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BIOTERRORISM POLICY REFORM AND IMPLEMENTATION IN THE UNITED STATES:

THE IMPACT OF THE 2001 ANTHRAX ATTACKS

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Abstract

The 2001 anthrax attacks on the United States (U.S.) Congress and U.S. media outlets showed the world that a new form of terror has emerged in our modern society. Prior to 2001, bioterrorism and biological warfare had brief mentions in history books, however, since the 2001 anthrax attacks, a new type of security has been a major priority for the U.S. U.S. politicians, public health workers, three levels of law enforcement, and the entire nation were caught off guard. Now that over a decade has passed, it is appropriate to take a closer look at the impact this act of bioterrorism had on the U.S. government's formation and implementation of new policies and procedures. This thesis will focus on the 2001 anthrax attacks and will serve as a case study to evaluate whether the U.S. is still missing the mark on combating biological terrorism.

Despite the warnings before the anthrax attacks, the US anthrax attacks exposed the lack of preparation for bioterrorism in the US. Therefore, it was inevitable for the post September 11th climate to produce a legislative (laws and policy) response. Bioterrorism is considered a low impact, high probability form of terrorism, which causes political fear due to the ambiguity surrounding the threat. Due to the American system of pork barrel politics, lobbyists with a financial hold over politicians, and political and media exaggeration, it was equally inevitable that the US government's response would be overblown. With the assistance of various academics and experts, this thesis will argue that while most of the initial preventative and responsive policies were necessary to enhance and modernize security and defensive measures against acts of bioterrorism, the ultimately overblown financial response to the US anthrax attacks has had a potentially bigger impact beyond budgetary matters; by taking away resources from public health programs, this has potentially left Americans less safe from threats (flu outbreak, viruses, etc) with a higher probability of occurring than bioterrorism. This overreaction led to significant overfunding to the field of

biological research and may have caused a new era of insecurity on various fronts, including an imbalance of priorities for the public health system.

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Bioterrorism Policy Reform and Implementation in the United States (US): The Impact of the 2001 Anthrax Attacks

The 2001 anthrax attacks were not only an indelible event in America's collective memory, but also the stimulus for a transformation in the US intelligence, law enforcement, scientific, and public health communities. The threat of bioterrorism became real as Americans faced exposure to anthrax-laden letters that were unsuspectingly circulated through the US Postal Service (USPS). Biological agents are relatively easy to produce or obtain and are an unpredictable threat to humans, agriculture, infrastructure and the economy. Many experts agree that it is not if another bioterrorist attack will occur, but when and how severe (Novick et al., 2003, 94). After more than 10 years of policy reform and implementation, it is timely to reflect on whether the legislative policies implemented in the US have been an effective response to a potential biological terrorist attack. The research undertaken for this thesis will be centered around the 2001 anthrax attacks on the US Congress and US media outlets and will serve as a case study to support the argument that the laws implemented after the attacks were necessary and effective in responding to, not only the threat, but also gaps in the legislation that existed prior to the event. The problem is that the uncertain nature of bioterrorism combined with the nature of the American political system created conditions that inevitably led to the US government overreacting to the problem by throwing money at it.

For the purpose of understanding the arguments made in this thesis, it is significant to highlight the difference between biological warfare and biological terrorism. The US Model State Emergency Health Powers Act defines bioterrorism as, "the intentional use of any naturally occurring microorganism, virus, infectious substance, or biological product, or any bioengineered component of any such microorganism, virus, infectious substance, or biological product, to cause death, disease, or other biological malfunction in a human, an

animal, a plant or another living organism in order to influence the conduct of government, or to intimidate or coerce a civilian population" (MSEHPA, December 21, 2001). The intentional poisoning of water and food supplies or the release of a biological agent in the ventilation system of a building are considered acts of bioterrorism. In contrast, "biowarfare or germ warfare is the use of any disease-causing organism or toxin found in nature as a weapon of war to incapacitate or kill an adversary" (Ryan & Glarum, 2008, 20). Bioterrorism is an offshoot of biowarfare, but it differs in the sense that "biological warfare is a highly organized aggressive activity carried out by one state against another, usually through a military arm, using biological agents to kill, disable, and disorganize people to achieve a large military goal" (Clark, 2008, 22). Although bioterrorism may use the same tactics and biological agents as biowarfare, it is more of an ad hoc activity carried out by individuals, non-state actors, governments or other political groups (Clark, 2008, 22-3). One academic, William Clark, has presented a third category called "biocrime," which may involve the same agents used in bioterrorism or biowarfare, but aims at short-term gains for a restricted number of individuals (Clark, 2008, 24). For example, the thousands of hoax anthrax letters that have been investigated would qualify as biocrimes (Clark, 2008, 24). Clark is also skeptical about calling the 2001 anthrax attacks acts of bioterrorism, because the unknown perpetrator who carried out the attacks has not been convicted, making it impossible to understand the motives behind them (Clark, 2008, 24).

To understand bioterrorism and biological warfare, it is important to recognize why terrorists might wish to use biological weapons (BWs). Referred to as "the poor man's atom bomb," the economic outlay of BWs is significantly less than nuclear weapons, because less is needed in terms of knowledge, infrastructure and equipment and the materials themselves are less rare (Block, *American Scientist*, January-February 2001). Although the dispersal of certain agents is vulnerable to winds and weather conditions, BWs may be untraceable, are

easier to conceal and can cause a large number of fatalities (Johnson, 2000, 22). A 1993 study conducted by the US Office of Technology Assessment estimated that the release of 100 kilograms of anthrax spores upwind from the Washington, DC, area in desirable conditions could result in between 130,000 and 3 million deaths, which matches a hydrogen bomb in terms of lethality (Pilch, 2002, 285). It would be ideal to deliver a biological agent using a system of aerosol sprayers attached to an aircraft, a boat, a vehicle or simply attached to a device on the back of a terrorist (Johnson, 2000, 22). For example, directly after the September 11th attack, the US government ordered crop-dusters to be grounded fearing that terrorists were planning a biological or chemical attack (Pilch, 2002, 267). Some BWs are very resistant to external conditions and can remain latent but potentially infective for a hundred years or more (Màlek, 1968, 51). One case that will be examined further in the bioterrorism chapter is that of Gruinard Island, Scotland, where anthrax spores remained infective for more than 40 years (Màlek, 1968, 51). BWs, by weight, are hundreds of thousands of times more potent than the most toxic chemical warfare agents, such as sarin gas (Johnson, 2000, 22). Some biological agents, such as smallpox, can be spread from person to person, whereas, anthrax cannot (Màlek, 1968, 51). There is also the possibility of infection spread by use of living vectors (e.g., ticks, fleas, etc.) (Màlek, 1968, 51). For instance, in February 1952, North Korea alleged that the US dropped "American germ bombs" filled with diseased flies and pests to infect them during the Korean War (Hersh, 1968, 18). These accusations will be discussed further in the bioterrorism chapter. Some disadvantages of BWs are that the symptoms do not appear instantly, which diminishes the tactical value of a terrorist who is concerned with immediate advantage (Màlek, 1968, 53). Also, in practice, biological agents are much more difficult to control than chemical agents and can cause harm to the terrorist, as well as the intended targets (Màlek, 1968, 55). As a result of these disadvantages, BWs are considered low-probability, but high impact threats due to the

devastating effects they can have on lives and resources. Consequently, BWs warrant the attention of US preparatory efforts (Pilch, 2002, 272).

Today, bioterrorist experts and policymakers face the dilemma of "dual-use" technology, where the manufacture of benign and beneficial pharmacological products is nearly indistinguishable from the production of biological agents (Butler, 2001, 214). Hence, manufacturing BWs can look like the production of an over-the-counter pain reliever and could "easily be disguised as peaceful research" (Johnson, 2000, 81). As a director of the DCI (Director of Central Intelligence) Nonproliferation Center explained, "The overlap between BWs agents and vaccines, and between nerve agents and pesticides is considerable; the technologies used to prolong our lives and improve our standard of living can quite easily be used to cause mass casualties" (Johnson, 2000, 81). The vaccination process is also a predicament for policymakers, healthcare workers and bioterrorist experts, because no one can agree on whether it is necessary for any or all US citizens. However, the arguments made in favor of vaccination programs appear to outweigh the arguments against them. The eradication of smallpox and the dispute over the remaining unknown virus stocks provide evidence as to why vaccination stockpiles should be preserved and biological research on vaccinations should not only be necessary, but a priority.[1]

As science continues to advance, there is no telling whether someone will one day bioengineer a deadlier form of anthrax, as it is possible to create mutant forms of micro-organisms by means of exposure to radiation or toxic chemicals (Màlek, 1968, 54). Also, nearly all micro-organisms likely to be used as BWs can exist in naturally developed mutant forms for which further preventative measures would be necessary (Màlek, 1968, 54). US policymakers will need to continue to expand laws and policies as science evolves.

This thesis will argue that the modernization of the preventative and responsive policies implemented after the outcome of the anthrax mailings were essential in enhancing

and modernizing security and defensive measures against acts of bioterrorism. Equally, however, the uncertain nature of the threat combined with the nature of the American political system led to an overreaction in terms of financial resources. Lawmakers used the worst case scenario to form US policy, but the worst case scenario situation inevitably leads to overspending, as politicians want to show a preemptive strategy to their constituents. While a continued maintenance is needed to keep up with scientific advances and capabilities, the wasteful overspending and pork-barrel politics of the bioterrorism budget is not necessary and is, in fact, taking money away from basic public health research. Considering a natural disaster or a flu pandemic are more probable than a bioterrorist attack, this thesis will argue that the public health infrastructure should not be disregarded. While the public health sector versus the biodefense budget is a zero sum game, the available funding should be more evenly distributed to ensure scientists are not forced to research biodefense over public health.

Methodology

The research undertaken for this project has involved various academic resources and historical research methods. These include not only secondary resources drawn from books and academic journal articles, but also primary material obtained from government websites, academic websites, and the media. Also, these resources have been interdisciplinary and cover a variety of issues across the field of bioterrorism, including detailed accounts of the 2001 anthrax attacks, scientific research on agents of bioterrorism, legislative and political measures and the history of bioterrorism to present day.

The Key Research Questions:

- Is there a threat from biological terrorism?
- Was the US policy prior to the 2001 anthrax attacks effective enough?
- Was the modernization of policy after the 2001 anthrax attacks needed to prevent a future attack from occurring or to alleviate the effect if one were to occur?
- Since September 11th, is policy an over exaggeration, an example of wasteful spending, or necessary for the current security climate?
- Are there other priorities that should be considered, such as general public health, for expenditure before dealing with bioterrorism?
- Does the American system of lobbying, political interests and fear mongering inevitably cause the problem of overblown policy?
- Now that it has been more than a decade since the anthrax attacks of 2001, have the US government become complacent in their attempts to combat a biological threat?

Chapter 2: Key Schools of Thought Regarding Bioterrorism

There are three main schools of thought when it comes to US bioterrorism policy. Group I makes the argument that there are still vulnerable areas that bioterrorists can exploit and, therefore, continued funding for biological research is essential. Alternatively, Group II believes that the increase in government-funded biodefense research and laws to counter an act of bioterrorism has only made the country more vulnerable, but agrees that certain biosecurity measures are needed. Group II also makes the argument that the US government is overfunding biodefense programs, while underfunding public health research. Finally, Group III argues that terrorism, including bioterrorism, is, in the words of Political Scientist John Mueller, "overblown" and that it is an area in security that has not necessarily warranted the surplus of policy, funding and publicity that it has received (Mueller, 2006, 8). The beliefs of all three groups differ in their approach to biosecurity, as Group I believes in legislating problems, whereas Group II focuses on the insecurities in science and Group III analyzes statistics and history to make its argument.

The politicians, who largely make up the Group I, claim the US is still unprepared for another bioterrorist attack. Politicians and elected officials have a duty to protect the people to whom they serve. Many would view biodefense as politician-fuelled security, as they are responsible for preventing and limiting another attack (Waever, 1995, 76). If citizens feel that they are being protected and provided for, elected officials are often reelected and/or retain employment, therefore, it is no surprise that they can often be driven by self interest. They are also financially supported by interest groups and lobbyists that can cause further bias to the decisions they make. After September 11, 2001, and the 2001 anthrax attacks, policies and laws were created because these events exposed failures in the system. During any crisis, frantic politicians usually attempt to blame each other for what the American

public perceives as a failure. After a terrorist attack, this anxiety plays right into the goals of the terrorists responsible and, to make matters worse, is often increased by the US news media. President Bill Clinton once told reporters that while he did not want to cause any "unnecessary panic," the possibility of a germ attack "keeps me awake at night" more than any other threat (Cole, 2009, 177). Silvio Waisbord, Associate Professor, Department of Journalism and Media Studies, Rutgers University, referenced the media coverage of the anthrax attacks when stating that the media have trouble reporting risk in a cautious and watchful manner (Waisbord, 2002, 209). He added, "the 'press panic' at the height of the anthrax scare in late 2001 confirmed that the media are better at scaring than reassuring" (Waisbord, 2002, 209). While politicians attempted to calm fears, the "press panic" did not make their jobs easy, publishing 12,454 articles between October 1, 2001, and January 19, 2002 (Waisbord, 2002, 210). According to Professor Waisbord, media coverage of the anthrax attacks demonstrated responsibility of risk and reported who was responsible for the anthrax attacks (Waisbord, 2002, 211). In the relationship between media and politics, one will find that risk management lies in the hands of officials, whereas journalism strongly depends on official sources to report risk (Waisbord, 2002, 212). For instance, the Bush Jr.Administration, unwilling to again be caught "sleeping at the wheel," exaggerated the chances of another terrorist assault, while the media plainly transmitted the Administration's estimation of risk without assessing the solidity of the information (Waisbord, 2002, 212). This scenario demonstrates how the response of politicians is like a pendulum that goes from no action to overreaction, leading to an overcorrection of the problem, sometimes for years after the event. Lawmakers do not want to be held liable if an attack with a weapon of mass destruction does occur. This concept is illustrated in Ron Suskind's book, *The One Percent Doctrine*, where he quotes Vice President Dick Cheney who said in November 2001, "If there's a one percent chance that Pakistani scientists are helping al Qaeda build or develop a

nuclear weapon, we have to treat it as certainty in terms of our response" (Suskind, 2006, 62). Cheney believed "It's not about analysis, or finding a preponderance of evidence … it's about our response" (Suskind, 2006, 62). This "Cheney Doctrine" set a standard that would frame events and responses from the Administration for years to come, including the invasion of Iraq in 2003 (Suskind, 2006, 62). Treating a one percent chance with certainty may seem a bit extreme, but not responding at all can be equally as dangerous. In June 2001, lawmakers and government officials conducted an exercise known as "Dark Winter" to test America's ability to respond to major health emergencies caused by terrorist attacks (Clark, 2008, 17). Policymakers discovered that if they did not resolve the major problems with communication and the healthcare response, they would have a major disaster on their hands. Later that year, the anthrax attacks exposed the problems those lawmakers had become aware of, including communication errors between the Federal Bureau of Investigation (FBI), US Postal Service (USPS), Center for Disease Control (CDC) and state public health agencies.

In wake of the 10-year anniversary of September 11th and the 2001 anthrax attacks, some politicians, academics and experts noted their concerns about the US becoming complacent with bioterrorism funding and policy. Many of them believe that continued government policy and funding of scientific research is essential for maintaining security and preparedness in the event a bioterrorist attack occurs. For example, US Representative Rush Holt, who has been outspoken on this issue, said in a 2011 interview, "I'm not confident that our investigative or our preventative agencies are prepared for - in fact I'm pretty sure they're not prepared for – the next bioterrorism attack" (Fielder, September 2, 2011). He added, "The one major bioterrorism attack against the US … showed that we were unprepared. It was poorly recognized at first, the response to it was bumbling, the investigation by the FBI was botched" (Fielder, September 2, 2011). These statements were made shortly after a nonprofit, nonpartisan group, Trust for America's Health, released a report stating that

complacency is the biggest threat to bioterrorism preparedness (Fielder, September 2, 2011). The Deputy Director of the group said, if funds are slashed, he worries that past progress will be reversed (Fielder, September 2, 2011). He concluded by stating that politicians are often quick to respond, but only after a public health emergency has occurred (Fielder, September 2, 2011).

One scientist who recognizes the argument of Group I is Dr. Tara O'Toole, former director of the Johns Hopkins Center for Civilian Biodefense Strategies, who warned in October 2002, "I want our national leaders to understand that BW[s] are a strategic threat to the U.S., and that hasn't happened yet" (Cole, 2009, 220). In testimony before the Budget Committee, US House of Representatives, Dr. O'Toole stated that she was a strong supporter of the FY 2003 budget request of the Department of Health and Human Services (HHS) for bioterrorism funding and she believes that sustained funding is necessary in creating a public health infrastructure for the 21st century (O'Toole, February 28, 2002). Dr. O'Toole is now the Under Secretary for Science and Technology, Department of Homeland Security (DHS), and is still a supporter of bioterrorism research and funding.

More biodefense research funding is something that Group II would argue against, because it is their belief that more research and funding be spent on public health problems, not bioterrorism. Group II, which is made up primarily of academics and journalists, deems that while continued biosecurity is needed, the biodefense field has, in fact, made the U.S less secure. This is because the growth in the number of biocontainment laboratories leaves civilians vulnerable to accidents at these facilities and grants more scientists and students access to bioagents. Some academics and scientists even argue that there is massive overfunding in biodefense research that deprives funding for public health. In 2005, 758 scientists, including two Nobel Prize winners, raised an outcry when they saw a major shift in

research funding (Mueller, 2006, 32). In a letter, researchers stated, "the diversion of research funds from projects of high public-health importance to projects of low public-health importance represents a misdirection of National Institutes of Health (NIH) priorities and a crisis for NIH-supported microbiological research" (Reppert, 2005, 310). According to these scientists, the National Institute of Allergy and Infectious Diseases (NIAID) has "prioritized bioweapons agents," because the number of grants given has increased from 33 in 1996–2000 to 497 since 2001, whereby, grants awarded to study non-biodefense-related model microorganisms have decreased by 41 percent (Reppert, 2005, 310). Several academics agree that the buildup of biodefense research is causing a decline in other areas of research. One academic, William R. Clark, trusts that the six to seven billion dollars per year the US has spent to upgrade its defenses has helped increase US security, but he believes that no nation has infinite resources; therefore, the US must make rational assessments of the threats that it can identify when deciding to write a permanent, renewable check for biodefense (Clark, 2008, 159, 190). He maintains that no one can ever know for sure that a bioterrorist attack will occur, but history has proven that a crippling pandemic will strike us at some point; therefore, public health needs to be a priority (Clark, 2008, 161). Clark also points out that the US government has spent over $40,000,000,000 from 2001-2008 on bioterrorism preparedness, however, due to the growing threat of a public health pandemic, "it's time to move on to other things" (Clark, 2008, 148, 190). Another academic at Emory University's School of Medicine, Erica Frank, argues that because of the US government's policy regarding terrorism, "enormous numbers of Americans will die unnecessarily" due to the redirection of funding away from basic and necessary public health services (Frank, 2005, 526). While Frank believes that it is justifiable for governments to appropriate substantial funds to prevent the "potential threats" to security, she also believes public funding for "current threats" should not be compromised (Frank, 2005, 527). Due to the fact that funds

and scientists are being allocated away from public health and towards bioterrorism research, some academics and scientists believe that the US is falling behind in public health services. As an administrator at the American Association for the Advancement of Science (AAAS) put it, "We are basically cutting ourselves out of the game for global health as well as the global research enterprise, and that's not good," (Leitenberg, 2010, 181).

Two authors, a senior science fellow with the Center for Arms Control and Non-Proliferation, Lynn Klotz, and science journalist Edward Sylvester, reiterate these points in their book *Breeding Bio Insecurity*, but take it one step further by saying that biosecurity is actually making the US more insecure. They discuss how over $50 million of the US biodefense budget goes towards research aimed at developing countermeasures for bioweapons like antidotes and vaccines (Klotz et al., 2009, 5). The pair said, "The US is building a biodefense empire that is putting us at greater risk than we face from an attack from terrorists or foreign powers in the foreseeable future. … At the same time, a swelling cadre of academic scientists is beating a path to research Earth's deadliest microbes, and toxins, further increasing that risk" (Klotz et al., 2009, 89). They argue that community is less secure with the increase in the number of BSL-3 and BSL-4 laboratories, where scientists conduct research on the deadliest pathogens (Klotz et al., 2009, 5). (See **Appendix A** for an explanation of BSL levels.) This type of research and the increased number of laboratories make this field vulnerable to hostile exploitation, accidents and theft. For example, in 2005, three research mice infected with the bubonic plague bacteria disappeared from a BSL-3 lab in Newark, New Jersey (Klotz et al., 2009, 12). To this day, it is still unclear what happened to the mice. It is possible they were either cannibalized by other mice or even escaped into the surrounding low-income housing community (Klotz et al., 2009, 12). There is also the possibility of an accounting error inside the lab, which means the mice were never missing to begin with (Klotz et al., 2009, 12). Richard Ebright, a professor at the Waksman Institute of

Microbiology at Rutgers University, also believes that this securitization driven by politicians is making US citizens more insecure than ever before. After 2001, Ebright began to worry that, by vastly increasing the number of biocontainment laboratories and people working on bioterror agents, would only increase the risk that a pathogen would accidentally escape or be deliberately released by a "disturbed, disgruntled, or adversarial" scientist (Enserink et al., 2005, 1397). He also noted, "If Al Qaeda wished to carry out a bioweapons attack in the U.S., their simplest means of acquiring access to the materials and the knowledge would be to send individuals to train within programs involved in biodefense research" (Klotz et al., 2009, 5-6). For instance, Mohammed Atta, the lead pilot in the September 11th attack, at that time would have then passed the background checks required to train within programs involved in biodefense research (Klotz et al., 2009, 6).

In September 2009, a US Government Accountability Office (GAO) report sent to Congress stated that the "increase in the number of researchers working with hazardous pathogens would 'inevitably' lead to an amplified risk of [a] bioterrorist attack perpetuated by a scientist working at a biocontainment facility" (Leitenberg, 2010, 174). Furthermore, Klotz and Sylvester also argue that, despite biocontainment laboratories being brilliantly designed, no security system is foolproof (Klotz et al., 2009, 179). To back up their argument, they often reference a case when Boston University was petitioning to get a BSL-2, BSL-3 and BSL-4 laboratory complex right in the middle of a local neighborhood (Klotz et al., 2009, 8). As a result, there was an ongoing battle between the University and the city's elected officials, congressional delegation and residents who had enlisted powerful allies of 147 leading scientists, including two Nobel laureates and several leaders in the biosecurity community, against the project (Klotz et al., 2009, 8). More scientists began to back the residents by stating that the BSL-4 lab "[would] involve work with some of the most dangerous biological organisms, viruses and toxins that can cause deadly diseases for which

there are no known cure … [and] if bioterrorism is really the fear driving this project, the laboratory might also become a target for intentional acts of violence" (Klotz et al., 2009, 179). The irony of this Boston University campaign was that the University provided its own proof as to why it should not be allowed to open these laboratories. At the beginning of the campaign to open the BSL-4 laboratory, Boston University laboratory workers accidently infected themselves with what was thought to be a noninfectious strain of *F. tularensis* (Klotz et al., 2009, 71). More alarming, because the University failed to immediately report the accident, the case deservedly became a high-profile incident (Klotz et al., 2009, 71). Klotz and Sylvester also point out how anthrax should be held in a BSL-2 lab (except for aerosol experiments) because, in case of an accident, antibiotics and a vaccine are available (Klotz, et al., 2009, 9). However, in most cases, anthrax has been held in BSL-3 and 4 labs.[2] Klotz and Sylvester believe that true biosecurity would require an effort that is guided by vigilant and informed citizenry, scientific ethics and politicians understanding the complexity of the issue (Klotz et al., 2009, 15). They also maintain that the process of accepting researchers and scientists into the field needs to be more selective, since the suspect for the 2001 anthrax attacks was a scientist.

Like the bioterrorism experts and academics in Group III, the scientists, journalists and academics in Group II also believe that it is important for citizens to know the difference between fear-mongering and the true analysis of risk. Group II focus more on ethical concerns over the industry, but recognize Group III's argument regarding the government's hasty over-reactive response that creates the biodefense policy. While Groups II and III have similar perspectives with regard to policy overreaction and wasteful spending, there are differences in their arguments. Group II's main concern is the impact biodefense research is having on other areas of science, however, Group II tends to agree with Group III regarding lawmakers' inflated anxiety and fear that has resulted in wasteful expenditures and policy

overreactions that can do more harm and cost more money than any act of terrorism can accomplish (Mueller, 2006, 1).

The third and final group (Group III) is comprised of a handful of academics and bioterrorism experts who believe that the US government has overreacted to the threat of bioterrorism and unnecessarily spent time and resources in order to thwart this threat. In an effort to describe the US government's exaggeration of the threat posed by terrorism, in his book, *Overblown*, John Mueller quotes the Turkish proverb, "If your enemy be an ant, imagine him to be an elephant" (Mueller, 2006, 25). He gives various reasons why the menace of bioterrorism has been overblown by US politicians. Like Klotz and Sylvester, Mueller believes that reducing national fear and panic is a major priority when fighting terrorism, and states, "…if we already are rather safe, efforts to make us safer are likely to be, at minimum inefficient" (Mueller, 2006, 143). Mueller maintains that while policy should sensibly focus on prevention, policing and mitigation efforts, it should also be concerned about preventing or dealing with panic (Mueller, 2010, 110). In his opinion, it is not the act of terrorism that causes the most harm, but it is the reaction or rather the overreaction to it. For example, between September 11 and December 31, 2001, because of the decision to drive instead of fly, statistics show more than 1,000 people died in automobile accidents alone (Mueller, 2006, 29). Matthew Carr shares a similar viewpoint in his book, *The Infernal Machine*, which discusses the use of fear to fuel bioterrorism policy as exemplified by the Clinton Administration's fixation with Aum Shinrikyo and Iraq. Carr also recalls a time when Defense Secretary William Cohen appeared on *ABC's This Week* with a five-pound bag of sugar and claimed that the equivalent of anthrax used in an attack on a Washington DC, "would destroy at least half the population" (Carr, 2011, 357). Both Mueller and Carr believe that the political fear of bioterrorism has also caused wasteful spending on a biodefense budget that is not necessarily needed. This is evident elsewhere in reaction to terrorism in

terms of how the September 11th attacks cost al Qaeda $500,000, whereas it cost the US $500 billion (Mueller, 2006, 3). One academic, David Rapoport, suggested that misreading attacks, such as the Aum Shinrikyo experience among others, could waste tens of billions of dollars (Rapoport, 2001, 14).

Milton Leitenberg, a senior research scholar at the University of Maryland's Center for International and Security Studies, notes that if a successful BWs attack from a terrorist organization is carried out, blame for the attack can largely be pinned on the U.S.'s incessant scaremongering about bioterrorism. Leitenberg maintains that the attention bioterrorism receives only emphasizes and reinforces its desirability to terrorist organizations (Leitenberg, 2010, 165). Leitenberg adds that policymakers need to end the fear-mongering and huckstering of the bioterrorism threat, because this threat has been divorced from reality for years (Leitenberg, 2010, 183). The exaggeration, propaganda and alarmism about BWs are counterproductive, as the US is helping to spread the fear to several other countries, including India and Russia (Leitenberg, 2010, 183). Another academic, Abigail Salyers, agrees that much of the fear and much of the research is unnecessary (Enserink et al., 2005, 1398). Her belief is that public health officials already know how to respond to a crisis and that dealing with a bioterror attack is not "rocket science" (Enserink et al., 2005, 1398). For example, she says that, even in 1947, when a smallpox case surfaced in New York City, millions were quickly vaccinated against the disease without a problem (Enserink et al., 2005, 1398). She believes that a powerful public healthcare system and effective communication strategy are the best preparations (Enserink et al., 2005, 1398). While this solution is somewhat idealistic because of the growing population in the U.S., vaccinations will not be as easy if the US does not have enough in the national stockpile to handle an epidemic. This is just one of several flaws with the arguments from Group III.

As mentioned, the argument of Group III is not without its problems. Carr attempts to use scientific research to prove that bioterrorism is exaggerated by citing a 1999 article in the *Bulletin of Atomic Scientists* titled "An Unlikely Threat" (Carr, 2011, 359). Unfortunately for Carr, the article fails to provide a relevant argument given that it was published two years prior to the 2001 anthrax attacks. Unlike the individuals from Group II, who point out that the capabilities already exist, Mueller argues that terrorists have major technological hurdles to overcome, such as gaining access to specialized ingredients, acquiring equipment, having the know-how to manufacture and disperse the agents and organizing a group that can resist infiltration from law enforcement (Mueller, 2006, 24). Rapoport also believes, while politicians and citizens are fearful about the use of BWs, they are an unlikely threat given the intense moral revulsion they arouse and the fact that the states threatened are able to retaliate with similar weapons (Rapoport, 2001, 20). He cites historical examples, including the Japanese BWs buildup and the Aum Shinrikyo attacks, to prove that, despite all the funding and resources dedicated to the programs, it is highly unlikely that states or terrorists can overcome the technological hurdles these groups faced (Rapoport, 2001, 20). While those in Group I disregard these hurdles when pushing their policies and budgets, members of Group II believe that with the growing number of scientists and students with access to the materials and knowledge, overcoming these hurdles is easier. Looking at the 2001 anthrax attacks, for instance, the FBI's prime suspect, Bruce Ivins, who remained a respectable scientist with access to the materials until his death in 2008 (Willman, 2011, xii). In fact, before deciding he was a suspect, the FBI called upon Ivins for assistance with the investigation of the 2001 anthrax letter attacks (Willman, 2011, xii).

The argument that is taken from three schools of thought will be laid out throughout this thesis. At the time of the 2001 anthrax attacks, politicians and lawmakers were right to address gaps in biosecurity law and policy; however, instead of just modernizing the policy

politicians went overboard and allowed lobbying and pork barrel politics to gain control of the spending for the biodefense budget. Given the nature of the US political system, overblown policies are inevitable. Politicians want to be reelected and special interest groups help them achieve this, politicians want to appear proactive, which can cause a surplus in unnecessary laws, policy and funding. Ultimately, the movement of funding has caused a problem for public health researchers who have noticed the prioritization of bioterrorism related research over general public health research.

Chapter 3: Overview of Bioterrorism and Biowarfare

Long before the bioterrorism attacks of 2001, the threat of such attacks existed. A historical perspective and overview of bioterrorism and biowarfare is essential in understanding the US government's long history with BWs, including the 1940s-60s, some of the crucial years for biological weapons research. Once that historical perspective is understood, the context for the case study on the 2001 US anthrax attacks will be clearer. It becomes evident that the US was unprepared with biodefense policy prior to the 2001 anthrax attacks.[3]

Through the years, many countries have experimented with or used BWs. Large countries, such as the former Soviet Union, had well-known BWs programs. Once the Soviet Union split apart, an unknown amount of scientists found themselves out of work. Today, there are two major concerns about BWs programs. The first concern is that hostile countries or terrorist groups already have or will attempt to recruit some of these scientists. The second fear is that biological agent stockpiles have somehow made their way into the wrong hands. For instance, the anthrax strain used in the 2001 anthrax attacks originated from Fort Detrick, or referred to today as the US Army Medical Research Institute of Infectious Diseases (USAMRIID), located in Frederick, Maryland. The USAMRIID was the base for the US offensive weapons program. Today, Fort Detrick occupies 1,143 acres of land and employs roughly 9,000 military, federal and contract personnel (Norris, 2012). After comparing Detrick employee numbers now to the once 700 scientifically trained personnel it had in the 1960's, there is no doubt that the US government wants to stay in the race for scientific advancement (Clarke, 1968, 6). It was a USAMRIID scientist who was the primary suspect for the first fatal bioterrorist incident in the US For these reasons, it is important to understand the history of BWs programs and their effect on bioterrorism.

Biological weaponry has improved immensely over the years, and has historically been used by states during warfare. Legend has it that, in 1347, Mongol armies catapulted dead disease-ridden bodies of their fallen soldiers over the city walls in an attack on an Italian trading post at Caffa in the Crimea (Klotz et al., 2009, 1). If this legend is true, this was said to have been the deadliest use of biological warfare in history, as it was supposed to have caused a plague that killed nearly a third of the continent's population (Klotz et al., 2009, 1). In the fifteenth and sixteenth centuries, the Republic of Venice used biological agents to carry out assassinations, because the resulting illness was considered a product of natural causes (Rapoport, 2001, 18). In 1763, during the French and Indian War, the British outpost of Fort Pitt was threatened by Delaware tribesman and, in response, the British commander decided to attack by distributing smallpox-contaminated blankets to the natives (Klotz et al., 2009, 2). The actions of the British, said to have been recorded by one of the fort commanders, aided in the devastation of the American Indian population (Klotz et al., 2009, 2). Even in 1874, the states that were represented at the Brussels Conference on Laws and Customs of War were concerned about the exploitation of microbiology and agreed to prohibit the use in war of "poison or poisoned weapons" (Guillemin, 2005, 3). World War I marked another age of biological terrorism when, to disrupt military supply lines, the Germans attempted to infect and kill allied mules and horses with one of two bacterial diseases, anthrax and glanders (Klotz et al., 2009, 2). Longshoremen pricked the animals with infected needles while they waited to be boarded onto ships (Alibek et al., 2005, 4). This attempt was mostly unsuccessful and had no effect on the allied war effort (Klotz et al., 2009, 2). In 1922, the Treaty of Washington banned the use of "asphyxiating, poisonous or other gases, and all analogous liquids, materials or devices" (Guillemin, 2005, 4). While the Treaty never entered into force, because France did not consent to a provision on submarine warfare, the chemical provisions of the Treaty became the template for the 1925 Geneva Protocol Treaty

(Guillemin, 2005, 4). The Treaty, that now has 137 signed parties, entered into law on February 8, 1928, and prohibited the use of chemical weapons and extended the prohibition to include "the use of bacteriological methods of warfare" (Guillemin, 2005, 4). While the Treaty banned the first use of BWs, it did not address the acquisition of these dangerous weapons (Guillemin, 2005, 5). Despite signing the Geneva Protocol Treaty in 1929, by 1938, Nazi Germany had begun its large-scale biological research (Hersh, 1968, 10). It was alleged that the Germans were planning to fill German V-1 launching sites with botulinus toxin-filled warheads (Hersh, 1968, 12). In 1944, when the first V-1 bomb went off with just explosives, it was learned that Germany had actually done relatively little with biological warfare (Hersh, 1968, 12).

Shortly before World War II, the Japanese government built Unit 731, its offensive BWs research, development and production compound (Alibek et al., 2005, 5). In Unit 731, they examined a number of infectious agents, including anthrax, and were said to have been capable of producing 1,400 pounds of anthrax annually (Alibek et al., 2005, 5). Researchers and engineers there designed a fragmentation bomb to disperse anthrax spores, as well as anthrax-infected chocolate (Alibek et al., 2005, 5). By the end of World War II, the Japanese had killed tens of thousands of defenseless Chinese in occupied Manchuria through hundreds of "experiments" with plague, cholera and other deadly bacteria that they sprayed from airplanes, put into food and water wells and injected directly into their victims (Klotz et al., 2009, 2). Given the deadly outcome of these pathogens and the amount of years they conducted these experiments, there is no surprise about the number who died at the hands of the Japanese. The Japanese initially developed their biological program because they anticipated that the Soviet Union would attempt to expel them from Manchuria (Rapoport, 2001, 20). Then, in 1942, after being attacked on Japanese soil, they decided to conduct a major biological attack on Chekiang, China (Rapoport, 2001, 20). However, because there

were difficulties in controlling the diseases, the attack backfired and Japanese toxins caused 10,000 Japanese casualties and 1,700 deaths (Rapoport, 2001, 19). After this major failure, the Japanese virtually abandoned their BWs program (Rapoport, 2001, 19). To avoid being tried for war crimes, members of Unit 731 handed over their research to the American military (O'Sullivan, 2006, 178). One academic, David Rapoport, believes that this provides proof that BWs will be an unlikely choice for states and terrorist groups alike (Rapoport, 2001, 19). This analysis is flawed, however, because this failure did not prevent the Japanese terrorist group, Aum Shinrikyo, from trying years later.

World War II marked a period of biological warfare development and implementation, most notably by Britain and the US Britain had its own facility for a biological research program known as the Microbiological Research Establishment (MRE) in Porton Down, Wiltshire (Clarke et al., 1968, 107). During the war, Gruinard Island, located nearly two miles off the coast of Scotland, was a BWs testing ground for British scientists. They sought to test the effects of lethal anthrax spores by tethering sheep at measured distances and exploding canisters that had been filled with a gruel containing anthrax spores. Within a day, the animals were dead or dying and contaminated carcasses and large quantities of anthrax spores in the soil began to litter the site. After the testing ended in 1943, the British government closed the island due to the undiminished spore count in the soil. The British later set fire to the island in anticipation that the spores would be destroyed, however, scientists were surprised to find that undiminished spore counts remained. For more than 40 years, anthrax spores remained in the soil and no one was permitted to go on the island. In 1990, the British government deemed the island safe after soaking portions of the island in tons of formaldehyde and seawater. The testing that took place on Gruinard Island stands as a monument to the durability and lethalness of anthrax spores (Cole, 2009, 25).

During this same period (1941), Prime Minister Winston Churchill allowed researchers to build an anthrax biological weapon that would be used against the Germans in the event they used a biological weapon first (Alibek et al., 2005, 5). This operation, known as "Operation Vegetarian," called for hollowed-out "cakes" made with finely ground meal and anthrax powder to be dropped over German agricultural districts where cattle, the intended target, would ingest the "cakes" (Alibek et al., 2005, 5). Although they were never used, five million cakes had been produced by 1943 (Alibek et al., 2005, 5). Contingency plans, in case others did not work, included dropping anthrax over six German cities, including Berlin, Hamburg and Frankfurt, as well as planning to assassinate Adolph Hitler by smuggling anthrax-filled vessels, such as fountain pens, to contaminate his clothing (Alibek et al., 2005, 5). While these plans never came to fruition and Britain terminated its offensive BWs program in 1957, numerous countries, including the U.S., were considering these types of methods during World War II and the years to follow. During the 1960's, British universities, including the University of Birmingham, had contracts to conduct chemical and biological warfare research (Clarke et al., 1968, 118). Around that same time in the U.S., unofficial reports suggest that more than 50 American universities and colleges had also received contracts for work on chemical and biological warfare (Clarke et al., 1968, 7).

In June 1943, the USAMRIID, became the main site for the US offensive weapons program (Alibek et al., 2005, 4). In Building 470, the US started developing anthrax weapons in large quantities (Alibek et al., 2005, 5). By the end of World War II, more than 4,000 people were employed in the American offensive weapons program, most of them working with anthrax, which was produced in large quantities in Building 470 (Alibek et al., 2005, 4). Fort Detrick conducted its own tests using Seventh Day Adventists volunteers, who served in the armed forces as non-combatants or, from time to time, prisoners of war (Langer, 1968, 124). This project, called "Operation Whitecoat," conducted live aerosol tests of Q-

fever and other pathogens on these volunteers (O'Sullivan, 2006, 179). Most of the research conducted at Detrick became a part of secret literature managed by the Defense Department. The findings were available to other government agencies or contractors only on a "need to know" basis (Langer, 1968, 123). In addition to its research activities, Fort Detrick was involved in the operation of pilot plants, such as Dugway Proving Ground and Pine Bluff Arsenal (Langer, 1968, 124). Dugway Proving Ground employed about 900 people and was the principal station for field assessment and testing of chemical and biological weapons (CBWs) (Langer, 1968, 123-4). Pine Bluff Arsenal, which had about 1,400 employees, produced biological munitions on a 15,000 acre installation outside Pine Bluff, Arkansas (Langer, 1968, 124). The US had produced approximately one quarter of a million bombs that could be filled with anthrax and, by the 1960's, anthrax was one of several agents in the US stockpile (Alibek et al., 2005, 6). While these weapons were supposedly never used, during the Korean War, North Korea alleged that the US dropped "American germ bombs" filled with diseased flies and pests to infect them (Hersh, 1968, 18). The charges were based on statements from more than 30 captured US Air Force officers and intelligence agents, but the US denied the charges and accused North Korea of brainwashing the captured pilots (Hersh, 1968, 18). Later, Communist China set up the "The International Scientific Commission for Investigation of the Facts Concerning Bacterial Warfare in Korea and China," which concluded that the US had used cholera-infected clams; anthrax-infected feathers; plague and yellow fever-infected lice, fleas, mosquitoes, rodents and other small animals; as well as non-living things like toilet paper, paper and pens filled with germ-laden ink (Hersh, 1968, 18-9). In April 1953, the US called for an impartial investigation by the United Nations, but China and Korea refused to grant access to their territories, so the issue died a few months later (Hersh, 1968, 19). During the years 1961-1964, the research and development budget for CBWs nearly tripled, rising from $57 million to about $158 million

(Langer, 1968, 121). Even though President Richard Nixon ended the US offensive weapons program in 1969, which was soon followed by the signing of the Biological and Toxic Weapons Convention Treaty (BTWC) in 1972, the US has continued to maintain these facilities for supposed defensive research.

Due to the growing concern over the use of BWs, the April 10, 1972, BTWC, also referred to as the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and their Destruction, entered into force on March 26, 1975. As of June 2005, 171 states had signed the BTWC and 155 of these had ratified it (University of Bradford, BTWC). However, the Convention did not limit, for defensive purposes, the development, production and research of BWs, the manufacture of BWs production equipment, the evolution of BWs war-fighting doctrines and protective training by the armed forces (Latter, 1991, 20). One problem that still exists today is the inability for the signatory states to agree upon a means of verifying adherence to the terms of the Treaty (Butler, 2001, 214). In 2001, a draft verification protocol was introduced, but the US took a stance against it, citing that it was unacceptable (Butler, 2001, 214). The US made the claim that verification is difficult, because the manufacture of biological warfare agents is nearly indistinguishable from the manufacture of benign and useful medical and pharmaceutical substances (Butler, 2001, 214). One year later, the George W. Bush Administration openly opposed negotiating an international inspection protocol, because the Administration held that inspectors can easily be deceived (Cole, 2009, 140). Richard Butler believes that, in order to get over the problems with verification, nations across the world need to agree that the mass production, possession and use of BWs are a crime against humanity (Butler, 2001, 215). If this agreement could be reached, then enforcement action could be taken and offending laboratories and facilities could immediately be removed (Butler, 2001, 215). Unfortunately, the reality is if states do not reach an agreement on the

terms of the BTWC Treaty or inspection protocols, Treaty violations and perhaps even future biowarfare is inevitable.

Despite agreeing to the terms and signing the Treaty, many states have been known violators, such as the former Soviet Union, Iraq, United Kingdom, U.S., and Libya. The Soviet Union violated the Treaty with its 60,000 scientists and technicians and their production of tons of anthrax, smallpox, and plague germs (Cole, 2009, 6). It had three facilities, Sverdlovsk, Penza and Kurgan, each with 50-ton reactors dedicated to the production of anthrax (Alibek et al., 2005, 6).[4] In 1979, an accidental release of anthrax spores from the Military and Virology Institute in the city of Sverdlovsk put the international community on high alert. While the release caused the death of an estimated 66-105 people in a nearby village and workers from a nearby ceramics plant, the incident caused the world to suspect the Soviet Union's violation of the BTWC Treaty (Alibek et al., 2005, 6). It was also revealed that the Soviet military ran a biological testing site that likely caused a smallpox epidemic in a town in Kazakhstan (Guillemin, 2005, 141). Despite the dissolution of the Soviet Union in 1991, Iran and perhaps Syria, Libya and other countries that are seen as threats to the American government, are thought to have courted former Soviet scientists for expansion of their own BWs programs (Cole, 2009, 6).

Iraq also signed the Treaty and accepted the obligations that came with it; however, years later, Saddam Hussein initiated the beginning of the Iraqi BWs program (Butler, 2001, 212). Iraq developed agents such as, anthrax, botulinum toxin, gas gangrene, aflatoxin and ricin and worked on ways to weaponize and deploy them (Butler, 2001, 212). It was not clear at the time as to why Iraqi scientists were making aflatoxin, because this particular agent displays no immediate symptoms, but does cause liver cancer five to ten years after exposure (Butler, 2001, 212). The answer may lie with southern Iraqis who came from a part of the country that rebelled against Saddam and his regime (Butler, 2001, 212). It was discovered

that some Iraqis, who have immigrated to Europe as refugees, are showing high rates of liver cancer (Butler, 2001, 212). After the United Nations Special Commission (UNSCOM) conducted investigations of Iraq's BWs program, Saddam's government, that once denied the program existed, confirmed that Iraq did have a program, but merely a small defensive program (Butler, 2001, 213). In a private conversation with Richard Butler, former Executive Chairman of the UNSCOM, Iraq's former Deputy Prime Minister, Tariq Aziz, confirmed that Iraq did have a BWs program "to use on the Persians and Jews" (Butler, 2001, 213). It was clear that Iraq's program was far from small though, given the severity of Saddam's resistance to UNSCOM's investigation (Butler, 2001, 213). According to the National Ground Intelligence Center, since May 2004, chemical weapons have been recovered in Iraq (Negroponte, 2006).

The US signed the BTWC Treaty in 1972 and officially ended its offensive BWs program in 1969; however, the 1975 Church Committee investigations into the US Central Intelligence Agency (CIA) revealed that the CIA had long been involved in stockpiling biological agents, even after the US signed the BTWC Treaty (AARC Public Library). The committee discovered that the CIA was interested in using biological agents for assassination attempts on foreign leaders, such as Cuba's Fidel Castro (AARC Public Library). The CIA worked closely with Fort Detrick from 1952-1970, but were said to have kept a small stockpile of biological agents and toxins, including 100 grams of anthrax and various other agents, even though it violated Nixon's 1969 ban (AARC Public Library). In 2001, the *New York Times* reported secret bioweapons research and held that the US government had crossed the line between defensive and offensive efforts, violating the BTWC Treaty (O'Sullivan, 2006, 179).[5] After the 2001 anthrax attacks, the US federal and local governments had to start preparing their local health officials and police for biological attacks, an action that would contradict the norm established by the BTWC Treaty (Butler,

2001, 214). Verifying compliance of the BTWC Treaty is difficult and, because of dual-use technology and facilities, the manufacture of BWs is nearly indistinguishable from the manufacture of benign and useful medical and pharmacological substances (Butler, 2001, 214).

Libya signed the BTWC in 1982, but has never been trustworthy in upholding the Treaty, as it is believed that Libya has continued its BWs program. Although Libya's program is not as developed as most, it still holds the capabilities. There was suspicion that Libya employed a former South African scientist and architect of South Africa's BWs project, Dr. Wouter Basson (NTI, 2011). Between 1993 and 1995, Dr. Basson made numerous trips to Tripoli and, by early 1995, US intelligence sources claimed that former Libyan President, Colonel Mu'ammar al-Qadhafi, attempted to recruit South African scientists who were previously involved in developing weapons used to assassinate opponents of the South African Apartheid Regime (NTI, 2011). In 1998, a report released by a US congressional task force alleged that Iraqi-Libyan CBWs collaboration had been taking place since the early 1990's (NTI, 2011). In December 2003, Colonel al-Qadhafi claimed to have abandoned Libya's pursuit of all weapons of mass destruction (WMDs) development activities and made an agreement to allow inspections to prove its commitment to complying with international agreements (NTI, 2011). During the overthrow of the al-Qadhafi regime, a former government minister warned *Al Jazeera* that al-Qadhafi would not hesitate to use CBWs on the protestors (Hough et al., February 24, 2011).

In the latter part of the 20th century and in the early 21st century, BWs have become increasingly popular among states and, therefore, potentially with terrorist groups as well. On January 11, 2007, the threat assessment presentation of Michael Maples, Director, US Defense Intelligence Agency (DIA), accentuated the lack of specifics on the number and status of offensive state BWs programs, because he mentioned North Korea, Iran, China,

Russia, India, Pakistan and Syria as all having the biotechnical infrastructure to develop BWs (Leitenberg, 2010, 162-3). Of that list, Iran and Syria are the only two states that the DIA was confident as having BWs programs (Leitenberg, 2010, 163). The other countries possessed the biotechnical infrastructure capable of supporting the production of BWs (Leitenberg, 2010, 162-3). The broad descriptions the DIA used in regard to the states that possessed or have the potential to possess offensive BWs programs could apply to the US and most European countries (Leitenberg, 2010, 163). Maples' generalized statements have raised serious questions regarding the legitimacy of the estimates of BWs programs in the 1970's and 1980's, excluding the Soviet Union, South Africa, Iraq and perhaps Iran (Leitenberg, 2010, 163). It is also difficult to determine what degree of an "offensive" nature exists in those programs, considering the previously described dual-use capabilities of some of the equipment and biological agents (Leitenberg, 2010, 163). While these states are different politically, geographically and ideologically, several of them still share the same hatred for western values and influence (Garrett, 2001, 218). It is this hatred that breeds terrorist organizations that are more unpredictable and dangerous than the state itself. Although history remarkably reveals few examples of BWs being used by terrorist groups, many historians, scientists and politicians are unsure as to whether that number will increase dramatically in years to come. Despite criticism from members of Group III in the previous chapter, this low-probability, high-impact threat has shaped the future of US bioterrorism policy and funding. Several bioterrorist incidents and the 2001 anthrax attacks are proof that the threat exists and that policy and funding advances are not all for naught. Modernization of policy and preparatory efforts should have been made a priority after the 2001 attacks; because, as will be discussed in Chapter 4, flaws in the policy were a main cause for the impact of the 2001 anthrax attacks. However, the impact of the attacks caused US lawmakers to over legislate and overfund the field of biodefense because of the uncertainty of the

magnitude of the bioterrorism threat. Chapter 4 will highlight the many laws and policies implemented after the 2001 anthrax attacks, but it is important to note that public approval and special interest assistance during these years may have helped certain lawmakers stay in office. Knowing the nature of the US political system, it is inevitable that the biodefense field has become a financial cash cow.

Chapter 4: Case Study of the 2001 Anthrax Attacks

The US was at one time viewed as invincible and invulnerable, however, that drastically changed with the September 11th and the 2001 anthrax letter attacks. Prior to 2001, lawmakers created laws in an effort to prevent and prepare for bioterrorism and biological warfare. However, despite their best intentions, scientists, government officials, agencies and lawmakers themselves underestimated the warnings about some vulnerable areas in the US public health infrastructure. In their defense, former Director of Central Intelligence (DCI), James Woolsey, and former Chairman of the National Intelligence Council, Joseph Nye, Jr., wrote, "the very nature of the US society makes it difficult to prepare for this problem [catastrophic terrorism]…. We are unlikely to mount an adequate defense until we suffer an attack" (Nye, 2001, 200). The truth of this statement is evident, because when faced with an act of terrorism, the U.S government typically overreacts due to the fear of it happening again. However, most actions taken after an incident are considered preventative measures towards future attacks, unless, like some laws before and after the 2001 anthrax attacks, the action is a waste of resources and funding.

US lawmakers share the blame for their late response to the incidents of 2001, because they typically respond to what the people want. While public opinion polls demonstrated that terrorism was a rising concern after the 1993 World Trade Center and 1995 Oklahoma City bombings, a January 2000 Gallup poll showed that the topic of world affairs was in 20th place of importance of issues for presidential candidates (Nye, 2001, 200). Richard Clarke, an antiterrorism official handling terrorism at the National Security Council for Presidents Clinton and Bush, Jr., said in a 1999 interview, "There is a problem convincing people that there is a threat. There is disbelief and resistance. Most people don't understand" (Nye, 2001, 200-1).

Politicians have responded to biological warfare and bioterrorism through legislative remedies since before the 1960's. In 1960, the head of the Army Chemical Corps warned Congress that an enemy could kill or disable about 60 million people by mounting a biological warfare attack (Hersh, 1968, 68). Despite President Richard Nixon enacting National Security Memorandum 35 in 1969 and signing the 1972 BTWC Treaty, which ended the US offensive BWs program, this warning from the head of the Army Chemical Corps was not ignored. 1972 marked the beginning of a new enemy for the U.S., as the first notable act of bioterrorism was discovered when a tiny youth environmentalist cult, known as R.I.S.E., plotted to contaminate the water supply in large cities with *Salmonella typhi* (Dolnik, 2007, 46). However, it was actually the anthrax incident in Sverdlovsk in 1979 that caused microbiologists, physicians and other specialists at the USAMRIID to be assigned a new mission that involved handling anthrax and other deadly biological agents (Willman, 2011, 28). The Soviet Union's blatant violation of the BTWC Treaty caused Nixon to form a purely defensive biological program that developed countermeasures, like vaccines, to protect US forces in the event of a biological attack (Willman, 2011, 28). Due to the threat of the acquisition of US technology by Eastern Bloc nations, in 1985 the Reagan Administration implemented US National Security Decision Directive 189. The Directive declared that the results of fundamental research be unrestricted to the maximum extent possible, however, federally funded research conducted in science, technology and engineering at universities and colleges would be subject to classification prior to grant approval (NSDD 189, September 18, 1985).

Despite US concerns over foreign biological weapons programs, terrorist organizations became a bigger threat as well. In 1984, a cult led by Bhagwan Shri Rajneesh used a biological agent, known as *Salmonella enterica*, to contaminate several restaurant salad bars in an effort to influence a local election near the town of Dallas, Oregon (Forest, 2007, 199).

A total of 751 fell ill with symptoms ranging from nausea and diarrhea to headache and fever, but there were no fatalities (Forest, 2007, 199). Only two members of the cult were prosecuted and there is no evidence that the group has continued to plot or carry out future attacks (Forest, 2007, 299). This was the first successful bioterrorist attack on US soil (Dolnik, 2007, 46). By 1989, the US responded with the Biological Weapons Anti-Terrorism Act, also known as the Biological Weapons Act, which maintained that US citizens abide by the BTWC Treaty that outlaws the development, production and stockpiling of BWs, except for purposes of peaceful scientific research and development (LOC, 1989). In 1991, members of the Minnesota Patriots Council (MPC) were convicted under the 1989 US Biological Weapons Anti-Terrorism Act for producing the toxin ricin from castor beans.[6] Fortunately, before the MPC members were arrested before they had the opportunity to use the ricin on law enforcement officials (Pilch, 2002, 276). Also in 1991, the US enacted the Chemical and Biological Weapons Control and Warfare Elimination Act, that was an embargo barring US companies from trading with countries suspected of developing BWs (Garrett, 2001, 219). The Act also encouraged international sanctions against countries that use CBWs against their own nationals, which the US later enforced against Iraq (Garrett, 2001, 219).

While earlier laws and directives mainly targeted biowarfare threats, the March 1995 Aum Shinrikyo attacks and the April 1995 Oklahoma City bombing spurred lawmakers to look at clarifying the law to target bioterrorism. Aum Shinrikyo, a Japanese apocalyptic cult, is best known for its March 1995 sarin gas attack on the Tokyo subway, that killed nearly a dozen and injured 1,039 (Dolnik, 2007, 46). While the cult gained worldwide notoriety for this incident, they had already unsuccessfully attacked Tokyo in June 1993 with botulinum and anthrax, causing no fatalities (Dolnik, 2007, 61). On June 9, the group predicted an Armageddon and wanted to gain recruits to join their army to fight against it by carrying out

an attack that consisted of spraying a bioweapon, botulinum toxin, in Tokyo from a car equipped with a spraying machine (Dolnik, 2007, 61). On June 28, Aum Shinrikyo, which means Aum Supreme Truth, sprayed anthrax from the roof of its Kameido compound in Tokyo's Koto ward, using a sprayer device equipped with a fan (Dolnik, 2007, 61). They would continue to disperse the agent over the following five weeks from the roof of their compound and from a sprayer truck near the legislative buildings in central Tokyo (Dolnik, 2007, 62). The attacks failed because they used harmless, nonviolent strains of the agents, but the outcome may have been very different if they had possessed a deadlier strain (Dolnik, 2007, 61-2). Aum Shinrikyo controlled an estimated $1 billion in assets and had some 26 university-trained scientists working in first-rate research facilities with the freedom to conduct research on any and all CBWs (Dolnik, 2007, 46). The group operated between 1987 and 1995 and was responsible for not only a number of their enemies assassinations, but at least 20 attempts to release chemical or biological substances which killed a total of 100 people (Dolnik, 2007, 58).

Many policymakers, including the Clinton Administration, used Aum Shinrikyo's attacks as a reason for bioterrorism funding and policy. Clinton signed Presidential Decision Directive-39 in 1995 and asserted that there was "no higher priority" for the US government than preventing bioweapons from falling into terrorists hands (O'Sullivan, 2006, 180). However, many bioterrorism experts and academics would conclude that, despite all of their efforts and resources, terrorists were still unsuccessful in their attempts. John Mueller argues that, despite the nine attempts over a five-year period and all of Aum Shinrikyo's funding and the nearly 300 scientists on its payroll, the cult was still unable to release a weapon that produced the "apocalyptic war" it had planned (Mueller, 2006, 24). The only success the cult actually had involved the use of chemical weapons, which is why it is a contradiction for US policymakers to allocate more funding towards preparedness efforts for acts of bioterrorism.

For instance, most legislation targets bioterrorism specifically, such as the Antiterrorism and Effective Death Penalty Act of 1996, the Agricultural Bioterrorism Protection Act of 2002 and the Bioterrorism Act of 2002, all of which will be discussed later.

Due to the heinous nature of both acts of terrorism in 1995, lawmakers focused on strengthening and streamlining federal law governing the imposition of the death penalty in certain terrorism cases by enacting the 1996 Antiterrorism and Effective Death Penalty Act (Clark, 2008, 110). Furthermore, it authorizes victims to sue foreign governments who support terrorism and makes assistance and compensation available (Doyle, June 3, 1996). Other provisions of this law require HHS to regulate transfers of dangerous human pathogens and toxins to prevent their acquisition by terrorists and criminals (Tucker, 2003, 19). Once the Antiterrorism and Effective Death Penalty Act went into effect on April 15, 1997, anyone shipping or receiving one or more of the microbes or toxins had to register with the CDC and declare a legitimate scientific or medical use for the material (Tucker, 2003, 19). Following the enactment of the Act, the CDC named 24 infectious organisms and 12 toxins as restricted agents that require a federal permit to use or possess (Garrett, 2001, 220). By the year's end, 335 facilities involved in transfers of select agents registered with the CDC (Tucker, 2003, 19). However, politicians did overlook one major loophole in the law, namely, where organizations experimenting with, rather than transporting, biological agents were not required to register with the government, though weapon uses of these agents were barred (Sidel, 2007, 150). Unfortunately, this law did not prevent a disgruntled Texas ex-hospital employee, in October 1996, from stealing *Shingella dysenteriae* from a hospital laboratory to poison muffins that caused 12 illnesses and 4 hospitalizations (Pilch, 2002, 274). Even today, areas that are still vulnerable targets are hospital laboratories, private collections in the unlocked cabinets or freezers of clinical microbiologists, and facilities known to work with

agents, such as military facilities like the USAMRIID, which have been known to lose multiple specimens over the years (Pilch, 2002, 276).

In the 1990's, al Qaeda, a growing terrorist organization, paid close attention to the mounting threat of bioterrorism. Some academics and bioterrorism experts believe that al Qaeda's knowledge and use of BWs was provoked by the severely overheated discussion in the US about the imminent danger of bioterrorism (Leitenberg, 2010, 165). One example was in November 1997, when Secretary of Defense William Cohen appeared on national television to educate viewers on the imminent BWs threat (Guillemin, 2005, 161). Cohen held up a five-pound bag of sugar and explained that the same size bag filled with anthrax, if sprayed from an airplane, could kill half the population of Washington, D.C. (Guillemin, 2005, 161). A few years later, on April 15, 1999, al Qaeda's then second in command and now leader, Ayman al-Zawahiri, noted, "We only became aware of them [BWs] when the enemy drew our attention to them by repeatedly expressing concerns that they can be produced simply with easily available materials" (Leitenberg, 2010, 165). Al-Zawahiri, a medical doctor who has had a long interest in CBWs, established al Qaeda's chemical and biological warfare research program, code named "Curdled Milk" (Schneider, 2007, 53). Scholar, Dr. Barry Schneider, notes that al-Zawahiri's interests were fueled by the western alarms that were sounded due to the Iraqi and former Soviet Union's chemical and biological programs (Schneider, 2007, 52). Al Qaeda was alleged to have successfully purchased samples of anthrax, plague, ricin and botulinum toxin in 1999, 2001 and 2002 and spelled out the methods by which BWs can be made in its 5,000-page *Encyclopedia of Jihad* (Schneider, 2007, 51-2).

President Clinton did see the warning signs and, in 1998, he signed Presidential Decision Directive 62 that called for the appointment of a national coordinator for security, infrastructure protection and counterterrorism to the National Security Council staff, and

identified lead agencies to create plans and goals with specific milestones (Nye, 2001, 201). He rejuvenated the Federal Emergency Management Agency (FEMA), strengthened the CIA's Counter-Terrorism Center and improved the FBI with a growing budget of $423 million by 2001 (Nye, 2001, 202). Unfortunately, this still did not prevent the problems that occurred with communication and cooperation between federal agencies before and after the 2001 anthrax attacks. Clinton used fear to develop biodefense policy and, in 1998, even had Richard Preston, author of the thriller, *The Cobra Event*, and a *New Yorker* journalist, appear before various senatorial committees as an expert on the subject of bioterrorism (Carr, 2011, 358). The President subsequently requested $94 million in funding to build up a civilian stockpile of medicines in the event of a chemical or biological attack (Carr, 2011, 358). Federal spending to combat terrorism rose by more than 50 percent from its 1996 level to approximately 1.5 billion in fiscal year 2000 (Nye, 2001, 201). This increase in funding proved unsuccessful and was either wasted or misappropriated, as the US was dangerously unprepared for the events of 2001. Some of these funds could have gone to the three classified and dangerous projects the Clinton Administration approved that involved creating and testing genetically modified anthrax strains, building a biological agent production facility to prove its easy construction and the testing of a "mock" biological bomb (Klotz et al., 88, 2009). In 1999, the CDC conducted a study of the U.S public health clinics, laboratories and hospitals and concluded they were astonishingly unprepared to react to a bioterror attack (Thompson, 2003, 63). In response, the CDC established the Bioterrorism Preparedness and Response Program, also known as the Laboratory Response Network, to help state laboratories adopt uniform testing methods for suspected bioagents (Cole, 2009, 9). Luckily, by 2001, there were 80 labs around the US participating in the "Laboratory Response Network" (Cole, 2009, 9).

The laws instituting inventory controls on biological agents in the late 1990's were prompted by some serious mistakes made by the American Type Culture Collection (ATCC), particularly one in 1995 that caused a domestic anthrax scare by a trained microbiologist, Larry Wayne Harris (Thompson, 2003, 9)[7]. The ATCC was not the only group to blame for the inventory control problems. For example, some researchers freely swapped samples of bacteria used in their experiments and, even after the laws were passed, some scientists suggested it was common to exchange germs among friends (Thompson, 2003, 9). Despite the issues with some scientists regarding the inappropriate handling of biological agents, US politicians did not entirely recognize the danger their own scientists would potentially become several years later. Unfortunately, the lawmakers who were aware of the danger were unsuccessful in their attempts to mend these security problems with law before September and October 2011.

In 2000, Senators Jon Kyl (R-AZ) and Dianne Feinstein (D-CA) co-sponsored a bill called the Counterterrorism Act 2000 to help close the loophole that the Antiterrorism and Effective Death Penalty Act created, which was caused, in part, by resistance from the scientific community (Tucker, 2003, 19). This legislation, if enacted, would require laboratories to register select agents they possessed or worked with, that the law did not originally address, even if the agents were obtained, transferred or received before the Antiterrorism and Effective Death Penalty law took effect (Tucker, 2003, 19). The Counterterrorism Act passed the US Senate during the 106th Congress, however, the House of Representatives did not have time to consider it (Tucker, 2003, 19). It is ironic that some of those very same lawmakers who had voted to pass this important measure in the US Senate would soon be affected by what was to come in the fall of 2001. Not long after this legislation vanished from the agenda of the US Congress, several serious warnings were given to government officials and lawmakers. In January 2001, the US Commission on

National Security/21st Century, which was co-chaired by former US Senators Gary Hart and Warren Rudman, predicted that "terrorism will end the relative invulnerability of the US homeland … a direct attack on American citizens on American soil is likely over the next quarter century" (U.S Commission on National Security, 2001). Later that June (22-23rd), about a dozen US higher-level policymakers took part in a "play" known as Dark Winter (Clark, 2008, 17). This "play" was an exercise mounted by a formidable array of producers, including the Johns Hopkins University Center for Civilian Biodefense Strategies, to test America's ability to respond to major health emergencies caused by terrorists using radiological and CBWs (Clark, 2008, 16-7). However, the exercise was a great awakening to the 50 or so government officials. What it demonstrated was policymakers' lack of knowledge regarding bioterrorism; the ignorance of government officials concerning the resources that are available to them in the event of such an attack; the ambiguity surrounding the respective roles, responsibilities and authorities of the federal versus state governments during a crisis; and finally an overall lack of preparation for the US health department to deal with a catastrophic health emergency (Clark, 2008, 18). Little did these senior-level policymakers realize was that, in approximately three months, the US government and healthcare system would be tested with two of the worst terrorist events the US had ever seen. Even the Federation of American Scientists considered the system inadequate and said there was a lack of "central inventory of dangerous microbes and toxins because many laboratories that work on anthrax are unregistered" (Sidel, 2007, 151). Unfortunately, the USAMRIID, a credible government laboratory, was at the center of the 2001 anthrax attacks.

The September and October 2001 anthrax attacks, given the name "Amerithrax" by the FBI, was an act of bioterrorism where anthrax-laden letters sent to different parts of the US infected 22 individuals, five of them fatally. While the attack was intended to target members of the U.S media and Congress, US postal employees and unsuspecting citizens

suffered the most. The attacks caused serious disruptions to daily life, including the closing of government buildings and the quarantine of tens of thousands of pieces of mail (Cole, 2006, 158). Anthrax is caused by a hardy bacterium, *Bacillus (B.) anthracis*, which, in humans and animals, can result in cutaneous, inhalation and gastrointestinal clinical forms. In cultures, *B. anthracis is* surrounded by a protective coating, has a distinctive rod shape and clumps together in long rods that resemble bamboo shoots (Thompson, 2003, 8).

Anthrax outbreaks have appeared throughout history. Scholars have characterized the 5th and 6th biblical plagues, as well as the "burning plague," described in Homer's *Iliad*, as an anthrax epidemic (950-700 B.C.) (Ryan et al., 2008, 42). In addition, Virgil wrote the earliest (70-19 B.C.) detailed description of one of the outbreaks in *Georgics* (Ryan et al., 2008, 42). Over the following 1,500 years, Europe witnessed sporadic outbreaks of the disease, with the most acute outbreaks occurring in 14th century Germany and 17th century Russia and central Europe (Ryan et al., 2008, 42). Most recently, livestock all around the world have been infected with naturally occurring anthrax, which has inadvertently infected humans.

The name anthrax is derived from the Greek word for coal, or anthracite, because of the coal-black sore trademark of the cutaneous form of the disease (Ryan et al., 2008, 42). The anthrax bacterium has several characteristics that make it a formidable bioterrorist threat. For example, it is stable in spore form; the culture and production of the anthrax bacterium is not difficult; it has the ability to be aerosolized; it causes a serious, life threatening disease and there is a lack of sufficient vaccine for widespread use (Ryan et al., 2008, 44). In addition, anthrax can also be used in an explosive device (Alibek et al., 2005, 4). For these reasons, anthrax has been the biological agent of choice for those states that have pursued BWs programs (Butler, 2001, 211). In June 1999, a panel of HHS agency representatives, law enforcement officials, military experts and, most importantly, nationally recognized infectious disease and public health experts met to analyze the threat of various agents on

civilian populations (Ryan et al., 2008, 39). Biological agents were divided into three categories A, B and C, where anthrax is classified as a category "A" agent, the most serious of the groupings (**Appendix B**).

It is relatively easy to grown anthrax spores through the process of fermentation, but it is the drying and milling process that causes the spores to reduce in size (Butler, 2001, 211). It is during this stage that the weaponization of anthrax occurs, because particle-size spores are then able to be aerosolized and delivered through the air to the lungs of human victims, causing the deadliest form of the disease, inhalational anthrax (Butler, 2001, 211). Since a small, lethal amount of the odorless and tasteless spores can go unseen, most victims are unaware of contamination. Nearly 90 percent of untreated victims of anthrax will die (Cole, 2009, 8). Cutaneous anthrax is contracted through cuts in the skin, and the gastrointestinal form is ingested. If left untreated, all three can cause septicemia and death, which is why it is a dangerous agent to fall into the hands of terrorists. Anthrax occurs naturally and, given the right temperature and conditions, can live in the soil for many years in spore form (Hasan, 2003, 10). This is why it is important an infected animal carcass is buried (Hasan, 2003, 10). Humans can become infected with the disease by touching or inhaling spores from products that come from anthrax-infected animals, which is why it was historically referred to as wool sorters' disease (Hersh, 1968, 96). In the U.S., only 18 cases of anthrax from inhaled spores were recorded by the 20th century (Cole, 2009, 7).[8] Cutaneous anthrax in humans is the most common form of the disease and accounts for 95 percent of reported US cases (Willman, 2011, 26).[9]

In the century to follow, 2001 marked the deadliest act of terrorism and bioterrorism carried out on US soil. As you can see from **Figure 1's** case timeline, letters were sent in two waves, one at the end of September and the second in the middle of October.[10] The letters did not have to be opened for contamination to occur, as the fine powdered spores continued

to leak out and contaminate every location they passed through. The first victim infected with inhalational anthrax was Robert Stevens, a 63-year-old photo editor for the *Sun*, a supermarket tabloid that was housed in the American Media Incorporation (AMI)[11] building in Boca Raton, Florida (Cole, 2009, 2). Stevens died on October 5, 2001, and was the first American anthrax fatality in 25 years (Hasan, 2003, 50). After a long investigation into Robert Steven's daily routine, anthrax spores found on Steven's keyboard, desk and mail slot and the illness of his co-worker, Ernesto Blanco, led investigators to suspect the mail (Thompson, 2003, 80). The letter that reached the US Congress caused hysteria around the Hart Senate Office Building, which houses the offices of half the nation's 100 US Senators. As a result, the building was closed. No one was allowed to return for a three-month period, a point in time when half the decontamination was completed at a cost of 41.7 million dollars (Cole, 2009, viii). While the 2001 anthrax letters caused five deaths, they also filled the American public and the US government with fear and anxiety, as witnessed by the run at the pharmacies on the antibiotic Cipro, the treatment used for anthrax exposure (Butler, 2001, 211).

Figure 1. Amerithrax Contamination and Case Timeline

(Jones, October, 10, 2011)

In determining who the suspected terrorist was, authorities had to search both domestically and internationally. The investigators knew that the anthrax was of a sophisticated grade, which implied that the individual who mailed it had the knowledge and the sophisticated equipment for its production (Butler, 2001, 213). Investigators and scientists determined that the strain of anthrax used in the attacks, the Ames strain, is very difficult (today impossible) to obtain casually, as it is mostly maintained in university and defense institute research laboratories (Clark, 2008, 34). Since this strain is resistant to many vaccines and was known to be in no more than 12 laboratories, these facts helped to marginally narrow down the suspect list (Hasan, 2003, 54). The strain was first acquired by the US army for vaccine research in Fort Detrick, after it infected some cows in Texas in 1981 (Cole, 2009, 200).[12] Although the Ames strain was found in the U.S., samples had been sent to overseas laboratories, including the British biological defense establishment at Porton Down (Cole, 2009, 200). This could have been yet another example of scientists from the tight-knit community traveling to conferences and meetings to swap sensitive information and vials of *B. anthracis* samples to share with trusted colleagues as a professional courtesy (Thompson, 2003, 22). This alarming discovery is just one of many that encouraged policymakers to put new, more secure laws in place, especially knowing that if Aum Shinrikyo had spores of the Ames strain quality, the attacks in Japan would have taken an entirely different turn (Clark, 2008, 34).

While the laws passed prior to 2001 were an attempt to prevent the sale of agents to terrorists and also tightened restrictions on the shipping and reporting of biological agents, the US government took little notice of the vulnerabilities that their own scientists exploited when obtaining, using and studying biological agents, until it was too late. There was also a major problem with the list of potential suspects and the list of scientists assisting with the investigation, providing more proof of how unprepared the US government was for this

attack. Agent Scott Stanley, who was assigned to the case, said, "We knew right out of the gate we could have had an offender working on our evidence" (Willman, 2011, 136). The FBI had a person of interest, Dr. Steven Jay Hatfill, who was later deemed innocent and awarded damages.[13]

Also, under immediate suspicion were al Qaeda and Iraq, but some bioterrorism experts and academics, such as Benjamin Friedman, argue that al Qaeda's failure to develop BWs in previous years proves that they are unlikely to succeed in mass destruction (Friedman, 2010, 189). However, it is possible that al Qaeda has already used BWs in the US (Schneider, 2007, 52). Several pieces of evidence, though circumstantial, have come to light involving the September 11th hijackers living in Florida. For example, in June 2001, hijacker Ahmed Ibrahim al-Haznawi went to the doctors complaining about a blackish scab covering a wound he claimed to have received on the edge of a suitcase (Thompson, 2003, 51). The doctor removed and discarded the scab, at the time, not thinking anything of it, but later realized, when questioned by the FBI, that it could have been a cutaneous anthrax lesion (Thompson, 2003, 52). Also around the same time, Muhammad Atta, the alleged ringleader, had made two suspicious visits in 2001 to check out and take pictures of crop dusting equipment (Thompson, 2003, 54). The year following the anthrax attacks, al Qaeda spokesman, Suleiman Abu Gheith, released a statement that said, "We [al Qaeda] have the right to kill 4 million Americans, 2 million of them children … cripple them in the hundreds of thousands. Furthermore, it is our obligation to fight them with CBWs, to afflict them with the fatal woes that have afflicted Muslims because of their CBWs" (Forest, 2007, 216-7). Senior al Qaeda strategist, Abu Musab Al-Suri, stated that "The last option is to destroy the US by means of decisive strategic operations with WMD including nuclear, chemical, or BWs if [M]ujahideen are able to obtain them in cooperation with those who possess them,

purchase them, or manufacture and use primitive atomic bombs or the so-called dirty bombs" (Forest, 2007, 218).

Despite the circumstantial evidence regarding other suspects, the FBI came to settle on a 62-year-old suspect named Dr. Bruce Edwards Ivins, who was a longtime scientist at the Fort Detrick Army microbiology laboratories (Cole, 2009, viii). On December 2, 1980, the US Army hired Dr. Ivins as a civilian microbiologist in the USAMRIID's Bacteriological Division, which allowed him to obtain a "secret" level security clearance without any evaluation of his psychiatric fitness (Willman, 2011, 30). In fact, the Army knew very little about Ivins, but entrusted him with one of the planet's most dangerous microorganisms, anthrax (Willman, 2011, 30). If the Army had evaluated Ivins' mental health, they may have discovered that he had been under the steady care of a psychiatrist in Washington, DC, who Ivins had confided in about his obsession over the sorority Kappa Kappa Gamma (KKG), his abusive childhood, his burglary of a KKG house, and his thoughts about killing a former colleague who had been a member of KKG (Willman, 2011, 30). The evidence surrounding the case was based on key card access logs showing his nocturnal hot suite laboratory hours in the months surrounding the attacks, as well as an issue with the sample of anthrax Dr. Ivins had submitted to the FBI.[14] The FBI was also aware that Ivins had cultured and grown ample quantities of anthrax spores that he shared with other researchers from the US and international laboratories (Willman, 2011, 95). It was also apparent to other scientists that Ivins, who initially reached out to offer his help in the case, was taking this particular case personally (Willman, 2011, 88). Circumstantial evidence, such as Dr. Ivins' night driving routine, his e-mail records to his friends and colleagues and other coincidences, left the FBI concerned.[15] Despite the FBI suspecting that Ivins was the anthrax killer, he committed suicide three days before the FBI and Justice Department were going to bring charges (July 29, 2008) and, therefore, could not be proven guilty in a court of law (Cole, 2009, viii). Since

Ivins is not alive to be prosecuted and left no suicide note, if he carried out the anthrax attacks, his motives will remain unknown. The U.S Attorney, Jeffrey Taylor, said that one possible motive was that Dr. Ivins wanted to create a scenario where people would realize the need for the vaccine program he had been working on for several years (Perez et al., *Wall Street Journal*, August, 7, 2008). It was the panic of a biowarfare threat, in 1990, during the Persian Gulf War, that showed Ivins how a threat could create opportunity (Willman, 2011, 40). He was a co-inventor of the anthrax vaccine, but the vaccine program was suspended after rumors that Gulf War veterans were ill due to the mandatory vaccination program (Willman, 2011, 55).[16]

The evidence that tied Ivins to the anthrax letters was shaky and the FBI was under a lot of scrutiny from the media and members of Congress, especially those whose offices were targeted. New Jersey Congressman Rush Holt, a physicist who represents the district where the anthrax letters were mailed, was one of the biggest skeptics with regard to the case being solved (Cole, 2009, ix). Congressman Holt believed that, while it could have been Ivins who sent the letters, another culprit could still be at large (Cole, 2009, ix). In fact, because the FBI did not have the scientific and technical expertise, the investigators had to rely heavily on outside experts, who were among an elite cadre of scientists with the requisite knowledge to carry out the crimes (Thompson, 2003, 192). Even though the FBI was under serious pressure to solve the case, both from the public and Congress, the FBI's Assistant Director in charge, Joseph Persichinim, maintained that "Bruce Ivins was responsible for the death, sickness, and fear brought to our country by the 2001 anthrax attacks" and, as far as he was concerned, the 2001 anthrax case was closed (FBI, August 6, 2008). A 2011 *PBS* Frontline special, "The Anthrax Files," recently shed light on the insufficient evidence the FBI had against Dr. Ivins, that has added to the controversy over whether the FBI got the one responsible (*PBS*, October 10, 2011). Regardless of whether the anthrax investigation is

closed or not, the increase of scientists with access to biological agents is a growing concern by some bioterrorism experts and scientists. In fact, experts argue that "Our bloated, largely secret biodefense program increases the risk of accidents and theft by terrorists, and its lack of transparency may be inadvertently fueling an international arms race in bioweapons" (Klotz et al., 2009, 4).

After the anthrax attacks, the response of politicians resembled a pendulum in the sense that they had to "over swing" or overcorrect the problem to prove to the American public that they were properly responding. Since the precedent of bioterrorism was set, it became critical that lawmakers reduce the vulnerability of the US through appropriate protective measures (Flynn, 2001, 191). Hence, it was not a surprise that politicians and the US government would respond with legislation and Presidential directives to attempt to fill the gaps with the existing law. It is the way the government struck back with unprecedented intensity and haste that causes experts to be concerned about the monumental biodefense program of the US (Klotz et al., 2009, 4). The amount of legislation introduced, while mostly necessary, was instituted to fix blame, seek revenge and line the pockets of pharmaceutical companies and anyone that benefited from the surplus funding (Klotz et al., 2009, 4). It was determined that, after the 2001 anthrax attacks, the US government spent $5 billion on bioterrorism preventative measures, which is $1 billion for every fatality (Mueller, 2006, 31). This statistic is one of the many reasons the members of Group III believe that biodefense is overblown. **Appendix C** estimates the dollar amount spent due to overreaction of the 2001 anthrax attacks, but does not take into account the influence the attacks had on the subsequent US war on terror. There are many reasons why this war on terror started, but the 2001 attacks gave the Bush Administration ammunition to aim at Saddam Hussein's regime that, the Administration claimed, already had anthrax and other pathogens "capable of killing millions" (Willman, 2011, 176). In an effort to further win public approval, the then

Secretary of State, Colin Powell, noted that the "thick intelligence file on Iraq's biological weapons," maintained by the U.S., demonstrated Iraq was hiding mobile biological agent factories (Willman, 2011, 177). Dr. John Ezzell, one of Fort Detrick's senior scientists at the time, referred to the anthrax used in the 2001 attacks as weaponized by possibly using bentonite, which drove government officials to suspect foreign involvement, perhaps Iraq (Willman, 2011, 105-7).[17] Powell later conceded the failure to find biological weapons in Iraq and voiced uncertainty about the war on terror that cost more than $750 billion and took the lives of more than 6,000 Americans and in excess of 100,000 Iraqis (Willman, 2011, 333).

After 2001, bioterrorism has challenged and changed existing laws and legal structures regarding issues of protection, including the movement of persons and products, isolation and quarantine, vaccination, the commandeering of facilities, federal versus state authorities, emergency licensing of healthcare professionals and more (Gursky, 2006, 713). Mandatory reporting requirements have encouraged the active involvement of state public health agencies. For example, the Model State Emergency Health Powers Act requires that healthcare providers report, within 24- hours, any illnesses that may be the potential cause of a public health emergency. In addition, pharmacists and veterinarians have the same duty to report suspicious prescriptions and diseases (Ryan et al., 2008, 218). Some states even have penalties for noncompliance of surveillance and reporting (Ryan et al., 2008, 218). Unfortunately, not all first responders are trained to recognize disease from a biological agent. Another issue that needed to be addressed was the lack of communication and cooperation between federal and state agencies. During the 2001 anthrax attacks, fatalities and illnesses could have been avoided if the CDC, FBI, USPS and the state public health systems had maintained better communication and responsive procedures. Dr. Tara O'Toole, Under Secretary for Science and Technology, DHS, was very vocal about the incompetence

of certain government agencies in responding to the anthrax attacks by stating, "I think the CDC was terrible. The official response was a national security travesty" (Cole, 2009, 220). Despite all the warning signs and advances in law prior to 2001, the *New York Times* reported two weeks after the September 11th attacks that US intelligence and law enforcement officials "failed by their own admission to share information adequately or coordinate their efforts, and were caught by surprise" (Nye, 2001, 202). The GAO thought the same applied to the anthrax attacks and reported that the governments' bioterrorism planning was "so disjointed that the agencies involved could not even agree on which biological agents posed the biggest threat" (Nye, 2001, 203).

In an effort to address these issues, President George W. Bush signed the Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism Act, also known as the U.S.A. Patriot Act, into law on October 26, 2001 (GPO, HR 3162). The controversial U.S.A. Patriot Act, which was rushed through Congress with little debate, granted unprecedented new powers of surveillance to the government and allowed the right to access people's personal e-mails and their records of borrowed library books (Carr, 2011, 390). Some argue that this legislation is a violation of their individual liberties, but the DOJ has claimed that this law "has played a vital role in the DOJ's efforts to preserve Americas' system of ordered liberty for future generations" (Khademian, 2006, 1100). Section 817 of this act makes it an offense for a person to knowingly possess any biological agent, toxin or delivery system that cannot be "reasonably justified by a prophylactic, protective, bona fide research, or other peaceful purpose" (GPO, HR 3162). While the U.S.A. Patriot Act allowed for new guidelines with regard to surveillance, its provisions on biological agents hardly made it stand out from previous legislation passed before 2001. [18] In its original legislative version, the law was much stricter, as it barred

foreign personnel from working on select agents (Sidel, 2007, 152). In 2002, after continuing to see gaps in existing law, lawmakers looked for further clarification.

On June 12, 2002, the US government passed the Public Health Security and Bioterrorism and Response Act, also known as the Bioterrorism Act. It sought to address and increase America's ability to prevent, prepare for and respond to acts of bioterrorism, especially involving issues with food, drug and water security and other public health emergencies (GPO, HR 3448). The new law also added additional safeguards for the possession and transfer of biological agents and required the notification of federal authorities of any unauthorized attempts to obtain a select agent (GPO, HR 3448). Most importantly, this law finally required all laboratories and facilities in possession of select agents to conduct background checks on those with access to such materials, a commonsense provision that might have revealed Dr. Ivins' mental state (Sidel, 2007, 154). Noncitizens from countries defined by the US government as supporting terrorists, felons, those convicted of drug-related offenses and several other groups continued to be banned from transporting and using biological agents (Sidel, 2007, 154). Subtitle B of the Bioterrorism Act was deemed the Agricultural Bioterrorism Protection Act and called for the establishment of a list of biological agents and toxins that are harmful to agriculture, livestock and humans for which possession, use and transfer requires federal government notification and registration (Obama White House).

Despite the passage of these new laws in the summer of 2002, a task force from the Council on Foreign Relations, chaired by former US Senators Rudman and Hart, released a report in October 2002 titled *America Still Unprepared-American Still in Danger* that highlighted the growing bioterrorism insecurity of the US (Hart et al., 2002). In the report, the Executive Director of the National Association of County and City Health Departments, Thomas Milne, said, "Our concern is that bioterrorism preparedness funding must be

adequate, fast and reliable to enable local public health agencies to build and sustain permanent improvements in their ability to protect twenty-four hours a day, seven days a week. Most communities do not now have this level of protection" (Hart et al., 2002, 24). In November 2002, this sense of vulnerability caused the enactment of the Homeland Security Act that established the DHS and gave the agency oversight on policies related to bioterrorism. The DHS dedicates political, personnel and financial resources toward bioterrorism prevention (Meyerson and Reaser, 2003, 307). Today, the DHS has 230,000 employees and a FY 2012 budget of $57 billion in total funding (DHS, 2011). Along with the DHS, the President has the authority to create national security policy and issue Homeland Security Presidential Directives (HSPDs) regarding the DHS and the Biotechnology Industry Organization (BIO). Since 2001, the DHS reports that 25 HSPDs have been issued regarding the DHS and the BIO (FAS, 2010) (Appendix D). Also instituted in 2002, BioWatch, funded by the DHS and operated in cooperation with the Environmental Protection Agency, was created to analyze samples of air to detect any aerosol release of bioagents in more than 30 US cities (O'Sullivan, 2006, 181). Unfortunately, system installation has been postponed from year 2016 to 2022 and the project has gone over the projected cost of 3.7 billion, because the technology does not currently exist and officials are unsure whether it ever will (Margolin, September 18, 2012). The GAO reported that there is "uncertainty about the incremental benefit of this kind of environmental monitoring as a risk mitigation activity" and "that the DHS did not systematically analyze alternatives because there was already departmental consensus about the solution" (GAO, 8, September 13, 2012). This can be interpreted to mean that the BioWatch Program was developed out of haste rather than science to show that officials were doing something after the 2001 attacks (Margolin, September 18, 2012).

In 2004, the former Director of the CIA, George Tenet, said that "al Qaeda's ability to conduct an anthrax attack is one of the most immediate threats the US has to face" (NCTA, 2004, 12). President George W. Bush recognized this threat, as well, and signed the 2004 Project Bioshield Act, that "provides new tools to improve medical countermeasures protecting Americans against a chemical, biological, radiological, or nuclear (CBRN) attack" and will essentially allow for a growth of our national stockpile of vaccines and fund new vaccine research and development (Bush White House, Project Bioshield). In order to persuade the pharmaceutical industry to develop new vaccines, therapeutics and rapid diagnostic tools, this new law made $5.6 billion in funding available (for fiscal years 2004-2012) and promised liability protection and some tax incentives (Gursky, 2006, 708). Critics of Project Bioshield today say that the Strategic National Stockpile, which under Bioshield is meant to protect the nation in the event of an outbreak, contains few new vaccines or drugs for pathogens other than anthrax and smallpox (Kaiser, 2011, 1). Additionally, critics say that Project Bioshield is a single hazard countermeasure that does little to strengthen everyday public health. From 2002 to 2008, for instance, a mere $320 million of the $50 billion biodefense budget was used to aid states in biopreparedness, however, $3.3 billion was spent by Bioshield on single hazard countermeasures (Klotz et al., 2009, 170). There is no doubt that public health problems are proving to be more costly than the unpredictable, and perhaps unlikely, reoccurrence of bioterrorism (Gursky, 2006, 709). In 2006, 64.1 percent of adults age 20 and over were considered obese, which is estimated in medical costs and loss of productivity to be $117 billion (Gursky, 2006, 708-9). Other figures from years prior to 2006 mentioned that diabetes, which affects 17 million Americans, directly and indirectly costs $132 trillion (Gursky, 2006, 709). A Professor from the Department of Family and Preventative Medicine, Erica Frank, suggests that bioterrorism funding is making us more insecure in other areas of public health. She uses an example in 2005 where North

Dakota's Governor Hoeven announced $300,000 in funding for the prevention of heart disease and stroke, however, when comparing it to the $7 million designated to the state for bioterrorism, it does not match up (Frank, 2005, 527). While there is no doubt that bioterrorism preparedness is tremendously beneficial, given the strain a large scale attack would put on our public health system, statistics can prove that funding and research should not be redirected away from the chronic diseases and infections that already affect the medical care of Americans.

In December 2008, the Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism, led by former Senators Bob Graham of Florida and Jim Talent of Missouri, issued a report that concluded a biological terrorist attack was likely to occur before the end of 2013 (Cole, 2009, 241). The bipartisan group of appointed US Senators and Representatives based this conclusion on several indicators and recommended that prevention of bioterrorism be made a higher priority (Graham et al., Dec. 2008, 24). While the report does acknowledge that most terrorist groups still lack the needed scientific and technical ability to make weapons, it does caution that those problems can easily be overcome if terrorists recruit scientists willing to participate or sell their knowledge (Graham et al., Dec. 2008, 11). The report states that, "The US should be less concerned that terrorists will become biologists and far more concerned that biologists will become terrorists" (Graham et al., 2008, 11). Included with the Commission's warning that terrorists will try to increase their access to biological agents, the Commission Chairman, Senator Bob Graham, said that anthrax is the most likely threat on the list of biological agents (Graham et al., Dec. 2008, 32). He also mentioned how contagious diseases, like the flu virus, can be a major threat considering how incurable, deadly and accessible it is (Graham et al., Dec. 2008, 12).

A Director of Terrorism Studies and an Associate Professor in the Combating Terrorism Center at West Point, Dr. James J. F. Forest, echoes the 2008 commission's

warning and references numerous statements made by al Qaeda members illustrating their desire to use WMDs. Dr. Forest and many politicians believe that countering the ideological dimensions of the threat and preparing for potential attacks should be a priority for the US and its allies (Forest, 2007, 218). Before retiring, US Senator Joe Lieberman vowed to examine the phenomenon of homegrown terrorism and violent Islamist radicalization (Lieberman, 2011). In response to the 2008 report from the Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism, Senator Lieberman introduced the Weapons of Mass Destruction Prevention and Preparedness Act of 2009, which would have provided a comprehensive framework for preventing and preparing for a WMD attack, particularly one using BWs (Lieberman, 2011). The legislation was never heard by the Senate and eventually died, but that did not stop Lieberman's support for the same legislation in 2011. US Representatives Bill Pascrell, Jr. and Peter King introduced The Weapons of Mass Destruction Prevention and Preparedness Act of 2011, but it too was unsuccessful.

In 2010, AQAP, a group of Yemeni and Saudi affiliates of al Qaeda that merged in 2009, attempted to carry out "Operation Hemorrhage" that would have involved blowing up toner cartridge bombs on two cargo planes (Cole (*ABC*), November 21, 2010). Although this was not an act that involved a biological weapon, the intelligence reports had shown that this group had contemplated poisoning salad bars and buffets at US hotels and restaurants with ricin and cyanide poisons, as well (Ahlers et al. (*CNN*), December 21, 2010). Finally, in early 2011, American counterterrorism officials became increasingly concerned over the attempts of al Qaeda affiliates in Yemen at acquiring large quantities of castor beans, which are required to produce ricin, a white powdery toxin that can kill you if a tiny amount is inhaled or reaches a person's bloodstream (Schmitt et al., (*NY Times*) August 12, 2011). Al Qaeda's involvement with BWs provides proof that, while they have not mastered the planning, preparation and production part of advancing their own BWs program, they are

certainly trying. The statements made by al Qaeda members illustrate their rationale for acquiring WMD's. As long as al Qaeda's ideology continues to resonate among parts of the Muslim world and it mobilizes support, several academics, bioterrorism experts and politicians, including James Forest, believe that it is only a matter of time before a catastrophic attack using BWs is attempted by its followers (Forest, 2007, 218). While the attention the U.S has given to BWs may have alerted al Qaeda to the dangers of BWs, this negligent discussion could have led others to exploit these insecurities, including the culprit who committed the 2001 anthrax letter attack on members of the U.S Congress and media. To this day, lawmakers are still trying to respond legislatively to bioterrorism preparedness, because despite the death of Osama bin Laden, there will always be a legitimate biological threat from terrorist groups. As US Representative, Mike Rogers, says, "Nothing has been abandoned and just because we've taken a significant player off the battlefield does not mean aspirations go away" (Stelter, *Security Director News*, July, 5, 2011). Brian Jenkins, Senior Advisor with the Research and Development Cooperation, points out that, "Over the past three decades, terrorists have multiplied the number of their victims by an order of magnitude every fifteen years" (Gerstein, 2009, 15). It has been proven that foreign governments are supporting terrorist organizations, such as Hezbollah, therefore, US government agencies will truly need to cooperate, communicate and use their budgets carefully in order to battle a new era of terrorism (Gerstein, 2009, 17).

There have been numerous lessons learned from the 2001 anthrax attacks and there will continue to be for decades to come, however, government officials still see signs that the US is far away from being fully prepared for a future attack. For example, in 2011, the GAO released a report that declared that the nation's bioterrorism defense is worthless (Kirkwood, 2011). This report backs the argument that biodefense spending is wasteful and not helping the preparedness efforts. The GAO was quoted saying, "There is no national plan to

coordinate federal, state, and local efforts following a bioterror attack, and the US lacks the technical and operational capabilities required for an adequate response" (Kirkwood, 2011). It means a great deal when the five departments, eight agencies and more than two dozen presidential appointees who oversee the $6.48 billion related to bioterrorism cannot put the funding to good use (Kirkwood, 2011). This report provides evidence for the arguments made by all three groups mentioned in chapter 2. For example, this report would support Group I's argument that more legislation, funding and research are needed to improve the responsive and preparedness efforts. It would also support Group II's argument that some of the spending on biodefense research is ineffective and may be best suited in other areas, such as public health. Finally, this report echo's Group III's argument that biodefense is wasteful and unjustified, since it has been 10 years and no attack has occurred.

In October 2011, the Bipartisan WMD Terrorism Research Center, led by former US Senators Graham and Talent, gave the US a failing grade for biological readiness efforts, despite agreeing that "the nation's ability to manage disasters has demonstrated significant improvement over the past decade" (Graham et al., 61, 2011). They argue that the more science advances, the easier it will become for terrorist groups to learn about and gain access to these biological agents (Matishak, *Global Security Newswire*, October 13, 2011). There is no denying that scientific capabilities are improving with the amount of funding that is allocated to biological research. The country now has a dozen BSL-4 laboratories, which is eight more than in 2001 (Kaiser, 2011, 1). Critics to the biodefense buildup question whether the laboratories are needed and Professor Ebright says, "We have created an opportunity for a repeat on a grand scale of the event that led to this explosion," meaning the new labs could one day open up the US to more accidental or intentional disasters (Kaiser, 2011, 1). While these reports may confirm that we are still behind in bioterrorism preparedness, despite all of

the efforts made legislatively and financially since 2001, some would argue that the level of preparedness is better than before.

The Obama Administration has taken bioterrorism on board and released a statement on the White House website that asserted, "By establishing well-planned, well-rehearsed, plans for coordinated response, we will also ensure a capability that can dramatically diminish the consequences of chemical, biological, radiological or nuclear incidents" (White House, 2011). To show this commitment, the Obama Administration is piloting the following two new initiatives: the postal plan, which requires USPS workers to deliver medications and information sheets in the event of an attack and another vaccine initiative that would offer select state and local officials the option to accept a federally funded course of anthrax vaccination (*Emergency Management*, September 18, 2012). Dr. Kenneth Bernard, the former assistant surgeon general with the US Public Health Service, stated that the difference is "like night and day" (Cole, 2009, 222). Regardless of the gains, Group III would highlight the negative impacts the policy has had on the US and, because there has been no attack since 2001 to enable the US to test preparedness and responsive efforts, experts in this group is correct in saying the policies have been overblown. Modernization of policy was essential after the 2001 anthrax attacks, but lawmakers took funding and policy too far because without a clear indication of the extent of the threat of bioterrorism, politicians used the worst case scenario to form policy. The worst case scenario situation leads to an overspending of the budget because politicians want to appear preemptive to their constituents. More dangerously, funding has prioritized high impact diseases such as anthrax and small pox over high probability low impact illnesses. Most recently, the US government has authorized the purchase of 200 million doses of smallpox vaccine at the cost of $462 million dollars (McNeil, March 12, 2013). Smallpox has been eradicated since 1980, but several countries still have access to the live virus. While it is necessary to have stockpiles of

the vaccine, this purchase is excessive because an infected person has two weeks before they come seriously ill and up to five days before they infect others, but by that time, they're normally too weak to walk and spread the virus (McNeil, March 12, 2013). This sale shows the influence pharmaceutical companies have over lawmakers policy making process.

Since October/November 2001, the US government has appropriated $64 billion for their BWs prevention and defense program (Leitenberg, 2010, 161). Furthermore, the current rate of annual appropriation is estimated to be $7 billion for future years to follow (Leitenberg, 2010, 161). Ironically, time helps to make Group III's argument, because the longer time passes without another bioterror attack and the more money the US government puts into biosecurity, the more it can be considered a waste of resources and time. Regardless, Group I can claim that preparatory efforts have been a deterrence and, until another bioterrorist attack occurs, we can only speculate until the true vulnerability of the US system can be tested. One scholar that appears to identify with Group III, Bruce Hoffman, believes that we cannot "put an end" to terrorism any more than we can stop drunk driving and, while gains can be statistical and meaningful, "victory" is impossible (Mueller, 2006, 144).

Chapter 5: Conclusion

Given the unprotected state of America's critical infrastructure and its lack of preparedness for acts of terrorism prior to 2001, it is surprising that the US dodged the bioterrorism bullet for as long as it did (Flynn, 2001, 191). Bioterrorism has been difficult to respond to, because, prior to 2001, most lawmakers knew very little about it. As a result, it is difficult to mount sufficient preparedness efforts against it. With growing scientific advances and the unknown amount of enemy countries, groups or individuals with the access to biological material; bioterrorism is a real threat. However, there was also an inherent inevitability to the response in that the two main factors that caused the overblown policy after the 2001 anthrax attacks are the uncertainty of the extent of the threat and the US political system that counts on special interest lobbyists, the media and the sometimes misinformed public for reelection. Today, despite the 11-year interval since the 2001 anthrax attacks, some politicians and scientists continue to support the need for biological research, the expansion of bioterrorism laws and the effort to sustain funding for federal, state and local preparedness efforts. Policy, preparedness and procedure were not good enough prior to the 2001 anthrax attacks. Clearly, politicians do not want to be caught unprepared as they were in previous years. However, by hastily introducing a surplus of biodefense policies and funding, such as BioWatch, that have not been properly considered, merely to demonstrate to the American public that they are hard at work, is not the answer. Research has also indicated that much of the current planning for America's response to bioterrorism was conceived without adequate input from the American public. For example, the US government may perhaps overestimate the degree of public cooperation with regard to medical countermeasures, considering that a number of American households are

"linguistically isolated." Statistics show that more than 24 million people who live in the US are unable to speak English "very well," if at all (Gursky, 2006, 714) (US Census, 2010).

After a disaster occurs, lawmakers naturally believe that the chances of it happening again are very high, but given the decade-long gap between the 2001 anthrax attacks and the present, politicians should learn not to immediately overreact, but to take the time to thoroughly evaluate the threat prior to making impulsive decisions (Baily, 2001, 277). Scholars, John Mueller, Bruce Hoffman and David Rapoport are all opposed to focusing on the threat of bioterrorism and maintain that the threat has been blown out of proportion (Betts, 2005, 508). However, Richard Betts agrees that terrorists do not currently have the expertise to use BWs, but argues that they miss the main point (Betts, 2005, 508). Betts states, "Low-probability threats with extreme consequences warrant more concern than high-probability threats with minor consequences" (Betts, 2005, 508). It is this theory that US policymakers sometimes overemphasize when determining biodefense budgets and policy. Unfortunately, because the extent of the threat is unknown, the US government inevitably overcompensates for this ambiguity by introducing a surplus of new laws, policies and budgetary changes. While the laws, preparative and preventive procedures needed to be updated according to new terrorist capabilities, the funding of biological research over general public health concerns should not have taken place.

With the 2001 anthrax attacks, lawmakers' overreactions caused the US to underfund the public health sector, which allowed for more insecurities in the scientific community. For instance, the likelihood of a flu pandemic is greater than an act of bioterrorism, so it is important that this area is not overlooked. The number of laboratories containing biological agents needs to remain a reasonable number and scientists should not be pushed into biodefense research due to greater grant opportunities. Ronald Atlas, Co-director of the Center for Deterrence of Biowarfare and Bioterrorism at the University of Louisville in

Kentucky, says that codes of conduct are needed "to prevent the life sciences from becoming the death sciences through bioterrorism and biowarfare" (Klotz et al., 2009, 188). A "culture of responsibility" is what Atlas believes we need in order to tackle the age of bioterrorism (Klotz et al., 2009, 188). This culture of responsibility will not only come from scientists, but from politicians and lawmakers who must make it a priority that policy is not only focused on communication, cooperation and policing, but it also focused on reducing public panic and fear.

Several areas still need to be addressed if the US biodefense program will ever be at its best. The first issue to tackle is that more oversight and structure are needed over biodefense policy and funding. Without structure, Congress, who benefits from the numerous committees that have influence over biodefense, makes the creation of a coherent strategy vulnerable to politics and lobbying from special interest groups (Runge, *Politico*, October 20, 2011). While President Obama still has no principal biodefense advisor, he does appear to be working hard to use the biodefense budget for sustainable goals. His FY 2013 budget for civilian biodefense totals $574.2 million, while the budget for programs with multiple goals and applications, including biodefense, is $4.96 billion (Center for Biosecurity, UPMC, 2012). According to a report from the Center for Biosecurity of UPMC, this means that "90% of the overall biodefense budget targets programs that promote public health, healthcare, national security, and international security (Center for Biosecurity UPMC, 2012). The attention to public health will please many scientists and academics in the field that believe public health needs continued support. Scholar, Bruce Hoffman, realizes that the overspending on the US biodefense program has taken away from public health and says, "[Bioterrorism] is the sexiest of all the terrorism threats and it was becoming a cash cow. So the threat of bioterrorism became a self-fulfilling prophecy. It was archetypical Washington politics in the sense that you generate an issue and it takes on a life

of its own" (Leitenberg, 2010, 172). Ironically, one of the biggest beneficiaries of federal resources was, of course, the next-generation anthrax vaccine co-invented by Dr. Bruce Ivins that was boosted by the first contract awarded under Project BioShield (Willman, 2011, 334).[19]

The overfunding of biodefense has also caused an explosion in the number of biocontainment laboratories, including over 1,000 BSL-3 laboratories registered to work on "select agents." With maps of laboratories (**Appendix E**) available on the internet, theft and threats from terrorists may be an imminent problem (Klotz et al., 2009, 5). Biocontainment laboratories were funded at upwards of $1.5 billion a year on the promise that they will make Americans safer by developing new antidotes and other products to counter biological terrorism (Willman, 2011, 334). This meant that these labs, which were staffed by more than 15,000 researchers and technicians, became an enormous security risk with an increase in people and institutions with access to the deadliest pathogens (Willman, 2011, 335). One journalist called the anthrax attacks a "Strangelovian legacy," since the crimes were allegedly committed by "a trusted researcher at the most presumptively secure American biodefense [facility]" (Willman, 2011, 335). Klotz and Sylvester believe that whistle-blowers in the scientific community will perhaps play the key role in biosecurity (Klotz et al., 2009, 190). Bioterrorism expert, Jeanne Guillemin, believes that only laws will protect reckless behavior by some scientists and says that, "the best hope for protection against BWs lies in the range of legal restraints that have been gradually building over the last several decades (Klotz et al., 2009, 189). Despite the need for policy changes after the 2001 anthrax attacks, as we may have seen, little can be done about a security cleared researcher who chooses to use his or her knowledge for evil.

Despite the continued financial support for the biodefense budget, some officials and academics worry that the US may become complacent, just as it was prior to the 2001 attacks.

According to Joseph Nye, Jr., the former Assistant Secretary of Defense for International Security Affairs and former Chair of the National Intelligence Council, the three main causes of the 'inertia that accounts for the lack of preparedness are: complacency, an unwillingness to spend money, and the fragmented bureaucratic structure and procedures of our government" (Nye, 2001, 204). In agreement with Nye, Dr. Greg Evans, Director of the Saint Louis University Institute for Biosecurity, said in 2011, "my fear is that we've become very complacent about the next terrorist attack. And I definitely think we will have one. It's inevitable. We're going to be less prepared as the years move forward if the country continues to cut funding for these efforts" (Saint Louis University Medical Center, August, 30, 2011). An Institute of Medicine report, *The Future of Public Health in the Twenty-First Century*, noted that federal, state and local public health laws are often outdated, which can lead to inefficiency and a lack of coordination (IOM, 2002, 4). With a lot of attention still on biological research and with new policy, such as the 2013 purchase of smallpox stocks, it seems unlikely that the US will become complacent. Complacency is not an option when science and terrorist capabilities are constantly changing, so there is a definite need for continuous modernization of biodefense policy. However, history proves that when a problem does present itself, lawmakers tend to overreact in the opposite manner by creating a surplus of policy and overfunding. While this overreaction and overspending is inevitable given the nature of the US government and political system and because the true extent of the threat of bioterrorism is unknown, throwing money at the problem will never be the answer, regardless of the fear of a future attack. By responding to terrorist acts with haste and fear, terrorism experts and scholars believe that the US is only adding fuel to an uncontrollable fire by helping the terrorists achieve their goals.

Despite which school of thought they identify with, most academics, bioterrorism experts, journalists and even some of the politicians can agree that fear of a catastrophic event

drives policymaking. As long as lawmakers continue to remain aware of this issue and work with scientists to keep up with the growing field of bioterrorism, the US will be at an advantage if an attack were to occur. Since it is impossible to be completely protected from terrorism, politicians need to evaluate biodefense spending to make sure other areas of vulnerability, such as public health, are adequately funded. Most legislation that was enacted after the 2001 anthrax attacks was necessary in filling voids in the law with regard to dealing with biological agents, but potential future attacks will likely expose new gaps that lawmakers never realized existed. Joseph Nye, Jr. and the former DCI, James Woolsey, maintain that we are unable to mount an adequate defense until after an attack. Former Senator Jim Talent agrees that it is hard for the government to prevent such an attack, but says, "an effective response system will limit the number of deaths if this attack does occur…. But also, it's a form of deterrence because whoever is thinking about doing this believes if they do it, the US is so well prepared the effect will be limited, so they're not likely to do it" (Stelter, *Security Director News*, July 5, 2011). Time can only tell whether the US is fully prepared for the next act of bioterrorism, but as time elapses without an attack, the more the threat of bioterrorism seems blown out of proportion.

Appendix A

Biosafety Levels for Biocontainment Laboratories

Biosafety Level 1 (BSL-1) – Involves practices used by microbiology labs that deal only with well-characterized organisms that do not typically produce disease in humans Uses standard microbiologic practices with open bench tops. Ex. High School biology lab.

Biosafety Level 2 (BSL-2) – Involves practices used by labs that deal with most human pathogens of moderate potential hazard. Lab coats, gloves and safety cabinets are used and access is restricted to trained personnel. Ex. Clinical Hospital Lab.

Biosafety Level 3 (BSL-3) – Involves practices used by labs that work with agents with the potential to cause serious and lethal disease via the inhalational route of exposure, so workers are immunized against agents in question. Workers use safety cabinets, respiratory protection, and scrub suits that are exchanged upon exiting the negatively pressurized lab. Ex. State Health Department Lab.

Biosafety Level 4 (BSL-4) – Involves practices used by labs working with highly infectious, hazardous human pathogens via the inhalational route. They typically differ from BSL-3 labs in that no vaccine or antibiotic therapy is available. Strict and sophisticated engineering controls are used and personnel wear sealed positive pressure "space suits" with supplied air after entering the negatively pressurized lab through a series of changing and showering rooms. Ex. Labs at the CDC, the USAMRIID, the Canadian Science Center for Human and Animal Health.

Cieslak, Theodore J.; Christopher, George W.; Etizen, Edward M, Jr. (2005) Chapter 9: Bioterrorism Alert for Healthcare Workers. In: Fong, I.W. and Alibek, Ken, eds. *Bioterrorism and Infectious Agents*. New York: Springer.

Appendix B
CDC's Category of Agents

Category A

The US public health system and primary healthcare providers must be prepared to address various biological agents, including pathogens that are rarely seen in the United States. High-priority agents include organisms that pose a risk to national security because they:

- can be easily disseminated or transmitted from person to person;
- result in high mortality rates and have the potential for major public health impact;
- might cause public panic and social disruption; and
- require special action for public health preparedness.

Agents/Diseases

- Anthrax (*Bacillus anthracis*)
- Botulism (*Clostridium botulinum* toxin)
- Plague (*Yersinia pestis*)
- Smallpox (variola major)
- Tularemia (*Francisella tularensis*)
- Viral hemorrhagic fevers (filoviruses [e.g., Ebola, Marburg] and arenaviruses [e.g., Lassa, Machupo])

Category B

Second highest priority agents include those that:

- are moderately easy to disseminate;
- result in moderate morbidity rates and low mortality rates; and
- require specific enhancements of CDC's diagnostic capacity and enhanced disease surveillance.

Agents/Diseases

- Brucellosis (*Brucella* species)
- Epsilon toxin of *Clostridium perfringens*
- Food safety threats (e.g., *Salmonella* species, *Escherichia coli* O157:H7, *Shigella*)
- Glanders (*Burkholderia mallei*)
- Melioidosis (*Burkholderia pseudomallei*)
- Psittacosis (*Chlamydia psittaci*)
- Q fever (*Coxiella burnetii*)
- Ricin toxin from *Ricinus communis* (castor beans)
- Staphylococcal enterotoxin B
- Typhus fever (*Rickettsia prowazekii*)
- Viral encephalitis (alphaviruses [e.g., Venezuelan equine encephalitis, eastern equine encephalitis, western equine encephalitis])
- Water safety threats (e.g., *Vibrio cholerae*, *Cryptosporidium parvum*)

Category C

Third highest priority agents include emerging pathogens that could be engineered for mass dissemination in the future because of:

- availability;
- ease of production and dissemination; and
- potential for high morbidity and mortality rates and major health impact.

Agents

- Emerging infectious diseases such as Nipah virus and hantavirus

CDC, [Online]

Appendix C

Estimated Costs Associated with the Anthrax Attacks in 2001

Source of Cost	Basis of Calculation	Total
Tests by laboratories associated with CDC on 125,000 clinical specimens and 1 million environmental specimens	$25-$30 per test	$30 million
CDC Personnel	5,000 individuals at $800 per week for 6 weeks	$24 million
Prophylactic antibiotics associated medical care	30,000 individuals, $10 each day for 60 days	$18 million
FBI Personnel	251,000 persons-hours (through January 2004) at $25 per hour	$6 million
Decontamination of Hart Senate Office Building	Publicly Reported	$42 million
Decontamination of US Postal facilities plus preparedness measures	Publicly Reported	$1.7 billion
Reduced Mail Revenue	October 2001-June 2002 compared with equivalent period 1 year later	$2.7 billion
Additional Costs: • State and local health and law enforcement • Clinical and environmental tests at military laboratories • Medical and hospital care for victims and the "worried well" • Lost work time and relocations associated with affected facilities • Lawsuits by victims and families • Ongoing FBI Investigation		$1-$2 billion
Grand Total (likely): >$6 billion		

(Cole, 2006, 170)--Based on his personal communications with officials from the CDC, FBI and US Postal Service, along with several other references.

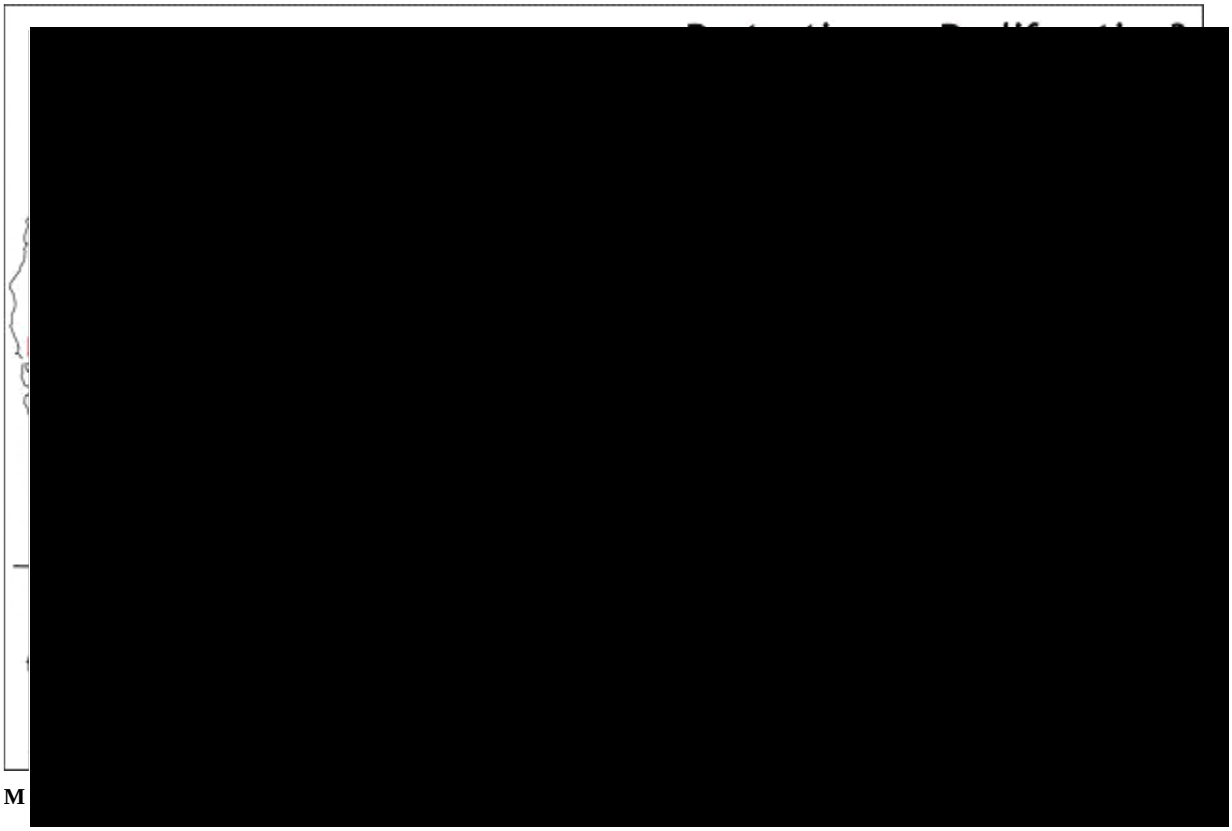
Appendix D

Homeland Security Presidential Directives

HSPD-3	March 2002	Establishes a Homeland Security Advisory System to provide a comprehensive and effective means to disseminate information regarding the risk of terrorist acts to Federal, State and local authorities and to the American people. It designated five "Threat Conditions" that would increase as the risk of the threat increases. (Bush White House, March 2002)
HSPD-4/NSPD-17: National Strategy to Combat Weapons of Mass Destruction	December 2002	"Calls for a strategy to comprehensively counter the WMD threat based on strengthening counterproliferation, nonproliferation, and consequence management. Also included are enabling functions that need be pursued on a priority basis: intelligence collection and analysis on WMD, delivery system technology, research and development on response to evolving threats; bilateral and multilateral cooperation; and targeted strategies against hostile states and terrorists" (Obama White House).
HSPD- 2: Combating Terrorism Through Immigration Policies	October 2001	Sets out the use of immigration policies to combat terrorism and, more importantly, paved the way for student immigration policies through which the US "prohibits certain students from receiving education and training in certain sensitive areas" (Bush White House, October 2001).
HSPD-9: Defense of United States Agriculture and Food	December 2003	"Establishes a national policy to defend the agriculture and food system against terrorist attacks, major disasters, and other emergencies" (Obama White House).
HSPD-10/NSPD-33: Biodefense for the 21st Century	April 2004	Establishes a comprehensive framework biodefense program of which the components are: threat awareness, prevention and protection, surveillance and detection, and response and recovery (Bush White House, April 28, 2004). This HSPD was responsible for the creation of the National Biodefense Analysis and Countermeasure Center and it directly increased funding for new vaccines, intelligence initiatives, biosurveillance, and mass casualty care, including decontamination (Ryan et al., 2008, 216-7).
HSPD 18: Medical Countermeasures against Weapons of Mass Destruction	January 2007	"Establishes policy guidelines to draw upon the public and private sector scientific communities to address medical countermeasure requirements relating to CBRN threats" (Obama White House). Assigns priorities to the development of effective medical countermeasures, including the promotion of new vaccines and drugs to prevent or mitigate adverse health effects caused by exposure to biological agents (Ryan et al., 2008, 217).
HSPD-21: Public Health and Medical Preparedness	October 2007	"Establishes a national strategy based on biosurveillance, countermeasure distribution, mass casualty care, and community resilience to protect the American people against all kinds of disasters" (Obama White House). Most importantly this directive outlines a strategy to achieve better coordination across levels of government, jurisdictions and disciplines and promotes the engagement of private sector, academia, individuals, families and nongovernment entities in preparedness and response efforts (Ryan et al., 2008, 217-8). This directive tackles a major gap in existing law that could have made a great deal of difference after the 2001 attacks.

Appendix E

[redacted]



Bibliography

Primary Sources:

AARC (Assignation Archives and Research Center) Public Library (September 16, 1975) 'Intelligence Activities – Unauthorized Storage of Toxic Agents.' [Online] Available at: http://www.aarclibrary.org/publib/church/reports/vol1/html/ChurchV1_0003b.htm [Accessed 8 December 2010].

Bush White House. 'Project Biosheild.' [Online] Available at: http://georgewbush-whitehouse.archives.gov/infocus/bioshield/ [Accessed 30 October 2011].

Bush White House (October 29, 2001) 'HSPD 2: Combating Terrorism Through Immigration Policies.' [Online] Available at: http://georgewbush-whitehouse.archives.gov/news/releases/2001/10/20011030-2.html [Accessed 12 July 2012].

Bush White House (March 2002) 'HSPD-3.' [Online] Available at: http://georgewbush-whitehouse.archives.gov/news/releases/2002/03/20020312-5.html [Accessed 30 October 2011].

Bush White House (April 28, 2004) 'HSPD-10/NSPD-33: Biodefense for the 21st Century.' [Online] Available at: http://www.fas.org/irp/offdocs/nspd/biodef.html [Accessed 12 July 2012].

CDC, 'Bioterrorism List of Agents/Diseases.' (Appendix B) [Online] Available at: http://emergency.cdc.gov/agent/agentlist-category.asp#catdef [Accessed 1 June 2012].

Center for Biosecurity UPMC (June 11, 2012). 'Federal Biodefense Spending Reduced'. [Online] Available at: http://www.upmc-biosecurity.org/website/about_us/pressroom/archive/2012-06-11_fedfunding.html [Accessed 11 June 2012].

DHS (2011) 'Overview of FY 2012 Budget.' [Online] Available at: http://www.dhs.gov/xlibrary/assets/budget-bib-fy2012-overview.pdf [Accessed 27 October 2011].

(FBI) Federal Bureau of Investigation. (August, 6, 2008) 'Closing the Anthrax Investigation.' [Online] Available at: http://www.fbi.gov/news/stories/2008/august/amerithrax080608a [Accessed 18 November 2010].

(FBI) Federal Bureau of Investigation. 'Amerithrax or Anthrax Investigation.' [Online] Available at: http://www.fbi.gov/about-us/history/famous-cases/anthrax-amerithrax [Accessed 18 November 2010].

GAO (Government Accountability Office) (September 13, 2012) 'Biosurveillance Observations on BioWatch Generation-3 and Other Federal Efforts.' [Online] Available at: http://www.gao.gov/assets/650/648265.pdf [Accessed 18 September 2012].

GPO (Authenticated U.S. Government Information) 'H.R. 3448: Public Health Security and Bioterrorism and Response Act.' [Online] Available at: http://www.gpo.gov/fdsys/pkg/BILLS-107hr3448enr/pdf/BILLS-107hr3448enr.pdf [Accessed 12 April 2012].

GPO (Authenticated U.S. Government Information) 'H.R. 3162: Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism (USA Patriot Act) of 2001.' [Online] Available at: http://www.gpo.gov/fdsys/pkg/PLAW-107publ56/html/PLAW-107publ56.htm [Accessed 12 July 2012].

Graham, Bob, U.S. Sen.; Talent, Jim, U.S. Sen., et al. (December 2008) 'World at Risk: The Report of the Commission on the Prevention of WMD Proliferation and Terrorism.' [Online] New York: Vintage Books. Available at: http://documents.scribd.com/docs/15bq1nrl9aerfu0yu9qd.pdf [Accessed 19 May 2011].

Graham, Bob, U.S. Sen.; Talent, Jim, U.S. Sen., et al. (October 2011) 'The Bipartisan WMD Terrorism Research Center Bio-Response Report Card.' [Online] Available at: http://www.wmdcenter.org/wp-content/uploads/2011/10/bio-response-report-card-2011.pdf [Accessed 23 September 2011].

Hart, Gary & Rudman, Warren, U.S. Commission on National Security. (2002) 'America Still Unprepared, America Still in Danger.' [Online] Available at: http://www.dleg.state.mi.us/mpsc/reports/AmStillUnprep.pdf [Accessed 15 May 2012].

Hough, Andrew; Hazell, Ben; Henderson, Barney & Bloxham, Andy (February 24, 2011) 'Libya protests: as it happened Feb 24.' *The Telegraph*. [Online] Available at: http://www.telegraph.co.uk/news/worldnews/africaandindianocean/libya/8346916/Libya-protests-as-it-happened-Feb-24.html [Accessed 24 February 2011].

(IOM) Institute of Medicine. (2002) 'The Future of the Public's Health in the Twenty-First Century.' Washington, DC: National Academy Press. [Online] Available at: http://www.nap.edu/openbook.php?record_id=10548&page=R1 [Accessed 12 May 2012].

Library of Congress (LOC). (1989) 'S.993--Biological Weapons Anti-Terrorism Act of 1989.' Available at: http://thomas.loc.gov/cgi-bin/query/z?c101:S.993.ENR: [Accessed 12 September 2011].

Lieberman, Joe, U.S. Senator. (2011) 'Homeland Security and Government Affairs.' [Online] Available at: http://lieberman.senate.gov/index.cfm/issues-legislation/homeland-security-and-governmental-affairs [Accessed 24 October 2011].

Margolin, Josh. (September 18, 2012) 'Nightmare State of Anti-Bioterror Plan.' *New York Post*. [Online] Available at: http://www.nypost.com/p/news/national/nightmare_state_of_anti_bioterror_1MnkiD9FQrTPr7CcEA2yLN [Accessed 18 September 2012].

McNeil, Jr., Donald. (March 12, 2013) 'Wary of Attack with Smallpox, U.S. Buys up a Costly Drug' *The New York Times*. [Online] Available at: http://www.nytimes.com/2013/03/13/health/us-stockpiles-smallpox-drug-in-case-of-bioterror-attack.html?pagewanted=all&_r=4& [Accessed March 12, 2013].

(NCTA) National Commission on Terrorist Attacks. (2004) 'Overview of the Enemy.' Staff Statement No. 15. [Online] Available at: http://govinfo.library.unt.edu/911/staff_statements/staff_statement_15.pdf [Accessed 17 July 2012].

Negroponte, John D. (June 21, 2006) 'Declassified National Ground Intelligence Center Report.' [Online] Available at: http://www.foxnews.com/projects/pdf/Iraq_WMD_Declassified.pdf [Accessed 26 September 2012].

NIAID (National Institute of Allergy and Infectious Diseases) [Last Updated September 12, 2012] 'Current National Biocontainment Laboratories (NBL) and Regional Biocontainment Laboratories (RBL)' (Map 1 of Appendix E) [Online] Available at: http://www.niaid.nih.gov/labsandresources/resources/dmid/nbl_rbl/Pages/site.aspx [Accessed 25 September 2011].

Norris, Melinda. (2012) Information on Fort Detrick. (E-Mail with Member of Staff at Detrick) (Personal Communication 2012).

NSDD 189: 'National Policy on the Transfer of Scientific, Technical and Engineering Information.' (September 21, 1985) [Online] Available at: http://www.partneringforcompliance.org/documents/nsdds.pdf [Accessed 12 July 2012].

Obama White House. 'Biosecurity.' [Online] Available at: http://www.whitehouse.gov/administration/eop/ostp/nstc/biosecurity [Accessed 12 July 2012]

O'Toole, Tara, Dr., (February 28, 2002) 'Department of Health and Human Services Budget Priorities for FY 2003.' Testimony before U.S. House of Representatives Committee on the Budget. [Online] Center for Biosecurity of UPMC. Available at: http://www.upmc-biosecurity.org/website/resources/To%20USG/Testimony_Briefings/2002/20020228FY2003budgetpriorities.html [Accessed 31 July 2011].

PBS. (October 10, 2011) 'The Anthrax Files.' [Online] Available at: http://video.pbs.org/video/2151158114/ [Accessed on October 14, 2011].

(MSEHPA) The Center for Law and Public Health at Georgetown and Johns Hopkins Universities. (December 21, 2001) 'The Model State Emergency Health Powers Act.' [Online] Available at: http://www.publichealthlaw.net/MSEHPA/MSEHPA.pdf [Accessed 12 July 2012].

University of Bradford at the request of the President of the Seventh Review Conference. 'Status of the Convention.' Biological and Toxin Weapons Convention (BTWC) Website. [Online] Available at: http://www.opbw.org/ [Accessed 25 October 2010].

U.S. Census Bureau. (April 27, 2010) 'New Census Bureau Report Analyzes Nation's Linguistic Diversity.' [Online] Available at: http://www.census.gov/newsroom/releases/archives/american_community_survey_acs/cb10-cn58.html [Accessed 12 July, 2012].

U.S. Commission on National Security/21st Century. (31 January 2001) 'Road Map for National Security: Imperative for Change.' Phase 3 Report. Washington, D.C. pp viii. [Online] Available at: http://govinfo.library.unt.edu/nssg/PhaseIIIFR.pdf [Accessed 31 July 2012].

White House. (2011) 'Homeland Security.' [Online] Available at: www.whitehouse.gov/issues/homeland-security/ [Accessed on 10 October 2011]

Secondary Sources:

Ahlers, Mike M. & Todd, Brian, (December 21, 2010) 'Al Qaeda Group Contemplated Poisoning Food in U.S., Officials Say.' *CNN*. [Online] Available at: http://articles.cnn.com/2010-12-21/us/al.qaeda.poison.plot_1_threat-stream-food-supply-al-qaeda-group?_s=PM:US. [Accessed 1 July 2011].

Alibek, Kenneth; Lobanova, Catherine; Popov, Serguei. (2005) 'Anthrax: A Disease and a Weapon.' In: Fong, I.W. and Alibek, Ken, eds. *Bioterrorism and Infectious Agents*. New York: Springer.

Baily, Martin N. (2001) Stirred Not Shaken: 'The Economic Repercussions.' In: Hoge, Jr., James F., and Rose, Gideon, eds. *How Did This Happen?* New York: Public Affairs. pp. 269-282.

Betts, Richard K. (2005): 'Maybe I'll Stop Driving.' *Terrorism and Political Violence*, Volume 17: Issue 4, pp. 507-510 [Online] Available at: http://dx.doi.org/10.1080/095465591009412 [Accessed 1 October 2012].

Block, Steven. (January-February 2001) 'The Growing Threat of Biological Weapons.' *American Scientist.* Vol. 89, (No. 1). Page: 28. [Online] Available at: http://www.americanscientist.org/issues/feature/the-growing-threat-of-biological-weapons/1 [Accessed 16 November 2010].

Butler, Richard. (2001) 'Germ Wars: The Biological Threat From Abroad.' In: Hoge, Jr., James F., and Rose, Gideon, eds. *How Did This Happen?* New York: Public Affairs. pp. 211-215.

Carr, Matthew. (2011) *The Infernal Machine*. London: Hurst & Company.

Cieslak, Theodore J.; Christopher, George W.; Etizen, Edward M, Jr. (2005) 'Chapter 9: Bioterrorism Alert for Health Care Workers.' In: Fong, I.W. and Alibek, Ken, eds. *Bioterrorism and Infectious Agents*. New York: Springer. (Appendix A)

Clark, William R. (2008) *Bracing for Armageddon?* New York: Oxford University Press.

Clarke, Robin; Robinson, J. Perry. (1968) 'Chapter 9: United Kingdom.' In: Rose, Steven, ed. *Chemical and Biological Warfare*. London: George G. Harrap & Co.Ltd.

Clarke, Robin. (1968) *We All Fall Down.* London: Allen Lane the Penguin Press.

Cole, Leonard A. (2009) *The Anthrax Letters.* New York: Skyhorse Publishing.

Cole, Leonard A. (2006) 'Chapter 11: WMD and Lessons from the Anthrax Attacks.' In: Kamien, David G. ed. *The McGraw-Hill Homeland Security Handbook.* New York: McGraw-Hill Companies, Inc. pp. 157-174.

Cole, Matthew (November 21, 2010) 'Al Qaeda Promises U.S. Death by a 'Thousand Cuts.' *ABC News*. [Online] Available at: http://abcnews.go.com/Blotter/al-qaeda-promises-us-death-thousand-cuts/story?id=12204726. [Accessed 1 July 2011].

Dolnik, Adam. (2007) *Understanding Terrorist Innovation*. London: Routledge

Doyle, Charles. (June 3, 1996) 'Antiterrorism and Effective Death Penalty Act of 1996: A Summary' [Online] Available at: http://www.fas.org/irp/crs/96-499.htm [Accessed 22 September 2012].

Emergency Management Magazine. (September 18, 2012) 'Anthrax Vaccine Trial Distribution Could Begin in 2013.' [Online] Available at: http://www.emergencymgmt.com/health/Anthrax-Vaccine-Trial-Distribution-2013.html [Accessed 23 September 2012].

Enserink, Martin; Kaiser, Jocelyn. (March 4, 2005) 'Has Biodefense Gone Overboard?' *Science.* Vol. 307. (No. 5714) pp: 1396-1398. Available through: JSTOR database. [Accessed 15 April 2010].

(FAS) Federation of American Scientists. (March 2, 2010) 'National Security Presidential Directives.' [Online] Available at: http://www.fas.org/irp/offdocs/nspd/ [Accessed 10 October 2011]

Fielder, Elizabeth. (September 2, 2011) 'Complacency, Lack of Funds Weaken U.S. Defense against Bioterrorism.*' Newsworks.* [Online] Available at: http://www.newsworks.org/index.php/health-science/item/25948-complacency-lack-of-funds-weaken-us-defense-against-bioterrorism [Accessed 2 September 2011]

Fisher, Louis. (2003) 'Deciding on War Against Iraq: Institutional Failures.' *Political Science Quarterly*. Vol. 118. (No. 3) [Online] Available at: http://www.loc.gov/law/help/usconlaw/pdf/PSQ-Fisher.pdf [Accessed 24 May 2011].

Flynn, Stephen E. (2001) 'The Unguarded Homeland.' In: Hoge, Jr., James F., and Rose, Gideon, eds. *How Did This Happen?* New York: Public Affairs. pp. 183-197.

Forest, James J.F. (2007) 'Terrorist Use of WMD.' In: Kindt, Michael T., Post, Jerrold M., Schneider, Barry R., eds. *Know Thy Enemy II.* Maxwell Air Force Base, Alabama: USAF Counterproliferation Center.

Frank, Erica. (September 10, 2005) 'Funding the Public Health Response to Terrorism: Has Cut Finds for Common Chronic Diseases: And for Disaster Relief in New Orleans.' *British Medical Journal*. Vol. 331 (No. 7516) pp. 526-527. Available through: JSTOR database. [Accessed 26 October 2010].

Friedman, Benjamin H. (2010) 'Managing Fear: The Politics of Homeland Security.' In: Friedman, Benjamin H., Harper, Jim, Preble, Christopher A., eds. *Terrorizing Ourselves*. Washington, D.C.: CATO Institute.

Garrett, Laurie. (2001) 'Countering Bioterrorism: Who's in charge?' In: Hoge, Jr., James F., and Rose, Gideon, eds. *How Did This Happen?* New York: Public Affairs. pp. 217-224.

Gerstein, Daniel M. (2009) *Bioterror in the 21st Century*. Annapolis, Maryland, USA: Naval Institute Press.

Guillemin, Jeanne. (2005) *Biological Weapons: From the Invention of State-Sponsored Programs to Contemporary Bioterrorism*. New York: Columbia University Press.

Gursky, Elin A. (2006) 'Chapter 45: Moving Target: Biological Threats to America.' In: Kamien, David G., ed. *The McGraw-Hill Homeland Security Handbook.* New York: McGraw-Hill Companies, Inc. pp. 703-719.

Hasan, Tahara. (2003) *Anthrax Attacks Around The World*. New York: The Rosen Publishing Group, Inc.

Hersh, Seymour M., (1968) *Chemical and Biological Warfare: America's Hidden Arsenal*. London: MacGibbon & Kee.

Johnson, Loch K. (2000) *Bombs, Bugs, Drugs and Thugs: Intelligence and Americas Quest for Security*. New York: New York University Press.

Jones, Brent (October 10, 2011) (Figure 1.) 'Amerithrax Attacks 2001.' In: Koenig, Robert. 'Case Closed, Circumstantial Evidence Strong.' *Saint Louis Beacon.* [Online] Available at: https://www.stlbeacon.org/#!/content/15043/case_closed_circumstantial_evidence_strong_but_doubts_persist_in_anthrax_case [Accessed 11 October 2011].

Kaiser, Jocelyn. (September 2, 2011) 'Taking Stock of the Biodefense Boom.' *Science Magazine*. Vol. 333. pp. 1214-15. Published by AAAS. Available through: PubMed database. [Accessed 1 November 2011].

Khademian, Anne M. (2006) 'Chapter 70: The Politics of Homeland Security.' In: Kamien, David G., ed. *The McGraw-Hill Homeland Security Handbook*. New York: McGraw-Hill Companies, Inc. pp. 1091-1114.

Kirkwood, R. Cort, 2011. 'Coburn: GAO Report Makes Congress "Look Like Jackasses"' *New American,* [online] 3 March. Available at: http://www.thenewamerican.com/index.php/usnews/politics/6541-coburn-gao-report-makes-congress-look-like-jackasses [Accessed 4 March 2011].

Langer, Elinor. (1968) 'Chapter 10: United States.' In: Rose, Steven, ed. *Chemical and Biological Warfare*. London: George G. Harrap & Co.Ltd.

Latter, Richard. (October 1991) Wilton Park Arms Control Seminar on Chemical and Biological Weapons: 20-22 September 1991. *Wilton Park Paper 46: Controlling Chemical and Biological Weapons Proliferation.* London: HMSO.

Latter, Richard. (November 1993) Wilton Park Arms Control Seminar IV: 24-26 September 1993: 'Controlling Biological Weapons.' *Wilton Park Paper 79: Curbing Biological Weapons Proliferation.* London: HMSO.

Latter, Richard. (October 1995) Wilton Park Arms Control Seminar VI: 29 September to 1 October 1995: 'Verification of the Biological Weapons Convention.' *Wilton Park Paper 109: Preventing the Proliferation of Biological Weapons*. London: HMSO.

Latter, Richard. (January 1997) Wilton Park Arms Control Seminar VII: 27-29 September 1996: 'Deterring Biological Warfare: What Needs to be done?' *Wilton Park Paper 124: Biological Weapons: The Growing Threat*. London: HMSO.

Leitenberg, Milton. (2010) 'Assessing the Threat of Bioterrorism.' In: Friedman, Benjamin H., Harper, Jim, Preble, Christopher A., eds. *Terrorizing Ourselves*. Washington, D.C.: CATO Institute.

Màlek, Ivan. (1968) 'Chapter 4: Biological Weapons.' In: Rose, Steven, ed. *Chemical and Biological Warfare*. London: George G. Harrap & Co.Ltd.

Markowitz, Gerald; Rosner, David. (2004) 'Emergency Preparedness, Bioterrorism, and the States: The First Two Years after September 11.' New York: Milbank Memorial Fund. [Online] Available at: http://www.milbank.org/reports/SEPT110406/SEPT110406.pdf. [Accessed 13 September 2011].

Matishak, Martin. (October 13, 2011) 'U.S. Receives Poor Marks in Latest Biodefense Report Card.' *Global Security Newswire.* [Online] Available at: http://gsn.nti.org/gsn/nw_20111013_2213.php [Accessed 13 October 2011].

Meyerson, Laura and Reaser, Jamie. (2003) 'Bioinvasions, Bioterrorism and Biosecurity.' *The Ecological Society of America*. Vol. 1 (No. 6) pp.307–314 [Online] Available at:

http://nrs.uri.edu/labs/invasive/PdfReprints/Meyerson&Reaser2003_FrontEcolEnv.pdf [Accessed 10 October 2011].

Miller, Seumas. (2009) *Terrorism and Counter-Terrorism: Ethics and Liberal Democracy.* Malden, MA, USA: Blackwell Publishing.

Morse, Anne. (Winter, 2002) 'Bioterrorism Preparedness for Local Health Departments.' *Journal of Community Health Nursing.* Vol. 19 (No. 4) pp. 203-211. Available through: JSTOR database. [Accessed 15 April 2010].

Mueller, John. (2006) *Overblown*. New York: Free Press.

Novick, Lloyd F.; Marr, John S. (2003) *Public Health Issues in Disaster Preparedness: Focus on Bioterrorism*. Sudbury, MA: Jones and Bartlett Publishers, Inc.

NTI (Nuclear Threat Initiative) (November 2011) 'Libya: Biological.' Produced by: James Martin Center for Nonproliferation Studies at the Monterey Institute of International Studies. [Online] Available at: http://www.nti.org/country-profiles/libya/biological/ [Accessed 10 July 2011].

Nye, Joseph S., Jr., (2001) 'Government's Challenge: Getting Serious about Terrorism.' In: Hoge, Jr., James F., and Rose, Gideon, eds. *How Did This Happen?* New York: Public Affairs. pp. 199-209.

OECD International Futures Program. (2008-2009) 'Legislation Around the World – Biological Legislation Information.' [Online] Available at: http://www.biosecuritycodes.org/leg.htm [Accessed 8 December 2010].

Osterholm, Michael T.; Schwartz, John. (2000) *Living Terrors*. New York: Dell Publishing.

O'Sullivan, Terrence M. (2006) 'Chapter 12: Biological Terrorism: Risks and Responses.' In: Kamien, David G. ed. *The McGraw-Hill Homeland Security Handbook.* New York: McGraw-Hill Companies, Inc. pp. 175-193.

Perez, Evan; Gorman, Siobhan; Fields, Gary; Williamson, Elizabeth. (August, 7, 2008). 'FBI Paints Chilling Portrait Of Anthrax-Attack Suspect.' *Wall Street Journal* [Online] Available at: http://online.wsj.com/article/SB121802782147216721.html [Accessed 16 November 2010].

Pilch, Richard F. (2002) 'The Bioterrorist Threat in the United States.' In: Howard, Russell, Sawyer, Reid. eds. *Terrorism and Counterterrorism (Second Edition): Understanding the New Security Environment*. Dubuque, Iowa: McGraw Hill Contemporary Learning Series. pp. 263-297.

Rapoport, David C. (2001) 'Terrorism and Weapons of the Apocalypse.' In: Sokolski, Henry, Ludes, James, M., *Twenty-First Century Weapons Proliferation*. London: Frank Cass.

Reppert, Barton. (April 2005). 'The Biodefense Buildup: Fallout for Other Research Areas.' *BioScience*, Vol. 55 (No. 4) p. 310. California: University of California Press. [Online] Available at: http://www.jstor.org/stable/10.1641/0006-3568%282005%29055%5B0310%3ATBBFFO%5D2.0.CO%3B2 [Accessed 01 September 2011].

Runge, Jeffrey. (October 20, 2011) 'Re-examining our bio-defense.' *Politico*. [Online] Available at: http://www.politico.com/news/stories/1011/66427.html [Accessed 28 October 2011]

Ryan, Jeffrey R.; Glarum, Jan. F. (2008) *Biosecurity and Bioterrorism: Containing and Preventing Biological Threats*. Oxford, United Kingdom: Elsevier, Inc.

Saint Louis University Medical Center. (August 30, 2011). 'How Safe Are We? Preparing for the Next Terrorist Attack.' *Newswise*. [Online] Available at:

http://www.newswise.com/articles/how-safe-are-we-preparing-for-the-next-terrorist-attack?ret=/articles/list&category=life&page=1&search%5Bstatus%5D=3&search%5Bsort%5D=date+desc&search%5Bsection%5D=30&search%5Bhas_multimedia%5D= [Accessed on 30 August 2011].

Schmitt, Eric; Shanker, Thom. (August 12, 2011) 'Qaeda Trying to Harness Toxin For Bombs', U.S. Officials Fear. *New York Times*. [Online] Available at: http://www.nytimes.com/2011/08/13/world/middleeast/13terror.html?_r=2&scp=1&sq=qaeda%20ricin&st=cse [Accessed August 12, 2011].

Schneider, Barry R. (November 2007) 'Al Qaeda's Modus Operandi: Anticipating their Target Selection.' In: Kindt, Michael; Post, Jerrold; Schneider, Barry, eds. *Know Thy Enemy II.* Alabama, USA: USAF Counterproliferation Center. pp. 37-63.

Sidel, Mark. (2007) *More Secure Less Free*? Ann Arbor, Michigan: The University of Michigan Press.

Stelter, Leischen. (July 5, 2011) 'Sen. Lieberman: "The threat of a bioterrorism attack keeps me up at night." *Security Director News*. [Online] Available at: http://www.securitydirectornews.com/?p=article&id=sd201107Cy9Ykh [Accessed 13 September 2011].

(SUNS) South-North Development Monitor (May 14, 2011) *Call to destroy remaining smallpox virus stocks.* Biosafety Information Centre [Online] Available at: http://www.biosafety-info.net/article.php?aid=786 [Accessed 15 May 2011].

Suskind, Ron. (2006) *The One Percent Doctrine: Deep Inside America's Pursuit of Its Enemies Since 9/11*. New York: Simon and Schuster.

The Sunshine Project. [Last Updated 20 February 2006] 'High Containment Laboratories and other Facilities of the U.S. Biodefense Program' (Map 2 of Appendix E). Texas: Austin. [Online] Available at: http://www.sunshine-project.org/ [Accessed 24 September 2012].

Thompson, Marilyn W. (2003) *The Killer Strain*. New York: HarperCollins Publishers, Inc.

Tucker, Jonathan B. (November 2003). 'Biosecurity: Limiting Terrorist Access to Deadly Pathogens.' Washington, DC: United States Institute of Peace. [Online] Available at: http://www.usip.org/files/resources/pwks52.pdf [Accessed 21 July 2011].

Waever, Ole. (1995) 'Securitization and Desecuritization.' In: Lipschutz, Ronnie D., ed. *On Security*. New York: Columbia University Press.

Waisbord, Silvio. (2002) 'Journalism, Risk, and Patriotism.' In: Zelizer, Barbie, Allan, Stuart, eds. *Journalism After September 11*. London: Routledge.

Wampler, Dr. Robert, ed. (2001). 'The Nixon Administration's Decision to End U.S. Biological Warfare Programs.' Vol. 3. National Security Archive Electronic Briefing Book No. 58 [Online] Available at: http://www.gwu.edu/~nsarchiv/NSAEBB/NSAEBB58/

Warrick, Joby. (November 30, 2008) 'Bipartisan Report Finds U.S. Vulnerable to Bioterrorism Attack.' *Washington Post* [Online] Available at: http://www.washingtonpost.com/wp-dyn/content/article/2008/11/29/AR2008112901921.html [Accessed on: 30 April 2011].

Willman, David. (2011) *The Mirage Man: Bruce Ivins, the Anthrax Attacks and America's Rush to War*. New York: Bantam Books.

Endnotes

[1] The World Health Organization (WHO) declared the end of the smallpox epidemic on May 8, 1980, and determined that vaccines for the virus were no longer necessary (Cole, 2009, 125). Today, if terrorists groups were able to manufacture the smallpox virus and disperse it, populations that were once universally vaccinated would be defenseless (Garrett, 2001, 218). More than 30 years since its eradication, there has been ongoing debate over whether to destroy the remaining known smallpox virus stocks, which are officially held in two WHO repositories in the U.S. and Russia (SUNS, 2011, 1). There has been a plea to destroy any and all remaining stocks around the world, because scientists say they do not need the live virus to continue to conduct the small amount of research that is being done today (SUNS, 2011, 1). However, some experts are concerned that other smallpox virus stocks may be currently in the wrong hands, which would leave the world defenseless if they were to be utilized. For example, D.A. Henderson, a bioterrorism expert and the individual assigned by the WHO to eradicate smallpox, was shocked to hear from Ken Alibek, the former high-ranking official of the Soviet biological weapons program, that the U.S. and Russia are not the only countries to have smallpox virus stocks (Osterholm et al, 2000, 107). Alibek stated, "We make a very serious error if we assume that only the U.S and Soviet Union have smallpox…. At least ten countries have the agent… I have one hundred percent confidence that North Korea has it" (Osterholm et al, 2000, 107).

[2] This is alarming to bioterrorist experts and possibly foreign countries, because research of anthrax in BSL-3 and BSL-4 laboratories gives the appearance of a cover for offensive bioweapons development research, a program which was said to have supposedly dissolved under the Nixon Administration (Klotz et al., 2009, 9).

[3] While it is important to note the research surrounding the arguments on the topic of bioterrorism, it is equally important to mention the numerous books and online references that have been helpful in developing this thesis. The first group of authors has served as resources for the biological weapons and bioterrorism section. In the 1968 book, *Chemical and Biological Warfare*, academics and bioterrorism experts Robin Clarke, Perry Robinson, Elinor Langer and Ivan Màlek clearly explained the characteristics of biological weapons and the U.S and United Kingdom's biological development programs. In another book published in 1968, also called *Chemical and Biological Warfare*, journalist Seymour Hersh gives a detailed historical perspective on the development of biowarfare prior to 1968. Jeanne Guillemin, author of *Biological Weapons*, published in 2005, gives a more thorough historical outlook on state-sponsored biological weapons programs and contemporary bioterrorism. In the comprehensive textbook, *Biosecurity and Bioterrorism*, Jeffrey Ryan and Jan Glarum have provided useful knowledge on biological agents, as well as prevention and response methodology. Similarly, *Bioterrorism and Infectious Agents* included chapter submissions from numerous academics, including academic and bioterrorism expert, Ken Alibek. Finally, Michael Osterholm and John Schwartz, authors of the book *Living Terrors*, published in 2000, provide a mixture of fictional scenarios that could, ironically, foreshadow the 2001 anthrax attacks, as well as hard facts regarding America's inability to respond. Adam Dolnik, an expert on the Aum Shinrikyo terrorist group, takes a closer look at terrorist groups and their tactics in *Understanding Terrorist Innovation*. Finally, several academics have provided useful information for the anthrax case study analysis. *The Anthrax Letters* by Leonard Cole, *Anthrax Attacks Around the World* by Tahara Hasan, *Amerithrax* by Robert Graysmith, *Death in a Small Package* by Susan Jones, *The Killer Strain* by Marilyn Thompson and *The Mirage Man* by David Willman have all provided insight on the 2001

U.S. anthrax attacks case that continues to have influence over bioterrorism policy and legislation. The analysis in this thesis would not have been possible without these resources and the several others not directly mentioned in this section.

[4] Sverdlovsk was the only active facility, as the other two were built in the event their production needed to be increased (Klotz et al., 2009, 6). During the 1980's, the height of the program, estimated production was up to 5,000 tons of anthrax a year (Klotz et al., 2009, 6).

[5] One covert U.S. counterterrorist program attempted to recreate technology, such as the BWs "bomblets" developed by the former Soviet Union, but it actually produced offensive weapons (O'Sullivan, 2006, 179).

[6] Toxins are chemicals of biological origin and the castor beans that make ricin are relatively easy to acquire (Pilch, 2002, 264).

[7] The ATCC was at the heart of all of the issues, especially when it came under fire in the late 1980's for shipping several varieties of anthrax and other pathogens to Iraq, a misstep that gave a sworn U.S. enemy seed material for a potential bioweapons arsenal (Thompson, 2003, 9). This incident was not the only motivation policymakers had for the tightening of laws. In May 1995, Larry Wayne Harris, a trained microbiologist, a member of an anti-government sect call the Christian Patriots and an officer in a neo-Nazi group called the Aryan Nations, ordered from the ATCC three vials of freeze-dried *Yersinia pestis*, the bacterium that causes the bubonic and other forms of plague (Clark, 2008, 37). Harris printed a fake letterhead, using a made-up scientific laboratory name with his home address in Lancaster, Ohio, and an Environmental Protection Agency (EPA) license number assigned to his employer, a microbial testing company in nearby Columbus, Ohio (Clark, 2008, 37). The ATCC was suspicious and alerted the Atlanta CDC that immediately contacted the public health authorities in Lancaster, Ohio, to arrest him (Clark, 2008, 37). Harris pleaded guilty to a federal wire-fraud charge and received a $50 fine and 18-month probation (Clark, 2008, 37). While still on probation, Harris, who constantly lied about working for the CIA and FBI as a bioweapons expert, broadcasted that he would be testing a machine on weaponized anthrax (Clark, 2008, 38). The FBI tracked him down and arrested him and a HazMat unit confiscated the anthrax, which was of the same grade as the anthrax Aum Shinrikyo had that was used for animal vaccines (Clark, 2008, 38). Larry Wayne Harris was finally tried again in federal court for violation of his probation, but when he was sentenced, he received an extension on his probation of just five months and was again released (Clark, 2008, 38).

[8] In 1976, an inhalational anthrax case was recorded when a California weaver was infected by anthrax spores in yarn made from Pakistani wool (Cole, 2009, 17).

[9] The modern world's largest cutaneous outbreak surfaced in Zimbabwe between 1979 and 1985, where 10,000 cases were believed to be a result of an experiment in germ warfare by the Rhodesian military (Thompson, 2003, 8).

[10] On September 18 2001, at least two letters containing anthrax spores were mailed from the Trenton, New Jersey (NJ), area (Alibek et al, 2005, 7). The NBC studio received an anthrax-laden letter addressed to news anchor, Tom Brokaw, on September 25, 2001 (Hasan, 2003, 49). The editor of the *New York Post* also received one around the same time (Alibek et al, 2005, 7). A probable third contaminated letter was sent to the media outlets in Boca Raton, Florida, but the letter was incinerated before experts could review it. A timeline could be established given that the first Florida victim entered the hospital on October 1, 2001 (Cole, 2009, 22). The final round of letters were mailed on October 9, 2001, from the Trenton, NJ, area (nearly three weeks later), and made their way to the Hamilton, NJ, post office and then

on to the Washington, D.C., Brentwood facility, before their final stop at the offices of U.S. Senators Tom Daschle and Patrick Leahy (Alibek et al, 2005, 7). It was assumed that one letter was mistakenly routed to the U.S. Department of State's processing unit before making its way to Senator Leahy's office (Cole, 2009, 90). On October 15, 2001, a member of U.S. Senator Tom Daschle's staff opened one of the letters filled with anthrax (Cole, 2009, vii).

[11] AMI owned the *Sun*, the *National Enquirer* and the *Globe* (Cole, 2009, 2).

[12] The Ames strain has been widely used in vaccine studies and is one of 89 known genetic variations of anthrax (Hasan, 2003, 54). It became known as the Ames strain because the USAMRIID wanted a wild-type strain and contacted a U.S. Agricultural Laboratory in Ames, Iowa, to obtain one (Thompson, 2003, 28).

[13] Hatfill gave the FBI good reason to suspect him, as it was hard for officials to determine the truth from the lies on his resume (Thompson, 2003, 191). Hatfill had claimed to be a member of the U.S. Army Special Forces and to have a Ph.D. in molecular biology, but both of those turned out to be false (Thompson, 2003, 191). In fact, after falsifying documents to show that he had a doctorate, it took the federal authorities two years to revoke his security clearance (Thompson, 2003, 192). Amid the highly publicized scrutiny, Hatfill still managed to land a $150,000 job at Louisiana State University teaching public safety personnel how to respond to acts of terrorism, however, a Justice Department administrator ordered the university to terminate his contract, since it was funded by a grant from the his agency (Willman, 2011, 172). As a result, Hatfill's character and reputation were destroyed by the FBI's investigation. He then filed a lawsuit and five years later was awarded a $5.82 million payout from the Justice Department and the FBI (Willman, 2011, 304).

[14] Coincidentally, Dr. Ivins was the reason an electronic access card was installed in the laboratories after he told the USAMRIID Commander, Charles Bailey, about a young woman at a swimming pool asking for blueprints of the offices, labs and animal pens during a time when animal rights activists were breaking into labs to liberate animals used in medical testing (Willman, 2011, 42). It was the same key card system that helped the FBI's case against him.

[15] While growing up, Ivins helped his father in the pharmacy he owned. The anthrax letters were folded twice horizontally and twice vertically with a pinch of anthrax inside, a common style once used among pharmacists (Willman, 2011, 81).

[16] One of Dr. Ivins Commanders, C.J. Peters, recalled, "If Bruce hadn't been on the team, they probably wouldn't have progressed with the next-phase of the vaccine … nobody else had the insight to carry out all the angles on the animal testing" (Willman, 2011, 45).

[17] Bentonite is a chemical additive with a claylike consistency known to have been used by the Iraqis in their suspicious work with a spore-forming, but nonlethal cousin of anthrax (Willman, 2011, 112).

[18] In November 2001, a Connecticut graduate student, Tom Foral, was charged under the U.S.A. Patriot Act after being found in possession of a biological agent (Snyder Sachs, 2003, 32). He saved two vials of anthrax-laced tissue cells from a cow, along with various other pathogens in his laboratory freezer, after being instructed to "clear out" a malfunctioning storage freezer (Snyder Sachs, 2003, 32). The U.S. Attorney spokesperson said he was charged, because "he had never done any research with anthrax, and had no plans to do so" (Snyder Sachs, 2003, 32).