Health Implications of Hurricanes

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Introduction

During the Atlantic hurricane season, the United State's East Coast is the target of severe and devastating storms, more commonly known as hurricanes. These types of storms have been wreaking havoc for centuries. The first hurricane to be documented was in 1635. Fourteen years after the first Thanksgiving in Plymouth Colony, New England was struck by a storm with recorded winds up to 130 mph and a surge of water 21 feet high. Later, this storm dubbed "The Great Colonial Hurricane" (Pielke, 2008). Killing around 700 people, this hurricane was the first in American history to cause such catastrophic damage. Since then, hurricanes have become an expected occurrence to those on the East Coast. Due to weather predicting technology and years of experience, most Americans are used to the idea of hurricane season and have time to prepare. However, this doesn't mean these storms are any less disastrous, killing hundreds of people and leaving thousands more homeless. In 2004 and 2005 alone, the damage seen on the East Coast was estimated to be more than $150 billion in damages (National Geographic). However, far more than buildings are harmed after a hurricane. In addition to the horrific amount of structural debris, there is significant effect on people's health.

The health implications of a hurricane are extremely broad and varied, however there are some that stand out more than others. There are three primary hurricanes that have made significant impact on the public's health and have sparked research in disaster response and relief: Hurricane Andrew, Hurricane Katrina and Hurricane Sandy. Each of these storms brought much harm to respective parts of the East Coast. While each of these hurricanes are similar in results, each one of them will be used as an example to highlight a certain issue.

Some of these issues are still being researched today in order that strategies can be implemented to prevent disease and damage when the next hurricane makes landfall.

Methods of Research

The research needed to answer what the health implications of a hurricane are is relatively simple, due to the apparent and immediate results of a natural disaster. In the journals and articles I studied for this paper, the majority of them performed studies by surveying populations at certain points after the specific hurricane. The results indicated and uncovered the presence and often the degree to which the person's health had been affected, making these results very accurate. Similarly, my research was conducted by finding this accurate research and extrapolating the information I needed to make my case.

General Physical Health Implications

When a hurricane hits, entire states, cities and communities suffer due to the ripple effect the destruction has. Everything that happens is connected and affects one another. The first injuries to happen in a storm are usually skin-related wounds or musculoskeletal trauma. Abrasions, punctures, cuts, fractures, sprains or dislocations are usually the most prevalent (CDC, 1996). These wounds occur during the hurricane strongest surge and winds. These injuries are not usually preventable; there are some initial and primary injuries that can be avoided if you know how to properly respond to disasters.

The first preventable disease is carbon monoxide poisoning. Due to the colorless and odorless character of carbon monoxide, many people are un aware of the danger and can die from this usually within three days of the disaster. After a disaster, people are susceptible to carbon monoxide poisoning due to their dependence on generators and charcoal fires as well as their lack of open space. The second is gastrointestinal disorders, such as gastroenteritis or diarrheal illnesses. This is contracted by the introduction of bacteria, such as Vibrio Cholera,

to the body. This is common in post disaster situations due to the disruption of the sewage system. It can affect on large-scale bodies of water, and thus large populations. The common pathway for bacterial transmission of these diseases can be from bathing and washing their hair and face in unsanitary water.

Effect on Mental Health – Hurricane Andrew

In August 1992, Hurricane Andrew, a Category 5 storm, made landfall. The states most affected were Florida and Louisiana, and they were not prepared for what came. A study was done by the Center for Disease Control (CDC) and found that more than 30,000 homes were destroyed, approximately 350,000 people were left homeless, and it was estimated to have caused 30 million dollars worth in damages (CDC, 1992). It was such an impactful event that many people suffered mentally for years afterwards. In a study done shortly after the storm, it was predicted that "about 80% of victims will experience some symptoms of Post Traumatic Stress Disorder (PTSD) for about a year; others, approximately five to 10 percent will suffer a more serious, long-lasting disorder" (Mauro, 1992). These other such disorders can include sleep disturbances, major depressive disorder, anxiety and panic disorder and sometimes multiple personality disorder. A reason these disorders persist is due to the constant stimuli the brain receives from the aftermath of the hurricane; there is a constant reminder of what occurred and the overwhelming feeling of fear that is associated with it. Dr. Charles Gibbs, a doctor with the Red Cross in 1992, estimated shortly after the hurricane that around "25,000 people will suffer lingering psychological effects" (Treaster, 1992).

The population whose mental health was most affected by the storm was children. It was found in a study done within three months of the hurricane that more than 60% of the 1,086 surveyed children had the symptoms of PTSD (Lubit, 2003). Children are the most vulnerable and feel the effects of a hurricane more because sudden change in their precious

environment can be difficult for them to process. They simply do not know how to make sense of what occurred. This is due to the brain's neurodevelopment occurring in children. Any major stress or trauma during these years can cause a physical effect on these developing neurons. The affect of this can be to long-term changes in the child's response to stressors as well as increase chances of developing a disorder (Vernburg, 1996). In addition, children are severely affected when loosing a parent. Not being capable of accepting or understanding that loss can lead to emotional incapability. It affects their long-term emotional regulation or even personal identity. Lastly, children are at risk as well due to the abuse that can occur after a storm. The amount of child abuse reports is "disproportionately higher in the quarter and half year following…disaster events" (Curtis, 2000). These effects on children can be just as harmful as PTSD.

Affect on Chronic Health – Hurricane Katrina

Hurricane Katrina hit the coast on August 23, 2005. It was "one of the strongest storms to impact the coast of the United States during the last 100 years" (NCDC). There were thousands of people affected and even more health issues that arose as a result; displacement being one of them. The Washington Post stated that Hurricane Katrina was "the largest displacement of Americans since the Civil War." The storm forced 76,000 people to find shelter and help. With in a seven state region, hospitals, hotels, convention centers, schools, churches, sports arenas and homes were filled (Lyman, 2006). This stress particularly had an effect on the elderly.

The elderly were among the first to be impacted with 71% of the dead being over the age of 60 (Alzheimer's Association). After the storm, many were affected by the displacement, particularly those elderly with mental disorders or forms of dementia, specifically Alzheimer's disease. Dementia is a degenerative brain condition causing impaired memory, communication, focus, judgment and perception. After a hurricane, like

Hurricane Katrina, the large spread of people causes a separation between these elderly from their families and caretakers. With health records inaccessible and often no form of identification, disaster response or emergency medical teams do not know an elder's condition, prescriptions, or dosage and lack of this knowledge causes a worsening of their condition. In addition, separation from their caretakers leads to distress in the elderly. Unfamiliarity of their surroundings compounded with their confusion causes further distress and increases the severity of their condition. Even months after the storm, some of the elderly were not found by family and caretakers (Huus, 2005).

Effect on Community Infrastructure – Hurricane Sandy

October 22, 2012, Hurricane Sandy devastated the coast of New Jersey and New York. Killing 285 people and injuring thousands, this Category 3 Hurricane changed how we think about hurricane preparation and specifically infrastructure of homes and businesses. The Northeast's infrequent encounter with hurricane's left those areas unprepared for the ensuing hurricane. In a statement after the hurricane, Governor Andrew Cuomo said that it would take 33 billion dollars to repair all the damaged housing and infrastructure in New York (Marsh, 1997). Resilience needs to be more in mind when considering the future infrastructure of cities and communities. Resilience in infrastructure can be thought of as a building with reduced failure, consequences and recovery time (Jones, 2012). New York is one of hundreds of cities rethinking their infrastructure to be more durable to storms.

The affect of the hurricane on infrastructure was broad. Due to the high water surge and heavy winds and rains there were power outages, phone lines down, and buildings damaged. It was estimate that more than 8 million people lost power during the storm (Rexrode, 2012). The most critical of these losses was at New York University's Langone Medical Center. During the storm this hospital loss their main power generator followed by their backup. This began a panicked rush to evacuate around 200 patients to other hospitals.

Among them were 20 newborns from the intensive care unit. Fortunately, disaster and loss of life was prevented due to the speed and efficiency of care providers. However, generator failure is a critical problem and can be avoided with proper infrastructure. An example of this is the IKEA store in the Red Hook District of Brooklyn. In the middle of the storm, this IKEA store maintained power and became one headquarter for the relief workers and provided shelter for the natives. The reason this store didn't loose power is because it was designed to place the generators on the top of the building and built the parking garage at the base of the building instead of on the side. This non-traditional approach to design allowed water to flow under the building and the generator to maintain power, thus avoiding the power loss and destruction other surrounding buildings encountered. This model is what being evaluated and considered while rebuilding the parts of the Northeast that have been flooded and destroyed by Hurricane Sandy.

Conclusion

Research and analysis is required for us to learn from these issues and better prepare ourselves for hurricanes and other natural disasters. From exploring these different health issues, there are many ways we can move forward to better prevent these problems. First, education is always critical. When people are informed, they are more prepared and know how to properly respond. There is less chance of preventable primary disease health problems such as carbon monoxide poisoning. Second, infrastructure must be reconsidered. This is the most important way to prevent disaster. If the infrastructure of cities is improved and modeled after buildings like IKEA most of the health conditions that come as a result of hurricanes or hurricane damage can be avoided. Families can better stay together, caretakers can provide for their patients and there is less loss in life. Hospitals are more stable and can remain open, and any electronic health records can be used to continue to care for those in critical care or with chronic illness. These two ways of progressive thinking should be

applied to the entire stretch of the East Coast in order to prevent the damage and decrease the number of deaths from hurricanes.

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