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Hurricane Sandy, New York: A Case Study

Introduction:

Hurricane Sandy, a 12-ft storm surge, crossed the major highway along the East River in Manhattan in October 2012 causing a total of 117 deaths (53 in New York, 34 in New Jersey, and the remaining in Pennsylvania, West Virginia, Connecticut, and Maryland).¹ The hurricane resulted in the evacuation and closure of three NY hospitals, deployment of nurses to other area hospitals, an examination of psychosocial challenges experienced by nurses on call, and a change to emergency preparedness safety measures to prevent future disasters from storms.²

Facts of the Case:

Hurricane Sandy which began as a tropical wave in the Caribbean, turned into a tropical storm or post-tropical cyclone, sweeping through the Caribbean and East Coast of the United States.³ The National Hurricane Center reported that the tropical force winds extended 820 miles at their widest, which compared to more intense but narrower hurricanes, resulted in storm surges and the destruction of a large area.⁴ It was also reported that the hurricane caused \$62 billion in damage in the US and at least \$315 million in the Caribbean, making Sandy the nation's most expensive storm since Hurricane Katrina. New York was most severely impacted due to damage to subways, roads, and roadway tunnels, as well as storm surges of 14 ft above the average low tide.⁵ Lastly, out of the death toll of 285, at least 125 were in the United States.¹

Epidemiological aspects of the event:

The Centers for Disease Control and Prevention (CDC) uses the Red Cross to track deaths during disasters such as this one. This data allows the CDC to provide adequate and necessary services to victims and their surviving family members. Red Cross volunteers also look for reports of disaster-related deaths from funeral homes, Federal Emergency Management Agency (FEMA), hospitals, and news reports. The data published is considered valid, accurate, and reliable because the primary source of information is from medical examiners or coroners, physicians, fire/police department, and family members of the deceased.¹

Deaths included in analyses were all Sandy-related deaths recorded on the Red Cross mortality forms which included age, sex, race, date, and location of death. Deaths were further classified into direct and indirect causes where direct deaths were caused by the environmental and structural forces of the disaster (wind, flood, structural collapse) and indirect deaths were caused by unsafe conditions (hazardous roads, electrical disruptions).² While direct deaths accounted for 57.3% of the deaths, 38% were characterized as indirect, and the remaining 4.7% were unknown.¹ The deaths were calculated based on the dates and characteristics mentioned above and they were then compared using chi-square tests and t-tests.¹

The deployed nurses in the three major NY hospitals that were closed encountered practice challenges related to working in an unfamiliar environment, as well as psychosocial challenges associated with the pressing experience of evacuation and uncertainty about the near future. To explore nurses' experiences during the disaster, specifically during deployment, a mixed-methods study was employed by VanDevanter et al.² The implemented mixed methods design consisted of a purposive sample of nurses, in-depth qualitative interviews, and a quantitative online survey of all nurses at the hospital at the time of evacuation and even deployment. Communication during and after the evacuation was challenging due to storm damage and the mentioned study was conducted six to ten months after evacuation so the nurses' ability to

remember events accurately may have been altered.² Challenges experienced by nurses should be further investigated to understand the long-term psychosocial impacts of the disaster.

Management of the event:

Following Hurricane Sandy's tragedy, healthcare coalitions have been developed as the foundation for disaster responsiveness. At the time, coalitions joined public health agencies, emergency health services, and private non-healthcare partners to minimize suffering, loss of life, and adverse effects on society.⁶ Additionally, the US Health and Human Services (USHHS) assisted medical staff with the collection and distribution of medical supplies. The Red Cross announced that about 4,000 disaster workers were working across storm-damaged areas and following the Major Disaster Declarations by the President, FEMA sent an additional 7,000 personnel to impacted area, established Discovery Recovery Centers, provided water, meals, and generators to affected states and approved about \$600 million in direct assistance to individuals impacted by the storm and its aftermath.⁷

In December 2012, President Obama issued an Executive Order to establish Hurricane Sandy's rebuilding task force. Rebuilding efforts focused on addressing economic conditions as well as rebuilding plans for the damaged infrastructure of public houses, transportation systems, and utilities. President Obama also focused on identifying requirements and resources that were necessary to bring systems to better conditions given current and future risks. Lastly, the Senate also passed a massive \$50.5 billion Hurricane Sandy relief bill which was signed in 2013 and was used for necessary expenses related to the consequences of Hurricane Sandy.

The public health response was effective for the most part because various sectors were considered in the individual and population levels. Economic and medical effects were also assessed and considered, however, as mentioned above, some of New York's largest and most important hospitals such as NYULMC were not prepared during the acute phase of the disaster.² Better emergency response practices such as hospital evacuation, rescue & recovery efforts, easing workplace disruption and instability, are necessary and could be improved.

Communications of the event:

Communication is critical in emergency management yet one of the greatest challenges faced by officials and individuals during disasters. Overall, communication regarding Hurricane Sandy was successful but some disagree and reported poor communication at the time of the disaster. The incident was mainly communicated through the media and according to complaints from communities along the East Coast, there was a lack of information given to them.⁸ Additionally, communication among individuals was limited because people were so in shock and frightened about water threatening their homes, they did not have any cell service, thus they used Twitter to dispel rumors and share information. Lastly, hurricane-related drowning deaths in evacuation zones are preventable,¹ however, since officials did not provide timely messages to those affected, this led to an unsuccessful evacuation and thus an increase in the number of deaths.

Summary:

As evidenced and stated above, Hurricane Sandy resulted in extensive damage to infrastructure, challenging conditions for residents, and disrupted day-to-day services. Those impacted suffered from direct and indirect causes such as prolonged power outages, storm surges, and a shockingly high number of deaths, within others. Although there have been tremendous advances in hurricane warning and evacuation systems, as well as other precautionary measures, the number of deaths could be further reduced with an improvement in communication (i.e.: by making communication more efficient).

References:

1. Deaths Associated with Hurricane Sandy - October–November 2012. SEARCH Search Morbidity and Mortality Weekly Report (MMWR). https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6220a1.htm?s_cid=mm6220a1_e. Published May 24, 2013.
2. VanDevanter N, Kovner CT, Raveis VH, McCollum M, & Keller R (2014). Challenges of Nurses' Deployment to Other New York City Hospitals in the Aftermath of Hurricane Sandy. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, Vol. 91, No. 4. doi:10.1007/s11524-014-9889-0
3. Sharp, Tim. "Superstorm Sandy: Facts About the Frankenstorm." LiveScience. Accessed February 24, 2014, <http://www.livescience.com/24380-hurricane-sandy-status-data.html>
4. Associated Press. "WHAT WE KNOW ABOUT SUPERSTORM SANDY A MONTH LATER." AP News. Accessed February 25, 2014, <http://bigstory.ap.org/article/what-we-know-about-superstorm-sandy-month-later>.
5. Boyle, Louise. "Hurricane Sandy batters New York's subway system as tunnels are flooded and network shuts down for up to FOUR DAYS." Daily Mail Online. Accessed February 25, 2014, <http://www.dailymail.co.uk/news/article-2225164/Hurricane-Sandy-batters-New-York-Citys-subway-tunnels-flooded-network-shuts-down.html>.
6. The next challenge in healthcare preparedness: Catastrophic health events. Center for Biosecurity of UPMC. Prepared for the U.S. Department of Health and Human Services under Contract No. HHSO100200700038C. 2010. <http://www.upmc-biosecurity.org>
7. Hurricane Sandy FEMA after-action report. FEMA. http://www.fema.gov/media-librarydata/20130726-1923-25045-7442/sandy_fema_aar.pdf Published July 1, 2013. Accessed September 10, 2015.
8. Sadri AM, Hasan S, Ukkusuri SV, Cebrian M. Crisis Communication Patterns in Social Media during Hurricane Sandy. *Transportation Research Record*. 2018;2672(1):125-137. doi:[10.1177/0361198118773896](https://doi.org/10.1177/0361198118773896)