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# The Lingering Specter of Bioterrorism: Assessing Al-Qaeda's Intent and Capability to Use Biological Weapons against the U.S.

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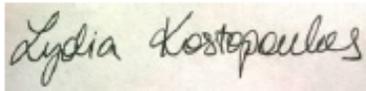
This thesis for the master's degree submitted by

Mason Ryan Davenport

Under the title

The Lingering Specter of Bioterrorism: Assessing Al-Qaeda's Intent and Capability to Use  
Biological Weapons against the U.S.

Has been read by the undersigned. It is hereby recommended for acceptance by the faculty with  
credit to the amount of 3 semester hours.



Dr. Lydia Kostopoulos | May 20<sup>th</sup>, 2014

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THE LINGERING SPECTER OF BIOTERRORISM:  
ASSESSING AL-QAEDA'S INTENT AND CAPABILITY  
TO USE BIOLOGICAL WEAPONS AGAINST THE U.S.

A Master Thesis

Submitted to the Faculty

of

American Public University

by

Mason Ryan Davenport

In Partial Fulfillment of the  
Requirements for the Degree

of

Master of Arts

May 2014

American Public University

Charles Town, WV

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## DEDICATION

I dedicate this thesis to my late grandfather. His enduringly high estimations of my potential instilled in me the confidence necessary for tackling life's biggest obstacles, not the least of which was this academic enterprise.

## ACKNOWLEDGEMENTS

I would like to thank the many peers that I encountered throughout my online studies. Their collective insight and backgrounds were invaluable to rounding out my higher education pursuit. I would especially like to thank Dr. Lydia Kostopoulos, my Capstone course instructor, for all her guidance and advice during the long slog of drafting this thesis; I cannot imagine a more perfect choice of professor for this final lap of instruction.

My studies with American Military University, in the field of Intelligence Studies, have been truly rewarding. As a member of the Intelligence Community, it is my belief that the Masters' curriculum has enabled me to cultivate a far more well-rounded analytical mindset.

## ABSTRACT OF THE THESIS

THE LINGERING SPECTER OF BIOTERRORISM: ASSESSING AL-QAEDA'S  
INTENT AND CAPABILITY TO USE BIOLOGICAL WEAPONS AGAINST THE U.S.

by

Mason Ryan Davenport

American Public University System, May 11, 2014

Charles Town, West Virginia

Professor Lydia Kostopoulos, Thesis Professor

Since 9/11, and the subsequent 2001 postal anthrax attacks, the U.S. government has spent billions of dollars to defend the country against bioterrorism. Yet, examples of bioterrorism in the 21<sup>st</sup> century are noticeably lacking; a litany of academics and scientific experts argue that terror groups, like al-Qaeda, could never conceivably carry out a bioterror attack. This paper examines in-depth the legitimacy of al-Qaeda's reported bioweapons pursuit and the factors necessary to conduct a successful bioterror attack on U.S. soil. Research consisted mainly of qualitative analysis of academic journals, media reports, and official al-Qaeda statements. The results of the study indicated many significant hurdles involved in either acquiring or producing a bioterror agent. Furthermore, al-Qaeda's desire to use bioweapons, long considered to be self-evident, may be diminishing in light of the group's many setbacks. While bioterrorism will always pose a threat to U.S. sovereignty, it is considerably less likely than many policymakers stress, especially in light of post-9/11 biodefense measures.

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**Note:** There are many different interpretations of the anglicized spelling of the 'al-Qaeda' terrorist organization with no clear consensus. In order to achieve consistency throughout this paper, the spelling of the group will be as follows: al-Qaeda. Any direct citations from other works will be modified to incorporate this prescribed spelling; this should not be considered a corruption / misquoting of the original text as it only constitutes a formatting change. This streamlining concept of set spellings shall also apply to other Arabic-origin names in this paper, such as Osama bin-Laden, Ayman al-Zawahiri, etc.

The bottom line on the feasibility of bioterrorism is quite clear. Today, terrorists have ready access to pathogens, the capability to weaponize them, and the means to effectively dispense a biological weapon.

— U.S. Senator Jim Talent, Vice-Chairman,  
Commission on the Prevention of Weapons of Mass  
Destruction Proliferation and Terrorism, June 23, 2011

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It is almost inconceivable that any terrorist organization we know of in the world today, foreign or domestic, could on their own develop, from scratch, a bioweapon capable of causing mass casualties on American soil. It just isn't going to happen.

— William R. Clark, Professor Emeritus of Immunology  
(UCLA), *Bracing for Armageddon?*, 2008

## **The Lingering Specter of Bioterrorism: Assessing Al-Qaeda's Intent and Capability to Use Biological Weapons against the U.S.**

### **INTRODUCTION**

On June 22<sup>nd</sup>, 2001 a group of 14 U.S. senior-level policy makers gathered at Andrews Air Force Base, outside of Washington, D.C.. Over the next two days, these professionals assumed the roles of the country's top tiers of leadership, to include the National Security Council (NSC); they played their parts as they were subjected to a scenario in which the country's infrastructure and social order strained under the weight of an outbreak of smallpox, an infectious disease that hasn't been evidenced in the U.S. since 1949. This was Dark Winter, "the first such exercise of its kind...undertaken to examine the challenges that senior-level policy makers would face if confronted with a bioterrorist attack that initiated outbreaks of highly contagious disease" (O'Toole et al 2002, 972). Dark Winter was scripted to represent 13 days, from first reports of smallpox infection to a swelling of hundreds of thousands of Americans infected, with the expectation that millions could be infected in the coming weeks. The exercise culminated with the news that the pathogen was intentionally released by an extremist group based in the Middle East. As with any exercise, the participants were instructed to consider what lessons could be derived from the scenario presented. 12 major 'lessons learned' were eventually provided by the group but an underlying theme was evident in

every one: Washington was “woefully unprepared” for a bioterror attack (Clark 2008a, 18).

78 days after Dark Winter, the U.S. suffered what is inarguably the most devastating terrorist attack in the nation’s history: 9/11. Terrorism, at the hands of al-Qaeda and other similar-minded groups, moved to the top of the nation’s security priorities. Just one week later, when America’s fears and paranoia about terrorism were still at fever pitch, bioterrorism became a reality in its own right: the nation suffered its first-ever significant act of bioterrorism. Postal letters containing anthrax spores began showing up at several U.S. news outlets and eventually the U.S. Senate. The 2001 anthrax attacks, termed “Amerithrax” by the Federal Bureau of Investigation (FBI), presented the Federal government with “many of the challenges and difficulties faced by the Dark Winter participants” (O’Toole et al 2002, 983). In the end, Amerithrax consisted of seven letters total: 22 people were infected, five of which died as a result. Initially, al-Qaeda was considered a prime suspect; pundits, officials, and average Americans thought the anthrax letters were a second wave of attack after 9/11. The FBI ultimately concluded that the attacks were conducted by an unstable American microbiologist rather than a terrorist organization. Nevertheless, the specter of bioterrorism has hung over the country for more than a decade and, consequently, biodefense has held a place in the top tier of national security priorities throughout that time.

As recently as February of this year, Congresswoman Susan Brooks held a hearing to raise awareness about the “threat of bioterrorism”; she is merely the latest in a long line of U.S. officials to insist that a bioterror attack is more a matter of *when* than *if* (Brooks 2014). Back in 1997, then-Secretary of Defense William Cohen made a dramatic point to national news outlets when he used a five-pound bag of sugar to demonstrate the amount of anthrax needed to cripple Washington D.C. (Leitenberg 2004, 35). Even though later reporting would indicate that Cohen’s assertion failed to account for dispersal problems associated with anthrax spores, it nevertheless set the tone for all bioterrorism reporting to come. The events of 9/11 and Amerithrax further cemented the severity of the threat for most. Accordingly, Washington has to date spent an estimated \$60 billion on biodefense (Spoerl 2011). Congress and the White House have commissioned several bioterrorism-specific reports, the nation’s vaccine stores have been amplified, and American emergency personnel have been compelled to integrate biological response into their training regimens. Yet, despite all of the alarm, the world, let alone the U.S., hasn’t experienced even one bioterror incident since Amerithrax. Moreover, as policymakers such as Congresswoman Brooks continue to beat the drum of biodefense necessity, the connection between al-Qaeda and biological weapons remains as tenuous now as it was twelve years ago.



**Figure 1: Secretary of Defense William Cohen and the Five-pound Bag of Sugar**

The scope and severity of 9/11 has had a lasting impact on the United States; it essentially pushed terrorism to the forefront of American security priorities. Yet, in truth, the quantity and frequency of terrorist attacks upon the U.S. is relatively small when compared with the rest of the world (Plumer 2012). Of those attacks, the number which utilized biological agents is notably low, nigh insignificant when compared with other recent attack trends such as lone gunmen or bombers. It is possible that Washington's fears about al-Qaeda's bioterrorism aims are overblown. The U.S.'s susceptibility to deadly biological agents is undeniable, as it is for nearly every country; however, vulnerability represents only one piece of the bioterror equation. The legitimacy of the threat surrounding terror groups and deadly biological agents is often considered a settled matter. After all, if al-Qaeda had the ingenuity to turn commercial airplanes into missiles, wouldn't it hold that they would regard natural pathogens (viruses and bacteria) as a viable means of attack? Still, fleshing out al-Qaeda's

bioterrorism agenda has continuously bedeviled the U.S. Intelligence Community (IC). The nation's prevailing school-of-thought maintains that, while the chances of a bioterror attack on U.S. soil are notably low, the consequences of such an attack are so extreme as to warrant action regardless. As repeated warnings and estimates of imminent bioterror attacks continually fail to materialize, the chorus of detractors grows: might Washington's allotment of time and money on biodefense be better spent elsewhere?

The purpose of this paper is to address whether or not al-Qaeda actually possesses both the **intent** and the **capability** to attack the U.S. with a biological weapon. Independent research on the intent and capability of non-state actors, with regards to microbial agents, is notably limited. This paper seeks to more clearly define the relationship between al-Qaeda and mankind's deadliest biological agents in the hope that it may afford U.S. policymakers a more accurate picture of the limitations inherent to biological weapons development among terror groups. Furthermore, the research could highlight some key aspects or links within al-Qaeda's overarching biological agenda which could potentially be exploited to disrupt any burgeoning capability. Optimistically, U.S. Intelligence professionals may be able to use the results of this study to streamline analytic effort on bioterrorism issues.

## LITERATURE REVIEW

The Global War on Terrorism (GWOT) has resulted in an immense amount of literature on the topic of bioterrorism. Intriguingly, there is actually a dearth of concise reporting on al-Qaeda's genuine capability to both produce and disperse what the Centers for Disease Control (CDC) refers to as "high-priority agents" (CDC 2014). The majority of academic papers and official reports on the subject tend to view it strictly from the scope of emergency management. Essentially, policymakers and biosecurity experts appear more concerned with whether or not the U.S. is ready to deal with either an intentional or unintentional spread of a pathogen inside its borders than with the realities of terrorists implementing a bioterror attack in the first place.

### **Alarmists vs. Skeptics**

A review of the literature reveals several recurring themes. One of the most common themes, and perhaps the one that is most pertinent to this research, is that al-Qaeda's desire to attack the U.S. via biologic means is a foregone conclusion. Justifications for this assumption are rare, although there are a few authors who attempt to do so, usually by citing how microbial agents are perfectly suited to the terror group's declared goals of "spectacular attack" (Swaine and Gardham 2011). Sammy Salama and Lydia Hansell, writing for *Nonproliferation Review*, note that there is not a lot of

open source research into terrorist's pursuit of weapons of mass destruction (WMD); the authors attempt to dissect al-Qaeda's intent via the group's history and literature (Salama and Hansell 2005).

In the journal *Defense against Weapons of Mass Destruction Terrorism*, Jonathan Tucker writes that "even small-scale incidents of [chemical-biological] terrorism can elicit a disproportionate level of fear", intimating that the attractiveness of these agents to terror groups is a given (Tucker 2009, 148). Christina Hellmich and Amanda Redig's article "The Question is When: The Ideology of al-Qaeda and the Reality of Bioterrorism," places a great deal of emphasis on al-Qaeda's ideological / religious underpinnings as a way to measure the organization's putative biological weapons aims (Hellmich and Redig 2007). The authors note how the collateral damage associated with biological weapons use, especially in the case of children, conflicts with Islamic law; they address the inconsistency by referring to al-Zawahiri's defense of "lax interpretations" when facing a proportionately stronger enemy (U.S.). Similar defenses are used to excuse the tactic of suicide attacks (Hellmich and Redig 2007, 381). Sammy Salama and Lydia Hansell also acknowledge how al-Qaeda views WMD as a way to level the field:

Despite their differences, the one point on which the various factions within [al-Qaeda] unanimously agreed was their view that the United States was a ferocious enemy but a dishonorable adversary. It would not hesitate to annihilate a weaker opponent but would retreat in disarray if faced with a stronger enemy. To that end, the al-Qaeda

leadership agreed to continue to refer to CBRN (Chemical, Biological, Radiological, Nuclear) agents despite their limited operational benefit... (Salama and Hansell 2005, 626)

For some academics, the lack of historical precedence (for bioterror attacks) immediately brings into question the widespread notion that a bioterror attack on the U.S. is looming on the horizon. For example, in the exhaustive Army War College paper, "Assessing the Biological Weapons and Bioterrorism Threat," author Milton Leitenberg notes how "there is an *extremely low* incidence of real biological events" in the 20<sup>th</sup> century (Leitenberg 2005, 21). At present, the lack of any further bioterror incidents since 2001 makes Amerithrax (FBI designation of the postal anthrax attacks) seem all the more anomalous. In the book "Bracing for Armageddon", author William Clark, Professor Emeritus of Immunology in the Department of Molecular, Cell and Developmental Biology at the University of California, devotes an entire chapter to examining the history of bioterrorism. In it, he argues for a distinction between bioterrorism and 'biocrime': the aims of biocrime are "much narrower—short term gains for a restricted number of individuals" (Clark 2008a, 24). Using this definition, cases such as the Rajneesh cult in Oregon (salmonella, 1984) and the right-wing Minnesota Patriots Council (ricin, early '90s) can be viewed as negligible in the overall accounting of bioterrorism in the modern era.

...documented instances of the use of [bioweapons] makes it clear that to date we have seen more *biocrime*, both in America and the world at large, than what we would think of as actual bioterrorism. The perpetrators range from disgruntled individuals acting for a variety of idiosyncratic motives, through loosely defined groups often acting around religious themes. Their skills ranged from essentially zero to moderately sophisticated. The number of people they killed is small by comparison with other, deadlier forms of political terrorism. (Clark 2008a, 28)

Milton Leitenberg also stresses the importance of differentiating between hoaxes / threats and genuine bioterrorism; however, Clark somewhat refutes this idea by pointing out that hoaxes, such as the thousands of white-powder copycats which followed Amerithrax, still elicit the same levels of public anxiety and police investigation as bona fide bioterror acts (Clark 2008a, 24).

### **Bioterrorism Realities**

Another major theme revealed in the literature is the contention that there is a host of inherent dangers and obvious problems associated with both acquiring and developing bioweapons. Salama and Hansell's report, "Does Intent Equal Capability?," actively question al-Qaeda's supposed competency with bioweapons (Salama and Hansell 2005). They address the various difficulties associated with production of biological weapons; namely, problems related to not only securing lethal strains of bacteria but to dispersing them effectively. Salama and Hansell explain that there is a notable disconnect between the terror group's declared desire to acquire

WMD and the technical measures necessary to successfully carry out such an attack: “not only are there basic technical flaws in [al-Qaeda WMD production manuals], but the literature also fails to mention the importance of effective deployment strategies and techniques” (Salama and Hansell 2005, 636).

Clark breaks down the particulars of the most dangerous biological weapons, offering insight into their most disturbing characteristics as well as their noteworthy limitations. He stresses the fact that the “totally indiscriminate” nature of bioweapons makes them an unappealing option, as evidenced by the dearth of wartime bioweapons use in the last century (Clark 2008a, 25). Accordingly, pathogens are problematic for *any* would be bioterrorist. Additionally, the dispersal of biological agents is always a risky venture due to the chance of ‘blowback’—potentially infecting populations that were never intended to be targets. Such occurrences would prove counterproductive for al-Qaeda as it might turn a previously tolerant / supportive community against them. In addition, the group would chance the possibility of bioweapons infecting their own ranks; this scenario may have actually played out when as many as 40 al-Qaeda members in Algeria died after contracting plague (*The Telegraph* 2009). Clark ultimately asserts that the execution of a successful bioterror attack is simply out of reach for groups like al-Qaeda:

It is almost inconceivable that any terrorist organization we know of in the world today, foreign or domestic, could on their own develop, from scratch, a bioweapon capable of causing mass casualties on American soil. It just isn't going to happen. The isolation and purification of the requisite pathogens from nature, although theoretically possible, is far beyond the ability of all but a handful of advanced scientific laboratories in the world. So is development of a mass-scale delivery system for most pathogens. (Clark 2008a, 170-171)

The literature also reveals stark disagreement over the level of education required to cultivate deadly viruses, bacteria, and toxins. Mark Sharoff, a contributor to *Georgetown Public Policy Review* (online edition), claims that "graduate school-level technical expertise" is all that is required to develop lethal agents (Sharoff 2011). In the *Chemical-Biological Warfare (CBW) Magazine* article "Is Bioterrorism Threat Credible?," author Animesh Roul opines that the mere fact al-Qaeda has recruited individuals with a medical background is indicative of a biological weapons program (Roul 2009). Leitenberg finds al-Qaeda's active recruitment of "educated, college graduates" worrisome as well (Leitenberg 2005, 39). William Clark, however, repeatedly makes the case throughout his book that most pathogens are far more fragile than assumed: they require state-of-the-art laboratories and a highly sophisticated level of expertise (Clark 2008a, 31, 165, 171). He specifically calls attention to the Japanese Aum Shinrikyo cult failing to produce any lethal strains of either anthrax or botulinum toxin despite the group's significant bankroll and its "modern, well-equipped scientific research laboratories" (Clark 2008a, 164).

Aside from producing a pathogen from nature, there is also a great deal of discussion surrounding the illicit gathering of already viable stocks of microbial agents. Yet, the literature clearly demonstrates that this area is just as rife with innate difficulties. In the article “Lone Wolf Terrorism and Weapons of Mass Destruction: An Examination of Capabilities and Countermeasures,” author Patrick Ellis, an instructor at the U.S. Air Force Counterproliferation Center, writes the following: “initial observations suggest that advanced security barriers make it difficult for sophisticated autonomous cells...to gain access to such weapons” (Ellis 2014, 220). Among the bioterrorism limitations that Hellmich and Redig identify, “access to materials” sits at the top of the list (Hellmich and Redig 2007, 383).

Even though most contemporary academics view a bioterror attack as an unlikely, though not impossible, scenario, there exists a consensus that “the emergence of new technologies” (Ellis 2014, 220) may make it easier for terrorists to produce bioweapons. In a column for the online journal *World Politics Review*, contributor Richard Weitz laments how “several scientific disciplines...are engaged in activities that, while extraordinarily beneficial in terms of creating new medical treatments and other discoveries, could also help develop new types of biological weapons and their means of delivery” (Weitz 2009). Like Weitz, Mark Sharoff opines that the “life sciences revolution” means it is easier for groups like al-Qaeda to design a bioweapon (Sharoff 2011). Indeed, synthetic biology has already reshaped

America's agricultural sector: crops have been genetically altered to make them more resistant to disease. The potential for abuse in microbiology is apparent. Clark, among others, writes about the immense dangers presented by recombinant DNA technology: pathogens that humanity has effectively countered can now be modified to be more lethal and more contagious than in their present, natural forms (Clark 2008a, 57-60). Alarmingly, even agents which have ever only affected other species could potentially be reengineered with human DNA in order to produce an entirely new threat.

### **Framing the Threat**

A slew of academic papers refute much of Washington's furor over al-Qaeda's bioweapons program. Seemingly, discussions in the Legislative and Executive branches mainly revolve around generalizations or outright misinformation. Rolf Mowatt-Larssen, a former Central Intelligence Agency (CIA) officer, provides a pointed case study in this regard. Titled "Al-Qaeda Weapons of Mass Destruction Threat: Hype or Reality?," the report investigates the veracity of a U.S. government-issued warning from 2003 in which an al-Qaeda WMD attack was predicted within two-year's time (Mowatt-Larssen 2010a). Likewise, a predicted 2013 attack of a biological or chemical nature, as written in 2008 by Congress's Graham/Talent WMD Commission, also failed to materialize (Sharoff 2011). Mowatt-Larssen, a former Director of Intelligence and Counterintelligence at the U.S.

Department of Energy, could be considered one of the foremost authorities on the subject of WMD-terrorism as his work is frequently referenced in other papers. His report presents a chronology of al-Qaeda WMD items of interest from 1998 to 2003, allowing the reader to draw their own conclusions about the legitimacy of the 2003 warning. However, Mowatt-Larssen does pose the question as to whether the threat was “hyped for political purposes” (Mowatt-Larssen 2010a, 9). Leonard Cole’s article in the *Combating Terrorism Center (CTC) Sentinel*, “Bioterrorism: Still a Threat to the United States,” takes D.C. to task over bloated and “misapplied” biodefense spending (Cole 2013, 10). Simply put, Cole’s argument is similar to those of other detractors: Washington excels at exaggerating the bioterrorism threat.

For evidence of Washington’s propensity to overstate the bioterror threat, most scholars refer to standard U.S. bioterror exercise scenarios. Clark emphasizes that these scenarios are “extreme...often inflating the capabilities of the terrorists” (Clark 2008a, 19). Leonard Cole echoes this sentiment, writing that “descriptions of possible bioterrorism scenarios are often hyperbolic” (Cole 2012, 11). Ostensibly, most U.S. bioterrorism exercise scenarios were noted as having a tendency for oversimplification: “scenarios for national biological weapons (BW) exercises that posit various BW agents in advanced states of preparation in the hands of terrorist groups

simply disregard the requirements in knowledge and practice that such groups would need in order to work with pathogens" (Leitenberg 2005, 88).

One of the more unfortunate aspects of the U.S.'s effort to counter bioterrorism is the fact that it may be giving extremists a 'playbook' they didn't previously have: "years of widely broadcast public discussion has provided such groups, at least on a general level, with suggestions as to what paths to follow" (Leitenberg 2005, 88). Ayman al-Zawahiri, al-Qaeda's current leader, is even on record admitting that the terror group didn't put much thought into biological weapons until the U.S. Congress started sounding the alarm in the '90s. In "Revisiting Al-Qaeda's Anthrax Program," authors Rene Pita and Rohan Gunaratna break down the group's early biological weapons program. They focus particular attention upon an electronic message sent by al-Zawahiri to Mohammed Atif (former military chief of al-Qaeda): "Despite [bioweapons'] extreme danger, we only became aware of them when the enemy drew our attention to them by repeatedly expressing concerns that they can be produced simply with easily available materials..." (Pita and Gunaratna 2009, 10). Tellingly, the terror outfit only began its push for a bioweapons research laboratory after Secretary of Defense Cohen's dramatic press hearing with the bag of sugar meant to represent anthrax. Still, as previously covered, aspirations alone don't really equate to successful enterprise. Many researchers note how Aum Shinrikyo failed to acquire or cultivate a lethal pathogen despite significant financial

backing and state-of-the-art laboratories. Al-Qaeda has never come close to the capability of Aum Shinrikyo. For similar reasons, fears of lone-wolf bioterrorism appear just as implausible. Ellis surmises that lone wolf bioterror threats are most probable when it is an “insider” as it was in the case of Amerithrax (Ellis 2014, 214).

Some of the literature uncovered during preliminary research showed a strong inclination, by researchers, to group biological weapons into the broader WMD / CBRN category: the Ellis, Mowatt-Larssen, and Salama/Hansell reports are all prime examples of this trend. This approach was considered as having a negative impact on this research paper’s main aim. Basically, viewing biological weapons on the same terms as nuclear and chemical issues marginalizes what could otherwise be a concise appreciation of al-Qaeda’s bioweapons agenda. Tucker’s report follows a similar, if slightly different model: it lumps biological weapons with chemical ones (not nuclear or radiological) (Tucker 2009). Chemical weapons are often grouped with bioweapons in their own distinct category (CB), but doing so glosses over the many distinct differences between chemical and biological weapons. For one, research indicates that chemical weapons, while presenting the same dispersal challenges, are far more readily available than biological ones.

An interesting notion is that the last decade’s worth of preventative measures, on the part of the U.S. and other Western nations, may have forced al-Qaeda to rethink bioweapons entirely. A chief contention is that

D.C.'s consistent trend towards hyperbole, when framing the bioterrorism threat, has inevitably led to a stronger national defense against biological weapons. Potentially, bioweapons may now be ill-suited to extremist aims of high-visibility, high-casualty attacks. For instance, "the U.S. has now developed vaccines or drugs to counter most known conventional pathogens" (Clark 2008a, 183). Project BioShield, established in 2004, provides U.S.-based drug companies with a monetary incentive to develop, produce, and stockpile various vaccines and drugs that would otherwise have no commercial appeal. Mark Sharoff and Leonard Cole each contend that Project BioShield has been largely ineffective in its main objective; yet, regardless of some high-profile failures in the program (VaxGen's unstable anthrax vaccine), increased budgetary allotments are nevertheless considered a worthy enterprise since even one new vaccine further limits terrorists' options. The BioWatch program involves air samplers in several U.S. cities in order to detect aerosolized pathogens. The Department of Homeland Security's (DHS's) development of the Strategic National Stockpile and 'push packages', pre-packaged, rapidly deployable cargo containers full of vaccines and other medical supplies, further diminishes the impact and extent of any prospective bioterror incident (Clark 2008a, 114).

Due to all the hype surrounding the issue of bioterrorism, some experts urge policymakers, and the general public, to put the threat in context. Clark and Leitenberg each contrast bioterrorism with other modern-

day global issues that pose far greater danger to the U.S. way-of-life. Clark actually ends his book with a discussion of climate change, saying “challenges in the years ahead...make bioterrorism pale in comparison” (Clark 2008a, 190). Leitenberg also compares the threat of bioterrorism with that of climate change plus several additional planet-spanning problems: ocean pollution, population growth, war, poverty, nuclear terrorism, and naturally-occurring pandemics / epidemics (Leitenberg 2005, pp. 2-3). In light of the magnitude of these issues, such as HIV / AIDS already killing 5 million people “year in, year out”, these comparisons reveal a sense of imbalance in U.S. national security priorities (Leitenberg 2005, 3). Compellingly, Rolf Mowatt-Larssen proffers the hypothesis that al-Qaeda could be engaging in a “deception ruse”: continually drawing attention to their supposed desire for bioweapons if only to put the U.S. off the scent of their legitimate tactics (Mowatt-Larssen 2010a, 8). This concept certainly warrants further investigation.

Assumptions about al-Qaeda’s plans to pursue biological weapons over easier-to-acquire and less problematic conventional attack means has not really been explored in depth. 21<sup>st</sup> century terror attacks thus far have involved predominantly small-arms and improvised explosive devices (IEDs). Much of the literature demonstrates distinctly Western mindsets (when regarding terrorism) or, at least, views bioterrorism through the scope of U.S.-specific defense concerns. There is an evident desire among U.S.

politicians and scientists to boost their cases for increased biodefense budgets or, as Leitenberg puts it, “a small coterie of individuals constantly calls for increasing [biodefense] expenditures still further” (Leitenberg 2011). This fact alone has unnecessarily complicated academic research into bioterrorism since 9/11. Furthermore, the literature overwhelmingly indicates that a biological attack on the homeland is far from the apocalyptic scenario that Congress and the White House typically portrays; a bioterror attack on U.S. soil is likely to cause “disruptions rather than mass casualties” (Ellis 2014, p. 220). Incidentally, the numerous statements and press releases from al-Qaeda primarily serve as propaganda, making it difficult to differentiate between genuine intent and fear-mongering.

### **Examining Intent via Capability**

The bulk of research available on the topic of bioterrorism revolves around debunking terrorists’ biological capabilities with scientific reasoning. While some scholars genuinely question the widespread perception that bioweapons fit perfectly into al-Qaeda’s WMD aspirations, there is too little research into the group’s actual intent to pointedly pursue the B portion of CBRN-associated weapons. Tellingly, no terrorist yet has been able to properly cultivate and weaponize any natural pathogens. According to Leitenberg, al-Qaeda’s inability to produce a pathogenic strain of anthrax in the ‘90s, despite the virus being “endemic in Afghanistan”, speaks to both the group’s incompetence at large and the exacting nature of microbiology

(Leitenberg 2005, 26). Also, the 'smoking-gun' al-Qaeda training manuals, found in the terror group's abandoned Kandahar camp, all contained openly-available biological weapons information; most of this information dated from the 1950s and '60s (Leitenberg 2005, 29). In a way, it seems like al-Qaeda has been 'playing at' bioterrorism more so than truly pursuing it as an attack option. The reasons for this ruse are perfectly in line with terrorist aims; keeping the enemy unhinged even in the absence of a legitimate threat is a big part of the terrorist playbook. It stands to reason that even if al-Qaeda has no more than a passing desire to model their attacks around bioweapons deployment, they would be remiss to 'show their hand' in that regard. Doing otherwise might undo the image of unpredictability the group has worked so hard to foment among its Western enemies.

Still, the literature indicates some basic, undeniable facts: 1) al-Qaeda continues to pose a serious risk to U.S. national security and 2) the U.S., much like any other first-world nation, is extremely vulnerable to pathogens, both naturally occurring and intentionally delivered. The implication remains that if Zawahiri, or any other rank-and-file al-Qaeda operative, were to come into possession of a ready-made, safe-to-handle, and easy-to-deliver bioweapon, they wouldn't hesitate to use it against their sworn enemy.

## **METHODOLOGY AND RESEARCH STRATEGY**

This research paper stems from past and present claims about bioterrorism posing a major national security threat despite any substantial links between al-Qaeda and successful production of lethal biological agents as well as the utter lack of any bioterror incident since Amerithrax in 2001. The Amerithrax incident, as well as the many hoaxes that mimicked it, clearly revealed some serious gaps in U.S. biodefense. As a result, Washington has dedicated a lot of money and manpower to the biodefense effort over the last twelve years. Interestingly, U.S. officials continue to present the bioterror threat as imminent—as though it is only a matter of time before al-Qaeda unleashes a deadly microbial agent against U.S. interests—despite the fact that not only is the country more prepared for a bioterror incident but that al-Qaeda has suffered serious setbacks and losses in the American-led Global War on Terrorism (GWOT). Exaggerations of al-Qaeda’s capabilities, specifically with regards to microbiology, abound to this day. Moreover, al-Qaeda’s intent to use bioweapons, which categorically fits the mold of bin-Laden’s previously declared goal of mass American casualties, hasn’t truly been studied in depth as a bona fide weapon-of-choice for the terrorist organization.

For the purposes of this paper, the definition of what constitutes ‘al-Qaeda’ is based on Thomas Joscelyn’s July 2013 testimony before the House Committee on Foreign Affairs Subcommittee on Terrorism, Nonproliferation,

and Trade (Joscelyn 2013a). Joscelyn is a senior editor of *The Long War Journal* and a senior fellow at the *Foundation for Defense of Democracies*. Al-Qaeda is herein considered to be consisting of the core group (Afghansitan and Pakistan), al-Qaeda in the Arabian Peninsula (AQAP), al-Qaeda in Iraq (AQI), al-Qaeda in the Islamic Maghreb (AQIM), and al-Shabaab in Somalia (Joscelyn 2013a). All of these groups are known to have sworn fealty to al-Qaeda Core senior leadership. Jabhat al-Nusra (Syria and Lebanon) and Ansar al-Sharia (Yemen and North Africa) will be grouped in as well since these outfits have either made informal proclamations of fealty or have indisputable ties to the other al-Qaeda affiliates.

This thesis mainly intends to build upon both Milton Leitenberg's 2005 monograph and Salama and Hansell's 2005 *Nonproliferation Review* report. Leitenberg and Salama/Hansell have provided a very thorough assessment of al-Qaeda's biological weapons capabilities but both papers are now significantly outdated; consequently, they fail to account for recent developments such as bin-Laden's death, the splintering of al-Qaeda on the whole, and improved U.S. preparedness for a bioterror attack. Reviewing the history of al-Qaeda's rhetoric may ultimately provide new insight into the group's underlying views on the efficacy of biological weapons. While there is a significant amount of literature about the impact of Osama bin-Laden's death on the greater al-Qaeda organization, the group's putative bioterror aspirations have not really been thoroughly reevaluated since Ayman al-

Zawahiri filled the power vacuum in 2011. In light of this, the group's intent to acquire and use bioweapons against its enemies should be reexamined through a contemporary lens.

This thesis will test the validity of the following two hypotheses:

Hypothesis 1: Al-Qaeda is no longer actively seeking a biological avenue to achieve their aim of a high-visibility, mass-casualty attack on U.S. soil.

Hypothesis 2: Al-Qaeda and its affiliates have experienced difficulties with producing and/or acquiring lethal pathogens as well as determining effective delivery means; hence, the group will continue to rely on other, more practical tactics.

All portions of this study will rely on the compiled literature and readily available technical data to make a summary conclusion as to al-Qaeda's modern-day bioweapons aptitude and aspirations. Potential limitations such as bias and open source-only reporting have been considered as having an impact on the results of the study. Given the fact that the majority of works published on the topic of bioterrorism are estimative or predictive in nature, there is a high probability that varying degrees of academic biases are present. In addition, confirmation bias is possible considering this researcher's decade-plus experience as an intelligence professional. To combat all forms of bias, the devil's advocacy analytic method has been

chosen to drive the research. Differing schools of thought will purposely be sought out and investigated at length. The paper will also be submitted to reviews by peers in the Intelligence field. Some segments of the U.S. Intelligence Community (IC), such as the Department of Homeland Security (DHS) and the Central Intelligence Agency (CIA), have likely produced or are in the process of producing similar analytical reports within the classified data spectrum, potentially negating any IC need for this academic paper. However, it is still likely that a paper using only openly available information may hit upon areas or themes that the IC overlooks if only due to a preference for all things classified.

The following are the independent and dependent variables, as identified during the literature review:

*Independent Variables:* Ayman al-Zawahiri's ideology, bioweapons science (microbiology), history of al-Qaeda terror acts since 9/11, past statements by Congress and the White House on the severity of the bioterror threat.

*Dependent Variables:* al-Qaeda's attack tactics, al-Qaeda's bioweapons intent, U.S. biodefense measures.

Analysis for this paper is structured around a dichotomous approach. The first section will dissect the truth of al-Qaeda's biological *capabilities* while the second will attempt to assess al-Qaeda's present-day biological *intentions*. The established time frame for each research category will be

October 2001 through April 2014, representing the period from the U.S.'s last bioterrorism incident (Amerithrax) and the research phase for this paper.

The capability piece of the paper will consist of qualitative research. The scientific specifics involved in developing / cultivating lethal microbial agents / toxins will provide the foundation for bulk of the qualitative research. To streamline the analysis, this paper will focus only on select bioweapons. The Center for Disease Control's (CDC's) website will be utilized to identify the agents which are considered the most dangerous; the CDC regards these agents as "Category A" (CDC 2014). Agents will be selected from Category A and B based on their appearance in either U.S. bioterrorism exercise scenarios or official threat warnings. Analysis of the data may demonstrate a disconnect between the way the U.S. Legislative and Executive branches stress the dangers of bioterrorism and the way the scientific community regards those agents. For example, statements about infection rates, via official U.S. bioterror exercises or Congressional hearings, will be weighed against scientifically agreed upon models. Similar comparisons will be made with other facets of the subject, such as morbidity rates, mortality rates, dispersal tactics, and the various intricacies associated with proper cultivation of a lethal agent.

In addition, data from books, journals, and online news sites will be collated in order to develop a comprehensive chronology of al-Qaeda's ties

to bioterrorism (attacks, attempted attacks, R&D, etc.). This chronology will provide a reference point for the group's experienced bioweapon pursuit difficulties potentially explaining the absence of even one successful al-Qaeda-led bioterror attack.

The 'intent portion' of the paper will consist of a mix of qualitative and quantitative analysis. Media reports and transcribed text reports of al-Qaeda's official statements will be collated. Bryn Mawr, Haverford, and Swarthmore Colleges jointly maintain a digital repository (called Triceratops) of nearly 500 official al-Qaeda statements dating back to 1994. Every single report maintained in the repository dating from late 2001 to early 2014 will be searched for both general and key terms associated with biological agents. Content analysis of the reporting should indicate if there is a marked decline in al-Qaeda's biological aims since 2001. This method may also indicate if bin-Laden's death had any impact on al-Qaeda's pursuit of weapons of mass destruction (WMD) entire; bin-Laden was directly tied to attempts to acquire deadly agents back in the '90s. Ayman al-Zawahiri, the new number one following bin-Laden's death, is actually a doctor who has specifically stated biological aims in the past, but it has yet to be determined if these are empty threats. Compiled data will be used to juxtapose the level and intensity of reporting on bioterrorism with the reporting on other types of terrorism to determine the extent of the role that bioterrorism plays in international terrorism over the last decade. The reporting may back the

hypothesis that al-Qaeda favors more traditional and more readily-available attack means such as small arms and improvised explosive devices (IEDs).

A thorough review of news reports about bioterror plans and attacks that are linked to the al-Qaeda organization will also be conducted. Perchance, the level of open-source reporting (outside of al-Qaeda channels) will show a decline in terrorism of a biological bent. Studying biographies on al-Qaeda's leadership or other noteworthy members should present a picture of the group's overall scientific expertise. Also, if al-Qaeda is shown to consistently recruit or attempt to recruit people with backgrounds in biological sciences it can be inferred that the group's bioweapons programs are still in play. Graphical support, via matrices and tables, will be built pertaining to the following categories: historical incidence of al-Qaeda connections to bioterror agents since late 2001 (as per press reports) and characteristics of selected bioterrorism agents, to include statistics related to mortality rates, morbidity rates, etc..

## FINDINGS AND ANALYSIS

### Assessing Capability

#### *Review of Bioterror Agents*

When it comes to the types of biological weapons al-Qaeda has either actively pursued or shown interest in acquiring, it could be argued that a wide swath of agents fits the bill. Indeed, if making assumptions solely off of the documents recovered from the abandoned camps in Afghanistan in late 2001, it would mean that virtually all kinds of lethal biological agents were on the terror group's radar:

Among the items found were books on biological warfare and microbiology, dating mostly from the 1950s and '60s. There were also articles from scientific journals, some fairly recent at the time, on pathogens such as *B. anthracis*, *Y. pestis*, and *C. botulinum*, as well as hepatitis viruses. (Clark 2008a, 181-182)

In reality, al-Qaeda's historical effort at engineering bioweapons is noticeably limited to a select few agents. Salama and Hansell's past assertion that "the majority of allegations concerning al-Qaeda's biological endeavors [involves] anthrax bacteria, botulinum toxin, and ricin" continues to be true to this day, save perhaps for plague (Salama and Hansell 2005, 619).

As far as the CDC is concerned, there are six specific bioterrorism agents that are both highly transmissible and are likely to "cause public panic and social disruption"; they refer to these as Category A agents (CDC 2014). Category A agents include anthrax (*Bacillus anthracis*), botulism

(*Clostridium botulinum*), plague (*Yersinia pestis*), smallpox (*Variola major*), tularemia (*Francisella tularensis*), and viral hemorrhagic fevers (such as Ebola and Marburg) (CDC 2014). In order to more properly judge al-Qaeda's biological attack capabilities against the U.S., it is important to appraise the strengths and weaknesses of the Category A agents as well as any al-Qaeda connections to them. Ricin, a selection from CDC's Category B agents, will also be included considering its prevalence in modern bioterrorism history.

### *Anthrax*

*Bacillus anthracis* is a bacterium that mainly affects livestock. The infamous 'spores' of anthrax actually represent a suspended state of the bacteria; it is a means for the bacteria to survive the absence of an adequate host. There are naturally occurring cases of anthrax in humans to this day, but they are rare. Anthrax infects a human through either cutaneous means (cuts on skin) or inhalation. Cutaneous anthrax is relatively treatable while inhalation anthrax is usually deadly (Clark 2008a, 44). Anthrax is not contagious in the slightest; hence, any spores a would-be-terrorist produces would make for the only source of infection.

Al-Qaeda has sought to acquire or cultivate anthrax since the 1990s: "evidence from al-Qaeda documents and interrogations suggests that terrorist leaders had settled on anthrax as the weapon of choice" (Warrick 2010). Yazid Sufaat's laboratory in Afghanistan was meant for anthrax

production but, by most accounts, he was never close to accomplishing the task Zawahiri set before him despite the fact that *B. anthracis* is widespread throughout Afghanistan's cattle population (Pita and Gunaratna 2009, 12). According to Leitenberg, this failure "demonstrates the same difficulty faced by the Aum Shinrikyo group" (Leitenberg 2005, 33).

### *Botulism*

The bacteria *Clostridium botulinum* may produce the "most lethal biological poison" known to man but, like anthrax, it is not contagious (Clark 2008a, 48). Another similarity between botulism and anthrax is the bacteria's ability to form spores. Botulism affects the human nervous system and there are, on average, 145 cases reported in the U.S. every year (CDC 2014). There are a few stories linking al-Qaeda to botulism. Menad Benchellali, whose 2002 arrest led authorities to the eventual London ricin plot, was reportedly seeking to cultivate *C. botulinum* too (Warrick 2004). Also, al-Masri's testing on animals in Afghanistan for the edification of al-Qaeda trainees reportedly included botulism (Mowatt-Larssen 2010, 23).

### *Plague*

Plague, or as it was referred to in the Middle Ages, the 'Black Death', is caused by the bacteria *Yersinia pestis*. *Y. pestis* is commonly found in fleas and rodents and it cannot produce spores. Pneumonic plague affects the

lungs and, unlike bubonic plague, is communicable from person to person. Even though many regard plague as an 'Old World' disease, there are still between five to 15 natural cases reported in the U.S. each year (CDC 2014). William Clark's assertion that "there have been no documented attempts to use *Y. pestis* as a bioterrorism agent" was just a year shy of the 2009 debacle in Algeria where more than 40 al-Qaeda members were found dead due to suspected exposure to plague (Clark 2008, 48; Pita et al 2009, 1). Intriguingly, Pita, Gunaratna, and Henika claim the Algeria incident "could have been a natural outbreak": the region where the deaths occurred has evidenced fleas infected with *Y. pestis* in the past (Pita et al 2009, 21). Potentially, the globe still has yet to witness any legitimate connection between terrorists and plague.

### *Smallpox*

Smallpox is quite possibly the pathogen that U.S. biodefense specialists worry about the most; it appears as the 'culprit' in several of the country's scripted bioterrorism exercises (Leitenberg 2005, 48). *Variola major*, the virus which causes smallpox, is considered a 'worst-case' biological agent for a multitude of reasons:

...a single uncontrolled case [of smallpox] would likely infect three to six more people, exponentially spreading the disease. It also has a low infectious dose and a relatively high fatality rate. In addition, *V. major* can be stable for hours as an aerosol (over 24 hours in optimal environmental conditions) and can be produced and stored in large quantities. The majority of the global population is unvaccinated

against smallpox...The Soviet Union produced tons of weaponized *Variola major* per year during the Cold War, in violation of the 1975 Biological Weapons Convention. With the fall of the Soviet Union in 1991 and the disarray that followed, stocks of smallpox may exist outside of the designated research facility in Russia... (FAS 2013)

Al-Qaeda records recovered in Afghanistan indicate that bin-Laden “devoted money and personnel to pursue smallpox”, although the extent to which he did so is unclear (Gellman 2002). Tellingly, there is no reporting after 2002 to substantiate al-Qaeda’s purported pursuit of smallpox; terrorists may consider the virus too difficult to acquire and too dangerous to handle.

### *Tularemia*

*Francisella tularensis* is a bacterium found in small animals, such as rabbits and rodents. Since only a very small number of *F. tularensis* organisms can cause tularemia in a human host, it’s considered very infectious; this, coupled with its’ high natural occurrence, are the primary concerns of the agent with regards to bioterrorism (CDC 2014). However, as with all Category A agents, it would require “considerable sophistication” to create an appropriate aerosol delivery system (CDC 2003). Even though many nations’ biowarfare programs (prior to the Biological Weapons Convention) comprised *F. tularensis*, there are no reports which link al-Qaeda, or any other terror group, to the agent.

*Viral Hemorrhagic Fevers (VHF)*

Ebola and Marburg are the most well-known / notorious viruses of the hemorrhagic fevers group. The hallmark of these viruses is the extremely high mortality rate. Both Ebola and Marburg are “fairly recent additions to the repertoire of human pathogens”: Marburg was discovered in the late ‘60s and Ebola in the late ‘70s (Clark 2008a, 50). At the time of the writing of this paper, the World Health Organization (WHO) is trying to contain the outbreak of a new strain of Ebola in West Africa that has killed more than 135 people thus far (Samb 2014). The ‘unknowns’ surrounding HVF alone afford them their place on the CDC’s top tier of bioterror agents. There are no genuine indications that al-Qaeda has ever pursued VHF as a bioweapon.

*Ricin*

Ricin toxin is derived from the plant *Ricinus communis*. More specifically, the poison is extracted from the plant’s castor beans. Ricin toxin disrupts the human body’s ability to synthesize protein. There is no antidote for ricin and there is no clear diagnostic procedure (there is a way to test urine samples for ricin but it’s only done at the CDC site). Ricin is famous for being the agent used in the only known bio-assassination: the 1978 killing of a Bulgarian dissident via a gas-driven umbrella gun (Clark 2008a, 54).

Second only to anthrax, ricin is al-Qaeda’s most oft-pursued bioterror agent. The putative London Underground attack plot was built around ricin,

al-Qaeda's affiliate in Yemen were shown to be amassing castor beans in 2009, and ricin was used in Abu Khabab al-Masri's animal experiments at Afghan training camps. The fact that castor beans are so readily available means that ricin will always be among the most likely go-to bioweapons for terrorists.

Bioterror Agent	Type	Mortality	Contagious?	Easy to Produce?
Anthrax <i>Bacillus anthracis</i>	Bacteria	100% - inhalation 25% - cutaneous	No	No
Botulism <i>Clostridium botulinum</i>	Bacteria	3-5% treated 70% untreated	No	Yes
Plague <i>Yersinia pestis</i>	Bacteria	1-15% treated 40-60% untreated	Moderately	No
Smallpox <i>Variola major</i>	Virus	30%	Highly	No
Tularemia <i>Francisella tularensis</i>	Bacteria	< 2% treated 30-60% untreated	No	Yes
Hemorrhagic Fever <i>Ebola, Marburg, etc.</i>	Viruses	Varied, but generally high	Moderately - Highly	Yes
Ricin <i>Ricinus communis</i>	Plant toxin	High, depending on exposure	No	Yes

**Table 1: Characteristics of Selected Bioterror Agents**

### *Analysis (1)*

Overall, there exists a lot of difficulty in acquiring or cultivating a lethal pathogen from nature: "acquiring the requisite capabilities is something complex and requires adequate explicit and tacit knowledge" (Pita et al 2009, 22). Al-Qaeda's network may be far-reaching but history demonstrates that the group's resources are markedly less than those of Aum Shinrikyo, who themselves failed to produce effective strains of botulinum or anthrax even though they enjoyed significant financial backing,

a dedicated, well-educated staff, and “the most up-to-date scientific equipment” (Clark 2008a, 31). Even if al-Qaeda were to acquire a ready-made bioweapon on the black market, there is still the problem of how to properly deploy the agent. Improvised explosive devices (IEDs), al-Qaeda’s contemporary stock in trade, pose the problem of incinerating the notoriously fragile microorganisms. Aerosol delivery devices are the only valid method. Records show that al-Qaeda looked into using crop dusters and spray dryers as a means for spreading anthrax spores and the like (Hellmich and Redig 2007, 382). Yet, al-Qaeda bioterror planning never really addresses the challenges associated with “[transforming agents] into the extremely high concentration needed for aerosol delivery” (Sharoff 2011).

### ***Chronology of Al-Qaeda’s Ties to Bioterror Activity***

The following is a chronology of press reports tying al-Qaeda to bioterror activity after the 9/11 attacks. It is intended to expand upon Rolf Mowatt-Larssen’s (2010a) WMD chronology, but with a singular focus on only bioterror agents. Information about high-profile al-Qaeda members admitting to anthrax production or likewise is not included as instances such as these are not viewed as significant incidents in their own right and would only serve to corroborate media reporting.

- November 2001 – The Kabul offices of Umma Tameer e Nau (UTN), a ‘humanitarian’ organization founded by a Pakistani nuclear scientist, is searched. The search reveals “crude...biological-related...documents”, both hand written and soft copies (Mowatt-Larssen 2010a, 19).
  
- December 2001 – Yazid Sufaat, a Malaysian biochemist and senior operative for Jemaah Islamiyah is captured. Rauf Ahmed, a biologist with the Pakistani government, is also arrested. Ahmed’s correspondence with Ayman al-Zawahiri shows that he plays a part in al-Qaeda’s bioweapons program (Mowatt-Larssen 2010a, 19).
  
- December 2001 – Abandoned al-Qaeda camps in Afghanistan contain material related to bioterrorism, although the majority of the material is openly available and dated from the ‘50s and ‘60s (Clark 2008, 182). Some of the material recovered reveals that Yazid Sufaat had a laboratory near Kandahar airport which was intended for cultivating a pathogenic strain of anthrax (Pita and Gunaratna 2009, 12).
  
- June 2002 – “Extremists under the command of Abu Musab al-Zarqawi conduct crude chemical and biological training and experiments in a remote camp in northeastern Iraq (Khurmal)” (Mowatt-Larssen 2010, 22).

- August 2002 – A CNN report relays that Abu Khabab al-Masri was a special instructor for al-Qaeda trainees in Afghansitan. Al-Masri reportedly taught using chemical and biological weapons to the students and even conducted live experiments on animals at the camps; ricin is named as one of the toxins he used for these experiments. Mowatt-Larssen writes that al-Masri was upset that the trainees evidently did not take his brand of weapons training “to heart” (Mowatt-Larssen 2010a, 23).
  
- January 5, 2003 – London authorities arrest associates of Abu Musab al-Zarqawi (then-leader of al-Qaeda in Iraq) after they supposedly find ricin in a Wood Green flat. The ricin is thought to be intended for attacks on the London Underground. Details of the plot were uncovered during interrogations of Menad Benchellali, an al-Qaeda-linked Islamist arrested in France a year earlier, who is believed to have produced ricin and botulinum toxin in the past (Warrick 2004). Several other associates are arrested in the following months in the U.K., Spain, France, and Italy (Mowatt-Larssen 2010, 25).
  - *Note:* The veracity of the ricin attack plot would later come into question by several news outlets. In fact, the test that determined ricin was the agent found in the Wood Green flat is later considered a “false positive” (Pincus 2005, A22).

- March 2003 - Ayman Zawahiri calls off a planned attack on the New York City subway system. As this attack was supposed to use cyanide gas, it does not fall into the 'biological' category. However, the dispersal device for such an attack could be considered similar to those needed for a successful bioterror attack. Furthermore, Zawahiri was said to have cancelled the plan for "something better" (Tenet 2007, 273).
  
- October 2003 – The mastermind of the 2002 Bali nightclub bombing, Riduan Isamuddin, tells U.S. interrogators that al-Qaeda wanted to build a bioweapons plant in Indonesia that was intended to weaponize lethal strains of anthrax (Wright 2003).
  
- September 2006 – In an audiotape, Zarqawi's replacement, Abu Hamza al-Muhajir, also known as Abu Ayaab al-Masri (not to be confused with Abu Khabab al-Masri), calls for the use of biological weapons against American forces in Iraq (Roggio 2006).
  
- January 2009 – News outlets begin reporting a story about the deaths of as many as 40 members of al-Qaeda in the Islamic Maghreb (AQIM) in Algeria possibly due to exposure to bubonic plague. It is implied that

the group was experimenting with plague for future attack plans (Lake 2009).

- February 2009 – Al-Jazeera airs an al-Qaeda recruitment video that suggests smuggling a bioweapon into the U.S. via “tunnels under the Mexico border” (*Washington Times* 2009). In the video, Abdallah al-Nafisi, who is identified as a Kuwaiti ‘professor,’ specifically mentions targeting the White House with “four pounds of anthrax” (Pita and Gunaratna 2009, 10).
  
- April 2009 – The Islamic State of Iraq, which could be considered an al-Qaeda umbrella group, claims they are in “great need” of both biological and chemical weapons (Pita and Gunaratna 2009, 10).
  
- August 2010 – U.S. Intelligence officials brief President Barack Obama about Yemen-based al-Qaeda’s “efforts to acquire large quantities of castor beans” in order to produce ricin (Schmitt and Shanker 2011).
  
- May 3, 2012 – In *Inspire*, al-Qaeda’s English-language magazine, U.S.-born Anwar al-Awlaki (who had been killed in a drone strike in Yemen prior to publication) is quoted as saying that “the use of

chemical and biological weapons against population centers is allowed and is strongly recommended” (Kreider and Ross 2012).

- Oct 19, 2013 – Secondary news outlets point out a report from Henry Jackson Society, a British think tank, which claims that al-Qaeda is strongly pursuing or may already be in possession of Syrian bioweapons as a result of that country’s civil war (Soffer 2013).
- Nov 18, 2013 – Disclosed Israeli court documents reveal that Tel Aviv has been detaining Samar al-Baraq, a Palestinian microbiologist with alleged ties to al-Qaeda, for the last three years (Lubell 2013).

Agent \ Year	Year												
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Anthrax	X		X						X				
Botulism	X	X											
Plague									X				
Smallpox	X												
Tularemia													
HFVs													
Ricin	X	X	X							X			
Non-specific	X	X				X			X			X	X

**Table 2: Historical Incidence of Al-Qaeda Connections to Bioterror Agents**

*Analysis (2)*

The above chronology supports the hypothesis that the al-Qaeda organization has experienced numerous setbacks and difficulties with pursuing biological attack avenues, thereby making biological agents an unappealing weapon choice, especially in light of the other al-Qaeda terror attacks within the same time frame. Also, al-Qaeda's biological weapons pursuit, which was notably high in the late '90s to early 2000s, seems to have waned considerably in recent years. Much of the recent history of al-Qaeda connections to bioterrorism are unsubstantiated, non-specific threats and activities, indicating there may no longer be a full-fledged al-Qaeda bioweapons program as there was just prior to 9/11.

***Biographies of Key Al-Qaeda Members***

Al-Qaeda's most dedicated attempt at acquiring a bioterror capability is undeniably their efforts to cultivate anthrax in Afghanistan in the early 2000s. Yet, that program was characterized by "its unsuccessful attempts to recruit Pakistani and Indonesian scientists" (Pita and Gunaratna 2009, 13). Therefore, the most danger lies in the group recruiting microbiologists to their cause. There is a common assumption amongst the media and policymakers that most doctoral-level training provides a person the knowledge necessary to tackle the field of microbiology. However, microbiology is a very exacting scientific field which requires far more defined, intensive

study: “the Aum Shinrikyo guys tried [at bioweapons] for six, seven years and couldn’t get it to work...and a lot of them had Ph.D.s.” (Clark 2008b). The following paragraphs cover the educational backgrounds of key al-Qaeda personalities as a means of further differentiating between simply exploring bioterror avenues and palpable bioweapons competency.

### *Ayman al-Zawahiri*

Ayman Muhammad Rabaie al-Zawahiri was born in 1951. Zawahiri met bin-Laden while they were united in repelling Soviet Forces from Afghanistan. He led the Egyptian Islamic Jihad (EIJ) until he merged the group with bin-Laden’s al-Qaeda in 1998. Once bin-Laden was killed in May of 2011, Zawahiri was considered the heir apparent of the terror network. Zawahiri’s highest education level is a Master’s degree in surgery, which he earned from Cairo University in 1978 (Biography.com 2014). Yet, Zawahiri joined radical Islamic causes just one year after he graduated; the amount of time he spent actually practicing medicine is debatable.

### *Abdur Rauf Ahmed*

Zawahiri recruited Abdur Rauf Ahmed, a Pakistani government microbiologist, in 1999 to set up labs and acquire appropriate equipment for a bioweapons program. Abdur Rauf was a Ph.D.-level scientist but he was apparently never a ‘true-believer’. He used his degree to gain access to

Western labs and conferences and supposedly attempted to find lethal strains of anthrax for al-Qaeda, although he “was not prepared to do any of the laboratory work himself” (Leitenberg 2005, 31). Evidently tired of Rauf’s frequent requests for more money and notable lack of progress, Zawahiri “dispensed with his services” in 2000 (Pita and Gunaratna 2009, 11).

### *Yazid Sufaat*

Yazid Sufaat, a former Malaysian Army captain born in 1964, earned a Bachelor’s degree in biological sciences from California State University (Sacramento) in 1987 (Joscelyn 2008). A now-detained high-ranking al-Qaeda member, Riudan Isamuddin, introduced Sufaat to Zawahiri sometime prior to 9/11. Displeased with Abdur Rauf’s approach, Zawahiri had been shopping around for a scientist who shared al-Qaeda’s ideologies (Pita and Gunaratna 2009, 11). The fact that Zawahiri kept looking for outside help explicitly demonstrates that he considers bioweapons pursuit beyond his own level of expertise. Sufaat fled Afghanistan during the U.S.-led invasion; he was subsequently detained by Malaysian authorities in December of 2001. He was released in 2008 but was arrested again in 2013 for “[inciting] terrorist activities” (*Times of Israel* 2013). Sufaat’s education was less than that of Abdur Rauf and his work in Afghanistan never really progressed beyond the “planning stages” (Clark 2008a, 182).

*Abu Khabab al-Masri*

Abu Khabab was a scientist in Egypt's chemical weapons program during the '70s. He joined Zawahiri's EIJ and, once the group allied itself with bin-Laden, he spearheaded al-Qaeda's chemical / biological weapons program, known as Project al-Zabadi (translated: curdled milk). Al-Masri is notorious for disseminating chem-bio training manuals to al-Qaeda members and teaching chem-bio basic training courses to new recruits; these courses allegedly included experiments on animals with toxins and poisons (Mowatt-Larssen 2010b). Al-Masri was killed in Pakistan in a U.S. drone strike in 2008 (Roggio 2008).

*Samar al-Baraq*

Samar al-Baraq is a Palestinian who studied microbiology in Pakistan. The extent of his education is not known. Al-Baraq has been held by Israel since August of 2010 due to "his al-Qaeda connections" (Cohen and Khoury 2013). Tel Aviv has accused al-Baraq of being an al-Qaeda bioweapons expert: the wording of the February 2014 indictment against him expressly mentions that he is knowledgeable in botulinum toxin and that "he practiced killing dogs with poisons and was tasked with developing biological weapons by...Ayman al-Zawahiri" (Levinson 2014).

*Analysis (3)*

Abdur Rauf may be the closest al-Qaeda ever came to retaining the proper level of talent needed to undertake bioterrorism. Still, expertise alone is not enough to cultivate a pathogen. Special equipment and sterile, cutting-edge laboratories are also necessary. In addition, if al-Qaeda wished to conduct a successful, mass-casualty bioterror attack, it would likely need more than just one expert: they would have to recruit "a multidisciplinary team" (Pita and Gunaratna 2009, 12). Despite the many documents uncovered about al-Qaeda's Project al-Zabadi, there is no record that the group ever attempted to recruit a biotechnologist, to engineer a suitable dispersal device, or a meteorologist, to forecast weather patterns that are most advantageous for aerosolized agents (Clark 2008a, 166). Hellmich and Redig argue that al-Qaeda's past ingenuity should be taken into account when it comes to the various bioterrorism hurdles (Hellmich and Redig 2007). Yet, the group's most successful attack, 9/11, involved the hijacking of U.S. commercial airliners to be used as missiles; while this certainly speaks to the group's ingenuity, it also serves to indicate that al-Qaeda relies on simple solutions and readily-available materials. Microbial agents are both notoriously complex and exceptionally fragile.

## Assessing Intent

### *Chronology of Al-Qaeda Official Statements*

Triceratops, the tri-college (Bryn Mawr, Haverford, and Swarthmore Colleges) database, maintains a collection of official statements and media releases from the al-Qaeda network. A total of 337 Triceratops reports were reviewed as a means of gauging the group's bioweapons intentions. The results of this review are as follows:

- November 7, 2001 – In his first post-9/11 interview, Osama bin-Laden is asked about reports claiming al-Qaeda is pursuing WMD. Bin-Laden responds: “I wish to declare that if America used chemical or nuclear weapons against us, then we may retort with chemical and nuclear weapons. We have the weapons as deterrent” (Bin-Laden 2001a). Even though bioweapons are not mentioned specifically, this statement nevertheless relays al-Qaeda Core's basis for WMD use.
  
- February 10, 2002 – In an al-Qaeda internet magazine, a top bin-Laden aide, Abu Ubeid al-Qurayshi, authors an article on the terror group's fight against a technologically superior adversary:

...technology did not help these great [American] armies, even though [this technology] is sufficient to destroy the planet hundreds of times over using the arsenal of nuclear, chemical, and biological weapons. The Mujahedeen proved their superiority in fourth-generation warfare using only light weaponry. (Al-Qurayshi 2002)

- April 24, 2002 – An al-Qaeda statement, possibly by al-Zawahiri, lists seven conditions that excuse the group's killing of women and children, who are supposed to be protected from targeting according to the Quran. One of the conditions the author cites is when Muslim adherents use "heavy weapons that do not distinguish between combatants and protected ones" (Qaedat al-Jihad 2002). The reasoning for this excusal references the use of catapults by the Prophet Mohammed during the siege of Ta'if in the seventh century.
  
- June 12, 2002 – Al-Qaeda spokesman Sulaiman Abu Ghaith declares that his group has the right to kill 4 million Americans with WMD. More specifically, Geith says: "it is our right to fight [the U.S.] with chemical and biological weapons, so as to afflict them with the fatal maladies that have afflicted the Muslims because of the [Americans'] chemical and biological weapons" (Abu Ghaith 2002).
  
- Jan 2008 – In a paper intending to address frequently asked questions of al-Qaida justifications, Ayman al-Zawahiri writes: "America possesses an enormous stockpile of nuclear, chemical, and biological weapons; however, it forbids these things to others, so that the world may remain under America's threat" (Al-Zawahiri 2008).

*Analysis (4)*

Of the more than 300 records reviewed, the June 2002 statement is the only one that explicitly mentions al-Qaeda's desire to use bioweapons. There were other records that dealt with general WMD but they had more to do with accusing the U.S. of ramping up the case for war with Iraq than they did with being considered an offensive option for the group. All records were searched for direct references to biological agents thought to be the most pervasive al-Qaeda bioweapons programs. 'Anthrax', 'botulinum', 'plague', and 'ricin' (and variations therein) comprised the key terms for data mining: there was absolutely no incidence of al-Qaeda referencing any of these biological agents by name. Remarkably, there are no recent official statements about biological aims; Zawahiri's 2008 paper, which touches upon America's own bioweapons, is the last such instance.

The data review also revealed that al-Qaeda demonstrates a tendency to willfully mislead via official statements. Shortly after 9/11, bin-Laden vehemently denied a part in the attacks:

I have already said that I am not involved in the 11 September attacks in the United States. As a Muslim, I try my best to avoid telling a lie. I had no knowledge of these attacks, nor do I consider the killing of innocent women, children and other humans as an appreciable act. Islam strictly forbids causing harm to innocent women, children and other people. Such a practice is forbidden even in the course of a battle. (Bin-Laden 2001c)

In a report just one month later (October 2001), bin-Laden seemingly re-clarified his earlier statement: "the Qur'an forbids the killing of women and

children, or innocent civilians, but enjoins retaliation if infidels commit such crimes..." (Bin-Laden 2001b). There is, of course, an obvious disparity between al-Qaeda's Islamic underpinnings and their actions as well. In light of the visage that al-Qaeda presents to the mainstream, it is clear that gauging the group's bioterror intent via 'official' statements is an imperfect approach. The dearth of references to bioterrorism plans could indicate that, as far as using WMD to achieve an Islamic state, there is not genuine 'buy-in' from all segments of the al-Qaeda network. To wit, Zawahiri himself hasn't orchestrated many terror attacks since taking the reins from bin-Laden. The reason behind his cancellation of the 2003 attack against the New York City subway (with cyanide gas) has never been revealed, possibly lending credence to assumptions that al-Qaeda lacks the technical proficiency for such attack types.

There are significant questions surrounding Zawahiri's direction of al-Qaeda since the death of bin-Laden. Dr. Elena Mastors, who has written extensively on al-Qaeda's psychological tenets, claims that a portion of Islamic extremists, possibly even within al-Qaeda proper, view Zawahiri as a coward: he departed Sudan early despite urging his followers to fight to the death and suspicions abound about his possible involvement in the deaths of al-Qaeda members who were on record as challenging his authority (Mastors 2010, 156). Counterterrorism experts often color Zawahiri as a more calculating zealot than most if only for his level of education, but he

noticeably lacks his predecessor's charismatic personality. Zawahiri's commitment to extremist aims has even been called into question; Mastors explains that Zawahiri actually confessed, possibly under torture by the Egyptians, about his EIJ associates and their whereabouts (Mastors 2010, 157).

## CONCLUSIONS

The threat of bioterrorism first entered the American public consciousness in 1985 due to the Rajneesh cult's intentional spread of salmonella at salad bars in Oregon. In the 1990s, comments from policymakers like William Cohen further fanned the flames of bioterrorism concerns. When the postal anthrax attacks occurred in 2001, shortly after the worst terrorist attack on U.S. soil, the fear of bioterrorism became firmly entrenched in reality; for policymakers, and the general public alike, there were no longer questions about whether America could be terrorized with lethal biological agents. Yet, more than 12 years on, no other Amerithrax-like attack has occurred, either in the U.S. or the world entire. While it is undeniable that al-Qaeda sought to attack the U.S. via biological means, even prior to 9/11, research strongly indicates that the group never came close to developing a lethal microbial agent, no less a concrete bioterror attack plan. Possibly due to the sheer audacity of the 9/11 attacks, the group's capabilities have been consistently overstated both by politicians in Washington (to promote a strong national biodefense) as well as by al-Qaeda's own leadership (to keep the U.S. unhinged). Al-Qaeda's failure to either acquire or cultivate lethal biological agents over the last decade should bear more weight on D.C.'s incessant terrorism-cum-bioweapons debate.

As 'imminent' bioterror threats continually fail to pan out, it stands to reason that al-Qaeda's attempts at bioterrorism are more wishful thinking than serious dedication. Osama bin-Laden's claims of overarching WMD capability has always existed more in the realm of delusion than in the realm of reality. At various times, bin-Laden exhibited a propensity for lying, going so far as trying to convince the West that he was already in possession of nuclear weapons. Much has been made about bin-Laden's background in construction potentially lending itself to the 9-11 attack planning. Similarly, Zawahiri's medical background has been seen as having the potential to angle al-Qaeda towards science-based attacks. Indeed, al-Qaeda's abandoned anthrax program appears to have much more to do with Zawahiri's aspirations than any other high-ranking al-Qaeda figure. Still, the fact that Zawahiri admitted he never thought of bioweapons until the U.S. brought them to his attention, coupled with his documented push to find outside scientific help for al-Qaeda's anthrax program, make any claims about his inherent microbiology expertise immediately spurious.

The magnitude of 9-11 made most people regard al-Qaeda as a more-than-competent threat to Western interests. Additional large-scale, mass-casualty attacks, like those on the World Trade Center and the Pentagon, were thought to be impending. A contemporary appraisal of al-Qaeda's tactics, however, indicates that the group instead prefers small-scale, low-tech attacks. Pundits and academics alike continue to caution that al-

Qaeda's reach and devotion make it all the more likely the group will acquire WMD; some still believe al-Qaeda could succeed where Aum Shinrikyo failed. In truth, al-Qaeda's Project al-Zabadi is more on par with the hoaxes that followed Amerithrax than it is with anything Aum Shinrikyo attempted. Al-Qaeda's efforts in the field are no more noteworthy than that of other, lesser terror outfits. The Minnesota Patriot's Council's lackluster attempt at extracting ricin (in the early '90s) is more advanced than anything in the historical record of al-Qaeda's quest for bioweapons: the right-wing group was able to produce "less than a gram of [ricin] powder...judged to be about five percent pure" (Clark 2008a, 36-37). Leitenberg chides U.K. authorities for sounding the bioterror alarm over the mysterious brown substance found in a coffee grinder (in the Wood Green apartment), pointing out that coffee grounds, not ricin, make for a more logical explanation (Leitenberg 2005, 27).

Supposedly, at least one of bin-Laden's bioterror attack plans "suffered a setback" when Khalid Sheik Mohammed was arrested in 2003 (Hellmich and Redig 2007, 382); this may signify that al-Qaeda's nascent bioweapons program was further thrown into disarray upon the death of bin-Laden. Perhaps the attrition of other key al-Qaeda members over the last decade has led the group to abandon their loftier, 'spectacular' attack goals altogether. The absence of any al-Qaeda-driven bioterror attacks along with

the diminishing frequency of press reports linking the group to bioweapons pursuit strongly supports this idea.

There is a noticeable disconnect between the science surrounding bioterror agents and the way in which Washington frames the threat. For one, the nation's numerous bioterrorism exercises demonstrate a propensity for exaggeration: "...there [are] concerning differences in the projected infection rates, death rates, and person-to-person transmission potential" (Russotti 2006). Leitenberg covered many of the inconsistencies between exercise scripting and real world parameters, such as al-Qaeda splinter groups being able to both acquire and effectively weaponize *V. major* or *Y. pestis* (Leitenberg 2005, 48). Incongruously, exercise planners frequently use smallpox for hypothetical bioterror scenarios even though it is far from the likeliest threat. In Black ICE, a joint U.S.-Switzerland bioterror exercise in 2006, the planners used smallpox as the bioterror agent, but they at least wrote the method of delivery as witting terrorist hosts traveling on international flights (Black ICE 2006). Congress mandates annual national-level exercises (NLEs) to test federal, state, and local responses to terror / catastrophic events in the homeland. Interestingly, the last time one of these NLEs used a bioterror type of attack was in 2005, in TOPOFF III. Therefore, it is difficult to assess if the U.S. is still in the habit of inflating the morbidity and mortality rates of particular biological agents.

Even if Federal exercises planners have moved away from bioterrorism scenarios, U.S. politicians continue to overstate the threat. The Graham/Talent Commission's 2008 prediction that a terrorist-made chemical or biological weapon would be used against the U.S. by 2013 has since proven false. Congresswoman Brooks' recent lamentation that the memories of Amerithrax have "receded from too many people's memories" demonstrates how D.C. continues to lean on past tragedy to provide the basis for present-day biodefense measures even though the U.S. has taken several steps to defend against bioweapons since Amerithrax (Brooks 2014). Project BioShield and Project BioWatch, along with increased national stockpiles of vaccines and dedicated multi-tiered biological response training (down to local municipalities) make the nation considerably more prepared to deal with a bioterrorism incident than it was back in 2001. Why does Washington continue to sound the alarm on bioterrorism if, as William Clark claims, "...those who argued most strongly for a vigorous effort by the United States to defend itself...never considered bioterrorism more than a low-probability, high-consequence possibility" (Clark 2008a, 190)?

While the White House and Congress could rightfully be accused of crying wolf based solely on the embellishment with which they frame the bioterror threat, recent events may portend otherwise. The deteriorating stability of the Assad regime in Syria may be the biggest danger in this area. The focus on Assad's WMD programs has been mainly fixed on chemical

weapons but Syria has long been considered as having a commensurate bioweapons program. Furthermore, questions abound about the stability of Libya's purported bioweapons stores since the ouster of Qaddafi's government in 2011. Al-Qaeda may have difficulty cultivating agents on their own due to the "fragile and fastidious" nature of most deadly microbial agents, but the possibility that they could acquire stores of ready-made bioweapons is a serious and pressing concern (Leitenberg 2005, 49). Reportedly, some Syrian laboratories have been looted and the country's bio-pharmaceutical sector is in disarray (Ehrenfeld et al 2013). Intriguingly, charges brought against Yazid Sufaat, the leader of al-Qaeda's anthrax program, after his February 2013 re-arrest, tied Sufaat to terrorist activity in Syria (Associated Press 2013).

Lone wolves, not terror groups, constitute the far more appreciable bioterrorism threat. The 2009 shooting at Fort Hood demonstrates the ability of extremist elements to radicalize American insiders. According to FBI conclusions in the Amerithrax case, scientist Bruce E. Ivins, who worked at Fort Detrick, Maryland, was the sole perpetrator of the anthrax mail attacks (FBI 2014). Prior to the Ivins episode, another American microbiologist, Larry Wayne Harris, ran afoul of the FBI on more than one occasion: in 1995, he acquired vials of *Y. pestis* (before it was illegal to do so) and later, in 1998, he boasted to colleagues that he was in possession of weapons-grade anthrax (he only had animal anthrax vaccine strains) (Ellis 2014,

214). Hellmich and Redig's assertion that "there is no guarantee that an American national cannot be converted to the cause of al-Qaeda" is irrefutable (Hellmich and Redig 2007, p. 388). However, this argument glosses over the layered security protocols the U.S. and many other countries have implemented over the years since Amerithrax: "steps have been taken to assure that commercial access to pathogens of the quality used in that attack are placed beyond the reach of even the relatively few who know where to look for them in the first place" (Clark 2008a, 180).

Naturally occurring pathogens will continue to pose a far more serious and valid threat than any bioterrorism scenario. Seasonal influenza is consistently in the top 10 leading causes of death in the U.S. per year, the current Ebola outbreak in Guinea has the World Health Organization scrambling, and the vast majority of biodefense specialists consider highly pathogenic viruses, like H5N1 (bird flu), the biggest threat to the American way of life (Hoyert and Xu 2012, 4). Thankfully, the consistent flow of bioterrorism hyperbole coming out of Washington has produced a "tail wagging the dog" upshot: a decade's worth of established U.S. biological counter-measures has, in effect, bolstered the nation's defenses against natural pandemics (Clark 2008b).

Within the span of one week in 2001, television screens replaced images of the Twin Towers' collapse with those of people being evacuated from the U.S. Capitol building due to suspected anthrax. At the time, it was

easy to conclude that bioweapons would play a significant role in the brave new world of international terrorism. Yet, the last decade has evidenced that the Amerithrax case was more an anomaly than a harbinger; at present, Amerithrax remains the only concrete example of a successful bioterror attack on U.S. soil. Considering the biodefense measures the nation has taken since 2001, as well as the overwhelming evidence that even the most competent terrorist organizations have never advanced a bioterror program “beyond the initial exploratory” stage, the lack of other 21<sup>st</sup> century bioterrorism incidents is not surprising (Roul 2009). Consequently, the present, pervasive contention that America needs to worry about al-Qaeda using genetically modified pathogens, as imparted by academics such as Ellis, Sharoff, and Weitz, is all the more absurd.

Research strongly suggests the threat of bioterrorism is consistently overblown. However, in an age where extremists have demonstrated global reach and regimes with bioweapons stockpiles are increasingly at risk of collapse, bioterrorism can never be outright dismissed. Moreover, the U.S., let alone any nation, cannot fully insulate itself against lethal microbial agents, be they intentionally spread or naturally occurring. The Obama administration continually trumpets nuclear terrorism as America’s number one security concern, but that focus hasn’t curbed the funneling of billions of annual tax revenue towards the countering of bioterrorism (Jackson 2010). Even though Washington could not conceivably be expected to ignore the

potentiality for bioterrorism in the 21<sup>st</sup> century, it could, hopefully, begin to curb its habitual “misappropriation of funds and misallocation of priorities” (Leitenberg 2011). To that end, this paper makes two suggestions: (1) Washington should ensure that biodefense money which is allocated for the scientific exploration and stockpiling of particular vaccines / drugs for bioterror agents be equally applied to natural pandemic threats and (2) policymakers should undertake a concerted effort to educate the public at large about reasonable expectations and government responses to an outbreak of any type; doing so may hopefully alleviate a portion of the persistently predicted impact either a pandemic or small-scale bioterror attack would have on U.S. infrastructure while simultaneously slimming bloated biodefense spending.

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