found families for orphaned children. On March 25, Sister Pauline and her colleagues treated 45 outpatients as planes flew over them, and then she and Sister Leonie worked in the operating room all afternoon.[52] Most of the secular nurses had left the hospital to be with their families, and priests began assisting the sisters with feedings and care of babies. On April 3, Sister Pauline wrote, "Father Johnston did well on night duty leaving everything in ship shape. Father Frawley was heard saying to him last night: 'Be sure you have plenty of nappies before you go because I ran short last night.'"[53]

On April 26, Sister Pauline held a huge clinic and gave instructions to the priests on how to put on sterile gloves. The following day, one of them "scrubbed up" to help her in the operating room.[54] In this emergent situation, the existing mission hierarchy blurred: Sister doctors taught *priests* how to be nursing assistants and even how to change diapers.

In the eastern region where military operations were the most active, farming could not take place and famine resulted. Although the exact number is unknown, one Irish priest reported that "more than 2 million have died as a result of the blockade set up by Nigeria."[55] Because of the famine, an international ecumenical airlift began operating in violation of Nigerian airspace and without Nigerian authority. In 1968, Protestants and Catholics, with financial support from the American Jewish community, formed the Joint Church Aid organization. These emergent groups were joined by Protestant church agencies in Denmark, Norway, Sweden, and Finland in forming an international Joint Church Aid group. Much of the relief material raised internationally came through these agencies, along with a Canadian group, the World Council of Churches, Africa Concern, and Oxfam. All these agencies proclaimed their neutrality even as they defied the federal blockade, often under gunfire, and flew in medicines and food to Biafra, despite the fact that the Nigerian government had banned outside aid flights.[56]

The International Committee of the Red Cross also had an airlift, but it withdrew after one of its planes was shot down and four of its relief workers were killed. The airlifts were the only remaining lifelines for those in the eastern enclave. The aid agencies used a widened stretch of blacktop road at Uli airport as a nighttime landing strip for the supply planes that flew in from neutral sites. The airstrip was bombed periodically.[57]

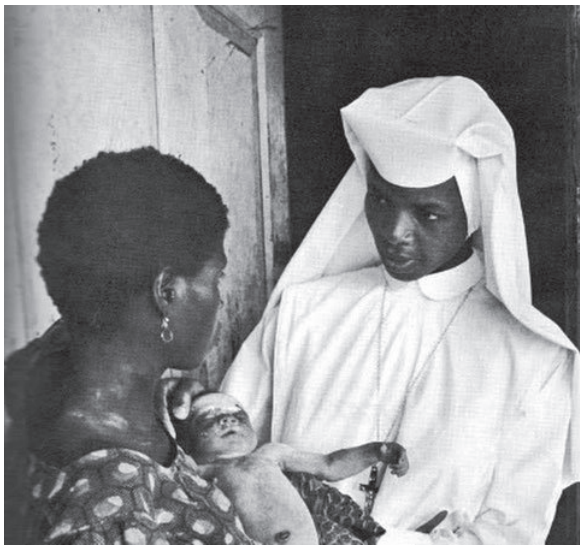
Obviously, the Nigerians were in the majority, but the voices of the people on the ground are silent in missionary archives. Photographs again can be useful. One shows UNICEF and Joint Church Aid workers posing alongside Nigerians who all were rendering service at Uli Airport.

Historians also can read between the lines of written documents. Eventually, the government forced the sisters to evacuate, and they first said goodbye to a Mrs. Hogan, a Nigerian nurse midwife who had trained in England. Sister Pauline mentioned her several times in her diary, although she gave few details of Mrs. Hogan's work and none of her background. When the nuns left in September 1968, Mrs. Hogan stayed behind.[58]

The sisters had another key resource on their side: Nigerian sisters in their congregations and in others who could maintain the hospitals and schools after the expatriates left.[59] One photograph shows a teacher, Sister Joseph Theresa Agbasiere, a Holy Rosary Sister, comforting a woman and baby.

This photo is important in showing the local response of Nigerians caring for themselves. Photographs also reveal that, in this case, emergent groups included a mix of people. Those affected by the disaster included the church workers, local citizens, and international workers who were present to provide relief, shelter, food, and health care—"all important disaster functions."[60]

The Catholic Church's role in the conflict, however, caused considerable political controversy. The Nigerian government was hostile to the priests, sister



Sister Joseph Theresa Agbasiere at Owerri feeding center. Reprinted with permission of the Missionary Sisters of the Holy Rosary, County Cavan, Ireland.

nurses and physicians, and other relief agencies, arguing that they prolonged the war by feeding the enemy.[61] To the government, this work was illegal, and it became the main reason for its decision to expel 300 priests and 200 sister nurses and physicians from the country. Only a few were invited back later in the 1970s.[62]

The press vilified the Red Cross for not confronting the Nigerian government. Indeed, the international media dwelt extensively on photos of starving Biafran children, which shaped the disaster discourse and grabbed the attention of the public. The French, who had maintained some support for the Biafran government, were especially indignant. What resulted was a new, more "militant" generation of relief organizations, including the French Médicins sans Frontières (Doctors without Borders) and the group called the Irish Concern.[63] Since then, these groups have been very active in disaster relief.

Although I discussed earlier the role of race on emergent phenomena, research can also inform us about gender. Debate abounds as to "whether men or women are more involved in [emergency responses] and what types of roles they play in disaster."[64] Most results show a gender differentiation, with women's work restricted to domestic duties and the provision of sympathy and psychological support.[65] A history of nursing in disasters, however, shows something different. During the Biafra conflict, for example, it was mainly the men running the airlift who received the media coverage. Yet my sources illustrate women in the role of nurses and doctors in the thick of the suffering. They performed several tasks that definitely were *not* restricted to domestic labor and mere provision of sympathy.

To conclude, until the late 1980s, research on emergent phenomena included studies of physicians, nurses, firefighters, and other relief workers who "remained the preferred approach to disaster management." In the 1990s, in addition to disaster assistance, scholarly interest began to include disaster prevention and risk reduction, bringing in engineers, geophysicists, and meteorologists.[66] Rather than strictly reacting to disasters with firefighters, search and rescue teams, and emergency medical care, greater attention was paid to anticipating and preventing disasters. For example, in 2005, Portugal took the lead in urging the European Union to put in place a disaster warning system in the Atlantic and Mediterranean regions.[67]

However, as the cases described here reveal, one cannot plan or prevent all disasters. As another example, during the Tokyo subway sarin nerve gas attack in 1995, St. Luke's Hospital received most of the patients. Prior to the attack, the hospital had a disaster plan that focused on conditions from earthquakes, fires, or floods. Officials had never considered a chemical disaster.[68]

So, why is all of this important? Much still needs to be learned about emergent response groups. Sociologists argue that "some groups of people are known for their ability to remain cool and stay clear-headed under pressure, including veteran military officers, [as well as] fire and police commanders."[69] Mayors of cities and others who respond to disasters can also benefit by observing nurses and physicians at their regular work as they cooperate and communicate with many other health care workers daily under extreme pressure. Nurses and physicians are ready for contingencies. They do this every day. After the tsunami in Japan in 2011, 3,000 nurses immediately volunteered to work. They were ready. Likewise, after the Boston marathon bombing on April 15, 2013, a reporter asked a trauma surgeon at Massachusetts General Hospital, which had received many of the injured, about his situation. The doctor replied, "This is work. We just go to work."[70] No doubt nurses were right there with him. These professionals have to gear up for the unexpected and quickly adjust. Policies and protocols may no longer apply as expediency and patients' needs take priority.[71]

To understand and effectively deal with disasters, multidisciplinary approaches are needed, including meteorologists, engineers, anthropologists, lawyers, political scientists, economists, journalists, and others.[72] I suggest that as we study these approaches, we also include historians and nurses in any research on disaster response.

Notes

1. Barbra Mann Wall, "Hannah Lecture," (lecture, Victoria, Bristish Columbia, Canada, June 1, 2013).

2. Sociologists have extensively debated definitions of disaster. For an example, see Thomas Drabek, "Revisiting the Disaster Encyclopedia," *International Journal of Mass Emergencies and Disaster* 17, no. 2 (1999): 237–57.

3. Thomas E. Drabek and David A. McEntire, "Emergent Phenomena and Multiorganizational Coordination in Disasters: Lessons from the Research Literature," *International Journal of Mass Emergencies and Disasters* 20, no. 2 (2002): 198.

4. Thomas E. Drabek and David A. McEntire, "Emergent Phenomena and the Sociology of Disaster: Lessons, Trends and Opportunities from the Research Literature," *Disaster Prevention and Management* 12, no. 2 (2003): 99, 101.

5. Russell Dynes, "Community Emergency Planning: False Assumptions and Inappropriate Analogies," *International Journal of Mass Emergencies and Disasters* 12 (1994): 141–58; Drabek and McEntire, "Emergent Phenomena and the Sociology of Disaster: Lessons, Trends and Opportunities from the Research Literature," *Disaster Prevention and Management* 12, no. 2 (2003): 99, 101.

6. Julie A. Fairman and Jonathan Gilbride, "Gendered Notions of Expertise and Bravery: New York City 2001," in *Nurses on the Front Line: When Disaster Strikes,*

1878–2010, ed. Barbra Mann Wall and Arlene Keeling (New York: Springer Publishing, 2011), 223–30.

7. Joseph T. Scanlon, "Rewriting a Living Legend: Researching the 1917 Halifax Explosion," in *Methods of Disaster Research*, ed. Robert A. Stallings (Philadelphia: Xlibris, 2002), 267.

8. Philip Fradkin, *The Great Earthquake and Firestorms of 1906: How San Francisco Nearly Destroyed Itself* (Berkeley: University of California Press, 2005).

9. Barbra Mann Wall and Arlene Keeling, *Nurses on the Front Line: When Disaster Strikes, 1878–2010* (New York: Springer Publishing Co., 2011).

10. Ibid. See, in particular, Chapters 1, 2, 5, 6, 11, and 13.

11. Caroline Moorehead, *Dunant's Dream: War, Switzerland, and the History of the Red Cross* (London: HarperCollins, 1999); John Hannigan, *Disasters without Borders* (Cambridge: Polity, 2012); Marian Moser Jones, *The American Red Cross from Clara Barton to the New Deal* (Baltimore: Johns Hopkins University Press, 2013).

12. Lucy B. Fisher, "A Nurse's Earthquake Story," *American Journal of Nursing* 7, no. 2 (1906): 84–98. Aspects of this disaster are published in Barbra Mann Wall and Marie E. Kelly, "'A Lifetime of Experience': The San Francisco Earthquake and Fire, 1906," in *Nurses on the Front Line*, ed. Barbra Mann Wall and Arlene Keeling (New York: Springer Publishing, 2010), 43–67.

13. Fisher, "A Nurse's Earthquake Story,".

14. Typed copy of Rene Bine to folks, n. d., MS 3640, folder 6, California Historical Society, San Francisco (hereafter cited as CHS). See also Rene Bine to folks, Monday, April 30, 1906, MS 3540, folder 6, CHS; and "Personal Recollections During the Eventful Days of April, 1906," *Online Archive of California*, http://www.oac.cdlib.org/view?docId=hb4p3007dw&brand=oac4&doc.view=entier_text, accessed May 6, 2013.

15. Nellie May Brown to mother, April 20, 1906, CHS.

16. Hugh W. Stephens, *The Texas City Disaster, 1947* (Austin: University of Texas Press, 1997).

17. Ella Tarbell, "Response Impresses Red Cross Leaders: Food, Shelter, Comfort Given Blast Victims," *Houston Post*, April 18, 1947, 6.

18. Aspects of this disaster are published in Barbra Mann Wall, "Healing After Disasters in Early Twentieth-Century Texas," *Advances in Nursing Science* 31, no. 3 (2008): 211–24. See also Elizabeth Lee Wheaton, *Texas City Remembers* (San Antonio: Naylor, 1948): 1–74.

19. Ben Powell, in Wheaton, *Texas City Remembers*, 20.

20. Mrs. J. F. White, in ibid., 18.

21. Mrs. Helen Clough, in ibid., 18 and 20.

22. Drabek and McEntire, "Emergent Phenomena and the Sociology of Disaster," 99.

23. This is seen in Havidan Rodriquez, Enrico L. Quarantelli, and Russell R. Dynes, eds., *Handbook of Disaster Research* (New York: Springer Publishing, 2007).

24. Luci P. Givin, "Texas City Disaster Memoir," (Galveston: University of Texas Medical Branch Library [hereafter cited as UTMBL], Blocker Historical Collections, 1948).

25. Ibid.

26. Sam to folks, April 16, 1947, UTMBL. Senior students at the scene in Texas City gave plasma, with one medical student claiming to have given 40 units the first day. They also took medical histories and performed physical assessments.

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Barbra Mann Wall, PhD, RN, FAAN
Associate Professor of Nursing
University of Pennsylvania School of Nursing
2019 Claire Fagin Hall
418 Curie Boulevard
Philadelphia, PA 19104-4217