

**What We Can Learn from Hurricane Katrina: Applying Lessons Learned to the Response
and Recovery of the United States After COVID-19**

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On my honor as a University Student, I have neither given nor received unauthorized aid on this
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Advisor

Kathryn A. Neeley, Associate Professor of STS, Department of Engineering and Society

Introduction

There are only three things that are inevitable in this world. Death, taxes, and flu pandemics.

– Dr. Allison McGeer (Ellis, 2019)

Pandemics have happened regularly for all of human history (Jarus, 2020). Some of the earliest pandemics on record took place over 5000 years ago. Since then, countless pandemics have devastated populations large and small. In the sixth century, for example, “a pandemic killed half of the world’s population” (Ellis, 2019). The Black Death killed nearly half of Europe’s population in the 14th century (Jarus, 2020). In more recent centuries, the world has seen smallpox, the Spanish flu, polio, and measles, among others. The most recent pandemic has brought nearly every corner of the world to its knees.

COVID-19 has wrecked the world-wide economy and strained cultures and communities to their core. The vaccine is currently in the rollout stage with more and more people getting vaccinated every day. Some places have done a much better job handling the virus than other and there were big mistakes made throughout the whole process. This is surely not the last pandemic the globe will face and with the globe only to become more interconnected as borders open and globalization occurs. It is very important that we learn what mistakes were made throughout the stages of this pandemic and that we are prepared to correct them when the next pandemic comes. Last semester, the subject of my technical project was a battery powered two-way filtration mask. The mask successfully used fans to assist breathing by providing airflow through filters. This mask was the first of its kind because unlike most fan powered masks, the exhalation was filtered in addition to the inhalation. The development of a superior mask could help mitigate the spread of the next pandemic, but there are many other issues that must be addressed that could have much greater impacts than a mask design. Before and in the midst of the pandemic, grave

mistakes were made and the world paid the price for these mistakes. Unfortunately, people are not often quick to admit their own mistakes. If society, leaders, and individuals do not learn from these mistakes then the world could be hit by the next pandemic even harder. More lives could be lost and more livelihoods could be destroyed. In this paper, I argue that the United States must apply lessons learned from Hurricane Katrina to the COVID-19 pandemic, so the country will be better prepared for the next pandemic.

Part I: From Underprepared to Unprepared - The United States Government's Capacity to Handle a Pandemic

One of the first mistakes made during the pandemic response occurred when the United States government did not instill confidence in the public. In general, the guidelines and announcements of public figures to the general public conveyed “mistrust and paternalism” (Tufekci, 2021). One of the factors that contributed to this mistrust was an idea known as risk compensation. Risk compensation is the idea that safety measures such as masks, rapid tests, and social distancing would lead the public to act more recklessly, therefore undermining the purpose of the safety measures in the first place. Risk compensation has long been a topic of controversy when implementing new safeguards. One example of risk compensation is the bicycle helmet. Initially, concerns arose that a person wearing a bicycle helmet would act more recklessly while riding, therefore negating any safety benefits the helmet offered (Thompson et al., 2002). In almost all cases, safeguards successfully lead to risk reduction instead of compensation (Houston et. al., 2007). In fact, research on COVID-19 quickly showed that face masks increase compliance with other measures such as social distancing (Seres et. al., 2020). The paternalism shown by lawmakers helped make the public skeptical of the rules the lawmakers would eventually make

In addition to creating skepticism, the lawmakers also wasted valuable time in passing legislation and putting together a coherent message to the public. Over a month passed after the WHO declared the COVID-19 outbreak a pandemic before the United States administration agreed that “all Americans should... wear face covering in public settings” (Fottrell, 2021). This lag in proper and united guidance allowed corona virus to spread across the country relatively unmitigated for over a month.

Even after the US government finally reacted, the response did not have the potency necessary to address many issues. According to letters written by James Clyburn, the Chairman of the Subcommittee on the Coronavirus Crisis, “the Trump Administration failed to react quickly to the coronavirus pandemic in Spring 2020 despite urgent warnings, failed to implement a national strategy to alleviate critical supply shortages..., and pursued a haphazard and ineffective approach to procurement” (Cyburn et al., 2021). According to the committee he administration took too little action too late.

Earlier, in 2018 the U.S. dismantled the White House pandemic response team. According to a 2018 article in the *Washington Post*, “The top White House official responsible for leading the U.S. response in the event of a deadly pandemic has left the administration”. The team was disbanded during a reorganization. The change happened at a “time when many experts say the country is already underprepared for the increasing risks of a pandemic” (Sun, 2018). The administration went from underprepared to unprepared in 2018.

The US did not have proper stores of medical equipment or enough manufacturing capability to deal with the demand surge for face masks. During the heat of the pandemic, the United States government did not take “effective action ... to maintain and distribute domestic inventories” (Cohen & Rodgers, 2020). Global supply chain issues also contributed to the

shortage of masks. Lack of manufacturing and proper distribution were not the only causes of mask shortages however. Since public health is a public good, the responsibility for the maintenance of this good cannot be provided safely by an open market. Just like national security, the government must take control and make sure that there are ample stores of PPE. The federal government did not meet the needs of the people. The US government has known about a national shortage “since at least 2006 when the National Institute for Occupational Safety and Health commissioned a report examining the lack of preparedness of the healthcare system ... in the event of pandemic influenza” (Cohen & Rodgers, 2020). The government knew there were shortages and yet nothing was done about it. This problem was ignored because people underestimate the risk of rare, bad things happening.

Psychological research reveals biases and habits of mind that would let this undersupply exist for such a long time without being fixed. The human mind does not judge probabilities in a perfectly rational way. A common misjudgment is based in the tendency “to judge probabilities based on previous encounters with an event” (Vasiljevic, 2013, p. 8). This tendency is called the availability heuristic. This heuristic is “a common strategy for making judgments about likelihood of occurrence in which the individual bases such judgments on the salience of the information held in his or her memory” (“Availability Heuristic,” 2021). In other words, the ability of an individual to come up with examples or other information about an event will affect that person’s judgement of said event’s likelihood. Since most people do not often think about severe pandemics, people, including politicians, will underestimate the likelihood of a deadly pandemic.

Part II: The Crosspollination of Knowledge - Using the Katrina Disaster in New Orleans to Better Understand the Pandemic Response

Understanding the Hurricane Katrina Disaster in New Orleans

At the end of August 2005, Hurricane Katrina made landfall near New Orleans, Louisiana (“Hurricane Katrina,” 2020). About 1.2 million people evacuated the area as over 10 inches of rain and a storm surge overwhelmed the levee system which protects the city. During the hurricane and its aftermath, more than 1,800 people died. On August 30th 80% of the city was underwater. Enormous efforts were made to clean up the city and rescue the residents who were stranded. All in all, the storm caused over \$160 billion of damage. The rain completely overwhelmed the defenses of the city and

Relating Katrina to a Flu Pandemic

Despite very different causes and quite dissimilar effects, natural disasters, such as Katrina, can be quite analogous to flu pandemics. As stated in a document produced by the American Society of Civil Engineers (ASCE), “Hurricane Katrina created a human disaster of immense proportions” (Anderson, 2007, p. 1). Using this document as a guide, we can compare some of the issues that allowed Katrina to devastate New Orleans with some similar issues that allowed Covid to cripple the country and the world. All of the issues fall under four main categories: “understand the risk and embrace safety; re-evaluate and fix the hurricane protection system; revamp the management of the hurricane protection system; and demand engineering quality” (Anderson, 2007, p. 1). These categories are broad enough to be applied to almost any risk prevention system and next we will apply them to pandemic response.

In the Hurricane Katrina review document, the ASCE makes ten critical recommendations to help prevent the disaster from happening again. Table 1 shows the ten recommendations and their respective thought approaches.

Table 1: Thought Approaches and Calls to Action. Adapted from “Hurricane Katrina: One Year Later – What Must We Do Next?”

Thought Approach	Call-to-Action
<u>Understand the Risk and Embrace Safety</u>	1. Keep safety at the forefront of public priorities.
	2. Quantify the risks.
	3. Communicate the risks to the public and decide how much risk is acceptable.
<u>Re-evaluate and Fix the Hurricane Protection System</u>	4. Rethink the whole system, including land use in New Orleans.
	5. Correct the deficiencies.
<u>Revamp the Management of the Hurricane Protection System</u>	6. Put someone in charge.
	7. Improve inter-agency coordination.
<u>Demand Engineering Quality</u>	8. Upgrade engineering design procedures.
	9. Bring in independent experts.
	10. Place safety first.

Understand the Risk and Embrace Safety

The next section will go through each call-to-action in Table 1 to better understand how hurricane disaster management can be applied to a situation such as a pandemic.

I. *Keep safety at the forefront of public priorities.*

First, the United States government must keep the public safe. According to the preamble of the Constitution of the United States, the government must “provide for the common defence, promote the general Welfare [sic]” (*The Constitution*, 2015). It is safe to say that protection against a hurricane and flu pandemic is considered either defense or welfare, if not both. When

considering the US Constitution, it become clear that the first recommendation by the ASCE, to place “safety at the forefront of public priorities”, is not a new or unrealistic request (Anderson, 2007, p. 1). The role of government is to protect its citizens, so those who govern must continually place the safety of those governed as their top priority.

II. Quantify the risks.

Second, the risks must be quantified. Quantifying the risks associated with a catastrophe helps put the scale of risks in real terms that can be prioritized. Predicting the future is an impossible task, so lessons and events in the past must not be ignored. As mentioned earlier, Hurricane Katrina resulted in approximately \$160 billion of damage and over 1,800 lives lost (“Hurricane Katrina”, 2020). The risks and damages of Covid-19 are enormous and impossible to completely quantify. Costs to the nation, to the world, and to individuals can be represented in innumerable ways. Perhaps the most important measure of risk during a pandemic is the loss of human life. According to the Johns Hopkins Coronavirus Resource Center, in the United States alone there have been over 580,000 deaths as of May 2021 (“COVID-19 United States Cases by County,” 2021). Another way of measuring the risk of a pandemic is by the change in gross domestic product (GDP). A study conducted by Terrie Walmsley and Adam Rose concludes that “net U.S. Real GDP losses from COVID-19 are estimated to range from \$3.2 trillion (14.8%) to \$4.8 trillion (23.0%) in a 2-year period” (Walmsley et al., 2020). The loss of life and the shrinking of GDP offer just two possible views into the risks associated with a pandemic such as Covid-19.

III. Communicate the risks to the public and decide how much risk is acceptable.

Third, governing bodies must communicate risk and make decisions regarding the acceptable levels of each risk. Community leaders must “initiate and maintain an honest and open dialogue

with all major stakeholders” (Anderson, 2007, p. 4). The open dialogue about potential risks must occur over all major sources of risk, not just hurricanes and other natural disasters.

Pandemics have intermittently caused catastrophic damage to societies as long as societies have existed (Jarus, 2020), so governments must be open and frank in their ability to protect their people against such dangers.

Re-Evaluate and Fix the Hurricane Protection System

IV. Rethink the whole system, including land use in New Orleans.

Fourth, the United States Army Corps of Engineers (USACE) came together to produce a full review of the issues which contributed to the failure of the hurricane protection system around New Orleans. The document that has been reference many times up to this point, “Hurricane Katrina: One Year Later – What Must We Do Next?”, is one piece of the USACE evaluation. One important conclusion made in this report is that “the ‘system’ was not a system” (Anderson, 2007, p. 5). It is important going forwards that the system be reassembled to successfully accomplish the purpose of the system. A similar statement could be made about the Covid-19 response. The system must be evaluated and repairs must be made so that the next pandemic can be handled with more unity and expedience.

V. Correct deficiencies.

Fifth, the deficiencies that are uncovered by an honest review of the system must be corrected. Hurricane Katrina damaged many critical structures and “brought to light many weaknesses and deficiencies in the existing system that, if not fixed, remain vulnerable to future hurricanes” (Anderson, 2007, p. 6). At the height of the coronavirus, many weaknesses and deficiencies in the response system were exposed by the extreme situation. The government shortage of PPE, budget cuts in the Centers for Disease Control and Prevention (CDC), and

unwillingness of the government to invoke its power to make private firms produce PPE all exemplify weaknesses in the system (Cohen & Rogers, 2020). Unless drastic changes are made to correct deficiencies, history will repeat itself.

Revamp the Management of the Hurricane Protection System

VI. Put someone in charge.

Sixth, the government must put someone in charge to make sure necessary actions are carried out. In the case of the New Orleans flood planning infrastructure, no one person held responsibility for the entire system. As the Katrina report puts it, “local, state, and federal leaders should agree to assign to a single individual the responsibility for managing” critical protection and response systems (Anderson, 2007, p. 8). A single leader must be held responsible during a hurricane or a pandemic. As mentioned earlier, in 2018 the top White House official for pandemic response was dismissed and the entire team was disbanded (Sun, 2018). Someone must be in charge, so they can hold responsibility and make decisions.

VII. Improve inter-agency coordination.

Seventh, interagency coordination must increase across all levels. Placing a single individual in charge will help be the liaison between many agencies. In the case of Katrina, there “has been a historic lack of coordination between agencies at all levels” (Anderson, 2007, p. 9). In the case of international pandemics, countries must hold each other accountable for possible diseases exiting their own borders. Honest and timely information must be exchange on an international level.

Demand Engineering Quality

VIII. Upgrade engineering design procedures.

Eighth, design procedures for the crisis response procedures must be upgraded. The scientific community should “take all reasonable steps to protect the public safety, health, and welfare” (Anderson, 2007, p. 10). As has been the case for all of these Katrina recommendations, this recommendation applies to the procedures which should be followed during a pandemic. The latest research and findings should be leveraged to make a national plan on how to handle pandemics.

IX. Bring in independent experts.

Ninth, the ASCE recommended to the local and federal governments to consult independent experts when evaluating all public projects. The ACE states that “many of the major deficiencies” in the hurricane protection system could have been avoided with independent review (Anderson, 2007, p. 11). A pandemic response could be evaluated by experts just as a flood management system could. Independent experts can offer useful and very valuable input to help make a system resilient and robust.

X. Place safety first.

Finally, safety should be the very top priority for any level of government with a responsibility to protect its people. Just as the United States Constitution mentions the welfare of the people in the first few sentences, safety should be at the forefront of politics and policy always (Anderson, 2007, p 11).

Part III: How to Do Better Next Time - Lessons Learned from Katrina and Key Areas to Re-evaluate

The government must do what no individual or corporation will do. The government exists to support its people in ways that a market cannot. Pandemic preparedness must be taken seriously as a public good, just like national security. In their study, Cohen and Rogers found

that while markets provide efficient distribution of most private goods, “[markets] are not a good mechanism for rationing resources that are necessary for health because health is a public good” (Cohen & Rodgers, 2020). The provision and maintenance of public goods are one of the key purposes of government. In order to better prepare the US for the next pandemic, the US must “strengthen the capacity of local, state, and federal government to maintain and distribute stockpiles” (Cohen & Rodgers, 2020). As mentioned earlier, severe shortages of masks have existed in the US since at least 2006, so drastic changes must occur if the US is to be better prepared next time.

The United States must hold international partners responsible for misinformation. Just as a lack of inter-agency coordination played a role in the Katrina disaster, international communication during the COVID-19 outbreak lacked accuracy and honesty. The Department of Homeland Security “[assessed] the Chinese Government intentionally concealed the severity of COVID-19 from the International community in early January while it stockpiled medical supplies by both increasing imports and decreasing exports” (Williams & Luce, 2020). While this kind of obfuscation must not be tolerated, the United States must also be prepared for it to happen again.

The United States must take matters into its own hands by increasing the capabilities of domestic manufacturing. Just as the ASCE recommended that the local and state governments correct deficiencies in the hurricane protection system of New Orleans, the federal government must correct the deficiencies which presented themselves during the pandemic. One major deficiency is the lack of domestic medical manufacturing. The federal government must enact “policy to increase US production of medical supplies and to reduce the dependence on the global supply chain for PPE” (Cohen & Rodgers, 2020).

Another major change that should not be ignored is the importance of a person in charge. As the Katrina disaster portrayed, having someone responsible for every situation makes for a much more cohesive system. Going forward, there ought to be a person who oversees the protocol and execution of a national pandemic response. The presence of this role will help organizations such as the WHO, the CDC, the White House, and independent research facilities coordinate and act with more unity and speed. This person must also be committed to trusting and acting on scientific findings. As was mentioned in the discussion of the availability heuristic, politicians may fall prey to biases, so scientific processes must help counteract these biases.

Conclusion

As Dr. Allison McGeer said, pandemics have been part of humanity's past, and they will certainly be part of humanity's future (Ellis, 2019). Preparation for the next pandemic cannot start soon enough, and now is the best time to start correcting deficiencies that appeared during COVID-19. Hurricane Katrina, the failures, the recovery, and the lessons learned can offer us a great deal of insight into how we must continue to improve if we are to handle the next challenge.

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