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New Mexico: A Desert Too Hot

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Concept in Climate Change & Public Health Preparedness

University of New Mexico

Part 1

New Mexico is located in the Southwest region and this desert land is known to be the hottest and driest part of the United States. As global warming becomes a bigger issue, New Mexico temperatures have shown to get hotter and hotter and they are predicted to continue doing so. According to the article *How Is The Climate Crisis Affecting New Mexico*, “Since the 1970s, New Mexico’s average annual temperature has increased by about 2.7 degrees Fahrenheit, and without action to reduce greenhouse gas emissions, **‘historically unprecedented warming is projected [in the state] by the end of the 21st century’**” (Climate Reality Project, 2020). There has been an upward trend in temperatures here in New Mexico, with temperatures already going up to and beyond 100 degrees Fahrenheit in some cities, resulting in dangerously high temperatures for the human body and livestock. The issue doesn’t end with increasing heat.

The United States Environmental Protection Agency predicts that in coming decades, water flow to the Colorado, Rio Grande, and other rivers will decrease as a result of climate change (What Climate Change Means for New Mexico, 2017). A decrease in waterflow will then further disrupt livestock and farming. A hotter desert with less water could result in a number of detrimental environmental issues that New Mexico already experiences such as wildfires and drought. The effects of these environmental issues will be even more detrimental when paired with increasing heat and decreasing waterflow. According to the article *Confronting Climate Change in New Mexico*, New Mexico is currently the sixth-fastest-warming state in the entire nation (UCSUSA, 2016). As the temperatures rise and the water levels fall, farmers who rely on water allocations from reservoirs and streams are experiencing a shortage and are faced with the issue of coming up with a plan to adequately irrigate their crops (Confronting Climate Change in New Mexico, 2016).

Hotter conditions lead to hotter winters, which then lead to earlier snow melt. As the snow melts earlier than usual, the forests experience extreme heats with drier conditions for longer periods of time. This is an issue especially during the spring season, where forests endure dry, hot conditions for a prolonged period of time before the monsoon season begins. This prolonged time of heat, dryness, and a lack of snow or rain increases the risk for forest fires along with a predicted increase for the amount of damage those fires could cause. In fact, the fire season here in New Mexico has already increased from five months long to seven months long and the burn area covered during the fire season is predicted to increase drastically in coming years (Confronting Climate Change in New Mexico, 2016).

New Mexico forest and agriculture are not the only factors vulnerable to extreme heat, there are also many populations that are vulnerable to rising temperatures such as children, the elderly, the sick, and the poor (What Climate Change Means for New Mexico, 2017). High temperatures could cause severe medical issues for vulnerable populations, the most common one being dehydration. High temperatures can also result in cardiovascular issues, respiratory issues, and nervous system issues. As the state of New Mexico continues to warm, it becomes a less sustainable environment for agriculture, forest life, and human life.

Part 2

The state of New Mexico received a B- on America's Preparedness Report Card (Climate Central, 2015). This letter grade classifies New Mexico as being in extreme heat, meaning that the state will face increasing threats from extreme heat, drought and wildfires through 2050. This grade indicates that New Mexico faces an above average threat when compared with the lower

48 states. According to this report, there are approximately 80,000 people in New Mexico who are vulnerable to extreme heat, this number includes people aged 65+ years old, those under 5 years old, and those living below the poverty line. According to the article, Potential Effects of Climate Change on New Mexico, prolonged heat exposure can result in heat related injuries and increases in the incidence of heart attacks and stroke in those who have cardiovascular disease (Agency Technical Workgroup, State of New Mexico, 2005). The negative effects of extreme heats in regard to health will likely be experienced by those in higher-elevations and northerly areas of New Mexico, especially those areas where air conditioning is lacking in homes and public buildings (Agency Technical Workgroup, State of New Mexico, 2005).

Older adults are vulnerable to extreme heat because their aging bodies do not adjust to changes in temperatures very well. Many of the elderly have underlying medical conditions or take prescription medications that result in being vulnerable to temperatures (CDC, 2017). Similar to the elderly, young children are also unable to tolerate extreme temperatures. Heat-related illnesses include heat stroke, heat exhaustion, heat cramps, sunburn, and heat rash. Heat-stroke is a medical emergency and 911 needs to be called immediately if it is suspected that someone is experiencing heat stroke. The signs and symptoms of heat stroke include a high body temperature (103F), hot, red, and dry skin, a fast and strong pulse, headache, dizziness, nausea, confusion, and loss of consciousness. Everyone in extreme heat could be a victim of heat-related illnesses, but the very young and the very old are most at risk of developing these issues.

Extreme heat can be a deadly hazard for those with cardiovascular disease. Studies from Australia found that hot weather can cause changes in blood pressure, blood thickness, cholesterol, and heart rate, which puts a strain on the cardiovascular system (LHSFNA, 2018). A strain on the cardiovascular system in someone who already suffers from cardiovascular disease

can result in fatal consequences, such as a fatal heart attack. When the body experiences extreme heat the excess heat is moved into the blood and the heart works to circulate more blood to the skin in order for it to be cooled (LHSFNA, 2018). This process is called radiation. Radiation is a normal process that the body performs in an attempt to cool off in response to heat. Although this can be effective in cooling the body, it puts a strain on the heart, causing it to pump harder and faster than normal. When this process occurs in someone who has cardiovascular disease, their heart is already strained due to their disease process. This heat regulation process then further strain the heart, increases cholesterol levels, which can then result in a heart attack. Many elderly people, especially here in America have some underlying cardiovascular problem, which once again puts the elderly population at a higher risk for experiencing health issues related to extreme health.

Part 3

The first concept in the Public Health Preparedness Framework is preparedness. According to the article Emergency Management in the United States, preparedness involves planning, training, and educating on possible disasters (FEMA, 2020). One example of preparedness is conducting risk-based approaches to assess vulnerabilities within a community. By assessing vulnerabilities beforehand, these factors are able to be taken into consideration and involved in planning for future disasters. When a vulnerability is identified, taken into consideration, and implemented in planning, communities are able to mitigate and respond to impacts (U.S. Climate Resilience Toolkit, 2019). According to the U.S. Climate Resilience Toolkit, documentation of climate change planning in Midwest communities are low. A risk-

based approach relies heavily on community participation, and without adequate amounts of community participation, the risk assessment loses effectiveness in planning and implementation. In the previous section I discussed how the elderly population is extremely vulnerable to increasing heat within New Mexico. One way this population could prepare for climate change is to participate in these risk-based assessments in order to identify their vulnerabilities and be taken into consideration when developing community plans. Not only will participating in these assessments help organizations to come up with plans that assist their vulnerabilities, but it will also educate participants on resources specific to this population and their vulnerabilities, which will serve as a helpful toolkit.

While preparedness involves actions before an event occurs, mitigation involves actions taken to reduce the impact of a disaster. When talking about mitigation in regards to the effects of excessive heat on the elderly population, we want to look at how the elderly population can take action to avoid any heat related injuries or illnesses. One action that is extremely important when dealing with heat is hydration. Even without extreme heat, the elderly population is vulnerable to dehydration due to many factors associated with aging. Some people don't like to hydrate too much because they end up having to go to the restroom frequently, some body systems may start to slow down, therefore the drive to drink isn't always there, and some people may just not like drinking water and would rather have a coke. This is important to keep in mind while educating this population on ways to decrease the consequences of extreme heat on their health. We must remind this population of the importance of adequate hydration and the negative outcomes that could result from dehydration. The effects of extreme heat can also be mitigated by reminding the elderly population to refrain from being in extreme heat for prolonged periods

of time. If they must be out in the heat and begin to have symptoms of a heat related illness, they should seek an air-conditioned location to rest in.

Response occurs immediately after a disaster occurs. During this phase is when the plans that were developed in the preparedness phase are actually implemented in the community. A response to a heat wave could involve providing heat warnings and information about the response plans, such as instructing vulnerable groups to remain in air-conditioned rooms and providing symptom and treatment information (United States Environmental Protection Agency, 2019). A response plan could also involve community cooling centers for those who may not have access to air conditioned facilities.

Part 4

According to FEMA, recovery is the period of restoration after a disaster. The effects of extreme heat are already being felt throughout the state as temperatures are currently reaching into the three digit category. The effects of climate change are already causing negative impacts, therefore, you could say the disaster is already occurring. Unlike typical disasters that come and go, climate change is one that has been around for some time and is continuing to progress. That being said, preparedness, mitigation, response, and restoration are all occurring simultaneously as communities try to address the developing conditions affected by climate change. One way to recover from the effects of extreme heat is to improve infrastructure. According to the article *Adapting to Heat*, something as simple as increased vegetation and trees could restore the impacts of extreme heat and lead to reduced temperatures in the future (USEPA, 2019). Cool pavements that absorb more solar energy can also work to keep communities cooler (USEPA,

2019). These two actions implemented together could provide cooler temperatures outdoors, making it safer for the elderly population to go outdoors while avoiding heat illnesses. This would be a positive way to move forward in dealing with the threat of extreme heats on the elderly population without having to trap them in an air conditioned room. These actions provides more freedom and normality while protecting this vulnerable population.

Another way to recover from extreme heat is to get involved with community planning. As the effects of extreme heat are being felt throughout the state, one can find an organization within the community who work to come up with heat response plans. By getting involved in this planning phase, vulnerable populations are given a voice to advocate for themselves. Working with these organizations could involve ensuring that proper measures are in place for extreme heat days in schools, workplaces, and community centers (Climate Change and Extreme Heat, 2016). Getting involved in the community could also include participating in the risk-based assessments that were discussed previously. The information collected from these assessments would then be used when developing heat response plans in the future.

In conclusion, climate change is an issue that is affecting the world in a number of different ways. Here in New Mexico we are faced with extreme threats from increasing temperatures that continue to steadily rise. If this rise in temperature continues, New Mexico could possibly become inhabitable and unable to sustain life. The time is now to take a stand and to make an effort into saving our communities, and most of all, our planet. The effects of extreme heat have only begun to be noticed, but they will not end anytime soon unless the people take a stand against climate change and make the effort to restore our world to the healthy conditions it once thrived in. Now is the time to do the research, to get educated on this topic, and most of all, to get involved. The task of beating climate change may seem impossible, but it

is not about fighting the whole battle alone. It is about fighting the small battles that we can and with each little battle fought by each person, we could win this war together.

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